

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 Intensive 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 J41-110
- External planting – refer NBS section Q31

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions.

GENERAL**110 INTENSIVE GREEN ROOF:** Garden Roof

- **Landscape finish:** Planting by Others
- **Substrate:** New Concrete Deck
- **Slope:** 0°
- **Waterproofing System:** BAUDER TOTAL GREEN ROOF SYSTEM
- **Slip Layer:** Bauder PE Foil (loose laid) rolled out in two layers, with sheets staggered . Installation as clause 745.
- **Protection layer:** Bauder FSM600 - 4 mm protection fleece. Installation as clause 750C.
- **Water storage/drainage layer:** Bauder DSE60 – 60 mm drainage / water storage panel. Installation as clause 770I.
- **Filter membrane:** Bauder Filter Fleece. Installation as clause 780A.
- **Fill layer:** Bauder Mineral Drain granular fill. Installation as clause 785A.
- **Growing medium:** Bauder Intensive Substrate, depth 250mm above the filter fleece. Installation as clause 790E.
- **Landscaping depth:** TBC
- **Planting:** Planting (supplied and installed by others) in accordance with the landscape designers planting scheme and requirements. Refer clause 802.
- **Surfacing:** N/A
- **Accessories:**
 - Project specific irrigation system (designed, supplied and installed by others), as clause 463.

- Fertiliser as specified by the client (supplied by others), as clause 464B and applied in accordance with the plant suppliers recommendations and following the manufacturers guidelines.
- Bauder ALU 250 Inspection chambers, 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 100 mm, additional height adapter units must be used to achieve the required chamber depth. Installation as clause 830.
- 20 - 40 mm round washed pebble vegetation barrier provided at all perimeters and protrusions, as clause 440. Installation as clause 840.
- **Additional requirements:** 210, 710, 715A, 720, 910, 915C, 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

440 PEBBLE BALLAST

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

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 GREEN ROOF RELATED REQUIREMENTS

- **The following are vital to the accurate pricing, correct installation, and ultimately the long-term life of a green 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 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 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:** Adequate provision for watering the installed any form of planting must be in place on site before the product is installed. Irrigation systems if fitted should be operational. Initial watering should be by surface sprinklers to water in the fertilizer, where this is specified. 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.
- **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 hand over of a flourishing green roof.

720 ADVERSE WEATHER

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

745 SLIP LAYER INSTALLATION

- **Installation:** to be rolled out loose over the root resistant layer as specified (one layer for Extensive landscaping and two layers for Intensive landscaping).
- This product is only required for roofs with a fall between 0-3° (A slip layer is not necessary or advisable for slopes above 3°).
- **Joints:** Minimize.
- **Overlaps (minimum):** All laps to be 150mm with care being taken to ensure that roll sides join between layers.
- **Upstands:** Extend to top of growing medium. Sufficient foil must be allowed for to enable it to be taken up all upstand and edge details prior to installation of the protection layer.

770I DRAINAGE / WATER STORAGE LAYER INSTALLATION

- **Extent:** Continuous over entire designated roof area.
- **Fitting:** Loose laid over the protection layer. Boards are to be tightly overlapped at the edges and staggered.
- **Upstands:** Fit closely around penetrations and outlets.

780A FILTER MEMBRANE INSTALLATION

- **Joints:** Minimize.
- **Overlaps (minimum):** 150 mm
- **Fitting:** Loose laid over drainage layer in accordance with manufacturer's recommendation.

- **Upstands (soft landscaping):** Extend up, between vegetation barrier and growing medium and trim flush with finished surface level.
- **Upstands (Hard landscaping):** Extend to top of perimeter abutments and trim flush just below finished surface level.

785A GRANULAR FILL

- **Extent:** Continuous over designated roof area.
- **Installation:** Applied directly to the water storage/ drainage board, filling the cellular troughs to a level flush with the upper crowns of the board and eliminating any hollows. Allowance should be made for any settlement that may occur.
- In soft landscaped situations where a vegetation barrier is to be installed (inspection chambers at outlet positions, perimeters, roof penetrations etc.), the granular fill should be stopped 300 mm short of the abutment and substituted with the 20/40 mm round washed pebbles used to create the vegetation barrier (see standard detail drawings).
- Depending on size and access of the project, the specified granular fill can be supplied by the manufacturer by various methods i.e. big bags, Tipper truck or via a silo lorry pumping directly onto the roof area.
- Prior to costing this element of the installation the 'Approved Contractor' should contact Bauder Ltd so that they may help to advise on the best solution, specific to any contract.

790E GROWING MEDIUM INSTALLATION

- **Handling:** Minimize.
- **Conditions:** Handle in the driest condition possible. Do not handle or install when wet or frozen.
- **Layers:** Start by applying two equal layers, building up to required maximum depth.
- **Sequence:** Gently firm each layer before spreading the next. Allowance should be made for any settlement that may occur. It is recommended that measuring stick markers of the required depth be used around the roof area to ensure that a minimum acceptable thickness of growing medium is achieved.
- **Supply:** Depending on size and access of the project the 'substrate' can be supplied by various methods i.e. Tipper, Silo lorry (pumping directly onto the roof area), Big bags, or sacks. Prior to costing this element of the installation the 'Approved Contractor' must contact Bauder Ltd so that they may advise on the best solution on any specific contract.
- **Important note regarding alternative substrates:** If alternative substrates are required (e.g. topsoil...etc), Bauder does not take any responsibility for the performance of such substrates supplied from an alternative source. We recommend that alternative substrates should be covered by a technical data sheet and certified in writing as suitable to support the system and plants specified. Saturated weight loadings must be provided directly from the supplier of the substrate and should be the subject to a structural engineer's approval.

LANDSCAPING INSTALLATION

802 PLANTING (SUPPLIED AND INSTALLED BY OTHERS)

- Supply and plant all soft landscaping in strict accordance with the suppliers recommendation and as per the clients landscaping specification.
 - Weight loadings for fully established planting /vegetation and other landscaping elements (non-Bauder products), should be provided directly from the supplier and should be the subject to a structural engineer's approval.
 - Bauder does not take any responsibility for the design, performance or maintenance of any planting schemes.

830 INSPECTION CHAMBER INSTALLATION

- **Location:** Install centrally over rainwater outlets.

- **Orientation:** Align parallel with adjacent features.
- **Surround:** Using 20/40 mm grade washed pebbles, the inspection chamber must be surrounded by a 300 mm 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 VPM / 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 50 mm or 100 mm units.
- **Box gutters and gullies:** Where a box gutter is to be constructed, provision should be made to accommodate the 250 mm 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 minimum 300 mm pebble vegetation barrier must be provided to all perimeters and roof penetrations and protrusions i.e. surrounds to roof light or plant upstand kerbs, rainwater outlets, soil vent pipes, man-safe posts etc. as specified. If there are adjacent buildings within 6 metres and the barrier functions also as a fire-break, then the width of the vegetation barrier should be increased to 500mm. On very large roof areas, a one metre wide pebble fire break should be incorporated every 40 metres.
- We recommend 20/40 mm rounded river washed pebbles. Stones or aggregates with sharp edges must not be used i.e. flint. Other materials may be used, but only after consultation and agreement with Bauder Ltd.
- At all open drainage perimeters AL80/100 drainage trim must be used to contain the vegetation barrier.
- For extensive green roofs where sedum blanket is specified, the vegetation barrier must cover the edges of the blanket by a minimum of 100 mm in order to protect the exposed edge of the blanket against wind uplift and substrate erosion.

COMPLETION

910 INSPECTION

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

915C INITIAL AND POST INSTALLATION WATERING

- It is the responsibility of the landscaping contractor to liaise with the main contractor/ building owner to provide initial watering to ensure that the growing medium, planting or turf does not dry out after planting/laying. An adequate mains supply of sufficient pressure must therefore be available and operational prior to the planting.

- Permanent Irrigation systems where installed, must fully operational where these are to provide Initial as well as post-installation watering. The end user should therefore be briefed as to the operation of the installed system. Bauder Ltd accepts no responsibility whatsoever for the condition of installed planting that is not properly watered or irrigated following landscaping works.

916 POST INSTALLATION MAINTENANCE

- **Soft landscaping:** Following the final maintenance visit and application of slow release fertiliser at the end of the agreed contract period, the responsibility for the ongoing maintenance of the green roof planting becomes the responsibility of the building owner.
- **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:**
 - Manufacturers guarantees and warranties.
 - Procedures for maintenance of the green roof.
 - Record drawings showing the location of planting and associated features.
- **Number of copies:** as required by client.