

PROJECT NAME: ELDON GROVE

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 J41-110
- Irrigation– refer NBS section S--
- External decks, boardwalks and pergolas – refer NBS section Q55

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions.

GENERAL

130 EXTENSIVE GREEN ROOF: Roof Garden

- **Landscaping finish:**
- **Substrate:** New Plywood Deck
- **Slope:** 1°
- **Waterproofing system:** BAUDER TOTAL GREEN ROOF SYSTEM – as per J41-110
- **Slip Layer:** Bauder PE Foil (loose laid) rolled out in single layer. Installation as clause 745.
- **Protection layer:** Bauder FSM600 - 4 mm protection fleece. Installation as clause 750C.
- **Drainage layer:** Bauder DSE40 - drainage / water storage panel. Installation as clause 770E.
- **Filter membrane:** Bauder Filter Fleece. Installation as clause 780A.
- **Growing Medium:** Bauder Extensive Substrate, depth 100mm above the filter fleece. Installation as clause 790A.
- **Landscaping depth:**
- **Vegetation:** Bauder XF118 Wild Flower Blanket. Installation as clause 794.
- **Surfacing: Timber decking:** Supplied by others to the client's specification - refer NBS Section Q55. Decking to be installed upon Bauder Support Pedestals fitted with the Kit Support Holders to secure the battens/ joists, as clause 836.
- **Accessories:**
 - Bauder AL80/100 drainage and retention trim, fitted to all open perimeters to contain a pebble vegetation barrier. Installation as clause 820D.
 - Purpose designed aluminium or stainless steel perimeter retention angles, used

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to contain pebble ballast at open perimeters, supplied and fabricated by others to the landscape architects requirements and incorporating drainage perforations where required. Refer clause 820H.

- Fixing of irrigation pipe work to the waterproofing. Installation as per the irrigation suppliers plan and clause 825.
- Bauder Xero Flor organic slow release fertiliser, applied as clause 850A.
- **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.

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

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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 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

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.

750C PROTECTION LAYER INSTALLATION

- **Installation:** Protection fleece rolled out and laid loose. Laps to be sealed by lightly heating overlap area with a propane gas torch to melt the polypropylene fibres and then press seal the two fleece sheets together.
- **Joints:** Minimize.
- **Overlaps (minimum):** Laps to be 150 mm
- **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.

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- **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):** 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.

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.

794 WILD FLOWER VEGETATION BLANKET INSTALLATION

- **Planting mix:** Non-aggressive selected wild flowers (see manufacturers literature)
- **Thickness:** 25mm.
- **Roll size:** 2m x 1m
- **Handling blankets and timing:** Lay within 24 hours of delivery. Watering and installation over large areas should be carried out in sections that could be completed within four hour time frame.
- **Laying blankets:** Dry, damaged, frosty or waterlogged blankets: Do not lay.
- **Excessive stacking:** Not permitted.
- **Method:** Laid manually / two-man operation

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Pre-grown wildflower blankets should be supplied and installed in strict accordance with the manufacturers recommendations.

- **Material loss (maximum):** 3% of total surface area.
- **Growing medium condition:** Immediately prior to planting, the whole system should be thoroughly watered to ensure that the water storage/drainage board is filled and the substrate growing medium saturated
- **Layers:** Pre-grown wild flower blankets should be typically applied directly over a minimum of 100mm of prepared level or gently undulating substrate.
- **Orientation:** Perpendicular to slope of roof.
- **Joints:** Staggered/tight abut together to minimize any 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 abut together tightly (as per the manufacturer's installation guideline).
- **Edges:** Finish with whole blankets.
- **Consolidation:** N/A
- **Dressing:** Bauder Xero Ter 3 substrate.
- **Application:** Brush in to fill joints.
- **Watering:** Thorough, immediately after laying and dressing, ensuring that the blanket and substrate are fully saturated before moving on to the next area.
- **Slopes:** When applying the system on roof slopes above 10°, on large or to exposed areas, the vegetation blankets should be secured in place by suitable bio-degradable landscaping pegs. Great care should be taken to prevent any damage to the waterproofing.
- **Please note** - Bauder Ltd does not take any responsibility for the design, performance or maintenance of any planting schemes.

820D EDGE RETAINING PROFILE INSTALLATION

- **Cutting:** Neat, accurate and without spalling.
- **Junctions:** Cut with a hack saw to form 90° corners – mitre cut fixing arm.
- **Position:** True to line and level. Smooth continuous lines.
- **Fixing:** The AL80/100 trim is to be secured in place by separate pieces of torch applied Bauder Plant-E capping sheet cut into strips 1000mm x 200mm, these bituminous flashings should be torched to the surface of the trim and set at intervals of 400mm between each one metre long flashing piece, bonding onto the main capping sheet by a minimum 100mm. Bauder AL80/100 can be installed either to form an 80 mm or 100 mm perforated retention upstand, depending on which way the fixing arm is secured.
- **Location:** AL80/100 must always be used in conjunction with the pebble vegetation barrier.
- **Precautionary note:** when cutting metal, please ensure that appropriate tools and personal protection equipment are used.

820H EDGE RETAINING PROFILE INSTALLATION

- **Cutting:** Neat, accurate and without spalling.
- **Junctions:** Cut with a hack saw to form 90° corners – mitre cut fixing arm.
- **Position:** True to line and level. Smooth continuous lines.
- **Fabrication:** The pre-fabricated trim is to be obtained from a specialist metal fabricating company. The metal should be regularly perforated on the vertical face to allow drainage, using 5 mm dia. Holes. The top leading edge should be folded fully or at a right angle by a minimum of 20 mm to eliminate the sharp edge.
- **Height:** designed and manufactured to accommodate the total depth of the landscaping build-up.
- **Fixing arm (when retained by waterproof flashings):** The fixing arm width should be a minimum of 100 mm, with regularly spaced 60 mm diameter holes positioned and cut centrally along the fixing arm at a rate of 6 no. per linear metre. The retention trim is secured in place using separate pieces of torch applied Bauder Plant-E capping sheet cut into strips 1000mm x

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200mm, these bituminous flashings should be torched to the surface of the trim and set at intervals of 400mm between each one metre long flashing piece, bonding onto the main capping sheet by a minimum 100mm.

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

825 FIXING OF IRRIGATION PIPEWORK

- Irrigation pipe work should be secured to the waterproofing using 50 mm x 200 mm straps of Bauder Plant-E capping sheet, carefully torch bonded to the main waterproofing surface at one metre intervals. Pipe work should be positioned as per the irrigation suppliers plan and retained in such a way as to not impede the sedum blanket fixing onto sedum retention strips (placing irrigation pipe directly behind the spikes will prevent the blanket from engaging onto the spikes) where fitted, or blanket entry into the SS40 edge retention trim. Normally, this involves setting back the irrigation pipe by 100 mm minimum from either of the two previously mentioned items.

836 TIMBER DECKING (MOUNTED ON ADJUSTABLE SUPPORTS)

- **Product ref:** Bauder Pedestal Support System
- **Material:** Polypropylene copolymer with min. 65% recycled content.
- **Colour:** Black
- **Placement - Supports to be installed according to the Bauder System build-up below: -**
 - **Bituminous membranes:** directly on to the waterproofing.
 - **Inverted insulation:** directly on to filter layer / vapour permeable membrane.
 - **Thermofol Single Ply Membrane:** directly on to Bauder protection fleece.
 - **Thermoplan Single Ply membrane:** directly on to membrane surface.
 - **LiquiTEC liquid cold applied system:** directly on to waterproofing surface.
- **Range of adjustment:** 17 mm - 850 mm (bracing system used on heights over 600 mm).
- **Head support (surface area):** 190 cm².
- **Base Support (surface area):** 315 cm².
- **Spacers/ shims:** range available to enhance acoustic performance and help leveling.
- **Joist support plates:** available kit support for joist battens - Support width of 65 mm, with fixing holes on both sides of the kit support for mechanical fixing.
- **Timber decking:** Refer to NBS Section Q55-110 for product specification. Decking planks screwed fixed to joists. Joists located by joist support plates and secured by screw fixing through side flanges. Joist support plates located by proprietary plugs and pin clips.
- **Slope compensation:** 0% - 5% @ half degree increments.
- **Compressive strength:** Maximum 1000 kg.
- **Installation:** Please refer to the manufacturer's technical literature and guidelines.
- **Extenders:** Additional height adjustment, where required, can be obtained by using extenders. See information above and the technical literature.
- **Installation:** System to be installed in accordance with the technical literature and installation instructions. If there is any doubt as to the exact requirements consultation should be made with Bauder Limited.

850A FERTILISER

- Xero Flor organic slow release fertiliser must be applied at a rate of 80g/m² onto the newly laid XF118 blanket. This is available from Bauder Ltd. Care must be taken to distribute the fertiliser evenly, through use of an approved applicator.
- The vegetation blanket 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 vegetation mat does not dry out within the first month.

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COMPLETION

910 INSPECTION

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

915E INITIAL WATERING

- It is the responsibility of the roofing contractor to liaise with the main contractor/ building owner to provide water and ensure that the planted and fertilised growing medium is thoroughly irrigated immediately after installation.
- For wildflower blankets, it will be necessary to keep the blanket substrate damp for a period of at least 10 weeks during the period of vegetation establishment. It should be established at tender stage, who is to carry out this task and that they have all relevant information available regarding watering requirements.
- An adequate mains water supply of sufficient pressure must be available and operational prior to the plants being delivered and installed. Initial watering must be by surface mounted sprinklers. For larger roofs this will likely entail more than one watering point at roof level.
- See the Bauder Watering Guide document for detailed information on watering requirements and establishment irrigation.
- 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.
- **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.
- **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:**
 - 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.

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NBS SECTION J41 - DESCRIPTION OF WORKS

Section J41 deals with the installation of the Bauder Waterproofing System, comprising coverings of multiple layers of reinforced bituminous membranes laid and jointed using self-adhesive and/or torch application as required. It includes where required, the vapour control layer, thermal insulation, underlayer and capping sheet membranes (root resistant for green roof systems) and presumes the deck substrate and roof falls 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

This section includes:

- The Bauder waterproofing system.
- Related Bauder system accessories
- Thermal insulation that meets the required U Value.

This section does not include:

- Construction of the structural deck.
- Proprietary rainwater drainage / plumbing – refer NBS section R10
- Lightning protection – refer NBS Engineering Services, Section W60.
- Green Roof landscaping – refer section Q37
- Proprietary metal capping system – refer Section H72.

J41 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS

To be read with Preliminaries/ General Conditions.

TYPES OF COVERING

110 BUILT-UP REINFORCED BITUMEN MEMBRANE WARM DECK ROOF COVERING

- **Roof area:** Roof Garden
- **Substrate:** New Plywood deck (designed and constructed to provide a minimum finished slope of 1°).
 - **Preparation:** As clause 610A.
- **Vapour control layer:** BauderTHERM DS1 Duo, 3.5 mm thick aluminium lined, elastomeric bitumen self-adhesive vapour barrier. Installation as clauses 670A, 710.
- **Insulation:** Bauder PIR FA-TE flat board, fire resistant, aluminium foil faced, zero ODP, highly efficient rigid urethane insulation 150mm thick to achieve the required U value (refer Clause 230). Installation as clause 680A
- **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, the Insulation is to be the same thickness and meet the same thermal value as used for the flat area. Installation as clause 681B.
- **Vertical upstands to insulated cavity wall abutments only:** 30 mm thick, Bauder PIR FA-TE flat board, fire resistant, aluminium foil faced, zero ODP, highly efficient rigid urethane insulation. In compliance with Part L of the current Building Regulations, the insulation to wall abutments should be 300 mm in height from the deck surface to the top of the upstand, with

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the vertical insulation being installed before the flat, so as to retain the insulation at the base. Installation as clause 681B.

- **Waterproof covering:** BAUDER TOTAL 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
 - **Underlayer:** BauderTEC KSA DUO, 3 mm thick, 200g/m² glass-fibre reinforced, elastomeric self-adhesive bitumen underlayer.
Attachment: As clauses 710, 747A
 - **Top layer / Cap sheet:** Bauder Plant-E, 5 mm thick, 250g/m² polyester reinforced, elastomeric bitumen root resistant, torch applied capping sheet, green slate finish.
Attachment: As clauses 710, 750B
 - **Flashings and detail work:** Bauder Plant-E root resistant capping sheet. Install as clause 775A
- **Surface protection:** Extensive green roof landscaping - refer Section Q37-130
- **Accessories:** -
 - New internal rainwater outlets (supplied and installed by others), as clause 490F.
- **Additional Requirements:** 210, 515, 520, 530, 540, 560, 561, 910B, 940, 950B

PERFORMANCE

210 ROOF PERFORMANCE

- **General:** Secure, free draining and weather tight.

230 INSULATION

- **Thermal transmittance (U-Value) of roof:** 0.15 W/m²K
- **Finished Surface:** Suitably even, stable and robust to receive roof covering.
- **Insulation compliance:** To relevant British Standard or Agrément certified.

PRODUCTS

320A FAST DRYING PRIMER

- **Type:** Any commercially available fast drying Bituminous Priming Solution meeting characteristics of BS 8217, clause 5.6.2., supplied by an approved installer.

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.

490F ROOF DRAINAGE OUTLETS

- **Manufacturer:** Wade International (UK) Ltd, Third Avenue, Halstead, Essex, CO9 2SX, Tel (01787) 475151
- **Product reference:** 3400 series outlets.
- **Material:** Cast iron.
- **Size:** as required to match existing pipe work.
- **Fixing:** As per the manufacturers recommendations.
- **Type of grate/ fittings:** supplied with clamping ring and grille.

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EXECUTION GENERALLY

515 ADVERSE WEATHER

- **General:** Do not lay coverings in high winds, wet or damp conditions or in extremes of temperature unless effective temporary cover is provided over working area.
- **Unfinished areas of roof:** Keep dry, protect edges of laid membrane from wind action.

520 INCOMPLETE WORK

- **End of working day:** Provide temporary seal to prevent water infiltration.
- **On resumption of work:** Cut away tail of membrane from completed area and remove from roof.

530 APPLYING PRIMERS

- **Coverage per coat (minimum):** As per manufacturer's recommendations.
- **Surface coverage:** Even and full.
- **Coats:** Fully bond. Allow volatiles to dry off thoroughly between coats.

560 GENERAL WORKMANSHIP REQUIREMENTS

- Installation of the Bauder waterproofing system may only be carried out by trained and certified operatives approved by Bauder Ltd and who carry current ID badges. These should be available for inspection at all times.
- Workmanship must comply with Codes of Practice BS 8217:2005 (or alternatively Bauder Ltd.'s specification where otherwise stated). Non-compliant workmanship will not be permitted, even if the system is watertight. The client will be told that all such faults must be remedied, before the Guarantee is issued.
- All waterproofing materials and system components must be supplied by Bauder Ltd, unless otherwise stated. Any sub-standard materials or un-authorized alternatives will be rejected. Any building work which is the responsibility of the roofing contractor and has a bearing on the life of the Bauder System must be carried out by properly trained and qualified tradesmen.
- Any structural damage, peculiarities or details discovered that might affect the performance of the Bauder system, should be reported immediately to the client's representative and Bauder Limited in order that they may assist in overcoming the problem.
- The contractor is to ensure water tightness of the roof at all times. Proper day joints must be formed at the end of each working day to provide a temporary seal. No mopping or loose covers will be permitted.
- 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 Bauder Site Technician or the Bauder nominated Independent surveyor until all associated trades are complete and the roof areas are clear from all debris and protection layers.
- It is imperative that the Bauder Approved Contractor conforms to the workmanship criteria as listed above. Any deviation will result in the contract being considered unguaranteeable.
- 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.
- 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 waterproofing.
- If any items of plant/equipment are to be situated on the finished roof, a sacrificial layer of Bauder capping sheet is to be loose laid beneath. This is to extend a minimum 25mm past the point of contact on all sides. In the case of heavy items it may be necessary to introduce a load-spreading slab, please contact Bauder for further advice.

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- All lead work to be carried out by skilled tradesmen and in accordance with current codes of practice and the recommendations of the Lead Development Association.

561 SITE INSPECTIONS

- Bauder Site Technicians will carry out regular inspections of the project during the course of the works. The Approved Contractor must give reasonable notice to Bauder of their intention to commence laying capping sheet. This will allow a discretionary inspection of the underlayer to take place, so that any remedial treatment necessary can be carried out prior to installing the capping sheet. This is particularly important when tapered insulation has been used to ensure that any areas of standing water that may remain can be addressed.
- Bauder must be notified when the roof is ready for final inspection and all related works and snagging complete. See also clauses 910A or 910B (Landscaped roofs).

SUBSTRATES / VAPOUR CONTROL LAYERS / WARM ROOF INSULATION

610A SUITABILITY OF SUBSTRATES (PLYWOOD)

- **Substrates generally:** Secure, clean, dry, smooth, and free from frost, contaminants, voids and protrusions. The new 18 mm thick WPB plywood should be BBA certified, conforming to BS EN 1995 & CPD/CE compliant, fixed directly to either the joists or firings using non corroding ring shank nails or recommended screw fasteners.
- **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 current codes of practice BS 8217:2005. No deflections or back-falls present if the deck is designed to achieve a 0° level finished surface (e.g. when using tapered insulation to provide falls).
- **Preliminary work:** Complete including:
 - Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
 - Fixing of battens, fillets and anchoring plugs/strips.
- **Moisture content and stability of substrate:** Must not impair roof integrity.
- **Preparation:** All such items to be rectified as necessary to eliminate the possibility of puncturing the new waterproofing system.
- **Taping of board joints:** Tape centrally over board joints with 200mm wide strips of Bauder R333 taping strip. These can be retained temporarily in place with clout nails, prior to the self-adhesive vapour barrier being laid.
- **Priming:** Prime all areas receiving the new waterproofing with fast drying bitumen primer, as clause 320A, and ensure this is thoroughly dry before applying the new waterproofing.

640 FIXING TIMBER TRIMS

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

670A LAYING VAPOUR CONTROL LAYER

- **Attachment:** Cold applied and fully bonded to substrate in accordance with manufacturer's requirements.
- **Side and end laps:** minimum 100 mm, laid red over blue with all laps torch sealed to provide a 5-10 mm bitumen bead extrusion. Installation methods as recommended by manufacturer.
- **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 150 mm above surface of insulation, thus providing 100 mm (minimum) seal when overlapped by the roof covering.
 - Care should be taken to ensure adhesion when the temperature is below + 5° C.

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- **Please note:** If BauderTHERM DS1 DUO Vapour barrier is left exposed for longer than two weeks as a temporary waterproof layer, the burn off release foil and surface of the torch-activated adhesive stripes will be effected by the exposure to ultra violet. This minor issue can be resolved by using more heat to activate the bitumen stripes, but the process will be slightly slower than when using newly laid material.

680A LAYING WARM ROOF INSULATION

- **Setting out:**
 - **Long edges:** Fully supported (if metal deck - run at right angles to metal deck troughs)
 - **End edges:** Fully supported.
 - **Joints:** close butted together.
 - **End joints:** Stagger.
- **Bedding:** Fully bed into torch activated bonding stripes of vapour control layer surface.
- **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, either in linear stripes or snake bonded, achieving no less than a minimum overall bond of 50%.
- **Protection to exposed edges of insulation:** Reduced thickness treated timber batten as clause 640 (or equivalent plywood construction), a minimum width of 150 mm and 10 mm less in thickness than the insulation to accommodate the build-up of the waterproofing layers – all securely fixed to the deck. Outer edges chamfered at changes in level.
- **Completion:** Boards must be in good condition, well-fitting and stable.

681B INSTALLING WARM ROOF INSULATION (INSULATED UPSTANDS)

- **Bedding:** Fully bonded to the vapour control layer by torch activating the membrane surface profiles. Board joints to be close butted. 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 insulation support bracket.
- **Protective hard edges:** treated timber battens or Bauder Insulated upstand brackets (as appropriate to given detail situation) must be used at all right angled edges e.g. top edges of parapet walls or abutment upstands.
- **Encapsulation seal:** Provision must be allowed for forming a minimum 100 mm lap seal between the vapour control layer and underlayer, where the insulation finishes.

WATERPROOF COVERINGS/ ACCESSORIES

710 LAYING REINFORCED BITUMEN MEMBRANES GENERALLY

- **Direction of laying:** Unrolled up the slope.
 - Where practicable, install so that water drains over and not into laps.
- **Side and end laps (minimum):** 100 mm, with the exception of mineral surfaced membranes, where side laps are 80 mm, but the head laps to remain 100 mm.
- **Head and side laps:** Offset.
- **Intermediate and top layer/Capping sheet:** Fully bond.
- **Successive layers:** Apply without delay. Do not trap moisture.
- **Strips of bitumen membrane for 'linear' details:** Cut from length of roll e.g. gutter sole pieces.
- **Detail flashings:** to be cut from width of roll.
- **Completed coverings:** Firmly attached, fully sealed, smooth, weather proof and free draining.

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747A SELF-ADHESIVE BONDING OF REINFORCED BITUMEN UNDERLAYER

- **Bond:** Full over whole surface, with no air pockets.
- **Underlayer:** Cold applied and fully bonded by removing the release foil sheet and installing in the approved Bauder manner, using the Bauder long handled roller to extrude a 5-10 mm bead of bitumen. Head laps to be 100 mm side laps to be 80 mm, lapping red strip over blue and torch sealing. All laps to upstands, edge details, flashings, etc., to be 100 mm. The underlayer must be taken up all upstands, edge details, in accordance with current British Standards and the manufacturer's recommendations.
- **Underlayer inspection:** The Approved Contractor must give reasonable notice to the nominated Bauder Site Technician of their intention to commence laying capping sheet. This will allow a discretionary inspection of the underlayer to take place, so that any remedial treatment necessary can be carried out prior to installing the capping sheet.

750B LAYING REINFORCED BITUMEN TORCH-ON CAPPING SHEET

- **Bond:** Full over whole surface, with no air pockets.
- **Excess compound at laps of top layer/ capping sheet:** Leave as a 5 mm - 10 mm continuous bitumen bead extrusion.
- **Laying top layer:** Fully bonded to the underlayer by torching in the approved Bauder manner. Head laps to be 100 mm, side laps to be 80 mm. All laps to upstands, edge details, flashings, etc. to be 100 mm.
- **Final Inspection:** No landscaping is to be applied until the root resistant capping sheet has been thoroughly inspected by the Bauder Site Technician. This is to ensure that any remedial treatment that is necessary can be carried out prior to laying the landscaping elements. Failure to ensure the instigation of this inspection will result in the issuing of the Bauder guarantee being put in jeopardy.

775A SKIRTINGS AND UPSTANDS

- **Insulated upstand brackets:** Bauder insulated upstand support brackets must be used at all vertical abutment wall upstands (where the wall cavity is insulated) in conjunction with 30 mm Bauder insulation. These are to be fixed at 400mm centres using suitable fixings through the vapour barrier, so that the top edge is a minimum of 300mm above the surface of the deck. A 3mm gap should be left between adjacent sections. The detail is to be carried out in accordance with the Bauder detail drawing, where provided.
- **Angle fillets:** Bauder PIR angle Fillets (61 mm x 61 mm) must be used at all right angled upstands, provisionally bonded in Bauder PUR membrane adhesive and subsequently retained once the underlay detailing is applied. Under no circumstances must fillets of an alternative material be incorporated (i.e. cork, fibre, etc.) as this would invalidate the guarantee.
- **Layers of bitumen membrane:** Carry in staggered formation up the upstand, with each layer fully bonded.
- **Upstands:**
- **At ends of rolls:** Underlay layer only, form with bitumen membrane carried up without using separate strip.
- **Elsewhere:** Form with matching strips of bitumen membrane, maintaining laps.
- **Additional fixing of bitumen membranes:** Mechanically fix the top leading edge of all upstand details in excess of 250 mm in height using appropriate fasteners. In the event of doubt, Bauder should be consulted regarding any specific requirement.
- **Upstand details (minimum height):** 150 mm. This must be taken from the surface of the finished landscaping. Special attention should be paid to all structures, such as rooflights, counter-flashings, window and door cills, pipes etc. Bauder cannot take responsibility for water ingress over waterproofing details constructed below the recommended minimum height.
- **Flashings:** Separate flashings must always be formed. Capping sheet taken up the upstand in one piece will not be permitted.

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COMPLETION

910B 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.

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 chemicals, traffic and adjacent or high level working.

950B GUARANTEE

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