POTTER RAPER

PLANNING/DESIGN AND ACCESS/HERITAGE STATEMENT

RELATING TO

CAPITAL WORKS

AT

BEVAN JOHN HOUSE, HARPUR MEWS
9-10 HARPUR ST AND 9-15 DOMBEY ST.
HOLBORN,
LONDON
WC1N 3PA

Contents

Quality Control

PREPARATION	
Prepared by:	James Dyson Building Surveyor
QA	
Reviewed by:	Alex Johnson Associate Director

REVISION NO.	BY	QA	DATE	COMMENTS
P1	JD	GP	11/04/2023	-
P2	JD	AJ	27/05/2024	Proposals clarified

1.0 Introduction

Potter Raper are working alongside Wates to obtain statutory consents for improvements to building elements on properties, on behalf of Clarion Housing.

This design and access statement will support the planning application for the improvements at the premises Bevan John House, Harpur Mews, 9-10 Harpur St and 9-15 Dombey St., Holborn, London WC1N 3PA.

2.0 Existing Building

The building at Bevan John House, 9 Harpur Street consists of four storeys, and is an Edwardian terraced street property converted into ten self-contained flats. The property is traditionally constructed with solid walls in multi-coloured stock bricks with characteristic twelve pane sash windows with red bricks lintels.

Figure 1: Front Elevation of Bevan John House

10 Harpur Street is a Grade II listed building built around 1760. The building is 4 storeys and is a basement terraced house with multi-coloured brick and Sash windows with stucco architraves. The front entrance door is characterised by a wooden door with attached Doric columns carrying entablature with triglyphs in frieze and open mutule pediment.

[1] 9-15 Dombey St is a Grade II listed building built around 1760.The block forms 7 terraced houses each with 4 storeys plus basement. Multi-coloured stock brick were used in construction, with brick arches forming architectural detailing. Numbers 13, 14 & 15 Dombey Street are finished with a stucco render to the ground floor.

Each entrance has a square-headed architrave with fanlights above (Numbers 9, 11 & 12 have patterned glazing within the fanlight) and panelled doors. Gauged red brick flat arches to recessed sash windows most with original glazing bars. Some of the parapets and upper floors have had repairs completed historically, using yellow stock brick.

Figure 2: Front Elevation of 10 Harpur Street and 9-15 Dombey St

3.0 Planning Restrictions

The building is situated in Bloomsbury Conservation Area. The Bloomsbury Conservation Area was designated in 1968. The Conservation Area covers an area of approximately 160 hectares extending from Euston Road in the north to High Holborn and Lincoln's Inn Fields in the south and from Tottenham Court Road in the west to King's Cross Road in the east. Bloomsbury is widely considered to be an internationally significant example of town planning. The building is attached to the property No.10 Harpur Steet that is a Grade II listed building. Even the properties from 9 to 15 Dombey Street are a Grade II Listed building. Both the Listed properties had been constructed around 1760s, and they are carateriside by multi-coloured stock brick, large sash windows and slate roof.

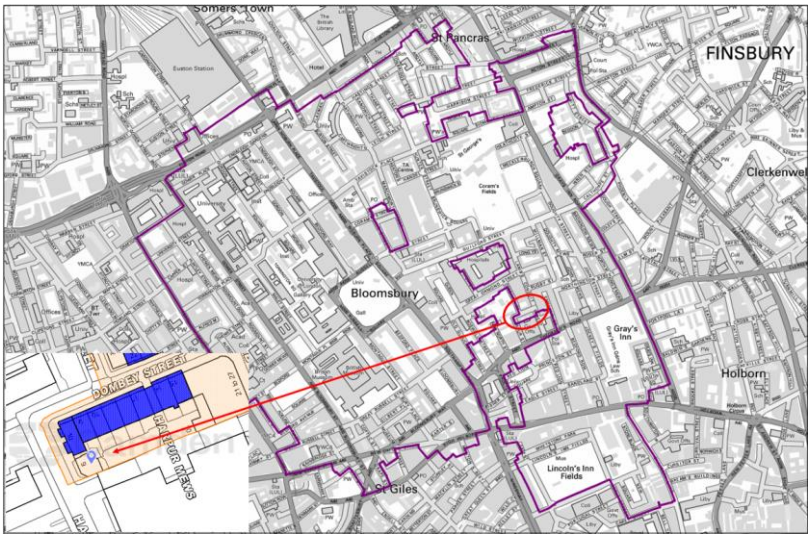


Figure 3: Kentish Town Conservation Area (source: Tower Hamlets website)

Besides, the building is located in an area of flood Zone 3 –in an area benefiting from flood defence measures. The EA Risk of Flooding from Surface Water map (Figure 4) indicates that the site is at 'High' risk of flooding from surface water.

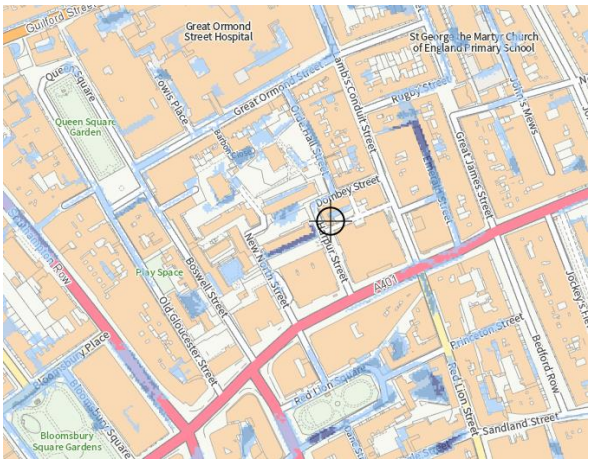


Figure 4: Environment agency risk of flooding from surface water (source: EA website)

3.1 Conservation Area Assessment

[2] Bloomsbury represents a period of London's early expansion northwards, dating from Stuart times (around 1660), which continued through the Georgian and Regency periods to around 1840. This period of expansion, which followed the Plague in 1665 and the Great Fire of London in 1666, replaced a series of Medieval Manors on the periphery of London and their associated agricultural and pastoral land. The first swathe of building created a mix of uses with houses, a market, commercial, cultural uses (the British Museum), hospitals and churches.

The progression of development across the Conservation Area illustrates the subtle changes in taste and style in domestic architecture that occurred throughout the 17th, 18th and 19th centuries. The Victorian era saw the urban area

evolve with a movement of the wealthy to newly developing urban and suburban areas to the north. New housing for the poor, often of a philanthropic nature, was built in several parts of the northern section of the Conservation Area. The development of a series of railway termini along Euston Road saw an expansion in hotel developments, and office development took place throughout the Conservation Area.

Recent housing developments have mostly meshed sensitively with the older fabric. There are a number of recent developments, undertaken both by the larger institutions (such as the university, the hospitals and the British Museum) and by smaller scale developers, for instance in the mews, continuing the Bloomsbury tradition of development of its time as exemplars of contemporary but contextual design.

4.0 Design Proposals

4.1 Roof Coverings

The existing roofs along 9-15 Dombey Street all consist of double-pitched roofs (Front to back) with a mansard style to the rear and a central valley, which would originally have been lead. 10 -15 Dombey Street have been significantly altered, creating an external wall at the front and rear roof pitches to form an outdoor space between the two pitches. This area is a flat roof, accessed via a timber structure included for replacement elsewhere due to leaks.

The roofs are all covered with slate tiles on all slopes, in keeping with the heritage and character of the building and area.

Photo 1: Pitched Roof Coverings 14 Dombey Street (Rear)

Photo 2: Pitched Roof Coverings 13 Dombey Street (Rear)

Photo 3: Pitched Roof Coverings 13 Dombey Street (Rear)

Photo 4: Pitched Roof Coverings 11, 12, 13 Dombey Street (Rear)

Photo 5: Pitched Roof Coverings 10, 11 Dombey Street (Rear)

Photo 6: Pitched Roof Coverings 9, 10 Dombey Street (Rear)

Photo 7: Corner of Harpur Street and Dombey Street (Rear)

Photo 8: Pitched Roof Coverings Bevan John House (Rear) With Lift Shaft Structure

Photo 9: Bevan John House (Rear)

Photo 10: Bevan John House Lift Shaft (Rear)

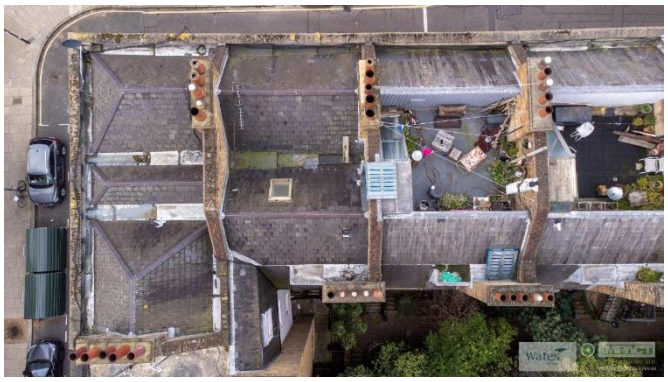


Photo 11: Arial View including 10 and 11 Dombey Street

Photo 12: Context View of corner of Harpur Street and Dombey Street

Phot 13: Front View including 10 Dombey Street to the left.

The current roof is not fulfilling the requirements of the residents at this property due to continuous leaks and water ingress.

The proposals are to remove the existing slates tiles to 10-15 Dombey Street and replace them with new natural Welsh slates. The slates will remain sympathetic to the original building, and will enhance it's character by virtue of the improving the condition. The replacement will ensure that the roof is as durable and weather resistant, providing effective protection from water ingress.

Full details of the proposed roof slates are included below

Product details:

Tile: Penrhyn Natural Welsh Slate

Size: 500 x 300mm

Grade: Country Grade (7mm thickness)

1 - Slate Tile

Datasheets for the tiles have also been provided in Appendix A.

4.2 Flat Roof Refurbishment

The flat roof sections between the pitches at 10-15 Dombey Street are also in a poor state of repair, with multiple issues with leaks into the properties below. These sections of the roof are not visible from the public realm as they are hidden by the roof slopes.

The specification for the flats roofs are included in appendix B.

4.3 Renewal of Flat roof access structures

The existing roof access structure is aged and is contributing significantly to the leaks experienced in the flats. The proposals include to replace these access structures entirely, with a similar layout but improved appearance and condition. The proposals are shown in Appendix C.

4.4 Raising Lift Shaft Roof Level at Bevan John House

The lift within Bevan John House is being replaced. This part of the site is not subject to the listings, but is within Bloomsbury Conservation Area. The lift replacement itself does not require planning permission to complete. The lift installation however does require additional space (height) for the mechanics of the lift to be installed, which involves raising the height of the flat roof to the lift motor room.

A site assessment has concluded that due to the existing depth of the concrete slab in place, compared with the new proposed timber structure, the additional height can be achieved without raising the height of the parapet walls that form the lift shaft. The lift shaft itself is already raised above the height of the other areas of the main flat roof, but is set back from the main road (Harpur Street) and is only visible from within the site. The flat part of the roof being raised will be hidden from all angles, as the parapet wall visible from within the site hides this section of the flat roof.

The proposals will therefore have very little visual impact on the building at all, as the new flat roof in question is not visible from the public realm, or from on the site either. It is only visible when accessing the flat roof.

The roof height will be raised by approximately 300mm, combined with the shallower roof depth, providing the 500mm additional space needed for the lift mechanics to be installed. Additional information is included in appendix D.

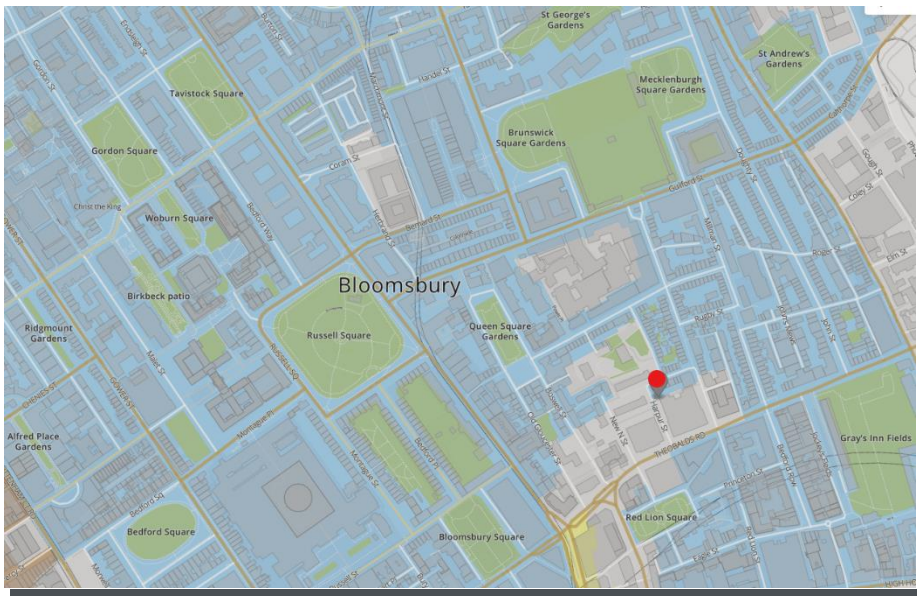
5.0 Architectural and Historical Appraisal

5.1 Historical Development of Local Area

(The information included within this section highlights the historic information of the Bloomsbury Conservation Area which has been extracted from the Appraisal [2])

The Bloomsbury Conservation Area is located within central London, its southern boundary around 750 metres north of the River Thames. It covers an area of approximately 160 hectares which extends from Lincoln's Inn Fields and High Holborn to Euston Road and from King's Cross Road to Tottenham Court Road.

The Conservation Area is situated midway between the earlier settlements of the City of London and the City of Westminster. Conservation Area is located to the northern periphery of the older areas of Soho and Covent Garden, which had been developed during second half part of the 17th century and now are a focus for leisure and entertainment. To the south-east is Finsbury which extends into the financial district of the City. Clerkenwell lies to the east. To the north of the Conservation Area, the great Victorian railway termini of King's Cross, St Pancras and Euston line the northern side of Euston Road. To the west is Fitzrovia extending to the boundary with Westminster.



Bloomsbury represents a period of London's early expansion northwards, dating from Stuart times (around 1660), which continued through the Georgian and Regency periods to around 1840. This period of expansion, which followed the Plague in 1665 and the Great Fire of London in 1666, replaced a series of Medieval Manors on the periphery of London and their associated agricultural and pastoral land. The first swathe of building created a mix of uses with houses, a market, commercial, cultural uses (the British Museum), hospitals and churches. Later expansion of the northern part of the Conservation Area was focussed on providing grander residential districts for wealthy families. This was carried out speculatively by a number of builders, on leases from major landowners, and followed a consistent form with terraced townhouses constructed on a formal grid pattern of streets and landscaped squares. The progression of development across the Conservation Area illustrates the subtle changes in taste and style in domestic architecture that occurred throughout the 17th, 18th and 19th centuries.

The Victorian era saw the urban area evolve with a movement of the wealthy to newly developing urban and suburban areas to the north. New uses emerged and existing ones expanded. There was an increase in industrial uses on the eastern fringes along the Fleet Valley, the establishment of University College, an expansion in specialist hospitals around Queen Square, and the development of the British Museum. Older areas such as St Giles High Street had

become notorious slums; this was addressed by the building of New Oxford Street, created as a new shopping and commercial area. New housing for the poor, often of a philanthropic nature, was built in several parts of i) LON \NEW Bloomsbury Conservation Area Appraisal and Management Strategy Adopted draft 18 April 2011 6 the northern section of the Conservation Area. The development of a series of railway termini along Euston Road saw an expansion in hotel developments, and office development took place throughout the Conservation Area. Around the long-established Inns of Court, dwellings were converted to offices for the legal profession.

During the 20th century, this change and the expansion of hospital, academic and cultural uses continued, particularly around the university and hospitals. Bomb damage from World War II lead to the replacement of some older housing stock with large scale new development such as the Brunswick Centre and Lasdun's Faculty of Education. However, some redevelopment proposals failed due to both local and national concerns regarding the loss of historic buildings in the area. The area has continued to evolve and change with more recent developments from the later 20th century and the early 21st century, , with some examples of national or even international architectural significance. Recent housing developments have mostly meshed sensitively with the older fabric. There are a number of recent developments, undertaken both by the larger institutions (such as the university, the hospitals and the British Museum) and by smaller scale developers, for instance in the mews, continuing the Bloomsbury tradition of development of its time as exemplars of contemporary but contextual design.

The area's relatively level topography reflects the area's geographic location in the Thames Basin. There is a gentle, almost imperceptible gradient down from Tottenham Court Road (around 27 metres AOD) to Gray's Inn Road (around 20 metres AOD). North to south the land is very gently undulating. This results in a homogenous appearance to the landscape across the Conservation Area.

On the eastern edge of the area, development has been built on the western side of the valley of the River Fleet with a noticeable change in level in the streets to the east of Gray's Inn Road, beyond the Conservation Area (and borough) boundary. This rise in land is the only instance of a significant change in topography in this area and forms a tangible physical 'edge' to the Conservation Area.

5.2 Assessment of Significance

5.2.1 Location and Setting

The Bloomsbury Conservation Area is located within a regular boundary, with the boundaries in each direction being irregular in nature. There are also numerous gaps that the Conservation Area does not cover. Which are surrounded by areas that are covered. There are also six other Conservation Areas that border Bloomsbury to the East and the West.

5.2.2 Architectural Interest and External Features

Brick is the predominant building material used across the Conservation Area as it was the cheapest locally available material. The closest brickfields were to be found at Hampstead Heath and Copenhagen Fields (in the London Borough of Islington). Red brick is seen in some of the earlier brick-built developments of the Tudor and Georgian period, whereas London stock was used from circa 1800. Red brick is also common in late Victorian and Edwardian buildings. Stone is also evident, cut into smooth blocks or used as cladding, and is most widely used in the construction of churches, the British Museum and key buildings in institutional uses.

Red brick, stone and stucco are all used as contrasting detailing in the articulation of frontages. The use of stucco is seen more commonly in buildings dating from the early 18th century, initially at ground floor level to mimic rusticated stone, and from the 1820s over entire facades of a classical design.

From the late 19th century, the use of glazed tiling, terracotta and faience began to be seen on public houses and other buildings (Russell Square Underground Station, the Russell Hotel). During the second half of the 20th century the use of concrete became more frequent, with varying degrees of success. More recently glass and steel have been utilised to create a new 21st century architecture of a light and precise character.

The predominant architectural styles of the Conservation Area are classically derived, regardless of period or building type.

The terraced townhouses have a number of characteristic details in their design including the repeated pattern of windows, reducing in height from the first floor upwards signifying their reducing significance, with properties generally being three windows across. In key locations the elevations were designed as unified compositions to give a grander, palatial scale, such as the terrace on the east side of Mecklenburgh Square. Windows are mainly sliding sashes, which range from the earliest examples set close to the face of the building and with thicker glazing bars, as are found in houses in Great James Street, to the more delicate division and recessed sashes of the late Georgian and Regency periods of which there are numerous examples. Doorways may have arched openings, flat roof timber porches on brackets, pediments and occasionally porticos. Other common elevation details include segmented heads, rubbed brick arches, the use of stone banding, delicate cast iron balconies and intricate fanlights. At roof level the individual townhouses are terminated with chimney stacks and pots, and in some terraces the party wall is expressed. Roofs are mainly covered in natural slate, but clay tiles can be found on earlier townhouses.

There is a notable character created by the consistent use of cast iron railings along frontages to separate the pavement from the basement lightwell. The details of the railings vary with an interesting variety of classically derived motifs (including urns, trefoils, spears) and Art Nouveau and Art Deco detailing on later buildings.

Later developments of the late 19th and early 20th centuries tend to be more eclectic and more intricately detailed with a greater use of ornamentation including Gothic, Italianate, neo-Tudor, Baroque and Arts and Crafts influences. Forms such as gables, turrets, oriels and bays were introduced to create interest in the elevations and at eaves level.

The buildings of the later 20th century have detailing more influenced by the Modern Movement, although some developments have adopted a more imitative, historicist approach.

5.3 Proposals and Assessment of Impact

There will be external works carried out at these blocks, which will focus on the bin stores, existing gates and surrounding fencing. These will be works that should result in a benefit for the residents living here and will not negatively affect the existing style and condition of the buildings themselves.

5.3.1 Pitched Roof Coverings

The Proposed pitched roof coverings at 10-15 Dombey Street are due to be Natural Welsh Slate. This is the most appropriate material for this work, and compliments the historical significance of the building.

5.3.2 Flat Roof Refurbishment

The flat roof sections between the pitches at 10-15 Dombey Street have little to no historical significance, and cannot be seen from the public realm, or from the site unless the flat roof sections are accessed. Replacement of these coverings will improve the condition of the building, and maintain the heritage asset without having a negative impact on the building as it stands.

5.3.3 Renewal of Flat roof access structures

The proposed Flat Roof access structures will replicate the existing building, but with much improved condition, resolving leaks that pose a risk to the heritage asset.

5.3.4 Raising Lift Shaft Roof Level at Bevan John House

This is work not associated with the listed section of the building. The proposals will not be visible from the public realm areas of Bloomsbury conservation area, and will have limited visual impact regardless..

6.0 Site Access

6.1 Car Parking/Transport

There is adequate parking on adjacent street, Harpur Street is in a CPZ. That will require a car parking resident permit.

Figure 4: Car parking in front the building (source: Google maps)

The block enjoys a location with many others transport methods such as buses, taxis and the London Underground (Holborn and Russell Square).

6.2 Refuse Disposal

All refuse which arises from the replacement floor will be carefully removed from site and disposed of in line with the building contractor's waste management plan.

7.0 Planning Fire Safety Statement (PFSS) for London Plan Policy D12

7.1 Information on space provisions for fire appliances and assembly points (criteria 1).

a) The application relates to a block of flats, across 5-stories (including basement). These can be accessed via the road by the fire service. There is no change proposed to the existing arrangements.

b) The assembly point for an evacuation of the buildings would be directly outside on the street (public realm).

7.2 Information on passive and active safety measures (criteria 2)

The application relates to a block of flats, across 5-stories (including basement), which we are only proposing to replace the roof and associated structures. This passive and active fire safety measures will remain as existing and are not relevant to the application.

7.3 Information and data on construction products and materials (criteria 3)

The application relates to a block of flats, across 5-stories (including basement), which we are only proposing to replace the roof and associated structures. The property is 5-storeys and the fire risk relating to products and materials choices have been considered. Window frames and glass are included in the exemptions list under the materials and workmanship (regulation 7) paragraph (3) Item (j).

7.4 Information on means of escape and evacuation strategy (criteria 4)

The application relates to a block of flats, across 5-stories (including basement), which we are only proposing to replace the roof and associated structures. The existing means of escape and evacuation strategy will remain the same.

7.5 Information on access and equipment for firefighting (criteria 6).

The application relates to a block of flats, across 5-stories (including basement), which we are only proposing to replace the roof and associated structures. This item is not relevant the application.

8.0 Summary

8.1 Heritage Conclusion

Based on the assessment above, it is considered that the proposed works on these blocks will not adversely affect the current aesthetics of the buildings which are of significance to the Bloomsbury Conservation Area. Any works undertaken aim to compliment the special architectural characteristic and the historic interests of the area. The proposals suggested above will help to preserve these buildings as they are, assisting with security concerns.

The justification for the proposal presented in this Heritage Statement refers to enhancing the significance of heritage assets by putting them to viable uses consistent with their conservation and the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality.

It is our view that the proposals are entirely in keeping with all national and local legislation and policy relating to the historic environment and there are, as such, no heritage reasons why the proposals should not be supported. Accordingly, we invite the Local Planning Authority to treat the proposals favourably and commend the approval of this application for listed building consent.

8.2 Proposals conclusion

This application includes works which will improve the quality of life for the residents within the housing block, whilst simultaneously retaining the existing heritage features of the building.

It is considered that the proposals will not harm the significance of Harpur/Dombey Street and its refurbishment will preserve the building's special architectural and historic interest. The proposals would give rise to modest economic and heritage benefits by making the property fit for purpose and improving its capacity to sustain a beneficial use. The conservation and, where possible, restoration of the historic fabric is also an integral part of the proposal.

The justification for the proposal presented is refers to enhancing the significance of heritage assets by putting them to viable uses consistent with their conservation and the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality. Materials used will be sympathetic to the original construction to ensure that the historic features remain true to the heritage asset, and do not contribute detrimentally to the building.

It is our view that the proposals are entirely in keeping with all national and local legislation and policy relating to the historic environment and there are, as such, no heritage reasons why the proposals should not be supported. Accordingly, we invite the local planning authority to treat the proposals favourably and commend the approval of this application.

8.3 References

[1] *Numbers 9-15 and attached railings, non civil parish - 1271985: Historic England* (no date) *1271985 | Historic England*. Available at: https://historicengland.org.uk/listing/the-list/list-entry/1271985?section=official-list-entry (Accessed: 27 May 2024).

[2] Bloomsbury Conservation Area Appraisal and Management Strategy . (2011). [online] London Borough of Camden. Available at: https://www.camden.gov.uk/documents/20142/7212389/Bloomsbury+Conservation+Area+Appraisal+and+Management+Strategy+Adopted+2011.pdf/6e29ae05-3837-6f7f-ce1b-3bbb0bd20493 [Accessed 27 May 2024].

Appendix A – Pitched Roof Coverings

Penrhyn County Grade Roofing Slate – EN 12326-1:2014

Reference of this commercial document:	**BPWS 110**	Date of issue	**September 2022**

Commercial document issued by: **Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom**

Location of quarry: **Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom**

This document records the conformity of the product described below and is incomplete without the explanation of the meaning of the test results and the requirements of EN 12326-1:2014.
The tests referred to and the criteria are contained in EN 12326-1:2014 and EN 12326-2:2011

Date of sampling	**26/5/22**		**Date of testing**		**13/6/22**
Product description and commercial name Relation between bedding and cleavage	Penrhyn County Grade Roofing Slate Beds parallel to cleavage				Conformity
1. Dimensional tolerances					
Format	Rectangular				
Deviation from declared length	±0.0mm				YES
Deviation from declared width	±0.0mm				YES
Deviation from squareness	0.1%				YES
Deviation from straightness of edges	2.0mm				YES
Slate type for deviation of flatness	Very Flat	Flat (Capital)	Normal (County)	Non-Flat (Celtic)	
Deviation from flatness	0.0%				YES
2. Thickness					
Nominal thickness and variation of individual thickness against nominal thickness	7 mm, ± 35%				YES
3. Strength					
Characteristic MoR	Transverse	59.8 N/mm²	Longitudinal	38.7 N/mm²	NR
4. Water absorption	Code A1 (≤0.6): 0.16%				YES
5. Freeze thaw					NR
6. Thermal cycle test	T1				YES
7. Apparent calcium carbonate content	0.0%				YES

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8. Sulphur dioxide exposure tests	**≤ 20% apparent calcium carbonate**	S1	YES
	> 20% apparent calcium carbonate		NA
9. Non-carbonate carbon content		1.0%	YES
10. External fire exposure		Deemed to satisfy class BROOF	YES
11. Reaction to fire		Deemed to satisfy class A1	YES
12. Release of dangerous substances		None in conditions of use as roofing or external cladding	NR

Meaning of the Test Results

Date of sampling and testing	If more than one date is applicable to sampling or testing they should be indicated against the individual test results	
Product description	Slate for roofing and external cladding or carbonate slate for roofing and external cladding. Slate type and origin	
1. Dimensional tolerances		
Length and width	Maximum deviation ± 5mm	
Deviation from squareness	Maximum deviation ± 1% of the length	
Deviation from straightness of edges	Slate length ≤ 500mm Permitted deviation ≤ 5mm	
	Slate length > 500mm Permitted deviation ≤ 1% of the length	
Flatness: The limits of deviation from the flatness are defined for four types of slate. The bevelled edges shall be applied to the convex face. Slates with deviation from flatness in excess of the limit may be used for special applications.	Slate type	Maximum deviation from flatness as a % of the slate length
	Very flat	< 0.9
	Flat	< 1.0
	Normal	< 1.5
	Non-flat	< 2.0
2. Thickness	The basic nominal thickness is determined as a function of the bending strength using the formulae given in 3, local climate conditions and traditional construction techniques. The basic nominal thickness is increased in relation to the slate's performance in the appropriate sulphur dioxide test (if required) as shown in 7 and 8 below.	

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3. Strength	Longitudinal and transverse characteristic modulus of rupture; there is no limit for characteristic modulus. However, the basic nominal thickness is determined as a function of the bend strength using the formulae given below, local climate conditions and traditional construction techniques.

$$el = X \sqrt{\frac{l}{Rcl}}$$

And

$$et = X \sqrt{\frac{b}{Rct}}$$

Where

el is the longitudinal thickness, (in mm);
et is the transverse thickness, (in mm);
/ is the length of the slate, (in mm);
b is the width of the slate, (in mm);
Rcl is the characteristic longitudinal modulus of rupture, (in N/mm²);
Rct is the characteristic transverse modulus of rupture, (in N/mm²);
X is a constant determined as a function of climate and the traditional construction techniques (in N½.mm-½).

NOTE: It may be different for each formula and is selected for the member state of use according to the table below.

National X Factors:

Member state	Transverse	Longitudinal	Member state	Transverse
Belgium	1.0	1.0	Czech Repub.	1.2
Ireland	0.9	1.1	Italy	1.2
France	1.0	1.0	Spain	1.0
Germany	1.2	1.2	UK	0.9

Those member states that have not declared a national value should select a value or pair of values in relation to their country's climate and traditional construction techniques. It should not be less than the minimum value or pair of values given above.

el and et are determined by using the length / and the width b of the slates. The maximum value determined is the basic individual thickness of the slate, ebi. The basic individual thickness is increased in relation to the slate's performance in the appropriate sulphur dioxide test as shown in 7 and 8 below.

4. Water Absorption	Code A1 (≤0.6), A2 (>0.6)
5. Freeze-thaw test	Slates tested indicate the mean value of the modulus of rupture after 50 cycles in transverse and longitudinal directions before and after the freeze/thaw test, if relevant, (test (if W1(>0.6)), or not required
6. Thermal cycle test	The following table explains the meaning of the test codes

Code	Observation in the test	Conformity to the standard
T1	No changes in appearance. Surface oxidation of metallic minerals. Colour changes that neither affect the structure nor form runs of discolouration.	Acceptable
T2	Oxidation or appearance changes of the metallic inclusions with runs of discolouration but without structural changes.	Acceptable
T3	Oxidation or appearance changes of the metallic minerals which penetrate the slate and risk the formation of holes.	Acceptable subject to the note below

NOTE: It is best only to use slates within code T3, which potentially may result in water penetration selectively with suitable methods of construction that avoid such penetration. Slates showing exfoliation splitting or other structural changes in this test are not acceptable.

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Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom

7. Apparent calcium carbonate content	There is no limit on apparent calcium carbonate content. However, the apparent calcium carbonate content determines which sulphur dioxide exposure test procedure should be carried out and, together with the strength, the minimum nominal thickness of the product. If the carbonate content is less than or equal to 20% then the sulphur dioxide exposure test procedure in EN 12326-2:2011, 14.1 applies. If the carbonate content is more than 20%, the sulphur dioxide exposure test procedure in EN 12326-2:2011, 14.2 applies. The minimum thickness is calculated using the table below

8. Minimal nominal thickness in relation to apparent calcium carbonate content and sulphur dioxide exposure code

Carbonate content %	SO2 exposure test code from EN 12326-2:2011, 14.1	Depth of softened layer from EN12326-2:2011, 14.2	Thickness adjustment
≤ 5.0	S1		None
	S2		ebi + 5%
	S3		ebi ≥ 8.0mm or switch to the test in EN 12326-2:2011, 14.2
> 5.0 ≤ 20.0	S1		ebi + 5%
	S2		ebi + 10%
	S3		ebi ≥ 8.0mm or switch to the test in EN 12326-2:2011, 14.2
> 20.0		0mm to 0.70mm	ebi + 0.50mm + $7t^2$

ebi is the basic individual thickness obtained from 3 above (in mm)

t is the thickness of the softened layer obtained from EN 12326-2:2011, 14.2 (in mm)

9. Non-carbonate carbon content: The non-carbonate carbon content shall be less than 2%

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Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom

CE Marking – Declaration of Performance Penrhyn County Grade Roofing Slate

CE

Welsh Slate roofing products conform to the requirements of the CE mark.
The following table provides the necessary information required to demonstrate conformity of Penrhyn County Grade Roofing Slate

Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom	
Ref: BPWS 113	
EN 12326-1:2014 System of Attestation = AVCP System 4	
Penrhyn County	
Intended to be used as discontinuous roofing and external cladding	
Dimensional variation	
Nominal thickness	7 mm
Individual thickness	7 mm (< +/- 35%)
Deviation of length and width	Complies
Deviation of edge straightness	Complies
Deviation of rectangularity	Complies
Mechanical resistance (Characteristic modulus of rupture)	
Transverse	59.8 N/mm²
Longitudinal	38.7 N/mm²
Water permeability – water absorption	**A1** (≤ 0.6%)
Apparent calcium carbonate content	≤ 5%
Durability	
Water absorption	**A1** (≤0.6%)
Freeze-thaw cycling	Required
Thermal cycling	**T1**
Sulphur dioxide exposure	**S1**
Non-carbonate carbon content	Complies: ≤ 2%
Release of dangerous substances: None in conditions of use as roofing or external cladding	
External fire performance: Deemed to satisfy	
Signed on behalf of the Manufacturer: 	**Sean G Edwards** - Operations Manager

Telephone: +44 (0) 1248 600 656
Website: www.welshslate.com e-mail: enquiries@welshslate.com
Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom

Certificate of Registration

This is to certify that the Management System of:

Welsh Slate Limited

Penrhyn Quarry, Bethesda, Nr Bangor, LL57 4YG

And as detailed on the Annex to this certificate

has been approved by Alcumus ISOQAR and is compliant with the requirements of:

ISO 9001: 2015

Certificate Number:	**14622-QMS-001**
Initial Registration Date:	19/06/2008
Previous Expiry Date:	06/02/2022
Recertification Audit Date:	25/01/2022
Re-issue Date:	09/02/2022
Current Expiry Date:	06/02/2025

Scope of Registration:

The extraction of slate and manufacture of slate product.

Signed:
Alyn Franklin, Chief Executive Officer
(on behalf of Alcumus ISOQAR)

This certificate will remain current subject to the company maintaining its system to the required standard. This will be monitored regularly by Alcumus ISOQAR. Further clarification regarding the scope of this certificate and the applicability of the relevant standards' requirement may be obtained by consulting Alcumus ISOQAR

Alcumus ISOQAR Limited, Cobra Court, 1 Blackmore Road, Stretford, Manchester M32 0QY.
T: 0161 865 3699 **E**: isoqarenquiries@alcumus.com **W**: alcumus.com/isoqar

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T: 0161 865 3699 **E**: isoqarenquiries@alcumus.com **W**: alcumus.com/isoqar

Appendix B – Flat Roof Specification

For Better Living

Specification Document

Project: 49276 – Rev 1

Project Name:	Bevan John House
Project Address:	9 Harpur Street London WC1N 3PA

Client:

Client Details:	Wates Construction Limited

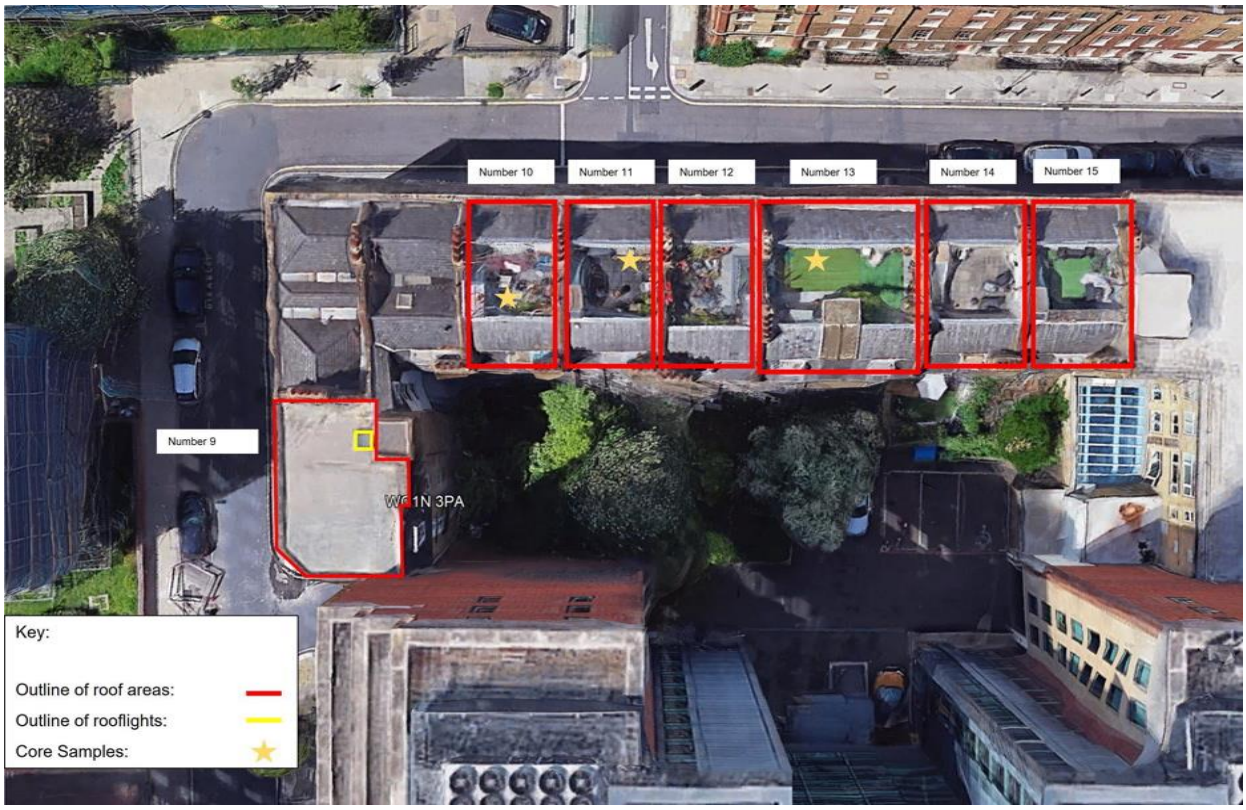
Specification written by:

Author Address:	Chetin Ali Langley Waterproofing Systems Limited Langley House Lamport Drive Heartlands Business Park Daventry Northants NN11 8YH
Telephone:	01327 704778
Mobile:	07811 393820
Web:	www.langley.co.uk

Table of Contents

Roofing Specification

Roof areas covered by this specification: Number 9 Strip to Deck specification, Number 10 Option 1 Strip to Deck Langley PU Slip Inhabitant, Number 10 Option 2 Strip to Deck Langley PU Paving Slabs, Number 11, 12, 14 & 15 Option 1 Strip to Deck Langley PU Slip Inhabitant, Number 11, 12, 14 & 15 Option 2 Strip to Deck Langley PU Paving Slabs, Number 13 Option 1 Overlay Langley PU Slip Inhabitant, Number 13 Option 2 Overlay Langley PU Paving Slabs.



Outline Description

This specification has been produced for Wates Construction Limited for the express use in the construction of the designated roof areas of the property stated above.

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

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 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.

3. 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.

4. 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.

5. The contractor shall provide all necessary latrines and other facilities for the use of operatives as required by the Construction (Design & Management) Regulations 2015 (CDM 2015), maintain them in decent condition and clear them away on completion.

6. 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.

7. 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".

8. 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.

Detailed Specification: 1

Number 9 Strip to Deck specification

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Modular Rooflights / Hatches - Guarantee**: The Langley Modular Rooflights / Hatches included within the following specification are to be covered by the Langley Waterproofing Systems Ltd, single-premium, pre-paid, independently-insured guarantee for the duration of the roofing guarantee from the date of practical completion.				
1.4	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.5	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.6	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				
1.8	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.9	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				

No.	Item	Unit	Qty	Rate	Total
1.10	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Removal of Existing Structural Deck and/or Waterproofing:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				
1.11	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.12	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				

No.	Item	Unit	Qty	Rate	Total
1.13	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.14	**Survey Not Undertaken - No Access**: Due to access issues at the time, no survey has been undertaken by Langley and therefore aspects of this specification have been based on assumptions. Before ordering any materials, Langley are required to visit site to confirm the suitability of this specification. Should any changes then be deemed necessary, either to materials and/or scope of works, any liability for costs due to these changes cannot be accepted by Langley Waterproofing. At this point, if any required changes to the scope of works are not possible, it may have implications for the guarantee, including exclusions where necessary.				
1.15	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see ‘General Guidance & Requirements’ in the appendices of this specification.				
1.16	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Existing Waterproofing System - Removal**: This specification is based on a full strip-up of the existing waterproofing system.				

No.	Item	Unit	Qty	Rate	Total
2.2	**Deck and Substrates - Timber Boarding**: This specification is suitable for application to a substrate of a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Removal of Existing Waterproofing System**: Existing coverings must not be stripped at a rate greater than can be safely re-waterproofed during that working day so as to reduce risk of water ingress to the property.				
2.4	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.5	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.6	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				
3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor must 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 coverings. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				

No.	Item	Unit	Qty	Rate	Total
3.3	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.4	**TV Aerials and/or Satellite Dish Arrays - Temporarily Remove**: Any TV aerials and/or satellite dish arrays that will impede roofing works are to be temporarily removed, raised, etc. to facilitate the works. The contractor must liaise with the client contract administrator directly in relation to how best serve the property so that minimal disturbance of services is achieved throughout the contract period.				
3.5	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				
3.6	**Cables - Temporarily Remove**: All cables must be carefully raised and/or temporarily supported clear of the roof surface to facilitate the works.				
3.7	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.8	**Rooflight/s - Discard**: Remove and dispose of existing rooflight/s to suitable waste facilities.				
3.9	**Rooflight Kerb/s - Discard**: Remove and dispose of existing rooflight kerbs to suitable waste facilities.				

No.	Item	Unit	Qty	Rate	Total
3.10	**Existing Waterproofing System - Remove**: Strip and remove to suitable waste containers all component layers of the existing waterproofing system including any insulation and or vapour control layers that may be found, back to but not including the original deck / substrate.				
3.11	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.12	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.13	**Parapet Coping Stones - Temporary Removal**: Carefully remove copings, clean and set aside for re-use. Clearly identify each coping and log its position to ensure their correct relocation on completion. Make good wall top surface to a flat smooth finish. Prime with the specified primer, ready to receive the new waterproofing.				
3.14	**Parapet Metal Cappings - Temporary Removal**: Carefully remove parapet metal capping sections and set aside for re-use. Clearly identify each section and log its position to ensure their correct relocation after completion of the new waterproofing system. Make good exposed surfaces to a flat smooth finish. Prime with the specified primer ready to receive the new waterproofing.				
3.15	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				
3.16	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				
3.17	**Priming Attachment Layer & Applicable Details - Paratene Self-adhesive AVCL**: Attachment layer and applicable details must be swept clear of all sand, dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				

No.	Item	Unit	Qty	Rate	Total
3.18	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
3.19	**Priming Substrate - Paratene Self-adhesive Carrier Membrane**: Where necessary sweep substrate clear of all dirt, debris and loose material. Substrate for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				

No.	Item	Unit	Qty	Rate	Total
3.20	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Important note**: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				

4	**AIR AND VAPOUR CONTROL**				
4.1	**Attachment Layer - Nailed**: Install Langley HT 180 polyester reinforced attachment membrane, nailed in accordance with BS 8217:2005. Loose lay and nail at maximum 150mm cross centres across the full width and at 50mm centres around the roof perimeters and at all side and end laps. Side and end laps must be a minimum 75mm. Important note: When using HT 180 with self-adhesive membranes the surface of the HT 180 must be thoroughly swept to remove all sand; without this there will be adhesion issues. The surface of the HT 180 must be suitably primed with Langley Spray-on (synthetic rubber) Primer before the application of the self-adhesive membranes.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				

5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Design Note - Carrier Membrane - Priming Substrate**: Substrate for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.3	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				

6.4	**Carrier Membrane - Paratene Self-Adhesive - To Kerbs**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to primed surface of substrate. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				
7.2	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				
7.3	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				
7.4	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				

7.6	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.7	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				
8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				

8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				
8.7	**Parapets - To Receive Metal Cappings**: The full Langley PU system, including GFM Reinforcement and carrier membrane (where specified) must be carried up the vertical inner face and across the top of the parapet detail, which must, in all cases, be fully supported. Terminate to leading edge. Where required, at the ends of the parapet meeting vertical abutments, the waterproofing must be turned up and to the side, to allow weathering with new horizontal and vertical cover flashings.				
8.8	**Parapets - To Receive Coping Stones**: The new full Langley PU system, including GFM Reinforcement and carrier membrane (where specified) must be carried up the vertical inner face and across the top of the parapet detail, which must, in all cases, be fully supported. Terminate at leading edge of wall. Whilst the system top coat is still wet, fully blind the top surface with Pararapide SL (kiln dried) Mortar sand to form a key for the mortar bedding. When cured, sweep away loose sand ready to receive the coping stones (detailed elsewhere). Parapet ends, abutment with vertical (if applicable), waterproofing must be turned up and to the side, to allow weathering with new horizontal and vertical flashing details.				

8.9	**Rooflight Kerbs - ParaKerb**: Must be a minimum 150mm above the finished roof surface. To a primed surface, fully bond Paratene carrier membrane to the full height of the kerb. Apply Langley PU liquid membrane, including reinforcement, as detailed above. Carrier membrane and waterproofing to be carried up the vertical face to the full height of the kerb. Secure top edge with the retaining trim provided. **Please Note** - Contractor must ensure the detailed rooflight schedule has been duly checked with particular regard to the type of unit and fixing instructions. No claims arising from preparation/installation error by contractor will be entertained by Langley Waterproofing Systems Ltd.				
8.10	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
8.11	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
9	**ROOFLIGHTS & OPENINGS IN DECK**				
9.1	**ParaRange Modular Rooflights - Requirement**: All Langley Waterproofing Systems Ltd Rooflights and ParaKerb Upstands are BBA accredited. Any deviation from the specification detailed below and or accompanying rooflight schedule can only be made with the approval of Langley Waterproofing Systems Ltd.				
9.2	**ParaRange Modular Rooflights - Installation**: All must be installed by the contractor strictly in accordance with BS 8217 and the fixing instructions provided in Detail Sheets of Agrément Certificate. When supplied as part of a total roofing package, ParaRange Rooflights are covered by all warranties and guarantees issued by Langley Waterproofing System Ltd Guarantee. **Note:** Installation must be carried out by an approved Langley installer in order to meet the requirements of the guarantee. See attached schedule for details.				

9.3	**ParaKerb - Installation**: All ParaKerbs kerbs must be installed strictly in accordance with BS8217 and BS8218 and as per fixing instructions provided in Agrément Certificate. When supplied as part of a total roofing package, ParaKerbs are covered by all warranties and guarantees issued by Langley Waterproofing System Ltd Guarantee. **Note:** Installation must be carried out by an approved Langley installer in order to meet the requirements of the guarantee. See attached schedule for details.				
9.4	**ParaRange Modular Rooflights - Schedule**: A detailed Rooflight Schedule by Langley Waterproofing Systems Ltd will be issued at tender stage to support this specification.				
9.5	**ParaKerbs - Fixing to Deck (Where Applicable)**: Screw-fix ParaKerb to roof deck. Fixings at maximum 300mm centres.				
9.6	**ParaKerbs - Fixing to Timber Grounds (Where Applicable)**: Screw-fix ParaKerb into timber grounds. Fixings at maximum 300mm centres. Timber grounds must be minimum 100mm wide and the same thickness as the insulation.				
9.7	**ParaRange Triple Skin Modular Rooflights - Installation**: Triple skinned polycarbonate. Clear outer skin, clear middle skin with inner skin diffused. Installed to ParaKerb / Adaptor Kerb as required with the security fixings supplied. Upon completion of fixing install aluminium snap-on security frame. Wipe unit clean. This item must be read in conjunction with the Langley issued Rooflight Schedule. **Note:** Should the Schedule show a differing skin colour format to that shown above then the Schedule takes precedence over the specification.				
9.8	**Aperture Linings**: Internal linings must be installed/ made good as necessary and decorated in accordance with the client contract administrator's detailed instruction or specification. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
9.9	**Aperture Linings - Existing - Unchecked**: **Existing lining construction is unknown at this time. If confirmed to be an ACM item, under no circumstances are the internal linings to be disturbed.** Any opening mechanisms/furniture etc. that are fixed through the linings are to be disconnected from the rooflight and left in-situ. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of specialist testing and or handling of this item should a requirement for removal be necessary. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				

10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Existing Parapet / Kerb Coping Stones - Reinstate**: Prepared clean, re-bed to original locations in sand and cement mortar and point joints. The contractor must ensure that suitable provision has been made to replace any damaged copings with new to match existing.				
10.3	**Existing Metal Cappings - Reinstate**: Re-fix to original locations with sealed joints. The contractor must ensure that suitable provision has been made to replace any damaged cappings or seals with new to match existing.				
10.4	**TV Aerials and/or Satellite Dish Arrays - Reinstate**: Reinstate to original locations or new positions as instructed by the client contract administrator all TV aerials and/or satellite dish arrays.				
10.5	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.6	**Cables - Reinstate**: Collate and support on cable trays if necessary. Secure cables to tray or to original locations and secure with plastic cable ties. If cable trays are used then they are to be rested on load-spreading bases on sacrificial pieces of cap sheet. Securely fasten trays to bases as required.				
10.7	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				
10.8	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.9	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Detailed Specification: 2

Number 10 Option 1 Strip to Deck Langley PU Slip Inhabitant

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.4	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.5	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				
1.6	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.8	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				

No.	Item	Unit	Qty	Rate	Total
1.9	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Removal of Existing Structural Deck and/or Waterproofing:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				
1.10	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.11	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				

No.	Item	Unit	Qty	Rate	Total
1.12	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.13	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see 'General Guidance & Requirements' in the appendices of this specification.				
1.14	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Existing Waterproofing System - Removal**: This specification is based on a full strip-up of the existing waterproofing system.				
2.2	**Deck and Substrates - Timber Boarding**: This specification is suitable for application to a substrate of a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Removal of Existing Waterproofing System**: Existing coverings must not be stripped at a rate greater than can be safely re-waterproofed during that working day so as to reduce risk of water ingress to the property.				

No.	Item	Unit	Qty	Rate	Total
2.4	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.5	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.6	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				
3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor must 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 coverings. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				
3.3	**Furniture, Plant Pots etc. - Temporarily Remove**: All free-standing items of furniture etc. to be temporarily removed and stored for reinstallation upon completion of the works.				

No.	Item	Unit	Qty	Rate	Total
3.4	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.5	**Plant & Equipment**: Carefully remove and set aside for re-fixing all free-standing roof mounted plant and items of equipment. No equipment is to be stored during the course of the works on completed areas unless suitable protection has been provided beneath.				
3.6	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				
3.7	**Rainwater Downpipes from Higher Levels - Temporary Removal**: To facilitate the re-roofing work. As required, temporarily remove all rainwater downpipes, shoes and supporting pipe brackets etc. Set aside and securely store for re-fixing on completion of waterproofing works.				
3.8	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.9	**Existing Waterproofing System - Remove**: Strip and remove to suitable waste containers all component layers of the existing waterproofing system including any insulation and or vapour control layers that may be found, back to but not including the original deck / substrate.				

No.	Item	Unit	Qty	Rate	Total
3.10	**Wall Cladding - Temporary Removal**: To facilitate the re-roofing works. The existing wall cladding is to be temporarily removed, set aside and safely stored for re-use. Contractor to allow for renewal of damaged or degraded sections of cladding, as necessary, to match existing.				
3.11	**Skirtings - Extend**: Should exposed skirtings be insufficient in height, the contractor must make provision to extending them. Extend by providing a treated timber or class 3, exterior grade plywood substrate as necessary to accommodate the minimum required skirting height of 150mm above the finished roof surface level.				
3.12	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.13	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.14	**Existing Render - Alteration**: The existing render is to be cut back to allow a new chase line to be cut at a higher level to accommodate the new levels presented by the new waterproofing system. The new chase must be cut with an angle grinder cutting disc to a minimum depth of 25mm, brushed clean and primed with appropriate primer to seal the substrate surface.				
3.15	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				
3.16	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				
3.17	**Priming Attachment Layer & Applicable Details - Paratene Self-adhesive AVCL**: Attachment layer and applicable details must be swept clear of all sand, dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				

No.	Item	Unit	Qty	Rate	Total
3.18	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
3.19	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				

4	**AIR AND VAPOUR CONTROL**				
4.1	**Attachment Layer - Nailed**: Install Langley HT 180 polyester reinforced attachment membrane, nailed in accordance with BS 8217:2005. Loose lay and nail at maximum 150mm cross centres across the full width and at 50mm centres around the roof perimeters and at all side and end laps. Side and end laps must be a minimum 75mm. Important note: When using HT 180 with self-adhesive membranes the surface of the HT 180 must be thoroughly swept to remove all sand; without this there will be adhesion issues. The surface of the HT 180 must be suitably primed with Langley Spray-on (synthetic rubber) Primer before the application of the self-adhesive membranes.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				

5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				

7.2	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				
7.3	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				
7.4	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				
7.6	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.7	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				

8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				
8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				
8.7	**Skirting to Chase**: To prepared chase. The full Langley PU detail system (including reinforcing fleece) to be dressed to the full depth (25mm) of the chase. Allow to cure and point with Langley Gap-Seal Mastic.				

8.8	**Overhangs - Adapted Counter Flashing - Langley TB62 GRP Termination Bar**: For use beneath Copings, Overhangs, Window cills and Door Frames etc, where required to suit site conditions. Install an adapted Langley TB62 GRP face-fixed Termination Bar. Modify by removing the bottom return section by cutting. Fix modified bar over the waterproofing, with the top angled return facing the upstand to form a "V" with the underside of the overhang. Apply a bead of Langley Gap-Seal Mastic to the rear surface before positioning over the membrane. Once aligned, secure in place by mechanically screwing and plug fixing with dome or pan head non-corroding screws at maximum 300mm centres. Infill the “V” with a bead of Langley Gap-Seal Mastic.				
8.9	**Skirting to Cladding - ParaFlash B3**: Install and protect skirtings detail with ParaFlash B3 lead-free counter flashings 150 mm wide. Dress into prepared chase and wedge at 450 mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100 mm and sealed with Langley Gap-Seal Mastic.				
8.10	**Skirting to Threshold/Cill - Flashing to Match Main Roof Skirtings**: Install and protect detail abutment skirtings with counter flashings to match main roof area, 150mm wide. Dress into prepared chase below threshold/cill and wedge at 450mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100mm and sealed with Langley Gap-Seal Mastic.				
8.11	**Skirtings To Low Thresholds/Cills <150mm - Self Terminating Strap**: To the prepared and primed surface (suitable Pararapide primer subject to adhesion tests). Apply a liberal coating of Pararapide WP Detailing coating system with a brush or roller at a rate of 2.5 – 3.5 kg/m². Roll out and embed 260mm wide Pararapide Fleece. Immediately apply a second coat of Pararapide WP Detailing. The self-terminating strap width should be a minimum of 300mm lapping 150mm onto the previously installed waterproofing system and threshold cill. Pararapide Sealer Coat. Colour: Dark Grey (RAL 7043). To a prepared surface. Apply the mixed resin with a roller or brush at a rate of 0.4 – 0.8 kg/m².If you would like to colour match the primary waterproof coating, a special colour order of RAL 7015 should be placed. For mixing and installation requirements, please refer to the Fixing Instruction and Guidance sections of this specification. **Note:** The Langley PUwaterproofing must be left to fully cure for a minimum of 28 days before the application of the Pararapide WP strap and Sealer Coat. **Important Note:** Details below 150mm will not be covered by the Langley Waterproofing guarantee except for threshold details which meet NHBC Standards 7.1.16 Accessible thresholds criteria.				

8.12	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
8.13	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
9	**WATERPROOFING COVER**				
9.1	**Demarcation and Access Walkways - Slip-inhibiting Finish**: Ensure that the Langley PU waterproofing system has cured for a minimum 28 days before overcoating. Ensure surface is clean and free from contaminants. Demarcate required walkway area boundaries with 50mm Gaffer tape (low tack). Apply the mixed Pararapide Slip Inhibiting Sealer Coat resin, with a roller or brush, at a rate of 1.2-1.5 kg/m² (see 'Fixing Instructions' for correct mixing procedures). Once material surface has partially cured, use a back rolling technique to achieve an even and textured slip resisting finish. Remove demarcation tape. Note: Standard colour of Pararapide Slip Inhibiting Sealer Coat is Dark Grey (RAL 7043) but any RAL colour is available to special order.				
10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Furniture, Plant Pots etc. – Reinstate**: Reinstate items of furniture etc. to original locations.				
10.3	**Plant and Equipment - Free Standing - Reinstatement**: All free-standing roof mounted plant and items of equipment must be placed on load-spreading slabs on sacrificial pieces of loose laid cap sheet, mineral surface down.				

10.4	**Existing Wall Cladding - Reinstate**: Upon completion of waterproofing details reinstate wall cladding to original locations. The contractor must allow to renew any damaged sections where necessary to match existing. The contractor must further allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Protection of Works. Please refer to 'General Guidance & Requirements'.				
10.5	**Rainwater Downpipes - Existing**: Re-fix all downpipes, supporting brackets and shoes upon completion of the new waterproofing system. Allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Replace any broken or damaged items to match existing.				
10.6	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.7	**Existing Render - Alteration**: Upon completion of the secondary waterproof counter flashing the contractor must install a new render-stop bead or bell-mouth render stop trim suitable to requirement. The render must be made good and re-decorated to match existing finishes.				
10.8	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				
10.9	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.10	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Detailed Specification: 3

Number 10 Option 2 Strip to Deck Langley PU Paving Slabs

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.4	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.5	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				
1.6	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.8	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				
1.9	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Removal of Existing Structural Deck and/or Waterproofing:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				

No.	Item	Unit	Qty	Rate	Total
1.10	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.11	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				
1.12	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.13	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see ‘General Guidance & Requirements’ in the appendices of this specification.				

No.	Item	Unit	Qty	Rate	Total
1.14	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Existing Waterproofing System - Removal**: This specification is based on a full strip-up of the existing waterproofing system.				
2.2	**Deck and Substrates - Timber Boarding**: This specification is suitable for application to a substrate of a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Removal of Existing Waterproofing System**: Existing coverings must not be stripped at a rate greater than can be safely re-waterproofed during that working day so as to reduce risk of water ingress to the property.				
2.4	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.5	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.6	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				

3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor must 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 coverings. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				
3.3	**Furniture, Plant Pots etc. - Temporarily Remove**: All free-standing items of furniture etc. to be temporarily removed and stored for reinstallation upon completion of the works.				
3.4	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.5	**Plant & Equipment**: Carefully remove and set aside for re-fixing all free-standing roof mounted plant and items of equipment. No equipment is to be stored during the course of the works on completed areas unless suitable protection has been provided beneath.				
3.6	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				

3.7	**Rainwater Downpipes from Higher Levels - Temporary Removal**: To facilitate the re-roofing work. As required, temporarily remove all rainwater downpipes, shoes and supporting pipe brackets etc. Set aside and securely store for re-fixing on completion of waterproofing works.				
3.8	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.9	**Existing Waterproofing System - Remove**: Strip and remove to suitable waste containers all component layers of the existing waterproofing system including any insulation and or vapour control layers that may be found, back to but not including the original deck / substrate.				
3.10	**Existing Flashings / Termination Bars etc. - Remove**: Carefully remove all existing secondary cover flashings, termination bars etc. and dispose of to suitable approved waste containers / facilities or return to contractors premises for safe disposal.				
3.11	**Wall Cladding - Temporary Removal**: To facilitate the re-roofing works. The existing wall cladding is to be temporarily removed, set aside and safely stored for re-use. Contractor to allow for renewal of damaged or degraded sections of cladding, as necessary, to match existing.				
3.12	**Skirtings - Extend**: Should exposed skirtings be insufficient in height, the contractor must make provision to extending them. Extend by providing a treated timber or class 3, exterior grade plywood substrate as necessary to accommodate the minimum required skirting height of 150mm above the finished roof surface level.				
3.13	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.14	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.15	**Existing Render - Alteration**: The existing render is to be cut back to allow a new chase line to be cut at a higher level to accommodate the new levels presented by the new waterproofing system. The new chase must be cut with an angle grinder cutting disc to a minimum depth of 25mm, brushed clean and primed with appropriate primer to seal the substrate surface.				

3.16	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				
3.17	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				
3.18	**Priming Attachment Layer & Applicable Details - Paratene Self-adhesive AVCL**: Attachment layer and applicable details must be swept clear of all sand, dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				
3.19	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				

3.20	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				

4	**AIR AND VAPOUR CONTROL**				
4.1	**Attachment Layer - Nailed**: Install Langley HT 180 polyester reinforced attachment membrane, nailed in accordance with BS 8217:2005. Loose lay and nail at maximum 150mm cross centres across the full width and at 50mm centres around the roof perimeters and at all side and end laps. Side and end laps must be a minimum 75mm. Important note: When using HT 180 with self-adhesive membranes the surface of the HT 180 must be thoroughly swept to remove all sand; without this there will be adhesion issues. The surface of the HT 180 must be suitably primed with Langley Spray-on (synthetic rubber) Primer before the application of the self-adhesive membranes.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				

5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				

7.2	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				
7.3	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				
7.4	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				
7.6	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.7	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				

8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				
8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				
8.7	**Skirting to Chase**: To prepared chase. The full Langley PU detail system (including reinforcing fleece) to be dressed to the full depth (25mm) of the chase. Allow to cure and point with Langley Gap-Seal Mastic.				

8.8	**Overhangs - Adapted Counter Flashing - Langley TB62 GRP Termination Bar**: For use beneath Copings, Overhangs, Window cills and Door Frames etc, where required to suit site conditions. Install an adapted Langley TB62 GRP face-fixed Termination Bar. Modify by removing the bottom return section by cutting. Fix modified bar over the waterproofing, with the top angled return facing the upstand to form a "V" with the underside of the overhang. Apply a bead of Langley Gap-Seal Mastic to the rear surface before positioning over the membrane. Once aligned, secure in place by mechanically screwing and plug fixing with dome or pan head non-corroding screws at maximum 300mm centres. Infill the “V” with a bead of Langley Gap-Seal Mastic.				
8.9	**Skirting to Cladding - ParaFlash B3**: Install and protect skirtings detail with ParaFlash B3 lead-free counter flashings 150 mm wide. Dress into prepared chase and wedge at 450 mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100 mm and sealed with Langley Gap-Seal Mastic.				
8.10	**Skirtings To Low Thresholds/Cills <150mm - Self Terminating Strap**: To the prepared and primed surface (suitable Pararapide primer subject to adhesion tests). Apply a liberal coating of Pararapide WP Detailing coating system with a brush or roller at a rate of 2.5 – 3.5 kg/m². Roll out and embed 260mm wide Pararapide Fleece. Immediately apply a second coat of Pararapide WP Detailing. The self-terminating strap width should be a minimum of 300mm lapping 150mm onto the previously installed waterproofing system and threshold cill. Pararapide Sealer Coat. Colour: Dark Grey (RAL 7043). To a prepared surface. Apply the mixed resin with a roller or brush at a rate of 0.4 – 0.8 kg/m².If you would like to colour match the primary waterproof coating, a special colour order of RAL 7015 should be placed. For mixing and installation requirements, please refer to the Fixing Instruction and Guidance sections of this specification. **Note:** The Langley PUwaterproofing must be left to fully cure for a minimum of 28 days before the application of the Pararapide WP strap and Sealer Coat. **Important Note:** Details below 150mm will not be covered by the Langley Waterproofing guarantee except for threshold details which meet NHBC Standards 7.1.16 Accessible thresholds criteria.				
8.11	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				

8.12	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
9	**WATERPROOFING COVER**				
9.1	**Geotextile Separating Layer**: Over the waterproofing and below the paving pedestals, loose lay a non-woven geotextile membrane separating layer, by others, density of no less than 250gsm (300gsm recommended). Installation as per manufacturers written instructions. Note: Where a geo-textile is used beneath decking, paving supports etc. it is intended as a separating layer between the supports and the waterproof covering and is only required where the two come into contact. It should be installed to allow free-draining of the areas so that water does not hold and stagnate.				
9.2	**Maintenance, Pedestrian and Terraced Areas - Paving Slabs/Tiles on Freestanding Supports - By Others**: To fully complete waterproof coverings (including inverted roof insulation and WFRL where applicable), install Paving Slabs/ Tiles to CA specification. To be laid loose on third party paving support pads and levelling shims or adjustable pedestals in accordance with the manufacturer's instructions. Size, colour and finish must be agreed with all parties Client / Contract Administrator & Roofing Contractor. NB: Slabs/ Tiling to be a minimum 80kg/m² to avoid floating, on inverted roof systems, and wind uplift				
10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Furniture, Plant Pots etc. – Reinstate**: Reinstate items of furniture etc. to original locations.				
10.3	**Plant and Equipment - Free Standing - Reinstatement**: All free-standing roof mounted plant and items of equipment must be placed on load-spreading slabs on sacrificial pieces of loose laid cap sheet, mineral surface down.				

10.4	**Existing Wall Cladding - Reinstate**: Upon completion of waterproofing details reinstate wall cladding to original locations. The contractor must allow to renew any damaged sections where necessary to match existing. The contractor must further allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Protection of Works. Please refer to 'General Guidance & Requirements'.				
10.5	**Rainwater Downpipes - Existing**: Re-fix all downpipes, supporting brackets and shoes upon completion of the new waterproofing system. Allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Replace any broken or damaged items to match existing.				
10.6	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.7	**Existing Render - Alteration**: Upon completion of the secondary waterproof counter flashing the contractor must install a new render-stop bead or bell-mouth render stop trim suitable to requirement. The render must be made good and re-decorated to match existing finishes.				
10.8	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				
10.9	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.10	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Detailed Specification: 4

Number 11, 12, 14 & 15 Option 1 Strip to Deck Langley PU Slip Inhabitant

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.4	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.5	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				
1.6	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.8	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				
1.9	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Removal of Existing Structural Deck and/or Waterproofing:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				

No.	Item	Unit	Qty	Rate	Total
1.10	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.11	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				
1.12	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.13	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see ‘General Guidance & Requirements’ in the appendices of this specification.				

No.	Item	Unit	Qty	Rate	Total
1.14	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Existing Waterproofing System - Removal**: This specification is based on a full strip-up of the existing waterproofing system.				
2.2	**Deck and Substrates - Timber Boarding**: This specification is suitable for application to a substrate of a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Removal of Existing Waterproofing System**: Existing coverings must not be stripped at a rate greater than can be safely re-waterproofed during that working day so as to reduce risk of water ingress to the property.				
2.4	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.5	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.6	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				

3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor must 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 coverings. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				
3.3	**Furniture, Plant Pots etc. - Temporarily Remove**: All free-standing items of furniture etc. to be temporarily removed and stored for reinstallation upon completion of the works.				
3.4	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.5	**Plant & Equipment**: Carefully remove and set aside for re-fixing all free-standing roof mounted plant and items of equipment. No equipment is to be stored during the course of the works on completed areas unless suitable protection has been provided beneath.				
3.6	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				

3.7	**Rainwater Downpipes from Higher Levels - Temporary Removal**: To facilitate the re-roofing work. As required, temporarily remove all rainwater downpipes, shoes and supporting pipe brackets etc. Set aside and securely store for re-fixing on completion of waterproofing works.				
3.8	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.9	**Existing Waterproofing System - Remove**: Strip and remove to suitable waste containers all component layers of the existing waterproofing system including any insulation and or vapour control layers that may be found, back to but not including the original deck / substrate.				
3.10	**Wall Cladding - Temporary Removal**: To facilitate the re-roofing works. The existing wall cladding is to be temporarily removed, set aside and safely stored for re-use. Contractor to allow for renewal of damaged or degraded sections of cladding, as necessary, to match existing.				
3.11	**Skirtings - Extend**: Should exposed skirtings be insufficient in height, the contractor must make provision to extending them. Extend by providing a treated timber or class 3, exterior grade plywood substrate as necessary to accommodate the minimum required skirting height of 150mm above the finished roof surface level.				
3.12	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.13	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.14	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				

3.15	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				
3.16	**Priming Attachment Layer & Applicable Details - Paratene Self-adhesive AVCL**: Attachment layer and applicable details must be swept clear of all sand, dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				
3.17	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				

3.18	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				

4	**AIR AND VAPOUR CONTROL**				
4.1	**Attachment Layer - Nailed**: Install Langley HT 180 polyester reinforced attachment membrane, nailed in accordance with BS 8217:2005. Loose lay and nail at maximum 150mm cross centres across the full width and at 50mm centres around the roof perimeters and at all side and end laps. Side and end laps must be a minimum 75mm. Important note: When using HT 180 with self-adhesive membranes the surface of the HT 180 must be thoroughly swept to remove all sand; without this there will be adhesion issues. The surface of the HT 180 must be suitably primed with Langley Spray-on (synthetic rubber) Primer before the application of the self-adhesive membranes.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				

5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				

7.2	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				
7.3	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				
7.4	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				
7.6	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.7	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				

8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				
8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				
8.7	**Skirting to Chase**: To prepared chase. The full Langley PU detail system (including reinforcing fleece) to be dressed to the full depth (25mm) of the chase. Allow to cure and point with Langley Gap-Seal Mastic.				

8.8	**Overhangs - Adapted Counter Flashing - Langley TB62 GRP Termination Bar**: For use beneath Copings, Overhangs, Window cills and Door Frames etc, where required to suit site conditions. Install an adapted Langley TB62 GRP face-fixed Termination Bar. Modify by removing the bottom return section by cutting. Fix modified bar over the waterproofing, with the top angled return facing the upstand to form a "V" with the underside of the overhang. Apply a bead of Langley Gap-Seal Mastic to the rear surface before positioning over the membrane. Once aligned, secure in place by mechanically screwing and plug fixing with dome or pan head non-corroding screws at maximum 300mm centres. Infill the “V” with a bead of Langley Gap-Seal Mastic.				
8.9	**Skirting to Cladding - ParaFlash B3**: Install and protect skirtings detail with ParaFlash B3 lead-free counter flashings 150 mm wide. Dress into prepared chase and wedge at 450 mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100 mm and sealed with Langley Gap-Seal Mastic.				
8.10	**Skirtings To Low Thresholds/Cills <150mm - Self Terminating Strap**: To the prepared and primed surface (suitable Pararapide primer subject to adhesion tests). Apply a liberal coating of Pararapide WP Detailing coating system with a brush or roller at a rate of 2.5 – 3.5 kg/m². Roll out and embed 260mm wide Pararapide Fleece. Immediately apply a second coat of Pararapide WP Detailing. The self-terminating strap width should be a minimum of 300mm lapping 150mm onto the previously installed waterproofing system and threshold cill. Pararapide Sealer Coat. Colour: Dark Grey (RAL 7043). To a prepared surface. Apply the mixed resin with a roller or brush at a rate of 0.4 – 0.8 kg/m².If you would like to colour match the primary waterproof coating, a special colour order of RAL 7015 should be placed. For mixing and installation requirements, please refer to the Fixing Instruction and Guidance sections of this specification. **Note:** The Langley PUwaterproofing must be left to fully cure for a minimum of 28 days before the application of the Pararapide WP strap and Sealer Coat. **Important Note:** Details below 150mm will not be covered by the Langley Waterproofing guarantee except for threshold details which meet NHBC Standards 7.1.16 Accessible thresholds criteria.				
8.11	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				

8.12	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
9	**WATERPROOFING COVER**				
9.1	**Demarcation and Access Walkways - Slip-inhibiting Finish**: Ensure that the Langley PU waterproofing system has cured for a minimum 28 days before overcoating. Ensure surface is clean and free from contaminants. Demarcate required walkway area boundaries with 50mm Gaffer tape (low tack). Apply the mixed Pararapide Slip Inhibiting Sealer Coat resin, with a roller or brush, at a rate of 1.2-1.5 kg/m² (see 'Fixing Instructions' for correct mixing procedures). Once material surface has partially cured, use a back rolling technique to achieve an even and textured slip resisting finish. Remove demarcation tape. Note: Standard colour of Pararapide Slip Inhibiting Sealer Coat is Dark Grey (RAL 7043) but any RAL colour is available to special order.				
10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Furniture, Plant Pots etc. – Reinstate**: Reinstate items of furniture etc. to original locations.				
10.3	**Plant and Equipment - Free Standing - Reinstatement**: All free-standing roof mounted plant and items of equipment must be placed on load-spreading slabs on sacrificial pieces of loose laid cap sheet, mineral surface down.				
10.4	**Existing Wall Cladding - Reinstate**: Upon completion of waterproofing details reinstate wall cladding to original locations. The contractor must allow to renew any damaged sections where necessary to match existing. The contractor must further allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Protection of Works. Please refer to 'General Guidance & Requirements'.				

10.5	**Rainwater Downpipes - Existing**: Re-fix all downpipes, supporting brackets and shoes upon completion of the new waterproofing system. Allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Replace any broken or damaged items to match existing.				
10.6	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.7	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				
10.8	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.9	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Detailed Specification: 5

Number 11, 12, 14 & 15 Option 2 Strip to Deck Langley PU Paving Slabs

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.4	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.5	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				
1.6	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.8	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				
1.9	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Removal of Existing Structural Deck and/or Waterproofing:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				

No.	Item	Unit	Qty	Rate	Total
1.10	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.11	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				
1.12	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.13	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see ‘General Guidance & Requirements’ in the appendices of this specification.				

No.	Item	Unit	Qty	Rate	Total
1.14	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Existing Waterproofing System - Removal**: This specification is based on a full strip-up of the existing waterproofing system.				
2.2	**Deck and Substrates - Timber Boarding**: This specification is suitable for application to a substrate of a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Removal of Existing Waterproofing System**: Existing coverings must not be stripped at a rate greater than can be safely re-waterproofed during that working day so as to reduce risk of water ingress to the property.				
2.4	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.5	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.6	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				

3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor must 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 coverings. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				
3.3	**Furniture, Plant Pots etc. - Temporarily Remove**: All free-standing items of furniture etc. to be temporarily removed and stored for reinstallation upon completion of the works.				
3.4	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.5	**Plant & Equipment**: Carefully remove and set aside for re-fixing all free-standing roof mounted plant and items of equipment. No equipment is to be stored during the course of the works on completed areas unless suitable protection has been provided beneath.				
3.6	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				

3.7	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.8	**Existing Waterproofing System - Remove**: Strip and remove to suitable waste containers all component layers of the existing waterproofing system including any insulation and or vapour control layers that may be found, back to but not including the original deck / substrate.				
3.9	**Wall Cladding - Temporary Removal**: To facilitate the re-roofing works. The existing wall cladding is to be temporarily removed, set aside and safely stored for re-use. Contractor to allow for renewal of damaged or degraded sections of cladding, as necessary, to match existing.				
3.10	**Skirtings - Extend**: Should exposed skirtings be insufficient in height, the contractor must make provision to extending them. Extend by providing a treated timber or class 3, exterior grade plywood substrate as necessary to accommodate the minimum required skirting height of 150mm above the finished roof surface level.				
3.11	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.12	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.13	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				
3.14	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				

3.15	**Priming Attachment Layer & Applicable Details - Paratene Self-adhesive AVCL**: Attachment layer and applicable details must be swept clear of all sand, dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				
3.16	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				

3.17	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				
3.18	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				

4	**AIR AND VAPOUR CONTROL**				
4.1	**Attachment Layer - Nailed**: Install Langley HT 180 polyester reinforced attachment membrane, nailed in accordance with BS 8217:2005. Loose lay and nail at maximum 150mm cross centres across the full width and at 50mm centres around the roof perimeters and at all side and end laps. Side and end laps must be a minimum 75mm. Important note: When using HT 180 with self-adhesive membranes the surface of the HT 180 must be thoroughly swept to remove all sand; without this there will be adhesion issues. The surface of the HT 180 must be suitably primed with Langley Spray-on (synthetic rubber) Primer before the application of the self-adhesive membranes.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				

5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				

7.2	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				
7.3	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.4	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.6	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				

8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				
8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				
8.7	**Skirting to Chase**: To prepared chase. The full Langley PU detail system (including reinforcing fleece) to be dressed to the full depth (25mm) of the chase. Allow to cure and point with Langley Gap-Seal Mastic.				

8.8	**Overhangs - Adapted Counter Flashing - Langley TB62 GRP Termination Bar**: For use beneath Copings, Overhangs, Window cills and Door Frames etc, where required to suit site conditions. Install an adapted Langley TB62 GRP face-fixed Termination Bar. Modify by removing the bottom return section by cutting. Fix modified bar over the waterproofing, with the top angled return facing the upstand to form a "V" with the underside of the overhang. Apply a bead of Langley Gap-Seal Mastic to the rear surface before positioning over the membrane. Once aligned, secure in place by mechanically screwing and plug fixing with dome or pan head non-corroding screws at maximum 300mm centres. Infill the “V” with a bead of Langley Gap-Seal Mastic.				
8.9	**Skirting to Cladding - ParaFlash B3**: Install and protect skirtings detail with ParaFlash B3 lead-free counter flashings 150 mm wide. Dress into prepared chase and wedge at 450 mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100 mm and sealed with Langley Gap-Seal Mastic.				
8.10	**Skirtings To Low Thresholds/Cills <150mm - Self Terminating Strap**: To the prepared and primed surface (suitable Pararapide primer subject to adhesion tests). Apply a liberal coating of Pararapide WP Detailing coating system with a brush or roller at a rate of 2.5 – 3.5 kg/m². Roll out and embed 260mm wide Pararapide Fleece. Immediately apply a second coat of Pararapide WP Detailing. The self-terminating strap width should be a minimum of 300mm lapping 150mm onto the previously installed waterproofing system and threshold cill. Pararapide Sealer Coat. Colour: Dark Grey (RAL 7043). To a prepared surface. Apply the mixed resin with a roller or brush at a rate of 0.4 – 0.8 kg/m².If you would like to colour match the primary waterproof coating, a special colour order of RAL 7015 should be placed. For mixing and installation requirements, please refer to the Fixing Instruction and Guidance sections of this specification. **Note:** The Langley PUwaterproofing must be left to fully cure for a minimum of 28 days before the application of the Pararapide WP strap and Sealer Coat. **Important Note:** Details below 150mm will not be covered by the Langley Waterproofing guarantee except for threshold details which meet NHBC Standards 7.1.16 Accessible thresholds criteria.				
8.11	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				

8.12	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
9	**WATERPROOFING COVER**				
9.1	**Geotextile Separating Layer**: Over the waterproofing and below the paving pedestals, loose lay a non-woven geotextile membrane separating layer, by others, density of no less than 250gsm (300gsm recommended). Installation as per manufacturers written instructions. Note: Where a geo-textile is used beneath decking, paving supports etc. it is intended as a separating layer between the supports and the waterproof covering and is only required where the two come into contact. It should be installed to allow free-draining of the areas so that water does not hold and stagnate.				
9.2	**Maintenance, Pedestrian and Terraced Areas - Paving Slabs/Tiles on Freestanding Supports - By Others**: To fully completed waterproof coverings (including inverted roof insulation and WFRL where applicable), install Paving Slabs/ Tiles to CA specification. To be laid loose on third party paving support pads and levelling shims or adjustable pedestals in accordance with the manufacturer's instructions. Size, colour and finish must be agreed with all parties Client / Contract Administrator & Roofing Contractor. NB: Slabs/ Tiling to be a minimum 80kg/m² to avoid floating, on inverted roof systems, and wind uplift				
10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Furniture, Plant Pots etc. – Reinstate**: Reinstate items of furniture etc. to original locations.				
10.3	**Plant and Equipment - Free Standing - Reinstatement**: All free-standing roof mounted plant and items of equipment must be placed on load-spreading slabs on sacrificial pieces of loose laid cap sheet, mineral surface down.				

10.4	**Existing Wall Cladding - Reinstate**: Upon completion of waterproofing details reinstate wall cladding to original locations. The contractor must allow to renew any damaged sections where necessary to match existing. The contractor must further allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Protection of Works. Please refer to 'General Guidance & Requirements'.				
10.5	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.6	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				
10.7	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.8	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Detailed Specification: 6

Number 13 Option 1 Overlay Langley PU Slip Inhabitant

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.4	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.5	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				
1.6	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.8	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				
1.9	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Overlaying Existing Waterproofing/Substrate:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				

No.	Item	Unit	Qty	Rate	Total
1.10	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.11	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				
1.12	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.13	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see ‘General Guidance & Requirements’ in the appendices of this specification.				

No.	Item	Unit	Qty	Rate	Total
1.14	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Overlay of Existing Asphalt**: This specification is based on an overlay of an existing asphalt covering.				
2.2	**Deck and Substrates - Existing Asphalt on Timber Boarding**: This specification is suitable for application to a substrate of an existing prepared asphalt system on a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.4	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.5	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				
3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor is to carry out his own inspection to satisfy himself with regard to the extent of works involved in the preparation of the existing roof coverings and substrates. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				

No.	Item	Unit	Qty	Rate	Total
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				
3.3	**Furniture, Plant Pots etc. - Temporarily Remove**: All free-standing items of furniture etc. to be temporarily removed and stored for reinstallation upon completion of the works.				
3.4	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.5	**Plant & Equipment**: Carefully remove and set aside for re-fixing all free-standing roof mounted plant and items of equipment. No equipment is to be stored during the course of the works on completed areas unless suitable protection has been provided beneath.				
3.6	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				

No.	Item	Unit	Qty	Rate	Total
3.7	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.8	**Walkway Mats - Discard**: Remove and dispose of to suitable waste facilities.				
3.9	**Deck/Substrate - Major Exposed Defects**: Investigate any structural defects or cracks found in the deck/substrate upon exposure and immediately inform Langley Waterproofing and/or the Client CA of findings for further instruction before proceeding to install the new waterproofing system. Any arisings from failing to report defects will not be considered by Langley Waterproofing.				
3.10	**Organic Growth - Remove**: Neutralise any residual bacterial growth with Langley Biowash. Apply with brush, roller or spray at rate of 6-8m² per litre. Allow to dry and sweep off any residue. Further washing will not be necessary.				
3.11	**Contamination - Remove**: Remove any contamination that could impair system adhesion. All affected areas should be swept or power washed. **Note:** Power Washing (max. 2000 psi) Care must be taken to avoid penetrating the existing waterproofing system through any existing defects. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				
3.12	**Loose Coverings and/or Patch Repairs - Remove**: All loose coverings, patch repairs, etc. must be removed and discarded to suitable waste containers.				
3.13	**Existing Asphalt Surface - Preparation**: Warm and smooth out all ridges and blisters. Where necessary, make good any damage to the asphalt surface.				
3.14	**Existing Asphalt Surface - Walkways and Balconies - Additional Requirements**: Contractor Requirement: Prior to application of any primer. Contractor to ensure that any undulations, deflections or poor falls that cannot be overcome by warming and smoothing are reported to both Langley and the CA for further inspection.				

No.	Item	Unit	Qty	Rate	Total
3.15	**Existing Asphalt Details - Repair**: Check integrity of asphalt upstands, skirtings and details generally. Cut back or repair as appropriate to ensure a sound secure base for the new liquid waterproofing system.				
3.16	**Existing Flashings / Termination Bars etc. - Remove**: Carefully remove all existing secondary cover flashings, termination bars etc. and dispose of to suitable approved waste containers / facilities or return to contractors premises for safe disposal.				
3.17	**Wall Cladding - Temporary Removal**: To facilitate the re-roofing works. The existing wall cladding is to be temporarily removed, set aside and safely stored for re-use. Contractor to allow for renewal of damaged or degraded sections of cladding, as necessary, to match existing.				
3.18	**Skirtings - Extend**: Should exposed skirtings be insufficient in height, the contractor must make provision to extending them. Extend by providing a treated timber or class 3, exterior grade plywood substrate as necessary to accommodate the minimum required skirting height of 150mm above the finished roof surface level.				
3.19	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.20	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.21	**Door Threshold/s - Raise Existing (ParaFlash B3)**: The threshold/s must be raised to allow a minimum skirting height of 150mm above the finished level of the main roof surface. Door/s and frame/s to be adapted as necessary and to include all decorative and security finishings. Install new ParaFlash B3, lead-free cover flashing/s, prior to re-fitting the threshold/s. The height of the threshold/s is to be such that the skirting / flashing height is the same as that on either side of the threshold/s. The contractor must confirm with the client / contract administrator the method and materials to be used to facilitate the raising of door threshold/s. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.22	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				

No.	Item	Unit	Qty	Rate	Total
3.23	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				
3.24	**Priming - Asphalt Surface & Detail Substrates - Air and Vapour Control Layer**: Sweep clear of all dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				
3.25	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				

No.	Item	Unit	Qty	Rate	Total
3.26	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				
3.27	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				

No.	Item	Unit	Qty	Rate	Total
4	**AIR AND VAPOUR CONTROL**				
4.1	**Air and Vapour Control Layer - Priming Substrate**: Substrate must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere). **Note:** Bitumen based primer must not be used.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				

No.	Item	Unit	Qty	Rate	Total
5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				

No.	Item	Unit	Qty	Rate	Total
7.2	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				
7.3	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.4	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.6	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				

No.	Item	Unit	Qty	Rate	Total
8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				
8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				

No.	Item	Unit	Qty	Rate	Total
8.7	**Skirting to Chase**: To prepared chase. The full Langley PU detail system (including reinforcing fleece) to be dressed to the full depth (25mm) of the chase. Allow to cure and point with Langley Gap-Seal Mastic.				
8.8	**Overhangs - Adapted Counter Flashing - Langley TB62 GRP Termination Bar**: For use beneath Copings, Overhangs, Window cills and Door Frames etc, where required to suit site conditions. Install an adapted Langley TB62 GRP face-fixed Termination Bar. Modify by removing the bottom return section by cutting. Fix modified bar over the waterproofing, with the top angled return facing the upstand to form a "V" with the underside of the overhang. Apply a bead of Langley Gap-Seal Mastic to the rear surface before positioning over the membrane. Once aligned, secure in place by mechanically screwing and plug fixing with dome or pan head non-corroding screws at maximum 300mm centres. Infill the “V” with a bead of Langley Gap-Seal Mastic.				
8.9	**Skirting to Cladding - ParaFlash B3**: Install and protect skirtings detail with ParaFlash B3 lead-free counter flashings 150 mm wide. Dress into prepared chase and wedge at 450 mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100 mm and sealed with Langley Gap-Seal Mastic.				
8.10	**Skirting to Threshold/Cill - Flashing to Match Main Roof Skirtings**: Install and protect detail abutment skirtings with counter flashings to match main roof area, 150mm wide. Dress into prepared chase below threshold/cill and wedge at 450mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100mm and sealed with Langley Gap-Seal Mastic.				

No.	Item	Unit	Qty	Rate	Total
8.11	**Skirtings To Low Thresholds/Cills <150mm - Self Terminating Strap**: To the prepared and primed surface (suitable Pararapide primer subject to adhesion tests). Apply a liberal coating of Pararapide WP Detailing coating system with a brush or roller at a rate of 2.5 – 3.5 kg/m². Roll out and embed 260mm wide Pararapide Fleece. Immediately apply a second coat of Pararapide WP Detailing. The self-terminating strap width should be a minimum of 300mm lapping 150mm onto the previously installed waterproofing system and threshold cill. Pararapide Sealer Coat. Colour: Dark Grey (RAL 7043). To a prepared surface. Apply the mixed resin with a roller or brush at a rate of 0.4 – 0.8 kg/m².If you would like to colour match the primary waterproof coating, a special colour order of RAL 7015 should be placed. For mixing and installation requirements, please refer to the Fixing Instruction and Guidance sections of this specification. **Note:** The Langley PUwaterproofing must be left to fully cure for a minimum of 28 days before the application of the Pararapide WP strap and Sealer Coat. **Important Note:** Details below 150mm will not be covered by the Langley Waterproofing guarantee except for threshold details which meet NHBC Standards 7.1.16 Accessible thresholds criteria.				
8.12	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
8.13	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				

9	**WATERPROOFING COVER**				
9.1	**Demarcation and Access Walkways - Slip-inhibiting Finish**: Ensure that the Langley PU waterproofing system has cured for a minimum 28 days before overcoating. Ensure surface is clean and free from contaminants. Demarcate required walkway area boundaries with 50mm Gaffer tape (low tack). Apply the mixed Pararapide Slip Inhibiting Sealer Coat resin, with a roller or brush, at a rate of 1.2-1.5 kg/m² (see 'Fixing Instructions' for correct mixing procedures). Once material surface has partially cured, use a back rolling technique to achieve an even and textured slip resisting finish. Remove demarcation tape. Note: Standard colour of Pararapide Slip Inhibiting Sealer Coat is Dark Grey (RAL 7043) but any RAL colour is available to special order.				
10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Furniture, Plant Pots etc. – Reinstate**: Reinstate items of furniture etc. to original locations.				
10.3	**Plant and Equipment - Free Standing - Reinstatement**: All free-standing roof mounted plant and items of equipment must be placed on load-spreading slabs on sacrificial pieces of loose laid cap sheet, mineral surface down.				
10.4	**Existing Wall Cladding - Reinstate**: Upon completion of waterproofing details reinstate wall cladding to original locations. The contractor must allow to renew any damaged sections where necessary to match existing. The contractor must further allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Protection of Works. Please refer to 'General Guidance & Requirements'.				
10.5	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.6	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				

10.7	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.8	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Detailed Specification: 7

Number 13 Option 2 Overlay Langley PU Paving Slabs

No.	Item	Unit	Qty	Rate	Total
1	**SPECIFICATION REQUIREMENTS**				
1.1	**Guarantee**: The following **PU-25-W** 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 ***25 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.				
1.2	**Projects Under CDM**: In relation to this project, under Construction (Design and Management) Regulations 2015 (CDM 2015) ensure that all duties are met as detailed here https://www.hse.gov.uk/construction/cdm/2015/summary.htm				
1.3	**Roof Drainage - Guarantee Requirement - CCTV Inspection**: Prior to works commencing and after practical completion; any existing external rainwater systems or internal outlet drainage points must be checked for blockages and cleared as necessary by the roofing contractor. In addition, it is a requirement that should internal drainage pipes exist, that they are inspected using CCTV technology to confirm their integrity and serviceability prior to the commencement of any works.				
1.4	**Design Note - Langley PU Liquid - Storage**: Store in a cool, dry place (5°C - 25°C), indoors and avoid unnecessary opening of containers. Keep away from any ignition sources. Storage stability – 6 months in unopened cans. Once opened Langley PU will start to cure and a skin will form.				
1.5	**Design Note - Warm Roof**: This specification is based on a warm roof construction. The principal thermal insulation is above the structural deck.				
1.6	**Design Note - Existing Falls**: Overlay of any existing roof system or deck. The new system will follow the existing falls and any deviations will be replicated. As a result, some areas of standing water may occur. However, **please note** the accumulation of ice, snow or ponding water will not have an adverse effect on the Langley products specified. This applies to both the life expectancy and/or long-term performance of the system specified and will not affect, in any way, the guarantee status.				

No.	Item	Unit	Qty	Rate	Total
1.7	**Tapered Insulation**: When preparing a tapered scheme, a flat and level deck is assumed and, although the tapered scheme is intended to provide adequate drainage, some ponding may still occur due to obstructions, membrane lap build-ups or unforeseen deck deflection. **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.				
1.8	**Design Note - Changes & Adjustments**: **Variations 'A' (general):** Any variations must be agreed in writing by both the contract administrator and Langley Waterproofing Systems Ltd. These must be costed and authorised by the client but not be implemented until instructed by the client. **Variations 'B' (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). **Unauthorised Changes 'C' (general):** 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, design or programme delays, etc., resulting from said changes.				
1.9	**Design Note - Approved Document Part B Building Regulations - Compartmented Walls**: **Overlaying Existing Waterproofing/Substrate:** Where the Langley Waterproofing system bridges a compartmented wall, it is expected that the existing underlying system is laid on a substrate or deck rated class A2-s3, D2 or better (non-combustible) to BS EN 13501-1. Some buildings (Hotels, boarding houses, residential colleges, residence halls, hostels, offices, assembly and recreation buildings) no taller than 15m are permitted to have a roof deck classified as Euroclass B-s3, D2 or worse (combustible). However, to comply with Approved Document Part B, additional fire stopping will be required underneath the roof deck. Because of the reduced resilience to fire, thermoplastic insulation materials (XPS, EPS) cannot be used within the 1500mm zone on either side of the compartment wall. Double-skinned insulated roof sheeting, such as standing seam or profile metal sheet roofing, should incorporate a band of material rated class A2-s3, D2 or better, a minimum of 300mm in width, centred over the wall. **Note:** Proposed specification and design will be subject to LABC (Local Authority Building Control) or assigned AI (Approved Inspector) approval before works can commence on-site. Where appropriate, Langley Waterproofing can offer support and guidance to assist application.				

No.	Item	Unit	Qty	Rate	Total
1.10	**Roof Structure - Disclaimer**: It is deemed the responsibility of the Client Representative, Contractor and/or Property Owner to give due consideration towards the ability of the existing roof deck accepting any additional loadings imposed by the application of the new waterproofing system proposed within this specification. Langley Waterproofing Systems Ltd will not be held responsible or accept any liability or associated costs should structural defects or structural failure occur.				
1.11	**Electronic Roof Integrity Test & Root Protection (Compulsory For Buried Systems) - Disclaimer**: Should the roof waterproofing system receive any subsequent coverings such as an inverted roof system, green roof system, paving slabs, ballast, decking, or similar, an electronic leak detection (ELD) test must be carried out by a qualified expert to confirm the waterproofing system integrity. You must also ensure an ELD is completed if the roof will receive a PV panel installation. You must ensure a record of this ELD test, and any repairs completed, is shared with Langley. Where appropriate, a root resistant membrane must be installed to protect the Langley waterproofing system from root penetration.				
1.12	**Fire Risk - Langley PU System**: This specification has been formulated on the basis that minimal hot works are required. Should the contractor/installer have reservations about any aspect of the specification proposal, or if during the course of the works any unforeseen items are discovered that present an actual or potential fire risk, they should contact Langley Waterproofing Systems Ltd immediately so that safer methods can be agreed and implemented which do not compromise the integrity of the specification and/or its guarantees. Notwithstanding the foregoing, the contractor/installer is reminded that they have a duty of care and responsibility to carry out their own assessment of the proposed works with regard to the potential fire risk, and introduce working practices that takes any such risks into account.				
1.13	**Fire Risk - Drying Out**: In the event of the roof being/becoming wet and drying out is necessary, the use of gas torches is not recommended and should be avoided. In all cases Safe2Torch guidelines should be followed. Standing water should be swept to the nearest outlets with a broom or squeegee (care must be taken to avoid debris blocking outlets). The remaining moisture should be soaked up using mops or dry rags and the surface left to dry out naturally. To speed up the process, specialist equipment is commercially available, see ‘General Guidance & Requirements’ in the appendices of this specification.				

No.	Item	Unit	Qty	Rate	Total
1.14	**Langley Detailed Drawings**: This specification is to be read in conjunction with detailed drawings issued and supplied by Langley Waterproofing. Should the contractor at any point find discrepancies between the issued specification and issued drawings, it is required that the specification takes precedence in all cases, unless otherwise notified and approved. No additional costs or liability arising from failure to follow specification or notifying Langley Waterproofing Systems Ltd of any discrepancies found in good time prior to commencement of works will be considered.				
2	**SCOPE OF APPLICATION**				
2.1	**Overlay of Existing Asphalt**: This specification is based on an overlay of an existing asphalt covering.				
2.2	**Deck and Substrates - Existing Asphalt on Timber Boarding**: This specification is suitable for application to a substrate of an existing prepared asphalt system on a timber boarded roof deck, not exceeding 5° from the horizontal.				
2.3	**Day/Night Joints**: The contractor must ensure at the end of each working day or period, that any exposed membranes or substrates that are susceptible to damage through water ingress are sealed with a Langley system compatible membrane to ensure complete water tightness. No loose laid membranes or other such covers are permitted.				
2.4	**U-value - Tapered Insulation**: To comply with Part L of the current Building Regulations, the average thickness of the scheme included in this specification is calculated in accordance with Annex E of EN ISO 6946: 2017. This is to ensure that the effective thickness of the scheme is sufficient to meet the target U-value of 0.16W/m²K.				
2.5	**Contractors Note - Tapered Insulation**: The specified tapered insulation scheme is based on the assumption that the contours of the underlying substrate reflects that of the existing roof coverings. In the event of any abnormalities being uncovered, it is the responsibility of the Roofing Contractor to report these immediately to Langley so that any amendments to the insulation scheme that may be necessary can be made. This may result in a delay. No claims arising from any additional costs incurred from such delays will be entertained by Langley Waterproofing Systems Ltd.				
3	**PREPARATION**				
3.1	**Contractor Preparation Note**: The contractor is to carry out his own inspection to satisfy himself with regard to the extent of works involved in the preparation of the existing roof coverings and substrates. No claims arising from failure to do so will be considered by Langley Waterproofing Systems Ltd.				

No.	Item	Unit	Qty	Rate	Total
3.2	**General Substrate Preparation**: All substrates must be: clean, dry, free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material including, but not limited to, paint, moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of the proposed waterproofing system. All substrates should have adhesion tests undertaken to determine if additional substrate preparation is required. Please contact Langley Technical if assistance is required.				
3.3	**Furniture, Plant Pots etc. - Temporarily Remove**: All free-standing items of furniture etc. to be temporarily removed and stored for reinstallation upon completion of the works.				
3.4	**Damp-proof Courses / Cavity Trays - Requirement**: Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.5	**Plant & Equipment**: Carefully remove and set aside for re-fixing all free-standing roof mounted plant and items of equipment. No equipment is to be stored during the course of the works on completed areas unless suitable protection has been provided beneath.				
3.6	**Wall Mounted Plant, Cables / Cable Trays / Conduits etc - Reposition (above skirting height)**: All wall mounted services and/or plant that will prevent facilitation of the works or will penetrate the new skirting heights. Raised and/or relocate. Allowance must be made for the following items as necessary: 1. Disconnection, de-gassing and re-connection, adaptation of all pipework, supports, connections, electrical connections and cabling. 2. Reposition (above skirting height) or relocate to suitable locations as required. Allow for all adaptions/adjustments and fixings required and re-connection. All in accordance with client's detailed requirements. 3. Certify as fully serviceable on completion.				

No.	Item	Unit	Qty	Rate	Total
3.7	**Existing Outlets - Refurbish with ParaFurb Outlets**: Make ready to accept new ParaFurb Refurbishment Outlets (detailed elsewhere). Where necessary, cut back and remove sufficient existing waterproofing from around the outlets and as required from the surrounding area to allow for correct installation. **Important Note:** ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Prior to ParaFurb Outlets being installed, any existing refurbishment outlets or lead sleeve inserts must first be removed and surrounding substrates made good.				
3.8	**Walkway Mats - Discard**: Remove and dispose of to suitable waste facilities.				
3.9	**Deck/Substrate - Major Exposed Defects**: Investigate any structural defects or cracks found in the deck/substrate upon exposure and immediately inform Langley Waterproofing and/or the Client CA of findings for further instruction before proceeding to install the new waterproofing system. Any arisings from failing to report defects will not be considered by Langley Waterproofing.				
3.10	**Organic Growth - Remove**: Neutralise any residual bacterial growth with Langley Biowash. Apply with brush, roller or spray at rate of 6-8m² per litre. Allow to dry and sweep off any residue. Further washing will not be necessary.				
3.11	**Contamination - Remove**: Remove any contamination that could impair system adhesion. All affected areas should be swept or power washed. **Note:** Power Washing (max. 2000 psi) Care must be taken to avoid penetrating the existing waterproofing system through any existing defects. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				
3.12	**Loose Coverings and/or Patch Repairs - Remove**: All loose coverings, patch repairs, etc. must be removed and discarded to suitable waste containers.				
3.13	**Existing Asphalt Surface - Preparation**: Warm and smooth out all ridges and blisters. Where necessary, make good any damage to the asphalt surface.				
3.14	**Existing Asphalt Surface - Walkways and Balconies - Additional Requirements**: Contractor Requirement: Prior to application of any primer. Contractor to ensure that any undulations, deflections or poor falls that cannot be overcome by warming and smoothing are reported to both Langley and the CA for further inspection.				

No.	Item	Unit	Qty	Rate	Total
3.15	**Existing Asphalt Details - Repair**: Check integrity of asphalt upstands, skirtings and details generally. Cut back or repair as appropriate to ensure a sound secure base for the new liquid waterproofing system.				
3.16	**Existing Flashings / Termination Bars etc. - Remove**: Carefully remove all existing secondary cover flashings, termination bars etc. and dispose of to suitable approved waste containers / facilities or return to contractors premises for safe disposal.				
3.17	**Wall Cladding - Temporary Removal**: To facilitate the re-roofing works. The existing wall cladding is to be temporarily removed, set aside and safely stored for re-use. Contractor to allow for renewal of damaged or degraded sections of cladding, as necessary, to match existing.				
3.18	**Skirtings - Extend**: Should exposed skirtings be insufficient in height, the contractor must make provision to extending them. Extend by providing a treated timber or class 3, exterior grade plywood substrate as necessary to accommodate the minimum required skirting height of 150mm above the finished roof surface level.				
3.19	**Redundant Chases - Make Good**: Rake out and prepare any redundant chase lines. In-fill with sand and cement mortar, flush with wall face.				
3.20	**Upstands - New Chase**: In preparation of a new cover flashing the contractor is to cut a new chase to a minimum 25mm depth and at a minimum height of 150mm above the intended finished roof level surface. Brush clean and prime with appropriate primer to seal substrate.				
3.21	**Door Threshold/s - Raise Existing (ParaFlash B3)**: The threshold/s must be raised to allow a minimum skirting height of 150mm above the finished level of the main roof surface. Door/s and frame/s to be adapted as necessary and to include all decorative and security finishings. Install new ParaFlash B3, lead-free cover flashing/s, prior to re-fitting the threshold/s. The height of the threshold/s is to be such that the skirting / flashing height is the same as that on either side of the threshold/s. The contractor must confirm with the client / contract administrator the method and materials to be used to facilitate the raising of door threshold/s. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.				
3.22	**Soil Vent Pipe/s - Extend**: Extend where necessary. Collar or pipe sleeve/s must be a minimum of 150mm above the finished roof surface. **Note:** Extension pipe/s must be fixed inside the existing pipe/s.				

No.	Item	Unit	Qty	Rate	Total
3.23	**Presented Substrate - Clean**: Prior to installation of the Langley PU system applicable substrates should be clean and any contamination that could impair system adhesion removed. Any contaminated areas should be swept or power washed as appropriate. **Note:** Power Washing (max. 2000 psi unless stated differently elsewhere within this specification) - care must be taken to avoid penetrating the substrate or any existing waterproofing system, where present, through cracks/fissures etc. Substrates should be dry prior to installation of proposed waterproofing system.				
3.24	**Priming - Asphalt Surface & Detail Substrates - Air and Vapour Control Layer**: Sweep clear of all dirt, debris and loose material. Prime with Langley Spray-on (synthetic rubber) Primer and allow to dry. **Note:** Bitumen based primer must not be used.				
3.25	**Design Note - Priming Insulation - Paratene Self-adhesive Carrier Membrane**: Surface of insulation must also be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				

No.	Item	Unit	Qty	Rate	Total
3.26	**Priming - Metal/Metallic Surfaces Receiving Direct Application of Langley PU System Only**: **All ferrous metal surfaces such as steel, cast iron and wrought iron:** Ensure loose rust and dirt are removed prior to application of primer. Bare metal should be cleaned to an St2 standard (thorough hand and power tool cleaning with wire brush, surface to have a faint metallic sheen) and washed down to remove all loose contaminants. Mix both component parts of the Langley PU Metal Primer together in the ratio that they are supplied. A test area should be undertaken to confirm adhesion requirements prior to full application. Note: For powder coated metal surfaces, adhesion tests should be undertaken to determine if additional surface preparation is required. Adhesion test area to be a minimum 300x300mm Apply with brush, roller or spray Langley PU Metal Primer. Application Rate: Approximately 7m² per litre. Allow to cure for at least 24 hours before over coating. **Corroded metal:** As above but surfaces should be abraded to an St3 standard (very thorough hand and power tool cleaning with wire brush, surface to have a pronounced metallic sheen) prior to application of metal primer. **Non-ferrous metals including lead, zinc, copper, aluminium and existing galvanised steel:** Clean and abrade surface prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **New galvanised steel:** Clean and abrade surfaces, wash with Mordant T-Wash prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. **Plastisol Coated Metal:** Clean surface to remove any contamination prior to waterproofing application. Primer should not be required however an adhesion test should be undertaken first to confirm this. Important note: At no time should surfaces be cleaned with soap detergent as this can leave residue which would impair adhesion.				
3.27	**Reactivation of Existing Coatings - Where Required**: Where delays exceed 4 days, prior to the application of new coatings, or if coatings are rained upon for a sustained period of time, a new adhesion test should be undertaken to determine if the coatings require additional preparation work. If adhesion tests fail then Langley Technical should be contacted for guidance on how best to proceed.				

No.	Item	Unit	Qty	Rate	Total
4	**AIR AND VAPOUR CONTROL**				
4.1	**Air and Vapour Control Layer - Priming Substrate**: Substrate must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere). **Note:** Bitumen based primer must not be used.				
4.2	**Air and Vapour Control Layer - Paratene Self-Adhesive Membrane**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to a primed surface. See Fixing Instructions. Side and End Laps: 80mm. **Note:** Laps must also be primed. At upstands, membrane to finish a minimum 50mm above top of insulation. In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
5	**INSULATION**				
5.1	**Insulation - Type & Thickness To Be Confirmed**: The specified insulation type and appropriate thickness is to be confirmed subject to project specific U-value calculations.				
5.2	**Parafoam Ultra Tapered Board Insulation - Field Area**: Install Tapered Parafoam Ultra Polyisocyanurate (PIR) roof insulation board. CFC/HCFC-free with zero ODP. Set out in accordance with tapered scheme drawings supplied by Langley Waterproofing Systems Ltd. Boards to be close butted with staggered joints.				
5.3	**Parafoam Ultra Tapered Insulation Scheme - Sumps to Outlet Positions**: Sumps to be a minimum of 500mm x 500mm square around outlet position. Form with Parafoam Ultra Polyisocyanurate (PIR) flat board insulation. Board thickness in accordance with Tapered Scheme drawing. A Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.4	**Parafoam Ultra Insulation - PU Attachment**: To prepared surface. Bond insulation with LangStik Solvent Free PU Adhesive. Surface of substrate must be swept clear of all dirt, debris and loose material, prior to application of the adhesive. Boards to be laid close butted with staggered joints. **Note:** For further information, please refer to 'Fixing Instructions' section of this specification.				
5.5	**Parafoam Ultra Insulation - Dual Layer Applications**: Where thicknesses in excess of 150mm are specified the contractor must allow for the installation of a second layer of boards and the additional adhesive required. All boards to be laid close butted with staggered joints with the top layer off-set from the preceding one.				

No.	Item	Unit	Qty	Rate	Total
5.6	**Insulation - Changes of Levels - Metal Hard Edge**: Langley Metal Hard Edge to be fixed to all exposed insulation edges. Bond to insulation with either low foaming PU adhesive or strapping with suitable fully bonded underlay membrane.				
5.7	**Priming - Hard Edges to Insulation**: All hard edges, metal and/or timber, must be primed with Langley Spray-on (synthetic rubber) Primer and allow to dry.				
5.8	**Surface Condensation/Moisture - Application Warning**: Contractor to ensure that the surface of the insulation is free of surface condensation/moisture prior to the application of the waterproofing system. **Important Note**: Surface condensation/moisture is particularly prevalent during cold months and during extreme hot weather.				
5.9	**Priming Insulation - Paratene Self-Adhesive Carrier Membrane**: Surface of Parafoam Ultra insulation. Must be primed with Langley Spray-on (synthetic rubber) Primer and allowed to dry. **Note:** Bitumen based primer must not be used.				
6	**WATERPROOFING - UNDERLAYS**				
6.1	**Design Note - Carrier Membrane - Priming Insulation**: Insulation surface for carrier membrane must be primed with Langley Spray-on (synthetic rubber) Primer (detailed elsewhere).				
6.2	**Carrier Membrane - Paratene Self-adhesive - To Insulation**: Install Paratene, aluminium foil faced, glass reinforced, bitumen membrane. Top Face: Polyester coated reinforced aluminium foil. Underside: Siliconised peel-off film. Fixing: Self-adhesive. Fully bond to (primed) surface of the insulation. Fixing Method: See Fixing Instructions. Side and end Laps: 80mm. **Note:** Laps must also be primed. At upstands, turn up membrane a minimum 50mm. **Note:** In all cases, primer must be Langley Spray-on (synthetic rubber) Primer (bitumen based primer must not be used).				
7	**WATERPROOFING - COVERINGS**				
7.1	**Detailing Generally**: All skirtings, details, penetrations, etc. to be waterproofed prior to the main area (see Detail Section).				
7.2	**Langley Winter Accelerator**: If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat. Shake 250g pack of Langley Winter Accelerator well, add to 12.5 litres of Langley PU Embedment Coat or Top Coat and stir thoroughly. Refer to fixing instructions for typical curing times				

No.	Item	Unit	Qty	Rate	Total
7.3	**Embedment Coat (25yr System)**: Mix Langley PU Embedment Coat thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 1.25 litres/m². Colour: Red **Note:** For installation requirements and handling of the Langley PU Embedment Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
7.4	**Embedment Coat Reinforcement**: Embed Langley PU GFM Reinforcement, with a roller, into the the wet embedment coat. The roller must be fully loaded with embedment coat. Under no circumstances should a dry roller or brush be used. Roll in, leaving no wicks. Ensure coating is forced through the mat removing all trapped air pockets. Allow to dry. Laps in reinforcement mat to be a minimum 50mm. **Note:** For installation requirements and handling of the Langley GFM Reinforcement please refer to the Fixing Instruction and Guidance sections of this specification.				
7.5	**Embedment Coat - Inspect**: When the embedment coat is dry, check for wicks. Any that are standing proud must be removed by cutting and sanding down.				
7.6	**Top Coat**: Mix thoroughly to a consistent colour. Apply a continuous and even coat by brush or roller, at the rate of 0.75 litres/m² Colour: Slate Grey (RAL 7015) **Note:** For installation requirements and handling of the Langley PU Top Coat please refer to the Fixing Instruction and Guidance sections of this specification.				
8	**DETAILS**				
8.1	**Detail Skirtings & Upstands - Requirement**: All detail skirtings and upstands must be a minimum of 150mm above the finished horizontal roof surface level, including any paving, ballast, green roof coverings etc.				
8.2	**Detailing General Requirement - Langley PU**: Details should be completed prior to main field areas. Waterproofing detail work must follow the same application guidance set out in the above waterproofing section. Details to be fully reinforced with GFM Reinforcement. **Note:** For installation requirements and handling of the Langley PU Embedment or Top Coats please refer to the Fixing Instruction and Guidance sections of this specification.				

No.	Item	Unit	Qty	Rate	Total
8.3	**Drainage - Outlet Sumps**: At change in level from field area to sump the Paratene carrier membrane should be dressed over the hard edge, down the face of the field area insulation and lap onto the Paratene AVCL to form a bund. An additional section of Paratene carrier membrane should also be dressed across the top of the sump insulation, up the change in level and lap onto field area carrier membrane by a minimum 75mm on either side of the sump. At the outlet opening the carrier membrane should be dressed down the face of the insulation and lap onto the AVCL. Side and end laps to be a minimum 75mm. Langley PU waterproofing system to be continuous throughout.				
8.4	**Internal Drainage - ParaFurb Outlets**: Install to suit diameter of downpipes, ParaFurb Outlet. Fully bond bitumen flange membrane to previously installed Paratene carrier membrane or appropriate substrate. To a primed surface apply the full Langley PU system over the flange and dressed into the outlet opening.				
8.5	**Where Design of Existing Outlets Preclude the Use of ParaFurb Outlets**: Remove grating, clamping ring and existing waterproofing. Clean and prime flange and bowl. Fully bond waterproofing layers to the flanges and openings to form watertight seals. Secure with clamping rings and re-fit grating. Prior to work continuing a method of waterproofing must be demonstrated, on site, with a working example, one for each type of outlet, for approval by Langley Waterproofing Systems Ltd. Once approved, the same method must be used for all subsequent outlets.				
8.6	**Counter Flashing - Code 4 Lead**: Install and protect detail abutment skirtings with Code 4 lead counter flashings. Dress lead into a prepared chase and wedge at 450mm centres with lead clips or mechanical fixings to suit chase conditions. Point with Langley Gap-Seal Mastic. Exposed Vertical Edges protect with vertical stepped flashings. All lead work must be fixed in accordance with LDA/LSA recommendations. Flashings must not exceed 1.5m in length with laps being a minimum of 100mm. Clips to be spaced along the free edge to suit the exposure conditions.				
8.7	**Skirting to Chase**: To prepared chase. The full Langley PU detail system (including reinforcing fleece) to be dressed to the full depth (25mm) of the chase. Allow to cure and point with Langley Gap-Seal Mastic.				

No.	Item	Unit	Qty	Rate	Total
8.8	**Overhangs - Adapted Counter Flashing - Langley TB62 GRP Termination Bar**: For use beneath Copings, Overhangs, Window cills and Door Frames etc, where required to suit site conditions. Install an adapted Langley TB62 GRP face-fixed Termination Bar. Modify by removing the bottom return section by cutting. Fix modified bar over the waterproofing, with the top angled return facing the upstand to form a "V" with the underside of the overhang. Apply a bead of Langley Gap-Seal Mastic to the rear surface before positioning over the membrane. Once aligned, secure in place by mechanically screwing and plug fixing with dome or pan head non-corroding screws at maximum 300mm centres. Infill the “V” with a bead of Langley Gap-Seal Mastic.				
8.9	**Skirting to Cladding - ParaFlash B3**: Install and protect skirtings detail with ParaFlash B3 lead-free counter flashings 150 mm wide. Dress into prepared chase and wedge at 450 mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100 mm and sealed with Langley Gap-Seal Mastic.				
8.10	**Skirting to Threshold/Cill - Flashing to Match Main Roof Skirtings**: Install and protect detail abutment skirtings with counter flashings to match main roof area, 150mm wide. Dress into prepared chase below threshold/cill and wedge at 450mm centres with stainless steel clips provided. Point with Langley Gap-Seal Mastic. Side laps to be a minimum of 100mm and sealed with Langley Gap-Seal Mastic.				
8.11	**Skirtings To Low Thresholds/Cills <150mm - Self Terminating Strap**: To the prepared and primed surface (suitable Pararapide primer subject to adhesion tests). Apply a liberal coating of Pararapide WP Detailing coating system with a brush or roller at a rate of 2.5 – 3.5 kg/m². Roll out and embed 260mm wide Pararapide Fleece. Immediately apply a second coat of Pararapide WP Detailing. The self-terminating strap width should be a minimum of 300mm lapping 150mm onto the previously installed waterproofing system and threshold cill. Pararapide Sealer Coat. Colour: Dark Grey (RAL 7043). To a prepared surface. Apply the mixed resin with a roller or brush at a rate of 0.4 – 0.8 kg/m².If you would like to colour match the primary waterproof coating, a special colour order of RAL 7015 should be placed. For mixing and installation requirements, please refer to the Fixing Instruction and Guidance sections of this specification. **Note:** The Langley PUwaterproofing must be left to fully cure for a minimum of 28 days before the application of the Pararapide WP strap and Sealer Coat. **Important Note:** Details below 150mm will not be covered by the Langley Waterproofing guarantee except for threshold details which meet NHBC Standards 7.1.16 Accessible thresholds criteria.				

No.	Item	Unit	Qty	Rate	Total
8.12	**Penetrations - Soil Vent Pipes**: Prime vent pipe with Langley PU Metal Primer and allow to dry. Langley PU liquid waterproofing membranes must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
8.13	**Penetrations - Pipes Generally**: Undertake an adhesion test to determine if a primer is required. Where necessary prime the pipe with the appropriate primer and allow to dry. Langley PU liquid waterproofing membranes, fully reinforced with GFM reinforcement, must extended up the pipe by a minimum of 150mm above the finished level of the roof surface. Protect finished detail with a suitable weathering collar or a jubilee clip and Langley Gap-Seal Mastic.				
9	**WATERPROOFING COVER**				
9.1	**Geotextile Separating Layer**: Over the waterproofing and below the paving pedestals, loose lay a non-woven geotextile membrane separating layer, by others, density of no less than 250gsm (300gsm recommended). Installation as per manufacturers written instructions. Note: Where a geo-textile is used beneath decking, paving supports etc. it is intended as a separating layer between the supports and the waterproof covering and is only required where the two come into contact. It should be installed to allow free-draining of the areas so that water does not hold and stagnate.				
9.2	**Maintenance, Pedestrian and Terraced Areas - Paving Slabs/Tiles on Freestanding Supports - By Others**: To fully completed waterproof coverings (including inverted roof insulation and WFRL where applicable), install Paving Slabs/ Tiles to CA specification. To be laid loose on third party paving support pads and levelling shims or adjustable pedestals in accordance with the manufacturer's instructions. Size, colour and finish must be agreed with all parties Client / Contract Administrator & Roofing Contractor. NB: Slabs/ Tiling to be a minimum 80kg/m² to avoid floating, on inverted roof systems, and wind uplift				
10	**COMPLETION**				
10.1	**Guarantee Requirement - Final Inspection**: In accordance with our guarantee requirements, Langley Waterproofing Systems Ltd are to be notified once all works are complete. A final inspection will then be undertaken by us and the contractor must ensure that safe working access is provided.				
10.2	**Furniture, Plant Pots etc. – Reinstate**: Reinstate items of furniture etc. to original locations.				

No.	Item	Unit	Qty	Rate	Total
10.3	**Plant and Equipment - Free Standing - Reinstatement**: All free-standing roof mounted plant and items of equipment must be placed on load-spreading slabs on sacrificial pieces of loose laid cap sheet, mineral surface down.				
10.4	**Existing Wall Cladding - Reinstate**: Upon completion of waterproofing details reinstate wall cladding to original locations. The contractor must allow to renew any damaged sections where necessary to match existing. The contractor must further allow for any modifications / adaptations necessary to accommodate any raised levels presented by the new roofing system. Protection of Works. Please refer to 'General Guidance & Requirements'.				
10.5	**Sacrificial Layers - Free-standing Plant / Handrails etc**: All freestanding items. Install a sacrificial layer of cap sheet (granule surface down) under all load spreading supports / pads.				
10.6	**Rainwater Outlets - ParaFurb Outlets**: Check for blockages. Clear if necessary and leave in a free-running condition. Ensure Ribseal (where present) is tightly secured to form correct pressure seal to pipe/s for applicable units. Ensure all supplied leaf guards are in place and tightly secured.				
10.7	**Completed Roof Surface - General**: Ensure visual inspection of all laps is undertaken to confirm integrity of system prior to final guarantee inspection. Sweep, clean and remove debris to suitable waste container.				
10.8	**Arisings from Works**: Remove from site all arisings for return to contractor storage or safe disposal.				

Schedule of Products

Langley Spray-on Primer - Canister
Synthetic rubber primer. Supplied as a canister (450mm x 330mm). Packaged in a cardboard carry box. Canister content: 18.5 kg. Gross canister weight: 24.5 kg
Coverage Rates: Self-adhered systems – up to 150m² (0.12m²/kg) Torch-on system – up to 250m² (13.5m²/kg). Other components required and supplied separately include: Applicator gun and 3m hose (re-usable). Spray-tip and Spray Cleaner

Langley Biowash
Single component pack, water based fungicidal and biocidal treatment. Approximate Coverage Rates: 6-8 m² Per Litre (30-40 m² per can). Supplied in 5 Litre cans.

Langley PU Metal Primer
Langley PU Metal Primer is a two-component, low odour high, performance anti-corrosive epoxy primer.
To be used to prime metal substitutes prior and applying Langley PU Embedment coat.
2 component parts are to be mixed at a ratio of 1.75 parts A / 0.75 part B
Supplied in 2.5 litre kits
Approximate Coverage Rates: 7 m²/litre (17.5 m²/kit).

Langley PU Solvent
Solvent for reactivating Langley PU embedment coat Approximate Coverage rate of up to : 20m² per litre (100m² per can). Supplied in 5 litre cans.

Paratene - Self-adhesive AVCL / Carrier Membrane Roll Size: 40m x 1.080m
Cold-applied, self-adhesive glass reinforced bituminous membrane. 0.60mm thick.
Top Face: Polyester coated reinforced aluminium foil.
Underside: Siliconised peel-off film.
Nominal Weight: 0.6 kg/m². 26 kg/roll.

Parafoam Ultra Tapered Insulation
Parafoam Ultra Tapered Polyisocyanurate (PIR) roof insulation boards. CFC/HCFC-free with zero ODP. Both Faces: Perforated mineral coated glass fibre tissue. Board Size: Variable to scheme. Cut-to-falls scheme drawings are supplied by Langley Waterproofing Systems Ltd.

Langley Metal Hard Edge
Galvanised Steel Angle. 3m lengths x 50mm x 50mm. Thickness 0.7mm.

Langley HT180 Attachment Layer - Roll Size: 20m x 1m
Polyester-reinforced bituminous membrane. Both faces: Sanded. Thickness 1.8 mm. Nominal Weight: 36kg/roll. (1.87 kg/m²).

ParaRange Modular Rooflights and Kerbs
All Langley Waterproofing Systems Ltd Rooflights and ParaKerb Upstands are BBA accredited. Accompanying Rooflight Schedule will be supplied by Langley Waterproofing Systems Ltd.

ParaFlash B3
Non-lead Flashing System. SBS elastomeric bitumen reinforced with a core of flattened, expanded aluminium mesh. Top Face: charcoal coloured granules. Underside: polypropylene film. Roll Size: 12m (length) x 150mm (width). Nominal Thickness: 3.5mm. Nominal Weight per Roll: 7.2Kg. Nominal Weight per m²: 4Kg. Each roll is supplied with 25 No. stainless steel chase retaining clips. Chase mastic sealant (Langley Gap-Seal Mastic supplied separately.

LangStik SF Can - Solvent-free PU Insulation Adhesive
Single component moisture curing solvent free polyurethane adhesive. Packaging: 6.5kg can. Nominal Coverage: 35m²/can.

LangStik SF Canister - Solvent-free PU Insulation Adhesive
Single component moisture curing solvent free polyurethane adhesive. Container: 18.5 kg / metal canister. Labelling: LangStik SF Canister. Nominal coverage, up to 350 m² / canister.

ParaFurb Outlets
Internal rainwater outlet with 500mm x 500mm flexible SBS felt membrane attachment flange.
Spigot Depth as Standard: 400mm.
Available Sizes:

- Drain Diameter 50mm - To suit existing pipe sizes of 59mm-75mm complete with EPDM rubber Ribseal and aluminium turbine leaf guard
- Drain Diameter 62mm - To suit existing pipe sizes of 71mm-88mm complete with EPDM rubber Ribseal and aluminium turbine leaf guard
- Drain Diameter 75mm - To suit existing pipe sizes of 85mm-106mm complete with EPDM rubber Ribseal and aluminium turbine leaf guard
- Drain Diameter 95mm - To suit existing pipe sizes of 103mm-109mm complete with EPDM rubber Ribseal and aluminium turbine leaf guard
- Drain Diameter 145mm - To suit existing pipe sizes of 150mm-198mm complete with EPDM rubber Ribseal and aluminium turbine leaf guard

Additional diameter, spigot sizes and accessories are available upon request.

Langley TB62 GRP Termination Bar
Dimensions: 62mm Deep x 3m Length
Available Colours: White - Dove Grey - Charcoal

Exterior Grade Plywood
Conforming to the relevant requirements of BS EN 636:2012 + A1:2015 Class 3 and marked BS EN 636-3. To be sourced direct from supplier.

Pre-treated Timber
As recommended in BS 5268: Part 5. The treatment should be compatible with the use of bitumen-based products. To be sourced direct from supplier.

Langley Gap-Seal Mastic
For use with ParaFlash B3, termination bars and lead counter flashings to close joints. Low modulus neutral cure silicone mastic sealant. Approximately 6Lm for 10mm x 10mm bead. Supplied in 310ml tube cartridges. Colour: Black.

Code 4 Rolled Lead Sheet
For use as counter flashings. To be sourced directly from a supplier of the contractors choice but must conform to BS EN 12588: 1999.

Clout Nails - Extra Large Headed
Minimum 20mm long galvanised steel to BS 1202: Part 1. To be sourced direct from supplier.

Langley PU Winter Accelerator
Langley PU Accelerator is a catalyst to be used with Langley PU Embedment Coat and Top Coat.
If application of waterproofing system is undertaken from September to March or if the ambient temperature falls below 10°C then Langley Winter Accelerator must be added to Langley PU Embedment Coat and Top Coat.
Pack size: 250g

Store in a cool, dry place (5°C – 25°C) away from ignition sources. Stability – 12 months if unopened.

Langley PU Embedment Coat
Single component pack, cold applied, elastomeric liquid polyurethane coating.
Colour: Red
Supplied in 12.5 litre packs
Approximate Coverage (25 year system): 10m² per pack (1.25 litres/m² application rate)

Langley GFM Reinforcement
An emulsion bonded, random weave 225 g/m² glass fibre mat for use within the Langley PU Systems.
Dimensions: Roll 0.95x52.7m.
Nominal Weight: Approximately 11.25kg per roll.

Langley PU Top Coat
Single component pack, cold applied, elastomeric liquid polyurethane coating.
Colour: Slate Grey (RAL 7015)
Supplied in 12.5 litre packs
Approximate Coverage: 16.6 m² per pack (0.75 litres/m²)

Pararapide Asphalt Primer
A 2 component, solvent-free resin primer. Colour: White. Approximate coverage rate: 0.50 kg/m² (20 m² per drum).
Packaging. 5 & 10 kg drum.

Pararapide Masonry Primer
A two component, solvent-free PMMA resin primer. Colour: White. Approximate coverage rate: 0.50 kg/m² (20 m² per drum).
Packaging. 10 kg drum (catalyst sold separately).

Pararapide Metal Primer
A single component, solvent-free, acrylate based primer. Colour: Grey. Approximate coverage rate: 0.20 kg/m² (5m² per can).
Packaging. 1 kg can.

Pararapide WP Detailing
A two component, solvent-free, high viscosity, thixotropic PMMA based waterproofing resin. Colour: Grey (RAL 7043).
Minimum coverage rate: 3.00 kg/m² (1.6 m² per 5 kg tin) (3.3 m² per 10 kg drum) (8.3 m² per 25 kg drum).
Packaging. 5 kg tin. 10 kg or 25 kg drums (catalyst sold separately).

Pararapide Sealer - Dark Grey
A two component, solvent-free, PMMA-based, pigmented (RAL 7043), sealing resin.
Approximate coverage rate: On smooth surface – 0.5 kg/m² (20 m²/drum).
On quartz granule finished surface - 0.60 kg/m² (16.6 m² per 10 kg drum).
Packaging. 10 kg drum (catalyst sold separately).

Pararapide Slip Inhibiting Sealer Coat
A two component, solvent-free, PMMA-based, pigmented (default colour RAL 7043, but any RAL colour available on special order), sealing resin with an integral slip resisting particle.

Approximate coverage rate: On smooth surface – 1.2-1.5 kg/m² (15 m²/drum).

Packaging. 15 kg drum (catalyst sold separately).

Pararapide Catalyst
Oxygen-rich, powdered, peroxide based compound. Colour: White.
Packaging. 0.10 kg plastic bag. Usage (normal conditions) 1 x bag = 2%. (ie. 1 bag per 5 kg of resin).
Packaging. 0.10 kg plastic bag.

Pararapide Fleece 0.26 m
A synthetic fibre reinforcement fleece. 110 g/m². Colour: White.
Packaging. Roll 0.26 x 50 m (13 m²/roll).

Pararapide De-Bonding Tape
A self-adhesive, multi-purpose, fabric reinforced cloth tape.
Supplied in 50 m rolls: 50 mm or 100 mm wide.

Fixing Instructions

Langley Spray-on Primer
Ensure substrates are dry and clean from grease, dirt and other contaminants before applying the primer. Set-up the canister as described in the Set-up & Maintenance Guides. Ensure the canister spray-system is spraying correctly and the spray-pattern is 300mm wide.
Apply 1-2 coats of the primer to the substrate, ensuring an even distribution of primer is achieved.
Allow the solvents to evaporate from the primer layer for a minimum of 20 minutes at 10°C. NB: this time will vary depending on temperature.

Paratene - Self-adhesive AVCL/Carrier Membrane
Cold applied.
Minimum application temperature + 5°C
Substrate surface must be dry and clean from grease, dirt and other contaminants.
All application surfaces, including laps, must be primed with Langley Spray-on (synthetic rubber) Primer.
Note: Bitumen based primer must not be used.
Unroll sheet and position.
Re-roll and remove siliconised release film as sheet is fixed in position.
Apply pressure with a heavy broom or roller.
Details: Take care not to entrap air pockets.
Side and End Laps: 80mm. Apply pressure to lap with a seam roller.

Note: When lifting membrane roll weights in excess of 25kg, a two person or mechanical lift is required.

Langley PU Metal Primer
Storage:
Store in a cool, dry place (5°C - 25°C) indoors, away from ignition sources.
Stability - 12 months unopened.
Surface preparation:
Clean metal to ST2 standard for manual cleaning and wash down to ensure loose contamination is removed.
Ensure all loose rust and dirt are removed before application.
Application:
Mix both components together thoroughly in the ratio they have been supplied.
Apply with a brush, roller or spray to the pre-cleaned and prepared metal surface.
It is always recommended that a test area is done to confirm good adhesion before full application
Application Temperature:
Check ambient and substrate temperature prior to application.
Typical working temperature range 5°C - 35°C
Coats:
Once dry, subsequent coat/s must be applied within 48 hours.
Coverage:
7 m²/litre
Curing time:

Substrate Temperature	Touch Dry	Fully Cured	Overcoating	
			Min	Max
20°C	8-16 hours	24 hours	24 hours	28 days

Liquid Coatings - Langley PU - 25 Year System
Storage:
Langley PU must be stored in a cool dry place between 5°C - 25°C at all times.
Avoid unnecessary opening of containers.
Keep away from any ignition source.
Application temperature:
Check ambient and substrate temperature prior to application.
Ambient temperature: 5°C-30°C
Substrate temperature: 5°C-35°C
Material: 5°C-30°C
Cure time:
Touch dry: 4 hours
Fully cured: 24 hours
Cure time between subsequent coats of Langley PU: Min 24 hours, Max 4 days
Times stated are for a substrate temperature of 20°C
Important note: Between September and March, or if the ambient temperature falls below 10°C, please add Langley Winter Accelerator and mix thoroughly before use. If this is not done, predicted cure times will not be achieved.

Substrate Temperature	Touch Dry	Fully Cured	Overcoating	
			Min	Max
20°C no Winter Accelerator	8 hours	Overnight	Overnight	4 days
20°C with Winter Accelerator	2 hours	3 hours	3 hours	4 days
5°C no Winter Accelerator	Overnight	2 – 3 days	2 – 3 days	4 days
5°C with Winter Accelerator	4 – 6 hours	Overnight	Overnight	4 days

Details:
Details to be waterproofed prior to field area
System products & application rates, general notes:
Primer: See primer matrix
Embedment coat: Langley PU Embedment Coat - 1.25 litres/m²
Reinforcement: Langley GFM Reinforcement - 50mm laps between sheets
Top coat: Langley PU Top Coat - 0.75 litres/m²

Bonding PIR Insulation with LangStik SF PU Adhesive
LangStik SF PU Adhesive - Canister (18.5 kg).
Guidelines for Use: Please note: A spray-tip is not required.
1. Ensure the insulation board or other roof substrate is dry and clean from grease, dirt and other contaminants before applying adhesive.
2. Set the canister up as described in the Set-Up and Maintenance Guide.
3. Ensure the LangStik SF Canister is applying a bead of adhesive approximately 20-40mm wide.
4. Apply beads at 300mm centres in the field area and 200mm centres in exposed perimeter zones of the roof or in compliance with specific wind uplift calculations.
5. Place the insulation board directly into LangStik SF.
6. Apply pressure to the insulation board to ensure full contact with LangStik SF Canister.
7. Allow to cure before weatherproofing the insulation board.

LangStik SF PU Adhesive - Can (6.5 kg).
Guidelines for Use: Applied direct from the can. Note. Once opened, contents of can must be used. Do not re-seal.
1. Substrate to be swept clear of all dirt, debris and loose material, prior to application of adhesive.
2. Pierce can to form a 20 mm hole.
3. Apply 20mm beads at 300mm centres in the field area and 200mm centres in exposed perimeter zones of the roof or in compliance with specific wind uplift calculations. Beads to be applied in a serpentine pattern.
4. Set board into the beads within 10-15 minutes and immediately walk-in the board to spread the beads for maximum contact.
5. Repeat walking-in every 5-7 minutes, until the board is firmly attached.
6. Allow to cure before weatherproofing the insulation board.

ParaFurb Outlets
ParaFurb Outlets must not be installed to outlet positions that already have an existing refurbishment outlet in place. Any existing refurbishment outlets or lead sleeve inserts must be removed with surrounding substrates being made good prior to any new ParaFurb Outlets being installed.

Fitting Instruction for units with EPDM rubber RibSeals:

- Select the correct size of outlet to suit the diameter of the downpipe.
- Check depth of existing outlet / downpipe and, if necessary, cut spigot to length. Minimum length of spigot must be 150mm.
- Prior to installing outlet, fix in place required system underlay or underlay soaker, 500mm x 500mm.
- Insert EPDM rubber Ribseal onto the end of the spigot. Ensure Ribseal fits tightly and shoulder is in full contact with the end of the spigot. Then Insert the complete assembly into the downpipe, ensuring the stainless steel supporting flange under the membrane flange is in full contact with the underlay / soaker. Secure in position with suitable fixings and washers through the four holes provided. Fully bond the outlet membrane flange to the underlay / soaker. Where applicable, fully bond the system cap sheet to the membrane flange. Install leaf guard / grating supplied.

ParaRange Rooflights, Hatches and Kerbs
To be installed strictly in accordance with BS 8217 / 8218, Langley Rooflight Schedule and the fixing instructions as detailed in accompanying Agrément Certificate.

Exposed Substrates - General Requirement
All structural deck types and detail substrates must be kept dry at all times during the construction phase.

Pararapide Resins (2 Components) - Mixing
Mix tub of resin with a twin paddle agitator for a minimum of 1 minute until the liquid has a uniform colour. Add the pre-measured Pararapide Catalyst and continue mixing for 2 minutes until the powder is completely mixed.
Note. The catalyst is completely dissolved when there no white specs remaining.

Pararapide Fleece
NB fleece must be dry. Apply directly to the wet Pararapide resin coating. Side & end laps 50 mm. Roll out, smooth side up, avoiding any folds or wrinkles (the fleece will rapidly saturate with the resin). Use the 250 mm roller (for details use the 100 mm roller) or a brush to work the fleece into the resin, working from the bottom up, to eliminate air bubbles, wrinkles etc. Once fleece is saturated, immediately apply a second coat of mixed resin.

GFM Reinforcement
Always wear gloves when handling fleece.
Ensure fleece is stored in packaging and kept dry until use.
Apply directly to the wet embedment/base coat.
Side & end laps 50 mm.
Roll out, smooth side up, avoiding any folds or wrinkles (the fleece will rapidly saturate with the resin).
Use the 250 mm roller (for details use the 100 mm roller) or a brush to work the fleece into the liquid, working from the bottom up, to eliminate air bubbles, wrinkles etc.

Design Note - Application Temperature
Pararapide PMMA cold applied waterproofing can be undertaken whilst air temperature is between - 15°C and 35°C. Note. The substrate must be a minimum of 3°C above the dew point.
An integrated, electronic measuring device is recommended for determining the dew point.

General Guidance and Requirements

Drying Out - Equipment Suggestions
Commercially available equipment includes the following:

- Leaf Blowers
- Hot Air Blowers
- Roof Pumps (puddle suckers)
- Bowdry Roller

Latent Defects
All specifications provided by Langley Waterproofing Systems Ltd 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/or structure.

Langley PU Liquid Applied Membranes - Installation
All Langley PU liquid applied membrane systems are to be installed in accordance with Langley Fixing Instructions.

Leadwork
Flashings and other sheet leadwork must be carried out in accordance with the recommendations of the Lead Development Association and the Lead Sheet Association.

Protection of Works - Caution Note
Any references within this specification relating to plant, equipment or materials being temporarily removed and/or stored for use / re-use, must not be stored, during the entire course of the works, at any time, on semi-completed or completed areas unless suitable protection measures are provided beneath. No claims arising from failure to protect Langley Waterproofing Systems Ltd installed products will be entertained.

Damp-Proof Courses / Cavity Trays
Where there is no existing damp-proof course, or where the skirtings and/or counter-flashings are being installed at a higher level than the existing D.P.C., a new cavity tray should be installed, especially in exposed conditions. Where tops of new waterproof skirtings will be above the line of the existing damp-proof course or cavity tray, it is a requirement that the contractor makes suitable provision to renew and raise these to a higher level. The contractor must liaise with, and seek separate instruction from the client contract administrator as to the method of raising these details. Any damp-proof courses that are covered by Langley waterproofing membranes or roof coverings are done so purely at client risk and will not be covered by the Langley Guarantee. Claims arising from failure to seek client instruction prior to commencement of works or provide suitable cost provision for this item will not be entertained by Langley Waterproofing Systems Ltd.

Exposed Openings - Caution Note
It is solely the contractor's responsibility that any exposed openings created during the construction phase; removal of rooflights / structural glazing, ducting, replacement of deck substrates, etc. must be temporarily and fully protected at all times to protect workforce and building occupants. Furthermore, any and all openings must be made watertight at the end of each working period.

Unforeseen - Deleterious Materials
During the construction phase, any exposed or discovered unforeseen deleterious materials must be notified immediately upon finding to the client contract administrator and Langley Waterproofing Systems Ltd to await further instruction before works proceed. No claims arising will be considered through failure to report such findings.

Prepared Surfaces - Requirement
Prepared surfaces and substrates to receive new waterproof coverings must be prepared all in accordance with detailed specification notes contained herein and must be swept clean of all dirt, debris and loose material. In addition, all surfaces must be dry.

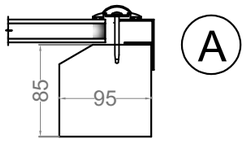
Upstand Skirtings - Requirement
For guarantee purposes, all upstand and skirting details must be a minimum height of 150mm above the finished roof surface level.

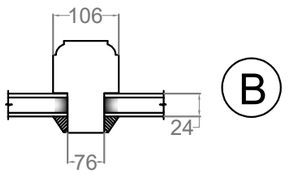
Langley PU Liquid Applied Membranes - Storage
All Langley PU liquid applied membrane products ***must be*** stored under cover, upright at between +5° to +25°C at all times.
If stored outside of this temperature range, then the liquids ***must be*** stabilised for a minimum 24 hours at between +5° to +25°C before use.

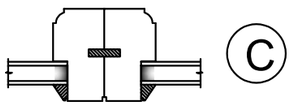
Langley Insulation Products - Storage
All insulation materials ***must be*** stored under cover. Plastic wrappings should not be considered to be sufficient protection for storage outside. If stored outside, insulation materials should be adequately protected with tarpaulins / sheeting and also be clear of the ground or supporting surfaces.

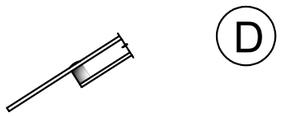
Fire Safety
The Roofing Contractor is to provide adequate fire extinguishers and fire safety measures throughout the duration of the contract period.

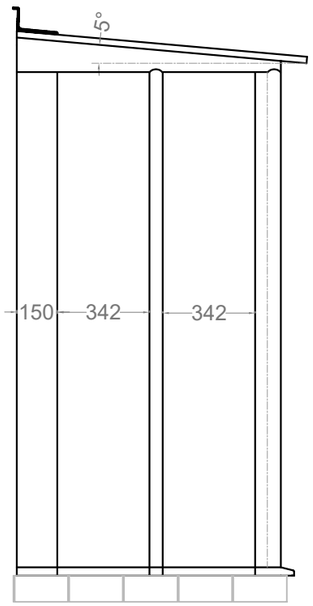
Appendix C – Roof Access Structure Design

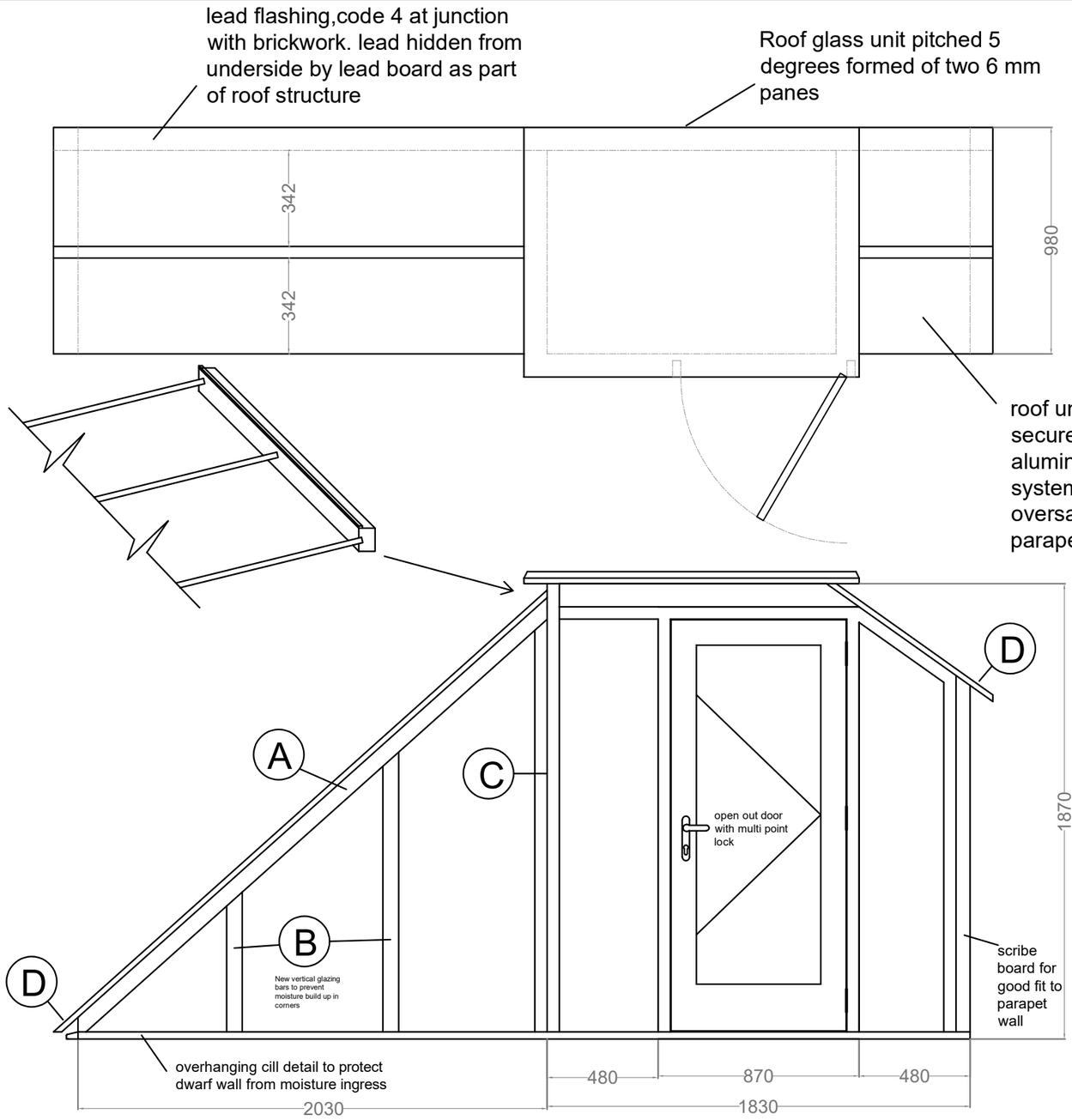


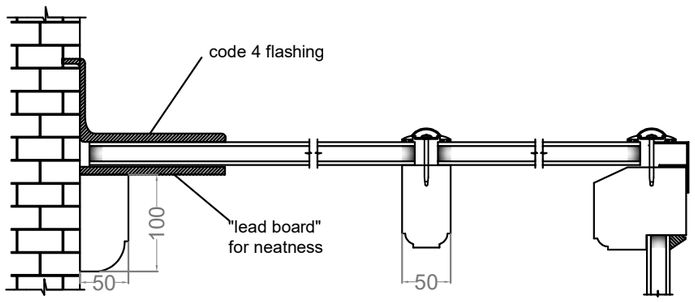












LA ROSSER
Bespoke Joinery

KBH HAUS

Title:
11-13 Dombey Street, Camden, London, WC1N 3PB - Roof Canopy Panelling Renewal Works

Created by:
Grzegorz Jasnoch

Date:
02.05.2024

Comments: hardwood construction, all glass 24mm toughened units

Appendix D – Bevan John House Lift Shaft Design

Lift Shaft Overrun

Project	Bevan John House				
Reference	J5756-TN-S-0001_00				
Date	2 May 2024	**Job number**	J5756	**Author**	JG

Introduction

Webb Yates Engineers were asked by Potter Raper to provide advice on the structural works required to raise the top of the lift shaft, situated to the rear of Bevan John House, 9 Harpur Street, London, WC1M 3PA.

Existing

We undertook a site visit on Tuesday 30th April. Access was provided allowing us to inspect the inside of the lift shaft and the roof overrun.

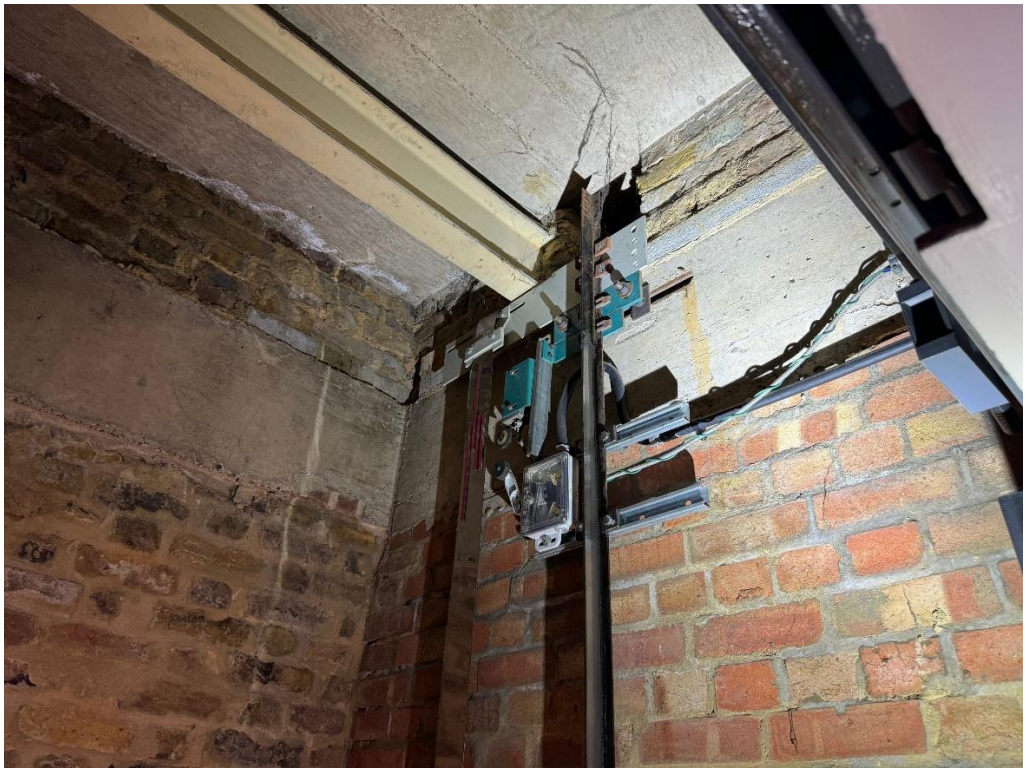


Figure 1: Picture inside lift shaft showing in-situ reinforced concrete cap spanning between masonry walls

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london@webbyates.com
www.webbyates.com

Figure 2: Picture showing existing lift overrun

The existing shaft is approximately 1.8m x 1.8m on plan.

Proposed

We understand that the existing cap over the lift shaft needs to be removed to increase the clearance at the top by circa 300mm.

The existing RC cap can be removed subject to a suitable methodology being agreed with a specialist demolition contractor.

The new roof over the lift shaft can be formed using 100mm dp x 50mm wd C16 timber joists @ 600mm cts fixed to the masonry walls using proprietary joist hangers with a 18mm WBP ply deck on top.

Roof finishes and waterproofing requirements to be confirmed by others.

We note that the property is in a conservation area. We assume that the any required approvals for these works will be obtained by others.

Project	BEVAN JOHN HOUSE		
Part of structure	LIFT OVERRUN		
Date 5/24		Job number J5756	
Engineer JS	Checked by	Checked date	Sheet number 01

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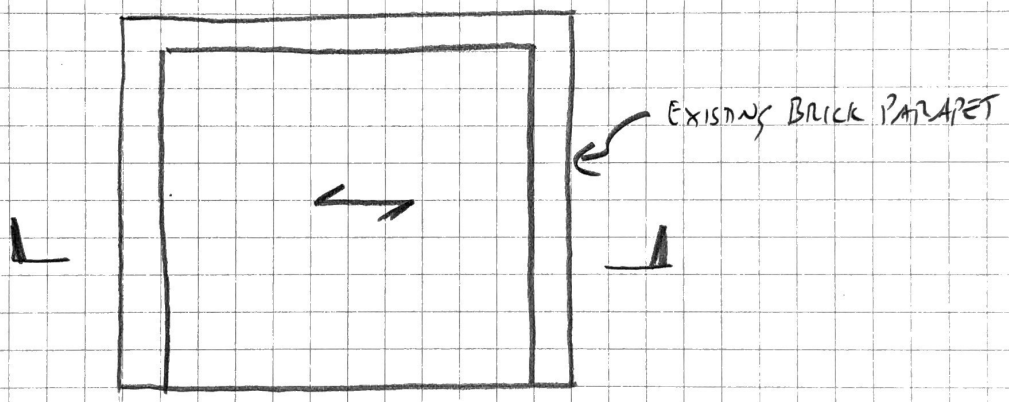
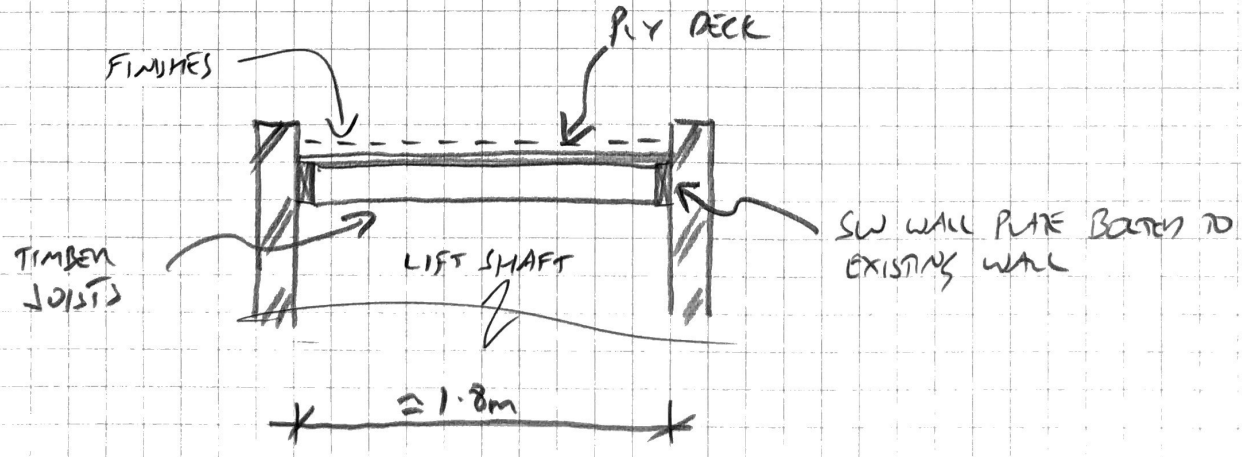
the following calculation is to assess the load and forces being applied to the new timber joists

Sketch Plan



Sketch Section



Project	BEVAN JOHN HOUSE		
Part of structure	LIFT OVERRUN		
Date 5/'24		Job number J5756	
Engineer JS	Checked by	Checked date	Sheet number 02

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LOADINGS

			kPa
DEAD LOAD :	ASPHALT WATERPROOFING	-	0.45
	JOISTS	-	0.20
			0.65 kPa
IMPOSED LOAD :	SNOW & ACCESS	-	0.75 kPa

DESIGN LOAD = $1.35 \times 0.65 + 1.5 \times 0.75 = 2.0$ kPa

$M = \frac{wL^2}{8} = \frac{2.0 \times 1.8^2}{8} = 0.81$ kNm/m

$Fv = \frac{wL}{2} = \frac{2.0 \times 1.8}{2} = 1.8$ kN/m

JOISTS @ 0.4m CTS

$M = 0.81 \times 0.4 = 0.32$ kNm

$Fv = 1.8 \times 0.4 = 0.72$ kN

REFER TO ATTACHED SPREADSHEET OUTPUT FOR JOIST SIZING.

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Project	Bevan John House		
Part of structure	Lift Overrun		
Date: May '24		Job number: J5756	
Engineer: JG	Checked by: AA	Checked date: May '24	Sheet number: 1

Eurocode Reference:

Loads and Geometry

Joist check at 600mm centres with applied loads:

N_{ed} = 0.00 kN $M_{yy,Ed}$ = 0.81 kNm
$V_{z,Ed}$ = 1.80 kN $M_{zz,Ed}$ = 0.00 kNm

h = 97 mm A = 46 cm²
b = 47 mm W_{yy} = 74 cm³
L = 1800 mm W_{zz} = 36 cm³
(No hole, No top ply, No bottom ply)

Solid Timber and Medium Term Load Duration, therefore:

k_{mod} = 0.80 k_{cr} = 0.67 k_m = 0.7 γ_m = 1.30

Bending (per joist)

$f_{m,d} = k_{mod}\frac{f_{m,k}}{\gamma_m}$ = 10.7 N/mm² *Section 2.4.1 (2.14)*

$M_{y,Rd} = f_{m,d}\,W_{yy}$ = 0.79 kNm ###### *Section 6.1.2 (6.1, 6.2)*

$M_{z,Rd} = f_{m,d}\,W_{zz}$ = 0.38 kNm OK

$\frac{M_{y,Ed}}{M_{y,Rd}} + k_m\frac{M_{z,Ed}}{M_{z,Rd}}$ = 0.61 $k_m\frac{M_{y,Ed}}{M_{y,Rd}} + \frac{M_{z,Ed}}{M_{z,Rd}}$ 0.43 OK *Section 6.1.6 (6.11, 6.12)*

Shear

$f_{v,d} = k_{mod}\frac{f_{v,k}}{\gamma_m}$ = 1.97 N/mm² *Section 2.4.1 (2.14)*

$V_{Rd} = \frac{k_{cr}\,f_{v,d}\,A_v}{1.5}$ = 4.01 kN OK *Section 6.1.7 (6.13, 6.13a)*

Torsion

$k_{shape} = \min(1.3, 1 + 0.05 * \frac{a}{b})$ = 1.10 *Section 6.1.8 (6.15)*

$f_{tor,d} = k_{shape}\frac{f_{v,k}}{\gamma_m}$ = 2.17 N/mm² *Section 6.1.8 (6.14)*

$t_{tor,Ed}$ = 0.00 N/mm² OK *Roark's Formulas for Stress and Strain*

Combined

$UF_{tor} + UF_{shear}{}^2$ = 0.0725 OK

Deflection

$E_{Dead} = \frac{E_{av}}{1 + k_{def}}$ = 5000 N/mm² *Section 2.2.3 (2.3)*

$E_{Imposed} = \frac{E_{av}}{1 + \varphi_2 k_{def}}$ = 8000 N/mm² *Section 2.2.3 (2.4)*

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Project	Bevan John House		
Part of structure	Lift Overrun		
Date	May '24	Job number	J5756
Engineer: JG	Checked by: AA	Checked date: May '24	Sheet number: 2

Eurocode Reference:

$\frac{Imposed}{Dead} =$ 1.15 $\quad E_{eff} = \frac{D+I}{D/E_{Dead} + I/E_{Imposed}} =$ 6254.5 N/mm² — *Section 2.2.3 (2.2)*

Simply supported UDL of 1.4 kN/m:

$u_{inst} =$ 4.2 mm $\quad u_{fin} =$ 5.4 mm

Point Load of 100 kN:

$u_{inst} =$ 424.9 mm $\quad u_{fin} =$ 543.5 mm

Compression

$f_{c,0,d} = k_{mod}\frac{f_{c,0,k}}{\gamma_m} =$ 10.5 N/mm² — *Section 2.4.1 (2.14)*

$N_{c,Rd} = A\, f_{c,0,d} =$ 47.7 kN OK — *Section 6.1.4 (6.2)*

Compression Stability

$E_{0.05} =$ 5400 N/mm²

$I_{min} =$ 357 cm⁴

$L_{eff} = 1.0L =$ 1800 mm

$\lambda_{max} = L_{eff}\sqrt{A/I_{min}} =$ 64

$\lambda_{rel} = \frac{\lambda_{max}}{\pi}\sqrt{\frac{f_{c,0,k}}{E_{0.05}}} =$ 1.15 — *Section 6.3.2 (6.21)*

$\beta_c =$ 0.2 — *Section 6.3.2 (6.29)*

$k_y = 0.5\left(1 + \beta_c(\lambda_{rel} - 0.3) + \lambda_{rel}^2\right) =$ 1.2 — *Section 6.3.2 (6.27)*

$k_{c,y} = \frac{1}{k_y\sqrt{k_y^2 - \lambda_{rel,y}^2}} =$ 0.58 — *Section 6.3.2 (6.25)*

$N_{c,b,Rd} = k_{c,y}\, A\, f_{c,0,d} =$ 27.69 kN OK

Bending Stability

$G_{0.05} =$ 500 N/mm²

$I_{tor} =$ 441.39 cm⁴

$L_{eff,m} = 0.9\, L =$ 1620 mm

$M_{y,crit} = \frac{\pi\sqrt{E_{0,05} I_{zz} G_{0.05} I_{tor}}}{L_{eff,m} W_{yy}} =$ 9.2099 kNm — *Section 6.3.3 (6.31)*

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			Eurocode Reference:
$\lambda_{rel,m} = \sqrt{\frac{f_{m,k} W_{yy}}{M_{y,crit}}} =$	0.37		*Section 6.3.3 (6.30)*
$k_{crit} =$	1.00		*Section 6.3.3 (6.34)*
$M_{y,b,Rd} = k_{crit} M_{y,Rd} =$	0.79 kNm	OK	*Section 6.3.3 (6.33)*

Combined Compression and Bending

$\left(\frac{N_{Ed}}{N_{c,Rd}}\right)^2 \frac{N_{Ed}}{N_{c,b,Rd}} + \frac{M_{y,Ed}}{M_{y,Rd}} + k_m \frac{M_{z,Ed}}{M_{z,Rd}} =$	0.61	OK	*Section 6.2.4 (6.19)*
$\left(\frac{N_{Ed}}{N_{c,Rd}}\right)^2 \frac{N_{Ed}}{N_{c,b,Rd}} + \frac{M_{y,Ed}}{M_{y,Rd}} + k_m \frac{M_{z,Ed}}{M_{z,Rd}} =$	0.43	OK	*Section 6.2.4 (6.20)*
$\frac{N_{Ed}}{N_{c,b,Rd}} + \frac{M_{y,Ed}}{M_{y,Rd}} + k_m \frac{M_{z,Ed}}{M_{z,Rd}} =$	0.61	OK	*Section 6.3.2 (6.23)*
$\frac{N_{Ed}}{N_{c,b,Rd}} + k_m \frac{M_{y,Ed}}{M_{y,Rd}} + \frac{M_{z,Ed}}{M_{z,Rd}} =$	0.43	OK	*Section 6.3.2 (6.24)*
$\left(\frac{M_{y,Ed}}{k_{crit} M_{y,Rd}}\right)^2 + \frac{N_{Ed}}{N_{c,b,Rd}} =$	0.38	OK	*Section 6.3.3 (6.35)*

Vibration

$f_1 = \frac{\pi}{2L^2}\sqrt{\frac{(EI)_L}{m}} =$	13.00 Hz			*Section 7.3.3 (7.5)*
$\frac{w}{F} =$	2.37 mm	$a =$	1.8 mm	*Section 7.3.3 (7.3)*
$v =$	0.03 m/(Ns²)	$b^{f_1 \xi - 1} =$	0.04 m/(Ns²)	*Section 7.3.3 (7.4)*