

NBS SECTION J42 - DESCRIPTION OF WORKS

Section J42 deals with the installation of the Bauder Single Ply System, comprising single layer coverings of polymeric sheets either mechanically fixed or adhesive bonded and jointed using hot air equipment. It includes where required the vapour control layers, insulation (whether above or below the waterproofing) the waterproof membrane and additional surface finishes of paving slabs or gravel in specifications where this finish is required. We presume the deck substrate and falls to be as stated within the specification below. Accessories are included where relevant.

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

- The Bauder Single Ply waterproofing system.
- Thermal insulation to meet the clients required U value.
- Related Bauder system accessories.
- Internal rainwater outlets (but not the connected drainage/plumbing goods).

This section does not include:

- Construction of the structural deck.
- Lightning protection – refer NBS Engineering Services, Section W60.
- Proprietary rainwater drainage / plumbing – refer NBS section R10.
- Fall arrest /restraint systems – refer NBS Section N25.
- Proprietary metal capping system – refer Section H72.

J42 SINGLE LAYER POLYMERIC SHEET COVERINGS

To be read with preliminaries /general conditions

110 WARM ROOF COVERING: Roof Areas North & South

- **Substrate:** New Concrete deck (designed and constructed level with no deflections, hollows or back-falls). Roof falls to be provided by the tapered insulation scheme.
- **Preparation:** As clause 610C.
- **Roof covering system:** BAUDER SINGLE PLY THERMOFOL GREEN ROOF SYSTEM
- **System manufacturer:** Bauder Limited, 70, Landseer Road, Ipswich, Suffolk, IP3 0DH.
Tel: 01473 257 671. **Fax:** 01473 230 761. **Email:** technical@bauder.co.uk
Web: www.bauder.co.uk
- **Primer type and application:** Bauder Quick Dry Primer, applied to the roof substrate and all upstands and skirtings. For application method and guidance information, refer clause as clause 660A.
- **Vapour control layer:** Bauder EVA 35, 3.5 mm thick aluminium lined, elastomeric bitumen torch applied vapour barrier. Installation as clause 670D.
- **Insulation:** BauderPIR Tapered insulation, highly efficient rigid urethane insulation. Installation in accordance with the Bauder scheme supplied to achieve the required U value (refer Clause 230). This product is fire resistant, has a zero ODP and a Green guide rating of 'A'. Installation as clause 680H.

- **Insulation to upstands:** Vertical upstands to roof light kerbs, access hatches i.e. builders kerbs (but excluding proprietary insulated integrated rooflight units) and changes of level to meet the same thermal value as used for the flat area. Please refer to Bauder tapered scheme and contact Bauder for confirmation of insulation thickness required. Installation as clause 681D.
- **Insulation to vertical upstands (abutment walls only):** 30mm thick, PIR flat board, fire resistant, zero ODP, highly efficient rigid urethane insulation. To comply with Part L of the building regulations, the insulation to wall abutments should be 300mm in height from the deck surface to the top of the upstand, with the vertical insulation being installed before the flat, so as to retain the insulation at the base. Installation as clause 681D.
- **Separating layer (loose laid):** N/A
- **Waterproof membrane:** Thermofol U15 FB, 1.5 mm thick polyester reinforced fleece backed waterproofing membrane, colour Light Grey, fully bonded by Bauder Spray Contact Adhesive. Installation as clauses 720C.
- **Lap joints:** All joints to be hot air welded, as clause 730A.
- **Details: -**
 - Two dimensional detailing:** formed using Thermofol pre-coated, pre-fabricated metal, or non-fleece backed membrane (colour and thickness as used for the flat areas), or used in combination where appropriate. Membrane to be either fully bonded using Bauder Full Bond Contact Adhesive or mechanically fixed according to the construction - refer to the Bauder Single Ply Installation Manual for further guidance.
 - Three dimensional detailing:** Complex three dimensional detailing to curves, pipes or awkward shapes to be formed using Thermofol un-reinforced D15 membrane. Otherwise Thermofol pre-formed corners must be used at intersections and returns.
 - Detailing generally:** to be carried out in accordance with clauses 760, 764A, 765A, 766A, 767A, 768A, 769, 770, 780A and the Bauder Single Ply Installation Manual.
- **Surface protection:** N/A
- **Surfacing:** Extensive Green Roof Landscaping – refer Q37-130
- **Accessories:**
 - Use of Bauder Mastic Sealant. Application as clause 901A.
 - Internal Rainwater outlet (size as required to match drainage pipe work). Installation as clause 904A.
- **Additional requirements:** 210, 310, 510A, 517, 520, 522, 523, 524, 910, 940, 950A
- Latchways Constant Force post system (supplied and installed via Latchways Registered Installers), Part number 65616-00 approved for use with Thermofol PVC and LiquiTEC membrane. Refer to Section N25 and the manufacturer's recommendations and installation guidance. Contact: Latchways plc, Hopton Park, DEVIZES, Wiltshire, SN10 2JP. Telephone: +44 (0)1380 732700. email: info@latchways.com or bauder@latchways.com

PERFORMANCE

210 ROOF PERFORMANCE

- **Roof covering:** Secure, free draining and weather-tight.

230 INSULATION

- **Thermal transmittance (U-Value) of roof:** 0.18 W/m²K
- **Finished Surface:** Suitably even, stable and robust to receive roof covering.
- **Insulation compliance:** To relevant British Standard or Agrément certified.

PRODUCTS

310 ANCILLARY PRODUCTS AND ACCESSORIES

- Types: Recommended by coating manufacturer

330 TIMBER TRIMS, ETC

- **Quality:** Planed. Free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- **Moisture content at time of covering (maximum):** 22%.
- **Preservative treatment:** Please note organic solvent based timber preservatives are not permitted, as these attack bitumen based materials.

EXECUTION GENERALLY**510A ADVERSE WEATHER**

- **General:** Do not lay membrane at temperatures below 5°C or in wet or damp conditions.
- Provide temporary covers and drainage as required to keep finished areas of the roof dry.
- **Poor weather:** Suspend work in severe or continuously wet weather, unless an effective temporary roof is provided over the working area.
- If unavoidable wetting of the construction does occur, take prompt action to minimise and make good any damage.
- **Unfinished areas of roof:** Temporarily ballast incomplete areas of membrane as necessary to protect from wind action.

517 GENERAL WORKMANSHIP REQUIREMENTS

- Installation of the Bauder waterproofing system may only be carried out by approved Bauder contractors.
- Workmanship should comply with current Codes of Practice, BS6229 and Bauder Ltd installation instructions. All waterproofing materials and system components should be supplied by Bauder Ltd, unless otherwise stated, to be included within the guarantee. Non-compliant workmanship will not be permitted (even if the system is watertight). All such faults must be remedied, before the Guarantee can be issued.
- Any building work which is the responsibility of the roofing contractor and has a bearing on the life of the Bauder System should be carried out by properly trained and qualified tradesmen.
- Any structural damage, peculiarities or defects discovered that might affect the performance of the Bauder waterproofing, should be reported immediately to the client and Bauder in order that they may make a decision in overcoming the problem prior to waterproofing.
- The contractor is to ensure water tightness of the roof at all times.
- Where building works are to be carried out by other trades, following completion of the waterproofing, the contractor must make adequate provision for supplying protection to prevent damage to the new membranes. The final inspection will not be carried out by the independent surveyor until all associated trades are complete and the roof areas are clear from all debris and protection layers.
- All mechanical and electrical work to plant and equipment should be carried out by competent mechanical and electrical qualified tradesmen. All plant is to be reinstated and re-commissioned on completion of the roofing works in accordance with the client's detailed specification.
- Any lead work must be carried out by skilled tradesmen and in accordance with current codes of practice and the recommendations of the Lead Development Association.

520 INCOMPLETE WORK

- **End of working day:** Provide temporary seal to the deck to prevent water infiltration, ensuring that the insulation, if present, is protected.
- Ensure that the sequence of laying enables temporary sealing of loose membrane edges to be down on the slope and not against the flow of water.
- **On resumption of work:** Cut away tail of membrane from completed area and remove from roof.

522 PROTECTION AND STORAGE OF MATERIALS

- Store rolls of polymeric membrane and associated products in a clean, dry, well ventilated and cool conditions.
- Store materials designated by the manufacturers as temperature sensitive in facilities where temperature can be maintained at the recommended level.
- Insulation products must be kept dry and protected from wet weather during storage and installation.

523 PROTECTION OF WORK

- Ensure that from completion of the roof until practical completion:
- The roof is not used as a working platform, unless fully protected to the satisfaction of the CA.
- No paints, solvents or other volatile substances harmful to the membrane are allowed to come into contact with the roof surface.
- No building materials stored on the roof.
- Finished roof areas are adequately protected from damage by subsequent building operations.

524 HEALTH & SAFETY INFORMATION – ROOFING WORK

1. Suitable precautions must be taken to prevent accidents occurring when roofing systems are being installed.
2. The contractor must ensure that adequate measures are taken to effectively prevent injury to members of the public, contractors and any other persons who may be affected by the works including the public.
3. Where microwave equipment is installed at roof level, care must be taken to prevent persons working on the roof from being exposed to large doses of microwave radiation.
4. Similarly, the contractor should liaise with the client to ensure that there are no extract outlets situated on the roof where noxious or harmful emissions could affect persons working. Suitable precautions will be necessary to prevent exposure where this situation arises.
5. The contractor is responsible for providing adequate firefighting equipment in the form of extinguishers during work on the roof. These should be kept in easily accessible locations and be suitably signed.
6. Whenever possible, access to the roof should be made via internal staircases rather than by temporary means. Where this is not available, it is the responsibility of the contractor to ensure a safe means of access, egress and a safe workplace.

As far as roofs are concerned, edge protection in the form of scaffolding or a fixed structure should be in place to a height of 1.1 metres in accordance with the Workplace (Health, Safety and Welfare) Regulations 1992.

Failing this, the hierarchy of controls should be applied from the Work at Height Regulations 2005. Means of access should be by fixed ladder, passenger hoist or scaffolding.

7. The contractor must ensure that suitable written method statements and risk assessments are available for the work being undertaken. In particular, it is essential that manual handling methods be fully assessed as roofing materials are heavy and can cause serious injury.
8. The contractor must ensure that suitable information about the roof covering is provided to the Client at the end of the work to ensure that work in future can be carried out safely. This information will form part of the Safety File.
9. All persons working on the roof should be provided with, and wear, suitable personal protective equipment and wet weather gear. Training must be provided to all contract staff on the safe use of the equipment.
10. The installer must observe Product Safety Datasheets, relevant to the materials being used as well as completing and complying with COSHH risk assessments.
11. The Construction Design Management Regulations must also be complied with.

SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM ROOF INSULATION

610C SUITABILITY OF SUBSTRATES (CONCRETE)

- **Substrates generally:** Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
- **Falls:** Where provided, the falls/cross-falls should be designed to 1:40 to achieve minimum finished falls of 1:80 to comply with drainage requirements of BS 6229:2003 and the SPRA design guide. No deflections or back-falls present if the deck is designed to achieve a 0° level finished surface.
- **Preliminary work:** Complete including:
 - Grouting of deck slab joints, application of surface screed (including falls if specified).
 - Formation of abutment upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
 - Fixing of battens, fillets and anchoring plugs/ strips as required.
- **Moisture content and stability of substrate:** Must not impair roof integrity. Please note that cast in-situ concrete with steel trapezoidal formers need 60 days to dry out and cure before they can be waterproofed. Otherwise, 30 days.
- **Preparation:** The new concrete/ screed deck to be allowed to cure thoroughly, remove rough edges, and surface defects. If the surface is very rough a skin screed of concrete to be applied to give a smooth surface.

640 FIXING TIMBER TRIMS

- **Fasteners:** fastener type/length appropriate and suitable to particular deck substrate.
- **Fixing centres (maximum):** 500 mm.

660A APPLYING PRIMER

- **Purpose:** Quick drying substrate primer to seal and prepare dry surfaces of a variety of common substrate material prior to the application of Bauder bituminous waterproof membranes.

- **Before application:** All surfaces must be dry, clean and free from dust, dirt, oil, grease and loose material. Smooth metal to be prepared using a wire brush.
- **Application method:** Apply a thin even coat using a brush or roller to provide full coverage. Avoid pooling.
- **Application rate:** between 4-8 litres per m², dependent upon substrate porosity
- **Application temperature:** 5-25°C
- **Drying time:** 3-6 hours dependent upon ambient temperature and substrate porosity.
- **Coats:** Fully bond. Allow volatiles to dry off thoroughly between coats. Never attempt torching within 30 min of primer application, even if the surface appears dry.
- **Re-application:** Necessary after 24 hours exposure if waterproofing has not yet been applied, to maintain adhesion performance.
- **Caution:** Use only outdoors in well ventilated areas or with respiratory apparatus and keep away from all sources of ignition. Take necessary precautions to avoid the solvent vapour from entering the buildings ventilation system.

670D LAYING VAPOUR CONTROL LAYER

- **Attachment:** Fully bonded to deck substrate in accordance with manufacturer's requirements. However for new concrete, the vapour barrier should be partially bonded (in the approved Bauder manner) to meet the requirements of the current codes of practice.
- **Side and end laps:** minimum 100 mm, with all laps torch sealed to provide a 5-10 mm bitumen bead extrusion. Installation methods as recommended by manufacturer. With metal decks the sheets should run in the direction of the crowns/troughs, with laps formed on the crowns of the deck to ensure that they are fully supported in accordance with manufacturer's requirements.
- **Penetrations:** Fully seal using bonding methods recommended by manufacturer.
- **Edges of insulation at roof edges, abutments, upstands, kerbs, penetrations and the like:** Enclose, with vapour control layer, dressed up level with the surface of insulation.

680H LAYING WARM ROOF INSULATION

- **Setting out:** Laid strictly in accordance with the manufacturers scheme plan and installation instructions. Bauder cannot be held responsible for the drainage performance of tapered insulation schemes applied to an inappropriate deck surface and it is the responsibility of the installing contractor to check the roof deck surface and report any discrepancies.
 - **Long edges:** Fully supported. (Where metal decking is specified, the long edges must be fully support and run at right angles to metal deck troughs).
 - **End edges:** Fully supported.
 - **Joints:** close butted together.
 - **End joints:** Stagger.
- **Thermal performance:** Refer to Manufacturer's Tapered Insulation Layout Plan for details of 'U' value achieved by this scheme.
- **Before installing:** No tapered boards should be laid on site without a copy of the latest scheme to hand. Contractors should always refer to the Manufacturer's scheme with regard to the recommended start point and layout of boards. If contractors are unsure of the correct plan being on site they should check with the Manufacturer's Technical Department ASAP.
- **Wastage:** All off-cuts over 300mm must be considered as usable and are included as such within the scheme plan.
- **Bedding:** Bonded to the upper surface of the Vapour barrier using Bauder Polyurethane Insulation Adhesive. The adhesive should be applied in strips following the direction of the board length giving 6 no. 8 mm wide continuous and equally spaced adhesive beads within each 600 mm board width.
- **Multiple board layers:** Where the total thickness of insulation required is greater than can be achieved by a single standard board, then additional boards of the same product can be

adhered to make up the total thickness required. These additional boards should be bonded using Bauder Insulation Adhesive applied in strips following the direction of the board length giving 6 no. 8 mm wide continuous and equally spaced adhesive beads within each 600 mm board width. The second layer of boards should be laid off-set and staggered.

- **Protection to exposed edges of insulation:** A hard timber edge or similar protection should be incorporated at all exposed edges. See clauses 330 & 640.
- **Completion:** Boards must be in good condition, well-fitting and stable.

681D INSTALLING WARM ROOF INSULATION (INSULATED UPSTANDS)

- **Bedding:** Bonded to the upper surface of the Vapour barrier using Bauder Polyurethane Insulation Adhesive, following the guidance/installation instructions on the container. The adhesive should be applied in strips following the direction of the board length giving 4 no. 8 mm wide continuous and equally spaced adhesive beads within each 600 mm board width. Upstand insulation boards should be installed before the insulation to the flat areas so that the vertical upstand insulation is retained both at the base and at the top. At vertical wall abutments that are cavity insulated, retention is obtained by mechanical fixing of the Bauder pre-formed metal trim.
- **Protective hard edges:** treated timber battens or Bauder pre-formed metal trim (as appropriate to given detail situation) must be used at all right angled edges e.g. top edges of parapet walls or abutment upstands.

WATERPROOF COVERINGS/ ACCESSORIES

720C ADHESIVE BONDING OF WATERPROOF MEMBRANE

- **Attachment:** To be bonded directly to the surface of the Insulation. The adhesive for this application must be **Bauder Spray Contact Adhesive**. The adhesive is to be applied to the upper surface of the insulation in a full and continuous covering and to the fleece underside of the membrane in a full and continuous covering. The adhesive coverage rate is approximately 3-4 m²/kg, for a two coat application, however guidance should be sought from Bauder Ltd when installing onto Bauder tapered insulation. It is essential that the surface of the insulation is clean, dry and free from dust etc., before applying the adhesive. Care should be taken to ensure that the adhesive does not come into contact with the areas of the membrane that will require welding. The coated membrane should be applied directly onto the adhesive coated substrate after approximately 5-10 minutes of it being applied and then pressure rolled over its full surface area. All side and end laps to be hot air welded. Detailed instructions for the installation of the membrane can be found in the Bauder Installation Guide. Installation shall be carried out in accordance with the details given in the Bauder Installation Guide.
- **Note:** A range of approved hot air welding machines and accessories specifically designed for this operation are listed in the Bauder Installation Guide.
- **Installation:** Installation shall only be carried out by Bauder trained installers in strict accordance with the details given in the Bauder Installation Guide.

730A WELDED JOINTING

- **Laying:** Loose lay, do not wrinkle or stretch.
 - **Side and end joints:** manufacturer's/ supplier's recommendation
 - **Laps (minimum):** manufacturer's/ supplier's recommendation
 - **Preparation:** Clean and dry surfaces for full width of joint.
 - **Sealing:** Weld together (Hot Air welded).
- **Condition at completion:** Fully sealed, smooth, weatherproof and free draining.
- **Accessories:** None

760 PERIMETER OF MEMBRANE

- **General:** Secure membrane at roof edge conditions, changes of plane, curb flashings, upstands to roof lights, etc. with mechanical fasteners.

764A PRE-FORMED PRE-COATED METAL FLASHINGS

- Thermofol Pre-Coated Metal sheet is available from Bauder for the formation of fabricated metal flashings, trims and terminations. A list of fabrication companies who already hold this material for bespoke flashing fabrication is available from Bauder Ltd. All detail designs if not in accordance with the design shown within our detail drawing attached must be submitted to Bauder for approval prior to fabrication.
- All Thermofol Coated Metal flashings must be mechanically attached using recommended fastenings installed at 250mm centres. The flashing must be sealed using Thermofol Tape 20 to the structure as shown in the attached detail drawing to ensure minimum air passage through or below the flashing. The chosen fastener supplier can give guidance as to the type of fastener required (fasteners must have counter sunk head style).

765A PERIMETER DETAILS FOR THERMOPLASTIC MEMBRANES

- **Upstands, edge trims, drips, kerbs, etc:** Secure Bauder Thermofol preformed pre-coated metal sections to roof structure with mechanical fasteners.
- Roof membrane: Dress over perimeter profile. Overlap beyond fasteners as per manufacturers recommendations
- Sealing: Weld together.

766A WATERPROOFING MEMBRANE (TWO DIMENSIONAL DETAILS)

- **Upstands, edge details, flashings etc:** Detail work requiring membrane is to be carried out with Bauder Thermofol membrane restrained beneath or welded directly to Thermofol Coated Metal as shown in the attached detail drawings. Thermofol Pre-Formed Corners must be used for the formation of internal or external corner details.
- Special consideration must be given to the preparation required prior to hot air welding of the all laps within the Bauder Thermofol System.
- A list of suitable Hot Air Welding machines and accessories specifically designed for this operation is contained in the Bauder application manual/data sheets.

767A WATERPROOFING MEMBRANE (THREE DIMENSIONAL DETAILS)

- **Pipes, Roof Penetrations etc.:** Detail work requiring the membrane to be used in irregular angles is to be carried out with Bauder Thermofol D non-reinforced or Thermofol Pre-Formed Accessory detailing items. Special consideration must be given to the preparation required prior to the hot air welding of all detailing joints within the Bauder Thermofol System.
- Special consideration must be given to the preparation required prior to hot air welding of the all laps within the Bauder Thermofol System.
- A list of suitable Hot Air Welding machines and accessories specifically designed for this operation is contained in the Bauder application manual/data sheets.

768A COVER STRAPS TO THERMOFOL METAL

- Provision should be made to allow a 4mm gap between abutting sections in the Thermofol metal edge trim, for expansion/contraction. Supply and install Thermofol reinforced cover straps, 200mm in width fixed over the joints in the Thermofol metal edge trim to provide a smooth neat finish. The membrane should be welded to the surface of the Thermofol metal leaving the centre section of the cover strap un-welded. The cover strap should be cut to remove visible 90° corners.

769 DETAILS GENERALLY

- The minimum recommended height for constructing waterproofing details is 150mm from the top of the waterproofing. Special attention should be paid to all structures such as rooflights, counter-flashings, window and door cills etc. These may have to be raised to enable a 150mm waterproofing detail to be formed. We cannot take responsibility for water ingress over waterproofing details the do not meet the minimum required height.

770 PERIMETER DETAILS FOR THERMOPLASTIC

- **Upstands, edge trims, drips, kerbs, etc:** Form flashings from waterproof membrane material.
- **Roof membrane:** Terminate in horizontal plane immediately adjacent to change in direction and secure with mechanical fasteners.
- **Flashings:** Dress over perimeter profile. Overlap horizontal roof membrane beyond perimeter securement, strictly in accordance with the manufacturer's recommendations.
- **Sealing:** Weld together.

780A ROOF PENETRATIONS THROUGH THERMOPLASTIC MEMBRANES

- **Roof membrane:** Cut around penetrations and secure to deck.
- **Flanged sleeve:**
 - **Type:** Form from Thermofol D 15 un-reinforced membrane, complete with base flange.
 - **Installation:** Dress over and around penetration.
 - **Roof membrane overlap to flange (minimum):** 50 mm beyond fasteners.
 - **Sealing:** Weld flange to roof membrane.
 - **Protection to top edge of sleeve:** Flashing or weathering cravat.

SURFACING**850A LAYING MEMBRANE WALKWAYS**

- **Attachment:** The membrane should be heat welded around it's full perimeter to the surface of the finished waterproofing.

ACCESSORIES**901A MASTIC SEALANT**

- Provision should be made to allow for the use of Bauder Sealant in conjunction with Bauder Sealant Primer at all abutments with the Thermofol system, and any other instances where a mastic seal is required.
- It is imperative that the primer is used to prepare the surfaces effectively to enable a long lasting key with the sealant.

904A INTERNAL OUTLET

- Internal rainwater outlet/s (suitable for PVC membranes) of the correct size is to be installed through the system and deck after creation of a suitable size diameter opening. The outlet should be secured using suitable fasteners.
- All vapour barrier edges should be sealed to the deck using Tape 03. Connection to the rainwater waste pipe should be made by others, details for this connection can be found in the product data pages. The outlet is designed to be connected into the standard spigot end connector on the rainwater waste pipe. The outlet spigot is universal length to cope with differing insulation thickness's and will require cutting down to the correct length. The Thermofol waterproofing membrane should be welded on to the outlets pre-attached PVC membrane (if present) or to the body of the outlet. Install the clip-fix leaf grille.

COMPLETION

910 INSPECTION

- **Interim and final roof inspections:** in accordance with the manufacturer's requirements for guarantee.
- **Notification:** It is the responsibility of the approved contractor to advise Bauder Ltd when the roof is ready for Final Inspection. The 'Final Inspection' of the waterproofing must be carried out and approved by Bauder Ltd prior to any landscaping products/materials being installed; otherwise a guarantee cannot be issued.
- **Other requirements:** Please also refer to preliminaries / general conditions.
- **Site contact details - Site Technician: Robert Lane,** Tel: 07787 226231
- **Technical Contact Details - Area Sales Manager: Andrew Harper,** Tel: 07590 774142

940 COMPLETION

- **Roof areas:** Clean.
 - **Outlets:** Clear.
- **Work necessary to provide a weather-tight finish:** Complete.
- **Storage of materials on finished surface:** Not permitted.
- **Completed membrane:** Do not damage. Protect from traffic and adjacent or high level working.

950A GUARANTEE

- A 20 year guarantee is to be provided upon completion following a Final Inspection by Bauder. Details regarding the full terms and conditions of this guarantee are available separately from Bauder Ltd upon request. This system must be installed by a trained Bauder installer to be eligible for guarantee.

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.

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 J42-110
- Irrigation– refer NBS section S__.

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions.

GENERAL**130 EXTENSIVE GREEN ROOF: Roof Areas North & South**

- **Landscaping finish:** Planting by Others
- **Substrate:** Concrete Deck
- **Slope:** 1°
- **Waterproofing system:** BAUDER SINGLE PLY THERMOFOL SYSTEM
- **Slip Layer:** N/A
- **Protection layer:** Bauder Eco-Mat - 6mm thick protection fleece. Installation as clause 750A.
- **Drainage layer:** Bauder DSE40 - drainage / water storage panel. Installation as clause 770E.
- **Filter membrane:** Bauder Filter Fleece. Installation as clause 780A.
- **Growing Medium:** Bauder Biodiverse Substrate (FLL compliant), depth 100mm above the filter fleece. Installation as clause 790A.
- **Landscaping depth:** TBC
- **Vegetation:** Extensive Planting (supplied and installed by others) in accordance with the landscape designers planting scheme and requirements. Refer clause 802E.
- **Accessories: -**
 - Project specific irrigation system (designed, supplied and installed by others), as clause 463.
 - Bauder AL150 drainage and retention trim, fitted to all open perimeters to contain the pebble vegetation barrier. Installation as clause 820J.
 - 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 to protrusions and perimeters (other than to open perimeters serviced by external guttering), as clause 460. Installation as clause 840.
- **Additional requirements:** As clauses 210, 710, 715A, 720, 910, 915E, 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.

463 IRRIGATION SYSTEM

- **Manufacturer/Supplier:** _____ .
- **Product reference:** _____ .
- **Type:** _____ .

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 fertiliser, 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 handover 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.

LANDSCAPING INSTALLATION

750A PROTECTION LAYER INSTALLATION

- **Installation:** 6mm thick Protection Fleece, rolled out and laid loose.
- **Joints:** Minimize.
- **Overlaps (minimum):** Laps to be 150mm.
- **Upstands:** Sufficient protection fleece must be allowed for so that it may be installed to all abutment upstands and edge details, in accordance with the manufacturer's instructions. Extend to full height of the upstand and secure in place by using a lead or fabricated metal counter-flashing.
- **Openings in landscape restraint kerbs:** Where these kerbs are present (roof slopes above 5°), the protection layer should be cut away from the openings/ gaps to avoid impeding drainage.

770E DRAINAGE / WATER STORAGE LAYER INSTALLATION

- **Extent:** Continuous over entire designated roof area.
- **Fitting:** Loose laid over the protection layer. Boards to overlap and interlock by one cup profile at sides and ends and each row be laid staggered. The 'X' stamped impression on the highpoint of the cup moulding indicates where boards overlap.
- **Upstands:** Carefully cut to fit closely around penetrations and outlets.

- **Construction of planter walls:** The drainage/water storage board provides a suitable base surface for building concrete or brick kerbs/walls. The specified infill haunching should be installed over the board to required depth of cover, poured directly into the cells of board. These should be constructed to provide an adequate support for the raised masonry planters. For the specification of the type of infill and all kerb/wall construction elements – please refer to the structural engineer’s plans and the specification. An internal surface of the planter wall may be primed using bituminous primer and then lined with single layer of torch applied root resistant Bauder Plant-E. The bright green slate finish may be considered undesirable, but the slate is necessary for long-term UV protection of the bitumen. To disguise and blacken the slate colour, paint exposed areas above anticipated soil level with a light coat of bituminous primer.

780A FILTER MEMBRANE INSTALLATION

- **Joints:** Minimize.
- **Overlaps (minimum):** 150mm
- **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.

790A 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.

802E EXTENSIVE 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.
- Please note - Bauder Ltd does not take any responsibility for the design, performance or maintenance of any planting schemes.

820J EDGE RETAINING PROFILE INSTALLATION

- **Cutting:** Neat, accurate and without spalling.
- **Junctions:** Use the supplied connection pieces to reinforce and support the abutment of trim

sections.

- **Corners:** The trim is cut to the length required. The supplied aluminium connection pieces have a perforated vertical line in the centre of the component to enable folding the unit through 90° to form the corner reinforcement.
- **Position:** True to line and level. Smooth continuous lines.
- **Fixing:** The AL150 retaining trim is to be secured in place by separate pieces of reinforced Thermofol 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.
- **Location:** To contain soft landscaping at abutments and open perimeters, used in conjunction with the vegetation barrier.
- **Precautionary note:** When cutting metal, please ensure that appropriate tools and personal protection equipment are used.

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 minimum 500mm 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.
- 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.
- We recommend 20/40mm 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, 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 100mm in order to protect the exposed edge of the blanket against wind uplift and substrate erosion.
- **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 roof areas and for this reason some clients/designers choose to reduce this width or otherwise remove the barrier altogether. The current barrier width of 500mm is set by the GRO codes of practice and FLL industry guidelines, which 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/ FLL guidelines.

COMPLETION

910 INSPECTION

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

915E ESTABLISHMENT WATERING REQUIREMENTS

- The planted plugs and seeds require surface watering for the first 10 weeks following installation to ensure the substrate remains moist to the touch. It is the responsibility of the roofing contractor to liaise with the main contractor/ building owner to provide water and ensure that the planting is thoroughly watered until established.
- It is the responsibility of the landscaping contractor to liaise with the main contractor/ building owner to provide initial watering to planted areas to ensure that the growing medium does not dry out after installation.
- An adequate water supply of sufficient pressure must therefore be available and operational prior to the planting.
- 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

- 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 roof planting becomes the responsibility of the building owner or the Main Contractor, where this element forms part of the contract.
- **Maintenance services:** Bauder Ltd offers a professional maintenance service using experienced green 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.

REF No: B161695

PROJECT NAME: GRETER LONDON HOUSE

- **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 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.