# 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: Green Roof

Substrate: New 18mm WBP plywood deck (designed and constructed to provide a minimum finished slope of 1°).

- Preparation: As clause 610E.

Vapour control layer: Bauder VB4-Expal, 4 mm thick aluminium lined, elastomeric bitumen torch applied vapour barrier. Installation as clauses 670D, 710.

Insulation: Bauder FATE PIR flat board, fire resistant, zero ODP, highly efficient rigid urethane insulation 130 mm thick to achieve the required U value (refer Clause 230). Installation as clause 680A.

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: Bauder G4E, 4 mm thick, 200g/m² glass-fibre reinforced, elastomeric torch applied bitumen underlayer.
  Attachment: As clauses 710, 740A.
- 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 K5K capping sheet, charcoal grey finish. Install as clause 775.
- Supply and install new Bauder Bituminous Compact Insulated Vertical rainwater outlets, quantity as required, 100 mm nominal bore, complete with pre-attached bitumen connection flange and dome grating. The appropriate depth extension unit (supplied separately) must when this outlet is used within warm roof construction. Installation as clause 784A.

Surface protection: Extensive green roof landscaping - refer Section Q37-130.

Accessories: -

- Bauder 61 mm x 61 mm PIR angle fillets. Installation, as clause 775.

Additional Requirements: 210, 230, 515, 520, 530, 540, 560, 561, 562, 910B, 940, 950B.

## PERFORMANCE

### 210 ROOF PERFORMANCE

- General: Secure, free draining and weather tight.

### 230 INSULATION

- Thermal transmittance (U-Value) of roof: 0.16 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.

### 325 BONDING COMPOUND

- Type: Oxidized bitumen to BS 3690-2, grade 95/25.
- Restriction: For heat sensitive insulation materials, use cold bonding compounds.

### 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.

### 335A ANGLE FILLETS

- Material: Treated timber angle fillets
- - Size (minimum): 50mm x 50 mm.

- 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

### 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.

### 540 APPLYING BONDING COMPOUNDS

- Roof sited boilers: Permitted or Not permitted (please delete as required).
- Temperature of compound: Suitable to achieve bond over whole surface. Do not overheat.

### 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 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).

### 562 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 and other persons using the premises.

3. 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 and a safe working place is established though the risk assessment process.

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 fire fighting equipment in the form of extinguishers during work on the roof. These should be kept in easily accessible locations and be suitably signed.

7. The contractor must ensure that suitable written method statements and risk assessments are available for the work being undertaken. It is essential that working at height and 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 Health and Safety File.

9. All persons working on the roof should be provided with, and wear, suitable personal protective equipment and wet weather gear as identified in the risk assessment. Training must be provided to all contract staff on the safe use of the equipment.

10. The installer must observe Product Safety Datasheets and complete COSHH assessments relevant to the materials being used.

11. No work must be carried out on fragile roofs or where there are skylights unless a suitable risk assessment has been completed and precautions taken to prevent persons falling through fragile roofs and openings.

12. HSE guidance must be followed when carrying out any work involving interference with asbestos.

13. Current CDM Regulations must be observed.

## SUBSTRATES / VAPOUR CONTROL LAYERS / WARM ROOF INSULATION

### 610E SUITABILITY OF SUBSTRATES (OSB BOARD)

- Substrates generally: Secure, clean, dry, smooth, and free from frost, contaminants, voids and protrusions. The new 18mm WBP plywood board deck, thickness as specified by client, should be BBA certified, conforming to BS EN 1995 & CPD/CE compliant, fixed directly to the metal using recommended 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.
- 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.
-

### 670D LAYING VAPOUR CONTROL LAYER

- Attachment: Generally, 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.
- 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.

## 680A LAYING WARM ROOF FATE 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 an 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.

# 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.

## 740A TORCH-ON BONDING OF REINFORCED BITUMEN UNDERLAYER

- Bond: Partially bonded in the approved Bauder manner.
- Laps: Head and side laps to be 100 mm. All laps to upstands, edge details, flashings, etc., to be a minimum 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.
- Alternative detailing membrane (flammable abutments): For application to areas constructed from potentially flammable materials, such as timber, plywood OSB/3 etc. or where considered appropriate to minimise fire risk, BauderTEC Sprint DUO must be used for the underlayer detailing.

## 750A LAYING MINERAL FACED 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: 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

- 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.

## 775 SKIRTINGS AND UPSTANDS

- 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.

## 775B SKIRTINGS AND UPSTANDS

- Angle fillets: as per clause 335A, must be incorporated at all right angled upstand abutments, screw fixed to the structural deck. Alternatively, BauderPIR angle fillets may be used, bonded using cold applied Bauder polyurethane membrane adhesive. 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 specified 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 all upstands 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 minimum, 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.

## 784A ROOF DRAINAGE OUTLETS

- Product name: Bauder Bituminous Compact Insulated Vertical Outlet
- Material: Cast polyurethane body with integral bituminous connection flange.
- Product size/ reference: 100 mm nominal bore, with vertical spigot designed to connect to standard 110mm pipework (ref Part Nr. GB60262100).
- Flow rate: 6.1 litres/sec. (Based upon vertical pipework and a 35 mm head of water pressure – according to BS EN 1206:3:2000).
- Pipe connection: Bauder Compact Insulated Vertical Outlets are suitable for connection to:
- uPVC “O” ring socketed soil grade pipe to BS 4514: 1983
- Socketed and socket-less cast iron pipework to BS 416:1973 and EN 887. Socketed pipework will require cold caulking or PVC to cast iron adaptors. Socket-less pipework can be connection using an appropriate SML mechanical coupling.
- HDPE pipework with appropriate SML mechanical coupling
- Type of grate/ fittings: supplied with a tough polyamide leaf guard.
- Insulation Extension - Warm roofs only: When the outlet is used as part of a warm roof build-up and the insulation thickness exceeds 60 mm, an additional extension component must be used. The Bauder Compact Extension Unit is available in two sizes:
- 60mm -150 mm (ref. Part Nr. GB60263060)
- 120mm - 220 mm (ref. Part Nr. GB60263120)
- The extension unit must be mechanically fixed through the PUR rim to the structural deck.
- Installation requirements: These outlets are components that form part of the Bauder waterproofing system and for guarantee reasons, should only be installed by Bauder Approved installers. Connectivity to below deck drainage pipework to be the responsibility of the plumbing contractor.
- Fixing: The outlet is to be secured through the rim to the structural deck by a minimum of four fasteners appropriate to obtain an adequate attachment to the deck substrate material. Some deck structures require preparatory works before the outlets can be installed: -
- Concrete decks – the opening for the outlet to be either pre-cast or core-drilled so that the outlet can be installed at the same time as the vapour barrier layer. Provision for a 250 mm dia. opening is required.
- Profiled metal decks – these also require a 250 mm dia. Opening cut into the decking, but in addition will require a 600 x 600 x 1.25 mm galvanised steel reinforcing plate secured to the deck before the outlet can be installed. This item has a pre-cut 250 mm dia. hole and is available from Bauder as accessory item, ref: Part Nr. GB60266250.
- For detailed information, refer to the manufacturers installation guidelines.

# SURFACING

## 863A DESIGNATED MAINTENANCE WALKWAYS

- Location: as designated by the client.
- Material: Bauder K5K capping sheet.
- Colour: Brown.

- Application: Remove the selvedge lap prior to installing. Membrane to be fully bonded to the previous capping sheet layer, making provision for leaving intermittent 100 mm gaps between sheets to form drainage channels, particularly where the walkway layer impedes water run-off.

## COMPLETION

### 910A INSPECTION

- Interim and final roof inspections: Strictly 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.
- Other requirements: Please also refer to preliminaries / general conditions.

### 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.
- Site contact details - Site Technician: Mike Goodchild, Tel: 07889 680 430
- Technical Contact Details - Area Sales Manager: Mike Jones, Tel: 07885 291982

### 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.