
Report Document

Project: 43837

Project Name: Harlyn Primary School
Project Address: Tolcarne Drive
London
HA5 2DR

Client:

Client Details: London Borough of Hillingdon

Report written by:

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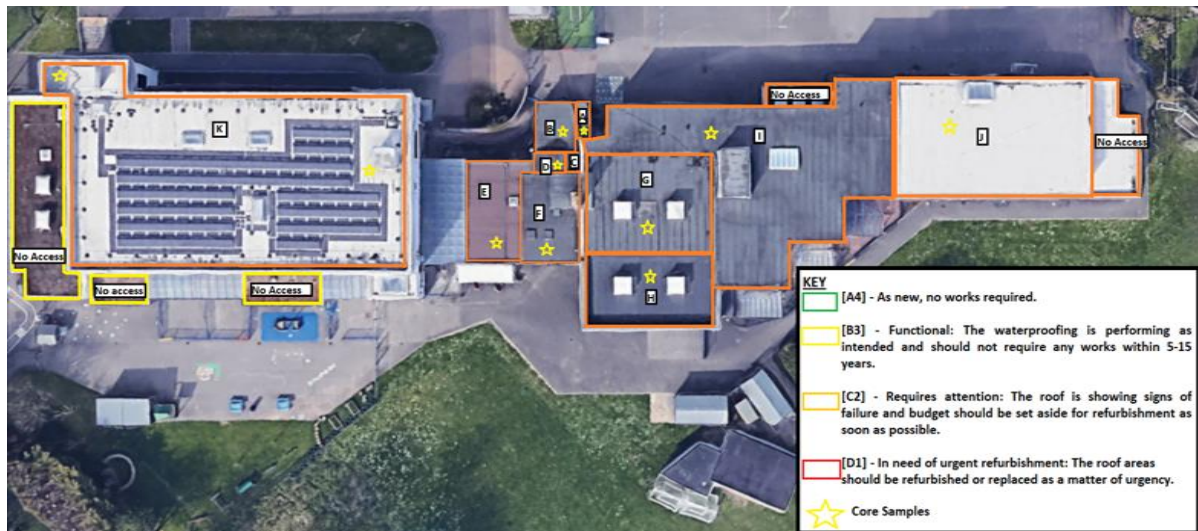


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Roof Survey Report & Recommendations

Roof area covered by this report: Roof A , Roof B, Roof C, Roof D, Roof E, Roof F, Roof G, Roof H, Roof I, Roof J, Roof K



1. Outline Description

This report has been produced for London Borough of Hillingdon for the express use in the refurbishment of the designated roof areas of the property stated above. It is based on our site inspection of Tolcarne Drive, London, HA5 2DR and should be read in conjunction with the enclosed photographs.

2. Scope of Report

This report is not a structural survey.

Any comments on roof structure or other building related issues in this report should not be taken to imply that its integrity has been assessed or deemed acceptable. A qualified party should verify any concerns relating to the integrity and/or capabilities of any part of the structure.

All the Langley Waterproofing Systems Ltd reports are written on the basis that the substrates, roof deck and structure are sound and durable. We cannot accept responsibility for the consequences of the latent defects in the roof deck and structure.

Listed Building Status: It is the responsibility of the building surveyor and/or client to ascertain the status of the building/s in question.

3. Roofs

Core Samples: These are taken for guidance purposes and indicate the construction only at the sample locations. Condition or levels of degradation affecting the coverings are only applicable at the time of inspection. Both construction and condition may vary throughout the roof area.

3.1. Roof A, B, C, D, F, G & I

Existing Construction

Core Sample – Roof A, F, G & I

Deck – Screeded concrete
Waterproofing – RBM Felt

Photographic Record



Core Sample – Roof B & C

Deck – Plywood
Waterproofing – RBM Felt



Core Sample – Roof D

Deck – Pre-screeded woodwool slab

Waterproofing – RBM let

Thermal Properties

- Langley U-value calculations are carried out in accordance with BS EN ISO 6946: 2007. Condensation calculations performed in accordance with BS5250.
- Building Regulations – Approved Document L2B Conservation of fuel and power in existing buildings requires that (when re-roofing), the existing roof construction must achieve the threshold U-value of 0.35 W/m²K or better. If the threshold value is not achieved, then the roof must be thermally upgraded to meet the current required maximum U-value of 0.18 W/m²K.
- The current U-value of the main roof is circa 5.56 W/m²K which falls well outside the threshold U-value of 0.35 W/m²K and should be considered extremely poor. This area will therefore require thermally upgrading upon refurbishment.

Roof Defects and Design Considerations

- **Main Area**
Visually all roofs are in fair condition. All roofs have an existing RBM waterproofing. RBM suffers with UV degradation and lichen growth due to its age. There are some felt repairs and liquid repairs evident on the roof area. Evidence of blistering also present on the roof which will cause further failures in the near future.
- **Perimeter**
Roofs A, B, C, D and I all have a kerb around the perimeter with felt finished into a trim. Roof G has a high parapet wall around the perimeter with felt finished into a trim.
- **Drainage**
Visually all roofs have fair falls (visual estimate 1:100/110). Roofs A, B, D and I all drain through a drip edge into external gutter. Roof C drains onto roof A. Roof F drains onto roof E and then through a chute into a hopper. Roof G drains into an internal outlet. Furthermore, moss growth evident on roof B indicating poor falls on the roof.
- **Penetration**
Soil vent pipes present on roof B and I. Both soil vent pipes have poor detailing around them, which will allow water ingress in the near future.
- **Skirtings**
There are skirtings upstand present on roof C circa 200mm above the roof surface. Air vent present on roof I circa 450mm above the roof surface

- **Threshold/Cills**

Low window cill present on roof G circa 130mm above roof surface.

Low window cill is present on roof A circa 120mm above the roof surface.

- **Plant**

There are a few items of plant present on the roof areas. These include:

- Kerb mounted extractor fans
- Cables
- Lightning conductors
- Pipe supports
- Wall mounted cables circa 200mm above the roof surface.
- Solar panels on roof I.

Photographic Record

Roof A



Overview of the roof area



As above



Window cill circa 120mm above the roof surface

Roof B



Overview of Roof B
Pipe work with support present on the roof



Overview of the roof area



Moss growth present on the roof



Possible ACM soil vent pipe present on the roof.

Photographic Record – Roof C



Overview of the roof area



As above

Photographic Record



Overview of the roof area



As above

Photographic Record – Roof F



Overview of the roof area



Mastic repair to the upstand indicating previous water ingress issues.



Further overview of the roof area



Overview of perimeter kerb

Photographic Record – Roof G



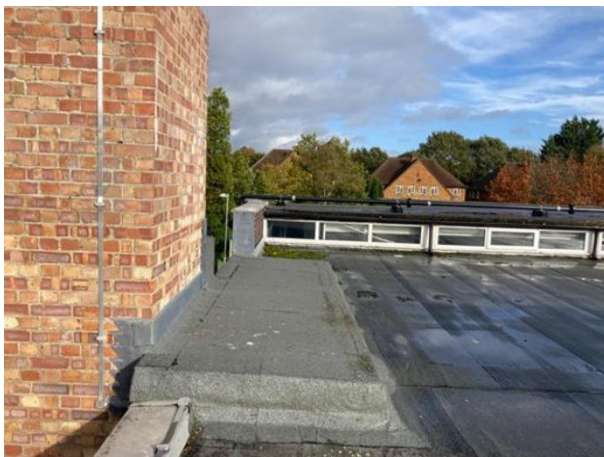
Overview of the roof area



As above



As above



Further overview



Window cill circa 130mm above the roof surface



Extractor fan



Overview of windows

Photographic Record – Roof I



Overview of the roof area



As above



Pipe work on supports present on the roof



Soil vent pipe present on the roof



Solar panel present on the roof



Tank room with UPVC cladding



Soil vent pipe near the UPVC cladding



Roof drains into external gutter



**Wall cladding 120mm above the roof surface.
Wall vent circa 450mm above the roof surface.**



Evidence of previous repairs

3.2. Roof E & H

Existing Construction

Core Sample – Roof E

Deck – Plywood
Insulation – 200mm PUR
Plywood sheeting
Waterproofing – RBM

Photographic Record



Core Sample – Roof H

Deck – Plywood

Insulation – Cork 100mm

Waterproofing – RBM



Thermal Properties

- Langley U-value calculations are carried out in accordance with BS EN ISO 6946: 2007. Condensation calculations performed in accordance with BS5250.
- Building Regulations – Approved Document L2B Conservation of fuel and power in existing buildings requires that (when re-roofing), the existing roof construction must achieve the threshold U-value of 0.35 W/m²K or better. If the threshold value is not achieved, then the roof must be thermally upgraded to meet the current required maximum U-value of 0.18 W/m²K.
- The current U-value of roof E is circa 0.18 W/m²K and roof H circa 0.33 W/m²K which falls inside the threshold U-value of 0.35 W/m²K and should be considered good.

Roof Defects and Design Considerations

- **Main Area**
Visually both roofs are in fair condition and have an existing RBM waterproofing. RBM suffers with UV degradation and lichen growth due to its age. There are some felt repairs evident on the roof area. Evidence of blistering also present on roof E which will cause further failures in the near future.
- **Perimeter**
Roof E has a kerb around the perimeter with felt finished into a trim. Roof H has high parapet wall with felt finished into a trim.

- **Drainage**

Visually falls on both roofs are fair. Roof E drains through internal gutter and into a hopper via a chute. Roof H also drains into internal gutter and into internal outlet. Ponding is evident inside the gutter and vegetation growth present indicating standing water from a blocked outlet.

- **Rooflight**

There is 1No. rooflight present on roof E. Rooflight suffers with UV degradation and requires replacement.

- **Plant**

There are a few items of plant present on the roof areas. These include:

- Kerb mounted extractor fans
- Cables
- Lightning conductors
- Polycarbonate roof suspended on top of roof E.

Photographic Record



Overview of roof E



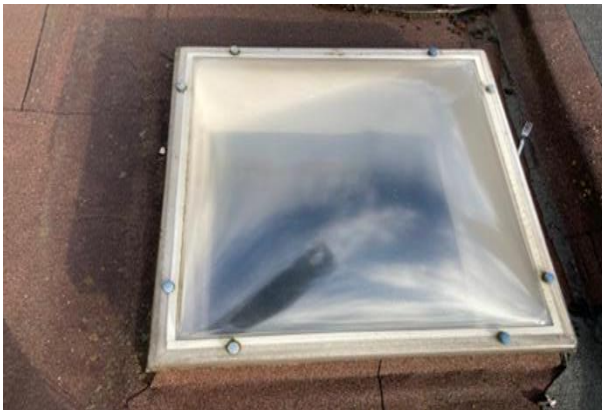
As above



Overview of internal gutter



Evidence of blistering on the roof.



Overview of the rooflight



Evidence of previous repairs

Photographic Record



Overview of the roof area



Overview of the gutter with evidence of ponding



Evidence of vegetation growth

3.3. Roof J

Existing Construction

Cs10

Thermal Properties

- Langley U-value calculations are carried out in accordance with BS EN ISO 6946: 2007. Condensation calculations performed in accordance with BS5250.
- Building Regulations – Approved Document L2B Conservation of fuel and power in existing buildings requires that (when re-roofing), the existing roof construction must achieve the threshold U-value of 0.35 W/m²K or better. If the threshold value is not achieved, then the roof must be thermally upgraded to meet the current required maximum U-value of 0.18 W/m²K.
- The current U-value of the main roof is circa 0.23 W/m²K which falls well inside the threshold U-value of 0.35 W/m²K and should be considered good.

Existing construction

Core Sample

Deck – Plywood

Insulation – 120mm PUR

Waterproofing – Single Ply

Roof Defects and Design Considerations

- **Main Area**

The roof is visually in poor condition and has an existing mech-fixed single ply waterproofing system. Signs of blisters and moss growth are evident on the roof indicating standing water, which will lead to further failures in the near future.

- **Drainage/Falls**

Falls on the roof are average (visually estimate 1:80). The water drains into internal gutter and into internal outlet. Evidence of moss growth is evident inside the gutter indicating that water is not reaching an outlet and just standing in the sump, thus supporting moss growth. Furthermore, this has created major ponding inside the gutter especially on roof K.

- **Parapets/Perimeter**

Roof J has a perimeter kerb with single ply waterproofing finished into a trim. Roof K has a high parapet wall with single ply finished into a trim.

- **Plant**

Extractor fan present on the roof. Lightning conductor is attached on top of timber kerb and parapet wall. Furthermore, Roof K has solar panels across the roof and air conditioner units. Handrail is present around the perimeter.

Photographic Record



Overview of the roof area



Internal gutter with evidence of ponding water



Further overview of the roof area



As above



As above



Overview of the outlet

Photographic Record – Roof K



Overview of the roof area



As above



As above



Evidence of failing single ply



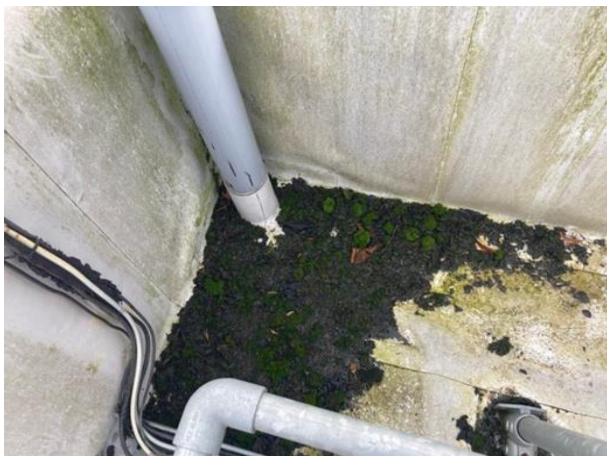
Overview of gutter with ponding inside



AC unit



Handrail present around the perimeter



Moss growth



Further evidence of major ponding inside the gutter.



As above

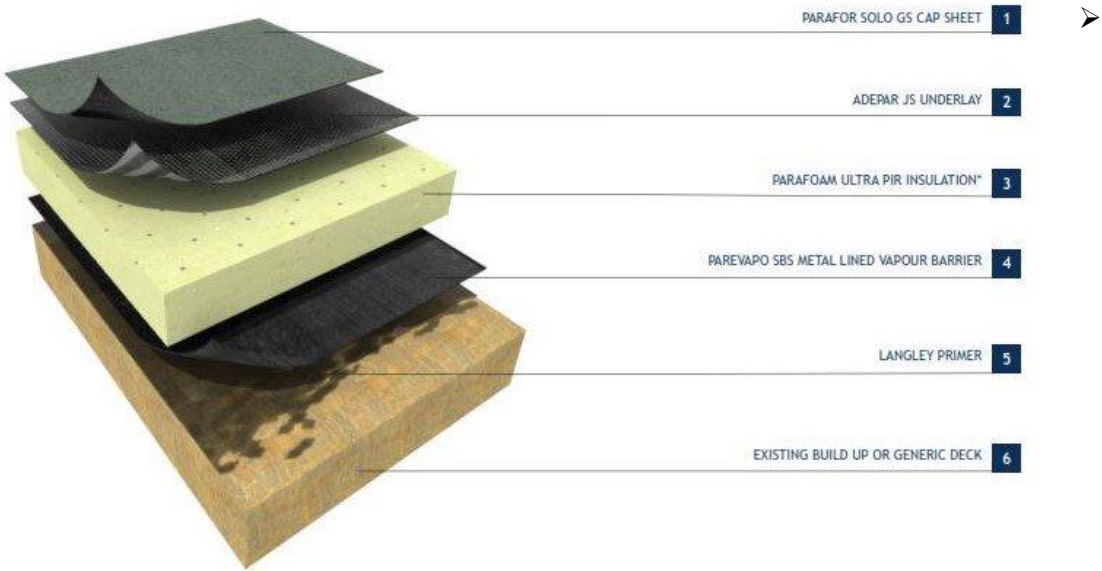
4. Summary

Overall, all the roofs are in poor condition, with evidence of numerous attempted repairs to the roof suggesting a history of water ingress issues. This indicates that further repairs would be futile and that a replacement of roof waterproofing is required. Furthermore, the U-values of 5.56 W/m²K, 4.17 W/m²K, and 3.50 W/m²K are poor and the roofs require to be thermally upgraded to meet the building standard of 0.18 W/m²K.

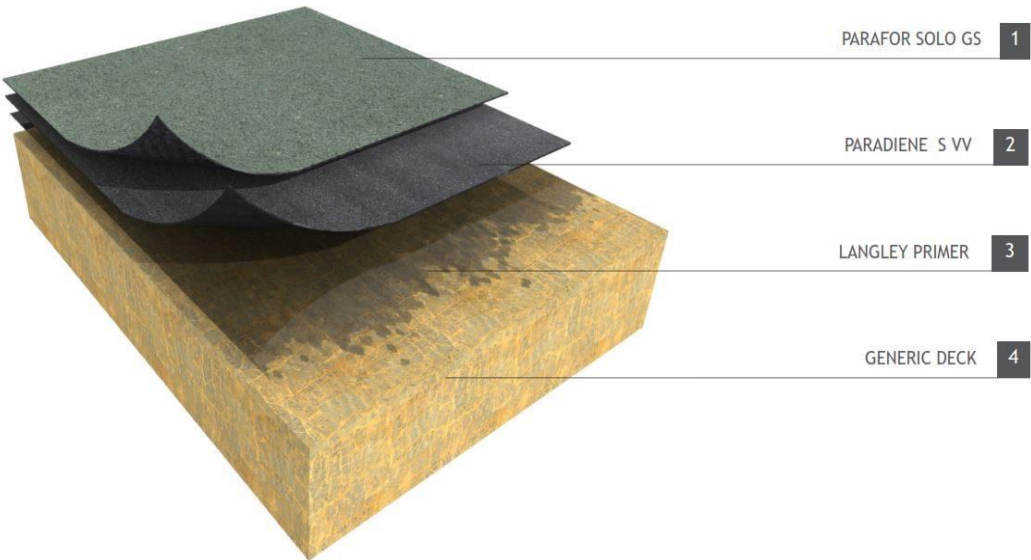
5. Recommendations

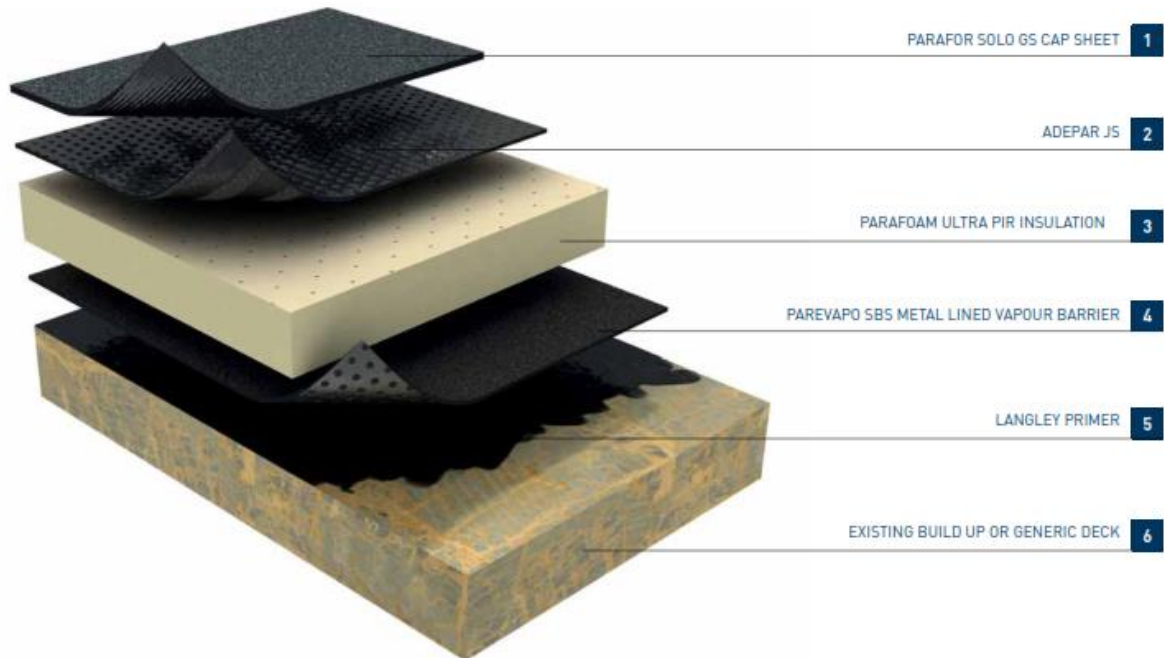
- It is recommended to overlay roofs A, B, C, D, F, G and I with Langley High Performance TA-30 system incorporating 130mm of flatboard insulation.
- It is recommended to overlay Roof H with Langley high Performance TA-30 system incorporating 80mm of flatboard insulation.
- It is recommended to overlay Roof E with Langley High Performance TA_30 cold system
- It is recommended to overlay Roof J and K with Langley High Performance TA-30 incorporating 50mm which will achieve the U-value to a building standard of 0.18 W/m²K.
- It is recommended to replace the rooflights.

Recommended system for roofs A, B, C, D, F, G, H, I, J and K



Recommended system for roof E.





Langley Waterproofing Systems Ltd Guarantee

All the specified systems come with Langley Waterproofing Systems Ltd, unique single premium, independent insurance-backed guarantee. The premium is pre-paid, in full, for the guarantee period stated in the specification and covers the following:

- ✓ **Materials**
- ✓ **Labour**
- ✓ **System Design**
- ✓ **Consequential Loss**

In addition:

- **The guarantee is transferable between building owners**
- **Cover increases in line with an approved construction price index**
- **Each project is covered for the full value of reinstatement of materials including installation**
- **Insurance cover automatically reverts to the building owner should Langley and the roofing contractor fail to rectify defects for whatever reason**

Langley Waterproofing Technical Support

The project/works will also be monitored by a Langley Technical Manager on a weekly basis, who will provide a written report on the progress and any issues arising. This monitoring service is provided to ensure full compliance with the specification and to approve the completed works for guarantee purposes and includes:

- A detailed final inspection highlighting any snagging items.
- A joint 6 or 12 month defects inspection.

Appendices

- Glossary of Terms
- Bibliography

GLOSSARY OF TERMS

A/C units	Air conditioning plant.
ACM	Asbestos Containing Material.
Attachment layer fixed/nailed)	An underlay used to isolate the new system from the substrate (usually mechanically.
Bunding	Internal waterproofing creating a 'tank' to contain potential leaks from water tanks.
BUR	Built-up felt roofing.
Cap sheet	Top layer of a built-up membrane system.
Cat ladder	Fixed (vertical) access ladder.
Cold roof	Roof structure designed with the insulation on the warm side (inside) of the roof deck.
Composite deck	A hybrid structural deck of rigid foam insulation with a factory bonded plywood top.
Cut-to-falls insulation	Insulation boards manufactured with a built-in fall.
Dew point (condensate).	Temperature at which moisture laden air releases the moisture as liquid water.
Free-draining edge	Roof perimeter that allows water to drain over, usually to an external gutter.
Free-standing	Not affixed to or through the structure.
Granule finish	Factory applied protective layer of fine granules to cap sheet.
Hard edge	A timber batten installed at exposed edges of insulation as a support to prevent damage to the insulation.
Hybrid deck	A structural deck that is also an insulant.
Inverted roof	A warm roof structure designed with the insulation placed over the waterproofing system.
LMR	Lift Motor Room.
Mushroom vent	Roof penetration used as a pressure release to the substrate.
OSB	Oriented Strand board.
Partial bonding layer	See venting layer.
Pour & Roll	Method of bonding of bituminous membranes using hot bitumen.
PIR	Rigid polyisocyanurate.
Protected membrane roof	See Inverted Roof.
PUR	Rigid polyurethane.
RWO	Rain water outlet.
Refurbidrain	A purpose made rainwater outlet designed to fit inside an existing outlet.
Sandwich construction	A warm roof configuration, where the insulation is sandwiched between a vapour control layer and the waterproofing.
Scupper	Low level over-flow outlet from a bunded area such as a tank room etc.
Stramit	Trade name for a 'hybrid' supporting deck of compressed straw board.
SVP	Soil vent pipe.
SBS	Styrene-Butadiene-Styrene.
Tapered insulation	Insulation boards manufactured with a built-in fall.
Temperature gradient	The path of temperature change through a (roof) structure from inside to outside, plotted on a graph.
Timber deck	Either close boarding or tongue and grooved boards. (Not panelled material such as plywood, OSB board etc).
Torching	Method of bonding of bituminous membranes using propane gas torches.
Vapour barrier	See Vapour Control Layer. Bituminous membrane designed to prevent the passage of moisture laden air. Usually with an aluminium core.
Vapour check	See Vapour Control Layer. Bituminous membrane designed to restrict the passage of moisture laden air.
Vapour control layer	Underlay used below insulation to control the passage of moisture laden air.
Vapour barrier	See Vapour Control Layer. Bituminous membrane designed to prevent the passage of moisture laden air. Usually with an aluminium core.
Venting layer	Bituminous felt underlay with regular holes at predetermined centres to allow partial bonding of membranes on certain types of substrate.
Underlay	Interim layer of a multi-layer built-up membrane system.
Upside-down roof	See Inverted roof.
WBP	Water and Boil Proof (plywood).
Warm roof	Roof structure designed with the insulation on the cold side (outside) of the roof deck.

Wetted drip
Woodwool slab

Felt membrane edge detail.
Hybrid structural deck of cement coated wood shavings.

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BS 8217 : 2005	Code of Practice for Built-up Felt Roofing.
BS EN 636 : 2003	Plywood, specifications.
BS 5268 – 2: 2002	Structural Use of Timber. Code of Practice for Permissible Stress Design, Materials and Workmanship.
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BS 5250 : 2002	Code of Practice for the control of condensation in buildings.
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British Urethane Foam Manufacturers Association	(BRUFMA) Information Document 1/2001
BS 6651: 1999	Code of Practice for protection of structures against lightning.
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BS 3837 – 1: 1986 (2002)	Expanded polystyrene boards. Specification for boards manufactured from expandable beads.
BS 1105: 1981 (1994)	Specification for woodwool cement slabs up to 125mm thick.
BS 8281: 1998	Code of practice for mastic asphalt roofing.
BS EN 795: 1997	Protection against falls from height. Anchor devices. Requirements and testing.