

SPECIFICATION SUMMARY

System	BauderEXTENSIVE LIGHTWEIGHTsedum XF 301 sedum blanket system
Project plan	New Build
Applicable Structural decks	New Plywood Deck
Surface finish	Pre-cultivated Sedum vegetation blanket

Extensive, green flat roof waterproofing system with lightweight sedum blanket, which features 11 different species of sedum, mosses and grasses. This non-accessible green roof is suitable for both new build construction and retrofit refurbishment applications.



Product	Description	thickness	weight
1 BauderGREEN XF 301 lightweight sedum system	Light-weight all in one system available. It comprises mature sedum on 20mm of extensive substrate and incorporating multifunctional water retention and filter layer.	28mm	*44Kg/m ²
2 BauderGREEN SDF Drainage and Protection Layer Required on roofs with 0-2° slopes only	This product provides filtration, drainage and beneath the ballast layer.	20mm	1 Kg/m ²
3 Bauder Waterproofing System	Refer to attached specification	-	-
Landscaping System Build up (Fully saturated, excludes waterproofing system)		48mm	45Kg/m²

* Based on standard 2m x 1m roll length

IMPORTANT NOTE

Please note that changes made to the content of this document, outside of the available choices may impact technical suitability and eligibility to meet Bauder Limited's requirements for guarantee. For additional items to be added, not already included, please contact your local Area Technical Manager.

Design Information and Supporting Documents

This specification is to be read in conjunction with the Bauder waterproofing Specification Appendix and Technical calculations (where provided), Bauder Installation Guides and Bauder Standard Detail Drawings.

This specification has been produced based on the information supplied at the time of writing and is deemed to apply subject to the conditions outlined below, unless additional calculations proving otherwise have been completed and issued to you by Bauder Ltd or an approved supplier.

Weight Loadings: The loading of the proposed Green/Blue roof system with soft landscaping/hard surfacing/mechanical equipment/PV system, etc., needs to be accounted for in the design and construction of the structural deck, both during and following construction.

Watering Requirements: All soft landscaping finishes will have an initial establishment watering period. Following that, certain systems will require more regular watering than others. Please refer to the Bauder specification clause and the General Maintenance Watering Guide (available to download from our website).

General maintenance: All roofs require a minimum of two inspections a year to ensure that the outlets etc are maintained, regardless of the type of green roof. An intensive green roof will require regular maintenance associated with the planting scheme and landscape design, whereas an extensive green roof will need only minimal maintenance to ensure that any unwanted species do not become established. For details of general maintenance on the different types of our green roofs, please download our general maintenance brochures (available to download from our website).



Bauder endeavour to work in conjunction with the GRO Code of Best Practice for the UK.

REF No: B246319/1

PROJECT NAME: Crawford Street Bike/Bin Store Green Roof

NBS SECTION Q37 - DESCRIPTION OF WORKS

Section Q37 deals with the design and installation of the Bauder Green Roof landscaping system, including the various related elements i.e. separation, protection, and drainage layers, substrates, Bauder supplied planting and accessories such as inspection chambers, trims etc. It invokes clauses from related sections for waterproofing, insulation, landscaping and maintenance as necessary for a complete system.

It is intended for use on projects where the detailed design is completed by the specifier (architect or landscape architect) with technical assistance from the manufacturer as required and should be read in conjunction with any project specific drawings provided.

SCOPE OF WORKS

This section includes:

- Bauder Extensive green roof system components/ landscaping.
- Related Bauder system accessories

This section does not include:

- Construction of the structural deck
- Bauder waterproofing system – refer NBS Section J41-130.
- Stairs / ladders / handrails / balustrades – refer NBS section L30.
- Irrigation– refer NBS section S__.

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions.

GENERAL

130 EXTENSIVE GREEN ROOF

- **Roof Area:** Bike/Bin Store Green Roof
- **Landscaping finish:** BauderEXTENSIVE LIGHTWEIGHTsedum pre-cultivated Sedum vegetation blanket.
- **Substrate:** New Plywood Deck
Note: The loading of the proposed green roof system/landscaping needs to be accounted for in the design and construction of the structural deck, both during construction and then after.
- **Slope:** 0°-2°
- **Waterproofing system:** BAUDERFLEX GREEN SYSTEM - as per J41-130
- **Drainage / protection layer:** BauderGREEN SDF drainage and protection mat – 20mm. Installation as clause 770B.
- **Vegetation blanket:** BauderGREEN XF 301 lightweight sedum system (FAA fire rated), applied in standard length rolls 2m x 1m. Installation as clause 800B.
- **Landscaping depth:** ca. 48mm (excluding vegetation).
- **Vegetation:** Mainly Sedum with some moss and grasses.
- **Accessories:**
 - Project specific drip line irrigation system (designed and supplied by others), as clause

- 463A. Installation of irrigation pipe work to the waterproofing as clause 825.
- **BauderGREEN AL 40 edge trim**, fitted around all perimeters and / or protrusions (where required). Installation as clause 820.
- 20 - 40mm round washed pebble vegetation barrier provided at all perimeters and / or protrusions (where required), as clause 460. Installation as clause 840.
- **BauderGREEN DU UK** organic slow-release fertiliser, applied as clause 850A.
- **Additional requirements:** As clauses 210, 710, 715A, 720, 910, 915A, 916, 920, 930.

PERFORMANCE

210 GENERAL DESIGN

- **Green roof and associated features:** Complete the detailed design.
- **Proposals:** Submit drawings, technical information, calculations and manufacturers literature.

PRODUCTS

460 PEBBLE BALLAST

- **Type:** Washed, round pebbles.
- **Size:** Graded 20-40mm and free from fines and sharps.
- **Supplier:** Locally sourced.

463A IRRIGATION

- **Supplier:** Access Irrigation Ltd. Crick, Northampton NN6 7XS
Tel: 01788 823811, Fax: 01788 824256, E-mail: sales@access-irrigation.co.uk
- **Product reference:** Permadrip Pro - drip line irrigation system with anti-syphon design to resist clogging and pressure regulation.
- **Material:** Perforated UV resistant plastic - Colour: Dark Brown
- **Height:** 10mm
- **Operating range:** 0.8 -4.3bar.
- **Wall thickness:** 1.2mm
- **Nozzle output:** 1.6L/h
- **Spacing:** 150mm.
- **Pipe connection:** For Bauder Green/Blue Roofs, all irrigation systems using Permadrip Pro must use PoziLock compression fittings for both the dripline and water feed pipework. Barbed connectors are not permitted.
- **Location:**
 - **Bauder Vegetation Blankets:** Irrigation system to be installed flush with the surface of the vegetation blanket and tested to ensure that it is fully operational.
 - **Bauder Plug Plants, Flora Seeded Systems & Biodiversity:** Irrigation system to be installed flush with the surface of the growing medium and tested to ensure that it is fully operational prior to installation of the vegetation.
- **Design:** The design, water pressure, positioning and spacing of the drip line is critical to the performance and effectiveness of the system. Therefore, the irrigation scheme for each project should be designed accordingly to ensure it is fit for purpose. Irrigation is a specialist subjects and Access Irrigation Ltd provide a design service and can assist with information pertaining to any individual project upon request.
- **IMPORTANT NOTE:** These are permanent irrigation systems and do not negate the need for the establishment watering regime.

EXECUTION

710 INSTALLATION GENERALLY

- **Preparation:** Clear all surfaces of debris.
- **Timing:** After certification of waterproof membrane integrity.
- **Surface condition:** Visually inspect waterproof membrane, report any damage.
- **Faults in waterproof membrane:** Report.
- **Contamination:** Do not use materials detrimental to healthy plant growth.
- **Storage:** Do not overload.
- **Point loads:** Avoid.
- **Outlets:** Do not block.
- **Outlet grilles:** Installed (these can be omitted where Bauder inspection chambers are used, if the grille cap height obstructs the closing of the chamber lid).

715A LANDSCAPED ROOF RELATED REQUIREMENTS

- **The following are vital to the accurate pricing, correct installation, and ultimately the long-term life of a green/blue roof, and must, therefore, be included within the specification and tender documents: -**
- **Loadings:** It is assumed that the architect or his advisors have satisfied themselves that the roof structure and deck are suitable to receive the dead load of the proposed green/blue roof system and landscape both during construction and on completion of the works.
- **Additional protection:** A planned or contractual delay between the installation of the waterproofing and landscape will almost certainly necessitate additional/increased protection to the waterproofing. This protection may be temporary or permanent. The responsibility and cost of this possible extra protection should be clearly included within the tender documents.
- **Detailed drawings:** Correct detailing design and construction is essential to the long-term life of the green/blue roof. It is essential, therefore, that detail drawings illustrating for the construction are included with the tender documents, in order to enable the contractor to tender accurately.
- **Minimum upstand height requirements:** The waterproofing should be taken up all abutment upstands, pipes, detailing protrusions etc. a minimum of 150mm above finished landscape surface level to comply with British Standards and current code of practice BS8217:2005.
- **Provision for living products in hot weather conditions:** During hot weather conditions, living products such as plants, turf, sedum blankets etc. must be laid on the day of delivery to site. With regard to sedum blankets or turf, any rolls not installed should be laid out and kept watered prior to final installation.
- **Watering / Irrigation:** Initial watering should be by surface sprinklers to ensure that the plants are kept moist until established. Adequate provision for watering the installed planting must be in place on site before the product is installed. Irrigation systems if fitted should be operational. Surface sprinklers should be used to water in the fertiliser. All watering should be carried out in strict accordance with the Bauder watering requirements and guidance document.
- **Final Inspection:** No landscaping work should be installed until Bauder have carried out a final inspection to the waterproofing and have passed this as suitable for guarantee. It is the responsibility of the roofing contractor to advise and organise this inspection with Bauder. We cannot guarantee any waterproofing that has been landscaped without this inspection having been carried out and passed as acceptable.
Please note, there are/maybe further 'sign-off' inspections required to complete the roof(s) for this specification.
- **Sign-off Inspections:**

Bauder Extensive Green Roofs: Bauder Extensive or Biodiverse soft landscaped green roof installations require an inspection and it is the responsibility of the installing contractor to inform Bauder Ltd when the installation has been completed.

Bauder Blue Roofs: Landscaped roofs designated as 'Blue Roofs' and featuring outlets fitted with Bauder Blue roof flow rate restrictors, must be inspected and signed off by Bauder. This is to ensure correct installation of integral 'Blue Roof' components. Safe access to carry out this inspection must be provided.

- **Damage risk from other trades:** No landscaping should be installed while the roof area is subject to other site traffic. Bauder will carry out an inspection of the completed roof 4-6 weeks following installation and any site related damage by others will be reported to the client. Bauder accept no responsibility whatsoever for damage to the product or the installation caused by site work carried out by others after the landscaping has been installed.
- **First year maintenance:** The contractor must price into his tender the cost of post installation maintenance for a minimum period of 1 year to ensure the handover of a flourishing soft landscaped roof.

720 ADVERSE WEATHER

- **Unfinished work:** Secure from damage and wind uplift.
- **Conditions:** Do not install or work with frozen materials.

LANDSCAPING INSTALLATION

770B DRAINAGE LAYER INSTALLATION

- **Extent:** Continuous over designated roof area
- **Fitting:** Loose laid over the waterproofing and butt jointed with 100mm fleece overlap
- **Upstands:** Carefully cut to fit closely around penetrations and outlets.

800B VEGETATION BLANKET INSTALLATION

- **Handling blankets:**
- **Timing:** Lay within 36 hours of lifting from growing position.
- **Method:**
 - **Standard Roll Size:** laid manually – two-man operation
 - **Long Roll Size:** laid using a crane with lifting attachment – three-man operation.

- **Excessive stacking:** Not permitted.
- **Material loss (maximum):** 3% of total surface area.
- **Growing medium condition:** Thoroughly watered
- **Laying blankets:**

General: Do not lay if blankets are dried out, damaged, frosty or waterlogged.

Sloped Roofs: Blankets to laid over the spikes of the already installed Bauder retention strips and trod down to ensure that the spikes penetrate the moisture retention fleece to the underside of the blanket.

Retention Strips Required (BauderGREEN XF 301 Blanket ONLY):

- Bitumen Membrane Green Systems - from 10° and above.
- Bauder Single Ply Green Systems - from 5° and above.
- Bauder LiquiTEC Roofing System - from 5° and above.

Note: For BauderGREEN SB Sedum Blanket - On steeper slopes the blankets can be additionally pegged with bio-degradable pegs (supplied by others) to secure them until they root, but these must not penetrate further than the depth of the substrate growing medium.

- **Orientation:** Diagonal or perpendicular to slope of roof.
- **Joints:** Stagger. Butt together or slightly overlap to prevent gaps. Do not stretch blankets. All

excess vegetation should be removed from the overlap and the opposite leading edge of the blanket to ensure that the joints butt together tightly (as per the Bauder installation guideline).

- **Edges:** No smaller than 1m x 1m pieces.
- **Consolidation:** N/A
- **Dressing:** Bauder Extensive substrate.
- **Application:** Brush in to fill joints.
- **Watering:** Thoroughly water using surface sprinklers immediately after installation and substrate dressing, ensuring that the blankets and substrate are fully saturated before moving on to the next area.
- **Note:** Follow Bauder Establishment Watering Guidelines also.
- **Roll size:**
 - Standard:**
 - **BauderGREEN SB Sedum Blanket:** 2m x 0.5m
 - **BauderGREEN XF 301 lightweight sedum system:** 2m x 1m
 - Long:** 10m x 0.5m (or length size as required, cut in 1m increments)
- **BauderGREEN XF 301 lightweight sedum system on Exposed Sites:** It may be necessary to provide a stone ballast coating spread evenly to prevent wind uplift and erosion of the vegetation blanket in high winds and/or heavy rainfall.
 - **Installation:** 20 - 40mm rounded washed pebbles to be installed onto the vegetation blankets to provide the required loading of 27Kg/m².

820 EDGE RETAINING PROFILE INSTALLATION

- **Cutting:** Neat, accurate and without spalling.
- **Junctions:** Use connector pieces and pre-formed 90° corners where required.
- **Position:** True to line and level. Smooth continuous lines.
- **Fixing:** The **BauderGREEN AL 40 edge trim** (for **BauderGREEN XF 301** lightweight sedum blanket) is to be secured in place using additional strips/sections of capping sheet/membrane/waterproofing system the same as the main field area of the roof.
 - **Bitumen Membrane Green Systems** - Bauder capping sheet cut into strips 500mm x 200mm, these bituminous flashings should be torched through the holes in the trim to the waterproofing surface and set at intervals of 400mm between each flashing piece, bonding onto the main capping sheet by a minimum 100mm.
 - **Bauder Single Ply Green Systems** - Reinforced single ply membrane cut into strips 1000mm x 200mm. These retention flashings should be aligned to the vertical inner face of the trim and then welded into position starting with the holes in the fixing arm, then proceed to complete the full welding of the back edge of the retention flashing and the sides. The retention flashings to be set at intervals of 400mm between each flashing piece, bonding onto the main membrane by a minimum 100mm.
 - **Bauder LiquiTEC Roofing System** – Sections of **Bauder LiquiDETAIL** incorporating **Bauder 110g Reinforcement fleece**. These are to be a minimum of 1000mm x 200mm, applied through the holes in the trim to the waterproofing surface and set at intervals of 400mm, bonding onto the adjacent waterproofing by a minimum 100mm.
- **Location:** To secure and contain the exposed edges of **BauderGREEN XF 301 lightweight sedum system** at abutments and open perimeters.
- **Precautionary note:** When cutting metal, please ensure that appropriate tools and personal protection equipment are used.

825 INSTALLATION OF IRRIGATION PIPEWORK

- Pipe work should be installed and connected in accordance with the irrigation supplier's installation guidelines and set as per the plan provided.
- Bauder Vegetation Blankets** - Pipework should be secured at intervals to the vegetation

blanket using wire or cable ties, as required. Over time the planting will cover the pipework, visually hiding it.

Bauder Plug Plants / Flora Seed Mixes / Biodiversity - Pipework should be secured at intervals to the substrate as required using plastic pegs (available from irrigation supplier). Please note pegs should be installed in a manner so as not to cause damage to the waterproofing.

840 VEGETATION BARRIER / DRAINAGE BARRIER

- A pebble vegetation barrier must be provided to all perimeters, abutments and penetrations including protrusions i.e. man-safe posts etc. Bauder recommend 20/40mm rounded river washed pebbles. Stones/ aggregates with sharp edges must not be used i.e. flint.
- In accordance with current GRO guidelines, the specified barrier widths are as follows: -
 - Minimum 300mm wide / 50mm deep vegetation barrier to be installed around rainwater outlets to prevent vegetation blocking the outlets.
 - Minimum 300mm wide / 50mm deep vegetation barrier, to be installed at all open perimeters and roof verges (e.g., where green roofs are being terminated), in conjunction with a purpose designed metal perimeter retention/drainage angle.
 - Minimum 500mm wide / 75mm deep vegetation barrier is installed wherever the green roof abuts a vertical element i.e., at all perimeters and protrusions such as rooflights, man-safe posts, soil vent pipes, etc.
 - Additionally, on large roofs, a one-metre-wide / 50mm deep fire break is to be constructed from non-flammable materials such as solid paving or gravel/pebbles. This should be installed at 40m intervals across the roof. This is in accordance with the CWFT (Classified without Further Testing - EU fire protection standards)
- At all open drainage perimeters, a perimeter retention / drainage angle must be used to contain the vegetation barrier.
- For extensive green/blue roofs where **BauderGREEN XF 301 lightweight sedum system** is specified, the vegetation barrier must cover the edges of the blanket by a minimum of 100mm in order to protect the exposed edge of the blanket against wind uplift and substrate erosion. Please refer to Bauder standard green roof detailing for other extensive green roof systems.
- **Vegetation barriers removal or reduction of the recommended width or depth:** Pebble vegetation barriers function as a fire break between potentially flammable dry vegetation and abutting construction materials that are also potentially flammable, to prevent fire spreading. These can be seen as an aesthetic issue for smaller green/blue roof areas and for this reason some clients/designers choose to reduce this width or otherwise remove the barrier altogether.

The current barrier guidelines are set by the GRO codes of practice that Bauder follows and promotes. These are guidelines and not currently a legal requirement under British Standards or Building Regulations (for information, please see www.greenrooforganisation.org).

However, not following these guidelines may affect an insurance claim in the unlikely event of a fire. Consequently, Bauder Ltd cannot accept liability for issues arising from non-compliance with the current GRO guidelines.

850A FERTILISER

- Bauder Organic Fertiliser slow release must be applied at a rate of 80g/m² onto the installed planting.
- This product is to be supplied by Bauder Ltd.
- Care must be taken to distribute the fertiliser evenly, through use of an approved applicator.
- The vegetation / vegetation blankets should then be thoroughly saturated by the use of sprinklers so as to promote rapid establishment. It is the responsibility of the roofing contractor to liaise with the main contractor/ building owner to provide water to ensure that the growing medium/

blanket does not dry out within the first month – refer document ‘Watering Requirement Guidelines for Extensive and Bio-diverse green roof installations’.

COMPLETION

910 INSPECTION

- **Timing:** Before handover.
- **Give notice (minimum):** 3 days.

915A ESTABLISHMENT WATERING REQUIREMENTS

- **BauderGREEN XF 301** lightweight sedum system requires surface watering for the first 4 weeks following installation (to ensure that the sedum blanket remains moist to the touch) It is the responsibility of the roofing contractor to liaise with the main contractor/ building owner to provide water to ensure that the vegetation mat does not dry out during this period.
- An adequate mains supply of sufficient pressure must be available and operational prior to the sedum blanket being delivered and installed. Irrigation systems (where fitted on roof slopes above 10 degrees) must be operational, but initial watering in of the fertiliser must be by surface mounted sprinklers.
- See the Bauder Watering Guide document for detailed information on watering requirements.
- Bauder Ltd accepts no responsibilities whatsoever for the condition of installed sedum blankets that are not properly watered in accordance with our recommendations.

916 POST INSTALLATION MAINTENANCE

- The installing contractor should price into the tender, the cost of carrying out post-installation maintenance for a contract period to be agreed with the client's representative. Following completion of the landscaping installation and handover, the responsibility for future on-going maintenance of the green/blue roof planting becomes the responsibility of the building owner or the Main Contractor, where this element forms part of the contract.
- **Blue Roof Outlet Maintenance:** It is important that the Bauder Bitumen Blue Roof Vertical Outlets and Bauder Blue Roof Flow Restrictors are checked and maintained regularly to ensure there are no blockages that will affect the calculated flow rate. In addition to regular maintenance inspections the outlets should be inspected after a storm event.
- **Maintenance services:** Bauder Ltd offers a professional maintenance service using experienced green/blue roof technicians and would be pleased to provide an estimate for carrying out on-going maintenance. Please contact our green roof maintenance team on Tel: 01473 257671. Alternatively, the work can be contracted to experienced landscape contractors of your choice.
- **Period of maintenance contract:** *Insert requirement i.e. one year, two years etc.*
- **Scope of maintenance procedure:** as per manufacturer's recommendations.

920 COMPLETION

- **General:** Leave the works in a clean, tidy condition.
- **Surfaces:** Clean immediately before handover.
- **Outlets:** Clean and clear of obstructions.
- **Completed green/blue roof:** Protect from adjacent or high-level working.

930 DOCUMENTATION

- **Timing:** Submit at handover.
- **Contents:**
- Manufacturer's guarantees and warranties.

- Procedures for maintenance of the green/blue roof.
- Record drawings showing the location of planting and associated features.
- **Number of copies:** as required by client.

Bauder reserves the right to amend information and product specifications without prior notice. All reasonable care has been taken to ensure that the information is current and correct at the time of issue. Please note that any future regulation changes could result in this specification requiring an update. In the case of a previous roof survey a new survey will be necessary to establish if the condition has further deteriorated and therefore if the specification requires amendment. The specifier is responsible for ensuring that this specification information is still current prior to issue, as Bauder Ltd can accept no liability for any resulting errors or omissions. Any deviation or modification to this specification without Bauder's consent may result in the system not achieving the stated Fire Performance or Guarantee Requirements.