NBS Specification

Supporting deck	Concrete
Type of roof	Inverted
Application	Partial bond
System reference	FORCE 3000 LINE RE

J41 Reinforced bitumen membrane roof coverings

To be read with Preliminaries/General conditions.

TYPES OF ROOF COVERING

120 BUILT-UP REINFORCED BITUMEN MEMBRANE INVERTED ROOF COVERING

- Substrate: Concrete deck.
  - Preparation: Prime deck with Axter's VERNIS ANTAC quick drying primer, or contractor's choice and allow to dry thoroughly.
- Waterproof covering: Two layer reinforced polymer modified bitumen membrane roofing.
  - System manufacturer: Axter Ltd, West Road, Ransomes Europark, Ipswich, IP3 9SX, Tel: 01473 724056, Fax 01473 723263, email info@axterltd.co.uk, internet www.axter.co.uk.
  - First layer: THERMECRAN perforated membrane.
  - Attachment: Loose laid except for a strip to be 10% of the roof width around roof edges and all major penetrations.
  - Intermediate layer: FORCE LINE 2 VV a non-tissue glass reinforced SBS modified bitumen membrane (2.66 kg/m^2 nom.) with a thermo-fusible film to all surfaces.
  - Attachment: Torch bonding.
  - Top layer: FORCE 3000 LINE RE a polyester (180 gm/m^2) reinforced membrane (3.72 kg/m^2 nom.), manufactured with a polymer (SBS) modified bitumen binder with a sand surface and thermo-fusible plastic film on the under surface.
  - Attachment: This layer must be fully bonded by torching and on all laps a 2 mm bitumen bead must be visible.
  - Flashings and detail work: to be carried out with FORCE LINE 4.5 RE Colour Charcoal.
  - Insulation: Extruded polystyrene board.
  - Filter layer: Geotextile fabric as recommended by insulation manufacturer.
- Surface protection/ Securement: As drawing _____
- Accessories: As drawing _____

PERFORMANCE

210 ROOF PERFORMANCE

- General: Secure, free draining and weathertight.

230 INSULATION

- Requirement: Determine type and thickness of insulation and integral or separate overlay to satisfy the following criteria:
  - Thermal transmittance of roof (maximum): As required.
  - Compressive strength of insulation (minimum) at 10% compression: min 150 kPa.
  - Finished surface: Suitably even, stable and robust to receive the covering.
  - Insulation compliance: To relevant British Standard, or Agrément certified.

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PRODUCTS

320 PRIMER
- Type: Bitumen cut back with volatile solvent.
- Characteristics when tested to BS EN 13357:
  - Volatile solvent content (minimum): 40% by mass.
  - Viscosity (maximum) (STV at 25°C, 4 mm orifice): 10s.

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: As recommended by bitumen membrane manufacturer.

335 ANGLE FILLETS
- Material: As supplied by insulation manufacturer.
  - Size (minimum): 50 x 50 mm, triangular in section.
- Restriction: Fillets under torch-on bitumen sheets to be non-combustible.

345 PERIMETER TRIMS
- Type: GRP.
- Manufacturer: Contractor's choice.
  - Product reference: as above.
- Colour: As drawing _____
- Size: As drawing _____
  - Lengths (maximum): 3 m.

385 FILTER LAYER
- Type: Geotextile fabric.
- Manufacturer: Contractor's choice.
  - Product reference: as above.
- Grade: As drawing _____

440 EXTRUDED POLYSTYRENE (XPS) INVERTED ROOF INSULATION
- Standard: To BS EN 13164.
- Manufacturer: Contractor's choice.
  - Product reference: as required.
- Grade: As recommended by insulation manufacturer for traffic loading.
- Edges: Rebated.
- Thickness: as required to meet u value.
- Integral topping: Not required.

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460 STONE BALLAST
- Type: Washed, round aggregate.
- Supplier: Contractor's choice.
- Size: Graded 40-60 mm, free from fines and sharps.
- Colour: As drawing _____
- Recycled content: Contractor's choice.

465 PRECAST CONCRETE PAVING SLABS
- Standard: To BS EN 1339, hydraulically pressed.
- Manufacturer: Contractor's choice.
  - Product reference: as required.
- Colour: As drawing _____
- Finish: As drawing _____
- Size: As drawing _____.
- Recycled content: Contractor's choice.

467 SUPPORT SYSTEM FOR PRECAST CONCRETE PAVING SLABS
- Manufacturer: Axter Ltd.
  - Product reference: Axter adjustable paving slab supports.
- Size: As drawing _____
- Accessories: Not required.

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): 0.2 L/m².
- Surface coverage: Even and full.
- Coats: Fully bond. Allow volatiles to dry off thoroughly between coats.

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SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM DECK ROOF INSULATION

610 SUITABILITY OF SUBSTRATES

- Substrates generally: Secure, clean, dry, smooth, and free from frost, contaminants, voids and protrusions.
- Preliminary work: Complete including:
  - Grading to correct falls.
  - 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.

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: As recommended by bitumen membrane manufacturer.
- Head and side laps: Offset.
- Intermediate and top layer/ capsheet: Fully bond.
- Successive layers: Apply without delay. Do not trap moisture.
- Strips of bitumen membrane for 'linear' details: Cut from length of roll.
- Completed coverings: Firmly attached, fully sealed, smooth, weatherproof and free draining.

730 PARTIAL BONDING OF REINFORCED BITUMEN MEMBRANE

- Venting first layer: Loose lay, align and cut to length. Do not carry up angle fillets and vertical surfaces or through details.
  - Long edges: Overlap minimum 50 mm.
  - Ends: Butt together.
- Intermediate layer: Fully bond to first layer and through to substrate.

740 TORCH-ON BONDING OF REINFORCED BITUMEN MEMBRANE

- Bond: Full over whole surface, with no air pockets.
- Excess compound at laps of top layer/ capsheet: Leave as continuous bead.

775 SKIRTINGS AND UPSTANDS

- Angle fillets: Fix by bitumen bonding or nailing.
- Venting first layer of bitumen membrane: Stop at angle fillet. Fully bond in bitumen for 300 mm strip around perimeters. Overlap onto upstand with strips of BS 8747, Class S1P1 bitumen membrane, fully bonded.
- Other layers of bitumen membrane: Carry in staggered formation up upstand, with each layer fully bonded. Where practicable, carry top layer over top of upstand.

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- Upstands:
  - At ends of rolls: 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: Not required.

780 WELTED DRIPS
- Material: FORCE LINE 4.5 RE.
  - Length: Form using maximum length strips.
  - Height at external gutter (minimum): 75 mm.
- Welt tail: Nail to face of drip batten. Fold neatly.
- Welt: Bond together, carry minimum 100 mm onto roof. Overlap with top bitumen membrane.

785 FIXING PERIMETER TRIMS
- First/ Intermediate layers bitumen membrane: Lay over roof edge upstand. Project free edge 25 mm from wall or fascia.
- Trim:
  - Setting out (minimum): 3 mm clear from wall or fascia.
  - Fasteners: As drawing _____
  - Fixing: 30 mm from ends and at 300 mm (maximum) centres.
  - Jointing sleeves: Fix one side only.
  - Corner pieces: Purpose made.
- Completion:
  - Contact surfaces: Prime.
  - Joints: Cover with 150 mm long pads of bitumen membrane, bonded to trim.
- Completion of bitumen membrane:
  - Top layer/ Capsheet: Butt joint to rear edge of trim.
  - Cover strip: Fully bond to trim and top layer/ capsheet of bitumen membrane. Carry over roof edge upstand and lap 75 mm onto roof.
    Cover strip material: As top layer/ capsheet bitumen membrane.

SURFACING

810 LAYING INVERTED ROOF INSULATION
- Condition of substrate: Clean.
- Setting out: Loose lay with staggered joints.
  - Cutting: Minimize.
  - Small cut pieces: Avoid at perimeters and penetrations.
  - Joints: Butt together.
- Projections, upstands, rainwater outlets, etc: Cut insulation cleanly and fit closely around.
- Completion:
- Boards must be in good condition, well fitting and stable.
- Cover as soon as practicable to prevent wind uplift and flotation.

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820 LAYING STONE BALLAST
- Condition of substrate: Clean.
- Gravel guards: Fit to outlets.
- Previously laid materials: Protect during laying of ballast.
- Laying: Spread evenly. Do not pile to excessive heights.
  - Depth (minimum): As drawing _____

840 LAYING PRECAST CONCRETE PAVING SLABS
- Condition of substrate: Clean.
- Setting out: Minimize cutting.
- Joints: Open.
  - Width: Predetermined by support system.
  - Perimeter/ Upstands margins: 100 mm wide, stone ballast filled.
- Completion: Slabs must be level and stable.

COMPLETION

910 INSPECTION
- Interim and final roof inspections: Submit reports.

930 FLOOD TEST
- Condition of roof before testing: Complete to a stage where integrity of bitumen membrane covering can be tested.
- Outlets: Externally cover and seal. Protect against damage from water pressure using temporary kerbs. Do not use plugs to seal outlets.
- Flood levels: Submit proposals. In no case higher than kerbs.
- Flood duration: 12 hours.
- Inspection to detect leaks: Regular.
- Completion of test: Slowly drain roof. Do not overload or flood outlets.
- Test results and warranty: Submit on completion of testing.

940 COMPLETION
- Roof areas: Clean.
- Outlets: Clear.
- Work necessary to provide a weathertight 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.