PROPOSED ROOF INFORMATION

Specification Document

Project: 10049 BUR Rev 1

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ROOFING SYSTEMS
LANGLEY

APOLLO

Camden

Preliminaries and General Conditions

1. Before tendering, the contractor should examine the drawings and specification documents, visit the site and ascertain all local conditions and restrictions, accessibility, the full extent and nature of the work, the supply and conditions affecting labour and the execution of the contract generally. No claims arising from failure to do so will be considered.

2. The contractor is to take his own roof core samples to satisfy himself with regard to the existing roof build-up and ascertain the extent of work involved in stripping up the existing roof covering. No claims arising from failure to do so will be considered.

3. The contractor shall provide, erect and maintain all necessary hoists, scaffolding, mechanical equipment, plant etc of all descriptions required for the satisfactory completion of the works and remove all, as and when required, or when directed by the Contract Administrator.

4. The contractor shall not display any advertisements on the scaffolding other than the firm's name board and contact details; neither shall he permit any other advertisements to be displayed without the written authority of the Contracts Administrator.

5. The contractor shall provide all necessary containers and storage facilities for materials and for workshops that may be required, maintain them and clear them away on completion.

6. The contractor shall provide all necessary latrines and other facilities for the use of operatives as required by the Construction (Health, Safety and Welfare) Regulations 1996, maintain them in decent condition and clear them away on completion.

7. All roofing materials are to be supplied by Langley Waterproofing Systems Ltd and to be fit for purpose and of the type and quality described herein. Any sub-standard materials will be rejected. No alternatives are to be substituted.

8. The contractor shall employ none but fully qualified, competent tradesmen and the whole of the work shall be carried out and completed in accordance with "Best Practice".

9. The contractor shall carry out the works without undue inconvenience and nuisance and without danger to occupants and users.

Note

These preliminaries and general conditions will apply in all situations, except where the specifying client inserts a more comprehensive section of preliminaries and conditions, encompassing the complete project.

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.

DETAILED SPECIFICATION - MAIN ROOF & NORTH LIGHT UNITS

No	Item	Unit	Qty	Rate	Total
01.00	**GUARANTEE**				
01.01	The following specification is to be covered by the Langley Waterproofing Systems Ltd single-premium, pre-paid independently-insured workmanship and materials guarantee for a period of 20 years from the date of practical completion. In order to meet this requirement, only roofing contractors that participate in this guarantee scheme may be used. The eligibility of proposed roofing contractors should be confirmed with Langley Waterproofing Systems Ltd (Tel: (01327) 704778) prior to inviting tenders.				
01.02	Overlay of existing system. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. Please note that neither ice, snow or ponding water will have an adverse affect on the Langley products specified. This applies to both the life expectancy and long-term performance of the system and will not affect in any way, the guarantee status.				
01.03	Flat board insulation. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. Please note that neither ice, snow or ponding water will have an adverse affect on the Langley products specified. This applies to both the life expectancy and long-term performance of the system and will not affect in any way, the guarantee status.				
02.00	**CHANGES/ADJUSTMENTS**				
02.01	**a. Variations (general):** Any variations must be agreed in writing, by both the client and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client.				
02.02	**b. Variations (minor):** During work in progress Langley Waterproofing Systems Ltd must be informed immediately of any proposed change/s and operatives must not implement any change/s until agreed by Langley. (Minor changes are deemed to be any item not falling within the scope of section 'a').				

02.03	**c. Unauthorised Changes:** Langley Waterproofing Systems Ltd will not be responsible for any changes of which they are unaware or have not authorised, nor will they accept any liability or associated costs due to system failure, i.e.; labour, materials or design, or programme delays etc. resulting from said changes.				
03.00	**SCOPE OF APPLICATION**				
03.01	**Main Roof:** This specification is suitable for application to an existing asphalt waterproofing system on a timber roof deck not exceeding 5° from the horizontal.				
03.02	**North Light Roof & Verticals:** This specification is suitable for application to an existing asphalt waterproofing system on a timber roof deck not exceeding 30° from the horizontal.				
03.03	Woodwool slabs are regarded as fragile and suitable precautions should be taken.				
04.00	**PREPARATION**				
04.01	All roof-mounted plant, equipment, satellite communication dishes, handrail units with weighted slabs, aerials, cables and cable trays to be removed and set aside for re-positioning on completion.				
04.02	Strip and remove all existing felt waterproof membranes down to but not including the existing asphalt finish including all details.				
04.03	Remove perimeter edge trims and discard.				
04.04	All exposed openings are to be temporarily protected and made watertight at the end of each working period.				
04.05	Chippings: Remove and dispose of. Use a mechanical scabbler if necessary. Repair any resulting damage to the felt covering with patches of underlay, as work proceeds.				
04.06	Existing asphalt details to be removed using an angle grinder *(the use of hammer and chisel is not permitted).*				

04.07	Ridges and blisters in the existing asphalt surface are to be warmed and smoothed out.				
04.08	Existing asphalt surface to be cleaned and then treated with a suitable fungicide used strictly in accordance with the instructions of the manufacturer.				
04.09	Construct new timber frame structure around service pipes and install new 18mm exterior grade, WBP plywood decking to frame; to be fixed with all edges supported, by means of non-corroding ring shank nails or screws at 150mm centres around the perimeters of the panels and 300mm centres along the supports all in accordance with DD ENV 12872. Panels should be fixed with staggered cross joints and with a gap of 1mm per metre of panel size at all edges including perimeters. Plywood and its fixing should comply with the recommendations of Section 5.1.6 of BS 8217:2005. Allow all necessary service access points within new construction as required.				
04.10	Subject to further investigation when work commences, existing rainwater outlets to be either removed or prepared to accept refurbishment outlets and the asphalt around the outlets carefully cut back sufficiently to accommodate the new outlets and soakers.				
04.11	The contractor is to take his own roof core samples to satisfy himself with regard to the existing roof build-up and ascertain the extent of the work involved in stripping up the existing roof covering. No claims arising from failure to do so will be considered.				
04.12	Redundant vent pipes and other redundant penetrations to be removed and the holes in the deck made good.				
04.13	Remove permanently fixed handrail and discard.				
04.14	At the head and side of slopes, new treated timber drip battens to be screw-fixed at max. 300mm centres.				
04.15	Skirtings to be raised to accept the extra thickness due to the new insulation and waterproofing and to be min. 150mm above the finished roof surface.				

04.16	Window cill/s to be raised (to client's detailed specification) to allow a min. skirting height of 150mm above the finished roof surface.				
04.17	Vent pipes, flues, etc. to be extended, where necessary, to ensure that a minimum collar or pipe sleeve height of 150mm above the finished roof surface can be achieved.				
04.18	Surfaces to receive self-adhesive / torch-applied waterproofing must be smooth, clean and dry.				
04.19	Minor movement joints / fractures are to be covered with minimum 100mm wide, loose-laid strips of the under layer or vapour control layer.				
04.20	Asphalt surface and substrates for details to be primed with Langley Primer and allowed to dry.				
04.21	All Areas: Sweep to remove dust and debris.				
05.00	**WATERPROOFING - VAPOUR CONTROL**				
05.01	Parevapo SBS double reinforced, metal-lined, elastomeric vapour barrier fully bonded by torching (min. 75mm side and end laps).				
05.02	Vapour control layer to be turned up or returned at perimeters and openings to seal edges of insulation.				
06.00	**INSULATION**				
06.01	Parafoam Ultra LPC/FM 80mm thick CFC/HCFC-free with zero ODP, Polyisocyanurate (PIR) roof insulation boards fixed with Lang-Stik PU Adhesive. Boards to be laid with staggered joints.				
06.02	**Outlet/Chute Sumps:** Parafoam Ultra LPC/FM 50mm thick CFC/HCFC-free with zero ODP, Polyisocyanurate (PIR) roof insulation boards fixed with Lang-Stik PU Adhesive.				
06.03	**Internal Gutters:** Parafoam Ultra LPC/FM 80mm thick CFC/HCFC-free with zero ODP, Polyisocyanurate (PIR) roof insulation boards fixed with Lang-Stik PU Adhesive.				

06.04	Timber stop batten of the same thickness as the insulation to be mechanically fixed to the deck at the base of slopes.				
06.05	Timber nailing battens of the same thickness as the insulation to be mechanically fixed to the deck at the tops of slopes and elsewhere as necessary to suit setting out.				
06.06	Protective timber edging (150mm x 10mm less than the insulation thickness) to be mechanically-fixed to the deck at exposed edges (e.g., changes in level).				
06.07	Bonding Insulation with Lang-Stik PU Adhesive: Vapour control layer to be swept clear of all dirt, debris and loose material, prior to application of adhesive. Apply 15-20mm beads of Lang-Stik PU Adhesive to the vapour control layer in a serpentine pattern. Application Rates: Beads approximately 400mm apart. Set board into the beads within 10-15 minutes and immediately 'walk-in' the board to spread the beads for maximum contact. Repeat 'walking-in' every 5-7 minutes, until the board is firmly attached.				
07.00	**WATERPROOFING - UNDERLAY**				
07.01	Adepar JS self-adhesive elastomeric under layer fixed by means of its factory-applied self-adhesive strips (min. 80mm side laps, min. 120mm end laps). Each sheet to be unrolled and positioned then re-rolled. Siliconised film to be removed as the sheet is fixed in position with applied pressure. The side lap (min. 80mm) to be sealed by applying pressure: this lap is self-adhesive and does not need to be torched. The end lap (min. 120mm) must be sealed by lightly torching.				
07.02	Adepar JS under layer must be fully bonded by torching over a 500mm wide margin at all perimeters and around openings (NB: the siliconised film is not fusible). In this case, the sheet will be re-rolled and torched as it is unrolled (simultaneously removing the siliconised film).				

07.03	**Detail Underlay:** Paradiene 35 S R4 under layer to be fully bonded by torching to the full girth of all details and to extend at least 100mm onto the Adepar JS on the main area.				
08.00	**WATERPROOFING - CAPPING SHEET**				
08.01	Parafor Solo GS Dark Grey (No. 30) elastomeric cap sheet, fully bonded by torching (min. side lap width as determined by the selvedge, min. 150 mm end laps). This layer to extend to the top of the fillets and to be laid parallel to the under layer, breaking joints by at least 300 mm. Both surfaces being bonded must be heated and a bead of bitumen exuded from all laps.				
09.00	**DETAILS**				
09.01	At the base of all upstands etc. a 200 mm wide (100 mm horizontal and 100 mm vertical) reinforcing strip of Paradiene 35 S R4 underlay to be fully bonded by torching. ***Contractor's Note:** This item is in lieu of angle fillets.*				
09.02	Details to be formed separately using Parafor Solo GS of matching colour, cut from the width of the roll, on under layer of Paradiene 35 S R4 and fully bonded between layers and to primed base by torching, ensuring that both surfaces being bonded are heated and that a bead of bitumen is exuded from all laps.				
09.03	Parafor Solo GS to extend at least 150 mm onto the main area.				
09.04	Both layers of the new waterproofing are to be continued up the inner face of the perimeter kerb / parapet and across the top (fully supported) and dressed into new GRP edge trim; waterproofing upstands being formed, where required, at the ends of kerbs / parapets.				
09.05	ParaTrim GRP edge trim of the appropriate profile for the site conditions, colour charcoal, screw-fixed at max. 300mm centres over the under layer, which must extend to, and be turned over, the outer edge of the roof / kerb. Butt straps are to be inserted at all joints and preformed corner units are to be used where appropriate.				

09.06	Welted drips are to be formed to North Light Perimeters, from Dark Grey Parafor Solo GS, cut from the width of the roll, and formed over thin plywood formers nailed to new, treated timber drip battens.				
09.07	Paraflex Refurb Outlet: Select outlet to suit diameter/s of fall pipes. Before installing the outlet; fix a 500mm x 500mm soaker of Paradiene 35 S R4, fully bonded by torching. Then fully bond the membrane flange to the soaker by torching and fully bond cap sheet over. Install leaf guard/grating supplied. (Installation to be in accordance with Langley "Fixing Instructions").				
09.08	If it is not feasible to install new Paraflex Refurb outlets then provision should be made to install new lead rainwater outlets to suit diameters of fall pipes to be primed on both surfaces of the flange and fully bonded to min. 0.5m x 0.5m soaker of Paradiene 35 S R4. A reinforcing layer of Paradiene 35 S R4 to be then fully bonded to the primed lead outlet and projecting soaker prior to application of the cap sheet. Outlets and reinforcing layers are to be let into the roof / insulation surface. Wire guards are to be fitted on completion.				
09.09	New independent metal sleeves with base plates to be fixed to the roof deck around hot pipes and flues, leaving a min. 25mm air gap (and/or with non-combustible insulation against the pipe).				
09.10	Collars and pipe sleeves are to be min. 150mm high above the finished roof surface and protected by appropriate weathering aprons.				
09.11	Vent Pipes: Select the correct size of Lang-Vent to suit the diameter of the existing pipe. Fix in accordance with Langley "Fixing Instructions" with flexible flange fully bonded between soaker and cap sheet. NB: A 500mm x 500mm soaker of underlay must be installed prior to fixing vent.				
09.12	Site fabricated: New lead (or other non-ferrous metal) pipe sleeve/s (for cold pipes and cable entry points) with min. 300mm x 300mm base plates to be primed on both surfaces of the flange and fully bonded to min. 0.5 m x 0.5 m soaker of Paradiene 35 S R4. A reinforcing layer of Paradiene 35 S R4 to be then fully				

	bonded to the primed pipe sleeve flange and projecting soaker prior to application of the cap sheet.				
09.13	Lead pipe sleeves to be turned over the lips of the pipes and 25mm down into the pipes to provide a waterproof seal.				
10.00	**SURFACE PROTECTION**				
10.01	Roof-mounted plant, equipment and other free-standing items to be placed on load spreading paving slabs on sacrificial layers of cap sheet.				
11.00	**COMPLETION**				
11.01	Reinstate all roof-mounted plant, equipment, satellite communication dishes, handrail units with weighted slabs, aerials, cables and cable trays etc.				
11.02	New free-standing safety handrail to be installed to client's specification, ensuring that load-spreading bases are used and that they lie flat on the roof on sacrificial pieces of cap sheet.				
11.03	Cables to be supported on cable trays resting on load-spreading bases on sacrificial pieces of cap sheet.				
11.04	All outlets to be checked for blockages and cleared if necessary.				
11.05	Roof surface to be swept clean.				
11.06	All arisings from the works are to be removed from site and disposed of appropriately.				
12.00	**SCHEDULE OF PRODUCTS** **The following products are to be obtained from:** Langley Waterproofing Systems Limited. Bishop Crewe House North Street Daventry Northants Tel: 01327 704778 NN11 4GH Fax: 01327 704845				
12.01	Langley Primer cold-applied, quick drying, universal bitumen primer (25 litre cans). Approx. coverage is from 0.10 litre/m^2 (250m^2 / 25 litre) on steel to 0.40				

	litre/m² (63m² / 25 litre) on concrete.				
12.02	Parevapo SBS double-reinforced, (aluminium / polyester composite and glass mat), SBS-modified, elastomeric bitumen vapour barrier with sanded top surface and perforated fusible film on the underside (10m x 1m roll, 38 kg nominal weight).				
12.03	Parafoam Ultra LPC/FM, CFC/HCFC-free with zero ODP, Polyisocyanurate (PIR) roof insulation boards with bitumen-impregnated glass tissue on both faces (1.2m x 0.6m).				
12.04	Paradiene 35 S R4 polyester-reinforced, torch-applied SBS-modified elastomeric bitumen under-layer, with sanded top surface and fusible film on the underside (8m x 1m roll, 37.4 kg nominal weight).				
12.05	Adepar JS self-adhesive, partially-bonded, glass/polyester composite-reinforced, SBS-modified, elastomeric bitumen under layer. Surfaced with fusible film with siliconised peel-off film over self-adhesive selvedge. Underside sanded between self-adhesive strips and protected with siliconised peel-off film (10m x 1m roll, 33 kg nominal weight).				
12.06	Parafor Solo GS polyester-reinforced SBS-modified elastomeric bitumen cap sheet with granule surface finish, colour Dark Grey (No. 30), with continuous fusible film on grooved underside, nominal 90mm selvedge with scarified film (7m x 1m roll, 40 kg nominal weight).				
12.07	Paraflex Refurb Outlet: Rainwater outlet with flexible membrane flange and stainless steel spigot, to suit diameters of down pipes (nominal diameters: 75mm, 100mm, 150mm). N.B. Special fitting tool required.				
12.08	Para-Flash, lead-free flashing. Aluminium mesh reinforced SBS modified bitumen membrane, 3.9mm thick (10m roll). Surface finish, grey granules, underside polypropylene film.				
12.09	ParaTrim GRP edge trim profile Pf 40 / 65 / 100 / 100L (100/110) / 150, colour Charcoal / Dove Grey / White (3m lengths). Pre formed 90° corners 240mm x 240mm.				

12.10	Lang-Vent stainless steel refurbishment vent pipe with vent cowl. Spigots to suit diameters of existing vent pipe (nominal diameters: 75mm, 100mm, 150mm). See Langley data sheet for details. **The following products are to be obtained from others:**				
12.11	Plywood conforming to the relevant requirements of BS EN 636:2003 (clauses 7 and 8) and marked BS EN 636-2 or BS EN 636-3 all as specified in BS 8217:2005.				
12.12	Timber to be pre-treated as recommended in BS 5268: Part 5. The treatment should be compatible with the use of bitumen-based products.				
12.13	Lead for chutes, pipe sleeves and outlets to be Code 5 rolled lead sheet to BS EN 12588: 1999.				
12.14	Free standing handrail system.				
13.00	**FIXING INSTRUCTIONS**				
13.01	Waterproofing is to be installed in accordance with BS 8217: 2005, BS 8000: Part 4: 1989 and the Langley Fixing Instructions.				
13.02	All the Langley Waterproofing Systems Ltd specifications are written on the basis that the substrates, roof deck and structure are sound and durable. We cannot accept responsibility for the consequences of latent defects in the roof deck and structure.				
13.03	When fixing bitumen waterproofing membranes by torching, it is important that both surfaces being bonded are heated and that a narrow bead of bitumen is exuded from all laps. At end laps and in other situations where a lap is made onto a granuled surfaced, the granuled surface must first be heated and the granules removed to ensure a bitumen-to-bitumen bond.				
13.04	Rolls of waterproofing are to be stored under cover, on end, on a flat, firm surface and, if outside, clear of the ground or supporting surface.				

13.05	Existing waterproofing must not be stripped at a rate greater than can be safely re-waterproofed during that working day without risk of water ingress.				
13.06	Day joints must be sealed at the end of each working day with strips of under layer to ensure water tightness.				
13.07	When forming skirtings behind existing roof tiles / slates, vertical wall tiles / slates or timber boarding, particular attention must be paid to the risk of fire due to old, dry and dusty materials. Torch-on application must be undertaken with great care and if necessary, following an assessment of the risk on site, an alternative method of attachment should be used.				
13.08	Lang-Vent (not for hot flues) 1. Remove telescopic outer sleeve from vent assembly. Ensure rubber "O" ring seal is in place (approximately 25mm from the end of the inner spigot). 2. Place inner sleeve (with the flexible flange) over existing vent pipe. 3. Temporarily slide telescopic outer sleeve over the inner pipe and into existing vent pipe (ensuring rubber "O" ring is in place) to "centralise" the inner pipe and flange. 4. Ensure the s/s supporting flange (beneath the flexible membrane flange) is in full contact with the underlay/soaker. If necessary, secure in position with suitable fixings and washers through the four holes provided. 5. Fully bond the flexible membrane flange to the underlay/soaker (by either torching or hot bitumen as appropriate). 6. Temporarily remove telescopic sleeve and fully bond the system cap sheet to the membrane flange (either by torching or hot bitumen as appropriate). 7. Re-fit telescopic outer sleeve over the inner sleeve and push fully home.				

	8. Fix s/s vent cowl to top of assembly with fixings provided.				
13.09	Paraflex Refurb Outlet 1. Select the correct size of outlet to suit the diameter of the downpipe. 2. Check depth of existing outlet/downpipe and if necessary cut spigot to length. Minimum length of spigot must be 60mm. 3. Note: If outlet has the expanding EPDM rubber seal, the seal will project 50 mm from the spigot. Overall length, including seal, will be: minimum 110 mm; maximum 350 mm. 4. Prior to installing outlet: Fix in place either; a) System underlay. b) 500 x 500 mm bituminous membrane soaker. 5. Outlets with expanding EPDM rubber seal: a) Insert seal into the end of spigot. Ensure shoulder is in full contact with the end of the spigot and tighten s/s screws with the special screwdriver (supplied separately) until the top part of the seal has expanded sufficiently to secure the seal to the spigot. b) Insert the assembly into the downpipe, ensuring the s/s supporting flange (under the membrane flange) is in full contact with the underlay/soaker. If necessary, secure in position with suitable fixings and washers through the four holes provided. c) Fully bond the membrane flange to the underlay/soaker (either by torching or hot bitumen as appropriate). d) Activate the seal by further tightening the s/s screws until hand-tight. Do not over-tighten. Screws should be tightened in sequence and progressively. Where there are four screws (150 mm nominal diameter spigot) the sequence should be				

	diagonal pairs. e) Fully bond the system cap sheet to the membrane flange (either by torching or hot bitumen as appropriate). f) Install leaf guard/grating supplied. 6. Outlets with "O" ring seal: a) Place seal approximately 25 mm from the end of the spigot. b) Insert the assembly into the downpipe, ensuring the s/s supporting flange (under the membrane flange) is in full contact with the underlay/soaker. If necessary, secure in position with suitable fixings and washers through the four holes provided. c) Fully bond the membrane flange to the underlay/soaker (by either torching or hot bitumen as appropriate). d) Fully bond the system cap sheet to the membrane flange (either by torching or hot bitumen as appropriate). e) Install leaf guard/grating supplied.				
13.10	The roofing contractor is to provide adequate fire extinguishers.				
13.11	The work is to be carried out in accordance with current Health and Safety legislation.				
13.12	Allowance is to be made for protecting the works from damage due to inclement weather.				
13.13	The roofing contractor is to keep the site tidy at all times and to remove all debris, wrappers and surplus materials from the site each day or to deposit such materials in secure storage.				
13.14	Gas cylinders are to be removed from the roof at the end of each working day and stored in a secure compound designed for this purpose.				

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.
Welted drip	Felt membrane edge detail.
Woodwool slab	Hybrid structural deck of cement coated wood shavings.

BIBLIOGRAPHY

The following British and European Standards and Codes of Practice are relevant to the installation of Langley roofing systems and products.

BS 6399 – 1: 1996	Loadings for Buildings. Code of Practice for dead and imposed loads.
BS 6399 - 2: 1997	Loadings for Buildings. Code of Practice for Wind Loads.
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.
BS EN 300 : 1997	Oriented Strand Boards (OSB). Definitions, Classifications and Specifications.
BS 747 : 2000	Reinforced bitumen sheets for roofing.
BS 6229 : 2003	Flat Roofs With Continuously Supported Roof Coverings – Code of Practice.
BS EN 12056 – 3: 2000	Gravity Drainage Systems Inside Buildings – Part 3 : Roof Drainage, layout and calculations.
BS EN 1253 – 1: 1999	Gullies for Buildings – Part 1 : Requirements.
BS 476 – 3 : 2004	Fire tests on building materials and structures. External fire exposure roof test.
BS 5250 : 2002	Code of Practice for the control of condensation in buildings.
BS 5950 – 6: 1995	Structural use of steelwork in buildings. Code of Practice for design of light gauge profiled steel sheeting.
BS EN ISO 6946 : 1997 (Amendment 1)	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method.
BR443:2002	Conventions for U-value calculations.
BS EN 13162: 2001	Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification.
BS EN 13163: 2001	Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) - Specification.
BS EN 13164: 2001	Thermal insulation products for buildings – Factory made products of extruded polystyrene foam (XPS) - Specification.
BS EN 13165: 2001	Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products - Specification.
BS EN 13166: 2001	Thermal insulation products for buildings – Factory made products of phenolic foam (PF) - Specification.
BS EN 13168: 2001	Thermal insulation products for buildings – Factory made products of woodwool (WW) - Specification.
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