PROTEC SYSTEM WARM ROOF

(NEW TIMBER DECK)

OUTLINE SPECIFICATION

Ref: PR20107
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POLYROOF
ADVANCED LIQUID ROOFING

Part of Roberts Group

1 Introduction

The following outline specification is based on application of the advanced Protec System to a new timber deck in conjunction with new thermal insulation in the form of a warm roof design. Please note that this outline specification is based on preliminary discussions only. We welcome the opportunity to discuss your project further to finalise a proposal that is tailored to your exact requirements.

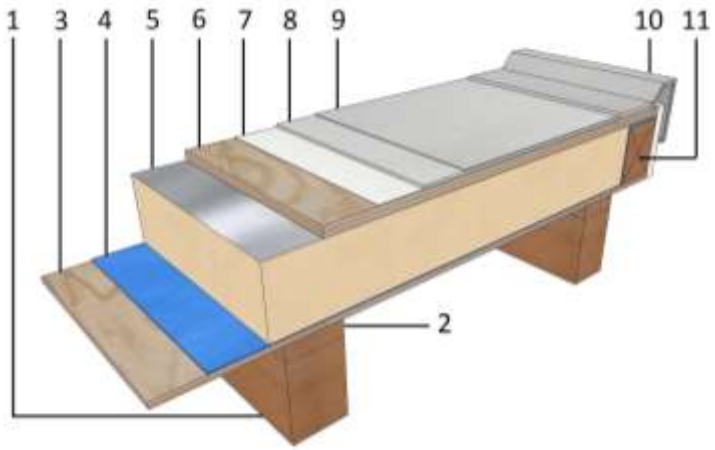
Further useful information in relation to the Protec System is available from the following website links:

- Literature and third party accreditations: http://polyroof.co.uk/products/protec-system/
- Guarantees: http://polyroof.co.uk/about/polyroof-guarantees/

2 Construction

2.1 Overview

The following drawing of the proposed roof construction is indicative only. Please note that perimeter edge detailing may vary.



Important - No deviation to the proposed construction or substitution of materials will be permitted unless advanced approval is obtained from Polyroof Products Technical Services.

1. Timber joists at 400mm centres
2. Timber firrings (min. 1 in 80 fall)
3. 18mm Plywood / OSB3 spreadsheet
4. 1000 gauge visqueen air and vapour control layer (AVCL)
5. Polyroof approved PIR insulation (e.g. Polyroof Foil-Therm Insulation)
6. 18mm Polyroof approved plywood / OSB3 (TG4) deck
7. Uni-Primer DP*
8. 1st coat of Protec Resin and Polymat 450 reinforcement*
9. 2nd coat of Protec Resin
10. Pre-formed Polyroof GRP upstand trim
11. Timber hard edge

*An alternative specification utilising PolyBase reinforced basecoat resin in lieu of Uni-Primer DP and 1st coat of Protec Resin has been in outlined in Section 6.

Please consult Polyroof Technical Services for further advice for insulation thicknesses in excess of 150mm as careful consideration should be given due to the potential length of mechanical fixings required.

It is recommended that wind uplift calculations are carried out prior to undertaking any roofing project to ensure that the adhesive and / or mechanical fixings meet the required performance. Please contact Polyroof Technical Services for further guidance.

2.2 Construction Notes

2.2.1 Preparation

For specific guidance on preparation of substrates please refer to the current application manual issued by Polyroof Technical Services.

2.2.2 Falls & Drainage

Timber Firrings – Where required firrings are to be installed to create a minimum recommended 1 in 80 fall using proprietary fixings applicable to the construction and environmental conditions.

NB: Although standing water is not detrimental to the Protec System it could be hazardous to foot traffic in icy conditions.

It has been assumed that the proposed / current drainage capacity is adequate.

2.2.3 Inspection / Removal (Refurbishment Projects)

The existing build up is to be stripped and removed from site.

Or,

The existing build up is to be inspected for defects, made good where required and retained. Any areas that are structurally unsound are to be removed and replaced on a like-for-like basis.

Any Chipboard decks must be removed. This specification assumes that all retained timber work is in good condition and free from any signs of wet/dry rot.

Any existing insulation present between the timber joists is to be removed along with any ventilation to the void.

Any lightning conductors are to be temporarily lifted prior to commencing works and then reinstalled upon completion by competent personnel. IMPORTANT – Lightning conductors must not be fixed directly through the new waterproofing membrane.

2.2.4 Support Layer

Refurbishment Projects:

The existing construction will act as a support layer for the new warm roof construction but where this is defective it should be replaced with a new support layer as outlined below.

New Build / Refurbishment Projects:

An 18mm plywood / OSB3 spreadsheet is to be mechanically fixed to the timber joists.

Plywood / OSB3 Spreadsheet to Timber Joists	
Fixing Type	EJOT TKR Range
Minimum Penetration into Timber Joists	40 mm
Minimum Fixings per Board	24 Nr (2400mm x 1200mm board)
Minimum Fixings per Board (OSB3)	20 Nr (2400mm x 600mm board)

2.2.5 Timber Hard Edge

A timber hard edge must be fitted to all exposed perimeter edges of the roof and must be installed in accordance with the: Timber Hard Edge and Trim Fixing Guidance

For installation of the air and vapour control layer (AVCL), insulation and Protec System refer to Sections 2.3-2.5.

2.3 Warm Roof Components

2.3.1 Air & Vapour Control Layer (AVCL)

A 1000 Gauge Visqueen AVCL is to be fitted and taped in accordance with the manufacturer's recommendations. The AVCL shall be continuous and encapsulate the insulation boards at abutments, penetrations and exposed edges.

An alternative specification for using the self-adhesive Polyroof SA Vapour Barrier is available upon request from Polyroof Technical Services.

2.3.2 Insulation

Polyroof approved PIR insulation (e.g. Polyroof Foil-Therm Insulation) is to be fitted. All boards should be laid staggered and should comply with the specification of the manufacturer.

2.3.3 Warm Roof – Other Notes

- It is the client's responsibility to confirm the required U-value based on performance requirements and current building regulations standards. If in any doubt further guidance should be sought from local authority building control regarding this.
- The warm roof construction should be suitably protected during the construction phase to avoid excessive moisture within the construction.
- If temporary protection fails and the roof construction becomes wet then advice should be sought from Polyroof Products Ltd Technical Services with regards to the requirement for temporary roof vents.

2.4 New Timber Deck for Protec

2.4.1 Overview

18mm Polyroof approved plywood / OSB3 (TG4) boards are to be mechanically fixed to the timber joists to provide a base for the Protec System. Boards must be installed strictly in accordance with the guidance below.

NB: The Protec System must only be applied to CPD approved boards that are CE structural 2+ and have a facing suitable for Protec. Suitable grades are provided below.

2.4.2 Polyroof Approved Plywood Substrate and Fixing Guidance (Option A)

NAME	GRADE	3rd PARTY APPROVAL
Metsä Wood	II/III or +III/III	Fin ply / BBA
Wisa Spruce	II/III	BBA
Wisa Spruce	Spruce Special	BBA
Southern Yellow Pine	APA-BCX	American Plywood Association
Rolpin Eco	+II/III	FCBA
Canadian Softwood Ply	Select tight faced	Can Ply
Douglas Fir (DFP)	G1S	Can ply
Sudati P&TS	BCX	BBA
Guaraply PS	BCX	BBA
TeboPin Solid	+III/III	CTB-X

NB: If plywood from the list above cannot be sourced, please seek advice from Polyroof Technical Department on 0800 801 890.

2.4.3 Fixing Schedule

18mm Polyroof Approved Plywood to Timber Joists	
Fixing Type	EJOT TKR Range
Minimum Penetration into Timber Joists	40 mm
Minimum Fixings per Board	24 Nr (2400mm x 1200mm board)

NB: All fixings to be capable of withstanding necessary wind uplift pressures and environmental conditions.

2.4.4 Plywood Fixing Guidance

Lay approved boards staggered (brick pattern) with long edges 90^0 to joists, with 3mm gaps between boards and 20mm at wall abutments. End joints to be centred over joists.

Approved boards should be fixed at each corner and at a maximum of 400mm (16") centres with a minimum of 24 fixings per 2400mm x 1200mm (8' x 4') sheet. Fixing heads must always be counter sunk into the decking and to finish flush with the surface of the plywood. (NB: Do not drive fixings further than 1-2mm below the face of the plywood).

IMPORTANT: Expansion trims will be required for any roof area in excess of 100m^2 or roofs greater than 15m in length. A 20mm allowance should be made in the plywood board joints at these positions. For expansion trim positions refer to Section 6.1.

NB: Plywood boards should be overcoated as soon as possible, ideally the same day. If the boards cannot be waterproofed then they should be suitably protected from the weather at all times to avoid the possibility of becoming wet.

2.4.5 Polyroof Approved OSB3 (TG4) Substrate and Fixing Guidance (Option B)

Name	Acceptable Grade(s)	3rd Party Control	CPR / CPD Compliance	Comments
Smartply Europe Ltd	Smartply OSB3 Smartply Roof (OSB3)	BBA Cert 98/3488	CE Marked Structural 2+	Square Edge or T&G Commonly available in merchants
Norbord Ltd	Sterling OSB3 Sterling Roofdeck (OSB3)	BBA Cert 01/3857	CE Marked Structural 2+	Square Edge or T&G Commonly available in merchants
Kronospan Ltd	Kronospan OSB3 Board	BBA Cert 07/4498	CE Marked Structural 2+	Square Edge or T&G
Egger	Eurostrand OSB3 Board	BBA Cert 08/4546	CE Marked Structural 2+	Square Edge or T&G
Norboard NV	Sterling OSB3 - Conti	BBA Cert 10/4802	CE Marked Structural 2+	Square Edge or T&G
Kronofrance SA	Kronoply OSB / 3	BBA Cert 04/4093	CE Marked Structural 2+	Square Edge or T&G

IMPORTANT: For Flame Retardant (FR) grades of OSB3, contact Polyroof Technical Services for advice.

NB: If OSB3 (TG4) boards from the list above cannot be sourced, please seek advice from Polyroof Technical Department on 0800 801 890.

2.4.6 Fixing Schedule

18mm Polyroof Approved OSB3 (TG4) to Timber Joists	
Fixing Type	EJOT TKR Range
Minimum Penetration into Timber Joists	40 mm
Minimum Fixings per Board	20 Nr (2400mm x 600mm board)

NB: All fixings to be capable of withstanding necessary wind uplift pressures and environmental conditions.

2.4.7 OSB3 (TG4) Fixing Guidance

Lay approved boards staggered (brick pattern) with the larger gap in the T&G joint face up (writing side up on most boards). A minimum 20mm expansion gap should be provided at wall abutments.

Approved boards should be fixed at a maximum of 200mm centres (4 fixings across the board width) and into every joist. A minimum of 20 fixings per 2400mm x 600mm board will be required. Fixing heads must always be counter sunk into the decking and to finish flush with the surface. (NB: Do not drive fixings further than 1-2mm below the face of the boards).

IMPORTANT: Expansion trims will be required for any roof area in excess of 100m^2 or roofs greater than 15m in length. A 20mm allowance should be made in the OSB3 (TG4) board joints at these positions. For expansion trim positions refer to Section 6.1.

NB: OSB3 (TG4) boards should be overcoated as soon as possible, ideally the same day. If the boards cannot be waterproofed then they should be suitably protected from the weather at all times to avoid the possibility of becoming wet.

2.5 Protec Application

2.5.1 Overview

The Protec Waterproofing System consists of reinforced hybrid polymer resin, cold applied on site by hand lay giving a seamless, joint-free construction. The system should be applied in accordance with the current application manual issued by Polyroof Products Limited.

2.5.2 Approved Contractors

Protec should only be applied by contractors in possession of a current approval certificate. The contractor must provide an approved applicator to supervise the Protec work and the approved applicator must remain on the site until the works are complete. Confirmation of approval can be sought by calling Polyroof Products Ltd Technical Services on +44 (0) 800 801 890. A final inspection shall be carried out by a Polyroof technician prior to a guarantee being issued.

2.5.3 Weather Considerations

The system should not be applied if the air temperature is outside the range of 3degC - 30degC (NB: The system can be installed down as low as 1degC deck temperature with the addition of Product Accelerators). The system must not be applied in damp or cold conditions which could cause surface condensation; during frost or if there is a risk of rain.

2.5.4 Pigment Colour

Protec is available pre-pigmented in Light Grey or Chromite Grey which are the recommended colours for use. If other colours are required, always consult Polyroof technical services for advice regarding determining suitability for the application.

2.5.5 Primer Coat

New Plywood / OSB3 (TG4) Deck – Uni-Primer DP at an approximate coverage rate of 6m^2/litre. Ensure that T&G joints are fully filled with the primer. Board edges may also be sealed with primer for additional protection if required. Allow to cure.

Other Surfaces – For priming of any other surfaces please refer to the Protec Manual issued by Polyroof Products Limited.

2.5.6 Board Joints

OSB3 (TG4) Deck – Local reinforcement will not be required to interlocking T&G board joints provided they are adequately filled with primer and providing a closed, pinhole free surface can be achieved with the main Protec System.

Square Edged Plywood / OSB3 (TG4) Deck – To all square edged and cut board joints local reinforcement will be required. Apply PolyBase and 75mm wide Polymat 450. Allow to cure.

2.5.7 Detailing

Pre-formed Polyroof GRP Trims – Pre-formed Polyroof GRP trims must be mechanically fixed on the horizontal fixing arm to the timber deck at 150mm maximum centres using 18mm galvanized clout nails (large headed). In addition, drip or upstand trims with a face depth equal to or greater than 150mm must be mechanically fixed to the trim support batten at 300mm maximum centres using 40mm Polytop S/S nails / 18mm galvanized clout nails (large headed). All angles shall be mitred and all joints should be reinforced with Protec Resin and 2 layers of 75mm wide Polymat 450. Allow to cure.

Important Notes:

- For drip or upstand trims additional support must be provided in the form of trim support battens and jointing strips at the trim joints.
- On exposed sites all trims must be face fixed regardless of size.

For further guidance please click on the following website link: Timber Hard Edge and Trim Fixing Guidance

Expansion Trims – Polyroof Pre-formed Expansion Trims have special requirements and must be fixed, taped and coated strictly in accordance with the Polyroof Expansion Trim Installation Notes (please refer to Section 6).

Other Details – To any other details requiring local reinforcement apply Protec Resin and 75mm wide Polymat 450. Allow to cure. NB: Apply 25mm dis-bondment tape to any cracks or joints subject to movement prior to application of local reinforcement.

2.5.8 First Coat Application

Apply 1st coat of Protec Resin and Polymat 450 using Polyroof rollers at a minimum coverage rate of 1.3 - 1.5Litres/m^2 (0.66 - 0.77m^2/Litre). Allow to cure. NB: All coverage rates are indicative only and it is the contractors' responsibility to ascertain the exact coverage rates on site.

2.5.9 Second Coat Application

Apply 2nd coat of Protec Resin using Polyroof rollers at a minimum coverage rate of 0.5Litres/m^2 (2.0m^2/Litre). Allow to cure.

2.5.10 Anti-Slip Finish (Optional)

Protec is designed to accept pedestrian foot traffic associated with normal maintenance operations; however, optional anti-slip finishes are available. Specifications are available upon request from Polyroof Products Ltd Technical Services.

2.5.11 Inspection

On completion of each coat check for pinholes / misses and rectify accordingly.

2.5.12 Protection of Finished Membrane

In the event of other trades working on or adjacent to the roof area, the client must make adequate provision to prevent damage to the roofing system, by other trades. Site specifics should be discussed with the Approved Contractor.

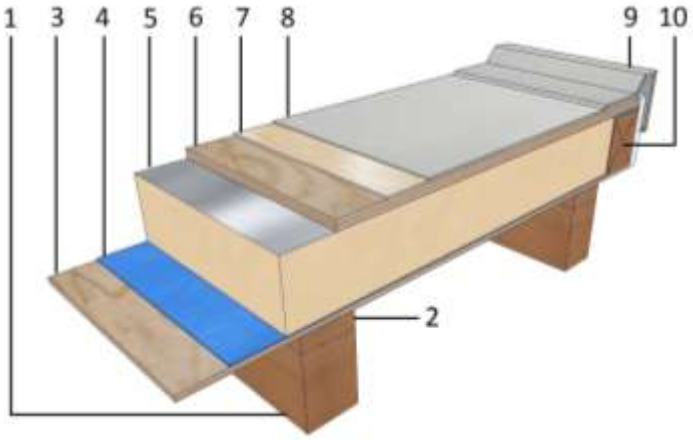
2.5.13 Additional Items

Should the client wish to install additional items such as paving slabs or timber decking, please consult Polyroof Products Ltd Technical Services prior to the commencement of any project.

Prior to the installation of additional items, the contractor should ensure that Polyroof Technical Services are contacted and given the opportunity to inspect the membrane before it is covered. Please note that should an inspection of the Protec System ever be required in the future it would be the client's responsibility to remove the additional items back to the membrane.

3 Alternative Protec Specification

The following is an overview of the proposed roof construction. Please contact Polyroof Technical Services on +44 (0) 800 801 890 for further guidance if required.



Important - No deviation to the proposed construction or substitution of materials will be permitted unless advanced approval is obtained from Polyroof Products Technical Services.

1. Timber joists at 400mm centres
2. Timber firrings (min. 1 in 80 fall)
3. 18mm Plywood / OSB3 spreadsheet
4. 1000 gauge visqueen air and vapour control layer (AVCL) or Polyroof SA Vapour Barrier
5. Polyroof approved PIR insulation (e.g. Polyroof Foil-Therm Insulation)
6. 18mm Polyroof approved plywood / OSB3 (TG4) deck
7. PolyBase Resin and Polymat 450 reinforcement
8. Protec Resin Topcoat
9. Pre-formed Polyroof GRP upstand trim
10. Timber hard edge

Primer Coat: No overall primer required when using PolyBase as the first coat.

Board Joints: Local reinforcement will not be required to interlocking T&G board joints provided they are adequately filled with PolyBase and providing a closed, pinhole free surface can be achieved. IMPORTANT: To all square edged and cut board joints local reinforcement will be required. Apply PolyBase and 75mm wide Polymat 450. Allow to cure.

First Coat Application: Apply PolyBase and Polymat 450 using Polyroof rollers at a minimum coverage rate of 1.2Litres/m^2 (0.84m^2/Litre). Allow to cure.

Second Coat Application: Apply Protec Resin using Polyroof rollers at a minimum coverage rate of 0.5Litres/m^2 (2.0m^2/Litre). Allow to cure.

4 Roof Details

Please note site investigation may be required to identify all roof details and to determine the required action to ensure they are left in a fully watertight condition. A range of CAD details are available for download from: http://polyroof.co.uk/products/protec-system/

Detailing Notes:

- Roof termination details should have a minimum 150mm upstand height above the finished surface of the roof and should be terminated into a chase or have a suitable cover flashing or weathering flange. Any details where this cannot be achieved will require periodic inspection and maintenance.
- Care should be taken to ensure all roof details are fully prepared and primed in accordance with the current application manual.
- All redundant roof details are to be removed prior to the commencement of works. The roof area underneath is to be made good as required, ensuring that it matches the build-up of the surrounding roof area.
- Pre-formed Polyroof GRP trims will be required at exposed perimeters.

5 Health & Safety

5.1 Personal Protective Equipment (PPE)

Should be worn at all times. Refer to Material Safety Data Sheets for advice.

In addition to PPE, barrier cream and hand cleaner may be used for secondary protection and cleaning of exposed areas of skin.

5.2 Material Safety Data Sheets (MSDS)

It is your responsibility to ensure that all relevant MSDS documents are on site at all times. MSDS documents are provided with your first order; additional copies of these sheets are available on request from Polyroof Technical Services. You can download the current versions from the Polyroof Approved Contractor Zone.

5.3 Risk Assessments / Method Statements

It is the responsibility of the contractor to ensure that adequate risk assessments (including COSHH assessments) and method statements are carried out prior to commencement of works.

5.4 VOC / Odour Control

Most products contain volatile components, such as solvents; these components evaporate from the system during and post application. Some of the volatiles within certain products have a strong odour and others such as within our Protec Evolve system have a low odour. Some volatiles require hazard control measures and these are stated on the MSDS sheets. Some hazardous VOCs (Volatile Organic Content) are assigned a 'Workplace Exposure Limit' (WEL): the legal maximum concentration in the air that an individual may be exposed to within a prescribed period of time. Some of these hazardous materials have also been assigned a 'Derived No Effect Level' (DNEL). Historic tests carried out on typical flat roofs indicate that neither the operatives fitting the system nor people within or in the vicinity of the building to which the system is applied, will be exposed to concentrations in excess of the WELs, the actual concentrations will be significantly lower.

It should be borne in mind that, whilst some of these VOCs have a strong odour and can be detected at low concentrations, the fact that they can be smelt does not mean individuals are exposed to hazardous levels.

The contractor carrying out the work is obliged to carry out a risk assessment and ensure sensible precautions are taken, such precautions would include checking the isolation of air intakes to the building and ensuring the avoidance of working within confined spaces: both could otherwise increase the exposure levels beyond those of our testing. It should also be noted that a low odour product such as Protec Evolve has a lower level of malodorous VOC's and this does not eliminate the need for a risk assessment.

To assure the occupants of the building, who may be concerned about an unfamiliar smell, warn them of the likelihood before work commences.

5.5 VOC Measuring

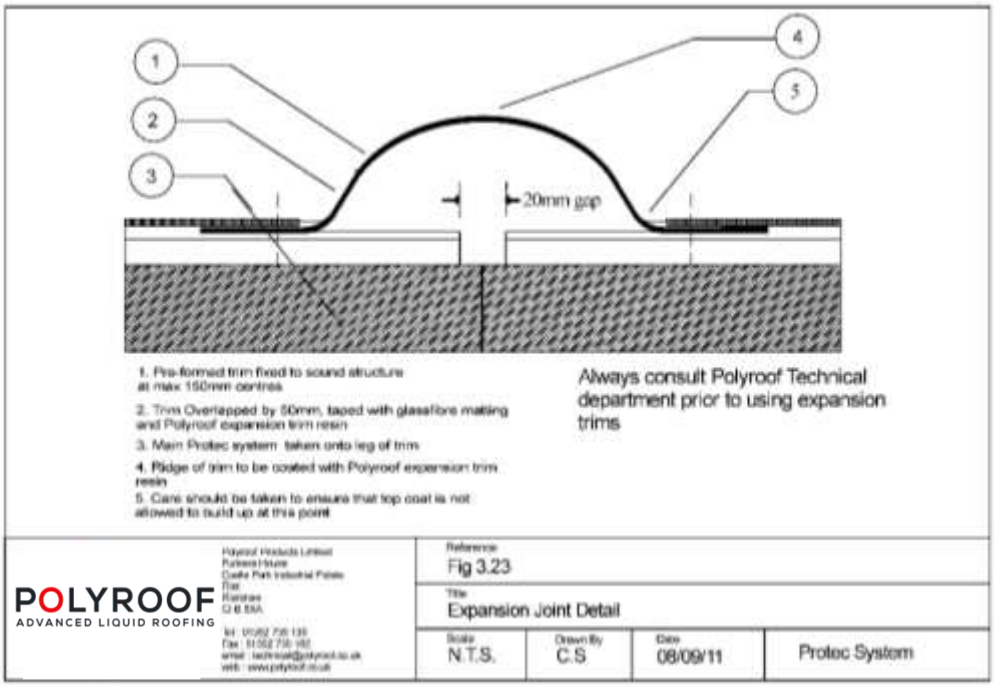
In sensitive areas it is usually possible to monitor the atmosphere for levels of VOC's, and potentially hazardous fumes by using specialist testing equipment. With most products portable site testing equipment may be used that will give an immediate indication of the concentration of specific solvents in the atmosphere. This can show that the appropriate WEL or DNEL, is not being exceeded. In rare circumstances the services of specialist industrial hygiene companies may be required.

The contractor's risk and COSHH assessments should identify if there is a need for atmospheric monitoring.

6 Further information

6.1 Expansion Trim Installation Notes

IMPORTANT: The Polyroof Approved Contractor must consult Polyroof Products Technical Services on 0800 801 890 to confirm the expansion trim layout prior to commencement of works. Please consult Polyroof Technical Services if positioning of expansion trims affects drainage in any way.



Polyroof pre-formed expansion trims must be fitted strictly in accordance with the Polyroof expansion trim guidance sheet (supplied with trims). A summarised version of the guidance is below for reference.

1. A 20mm gap is to be left between the plywood / OSB3 (TG4) board joints at the position of the expansion trims.
2. On the main roof deck the expansion trims should be overlapped (not butted) by a minimum of 50mm.
3. Expansion trims are to be chamfered appropriately against mansard and fillet details.
4. Expansion trims must be taken to the very edge of the roof. This includes parapet wall details.
5. At the perimeter trim junction i.e. upstand, drip, fillet trims should be fitted with a 10mm gap left.
6. Expansion trim joints must then be double taped using Protec Resin and 75mm wide Polymat 450. The perimeter trim joint is to be jointed in the same way. Never use PolyBase to tape expansion trims.
7. The full Protec System is then to be taken onto the flange of the trim just past the fixing points only. Note: Do not take all the way to the ridged section.
8. The curved section of the expansion trims (the whole flat area in the case of flat expansion trims) should be top coated using Pigmented Protec Resin only.

Should you require clarification on any of the above points please contact the Technical Department on 0800 801 890.

6.2 Further Reading

The following is a list of documents which provide further information in relation to the guidance provided in this outline specification:

- Protec Manual
- EJOT Building Fastener Catalogue
- 1000 Gauge Visqueen Air & Vapour Control Layer (AVCL) Datasheet

Please contact Polyroof Technical Services on +44 (0) 800 801 890 to request copies of the above or for further guidance.

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