

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

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions.

GENERAL**130 EXTENSIVE GREEN ROOF**

- **Roof Area:** Garage Roof
- **Landscaping finish:** Pre-cultivated Sedum vegetation blanket
- **Substrate:** New Plywood Deck
- **Slope:** 1:60
- **Waterproofing system:** BAUDER SYSTEM AIRTECH - as per J41-130
- **Drainage / protection layer:** Bauder SDF Mat - 20mm drainage / protection layer. Installation as clause 770B.
- **Vegetation blanket:** Bauder Xero Flor XF301 sedum blanket (FAA fire rated), applied in standard length rolls 2m x 1 m. Installation as clause 800B.
- **Landscaping depth:** ca. 48mm (excluding vegetation).
- **Vegetation:** Mainly Sedum with some moss and grasses.
- **Accessories:** -
 - Bauder ALU 250 Inspection chamber, to be installed over all internal rainwater outlets within soft landscaping areas. The lid of the chamber must be level with, or higher than the surrounding landscaping. For landscaping exceeding 100mm, additional height adapter units (available in 50mm or 100mm depths) must be used to achieve the required chamber depth, with the chamber lid being at least level with the surrounding landscaping or higher. Installation as clause 830

- 20 - 40mm round washed pebble vegetation barrier provided at all perimeters and protrusions, as clause 460. Installation as clause 840.
- Bauder Xero Flor organic fertiliser, apply 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.

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 form 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 be 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 (XF301 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 Bauder SB Substrate 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: 2m x 1m
Long: 10m x 1m (or length size as required, cut in 1m increments)
- **Bauder XF301 Sedum Blanket 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.

830 INSPECTION CHAMBER INSTALLATION

- **Location:** Install centrally over rainwater outlets.
- **Orientation:** Align parallel with adjacent features.
- **Surround:** Using 20/40mm grade washed pebbles; the inspection chamber must be surrounded by a 500mm vegetation barrier surround to prevent unwanted growth obstructing the drainage system.
- **Positioning:** Never place directly on the waterproofing membrane – see options below-
Intensive / extensive soft landscaping: Placed directly on to the drainage / water storage layer.
Inverted roof with pebble ballast: Placed directly on the vapour permeable membrane or filter layer.
Decorative aggregate finishes: Placed directly on the protection layer or vapour permeable membrane / filter layer
Important Note: Ensure that a suitably sized hole has been cut out of the underlying drainage board / protection layer to allow water to flow freely into the outlet.
- **Chamber Height:** The contractor should also allow for the installation of additional Bauder height adapter units as required, in order to bring the inspection chamber up to at least the height of the surrounding landscaping. These are available in either 50mm or 100mm units.
- **Box gutters and gullies:** Where a box gutter is to be constructed, provision should be made

to accommodate the 250mm diameter of the inspection chamber. The front support leg of the chamber will need to be removed (see installation guide) for the unit to fit inside a box gutter /gully. We recommend that all box gutters are constructed to a minimum finished width of 500mm to ensure that the support feet of the inspection chamber sufficiently clears the angle fillets within the gutter sole and leaves space to dress the pebble vegetation barrier around the main body of the chamber.

- **Precautionary note:** When cutting metal, please ensure that appropriate tools and personal protection equipment are used.

840 VEGETATION BARRIER / DRAINAGE BARRIER

- A vegetation barrier must be provided to all perimeters, abutments penetrations including protrusions i.e. man-safe posts etc. We 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, but increasing to 500mm at vertical walls with opening windows or doors or to abutments with opening rooflights.
- Every 40m, there is a 30mm high barrier constructed of non-flammable materials or a one metre wide strip of solid paving, gravel or pebbles.
- At all open drainage perimeters, drainage trim must be used to contain the vegetation barrier.
- For extensive green/blue roofs where Bauder XF301 Sedum Blanket 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:** 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. 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 –

- XF301 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 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. 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.

REF No: B181825

PROJECT NAME: BICESTER ECO HOMES