BURGESS HOUSE

NBS SPECIFICATION
J41 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS
AOC_207_J41

Prepared by:
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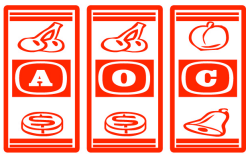

Am

Revision History

No.	Status	Date
/	Tender Issue	-

Clauses Amended in this Revision

No.	Clause	Info

J41 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS

To be read with Preliminaries/ General conditions.

REF no. B180378

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.

'Safe2Torch' advice:

The application of torch-on materials to or in the vicinity of combustible deck materials does not conform to the recommendations of BS8217:2005, clause 7.3.2.1, paragraph 3, or the advice given in the 'Safe2Torch' document produced by the National Federation of Roofing Contractors. When encountering an area which contains combustible material a minimum 900mm deep zone of the flat area around the material and any detail flashing to the material itself there is a requirement for 'Torch-Free' detailing. In these instances an appropriate alternative Bauder self-adhesive membrane should be used as described in: 'TORCH-FREE' & 'SAFE TO TORCH' zones (as per clause 773) - ALTERNATIVE MEMBRANES AND APPLICATION. The 'Torch-Free' & 'Safe to Torch' zone detailing and method of application will be described in the Additional Items section and the 'Torch-Free' & 'Safe to Torch' zones section of this specification and further shown in the Bauder 'Torch-Free' & Bauder Bituminous detail drawings.
***Please note**, there could be 'TORCH-FREE' areas within the roof area(s), however there are either no roof plans available or the design is not sufficiently complete at this stage in the project to enable Bauder to complete a 'TORCH-FREE' roof plan. Once this plan becomes available and the design is sufficiently complete, please contact the Bauder Area Technical Manager (details at the end of the specification) and this can then be created for this area.*

SCOPE OF WORKS

This section includes:

- The Bauder waterproofing system.
- Related Bauder system accessories
- Thermal insulation that meets the required U Value.
- Internal rainwater outlets (but not the connected drainage/plumbing goods)

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

TYPES OF ROOF COVERING

110A BUILT-UP REINFORCED BITUMEN MEMBRANE WARM DECK ROOF COVERING

- **Roof area:** Mono Pitch & Butterfly Roofs
- **Substrate:** New Plywood deck (designed and constructed to provide a minimum finished slope of 5°).

- **Preparation:** As clause 610A.

- **Primer type and application:** Bauder Multi-Purpose Primer or Bauder SA Bonding Primer, applied to the roof substrate and all upstands and skirtings. For application method and guidance information, refer clause 660B.
- **Vapour barrier:** BauderTEC KSD Mica, 2.5 mm thick aluminium lined, elastomeric bitumen self-adhesive vapour barrier. Installation as clauses 670G, 710.
- **Insulation:** Bauder PIR FA-TE flat board, aluminium foil faced, highly efficient rigid urethane insulation 220mm thick to achieve the required U value (refer Clause 230). Should the required total thickness of insulation exceed 160mm, the insulation will be made up of 140mm + 80mm Bauder FA-TE boards to achieve the required U Value. This product has a zero ODP and a Green guide rating of 'A'.
  Bauder 50 mm x 50 mm PIR angle fillets for use with insulated & un-insulated upstands.
  Installation as clauses 680D and 775.
- **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 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, 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 the vertical insulation being installed before the flat, so as to retain the insulation at the base. **Bauder Insulation upstand support brackets** should be installed to secure and provide a hard leading edge. 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
    Site contact details - Site Technician: Paul Osborne, Tel: 07730 529852
    Technical Contact Details - Area Technical Manager: Mike Jones, Tel: 07785 291982
    Technical Contact Details - Area Technical Manager: Chris Mutton, Tel: 07545 642309
- **Mechanical Retention Plate:** As clauses 332, 354, 715A.
  - **Underlayer:** BauderTEC KSA DUO, 3 mm thick, 200g/m^2 glass-fibre reinforced, elastomeric self-adhesive bitumen underlayer.
    Attachment: As clauses 710, 747A.
  - **Top layer / Cap sheet:** Bauder Plant-E, 5 mm thick, 250g/m^2 polyester reinforced, elastomeric bitumen root resistant, torch applied capping sheet, green slate finish.
    Attachment: As clauses 355A, 710, 715A, 750A.
  - **Flashings and detail work:** Bauder Plant-E root resistant capping sheet. Install as clauses 773, 775 & 777.
- **Surface protection:** N/A
- **Surfacing:** Extensive Green Landscaping – refer Q37-130
- **Accessories: -**
  - New internal rainwater outlets (supplied and installed by others), as clause 490.
- **Additional Requirements:** 210, 230, 515, 520, 560, 561, 562, 910, 940.
- **Guarantee information:** Refer clause 950B.

110B BUILT-UP REINFORCED BITUMEN MEMBRANE WARM DECK ROOF COVERING

- **Roof area:** Flat Roof
- **Substrate:** New Plywood deck (designed and constructed to provide a minimum finished slope of (1°) **1:60** .
  - **Preparation:** As clause 610A.
- **Primer type and application:** Bauder Multi-Purpose Primer or Bauder SA Bonding Primer, applied to the roof substrate and all upstands and skirtings. For application method and guidance information, refer clause 660B.
- **Vapour barrier:** BauderTEC KSD Mica, 2.5 mm thick aluminium lined, elastomeric bitumen self-adhesive vapour barrier. Installation as clauses 670G, 710.

- **Insulation:** Bauder PIR FA-TE flat board, aluminium foil faced, highly efficient rigid urethane insulation 220mm thick to achieve the required U value (refer Clause 230). Should the required total thickness of insulation exceed 160mm, the insulation will be made up of 140mm + 80mm Bauder FA-TE boards to achieve the required U Value. This product has a zero ODP and a Green guide rating of 'A'.
  Bauder 50 mm x 50 mm PIR angle fillets for use with insulated & un-insulated upstands. Installation as clauses 680D and 775.
- **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 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, 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 the vertical insulation being installed before the flat, so as to retain the insulation at the base. **Bauder Insulation upstand support brackets** should be installed to secure and provide a hard leading edge. Installation as clause 681B.
- **Waterproof covering:** BAUDER TOTAL 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
    Site contact details - Site Technician: Paul Osborne, Tel: 07730 529852
    Technical Contact Details - Area Technical Manager: Mike Jones, Tel: 07785 291982
    Technical Contact Details - Area Technical Manager: Chris Mutton, Tel: 07545 642309
  - **Underlayer:** BauderTEC KSA DUO, 3 mm thick, 200g/m^2 glass-fibre reinforced, elastomeric self-adhesive bitumen underlayer.
    Attachment: As clauses 710, 747A.
  - **Top layer / Cap sheet:** Bauder K5K, 5 mm thick, 250g/m^2 polyester reinforced, elastomeric bitumen torch applied capping sheet, charcoal grey finish.
    Attachment: As clauses 710, 750A.
  - **Flashings and detail work:** Bauder K5K capping sheet, charcoal grey finish. Install as clauses 773, 775 & 777.
- **Surface protection:** N/A
- **Surfacing:** N/A
- **Accessories: -**
  - New internal rainwater outlets (supplied and installed by others), as clause 490.
- **Additional Requirements:** 210, 230, 515, 520, 560, 561, 562, 910, 940.
- **Guarantee information:** Refer clause 950B.

PERFORMANCE

210 ROOF PERFORMANCE

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

230 INSULATION

- **Thermal transmittance (U-Value) of roof:** 0.10 W/m^{2}K
- **Finished Surface:** Suitably even, stable and robust to receive roof covering.
- **Insulation compliance:** To relevant British Standard or Agrément certified.

PRODUCTS

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.

331 PREFORMED METAL HARD EDGE INSULATION PROTECTION ANGLES

- **Material:** Galvanised mild steel
- **Thickness:** 1mm
- **Dimensions:** 50 mm x 50 mm
- **Length:** 3m max.

332 MECHANICAL RETENTION PLATE (ROOFS WITH A PITCH EXCEEDING 5°)

- **Material:** New exterior grade plywood or OSB3 timber laminate plates, conforming to BS EN 636-3 for plywood & BS EN 300 for OSB3, & CPD/CE compliance, fixed directly through the insulation to the deck using recommended screw fasteners.
- **Dimensions:** 18mm thick, 300mm in width and 2400mm in length, (cut from a 1200 x 2400 mm standard sheet to produce four equal width plates with no wastage).
- **Substrates generally:** Substrate to be fixed to should be secure, clean, dry, smooth, and free from frost, contaminants, voids and protrusions.
- **Moisture content and stability of substrate:** Must not impair roof integrity.
- **Preparation:** 12 no. fastener holes to be pre-drilled in accordance with the Bauder guidance document for the mechanical retention plate. The heads of the SFS Isotak tube fasteners are not required to be recessed into the plate.
- **Metal decks only:** The hole positions in the plate must be drilled to correspond with the centres of the deck crowns of the specified deck. For metal decks with larger crown/ trough profile, it may be necessary to use a plate wider than 300mm to pick up the crown centres and ensure that the plate can be fixed along both sides of its length and remain fully supported.

354 MECHANICAL FASTENERS (MECHANICAL RETENTION PLATE ONLY)

- **Type:** Iso-Tak Insulation tube fastener
- **Purpose:** Used for securing the mechanical retention plate to the deck.
- **Supplier:** SFS Group Fastening Technology Ltd. 153 Kirkstall Road, Leeds, West Yorkshire. LS4 2AT
  Tel: +44 (0)113 208 5500 Fax: +44 (0)113 208 5539 Email: uk.leeds@sfsintec.biz
  Web: www.sfsintec.biz/uk
- **Product reference:** Iso-Tak InsulationTube fastener with a minimum 45mm round head - Tube length must be a minimum of 70% of the total depth of the insulation. The screw fastener type as recommended by the supplier for the particular deck substrate. Please note that long screws and 80 x 40 mm washer plates are not suitable nor permitted for this application).

355A MECHANICAL FASTENERS

- **Type:** IWF-5.2x35 screws (suitable for plywood or OBS3) together with associated IFC/IW–82x40 galvanised pressed steel washer plates. Purpose used for fixing the membrane to the mechanical retention plate.
- **Supplier:** SFS Group Fastening Technology Ltd. 153 Kirkstall Road, Leeds, West Yorkshire. LS4 2AT
  Tel: +44 (0)113 208 5500 Fax: +44 (0)113 208 5539 Email: uk.leeds@sfsintec.biz
  Web: www.sfsintec.biz/uk

PRODUCTS

480 PIPE COLLARS
- Manufacturer: _____ .
- Product reference: _____ .
- Size: _____ .

485 ROOF VENTILATORS
- Manufacturer: _____ .
- Product reference: _____ .
- Size: _____ .

490 ROOF DRAINAGE OUTLETS

- **Manufacturer:** _____.
- **Product reference:** _____.
- **Material:** _____.
- **Size:** _____.

Fixing: _____.

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.

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-authorised 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.
- All lead work to be carried out by skilled tradesmen and in accordance with current codes of practice and the recommendations of the Lead Sheet 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 clause 910.

562 HEALTH & SAFETY INFORMATION – ROOFING WORK

1. Follow the advice shown in the "Responsible Specification Checklist" produced by the National Federation of Roofing Contractors.

2. Suitable precautions must be taken to prevent accidents occurring when roofing systems are being installed.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. The installer must observe Product Safety Datasheets, relevant to the materials being used as well as completing and complying with COSHH risk assessments.

12. We draw your attention to your duties under the Construction (Design and Management) Regulations 2015. Regulation 4, Client's duties in relation to managing projects states that the client must make suitable arrangements for managing a project, including the allocation of sufficient time and other resources. Regulation 5, Appointment of the Principal Designer and the Principal Contractor states that where more than one contractor will be working on a project at any time, the client must appoint a Principal Designer and a Principal Contractor.

    Please note that although Bauder will assist with the roof waterproofing system design, we will not undertake the role of Principal Designer.

13. It is always the responsibility of the contractor to carry out a risk assessment on all aspects of the contract. The 'Safe2Torch' checklist is solely for guidance for the safe installation of torch-on reinforced bitumen membranes and use of gas torches in the workplace

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 exterior grade plywood deck, minimum 18mm thickness as specified by client, should be BBA certified, conforming to BS EN 636-3 & CPD/CE compliance, 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.

640 FIXING TIMBER TRIMS

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

641 INSTALLING PREFORMED METAL HARD EDGE INSULATION PROTECTION ANGLES

- **Location:** Use to provide hard edge protection at all internal gutter channels on warm roofs where the insulation from the flat area steps down to meet the insulation in the gutter sole.
- **Preparation:** Surface to be inspected and cleaned if necessary using white spirit to remove any contaminants, dirt or dust or alternatively primed with bituminous primer. Prepared material to be thoroughly dry before use
- **Installation:** The 50 x 50 mm galvanised mild steel angle to be adhered to the exposed leading edge of the insulation using a small thin intermittent line of Bauder Polyurethane membrane adhesive along the upper surface/edge. The purpose being to retain the metal in position to prevent any post-installation movement.

660B APPLYING PRIMER

- **Purpose:** Bauder Multi-Purpose Primer, substrate primer to seal and prepare dry surfaces of a variety of common substrate material prior to the application of Bauder self-adhesive bitumen membranes.
- **Before application:** All surfaces must be dry, clean and free from dust, dirt, oil, grease and loose material.
- **Application method:** Spray Applied to provide even and full coverage. Avoid pooling. Never attempt torching within 10 min of primer application, even if the surface appears dry.
- **Application rate:**
  - 300mm wide spray
  - Coverage: Approx. 80 g/m^2
  - Two coats may be required for very porous substrates.
- **Application temperature:** +5 - +30°C
- **Drying time:** Approx.5 - 10 mins, dependent upon ambient temperature and material porosity.
- **Coats:** Fully bond. Allow volatiles to dry off thoroughly between coats.
- **Re-application:** Necessary after 4 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.

OR

- **Purpose:** Bauder SA Bonding primer to seal and prepare dry surfaces of a variety of common substrate material prior to the application of Bauder self-adhesive bitumen membranes.
- **Before application:** All surfaces must be dry, clean and free from dust, dirt, oil, grease and loose material.
- **Application method:** Apply by brush or roller to provide even and full coverage. Avoid pooling.
- **Application rate:**
  - Timber/Metal: Approx. 200 g/m^2
  - Concrete / brickwork: Approx. 200-300 g/m^2 depending upon roughness and porosity.
  - Two coats may be required for very porous substrates.
- **Application temperature:** 5-25°C
- **Drying time:** Approx.30 mins, dependent upon ambient temperature and material porosity.
- **Coats:** Fully bond. Allow volatiles to dry off thoroughly between coats.
- **Re-application:** Necessary after 4 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.

670G LAYING VAPOUR CONTROL LAYER

- **Attachment:** Cold applied and fully bonded to substrate in accordance with Bauder's requirements.
- **Side and end laps:** minimum 100 mm, laid with all laps heat sealed to provide a continuous bitumen bead extrusion. Installation methods as recommended by Bauder.
- **Penetrations:** Fully seal using bonding methods recommended by Bauder.
- **Edges of insulation at roof edges, abutments, upstands, kerbs, penetrations and the like**: Enclose, with vapour control layer:
  The vapour control layer must be dressed up all upstands and to the full extent of the detail. This is to ensure that the detail is fully encapsulated to reduce the risk to exposed combustible materials. The contractor is also to form all details in such a way that a fully bonded 100mm lap is obtained between the vapour control layer and the underlayer – please see Bauder Bituminous detail drawings.
  - Care should be taken to ensure adhesion when the temperature is below + 5° C.

680D 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:** Bonded to the upper surface of the Vapour barrier using suitable Bauder Polyurethane Insulation Adhesive. (Product selection assistance available from Bauder). The adhesive should be applied in strips following the direction of the board length. Giving continuous and equally spaced adhesive beads within each board width.
  - 600mm width insulation boards - 2 no: (increase to 3 no. at roof perimeter)*
  - 800mm width insulation boards - 3 no: (increase to 4 no. at roof perimeter)*
  - 1000mm width insulation boards - 4 no: (increase to 6 no. at roof perimeter)*

  Adhesive bead widths are stated on appropriate product label and datasheet.
- **Multiple board layers:** Where the total thickness of insulation required is greater than can be achieved by a single standard board, then additional boards can be adhered to make up the total thickness required.
  Foil to Foil Insulation Boards Only: These additional boards should be bonded using **Bauder Polyurethane Insulation Adhesive – Twin Cartridge**.
  Foil to Tissue Faced Boards: These additional boards should be bonded using suitable Bauder Insulation Adhesive.
  Adhesives applied in strips following the direction of the board length giving continuous and equally spaced adhesive beads within each board width (as above). The second layer of boards should be laid off-set and staggered.
  BauderRock Multi-layer systems only: Please note that an unfaced base board should be installed first and then faced board adhered above.
- **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.
- **Important Note:** Foil to foil installation (e.g. FA-TE to FA-TE) must not be carried out using Bauder insulation adhesive from the 6.5 Kg tin.

**BS EN 1991-1-4 uses the following guidance to calculate perimeter zones. Buildings up to and including 10m in height have a perimeter zone of not less than 2m. Buildings over 10m, uses the calculation of 2 x the building height ÷ 10. These are general guidance rules and do not take into account all of the information used in a full wind uplift calculation, they are therefore superseded by a project specific calculation.*

681B INSTALLING WARM ROOF INSULATION (INSULATED UPSTANDS)

- **Bedding:** Bonded to the upper surface of the Vapour barrier using suitable Bauder Polyurethane Insulation Adhesive. The adhesive should be applied in strips following the direction of the board length giving 3 no. continuous and equally spaced adhesive beads within each 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.
  Adhesive bead widths are stated on appropriate product label and datasheet.
  Note: Where the surface is uneven of difficult to bond to, it is permissible to use suitable thermally broken fixings.
- **Multiple board layers:** Where the total thickness of insulation required is greater than can be achieved by a single standard board, then additional boards can be adhered to make up the total thickness required. These additional boards should be bonded using suitable Bauder Insulation Adhesive.
  Foil to Foil Insulation Boards Only: These additional boards should be bonded using **Bauder Polyurethane Insulation Adhesive – Twin Cartridge**.
  Foil to Tissue Faced Boards: These additional boards should be bonded using suitable Bauder Insulation Adhesive.
  Adhesive bead widths are stated on appropriate product label and datasheet.

The adhesive should be applied in strips following the direction of the board length giving 3 no. continuous and equally spaced adhesive beads within each 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.
The second layer of boards should be laid off-set and staggered.
Note: Where the surface is uneven of difficult to bond to, it is permissible to use suitable thermally broken fixings.

- **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 30mm 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.
- **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 100mm lap seal between the vapour control layer and underlayer where the insulation finishes.
- **Important Note:** Foil to foil installation (e.g. FA-TE to FA-TE) must not be carried out using Bauder insulation adhesive from the 6.5 Kg tin.

WATERPROOF MEMBRANES/ 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.

715A LAYING REINFORCED BITUMEN MEMBRANES ON ROOFS PITCHED 5° AND ABOVE

- **18mm WBP Plywood or OSB3 Capsheet Retention Plate:** When insulation is to be incorporated within the system, the retention plate should be installed to allow provision for mechanical fixing of the top leading edge of the capping sheet. The plate to run continuously across the roof slopecoinciding with where the top leading edge of the capping sheet occurs.
- A continuous run of the retention plate will be required for each row where the cap sheet head laps are staggered. Head laps should not be fixed in a continuous line, unless the roof is less than the length of the roll from the ridge to the gutter eaves.
- Retention plate to be installed in accordance with the relevent Bauder guidance sheet.
  - **Locations:** In accordance with the Bauder Installation and Quality Assurance Manual.
  - **Size:** 18mm x 300mm x 2400mm.
  - **Insulation thickness:** Where the mechanical retention plate is to be incorporated, the insulation below needs to be 20mm thinner to ensure the plate finishes virtually flush with the main area insulation. Mechanically fix the plate through to the deck using the specificed thermally broken fasteners, as clause 354.
  - **Priming:** Bauder multipurpose primer to seal and prepare the surface of the mechanical retention plate prior to the application of Bauder membranes, as clause 660B.
- **Setting out of membranes:** Parallel to roof slope, with successive layers carried over ridges.
  - **Lengths (maximum):** As per roll length.
  - **End laps:** Half stagger and align on alternate bitumen membranes.

- **Additional fixing of bitumen membranes:** Mechanically fix all head laps of the capping sheet using 5 no. equally spaced fixings across the 1m wide sheet, using fasteners, as clause 355A. If there is any doubt as to the exact requirements, please contact Bauder Limited before proceeding.

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 peel off release film. The side laps are to be 100mm and must be **laid red over blue,** and heat sealed/torched (depending on 'Torch-Free' & 'Safe to Torch' zones) and rolling with the **Bauder Long Handled Lap Roller** to extrude a continuous bead of bitumen. Head laps to be 100mm and staggered, side laps to be 80mm and heat sealed/torched (depending on 'Torch-Free' & 'Safe to Torch' zones) to extrude a continuous bead of bitumen. The underlayer must be taken up all upstands, edge details, in accordance with current British Codes of Practice and Bauder's recommendations, and fully heat sealed/torched (depending on 'Torch-Free' & 'Safe to Torch' zones) with the vapour barrier by a minimum 100mm.
- **Alternative underlayer for detail work:** For detailing to un-insulated abutment upstands, where the waterproofing is to be applied to rough or uneven non-combustible surfaces i.e. brickwork or concrete, it is permissible for the installing contractor to use the Bauder underlayer appropriate to the specified system where this product is considered to be better for application to these surfaces. For all other situations, and particularly to vertical insulation, the Bauder Self-Adhesive Underlayer appropriate to the specified system must be used.
- **Provision for prevention of wind uplift (where required):** Mechanically fix as per the corresponding project specific wind load calculation, using appropriate thermally broken fasteners (for cold roofs as clause 355A and for warm roof as clause 355B), fixed through to the deck.
- **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.

750A LAYING MINERAL FACED REINFORCED BITUMEN TORCH-ON CAPPING SHEET - 'SAFE TO TORCH' ZONE

- **Bond:** Full over whole surface, with no air pockets.
- **Excess compound at laps of top layer/ capping sheet:** Leave as a 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:** The finished roof must be thoroughly inspected by the Bauder Site Technician. This is to ensure that any remedial treatment that is necessary can be carried out prior to issuing the guarantee. Failure to ensure the instigation of this inspection will result in the issuing of the Bauder guarantee being put in jeopardy.

750B LAYING REINFORCED BITUMEN TORCH-ON CAPPING SHEET - 'SAFE TO TORCH' ZONE

- **Bond:** Full over whole surface, with no air pockets.
- **Excess compound at laps of top layer/ capping sheet:** Leave as a 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.

FLASHINGS AND DETAIL WORK

773 'TORCH-FREE' & 'SAFE TO TORCH' ZONES - ALTERNATIVE MEMBRANES AND APPLICATION

For detailing application in locations constructed from or within the 'Torch-Free' & 'Safe to Torch' zones to potentially combustible materials or otherwise where it is considered appropriate by the contractor necessary to minimise the potential risk.

- **Primers: Bauder Multi-Purpose Primer** or **Bauder SA Bonding Primer** must be used when using Bauder self-adhesive membranes and a 'Torch-Free' application is required.
- **Underlayers:**
  It is permissible to use a Bauder self-adhesive membrane so long as this product is a recognised component of the system specified.
  Acceptable alternatives underlayers are listed below: -
  - **BTRS: Bauder G4E** to be replaced with **BauderTEC KSA Duo**
  - **BauderFlex: Bauder EGV3.5** to be replaced with **BauderTEC Sprint Duo**

  NB: Where surface is uneven or not suitable for a self-adhesive membrane and where the surface is of a non-combustible material and is not required to be a 'Torch-Free' or 'Safe to Torch' zone – it is permissable to use a Torch Applied underderlayer, so long as the product is a recognised component of the system specifed.
  Acceptable alternative underlayers are listed below:
  - **BTRS: BauderTEC KSA Duo** to be replaced with **Bauder G4E**
  - **BauderFlex: BauderTEC Sprint Duo** to be replaced with **Bauder EGV3.5**
- **Capping sheets:** Where appropriate, the installing contractor can use **Bauder KSO-P SN / KSO SN** self-adhesive capping sheet, applied using the hot air hand tools approved for use with bituminous systems. Please note that **Bauder Multi-Purpose Primer** must be applied to the underlayer prior to installation of the self-adhesive capping sheet.
  Bauder KSO-P SN is only available in one colour – Charcoal Grey.
  Bauder KSO SN is only available in two colours – Natural Slate or Brown.
  Self-adhered membranes - Mechanically fix the top leading edge of all upstand details at 300mm centres using appropriate fasteners, and suitable termination bar if required. Please refer to Bauder Bituminous Standard Detail Drawings.
- **Green Roof Notes:** Please note it is strictly only permissable to use self-adhesive capping sheet for flashings and detailing work when installing **Bauder XF301 Sedum Blanket** or Hard landscaping finishes.
- **Approved Hot Air Equipment**
  The **Bauder KSO-P SN / KSO SN** membrane must be applied using the approved hot air hand tools. The list of permissible hot air electrical equipment suppliers for installing Bauder waterproofing membranes are stated below. These are available either for purchase or hire from the below companies:

HOT AIR WELDING EQUIPMENT

LEISTER

Contact: Welwyn Tool Group, Tel 01707 331 111, http://www.welwyntoolgroup.co.uk

SIEVERT

Contact: Lister Gas Pro, Tel 0800 801 046, ch300@lister.co.uk

775 SKIRTINGS AND UPSTANDS

- **Angle Fillets:** BauderPIR angle Fillets (50 mm x 50 mm) must be used at all right angled upstands, provisionally bonded in suitable Bauder Polyurethane Insulation Adhesive and subsequently retained once the underlay detailing is applied.
  Important note - under no circumstances must fillets of an alternative material be incorporated (i.e. timber, 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 finished roof surface. Please note that for landscaped roofs, this minimum height is measured from the finished landscape surface as opposed to the waterproofing surface. *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.
- **Green Roof Notes:** If the client should desire not to see a green mineral finish then it is permissible to install a piece of suitable coloured Bauder bituminous capping sheet membrane. The Bauder root resistant capping sheet must be taken a minimum 150mm from the finished landscaping surface*. The suitable coloured Bauder bituminous capping sheet must be lapped onto the Bauder root resistant capping sheet by a minimum 150mm, and lapped onto the structure by a minimum of 100mm.

777 SECONDARY WEATHERING (PIPES, DUCTING etc.)

- Provision must be made to supply and install a secondary weathering flashing above all waterproof upstand detailing to pipe penetrations, balustrade posts, cable entry pipes, ventilation ducting, sun pipes etc. This can take the form of a welded collar (where appropriate) or a bespoke galvanized cowling or hood sealed with a suitable sealant and fasteners. Solvent welded plastic collars fitted to plastic soil vent pipes.

SURFACING

Extensive green roof landscaping - refer Section Q37-130

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.
- **If project needs to follow NHBC Requirements:** The waterproofing must be visually inspected and electronically tested for waterproofing integrity, faults rectified, and retested prior to the installation of any landscaping products. The results of the test(s) should be made available to the NHBC.
- **Site contact details - Site Technician: Paul Osborne**, Tel: 07730 529852
- **Technical Contact Details - Area Technical Manager: Mike Jones**, Tel: 07785 291982
- **Technical Contact Details - Area Technical Manager: Chris Mutton**, Tel: 07545 642309

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 system product, workmanship and design 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. The system comprises the waterproofing membranes, insulation, vapour control layer, and attachment of these products.