

Green Roof Systems



BMI

Canopia

Guide to our complete green and blue roofing solutions

bmigroup.com/uk

Meeting your needs: complete system solutions

Our market-leading brands cover every roofing technology, so we can recommend the best solution for our customers' needs.

Our philosophy is to look beyond just roofing products. Individually, our products offer exceptional performance. Working together, they offer unrivaled reliability and excellence.

That's why we are committed to developing complete and integrated systems which combine technologies, products, components and accessories with specialist support, services, training and guarantees.

We ensure a perfect alignment of form, function and performance.

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Why choose a BMI Canopia Green Roof?

Canon Burrows Primary School, Ashton-under-Lyne.

As the global leader in roof waterproofing systems, BMI offers comprehensive beginning-to-end project support to provide the strongest possible foundation for every green roof project. BMI is dedicated to providing the right balance of system performance, reliability and cost to help you meet the challenge of delivering best value.

THE STRENGTH OF A GLOBAL PARTNER

BMI Canopia builds its position on 160 years of experience in roofing and waterproofing. This demonstrates our commitment to provide waterproofing and green roof systems which can fully satisfy your project requirements.

SINGLE SOURCE RESPONSIBILITY

BMI Canopia as a single source provider eliminates the significant risk of problems occurring over liability should faults occur in the waterproofing integrity.

Our multi-product portfolio includes reinforced bitumen systems, single-ply and solvent-free liquid applied waterproofing which allows us to specify without any bias the correct solution for the roof in question.

COMMITMENT TO SUSTAINABILITY

As a company, BMI Canopia is proud of its strong environmental credentials, actively promoting the recycling of its products whenever possible, in order to minimise the use of raw materials and energy in the development and production of roofing and waterproofing solutions.

This means that many of our products already meet and often exceed environmental standards, and are already recognised by many of the industry bodies promoting excellence in this field.

TECHNICAL EXPERTISE

The financial implication of inappropriate design, poor recommendation or substandard product and workmanship can be considerable and can impact on the long term performance of the building. The BMI Canopia approach to any roof is well proven over many thousands of successful projects and ensures success from the initial design and consultation to the guarantee sign off.



ISO 9001



ISO 14001



Benefits of a Green Roof

IMPROVED AIR QUALITY

Green roof planting will improve air quality by absorbing atmospheric carbon dioxide and releasing oxygen.

ROOF MEMBRANE PROTECTION

Vegetation on a roof deck protects the roof surface from the extremes of weather, temperature and ultra-violet radiation, prolonging its life.

WILDLIFE HABITATS

Rooftop habitats can provide a 'green link' connecting natural pockets of habitat with each other. They can also provide isolated habitats, which aren't disturbed by other green areas at ground level.

IMPROVED TEMPERATURE REGULATION

Through the daily cycles of condensation and evaporation, plants are able to cool and humidify the surrounding air improving the micro-climate.

REDUCED STORM-WATER RUN-OFF

Water is stored by the green roof substrate and then taken up by the plants from where it is returned through transpiration and evaporation into the atmosphere. Green roofs also delay the time at which run-off occurs, resulting in decreased stress on drains and sewers at peak flow periods.

REDUCED ENERGY COSTS

The layers of a green roof system are able to improve the thermal performance of the roof, thereby reducing solar gain.

ATTRACTIVE DESIGN OPPORTUNITIES

Urban greening has, for a long time, been seen as a way to make towns and cities look more pleasing to the eye, and be of great value to the well being of building users.



Types of Green Roof



West Port, Edinburgh.

There are a number of different types of green roof, defined by the way they are used. The basic types of green roof fit into either extensive or intensive categories, but there are also those which are a hybrid of both - these types of systems could be termed semi-extensive or semi-intensive.

INTENSIVE SYSTEMS

These systems are designed to be accessible and used as recreational spaces, and often involve many features similar to traditional ground level gardens which can include paving, water features, lawns, shrubs and trees.

These intensive 'roof gardens' are soil based multi layered systems and are so called because they are labor-intensive requiring higher levels of irrigation, feeding, and other maintenance compared to their extensive counterparts.

EXTENSIVE SYSTEMS

Extensive green roof systems are generally intended to be viewed from another location as a decorative and ecological feature maximising otherwise unused space for biodiversity or aesthetic appearance. They are not normally used as a recreational space to be walked through or sat in and often have limited access for maintenance only.

Extensive Sedum Roofs

The sedum family of flowering plants is widespread throughout the Northern Hemisphere, varying from annual and creeping herbs to shrubs. They are succulents and therefore have leaves which are able to store water, making them ideal for green roofing applications.

Extensive Biodiverse / Meadow Roofs

Biodiverse and meadow roofs are intended to generally provide a habitat to create a wider diversity of flora and fauna compared to a traditional sedum green roof. They are often designed to either recreate or even improve the habitat that was lost when the building was erected. These types of roofs can be constructed to provide the right conditions for specific plants which in turn support other insect and bird species. Often wildflowers, grasses and sedums are the main species of vegetation designed to thrive within such systems.

Green roof systems can be established in a number of different ways which generally relate to budget, location, logistics and aesthetics:

- **Vegetation Mats.** Pre-grown vegetation mats which are laid onto the surface of the substrate are an ideal way to create a green roof that provides instant impact. This method of establishment is very common with extensive sedum and meadow systems. Of course, installing a pregrown lawn turf is also a common method of creating an intensive recreational area.

- **Plug Plants.** This method uses individually planted plug plants allowing a greater flexibility in the choice of species for the green roof, and is generally more cost effective compared to using vegetation mats. However, the establishment time to get full ground cover is longer (2 - 3 years).

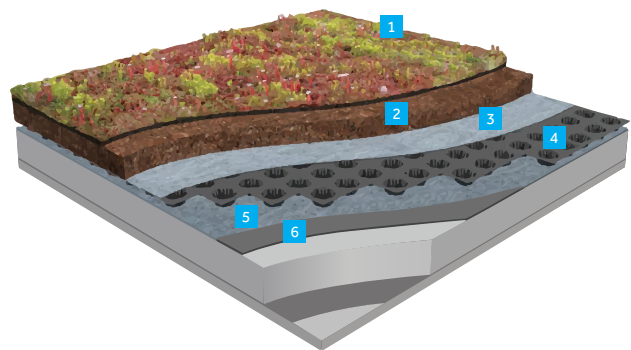
- **Seed.** Mixed seeds can be sown over the top of the installed substrate to create the habitat of choice. Although very cost effective, it takes several years for the vegetation to establish, therefore the combination of seed with plug planting is often used to speed up colonisation of the green roof.



BMI Canopia Green Roof Systems

BMI CANOPIA ST SEDUM MAT SYSTEM

An extensive lightweight green roof system utilising a pre-grown vegetation mat of 8 to 12 sedum species. Provides an immediate green planting scheme for instant impact. The vegetation mat is installed on a shallow depth of specially formulated free-draining substrate and drainage board.

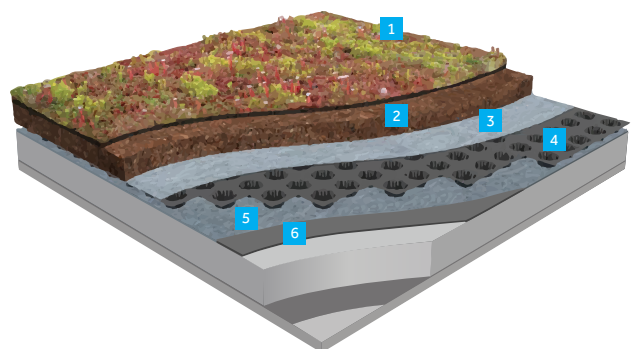


- 1 Canopia Extensive Sedum Mat
- 2 Canopia Extensive Sedum Substrate
- 3 Canopia Filter Fleece
- 4 Canopia Drainage Board
- 5 Canopia Protection Fleece
- 6 BMI Waterproofing System

System dry weight	80 kg/m ²
System saturated weight	100 kg/m ²
System typical depth	104 mm
Growing substrate depth	60 mm (settled)
Contouring	Flat / level

BMI CANOPIA LIGHTWEIGHT SEDUM MAT SYSTEM

An extra lightweight green roof system utilising a pre-grown vegetation mat of 8-12 species. The vegetation mat is installed on a very shallow depth of a specially formulated lightweight substrate with high water storage capacity.



- 1 Canopia Extensive Sedum Mat
- 2 Canopia Extensive Sedum Substrate
- 3 Canopia Filter Fleece
- 4 Canopia Drainage Board 20 mm
- 5 Canopia Protection Fleece
- 6 BMI Waterproofing System

System dry weight	Min. 25 kg/m ²
System saturated weight	Min. 53 kg/m ²
System typical depth	50 mm
Growing substrate depth	30 mm (settled)
Contouring	Flat / level

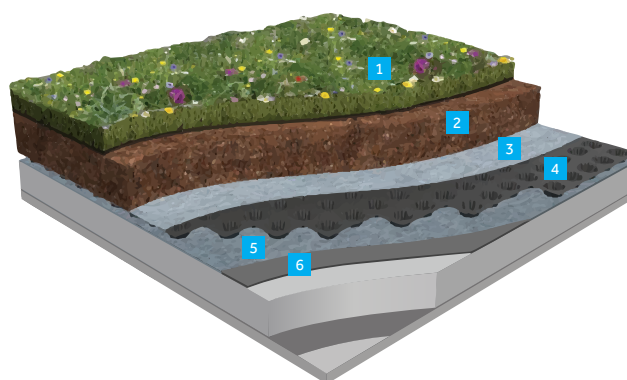


MoHo Apartments, Manchester.

BMI CANOPIA ST WILDFLOWER MAT SYSTEM

An extensive lightweight green roof system utilising a pre-grown vegetation mat sown with a mix of thirty eight wildflower and grass species. Meadow systems are designed to create the look of a terrestrial wildflower meadow and the use of a pre-grown mat creates a green planting scheme with instant impact. The vegetation mat is installed on a shallow depth of specially formulated free-draining substrate and drainage board.

System dry weight	120 kg/m ²
System saturated weight	165 kg/m ²
System typical depth	155 mm
Growing substrate depth	100 mm (settled)
Contouring	Flat / level

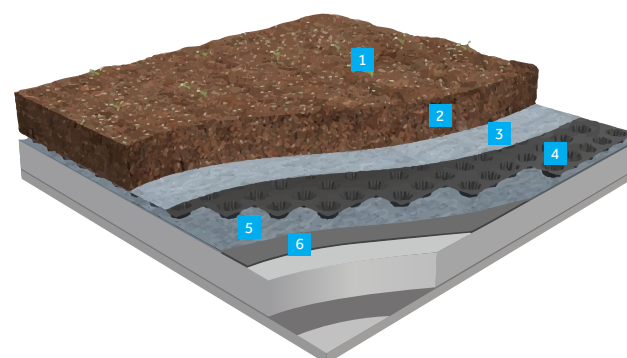


- 1 Canopia Extensive Wildflower Mat
- 2 Canopia Extensive Biodiverse Substrate
- 3 Canopia Filter Fleece
- 4 Canopia Drainage Board 20 mm
- 5 Canopia Protection Fleece
- 6 BMI Waterproofing System

BMI CANOPIA ST WILDFLOWER SEEDED SYSTEM

An extensive green roof system utilising a specially formulated free-draining substrate and drainage board. A wildflower and grass seed mix is broadcast over the surface of the substrate, and lightly worked in to germinate and grow over time.

System dry weight	Typically 100 kg/m ²
System saturated weight	Typically 150 kg/m ²
System typical depth	145 mm
Growing substrate depth	100 mm (settled)
Contouring	Undulated 75 – 125 mm

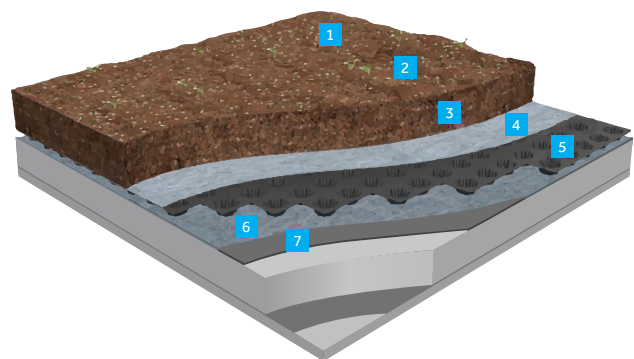


- 1 Canopia Extensive Wildflower Seed Mix
- 2 Canopia Extensive Biodiverse Substrate
- 3 Canopia Filter Fleece
- 4 Canopia Drainage Board 20FF
- 5 Canopia Protection Fleece
- 6 BMI Waterproofing System

BMI Canopia Green Roof Systems

BMI CANOPIA BIODIVERSE SEED & PLUG SYSTEM

An extensive green roof system designed to create a biodiverse habitat utilising a specially formulated free-draining substrate and drainage board. The vegetation is created using both wildflower / grass seed and plug plant mix which is allowed to grow and develop over time.

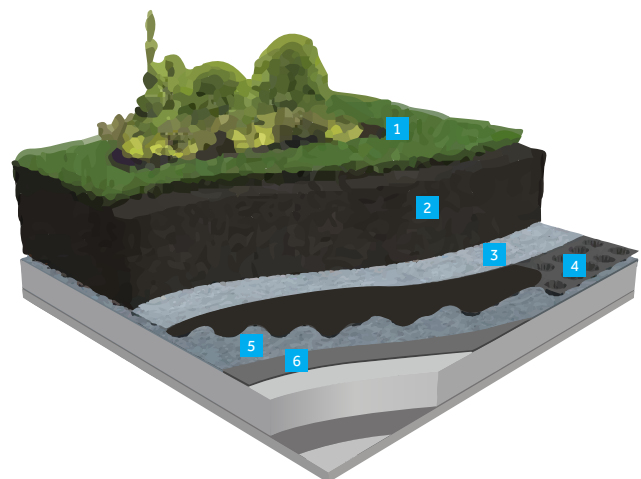


- 1 Canopia Extensive Biodiverse Plug Plants
- 2 Canopia Extensive Biodiverse Seed Mix
- 3 Canopia Extensive Biodiverse Substrate
- 4 Canopia Filter Fleece
- 5 Canopia Drainage Board 60 FF
- 6 Canopia Protection Fleece
- 7 BMI Waterproofing System

System dry weight	Typically 100 kg/m ²
System saturated weight	Typically 150 kg/m ²
System typical depth	145 mm
Growing substrate depth	100 mm (settled)
Contouring	Undulated 75 – 125 mm

BMI CANOPIA INTENSIVE SYSTEM

An intensive green roof system designed for ground cover, shrubs and trees. The depth of topsoil can be varied to accommodate the specific planting to be installed. The system composes of a specially formulated free-draining topsoil above a drainage board.



- 1 Canopia intensive plant scheme
- 2 Canopia lightweight topsoil / intensive substrate
- 3 Canopia Filter Fleece
- 4 Canopia Drainage Board 60 mm
- 5 Canopia Protection Fleece
- 6 BMI Waterproofing System

System dry weight	200 – 1100 kg/m ²
System saturated weight	300 – 1500 kg/m ²
System typical depth	250 – 1200 mm
Growing substrate depth	200 – 1000 mm (settled)
Contouring	To requirements

Design Considerations for a Successful Green Roof

For a green roof to flourish it requires suitable amounts of sunlight, water, sufficient drainage and aeration to encourage healthy plant growth. To deliver a successful green roof the designer must consider the building's position and location, along with the orientation of the roof during the day and any shade from surrounding buildings. The roof's height can have an affect due to wind action, and can cause wind scour of the substrate. Pebble borders are generally used to avoid this.

The additional weight loading from a green roof is a major factor to consider as the structure must have sufficient load bearing capacity to support a water saturated green roof system. The roof must have sufficient drainage which will help reduce the imposed loads and prevent excessive saturation of the growing substrate which can lead to deterioration of the planting.

A green roof will require regular safe access for maintenance and it is important that adequate fall protection measures are put in place to allow for safe inspection and maintenance of the roof.

The waterproofing system is paramount to the success of the green roof, as it is fundamental to prevent water ingress into the building. Many BMI waterproofing systems are suitable for use beneath a green roof and it is essential, when designing the roof details, that all adjacent building elements and interfaces are considered.

Green roofs will require water and provision for irrigation should be considered at the planning stage. All Green roofs will require irrigation during the establishment period and so a temporary water source should be provided. Intensive roof planting and lawns will require a permanent irrigation system to keep them supplied with water during hotter, drier, summer months. Extensive roofs will only need irrigating during the establishment phase, and very little subsequently except during longer periods of drought. Pitched roofs retain less water and therefore a permanent irrigation system should be considered.

COMPARISON

The table below provides a comparison of some of the differences between extensive and intensive green roof systems.

	Intensive Systems	Extensive Systems
Usage	Generally as a recreation space.	Generally for visual / environmental / biodiversity.
Landscaping	Trees, shrubs, lawn turf, hard landscaping.	Sedums, wildflowers, grasses, mosses.
Maintenance	Regular maintenance required.	Minimal requirement.
Irrigation	Regular irrigation required. Usually dedicated systems installed	Only generally required during the establishment phase, or in times of prolonged drought conditions.
Build-up depth	Typically around 200 – 1000 mm.	Typically around 80 – 200 mm.
System weights	Typically 150 – 1000 kg/m ² .	Typically 100 – 180 kg/m ² .
Roof slopes	Less suited to sloped roofs.	Suitable for flat or pitched roofs (with suitable retention systems in place).
Water Attenuation	Greater water attenuation due to deeper substrate depths.	Less water attenuation due to shallower substrate depths.

BMI Blue Roofs



BMI Blue Roof Solutions



Horbury Academy, Wakefield.

The BMI Blue Roof Systems are designed to explicitly store rainwater over a period of time, with each system designed specifically for each project.

BENEFITS OF A BLUE ROOF

There are many benefits of a blue roof, depending on design:

- temporary storage of rainfall to mitigate run-off impacts;
- reducing flow rate of the roof;
- storage of water for reuse, such as irrigation; and
- make up the drainage and support layer for green roofs.

TECHNICAL EXPERTISE

Our Technical Advisors can assist with the design, specification and supporting calculations required for a BMI Blue Roof system or hybrid system in conjunction with a Canopia Green Roof. Combining extensive roofing and waterproofing knowledge and expertise with sustainability, water management and attenuation recommendations.

The BMI approach to any roof is well proven over many thousands of successful projects and ensures success from the initial design and consultation to project sign-off.

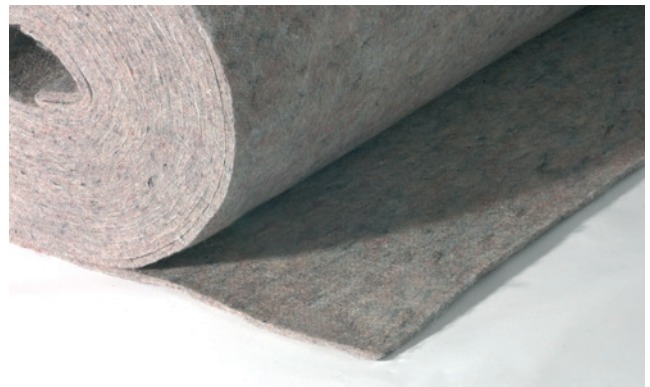
SINGLE SOURCE RESPONSIBILITY

BMI as a single source provider eliminates the significant risk of problems occurring over liability should the integrity of the waterproofing be comprised. Our multi-product portfolio includes reinforced bitumen systems, single-ply and solvent-free liquid applied waterproofing which allows us to specify without any bias the correct solution for the roof in question.

BMI Blue Roofs: Water Retention Solutions

BMI BLUE ROOF PROTECTION & STORAGE FLEECE – RMS 900

- Protects root barrier membrane or roof membrane from damage and stores water.



BLUE ROOF SUCTION & CAPILLARY FLEECE – RMS 500K

- 100 % PES needle fleece.
- Puncture resistance 2,600 N (EN ISO 12236).
- Vertical water permeability 37 L/s x m² (EN ISO 11058).
- Mechanically strengthened and detector tested.
- Rotproof.
- PES hydrophilic.
- Recyclable.



BMI BLUE ROOF PROTECTION & STORAGE FLEECE – RMS 300

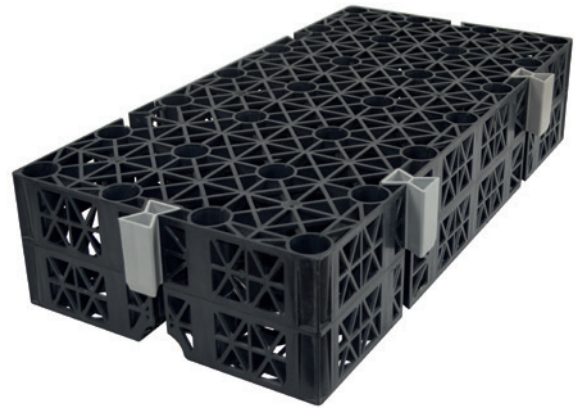
- Protects roof membrane against damage and stores water.





BMI BLUE ROOF WATER RETENTION BOX – 150 mm

- Cavity suitable for water retention.
- High pressure stability.
- Adjusted to specific project requirements.
- With capillary columns.



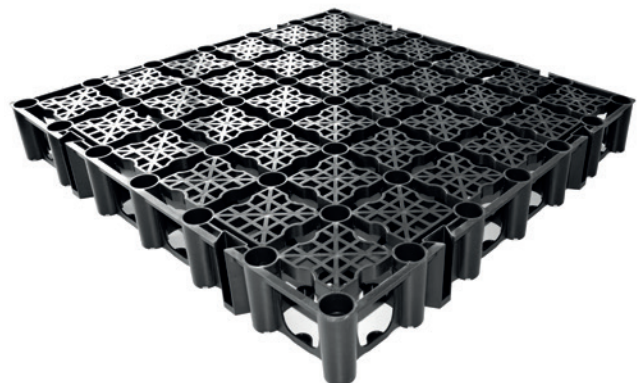
BMI BLUE ROOF WATER RETENTION BOX – WRB 85v

- 100% recycled PP (polypropylene).
- Approx. 95 Vol. % cavity volume for water retention.
- Coordinated via super structure above .
- High water storage volume.
- Low weight.
- With capillary columns.
- Recyclable.



BMI BLUE ROOF WATER RETENTION BOX – WRB 85i

- Cavity suitable for water retention.
- High pressure stability.
- Adjusted to specific project requirements.
- With capillary columns.



BMI Blue Roofs: Water Retention Solutions

BMI BLUE ROOF WATER RETENTION BOX – WRB 80F

- High cavity volume for water retention.
- Water retention adjustable to the green build up above.
- High water storage capability.
- With capillary columns.



BMI BLUE ROOF FILTER FLEECE – FIL 300

- Prevents fine particles from forming sludge in the drainage layer, high water permeability.



BMI BLUE ROOF FLOW CONTROL SYSTEM – ASF 70/100/125

- Flow control hole can be fitted at a defined height according to the property-related calculation via the waterproofing, through which rainwater can be collected.





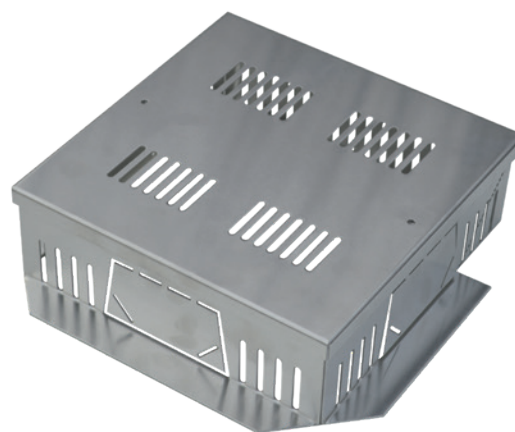
BMI BLUE ROOF FLOW CONTROL SYSTEM – ALD 100-110

- Flow control hole can be fitted at a defined height according to the property-related calculation via the waterproofing, through which rainwater can be collected.
- The roof drainage outlet is to be installed by a professional (e.g. roofer) according to the manufacturer's specifications.



BMI BLUE ROOF INSPECTION CHAMBER

- Chamber walls and cover with inlet slots, possible to connect 2 lengths triangle water conduit plus on three sides.
- Chamber cover with inlet slots, compressive strength approximately 150 kg.
- Insensitive to humic acid.
- Reverse releasable 80 mm high.
- Accessories: 50 mm and 100 mm height extensions available.



Waterproofing Systems



Eastleigh House, Totnes, UK

The waterproofing is paramount to the success of a green roof. It has a fundamental requirement to prevent water ingress into a building and resist damage from root penetration. The roofing system also provides thermal performance, roof drainage falls, air tightness and vapour control to the building.

BMI's experience in waterproofing technology allows us to deliver the correct specification of roof membrane and system to suit the criteria of the green roof project based on the choice of landscaping, performance and robustness required.

REINFORCED BITUMEN MEMBRANES

A multi-layer elastomeric Reinforced Bitumen Membrane (RBM) system incorporating the Rootbar Capsheet provides a high performance and extremely robust waterproofing system suitable for use under a wide range of green roof systems.

SINGLE PLY MEMBRANES

Sureplan FPO and Monarplan PVC single-ply membranes provide a lightweight high performance waterproofing option. The nature of single-ply membranes makes them more suited to extensive roof systems. Green roof waterproofing systems using Icopal Universal WS combine the benefits of a single layer membrane with the robustness of a bitumen membrane.

LIQUID APPLIED ROOFING

Sealoflex cold applied liquid waterproofing offers environmentally considerate and flexible solutions to previously frustrating and difficult waterproofing problems.

HOT MELT STRUCTURAL WATERPROOFING

The Parabit Hot Melt Structural Waterproofing System offers a seamless highly elastomeric bitumen waterproofing option ideally suited to large scale applications such as intensive roof systems and podium decks.





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BMI UK & Ireland is part of the world's largest roofing and waterproofing manufacturer. A global business specialising in building materials for today's and tomorrow's needs. BMI is a new name, backed-up with over 180 years of experience and knowledge. Bringing together the roofing expertise of industry leading Icopal and Redland and their experience in the specification, manufacture and supply of flat and pitched roofing solutions. United to deliver excellence for our customers.

Learn more at www.bmigroup.com/uk