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Geotechnical Engineering and Environmental Services across the UK.

## Green Roof Specification

546 Sipson, Road, Sipson, West Drayton UB7 0JB

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## LIMITATIONS

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The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by JA has not been independently verified by JA, unless otherwise stated in the report.

The methodology adopted and the sources of information used by JA in providing its services are outlined in this report. The work described in this report was undertaken in September 2023 and is based on the conditions encountered and the information available during the said period of time. The scope of this report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

JA disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to JA's attention after the date of the report.

Certain statements made in the report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JA specifically does not guarantee or warrant any estimate or projections contained in this report.

Costs may vary outside the ranges quoted. Whilst cost estimates are provided for individual issues in this report these are based upon information at the time which can be incomplete. Cost estimates for such issues may therefore vary from those provided. Where costs are supplied, these estimates should be considered in aggregate only. No reliance should be made in relation to any division of aggregate costs, including in relation to any issue, site or other subdivision.

No allowance has been made for changes in prices or exchange rates or changes in any other conditions which may result in price fluctuations in the future. Where assessments of works or costs necessary to achieve compliance have been made, these are based upon measures which, in JA's experience, could normally be negotiated with the relevant authorities under present legislation and enforcement practice, assuming a pro-active and reasonable approach by site management.

Forecast cost estimates do not include such costs associated with any negotiations, appeals or other non-technical actions associated with the agreement on measures to meet the requirements of the

authorities, nor are potential business loss and interruption costs considered that may be incurred as part of any technical measures.

## 1. Introduction

Jomas Associates have been appointed to undertake a Green Roof Specification for the development at 546 Sipson Road, Sipson, West Drayton UB7 0JB .

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, we shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Jomas Associates.

This report has been prepared in accordance with the instructions of our client for their sole and specific use.

## 2. The site and proposed development

The purpose of this report is to ensure that the green roofs are designed, specified and implemented in line with the planning condition (s) stipulated by the London Borough of Hillingdon as follows:

“Notwithstanding the plans hereby approved, details of the green roofs (including details of the species to be planted/seeded) shall be submitted to and approved in writing by the Local Planning Authority prior to any works commencing.

The green roofs shall:

- a) form biodiversity-based roofs with extensive substrate bases (depth 80-150mm);
- b) cover all the areas of flat roof on these dwellings; and
- c) be planted/seeded with an agreed mix of species within the first planting season following the practical completion of the building works.

The development shall be carried out strictly in accordance with the details so approved, shall be maintained as such thereafter, and no change therefrom shall take place without the prior written consent of the Local Planning Authority.”

### 3. Proposed Green Roof

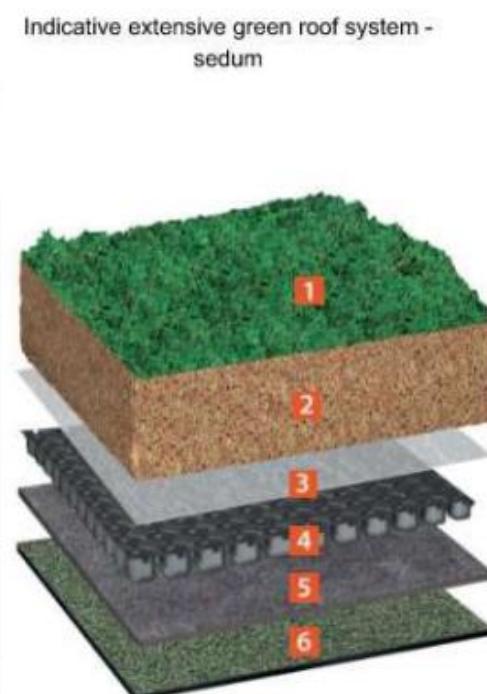
The proposed green roof system shall be an Extensive Green Roof.

The system is predominantly sedum and chosen to ensure the development provides the maximum possible provision towards creation of habitats within the constraints of building, access, layout and maintenance.

Proposed details are appended to this document.

- Landscaping finish: Pre-cultivated Sedum vegetation blanket
- Substrate: Extensive roof substrate 80mm
- Drainage / protection layer: Bauder SDF Mat - 20mm drainage / protection layer.
- Vegetation blanket: Bauder Xero Flor XF301 sedum blanket, applied in standard length rolls 2m x 1 m.
- Vegetation: Mainly Sedum with some moss and grasses.

	Function	Product name	Thickness (mm)	Weight (kg/m <sup>2</sup> )
1	*Vegetation Layer	BauderGREEN SB sedum blanket	28	24
2	Growing medium	BauderGREEN SUB-EM UK extensive substrate	80	96
3	Filtration layer	FV 125 filter fleece	1	0.13
4	Drainage Layer	DSE 20 drainage board	20	8.6
5	Protection Layer	FSM 600 protection mat	4	3.6
6	Underlying Waterproofing	Bauder's underlying waterproofing system	Not included	Not included
<b>System build-up (saturated)</b>		133	132	
*Bauder supply various green roof systems to meet required biodiverse targets and other green roof requirements In-depth and up-to-date product specific technical data is available for each element within a system. Download from our website <a href="http://bauder.co.uk/technical-centre">bauder.co.uk/technical-centre</a>				



The proposed system encompasses the following benefits:

- Self-sustaining in that it will require low maintenance.
- No permanent irrigation system is required. The mix consists of approximately 90% low growing, drought tolerant sedum plants and may also include other species such as Saxifrages, wild flowers,

grasses, moss and herbs. The extensive green roof system shall contain a maximum of 18 different species as follows:

*Sedum Album*

*Sedum ellacombianum*

*Sedum floriferum*

*Sedum hybr. Czar's Gold*

*Sedum montanum*

*Sedum kamtchaticum*

*Sedum Oreganum*

*Sedum pulchellum*

*Sedum reflexum*

*Sedum rupestre Angelina*

*Sedum sexangulare*

*Sedum spurium 'coccineum' [Purple Carpet]*

*Sedum spurium*

*Sedum spurium 'Summer Glory'*

*Sedum stenopetalum*

*Sedum stoloniferum*

*Sedum Saxifraga granulata*

*Sedum Sedum Hispnicum\**

The above species have been chosen by the manufacturer as they are particularly suited to the UK climate.

#### **4. Usage**

The green roof 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.

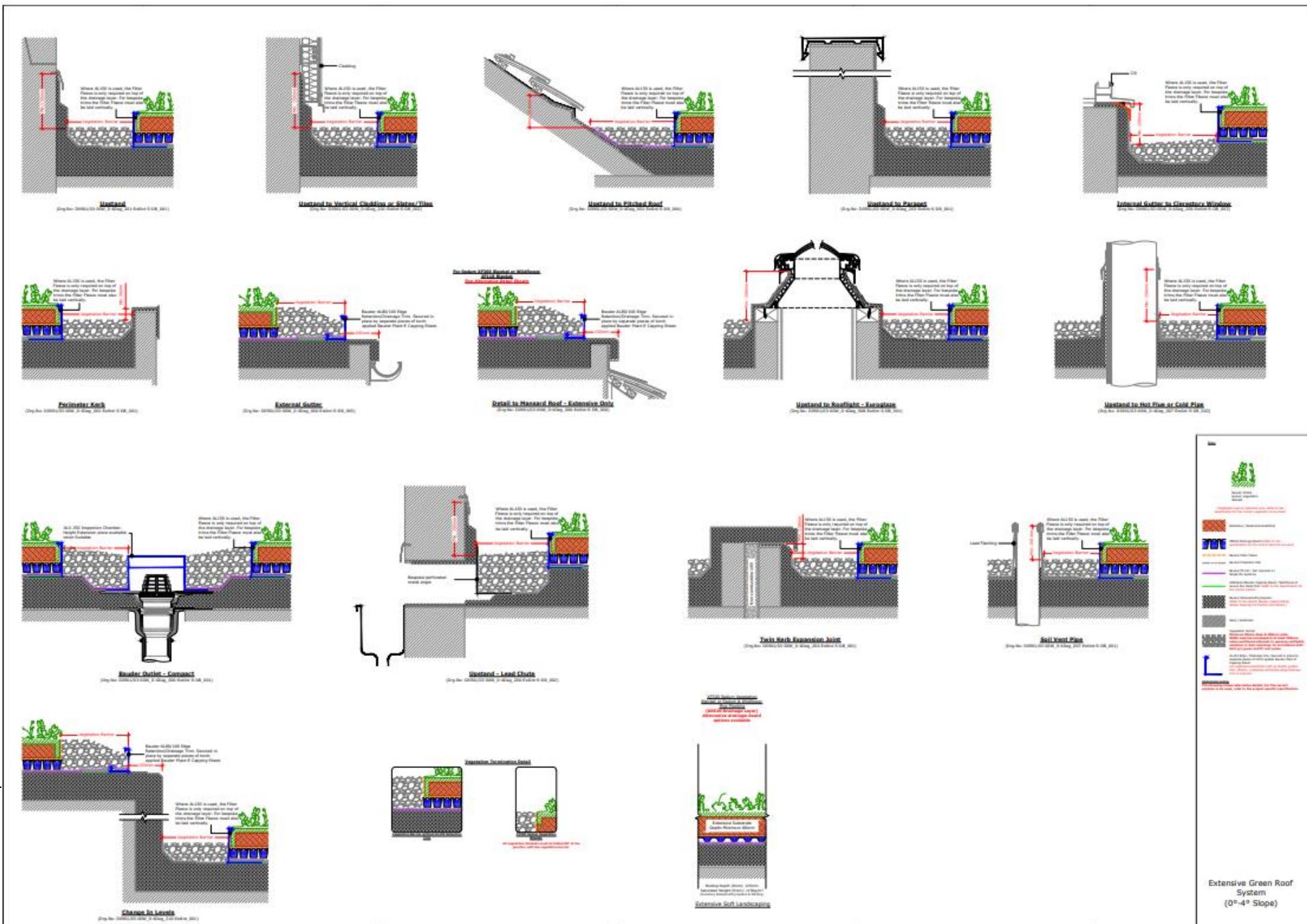
## 5. Maintenance

The 'extensive green roof system' is described as 'low maintenance' and shall be carried out strictly in accordance with the details so approved and shall be maintained as such thereafter.

General maintenance is normally carried out annually during springtime, however certain tasks such as the removal of weeds, seedlings and accumulated leaf litter may also be done during the autumn.

Fertiliser must be applied annually to ensure the that the plants become resistant to extremes of weather and temperature.

Maintenance shall be executed in accordance with the manufacturer's recommendations and the approved details.





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## TECHNICAL DATA SHEET

**BauderGREEN SB sedum blanket**

A British grown sedum blanket produced on a fully bio-degradable coir mat carrier designed to rapidly establish on exposed green roofs. SB sedum blanket is FLL and GRO compliant.

**Intended Use**

BauderGREEN SB sedum blanket is a mature vegetation blanket, sown with a broad variety of sedums. It is intended for application directly over BauderGREEN SUB-EM UK extensive substrate (see Technical Data Sheet) as the underlying growing medium. The biodegradable coir matting is designed to enable rapid rooting to the substrate to speed up establishment times.

The SB blanket is grown in the UK. Typically, it is not supplied until it is at least one year old, this ensures the root structure has developed, enabling it to cope with harvesting, transportation and relaying which can stress young sedum plants. The vegetation within this product is a broad mix of 17 hardy sedum species.

**PRODUCT INFORMATION AND TECHNICAL PERFORMANCE**

Characteristic	Unit	Value
Maximum saturated weight	kg/m <sup>2</sup>	≤ 24
Thickness	mm	30 to 40
Vegetation	No.s	Sown with 13 to 17 sedum species Species mixes are adjusted from time to time. Please contact Bauder technical department for more information.
Material		Substrate and sedum plants, grown on a coir mat carrier. (100% Bio-degradable)
Typical supply size	m	0.5 x 2
Rolls per pallet	rolls	Typically 30-40 rolls-dependant on weight (40m <sup>2</sup> )
Pallets per articulated lorry	pallets	26 pallets – dependant on weight (1,040m <sup>2</sup> )

**UNITED KINGDOM**

Bauder Ltd  
70 Landseer Road, Ipswich, Suffolk IP3 0DH  
T: +44 (0)1473 257671 E: [info@bauder.co.uk](mailto:info@bauder.co.uk)  
[bauder.co.uk](http://bauder.co.uk)

**IRELAND**

Bauder Ltd  
O'Duffy Centre, Carrickmacross, Co. Monaghan  
T: +353 (0)42 9892 333 E: [info@bauder.ie](mailto:info@bauder.ie)  
[bauder.ie](http://bauder.ie)



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## TECHNICAL DATA SHEET

CERTIFICATION AND ENVIRONMENTAL INFORMATION	
International Standards Organisation (ISO)	ISO 9001:2015 Quality Management Certificates EN1271 (UK) and 70499/03-15_e (Germany).
Recycled content	20% of the growing medium within the blanket

DELIVERY AND PACKAGING	
Packaging	Rolls are stacked on pallets wrapped in woven polyester mesh. Pallets are readily recycled.
Storage	Use on day of delivery, store in cool conditions out of direct sunlight
Delivery method	24 pallets per articulated trailer- dependant on weight (1,040m <sup>3</sup> ) (There is no recycled content to the packaging)

INSTALLATION GUIDANCE	
Normally installed directly onto the levelled substrate, it should be installed immediately upon delivery, SB blanket should only be laid by skilled operatives. Care should be taken not to traffic the sedum during or after installation. See Bauder's Green Roof Installation Guide for full details.	
The correct watering and aftercare is required for this product. See Bauder's Maintenance and Aftercare documents.	



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## TECHNICAL DATA SHEET

**BauderGREEN SUB-EM UK extensive substrate****BauderGREEN SUB-BM UK biodiverse substrate****BauderGREEN SUB-IM UK intensive substrate**

These lightweight, free draining substrates are green roof growing mediums for a broad range of different plant species. Being man-made, they have consistent characteristics that improves reliability in establishment of the vegetation.

**Intended Use**

These FLL/GRO compliant substrates provide a free draining, growing medium for green roof systems. The lightweight substrates are designed for most vegetation (sedum, wildflower or grass blankets, specimen shrubs and trees, plug plants or seed). Additionally, the substrates provide aeration qualities with some inherent water retention.

SUB-EM UK extensive substrate



SUB-BM UK biodiverse substrate



SUB-IM UK intensive substrate

**PRODUCT INFORMATION AND TECHNICAL PERFORMANCE**

Characteristic	Unit	SUB-EM UK Value	SUB-BM UK Value	SUB-IM UK Value
Maximum saturated weight	kg/m <sup>3</sup>	≤1,200	≤1,200	≤1,250
Typical supply weight	kg/m <sup>3</sup>	c. 900	c. 950	c. 1,000
Water storage	by vol	35%	35%	35%
pH value	pH	6 - 8.5	6 - 8.5	6 - 8.5
Bulk bag size	m <sup>3</sup>	1.25	1.25	1.25
Small bag size	litre	25	25	25
Material	Recycled crushed brick, expanded clay, shale, composted pine bark.			
Recycled content	≥ 95%			

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Bauder Ltd  
70 Landseer Road, Ipswich, Suffolk IP3 0DH  
T: +44 (0)1473 257671 E: [info@bauder.co.uk](mailto:info@bauder.co.uk)

**IRELAND**

Bauder Ltd  
O'Duffy Centre, Carrickmacross, Co. Monaghan  
T: +353 (0)42 9892 333 E: [info@bauder.ie](mailto:info@bauder.ie)



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## TECHNICAL DATA SHEET

## DELIVERY AND PACKAGING

Packaging	1.25 m <sup>3</sup> bulk bag	Woven polypropylene single use bulk bags delivered on pallets if required.
	25 litre bags	Transparent polypropylene sacks, widely recycled - 40 per pallet
Storage		Avoid using crane straps prior to lifting to roof
Delivery method		24 pallets/bulk bags per articulated trailer  (There is no recycled content to the packaging)

## INSTALLATION GUIDANCE

Normally installed above a filter fleece and drainage board product. Substrates are raked out to give an even coverage of the required depth after settlement.

See Bauder's Green Roof Installation Guide for full details.

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## UNITED KINGDOM

Bauder Ltd  
70 Landseer Road, Ipswich, Suffolk IP3 0DH  
T: +44 (0)1473 257671 E: [info@bauder.co.uk](mailto:info@bauder.co.uk)  
[bauder.co.uk](http://bauder.co.uk)

## IRELAND

Bauder Ltd  
O'Duffy Centre, Carrickmacross, Co. Monaghan  
T: +353 (0)42 9692 333 E: [info@bauder.ie](mailto:info@bauder.ie)  
[bauder.ie](http://bauder.ie)