SEDUM GREEN ROOF COMPLIANCE PACK

Planning Application Ref: F/TH/23/1614

Condition 8 – Sedum Roof Specification and Maintenance

Introduction

This document has been prepared by GRASS Cliftonville CIC to support the discharge of Condition 8 of planning permission F/TH/23/1614. The condition requires the submission of precise details relating to the proposed sedum green roofs, including the substrate base, species mix, and a long-term maintenance scheme. The documentation that follows is provided to fully comply with the wording of the condition:

> *Within 9 months of the decision date, details of the sedum roofs, as set out in Appendix A received on the 20th June 2024, shall be submitted to and approved in writing by the Local Planning Authority prior to any superstructure works commencing on site. These details shall include:*
>
> *Precise details of the substrate base; Sample of the sedum mix, shall be submitted to the Local Planning Authority. The agreed mix of species shall be sown within the first planting season following the practical completion of the building works; and a landscape maintenance scheme.*
>
> *The sedum roofs shall not be used as an amenity or sitting out space of any kind whatsoever and shall only be used in the case of essential maintenance or repair or escape in case of emergency.*
>
> *The sedum roofs shall be carried out strictly in accordance with the details so approved and within the first planting season after the decision and shall be maintained as such thereafter.*
>
> *GROUND:*
>
> *To ensure the development provides the maximum possible provision towards creation of habitats and valuable areas for biodiversity in accordance with policy SP30 of the Thanet Local Plan*

Purpose of This Document

This submission contains all required data sheets and manufacturer guidance documents to:

- Provide full product specifications for the sedum roof system being installed.
- Describe the substrate composition and drainage layers.
- Confirm the species mix of sedum used.
- Outline a practical maintenance programme.
- Demonstrate the installation of a non-vegetated stone firebreak perimeter.

23 May 2025

Overview of the Proposed System

GRASS Cliftonville CIC will be installing the Sky Garden Sedum Blanket System. This is a loose-laid, pre-cultivated vegetation blanket comprising mature sedum plants, underlain by a multi-layered build-up that includes a protection fleece, drainage layer, and extensive substrate. It is specifically designed for extensive green roofs in exposed environments, such as our coastal site at The Oval in Cliftonville.

Key features include:

- Sedum blankets pre-grown with a mix of drought-tolerant, UK-cultivated sedum species.
- Installation over 80–100mm of extensive green roof substrate.
- Use of a protection fleece and drainage board under the growing medium.
- Riverstone fire breaks around roof perimeters and upstands to a width of 300mm.

Installation Method

Installation will follow Sky Garden's guidance:

1. Lay protection fleece directly over the waterproof membrane.
2. Install drainage board with filter fleece.
3. Spread extensive substrate to required depth, accounting for 10% settlement.
4. Unroll sedum blankets within 24 hours of delivery and lay edge-to-edge.
5. Water thoroughly immediately after installation and continue regular watering for 12 weeks.
6. Install 300mm wide riverstone fire breaks around the perimeter.

Maintenance Plan

The maintenance programme follows Sky Garden's guidelines for extensive sedum blanket systems and includes:

- Visual inspections and vegetation checks twice annually.
- Weed removal and cutting back of taller species post flowering.
- Debris clearance from fire breaks and drainage outlets.
- Watering during extended dry periods (6+ weeks without rain).
- Avoiding over-fertilisation and using only slow-release fertiliser if required.

Contents

23 May 2025

DATA SHEET

SKY GARDEN SEDUM BLANKET SGSB01

Version 1.1

SKY GARDEN SEDUM BLANKET

High quality Sedum Blanket grown in the UK, to provide the perfect low maintenance solution for extensive green roof systems using a carefully selected mix of sedum species. Sedum are the most commonly used plant species in green roofing due to their ability to grow in harsh weather environments.

Pre-cultivated UK grown vegetation blanket, containing 13 species specifically chosen for extensive green roof applications. Grown on 20 mm substrate base on a carrier.

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SYSTEM CONSIDERATIONS

- Instant vegetative cover for extensive sedum blanket systems.
- Recommended minimum substrate depth 60mm.
- Low maintenance, shallow rooted, non-invasive vegetation cover.
- Sky Garden recommends annual maintenance of sedum roofs to remove unwanted invasive species and to ensure long term system functionality and sustainability.

PHYSICAL PROPERTIES

Composition	Base - Geotextile fabric / coir blanket.
	Growing Medium – 20 mm Sedum Mix.
	Vegetation - Mature Sedum plants grown from rhizome and seed.
Plant Height	20-50 mm, depending on growing stage of sedum.
Weight (dry)	10 kg/m2
Weight (saturated)	30 kg/m2
Consignment Size	40 m2 per Pallet (approx.)
Colour	Seasonal variation
Sizes	2m x 1m
Species	• Sedum Acre • Sedum Album • Sedum Floriferum • Sedum Hybridum • Sedum Middendorffianum • Sedum Montanum ssp. orientale • Sedum Montanum • Sedum Pulchellum • Sedum Reflexum • Sedum Ellacombianum • Sedum Selskianum • Sedum Sexangulare • Sedum Spurium

DATA SHEET

SKY GARDEN PROTECTION FLEECE PF01

Version 1.0

SKY GARDEN PROTECTION FLEECE

Sky Garden protection fleece is a thick needle punched non-woven geotextile manufactured from 100% virgin polypropylene high tenancy fibres containing 1% active carbon black. Manufactured from a unique blend of high tenancy fibres providing class leading durability. Optimised for maximum strength, performance and UV stability.

- For use on all green roof and podium systems.
- 100% virgin polypropylene.
- 3.5mm thick.
- Supplied in 50m x 1m rolls weighing 14kg.
- BS EN ISO9001

TECHNICAL PROPERTIES

Mechanical Properties	Test Standard	Units	Product Value
Static Puncture (CBR)	EN ISO 12236	kN	2.5
Push through displacement	EN ISO 12236	mm	65
Tensile Strength (MD/CMD)	EN ISO 10319	kN/m	15
Tensile Elongation (MD/CMD)	EN ISO 10319	%	80
Cone Drop	EN ISO 13433	mm	10

Filter Properties	Test Standard	Units	Product Value
Apparent opening size	EN ISO 12956	µm	150
Water Permeability	EN ISO 11058	(l/m2·s)	100
Coefficient of permeability	EN ISO 11058	(m/s 10-3)	7

Durability	Test Standard	Product Value
Weathering 50 MJ/m2 (1 month)	EN ISO 12224	>90% Retained Strength
Microbiological Resistance	EN ISO 12225	No Loss in Strength
Resistance to Acids & Alkalis	EN ISO 14030	No Loss in Strength
Oxidation at 112 days (110 years)	EN ISO 13438	>90% Retained Strength

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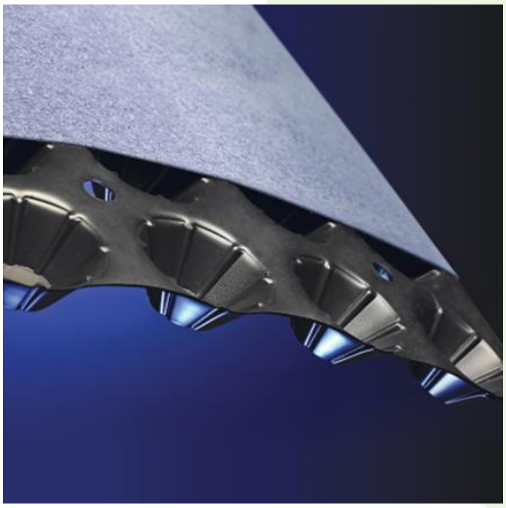
DATA SHEET

SKY GARDEN 20MM DRAINAGE BOARD WITH FILTER FLEECE DDRD20-1

Version 1.0

SKY GARDEN 20MM DRAINAGE BOARD WITH FILTER FLEECE

Rigid drainage board manufactured from HDPE. Combined function as a water-retention, drainage and filtration layer. Rigid sheet with integrated Polypropylene filter layer. Studded HDPE sheets contains perforations to drain surplus water and high capacity dimples (height c.20mm) for water retention. High compressive strength (115kPa). Delivery and installation according to Sky Garden instruction. Product arrives in 48.5 m2 size rolls.



TECHNICAL DATA

	Test	Unit	Mean Values		
Mechanical Properties - Geocomposite					
Compressive Strength	EN ISO 25619-2	kPa	115		
Tensile Strength (MD/CMD)	EN ISO 10319	kN/m	17		
Static Puncture	EN ISO 12236	kN	2.6		
Hydraulic Properties - Geotextile					
Water Permeability vH50	EN ISO 11058	l/(m2·s)	100		
Apparent Opening Size	EN ISO 12956	μm	80		
Hydraulic Properties - Geocomposite					
Water Flow Capacity In The Plane (Rigid/Rigid)	EN ISO 12958	l/(m2·s)	(i=1)	(i=0.5)	(i=0.1)
at 20kPa			10.0	8.0	5.0
at 100kPa			9.0	6.0	3.5
at 200kPa			5.0	2.0	1.0
Water Storage Capacity		l/m2	4.0		
Water flow Through Perforations	EN ISO 11058	l/(m2·s)			
Physical Properties					
Thickness at 2kPa	EN ISO 9836-1	mm	21		
Standard Colour			Black		
Perforations per m2			49		
Perforations diameter		mm	10		
Polymer - Cuspate			HDPE		
Polymer - Textile			PP		
Dimensions					
Standard Roll Length		m	50		
Standard Roll Width		m	0.97		
Approximate Roll Weight		kg	60		

DATA SHEET

SKY GARDEN RIVERSTONE RS01

Version 1.0

SKY GARDEN RIVERSTONE

Natural rounded stones for use as system ballast and perimeter borders to all living roof and bio-diverse roof installations, providing areas of free drainage, whilst acting as an effective barrier, helping to restrict the spread of plant material to drainage and gutter outlets.

- Provides free flowing drainage
- Contemporary, natural and aesthetic,
- Stone borders should be installed to 75mm in depth to a minimum width 500mm around all openings, penetrations and vertical abutments.

GUIDELINES

SKY GARDEN INSTALLATION GUIDELINES

Version 1.0

INSTALLATION GUIDELINES

The guidelines provided give a general installation procedure for Sky Garden green roofs. Please refer to your project brief for a project-by-project build-up.

STEP 1 - CHECK WORKING AREA & WATERPROOFING

Ensure the roof is complete and watertight. Check that roof is a safe working environment i.e. edge protection/scaffold or man safe system is in place. Have lifting equipment ready to lift materials to the roof. Ensure all other trades have finished working on roof before starting. Double check with site that the roof has been leak tested prior to our works and notify the contracts manager immediately if you spot any potential leaks.

Please ensure that when the delivery arrives, you make sure the quantities delivered match the delivery schedule issued as part of the project brief. If you are short, tell the contracts manager immediately – do not wait until the end of the project.

STEP 2 – PROTECTION FLEECE, ALUMINIUM EDGE & RIVERSTONE INSTALLATION

PROTECTION FLEECE

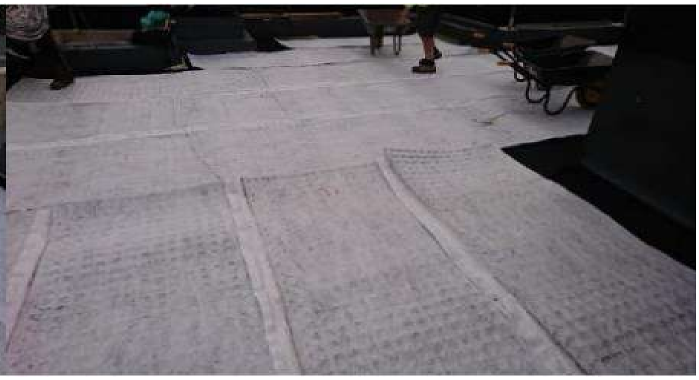
Place protection fleece roll onto the roof and lay over the waterproof layer in strips from one side to the other ensuring there is an overlap of at least 100mm for each strip of protection fleece to prevent any gaps that may expose the waterproofing beneath and risk subsequent damage. **(When cutting protection fleece ensure you use a sharp blade to avoid slippage and DO NOT under any circumstances cut near the waterproofing membrane. Damage to waterproofing is incredibly costly to Sky Garden and repeated instances may result in disciplinary proceedings. If you do accidentally cut the waterproofing, inform the contracts manager immediately and stop works)**

ALUMINIUM EDGE & STONES

The aluminium edge foot is placed under the Riverstone border but on top of the protection fleece which should be covering the whole roof area. The weight of the stones will hold the trim in place unless a fixing method is specified in the Method Statement or Brief. It is highly recommended that a fixing method is used when installing aluminium edge as a retention angle on a pitched roof system. Aluminium Edge is to be cut using snips and any sharp points/edges filed down to ensure no penetration to the waterproofing below. **(It is important that protection fleece is installed under the aluminium edging)**

As per GRO Guidelines, a Riverstone border of 500mm width and 75mm depth should have been specified unless otherwise communicated in the Project Brief and Method Statement. Place 25L sacks along the roof perimeter with a general spacing of 1 bag per 800mm. It is helpful to leave the cutting of the bags until the end of the works so that any trim can be repositioned if required.

STEP 3 – DRAINAGE BOARD WITH FILTER FLEECE

Sky Garden drainage board comes in two types. A drainage roll with a filter fleece already attached and drainage sheets that do not.

For drainage rolls with filter fleece already attached, place the sheets across the roof surface with an overlap of at least 100mm where the excess filter fleece is located – this lap is easily noticeable when the drainage rolls are unrolled. This overlap will prevent substrate reaching the protection fleece and waterproofing below. **(When cutting Drainage Board ensure you use a sharp blade to avoid slippage and DO NOT under any circumstances cut near the waterproofing membrane. Damage to waterproofing is incredibly costly. If you do accidentally cut the waterproofing, inform the roofing contractor immediately and stop works)**

Drainage board that arrives in sheets requires filter fleece to be laid over the top. 100mm overlaps are required. It is helpful to use either stone bags or substrate sacks to ballast the filter fleece as you lay it to stop it blowing around in the wind.

It is important to install drainage board underneath the river stone border to ensure continuity of drainage as per the GRO guidelines.

STEP 4 – SUBSTRATE INSTALLATION

Substrate arrives in either bulk bags or 25L sacks. The quickest method of installing substrate from bulk bags is to hover the bag 500-1,000mm above the drainage board from a crane and cut the bottom of the bag. The pile can then be raked to the required depth specified. Great care must be exercised when slewing bags onto the roof to prevent excessive point loading which could lead to damage of the building structure.

If substrate arrives in sacks, these should be distributed evenly across the drainage board and cut and poured using a sharp safety knife.


The roof area should be dipped to ensure the substrate depth is as required. The specified substrate depth must be achieved with an additional 10% settlement factor allowed for.

STEP 5 – VEGETATION INSTALLATION

(All vegetation should be installed within 24hrs of delivery)

Unroll the blankets on top of the substrate, butting each roll close to the other. Cut the rolls where required using a sharp blade, avoiding the waterproofing on upstands or around skylights. Use excess blanket to patch any bare areas.

The installed green roof system must be watered in, initially at a rate of 10-15litres/m2. Irrigation to take the form of complete system saturation at least once a week in the first 12 weeks following installation. The same steps should be taken during prolonged periods of hot and dry weather.

Please advise the customer of this requirement during sign off.

If no water is available to water in, please include on the sign off sheet and make the customer aware of the risks.

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TECHNICAL PROPERTIES

Composition	Mixed Rounded Naturally occurring Stones
Depth	c.75mm (Typical Ballast Margin)
Colour	Mixed (Normally Grey/Brown)
Shape	Rounded
Unit Width	20-40mm
Consignment Size	22kg Bags/Bulk Bags 1 tonne
Treatment	Washed

GUIDELINES

SKY GARDEN GREEN ROOF MAINTENANCE

Version 1.0

SKY GARDEN GREEN ROOF MAINTENANCE

All green roofs will require maintenance; it is important that access is considered at the design stage. Maintenance should be conducted by qualified personnel. This will help ensure the initial establishment and continued health of the green roof system. It is strongly recommended that the installing contractor remains responsible for the maintenance of the green roof during this establishment stage (between 12 - 15 months) and prior to the assignation of maintenance duties to the building owner's representative. Maintenance contractors, with specialist training in green roof care from organisations such as GRO, should be used where possible.

When designing a green roof, it is important that the green roof system is specified accounting for any budgetary constraints. The costs of roof maintenance should therefore form part of the life cycle cost analysis for the building, allowing the most appropriate green roof specification to be realised.

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GENERAL MAINTENANCE ACTIONS

All maintenance actions carried out at roof level must be in full compliance with the appropriate health and safety regulations, and particularly those specifically dealing with working at height. BS 4428:1989 - Code of practice for general landscape operations (excluding hard surfaces) and BS7370- 4:1993 Grounds maintenance - Part 4: Recommendations for maintenance of soft landscape (other than amenity turf) provide guidelines for maintenance actions.

1.1 IRRIGATION & WATERING

Irrigation is typically required for the initial establishment of the green roof for a period of 6 - 8 weeks depending on natural rainfall during this time. However, once vegetation cover is achieved, irrigation can be reduced.

All green roofs will need watering in periods of extended drought i.e. more than 6 weeks without any rain.

Care should be taken not to overwater green roofs, as this may harm the plants or overload the roof.

1.2 FERTILISING

GRO does not recommend regular or high use of fertiliser on the low-nutrient growing mediums used on green roofs as they can encourage invasive weeds and grasses and may leach into the watercourse. Each green roof should be assessed prior to any addition of fertiliser.

NOTE: Fertiliser should be slow and long release, and only be applied if downpipes are isolated from mains sewage system.

Intensive and simple intensive roofs are based on a more fertile growing medium and the planting installed will require regular fertilisation.

1.3 GENERAL VEGETATION MAINTENANCE

- Always remove species with large growth habits or aggressive root systems.
- Any wind-blown seeds or cuttings should be removed before they have the opportunity to take root.
- Many grass species can be invasive and should be removed from extensive green roofs, unless designed into the planting scheme.
- The ecological and aesthetic requirements of the site should guide the management of dominant species and habitat over time.
- Cut back taller flowering species to approx. 150mm above substrate surface in autumn/ winter after seeding.
- Excess dead plant matter should be removed to avoid encouraging fungal disease. However, for maximum wildlife support, care should be taken not to remove all vegetation straight after flowering as many insects over-winter in hollow plant stems. For this reason, rotational cutting (where not all vegetation is cut simultaneously) and removal is advised.

1.4 GENERAL CLEARANCE/REMOVAL

Generally, the removal of dead material is desirable as it allows plants the space to develop a greater coverage, improving the finished appearance of the roof, whilst also reducing the risk of fungal disease forming and spreading. However in some biodiverse applications, removing plant debris could be counter-productive in creating habitat.

MAINTENANCE ACTIONS BY ROOF TYPES

2.1 EXTENSIVE ROOF MAINTENANCE - < 100MM LOW NUTRITION SUBSTRATE

IRRIGATION: Post-establishment, irrigation is not generally required for extensive green roofs. However, the facility to water should be in place, if possible.

FERTILISATION: Extensive green roofs typically have low nutrient requirements. If required, they can be fertilised on an annual basis, each spring, using a slow-release fertiliser.

PLANT MANAGEMENT: Removal of undesirable plant species and fallen leaves should take place twice each year. General: Drainage outlets (including inspection chambers) and shingle/gravel perimeters to be cleared of vegetation, twice yearly.

2.2 BIODIVERSE ROOF MAINTENANCE – 80MM – 150+MM VERY LOW TO LOW NUTRITION SUBSTRATE

IRRIGATION: Typically, not required.

FERTILISATION: Generally not required, particularly where indigenous species are being encouraged to replicate native habitats. Whilst a low vegetative density is common, zero vegetation is generally undesirable.

PLANT MANAGEMENT: A maintenance program should be drawn up to follow the intended biodiversity objectives.

GENERAL: Drainage outlets (with inspection chambers) and gravel/shingle perimeters should be inspected twice yearly and cleared of any living or dead vegetation.

2.3 DEEPER SUBSTRATE EXTENSIVE ROOF MAINTENANCE - 100MM TO 200MM LOW TO MEDIUM NUTRITION SUBSTRATE

IRRIGATION: Periodic irrigation/watering is expected, depending upon the plant specification and the climatic and microclimatic conditions prevailing at roof level.

FERTILISATION: With a wider range of planting, using a more fertile growing medium, more regular fertilisation maybe required.

PLANT MANAGEMENT: Removal of undesirable vegetation on the greened area twice yearly.

GENERAL: Drainage outlets (including inspection chambers) and shingle/gravel perimeters to be cleared of vegetation, twice yearly.

2.4 INTENSIVE ROOF MAINTENANCE - 200MM + MEDIUM NUTRITION SUBSTRATES AND TOPSOILS

IRRIGATION: Regular irrigation is often required, subject to the plant specification and the climatic and microclimatic conditions prevailing at roof level.

FERTILISATION: With a wider range of planting, using a more fertile growing medium, more regular fertilisation maybe required.

PLANT MANAGEMENT: The intensive maintenance of lawns, hedges, borders etc is required on a regular basis, so as to maintain the roof aesthetics. Undesirable vegetation should be removed from the green areas at least twice yearly. Failed plants should be replaced.

GENERAL: Drainage outlets (including inspection chambers) and shingle/gravel perimeters to be cleared of vegetation, twice yearly. Where excessive substrate settlement has occurred, this should be replenished.

2.5 BLUE ROOF MAINTENANCE

INSPECTION: Restrictor chambers; orifices & roof outlets.

FILTRATION: Particle filter cleaning/ replacement as required.

GENERAL: Observation or general roof condition and report of any remedial works required.

PLEASE NOTE: Maintenance should take account of the intended wildlife support, in addition to standard green roof maintenance procedures. Care should be taken not to remove all vegetation after flowering as many insects hibernate over-winter in hollow plant stems.