

150 Holborn

DISCHARGE OF PLANNING CONDITONS
Condition Reference 29 - Green Roof

Planning Requirement:**Condition 29**

Full details in respect of the green roof in the area indicated on the approved roof plan shall be submitted to and approved by the local planning authority before the relevant part of the development commences. Details of the green roof provided shall include: species, planting density, substrate and a section at scale 1:20 showing that adequate depth is available in terms of the construction and long term viability of the green roof, as well as details of the maintenance programme for green roof.

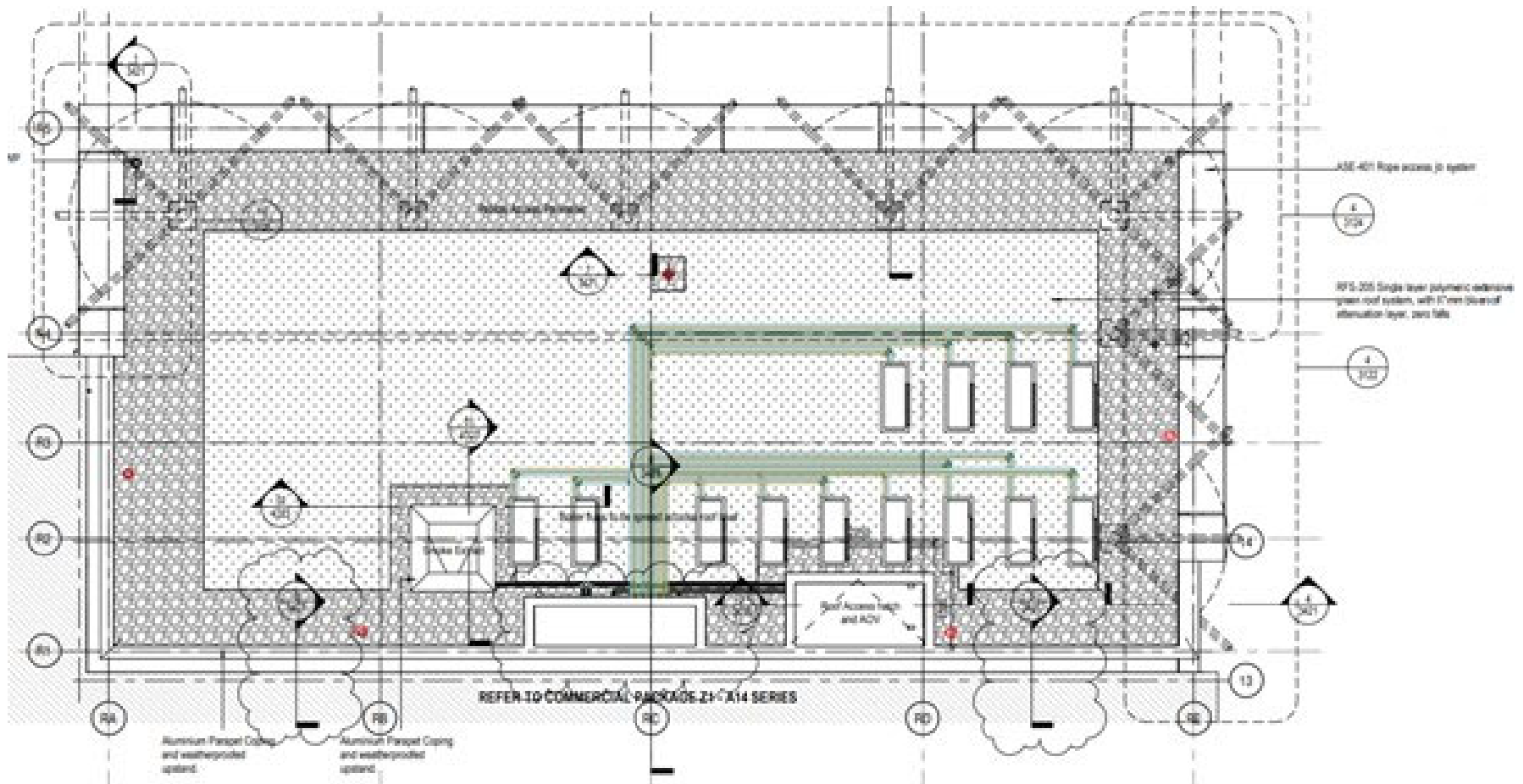
The buildings shall not be occupied until the approved details have been implemented and these works shall be permanently retained and maintained thereafter.

Reason: In order to ensure the development undertakes reasonable measures to take account of biodiversity and the water environment in accordance with policies A3, CC2, and CC3 of the London Borough of Camden Local Plan 2017.

Development Proposals – Residential Building : Soft & Hard Landscape

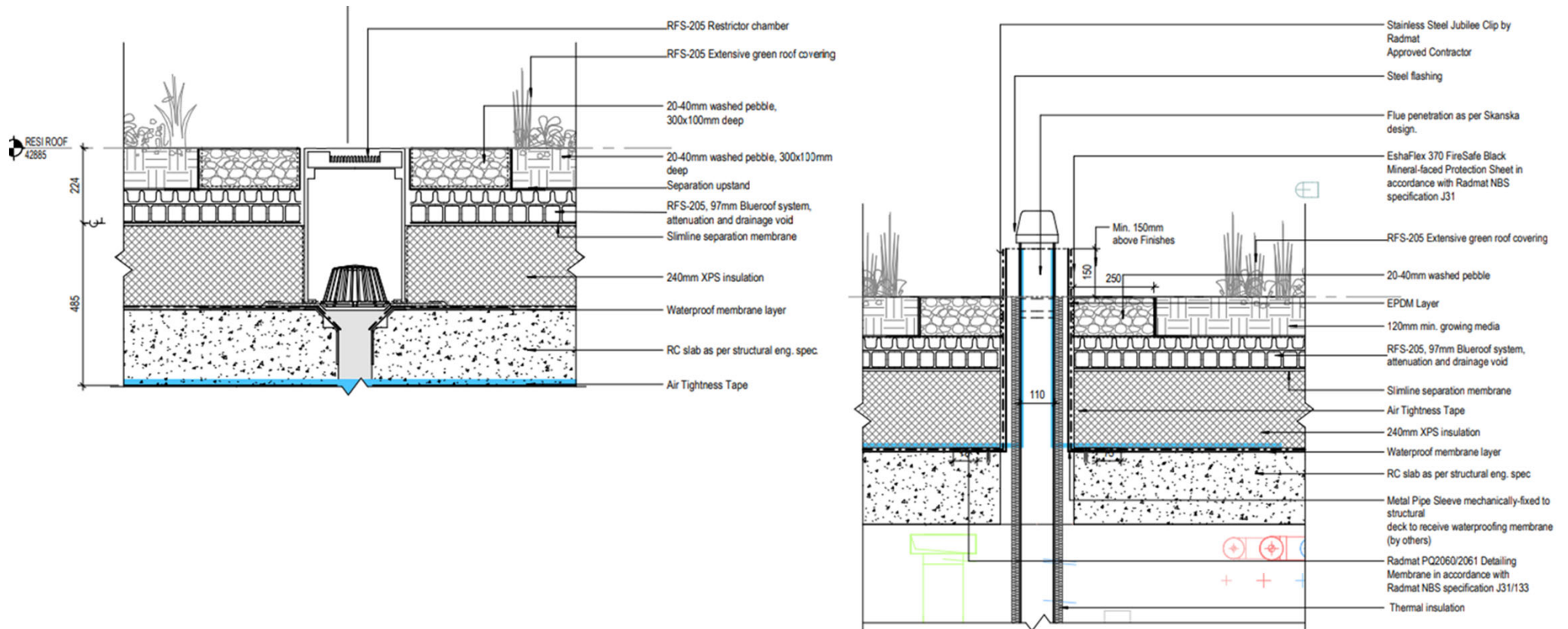
The Residential roof does not have any gardens or public spaces. This is simply for maintenance purposes only. It does however include a green roof above the blue roof attenuation system, and a pebbled access route around the perimeter.

See below details and technical literature overleaf.



Development Proposals – Residential Building : Green Roof Details

The green roof consists of a Sedum blanket / Growing medium on top of Filter fleece membrane which in turn sits on the Bluerooft attenuation system. All of this sits on top of the insulation and main inverted waterproofing layer.



GM20 Extensive Growing Medium

Product Data Sheet



A green roof substrate consisting grades of crushed brick blended with a green compost for sedum based green roofs or composted bark for wildflower based green roofs.

GM20 Extensive Growing Medium

General Information

Radmat GM20 Extensive Growing Medium provides a suitable base for a self-sustaining plant community consisting of pre-grown sedum plug plants or pre-grown sedum blankets (see separate Product Data Sheets for species options). Consisting of a blend of 2/5mm, 5/10mm and 5/15mm grades of crushed brick mixed with 10mm PAS100 green compost. Compliant with GRO substrate guidelines.

Application areas

Sedum based green roofs using pre-grown sedum plugs or pre-grown sedum blanket. Install GM30 extensive growing medium on either Radmat D25 or D40 drainage/reservoir board covered with G11 filter fleece in accordance with the Radmat specification.

Installation instructions

Apply to a depth as specified according to plant type allowing 10% post installation settlement. Indicative substrate depths are given in the table below, however the specified depth will vary based on a variety of factors including design load, building location, building height, plant species etc. It is therefore important to consult the project specification.

Planting Method	Roof Type	Post settlement substrate depth
Pre-grown sedum plugs	Inverted Roof	80mm
Pre-grown sedum blanket	Inverted Roof	70mm
Pre-grown sedum plugs	Warm Roof	60mm
Pre-grown sedum blanket	Warm Roof	50mm

Delivery conditions

Delivery Form

1.2m³ Bulk Bags
25 litre Sacks.

Storage and transport

Delivered on a pallet.
Store flat.

TECHNICAL FEATURES

Essential Characteristics		Performance	Unit
Grain size distribution	Particle size below 0.063mm	2.1	Mass %
	Particle size > 4.0mm	92.8	Mass %
Weight per volume	Dry	1000	kg/m ³
	Weight by max water capacity	1260	kg/m ³
Water / Air conditions	Total pore volume	63.3	Vol %
	Maximum water capacity	25.8	Vol %
	Air content as max water capacity	37.5	Vol %
	Hydraulic permeability	82	mm/min
Ph/Salinity	Ph value	7.6	
	Salinity (water extract)	1.97	g/l
	Salinity (gypsum extract)	1.28	g/l
Organic matter	Organic matter (LOI)	38	g/l
Available nutrients	Nitrogen (N)	34	mg/l
	Phosphorous (P)	≤ 50	mg/l
	Potassium (K)	≤ 500	mg/l
	Magnesium (Mg)	100	mg/l
Impurities	Tiles, glass, ceramics	0.0	% weight
	Metals, plastics	0.0	% weight
	Area sum for plastics	0.0	cm ² /l

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Med0 SedumPlus

Product Data Sheet



Product Data Sheet

General Information

Radmat SedumPlus sedum blanket is a low maintenance, drought resistant, ready to lay sedum vegetation blanket (Mat). Grown in the UK SedumPlus comprises sixteen varieties of sedum pre-grown in a strong biodegradable 450g/m² felt mat made from recycled British textiles.

Providing a variety of colour and interest, Radmat SedumPlus has been specially developed to provide a variety of different leaf types and flowers throughout the year whilst enhancing biodiversity. Colours range from greens through to vibrant reds, oranges, purples and browns at appropriate times of the Spring and Summer.

Installation instructions

Unroll over a suitably prepared and irrigated Radmat growing medium. Loosely butt sides and ends. Once installed irrigate for the prescribed period based on season.

Directions of applications

Delivery Form

Rolls

Storage and transport

48m² Delivered on a pallet. Store flat.

Product Dimensions		
Subject	Performance	Unit
Vegetative Coverage	80	%
Length	2.0	m
Width	0.6 or 1.2	m
Thickness	25	mm
m ² / roll	1.2 or 2.4	m ²
Weight / m ² (saturated)	25	kg
Species mix		
Variety	Common name	Description
Sedum Stoloniferum	Stolon Stonecrop	20cm, pink, starshaped flowers, red stems
Sedum Pulchellum	Widow's-cross	10cm, brilliant pink, rich flowering, lush green foliage
Sedum Oreganum	Oregon stonecrop	5cm, yellow, forms cushions, red-brown in sunlight.
Sedum Montanum	Jenny	20cm, golden, dark green needle-like foliage.
Sedum hybridum	Czars Gold	15cm, golden, rich flowering, reddish stems, ever green carpet
Sedum hispanicum	Spanish Stonecrop	10cm, cushion plant, whitish-pink, grey-green cushions.
Sedum Floriferum	Bailey's Gold	10cm, golden, evergreen, crenate foliage.
Sedum Ellacombianum	Selskianum hort	10cm, yellow, unbranched stems and scalloped leaves.
Sedum aizoon	Euphorbioides	40cm, abundant yellow star shaped flowers.
Sedum acre	Oktoberfest	6cm, bright cream-white starflowers, fresh green cushions.
Sedum acre	Yellow	6cm, yellow, mat-forming.
Sedum album	White	10cm, white umbel panicles.
Sedum Spurium	Coccineum	15cm, dark pink flowers.
Sedum Sexangulare	Tasteless Stonecrop	8cm, lemon yellow, dense sweet smelling foliage.
Sedum Reflexum	Crooked Yellow Stonecrop	30cm, yellow flowers with grey leaves.
Sedum telephium	Fabaria	40cm, dense purple-red umbels, dark stemmed, strong blue-green foliage. Attracts bees.

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Product Data Sheet

D25 Reservoir/Drainage Board

Article number:

General information: Radmat D25 is a drainage and water storage element for Extensive green roofing. Manufactured from recycled polystyrene Radmat D25 is chemically neutral, rotproof and resistant to mould and bacteria.

Radmat D25 is supplied in sheets 25 mm deep and is resistant to compression up to 238 kPa.

Certificates: CE 799-CPD-53

Installation instructions: Unroll over waterproofing membrane or protection fleece overlapping side and end laps by one cusplate.

Delivery conditions:

Delivery Form	Sheet
Storage and transport	Delivered flat on a pallet. Store flat.

Product Dimensions

Subject	Performance	Unit
Length	1.88	m
Width	0.90	m
m ² / Board	1.69	m ²
Weight / Board	1.79	Kg

Declared Performance

Essential characteristics	Performance	Units	According to	
Material	Recycled Polystyrene			
Weight	1060	gr/m ²		
Colour	black			
Height	25.0	mm		
Max. Crush Resistance (unfilled)	238	kPa	EN ISO 25619-2 06.2009	
Crush Resistance with 3.5 cm overfill	til 768	kPa	EN ISO 25619-2 06.2009	
Filling volume	10.1	l/m ²		
Water storage capacity (unfilled)	7.5	l/m ²		
Drainage capacity on				
	20 kPa load	1.180	l/ms	EN 12958
	100 kPa load	0.336	l/ms	EN 12958
	200 kPa load	0.112	l/ms	EN 12958
Fire protection classification	B2		acc. DIN 4102 part 2	

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Product Data Sheet

G11 Filter Fleece

Article number:

General information

Radmat G11 Filter Fleece is a needle punched polypropylene filter fleece for use as a protection and filter layer in green roofs.

Suitable for all types of green roof with a flat or sloped roof construction on new build or refurbishment.

To be covered within one month of application.

Certificates

n/a

Directions of application

Loose lay over a suitable Radmat reservoir and drainage panel.

Overlap adjacent rolls of Radmat G11 by a minimum of 150mm and turn up at all abutments the minimum depth of the growing media.

To be covered within one month of application.

According to guidelines given by Radmat Building Products Ltd.

Product description

Appearance	White polypropylene fleece
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Declared performance

Essential characteristic	Performance	Unit	Tolerance	Standard
Raw material	PP	---	---	---
Colour	White	---	---	---
Weight	150	g/m ²	+/- 10 %	EN ISO 9864
Length	100	m	---	---
Width	2	m	---	---
Roll	200	m ²	---	---
Weight per roll	30	kg	---	---
Thickness on	1.80	mm	+/- 20%	EN ISO 9863/1
	1.40	mm	+/- 20%	
	1.05	mm	+/- 20%	
CBR Puncture Resistance (stat.)	> 1500	N	+/- 10 %	EN ISO 12236
CBR Puncture Resistance (dyn.)	16	mm	+/- 10 %	EN ISO 13433
Classification according FGSV	3	GRK	---	
Tensile Strength MD	10	kN/m	- 1 kN/m	EN ISO 10319
Tensile Strength CMD	12	kN/m	- 1 kN/m	EN ISO 10319
Elongation	> 50	%	+/- 10 %	EN ISO 10319
Opening Size	0.074	mm	+/- 10 %	EN ISO 12956
Permeability in the plane	0.195	m/s	+/- 30 %	EN ISO 11058
Durability	At least 25 years in natural soil with a pH-value between 4 and 9 and a soil temperature of < 25° C.			

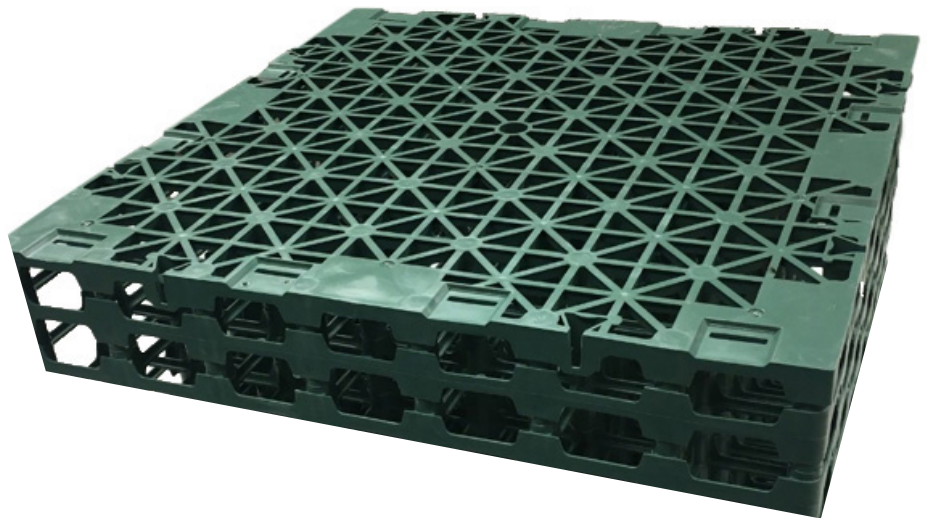
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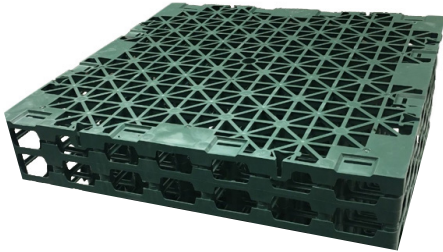
Blue Roof Storm Water System - SWG Geocell

Product Data Sheet



Provides attenuation as part of a Blue Roof system that is designed to manage and control incident rainfall at a rate in line with the SuDS strategy or attenuation for a development.

Product Data Sheet



General Information

The Radmat range of **SWG Blue Roof Geocells** provides attenuation as part of a Blue Roof system that is designed to manage and control incident rainfall at a rate in line with the SuDS strategy or the attenuation requirements for a development.

Manufactured from Polypropylene SWG Blue Roof Geocells are load bearing modular units that are clipped together to form a single or double layer attenuation cell that is wrapped in **Radmat G12 Geotextile Filter Fleece**. Used in conjunction with rainwater outlet restrictors to control discharge, the Blue Roof is designed to be half empty within 24 hours.

For a higher loading capability use SWB Blue Roof.

Property	Unit	SWG100	SWG150	SWG200	SWG300	SWG400	SWG600	
Length	mm	600	600	600	600	600	600	
Width	mm	600	600	600	600	600	600	
Height	mm	100	150	200	300	400	600	
Structure volume	m ³	0.036	0.054	0.072	0.108	0.144	0.216	
Storage volume	m ³	0.0324	0.0513	0.0684	0.1026	0.1368	0.2052	
Weight	kg	1.8	2.7	3.6	5.4	7.2	10.8	
Short term compressive strength	Vertical	kN/m ²	400	400	400	400	400	400
	Lateral	kN/m ²	100	100	100	100	100	100
Volume Void Ratio	%	90	90	95	95	95	95	
Average effective perforated surface	%	60	60	60	60	60	60	

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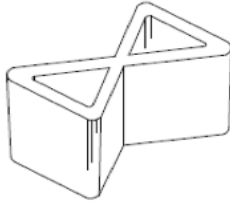
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Product Data Sheet

Ancillaries



Cross Connector



Twin Connector



Control End Plate



Installation

1. Install **Radmat G12 Geotextile Filter Fleece** over the roof surface and up all upstands, ensuring enough length is left around the installation for the G12 to wrap up the sides of the SWG Geocells, and enough to overlap a minimum 150mm onto the top of the SWG Geocells.
2. Lay **SWG Blue Roof Geocells**, clipping adjacent panels to each other using the SW Cross Connectors ensuring each SWG Blue Roof Geocell is correctly oriented for the clips to meet.
3. Cover with Radmat G12 Geotextile Filter Fleece ensuring minimum 150mm overlaps.
4. Immediately cover with the specified roof finish (green roof/paviors/ballast).

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