Specification: Warm roofs.

Specification: **J41 REINFORCED BITUMEN MEMBRANE ROOF COVERING**

Project: King Henry Road

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Issued By: Brett Townsend

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J41 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS

To be read with Preliminaries/General conditions.

TYPES OF ROOF COVERING

110 BUILT-UP REINFORCED BITUMEN MEMBRANE WARM DECK ROOF COVERING: “Extension Roof”.

- Substrate: Structural timber joisted structure made to falls as specified by the structural engineer and as per the architect’s drawings. Mechanically fix a minimum 22mm thick external grade plywood overlay to the timber structure. All fixings to be flush to provide a flat smooth surface. Plywood to be minimum 22mm thick and certificated to conform to BS EN 1995-1-1 Eurocode 5. Design of timber structures and to BS EN 636 Plywood, specifications minimum Service class 2 – ‘humid conditions’ or where required Service class 3 – ‘Exterior conditions.’

- All surfaces must be dry and clean of all contaminants including dust, grease, dampness and laitance. All loose dirt or debris to be brushed and blown clean using dry air or industrial vacuum machine.

- Primer: Esha RED Primer – applied by brush or roller as clause 320.
- Vapour control layer: Eshabase Alu SA - self-adhesive bitumen and aluminium vapour control layer.
  Attachment: Self-Adhesive. As clause 395.
- Insulation: 150mm ProTherm PIR TORCH Rigid Urethane Insulation Board to meet a ‘U’ value of 0.15 w/m^{2}k. Installation as clause 680.
- Insulation: Tapered ProTherm PIR TORCH Rigid Urethane Insulation Board to gutters. Installation as clause 680.
- Waterproof covering: System manufacturer: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372. Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com.
- Base layer: EshaFlex 370 Plain SBS modified polyester fleece and glass yarn reinforced bitumen membrane.
  Attachment: Torch applied, as clause 710.
- Intermediate layer to gutters: EshaFlex 370 Plain SBS modified polyester fleece and glass yarn reinforced bitumen membrane.
  Attachment: Torch applied, as clause 710.
- Cap Sheet: Top layer/Capsheet: EshaFlex 370 WS Minislate mineral SBS modified polyester fleece and glass yarn reinforced bitumen membrane mineral finished cap sheet with root inhibitor.
  Colour: Black.
  Attachment: Torch applied, as clause 710 & 750.

- Upstands and detail work: One layer of EshaFlex 370 plain, SBS modified polyester fleece and glass yarn-reinforced bitumen membrane sand finished underlay with with Groove Technology and one layer EshaFlex 370 Firesafe (Black) cap sheet membrane.
  Attachment: Torch applied,as clause 775.
  Accessories:
- Rainwater Outlets / chutes (supplied and installed by others).
- Angled insulation fillets to match the above specification.

PERFORMANCE

210 ROOF PERFORMANCE
- General: Secure, free draining and weathertight.

220 AVOIDANCE OF INTERSTITIAL CONDENSATION: WARM AND INVERTED ROOFS
- Interstitial condensation within roof construction: Determine risk as recommended in BS 6229.
- Basic design data:
- Outdoor notional psychrometric conditions, winter:
  Temperature: -5°C.
  Relative humidity: 90%.
  Vapour pressure: 0.36 kPa.
  Duration: 60 days.
- Outdoor notional psychrometric conditions, summer:
  Temperature: 18°C.
  Relative humidity: 65%.
  Vapour pressure: 1.34 kPa.
  Duration: 60 days.
- Indoor notional psychrometric conditions:
  Temperature: 18°C.
  Relative humidity: 65%.
  Vapour pressure: 1.34 kPa
- Winter interstitial condensate (warm roof):
  Calculated amount (maximum): 0.35kg/m².
  Calculated annual net retention: Nil.
- Vapour control layer: If necessary, provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

225 AVOIDANCE OF INTERSTITIAL CONDENSATION: WARM AND INVERTED ROOFS – BS 5250 AND BS EN ISO 13788
- Interstitial condensation within roof construction: Determine risk as recommended in BS 5250 and BS EN ISO 13788.
- Vapour control layer: If necessary, provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

230 INSULATION
- Requirement: Determine type and thickness of insulation and integral or separate overlay to satisfy the following criteria:
- Thermal transmittance of roof (maximum): 0.15 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

320a PRIMER TO PLYWOOD / TIMBER
- Manufacturer: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372. Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com.
- Product reference: Esha Red Primer.
- For best results ensure that surface to be primed is free from all loose dirt, grease, oil or dust. Sweep clean where necessary. All loose dirt or debris to be brushed and blown clean using dry air or industrial vacuum machine.
- Temperature for use: +5° C. and rising.
- Apply thinly with roller in one sweep (the red colour will denote area treated)- refill roller if “cobwebbing” occurs.
- Avoid puddling of the primer
- Drying time will be affected by surface porosity, film thickness and temperature and can vary between 40-90 minutes.
- Product will remain tacky even after dry. To test, using the back of a glove or dry object press into the primer and remove, there should be no transfer of the primer when the primer is ready.

320b APPLYING PRIMERS to INSULATION.
- Coverage: 8-16m^2/litre.
- Surface coverage: EshaPrimer to be sprayed, brushed or roller applied uniformly to all concrete surfaces and top surface of PIR insulation, receiving the new waterproofing, avoiding excessive application. Ponding of the primer is not recommended.
- Coats: Allow to dry before overcoating. Do not torch dry.

327 BONDING COMPOUND
- Type: Polyurethane.
- Manufacturer: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372. Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com.
- Product reference: EshaStik.
- Restriction: Roof slopes >10° should be confirmed by Radmat Technical Services.

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.

335 ANGLE FILLETS
- Material: Protherm Rockwool angle fillets.
- Size (minimum): 75mm x 30mm.
- Restriction: Fillets under torch-on bitumen membranes to be non-combustible.

340 PREFORMED SLEEVES AND CHUTE OUTLETS.
- Type: Lead.
- Manufacturer: Submit proposals.
- As per the Lead sheet Manufacturers guidelines.

345 PERIMETER TRIMS
- Type: Roof edge trim manufactured from pultruded glass fibre reinforced polyester resin.
- Manufacturer: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372. Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com.
- Product reference: EshaTrim GRP.
- Colour: Black.
- Size: 150mm x 65mm.
- Lengths (maximum): 2.5m.

395 VAPOUR CONTROL LAYER FOR TIMBER / PLYWOOD
- Type: EshaBase ALU SA - self-adhesive SBS modified bitumin and aluminium vapour control layer.
- Manufacturer and reference: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372 Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com
- Product reference: Eshabase Alu SA (self- adhesive).
- Vapour transmission rate resistance: 8, 12 X 10^{12} (m^2.s.Pa)/kg.

400 BUILT-UP REINFORCED BITUMEN WATERPROOF COVERING
- System manufacturer: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372. Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com.
- Product reference: Radmat Esha Total RBM Waterproofing System.
- Base layer: EshaFlex 370 plain.
- Attachment: Torch applied.
- Intermediate layer to gutter: EshaFlex 370 plain.
- Attachment: Torch applied.
- Cap Sheet: EshaFlex 370 WS Minslate (Root Inhibitor) Mineral.
- Colour: Black.
- Flashings and detail work: One layer of EshaFlex 370 plain, SBS modified polyester fleece and glass yarn-reinforced bitumen membrane sand finished underlay with Groove Technology and one layer Capsheet: EshaFlex 370 Firesafe (Black) mineral.
- Guarantee: “20” years.

420 RIGID URETHANE FOAM WARM DECK ROOF INSULATION
- Type: Polyisocyanurate rigid urethane.
- Manufacturer: Radmat Building Products Ltd, Holland House, Valley Way, Rockingham Road, Market Harborough, Leicestershire, LE16 7PS Tel: 01858 410372. Fax 01858 410572 email: techenquiries@radmat.com, Web: www.radmat.com.
- Product reference: Protherm PIR TORCH .
- Density: 31 Kg/m3
- Thickness: 150mm to achieve 0.15w/m^2K ‘U’ Value or better. To Comply with Building regulations Part L2A, the Services Engineer’s performance requirements and any other stated requirements in conjunction with other components.
- Facing: Bitumen impregnated.
- Thickness: Tapered Protherm PIR TORCH to gutters.
- Facing: Bitumen impregnated.

480 PIPE COLLARS
- Manufacturer: LEAD.
- Product reference: Bespoke Lead

- Size: Bespoke made on site.

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 ESHA PRIMER.
- Coverage per coat (minimum): Esha Primer between (8-16m^2/litre).
- Surface coverage: Even and full.
- Coats: Fully bond. Allow volatiles to dry off thoroughly between coats.

560 GENERAL WORKMANSHIP REQUIREMENTS
- Installation of the Esha waterproofing system may only be carried out by trained and certified operatives working for a Radmat Esha Approved Contractor.
- Workmanship must comply with Codes of Practice BS 8217:2005 or alternative Esha waterproofing specification where otherwise stated. Non-compliant workmanship will not be permitted. Any faults must be remedied, before the guarantee is issued.
- All waterproofing materials and system components must be supplied by Radmat Building Products, 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 Esha system must be carried out by properly trained tradesmen.
- Any structural damage, peculiarities or details discovered that might affect the performance of the system, should be reported immediately to the client’s representative and Radmat Building Products 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 until all associated trades are complete and the roof areas are clear from all debris and protection layers.
- 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 Esha 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 Radmat Building Products 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.

SUBSTRATES/ VAPOUR CONTROL LAYERS/ WARM DECK ROOF INSULATION

605 SITE INSPECTIONS
- Radmat Technical Advisers will carry out regular inspections of the project during the course of the works. The Radmat Approved Contractor must give reasonable notice to Radmat 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. Radmat must be notified when the roof is ready for final inspection and all related works and snagging complete.

610 SUITABILITY OF SUBSTRATES
- Substrates generally: Secure, clean, dry, smooth, and free from corrosion, contaminants, damage and protrusions.
- Preliminary work: Complete including:
Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion.
- Fixing of battens, fillets and anchoring plugs/ strips.
- Moisture content and stability of substrate: Must not impair roof integrity.
- 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.

640 FIXING TIMBER TRIMS
- Fasteners: Sherardized steel screws.
- Fixing centres (maximum): 600mm.

670 LAYING VAPOUR CONTROL
- Attachment: Securely bond to prepared substrate.
- Side and end laps: 80mm side and 100mm head laps.
- Joints in second layer (where applicable): Stagger by half a membrane.
- Penetrations: Fully seal using bonding or taping methods.
- Edges of insulation at roof edges, abutments, upstands, kerbs, penetrations and the like: Enclosed with vapour control layer:
- Dressed up sufficiently, providing 50 mm (minimum) seal when overlapped by the roof covering; or
- Turned back 150 mm (minimum) over the insulation and sealed down.

680 LAYING WARM DECK ROOF INSULATION
- Setting out:
- Long edges: Fully support and run at right angles to side laps in the membrane.
- End edges: Adequately support.
- Joints: Butt together.

- End joints: Stagger.
- Bedding: Full bed of EshaStik PU adhesive.
- Mechanical fixing: Not required.
- Protection to exposed edges of insulation: Reduced thickness treated timber batten, outer edge chamfered at changes in level.
- Completion: Boards must be in good condition, well fitting and stable.

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: 80m side and 100mm head.
- Head and side laps: Offset.
- Intermediate and top layer/ cap sheet: 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.

740 TORCH-ON BONDING OF REINFORCED BITUMEN MEMBRANES
- Bond: Full over whole surface, with no air pockets.
- Excess compound at laps of top layer/ capsheet: Leave as continuous bead.

747 SELF-ADHESIVE BONDING OF REINFORCED BITUMEN MEMBRANES
- Bond: Full over whole surface, with no air pockets.

750 LAYING MINERAL FACED REINFORCED BITUMEN MEMBRANES
- Lap positions and detailing of ridges, eaves, verges, hips, abutments, etc: Submit proposals.
- Setting out: Neat, with carefully formed junctions.
- Lap bonding: Carry out only at prefinished margins or prepared ‘black to black’ edges.
- Excess bonding compound at laps: Remove whilst still warm.

775 SKIRTINGS AND UPSTANDS
- Angle fillets: Fix by bitumen bonding or nailing.
- Venting first layer of bitumen membrane: Stop at angle fillet.
- 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.
- 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.

785 FIXING PERIMETER TRIMS
- First/ Intermediate layers bitumen membrane: Lay over roof edge upstand. Project free edge 25 mm from wall or fascia.
- Trim: EshaTrim GRP
- Fasteners: Screw fix.
- Fixing: 25 mm from ends and at 250 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/ Cap sheet: Butt joint to rear edge of trim.
- Cover strip: Fully bond to trim and top layer/ cap sheet of bitumen membrane. Carry over roof edge upstand and lap 75 mm onto roof.
  Cover strip material: EshaFlex 370 Black polyester fleece and glass yarn reinforced bitumen membrane mineral finished cap sheet with Groove Technology.

SURFACING

800 No additional surfacing required.

COMPLETION

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

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.

950 GUARANTEE
- A 20 year product and workmanship guarantee is to be provided upon completion following a final Inspection by Radmat Building Products Ltd. Details regarding the full terms and conditions are available separately upon request. This Esha RBM Roofing System must be installed by a Radmat Esha Approved Contractor, to be eligible for guarantee.