

Bituminous membrane and solar PV specification and associated documentation requirements for submittal.

The contractor shall make written application for acceptance prior to the tender phase, certifying that the proposed system and manufacturer thereof, will perform to the following requirements of Milton Keynes Community Foundation.

Please see the specification parameters below that must be met. Milton Keynes Community Foundation will not accept submittals of roofing systems that do not meet these criteria or the submitting contractor / manufacturer fails to submit ANY of the requested supporting documents.

1. GENERAL CONDITIONS

1.1 SUMMARY OF WORKS

- Torch applied modified bituminous membrane roofing system over prepared substrate and insulation system.
- System to include vapour barrier, rigid board insulation in adhesive, vented underlay and SBS modified cap sheet.
- Install flame-free self-adhesive membranes to high risk areas in accordance to NFRC safe2torch recommendations.
- All work carried out in strict accordance to HSE recommendations.
- All work carried out to follow current Government COVID 19 guidelines.
- Site to be left in a clean and tidy condition once work is completed.

1.2. DISCLOSURE OF MATERIALS AND SUBSTITUTIONS

The materials outlined herein are the type of materials that should be used in this project. Milton Keynes Community Foundation will not accept products with inferior performance criteria, roofing system manufacturers that do not meet the following criteria or roofing contractors that do not have all the necessary requirements covered.

Product submissions must meet or exceed the specifications, and include the following:

1. Material product data sheets.
2. A certificate from an accredited testing laboratory clearly demonstrating that material submissions are equal to or superior to the performance requirements set out in this document, including but not limited to the following:

Modified roofing membrane(s) substantiating:

- a. Visible defects in accordance with EN 1850-1 (or equivalent)
- b. Dimensions, tolerance, and mass per unit area in accordance with EN 1848-1 (or equivalent)
- c. Watertightness in accordance with EN 1928:2000 (or equivalent)
- d. External fire performance in accordance with EN 13501-5 (or equivalent)
- e. Reaction to fire in accordance with EN 13501-1:2007+A1:2009 (or equivalent)
- f. Peel resistance of joints in accordance with EN 12316-1 (or equivalent)
- g. Shear resistance of joints in accordance with EN 12317-1 (or equivalent)
- h. Water vapour resistance in accordance with EN 1931 (or equivalent)
- i. Resistance to impact in accordance with EN 12691 (or equivalent)
- j. Resistance to static loading in accordance with EN 12730:2001 (or equivalent)
- k. Tensile strength in accordance with EN 12311-1 (or equivalent)
- l. Resistance to tearing (nail shank) in accordance with EN 12310-1 (or equivalent)
- m. Resistance to root penetration in accordance with EN 13948 (or equivalent)
- n. Dimensional stability in accordance with EN 1170-1 (or equivalent)
- o. Flexibility at low temperature in accordance with EN 1109 (or equivalent)
- p. Flow resistance at elevated temperature in accordance with EN 1110 (or equivalent)
- q. Artificial ageing by long term exposure to UV, elevated temperature and water in accordance with EN 1297 (or equivalent)
- r. Artificial ageing by long term exposure to elevated temperature in accordance with EN 1296(or equivalent)
- s. Adhesion on granules (if applicable) in accordance with EN 12039 (or equivalent)

Test results must be dated, notarised and be on testing laboratory stationary.

3. A list of at least five (5) projects where the proposed material was used under similar conditions (Whether or not installed by the contractor). These projects must, be at least five

(5) years old, and each must be available for inspection by the specifier. All costs related to these inspections will be the responsibility of the contractor or manufacturer.

4. The manufacturer must also have current ISO 9001:2008 (or equivalent) certification for the manufacturing of the products to be utilised on this project.
5. A sample warranty by the manufacturer of the modified bitumen membrane roofing system. The manufacturer must be the organisation that guarantees the modified roofing membrane.
6. All products must be in accordance with the Health, Safety and Environmental Control (HSE) Regulations, e.g., No asbestos materials, no harmful solvent release materials, etc.
7. In making a request for submission, Bidder/Contractor represents:
 - a. He/she has personally investigated the proposed product or method and determined that it is equal or superior in all respects to that specified.
 - b. He/she will provide the same guarantee for the product and method specified.
 - c. He/she will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
 - d. He/she waives all claims for additional cost related to substitution, which consequently become apparent.
 - e. Cost data is complete and includes all related cost under his/her contract or other contracts.
 - f. Milton Keynes Community Foundation reserves the right to be the final authority on the acceptance or rejection of proposed roofing systems or materials.

1.3. SUBMITTALS OF SUITABLE PRODUCTS

- A. Product Data: Provide manufacturer's technical product data sheets for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.
- B. Samples: Submit two (2) samples of each product specified. 300mm x 300mm
- C. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membranes.
- D. Manufacturer's Certificate: Certify that roof system furnished is approved by the British Board of Agrément and that it meets the requirements set out by BS 6229:2018 and BS 8217:2005 and meets national building regulation.

- E. Manufacturer's Certificate: Acceptance of the securement of the designed roof system is proper to meet or exceed the specific project wind uplift requirements in accordance with BS EN 1991-1-4:2005 + A1:2010 + National Annex. (or equivalent)
- F. Manufacturer's Certificate: Certify that modified membrane materials to be used on this project conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- G. Manufacturer's Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001:2008 compliance certificate. (or equivalent)
- H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with BS EN 13707, BS 8747 and MOAT 64:2001. (or equivalent)
- I. Submit a copy of an unexecuted manufacturer's guarantee for review.
- J. Provide approval letters from insulation manufacturer for use of their insulation within this particular roof system type.
- K. Provide a sample of insulation type.
- L. Examples of details drawings relevant to this roof type installation.
 - Submit four (4) copies of detail drawings indicating complete installation details of tapered insulation system, including identification of each insulation block, sequence of installation, layout, drain locations, sumps, roof slopes, thicknesses, tapered crickets and saddles.
 - Detail drawings shall include: Outline of roof, location of drains, sumps, complete board layout of tapered insulation components, thickness and minimum and average U-Value for the completed insulation system.

1.4. ROOFING SYSTEM / ROOFING CONTRACTOR QUALIFICATIONS

- A. Manufacturer: Company specialising in manufacturing the products specified in this section with minimum 12 years documented experience and having ISO 9001:2008 certification. (or equivalent)
 - Provide last 3 years audited accounts as proof of good financial standing
 - Must have a D & B rating of 5 A 1
 - Must declare if there is any current legal action levied against them or any CCJ's or other adverse legal judgements within the past 3 years. To enable Milton Keynes Community Foundation to establish to its reasonable satisfaction that there are no grounds to consider that the manufacturer will not be able to undertake this project or meet their guarantee

obligations.

- B. Roofing Contractor /Installer: Company specialising in modified bituminous roofing installation with a minimum 5 years' experience and approved by roofing system manufacturer as qualified to install manufacturer's roofing materials.
- Supply the names of 4 references that will allow Milton Keynes Community Foundation to approach them to obtain the necessary reference to ensure suitability to undertake this project
 - Provide last 3 years audited accounts as proof of good financial standing
- C. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work and at any time roofing work is in progress. Maintain proper supervision of workers.
- Maintain a copy of the specifications in the possession of the Supervisor/Foremen and on the roof at all times.
- D. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner has the right to hire a qualified contractor and back charge the original contractor.
- E. Insurance Certification: Roofing Contractor must carry a minimum of:
- | | |
|-----------------------------|-------------|
| Employers Liability (EL) | £5,000,000 |
| Public Liability (PL) | £10,000,000 |
| Professional Indemnity (PI) | £10,000,000 |
- F. Source Limitations: Obtain all components of roof system from a single manufacturer (with the exception of insulation). Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.
1. Upon request of Milton Keynes Community Foundation submit Manufacturer's written approval of secondary components in list form, signed by an authorised agent of the Manufacturer.
- G. The Roofing Contractor / Manufacturer will both be a registered member of the NFRC or a similar professional organisations within its home jurisdiction and the contractor will deliver proof of membership on request.
- H. The Roofing Contractor / Manufacturer will be a registered member of the NFRC Safe2Torch campaign and submit Safe2Torch drawings and flame free data sheets at tender stage. Failure to do so will result in the application being denied.

1.5. DELIVERY, STORAGE AND HANDLING

- A. Products should be delivered to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or another raised surface. Stand all roll materials on end. Cover roll goods with a tarpaulin or other breathable material.
- C. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the substrate is not compromised at any time.

Damage to the substrate caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his/her expense.

1.6. MANUFACTURER'S / CONTRACTORS REQUIREMENTS

- A. When the project is in progress, the roofing system manufacturer will provide the following:
 - 1. Keep Milton Keynes Community Foundation informed as to the progress and quality of the work as observed.
 - 2. Provide quality assurance inspections a minimum of two (2) days a week with reports to the Milton Keynes Community Foundation.
 - 3. Report to Milton Keynes Community Foundation in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
 - 4. Confirm after completion that manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.
 - 5. The Waterproofing Manufacturer must be a registered member of the NFRC Safe2Torch Campaign. A fully bespoke specification for each project, including the use of flame free products where necessary must be submitted prior to commencement of each project. An initial survey must be carried out by the roofing manufacturer and contractor to determine any areas of fire risk and to inspect any known areas noted within the designer's risk assessment and this specification. Attention must be made to fire risk areas which can be but not limited to any combustible materials and substrates, void areas or areas where the substrate is

unknown. Any additional risks recognized must be raised with the contract administrator immediately. Safe2Torch detail drawings and flame free material data sheets must be submitted at tender stage.

6. The chosen Manufacturer must provide a minimum of 4 references from other local authorities or government facilities that may be contacted prior to the work being issued.
7. All materials specified must be provided by the chosen Manufacturer and no generic items or contractor sourced materials will be allowed.

1.7. PROJECT CONDITIONS

- A. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- B. Do not apply roofing insulation or membrane to damp deck surface.
- C. Do not expose materials vulnerable to water or UV damage in quantities greater than can be weatherproofed during same day.

1.8. SEQUENCING AND SCHEDULING

- A. Sequence installation of modified bituminous membrane with related units of work if specified in other sections to ensure that roof assemblies including roof accessories, flashing, trim and joint sealers are protected against damaging effects of weather, corrosion and adjacent construction activity.
- B. Fully complete all modified bituminous membrane roofing field assembly work each day, including any/all associated detailing.

1.9. WARRANTY

- A. Upon completion of installation, and acceptance by Milton Keynes Community Foundation the manufacturer of the roofing system will supply Milton Keynes Community Foundation a twenty five (25) year Guarantee covering the modified bitumen roof system and all components included in the specification including a 40.16kwp Solar PV system, including but not limited to insulation boards, fasteners, sealant, edge trim and any other integral component used in the construction of the roof system.

- B. The Roofing Contractor / Installer will submit a minimum of a 10-year (10) Guarantee to Milton Keynes Community Foundation. A sample Guarantee will be submitted for approval prior to tender stage and constitutes a pre-requisite of the pre - qualification requirement.
- C. At the request of the Owner, the roofing system manufacturer shall provide the Owner, or his/her representative, with an annual inspection of the roofing system. This period shall be for the duration of the delivered warranty period.

2. PRODUCTS, PRODUCT PERFORMANCE REQUIREMENTS, PRODUCT SPECIFICATION REQUIREMENTS, TESTING DATA AND SUPPORTING DOCUMENTATION

2.1 ACCEPTABLE MANUFACTURERS

- A. This specification is based on the performance characteristics of the system chosen by Milton Keynes Community Foundation. Any proposed alternate systems, specified or not, must meet or exceed the following listed characteristics and be submitted for approval.
- B. Any item or materials submitted, as a substitution to the specified standards must comply in all respects as to the quality and performance as stipulated.

Milton Keynes Community Foundation or its representative shall be the sole judge as to whether an item submitted as a substitute is truly equal. Should the Contractor choose to submit a substitute product, he/she shall assume all monetary or other risk involved, should Milton Keynes Community Foundation or its chosen representative find the substitution unacceptable. The manufacturer / Contractor must supply all requested information for this submittal to be accepted.

- C. Provide primary products, including each type of membrane, from a single source roof manufacturer. Provide secondary products (insulation, mechanical fasteners, outlets, vent stacks etc.) only as recommended by the roof manufacturer of primary products for use with the roof system specified.

2.2 DESCRIPTION

- A. Modified bituminous roofing work including but not limited to:
 - 1. Install specified vapour control layer prior to installing the specified insulation system.
 - 2. Install specified insulation system, adhered with polyurethane adhesive in accordance to manufacturers application guidelines including coverage rate.

3. One layer of venting underlay adhered by low temperature melting point stripes or patches, directly to the torch receivable insulation boards.
4. One layer of SBS modified mineral surfaced torch applied cap sheet.
5. One additional layer of SBS modified fully bonded base sheet to all upstands and details
6. Vapour Control Layer: an SBS modified bitumen VCL with a G200 Fiberglass/Aluminium composite reinforcement.
7. Base sheet modified membrane: a 4mm SBS modified roofing membrane with a min. 180 gsm polyester reinforcement with fibreglass filaments.
8. Modified Membrane venting layer underlayment: 3mm SBS modified roofing membrane with min. 180gsm polyester reinforcement with fibreglass filaments and low-temperature melting compound venting strips facing the insulation layer.
9. Cap sheet modified membrane: a min. 5.2mm thick SBS modified roofing membrane with a min. 230gsm polyester reinforcement with fibreglass filaments. Finished with a mineral surface. Cold temperature flexibility of -25 °C.
10. The proposed roofing system must conform to EN13501-5 – External Fire Exposure to Roofs and have achieved a rating of Broof(t4). Sampling requirements must be that of the system as specified and show that a full range of insulation thicknesses have been tested and confirm to the above requirement.

2.3 ROOFING MEMBRANE REQUIREMENTS

A. VAPOUR BARRIER

Thickness (EN 1849-1)	3mm
Tensile Strength (EN 12311-1)	1200/1200 N/50mm
Elongation at break (EN 12311-1)	4/4 %
Resistance to tearing (EN 12310-1)	200/200 N
Dimensional Stability (EN 1107-1)	0.1 %
Flexibility at low temperature (EN 1109)	-20°C
Water vapour transmission properties (EN1931)	1,500,000
Flow resistance at elevated temperature (EN 1110)	100 °C

B. BASE SHEET

Thickness (EN 1849-1)	4mm
Tensile Strength (EN 12311-1)	850/650 N/50mm
Elongation at break (EN 12311-1)	40/40 %
Resistance to tearing (EN 12310-1)	200/200 N
Dimensional Stability (EN 1107-1)	0.3 %
Flexibility at low temperature (EN 1109)	-15°C
Shear resistance of joint (EN 12317-1)	750/550 N/50mm
Flow resistance at elevated temperature (EN 1110)	100 °C

C. VENTING BASE LAYER

Thickness (EN 1849-1)	3mm
Tensile Strength (EN 12311-1)	900/700 N/50mm
Elongation at break (EN 12311-1)	45/55 %
Resistance to tearing (EN 12310-1)	150/150 N
Dimensional Stability (EN 1107-1)	0.2 %
Flexibility at low temperature (EN 1109)	-20°C
Shear resistance of joint (EN 12317-1)	250/120 N/50mm
Flow resistance at elevated temperature (EN 1110)	110 °C

D. MODIFIED MEMBRANE CAP SHEET

Thickness (EN 1849-1)	5.2mm
Tensile Strength (EN 12311-1)	1000/800 N/50mm
Elongation at break (EN 12311-1)	40/40 %
Resistance to tearing (EN 12310-1)	450/450 N
Dimensional Stability (EN 1107-1)	0.3 %

Flexibility at low temperature (EN 1109)	-25°C
Flexibility after ageing (EN 1296 + EN 1109)	-20 °C
Shear resistance of joint (EN 12317-1)	250/120 N/50mm
Peal resistance of joint (EN 12317-1)	≥100 N/50mm
Resistance to impact (EN 12691 Method A)	1000 mm
Resistance to static loading (EN 12730)	20 kg
Flow resistance at elevated temperature (EN 1110)	100 °C
External fire performance (EN 13501-5) (as system)	Broof (t4)

E. MODIFIED SELF-ADHESIVE BASE SHEET

Thickness (EN 1849-1)	3mm
Tensile Strength (EN 12311-1)	450/400 N/50mm
Elongation at break (EN 12311-1)	40/40 %
Resistance to tearing (EN 12310-1)	130/130 N
Dimensional Stability (EN 1107-1)	0.3 %
Flexibility at low temperature (EN 1109)	-25°C
Shear resistance of joint (EN 12317-1)	350/300 N/50mm
Resistance to impact (EN 12691 Method A)	800 mm
Flow resistance at elevated temperature (EN 1110)	100 °C

F. SELF ADHESIVE CAP SHEET

Thickness (EN 1849-1)	4mm
Tensile Strength (EN 12311-1)	700/500 N/50mm
Elongation at break (EN 12311-1)	40/45 %
Resistance to tearing (EN 12310-1)	200/200 N
Dimensional Stability (EN 1107-1)	0.3 %

Flexibility at low temperature (EN 1109)	-25°C
Flexibility after ageing (EN 1296 + EN 1109)	-20 °C
Shear resistance of joint (EN 12317-1)	600/400 N/50mm
Resistance to impact (EN 12691 Method A)	1250 mm
Resistance to static loading (EN 12730)	15 kg
Flow resistance at elevated temperature (EN 1110)	100 °C
External fire performance (EN 13501-5) (as system)	Broof (t4)

2.4 SURFACINGS

- A. MINERAL SURFACE MEMBRANES: Mineral surface shall be PCNT622 as supplied by Carrieres Des Lacs (France).

Roofing Manufacturer must supply proof that this surfacing is used in production.

2.5 RELATED MATERIALS

- A. Roof Insulation: In accordance with Insulation scheme and required U-Value as per specification requirements.
- B. Roof Insulation adhesive: High performance single component, solvent-free, non-flammable, polyurethane adhesive. Able to bond a range of insulation boards, including EPS, XPS and PIR both tissue and foil-faced.
- C. Polyurethane sealant: Low modulus joint sealant, formulated to ensure a bubble free cure even in high temperature and humid conditions. Must have a 50% joint movement accommodation factor and excellent adhesion to glass, aluminium, steel, polycarbonate, and GRP.

1.	Elongation (ASM D412/EN-ISO-527-3)	700%
3.	Hardness, Shore A (ASTM D2240/DIN 53505/ISO R868)	27
4.	Adhesion to concrete (ASTM D4541)	20 kg/cm ²
5.	Service temperature	-40°C to 80°C
6.	QUV Accelerated Weathering Test (ASTM G53)	Passes (2000hrs)

- D. Lead replacement membrane: Synthetic lead-alternative flashing membrane.

- E. GRP Edge Trim: Glass reinforced polyester roof edge trim available in black, grey and white. Must be min. 2mm thick and suitable to terminate modified bituminous membranes.
- F. Termination Bars: Extruded aluminium termination bar. Minimum 2mm thick and available in mill finish and black.
- H. Roof Drainage Outlets, soils vent pipes and associated items: Must be manufactured from stainless steel, with integrated reinforced modified bitumen sealing flange min. 300mm diameter.