J31 LIQUID APPLIED WATERPROOF ROOF COATINGS

Section J31 deals with the installation of the Bauder Bakor Hot Melt roof system comprising monolithic membrane (incorporating reinforcement), access/protection/root resistant layers as required and including insulation and vapour permeable/filter layers where specified. Surface finishes of paving slabs or gravel are included where required. We presume the deck substrate 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.

To be read with Preliminaries/ General conditions, Bakor QA Manual, Bauder fixing instructions and specifications.

This section includes:

- The Bauder waterproofing system.
- Thermal insulation to meet the required U value.

This section does not include:

- Construction of the structural deck.
- Rainwater drainage systems - refer NBS Section R10.
- Green Roof landscaping – refer NBS Section Q37-110 & Q37-110A.

110 INVERTED ROOF COATING TO: Flat Roof Area

- **Substrate:** Structural Concrete Deck, to falls, wood float finished and fully cured.
- **Preparation:** As clauses 420A, 710, 740.
- **Waterproof coating:** Bakor Hot Melt System
- **System manufacturer:** Bauder Limited, 70 Landseer Road, Ipswich, Suffolk, IP3 0DH
- Tel: 01473 257 671. Fax: 01473 230 761.
  Email: technical@bauder.co.uk Web: www.bauder.co.uk
- **Primer reference:** Bauder Polymer Primer 930-18
- **Application:** as clause 720.
- **Coating reference:** Bakor790-11EV hot melt rubberised bitumen
- **Application:** As clause 722, 760.
- **Reinforcement:** Bauder Polyester reinforcing.
- **Thickness (nominal):** 6 mm in two 3 mm coats, plus protection sheet / surfacing as described below.
- **Protection Layer (to all hard landscaped areas)** Bauder AP1. 2 mm thick, polyester based, elastomeric bitumen, access/protection layer, as clause 780B. Protection layer to Upstands and details, Bauder AP2, as clause 780F.
- **Insulation:** 120mm thick, BauderXPS extruded polystyrene insulation.
- **Installation:** As clause 830.
- **Insulation to upstands:** 60mm thick, BauderXPSU extruded polystyrene insulation. Install as clause 830.
- **Vapour permeable layer:** Bauder U-MAX Geo-textile Membrane. Install as clause 832.
- **Surfacing:** Concrete paving slabs on proprietary support pads, as clauses 370A, 850
- **Accessories:**
  Cast iron rainwater outlets (supplied and fitted by others) – see clauses 369, 772.

Bauder rainwater outlet access covers, as clause 855.
- **Additional requirements:** 210, 310, 410, 430E, 750, 910, 920, 930, 940.

PERFORMANCE

210 ROOF PERFORMANCE
- **General:** Firmly adhered, free draining and completely weather tight.

PRODUCTS

310 ANCILLARY PRODUCTS AND ACCESSORIES
- **Types:** Recommended by coating manufacturer.

369 ROOF DRAINAGE OUTLETS
- Manufacturer:
- Product reference:
- Material:
- Size:
- Fixing:

370A PRECAST CONCRETE PAVING SLABS
- **Standard:** To BS 7263-1, hydraulically pressed.
- **Manufacturer:** _____ .
  - **Product reference:** _____ .
- **Colour/ Finish:** _____ .
- **Size:** _____ .
- **Support system:** Lay slabs with open joints on proprietary paving supports (supplied by others) these should be height adjustable or include levelling shims where required.

EXECUTION GENERALLY

410 ADVERSE WEATHER
- **Do not apply coatings:**
  - In wet conditions or at temperatures below 5℃, unless otherwise permitted by coating manufacturer.
  - In windy conditions (wind speeds in excess of 7 m/s) unless adequate temporary windbreaks are erected.
- **Unfinished areas of roof:** Keep dry.

420A SUITABILITY OF SUBSTRATE (CONCRETE)
- **Surfaces to be coated:**
  - Firmly fixed, clean, dry, smooth, free from frost, contaminants, loose material, voids, protrusions and organic growths.
  - Compatible with coating system.
- **Preliminary work:** Complete (including formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion joints, and fixing of battens, fillets, anchoring plugs/ strips, etc.).
- **Moisture content and stability:** Must not impair integrity of roof.
- All concrete surfaces shall be cured a minimum of 14 days and shall be dry. All concrete placed into a profiled metal deck shall be cured a minimum of 60 days.
- Concrete Surfaces shall be to a wood float finish and uniform. Steel float finishes are too smooth and can produce laitance on its surface, which will need to be removed, prior to

priming. Please refer to the manufacturer's Installation and Quality Assurance Manual for important information.

- Before priming and application of the membrane, the substrate shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, oil, grease, curing compounds of any foreign matter detrimental to the adhesion of the hot applied rubberised bitumen system. Any scaling or laitant concrete shall be sandblasted off.
- Voids, cracks, holes, honeycombs and other damaged horizontal or vertical surfaces shall be repaired before application of the membrane.
- The contractor shall review all surfaces to receive the membrane and report any discrepancies prior to installing the waterproofing system.

430D INVERTED ROOFS - RELATED REQUIREMENTS

The following are vital to the accurate pricing, correct installation, and ultimately the long-term life of a inverted roof, and must, therefore, be included within the specification and tender documents: -

- 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 roof system, both during construction and on completion of the works.
- A planned or contractual delay between the installation of the waterproofing and insulation/ballast finish 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.
- Correct detailing design and construction is essential to the long-term life of the 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.
- The waterproofing should be taken up all abutment upstands, protrusions etc. a minimum of 150mm above finished surface level i.e. top of the ballast.
- No insulating or ballasting 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.

ROOF COATING SYSTEM

710 ADHESION TESTS

- **Requirement:** Carry out a trial coating to determine priming requirements and/or system suitability.
- **Nature of test:** The contractor shall carry out a "peel" test to each roof area prepared for waterproofing, by applying Bakor 790-11EV hot rubberised bitumen to the deck to test for proper adhesion. This must be carried out strictly in accordance with the manufacturer's requirements, as set out in the Bakor Installation and Quality Assurance Manual.
- **Test results:** Submit and arrange for inspection.

720 PRIMER

- **Application:** Bauder Polymer primer 930-18 to be spray, brushed, or roller applied uniformly to all surfaces receiving the new waterproofing, avoiding excessive application. Ponding of the primer is not recommended.
- The primer shall be thoroughly dry before applying the hot melt rubberised bitumen coating. Normal drying time is approximately 30 minutes.

722 MEMBRANE APPLICATION TO DETAILS (PRIOR TO FLAT AREA)

- The waterproofing system is applied to structural details first i.e. upstands, outlets, cracks etc. before the main deck area is waterproofed.
- Note there are optional build ups that can be applied to the details. The choice will be dependant on a number of criteria i.e. project size, number of visits to site required by the waterproofing contractor, construction sequence etc. See clause 770.

750 PRELIMINARY LOCAL REINFORCEMENT

- Appropriate 150 mm wide reinforcement strip (see below), applied centrally to the nick of the upstand i.e. taken 75 mm up the vertical and 75 mm out to the horizontal. Apply to all junctions at abutment upstands, penetrations and outlets, also to joints and fixings in discontinuous unit substrates. Bed in a preliminary application of Bakor hot melt coating. Smooth out wrinkles and press into coating to exclude air. Lap all joints between lengths.
- **Bauder Polyester reinforcing strip:** suitable with concrete decks where the upstand is either monolithically cast insitu, subsequently cast insitu or constructed from brick or block work.
- **Bauder Neoprene Reinforcement:** to be used in all other situations i.e. plywood or OSB substrates with abutment upstands or kerbs constructed from the same material, timber or metal sheeting. This reinforcement must also be used at all outlets, penetrations, fixings etc.

760 APPLICATION OF ROOF COATINGS

- Apply first layer of Bakor790-11EV hot melt rubberised bitumen coating at a working temperature of between 180℃ - 200 ℃, evenly to th e deck to a minimum depth of 3 mm. This layer of coating must be lapped onto the previously installed detailing at all abutment upstands, outlets, protrusions etc., in order to achieve a monolithic coating over the entire deck area.
- Bauder Polyester reinforcing layer to be rolled out and bedded into the Bakor790-11EV while it is still hot, to ensure it is fully bonded and ensuring partial bitumen bleed through.
- Overlaps to be a minimum of 10mm wide, ensuring that a layer of hot melt membrane is present between the layers.
- Apply the second layer of Bakor790-11EV hot melt rubberised bitumen coating at a working temperature of between 180℃ - 200 ℃, evenly onto the polyester reinforcing layer to a minimum depth of 3 mm, providing a total minimum monolithic waterproofing layer of 6 mm.
- **Continuity**: Maintain full thickness of coatings around angles, junctions and features.
- **Rainwater outlets:** Form with watertight joints.
- **Drainage systems:** Do not allow liquid coatings to enter piped rainwater or foul systems.

770A SKIRTINGS/ UPSTANDS

- **Preliminary reinforcement strip:** The correct reinforcement strip must first be applied at all right angled abutments, penetrations, outlets and fixings etc before the application of the Bakor 790-11EV detailing (except for when the alternative two-layer SBS membrane system is used). Please see clause 750. If unsure about the correct reinforcing material for any given situation, please refer to the Bauder Installation and Quality Assurance Manual or contact Bauder's Technical Department for confirmation or further information.

Waterproofing application:

- **First layer:** Bakor790-11EV hot melt rubberised bitumen membrane, applied 3mm thick up the upstands and out onto the deck a minimum of 200mm.
- **Reinforcement:** Bauder Polyester reinforcing sheet to be embedded into the first layer of Bakor790-11EV, up the upstands, and dressed down and out onto the flat by 75mm. Laps to be a minimum of 10mm. The reinforcing sheet must be applied when the hot melt rubberised bitumen is still hot in order to ensure a full adhesion and a partial bitumen bleed through.
- **Second layer:** Bakor790-11EV hot melt rubberised bitumen membrane, onto the deck and upstand over the reinforcement layer, 3mm thick up the upstands and out onto he deck a minimum of 200mm ensuring to "feather" down towards the edge.
- **Access/protection layer to upstands:** As clause 780D.

- Proprietary Termination Bar to be used to fix the waterproofing and access/protection which terminates on a vertical plane. Fixings to be at a minimum 300mm centres. Bauder Mastic Sealant to be applied in a neat bead both behind and along the top edge of the termination bar.
- **Top edges of coatings:** Where not protected by flashings, apply into chases cut to a depth of not less than 10 mm.
- **Completion of chases:** When coatings are fully cured, prepare chase by priming with Bauder mastic sealant primer and apply sealant as NBS Section Z22.
- **Sealant:** Bauder Mastic Sealant.

771 PITCH POCKET DETAIL - FIXING INSTRUCTIONS

- Drill suitably sized holes into the concrete deck to receive fixing bolts. Threaded studs to be installed by specialists in accordance with the specification and any related recommendations e.g. resin bonded.
- Clean any debris away from the bolts. Prime the concrete deck and the upstand of the item being waterproofed with Bakor Polymer Primer 930-18.
- Fix the base plate in place, tightening the nuts as required or to specific torque if specified. If for any reason the base plate has to be shimmed due to deck irregularities, the gap between the base plate and the waterproofing must be in filled with suitable resin grouting prior to installing the pitch pocket detail.
- Fix the metal pitch pocket former to the deck. The size of the pitch pocket former should such that there is at least a 30 mm margin inside between the pitch pocket and the base plate. This is the area of deck which will bond to the pitch pocket infill. The depth of the pitch pocket must be sufficient so that when filled the Bakor 970-11EV coating, it covers the bolts by a minimum of 4 - 5 mm.
- Infill the pitch pocket with Bakor 970-11EV hot melt rubberised bitumen coating at the optimum recommended temperature. Depending on the depth of the pitch pocket, this operation may need to be done in stages, to prevent the bitumen from “dishing” as it cools, and forming a water holding pocket around the base of the post.
- Secondary waterproof over the base of the pitch pocket using Bauder Plant-E to cover the fixings and up over the in filled pitch pocket to provide root resistance or to protect the bitumen from the effects of UV light degradation if exposed above landscaping.

772 DETAILING TO OUTLETS

- **Preparation:** Cast metal outlet to be fixed by others, to the deck, preferably with the flange flush with the surface of the deck, and clamping ring temporarily removed. The surfaces to be waterproofed to be primed using Bakor Polymer Primer 930-18, in accordance with clause 720.
- **First layer of coating:** Bakor790-11EV hot melt rubberised bitumen coating to be applied 3 mm thick, to the deck around the outlet to minimum width of 300mm and onto the flange of outlet to beneath the clamping ring.
- **Reinforcement:** Bauder Neoprene reinforcement sheet to be bedded into the layer of hot melt rubberised bitumen coating while it is still hot, to ensure a full bond. The Neoprene reinforcement must be pre-cut to size, so that it can be dressed over and around the flange to beneath the clamping ring and to then lap out onto the deck a minimum of 75mm.
- **Second layer coating:** Bakor790-11EV is applied in a second 3 mm layer over the Bauder Neoprene reinforcement sheet, ensuring that it is completely covered and overlapping onto the deck by 150mm and the edges “feathered” down.
- **Protection layer:** The specified Bauder protection layer to be bedded into the second layer of Bakor790-11EV hot melt rubberised bitumen, while it is still hot to ensure full adhesion. The protection layer must be dressed over the outlet flange to fit and be held by the outlet clamping ring. The protection layer must fitted so as to ensure that a 150mm width of hot melt rubberised bitumen system remains uncovered, to ensure that the hot melt system applied later to the main deck area can be lapped to it to form a completely homogeneous layer.

- **Completion:** Fix and secure the clamping ring and grille.

780B COATING PROTECTION
- **Location:** Perimeter Cleaning Route
- **Material:** Bauder AP1, 2mm thick, polyester based, elastomeric bitumen access/protection sheet to be rolled into the second layer of Bakor790-11EV hot melt rubberised bitumen coating while it is hot, to ensure a full bond. A wide headed brush used when rolling in will assist in avoiding wrinkles and prevent entrapping air bubbles.
- **Laps:** All laps to be a minimum of 75mm and properly sealed by ensuring that there is hot melt bitumen within the overlaps.

780D COATING PROTECTION
- **Location:** Main Roof Area
- **Material:** Bauder AP2, 5 mm thick, polyester based, root resistant elastomeric bitumen slate mineral surfaced access/protection sheet to be rolled into the second layer of Bakor790-11EV hot melt rubberised bitumen coating while it is hot, to ensure a full bond. A wide headed brush used when rolling in will assist in avoiding wrinkles and prevent entrapping air bubbles.
- **Laps:** All laps to be 100mm and torch sealed, ensuring there is a continuous extrusion of root resistant bitumen from all laps.

780F COATING PROTECTION
- **Location:** Detailing only, where a root resistant slate mineral finished material is required.
- **Material:** Bauder AP2, 5mm thick, polyester based, elastomeric bitumen mineral surfaced access/protection sheet to be rolled into the second layer of Bakor790-11EV hot melt rubberised bitumen coating while it is hot, to ensure a full bond. A wide headed brush used when rolling in will assist in avoiding wrinkles and prevent entrapping air bubbles.
- **Laps:** All laps to be 100mm and torch sealed, ensuring there is a continuous extrusion of root resistant bitumen from all laps.

SURFACING

830 INSTALLING INVERTED ROOF INSULATION
- **Preparation:** Clear roof of other trades.
- **Condition of substrate:** Clean.
- **Separating layer:** N/A
- **Setting out:** Loose lay insulation to brick pattern. Minimize cutting and avoid small pieces at perimeters and penetrations.
- **Joints:** Butt together.
- Projections, upstands, rainwater outlets, etc: Cut insulation cleanly and fit closely around.
- **Completion:** Boards in good condition, with no springing or rocking. Cover to prevent wind uplift as soon as practicable.
- **Insulation to upstands:** Bauder XPSU 50mm+10mm cementitious topped extruded polystyrene insulation to be used at all abutment upstands. The upstand insulation to be installed first, so it can be wedged in position by the boards to the flat area.

832 VAPOUR PERMEABLE MEMBRANE
- To be rolled out loose over the BauderXPS Inverted Roof Insulation. The material is to be lapped a minimum of 300 mm in a direction that helps shed water from the roof rather than beneath the membrane. The material should be dressed up all upstands and details to the height of the surfacing.

850 LAYING PAVING SLABS
- **Condition of substrate:** Clean.

- **Setting out:** Minimise cutting.
- **Joints:** Open.
- **Width:** *Insert as required*

855 RAINWATER OUTLET ACCESS COVER (FOR PAVED LANDSCAPING AREAS)

- The contractor shall provide suitable outlet inspection covers over all rainwater outlets on completion of the contract.
- For situations where traditional paving slabs are specified, Bauder produces two sizes of removable grille cover, with adjustable feet (height adjustment range 60 mm to 90 mm), that is suitable for most situations. Bauder GA250 (250 mm x 250 mm) or GA400 (400mm x 400mm).
- The feet of the unit should be manually adjusted so it finishes flush with the surrounding paving surface. Product information on these units can be found within the Bauder Intensive and Extensive Green Roof Technical Manuals. Alternatively, Bauder Ltd should be contacted regarding the suitability of these rainwater outlet access covers for your specific needs.

COMPLETION

910 INSPECTION

- **Coating surfaces:** Check when cured for pinholes and discontinuities.
- **Defective areas:** Apply another layer of coating.
- **Interim and final roof inspections:** This is a requirement for guarantee and must to be carried out in strict accordance with the manufacturer's requirements. It is the responsibility of the approved contractor to advise the Bauder Field Technician when the roof is ready for the Final Inspection.
- The final inspection of the waterproofing and the Electronic roof integrity test (refer clause 920) must be carried out and approved by Bauder prior to any landscaping being installed. This is mandatory for the issue of the guarantee.
- Please also refer to preliminaries / general conditions.

920 ELECTRONIC ROOF INTEGRITY TEST

- **Testing authority:** As per manufacturer's approval.
- **Timing of test:** immediately prior to installation of the landscaping.
- **Condition of roof prior to testing:**
  - **Coating:** Complete to a stage where integrity can be tested.
  - **Surface:** Clean.
- **Test results:** Submit copy to Bauder
- **Waterproof integrity certificate:** On completion of testing, submit copy to Bauder for processing of guarantee.

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 Clients representative.

940 COMPLETION

- **Roof areas:** Clean.
  - **Outlets:** Clear.
  - **Flashings:** Dressed into place.

- **Work necessary to provide a weather tight finish:** Complete.
- **Storage of materials on finished surface:** Not permitted.
- **Completed coatings:** Protect against damage from traffic and adjacent or high level working.