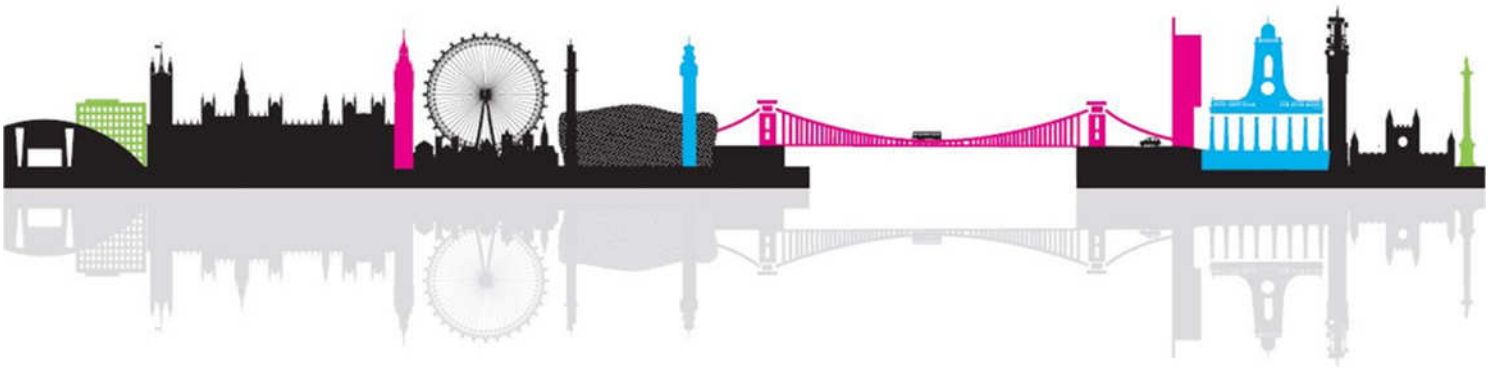
ROOF CONDITION REPORT



prepared for and on behalf of

NORTH NORTHANTS COUNCIL

for the premises known as

BRIGSTOCK LATHAM PRIMARY SCHOOL, LATHAM STREET, KETTERING, NORTHAMPTONSHIRE NN14 3HD

Prepared by: George Husson (CS2) & Andrew Fox (Garland UK)
Checked by: Matthew Cochrane BA(Hons) MSc
Date: 22 September 2023
Our reference: -
Revision: A

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Contents

1.0 Facility Summary

Brigstock Latham Primary School

Facility Data

Address 1	Latham Street
City	Kettering
County	Northamptonshire
Postal	NN14 3HD
Type of Facility	School

Asset Information

Name	Date Installed	Square Meters	Roof Access
Flat Roofs	approx 1993	360	Ladder Needed

2.0 Construction Details

Information			
Year Installed	approx 1993	Square Meters	360
Slope Dimension	-	Eave Height	single storey
Roof Access	Ladder Needed	System Type	Built Up Roof (BUR)

Assembly

Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	Deck	Plywood		-	-
1	Vapor Retarder	2 ply glass felt	Hot Bitumen	-	-
p1	Insulation	Polyisocyanurate	Hot Bitumen	-	50mm
1	Membrane	BUR - 2 ply	Hot Bitumen	-	-

Details

Perimeter Detail	Wall Flashing, Watercheck Curb
Drain System	Internal Roof Drains, Gutter System

Inventory

Inventory Type	Quantity
Drain	4
Skylight	6

The roof systems are expected to be in excess of 30 years old and are therefore nearing the end of their useful life, this has been confirmed by the increased amount of water ingress being experienced into the school. Roof leaks are leading to the asbestos ceilings becoming wet and vulnerable to collapse, therefore the entire block has been closed until the ceilings are replaced – the roof should also be considered for repair or complete restoration and these options have been detailed below. In their current condition the roofs can be overlaid with the gutters only being stripped and replaced. By overlaying the roof before complete replacement is required this will allow the existing insulation to be utilised which will reduce costs and prevent over 4 tonnes of landfill waste. By overlaying the roofs before the insulation becomes wet and complete replacement is required, the council will save approximately £12,000.

At the time of the inspection core samples were taken to identify the build-up and condition of the roof systems. Core samples are an indication of the area sampled only, Garland approved contractors must confirm the build-up during tendering. The core samples confirmed the following build up:

Core 1 – timber deck, felt vcl, 50mm PIR, 2 layers felt
Core 2 – timber deck, felt vcl, 50mm PIR, 2 layers felt

The moisture core samples identified that insulation at the roofs field was dry and the roofs can be overlaid. Overall the roofs current thermal performance is poor and the roof should be considered for a full thermal upgrade to current

regulations. An upgrade to current regulations will make up to an 59% improvement which will equate to a saving of 13% on heating. Insulating the roof to current regulations will result in net CO2e emissions of 800kg every year. This amount could increase with the introduction of a solar PV system and the proposed roof system will conform to BRoofT4 providing a solar ready roof covered by a 25 year single point guarantee.

The main source of water ingress as at the gutters and outlets where water ponds and lap failure is beginning to occur. The aged pour and roll felt consist of APP which is less flexible than the modern SBS bitumen membranes, as the felts become brittle they struggle to cope with changes in temperatures and the laps are the first to become de-bonded and fail. It is recommended that during major works the gutters are installed with a cut to falls insulation scheme and all drainage is changed to external, this means that all internal drainage is removed.
The roofs perimeter edge trim is also a source for water ingress. The aged felts are losing their bond with the edge trim, in many places the felts could be lifted and moss growth is evident suggesting water ingress under the felts.

The roof consists of rooflights which is classed as a ‘Fragile’ material and does not meet current HSE Regulations. It is evident that the lantern has been causing water ingress issues as the glazing has been sheeted over with polycarbonate sheets, this is restricting the smoke vents at the lantern.

HSE Regulation states:

“Fragile surfaces and materials will not safely support the weight of a person and any materials they may be carrying. All roofs, once fixed, should be treated as fragile until a competent person has confirmed that they are non-fragile. In particular, the following are likely to be fragile:
- Fibre-cement sheets – non-reinforced sheets irrespective of profile type;
- Rooflights – particularly those in the roof plane that can be difficult to see in certain •
Glass – including wired glass;
• Others – including wood wool slabs, slates and tiles.

Falls through fragile surfaces, account for 22% of all fall from height fatal injuries in the construction industry”

Based on the findings, the roof should be considered for the following options:

1. REPAIRS - liquid repairs to the failing gutters with new refurb outlets installed. All edge trims and debonded feltsshould be removed and replaced with new. No guarantee will be provided and the roof could fail at other areas over the coming years.

2. RESTORE - to overlay with a 3 layer built up warm roof system. The longer the roof is left the more expensive thereplacement will cost as water could soak the insulation and complete replacement will be required. Garland’s StressPly Flex Plus modified bitumen system will provide an overall waterproofing thickness of 12mm across 3 layers. The roof system will come with a 25 year Garland single point guarantee which covers design, material and workmanship. All details at the roof will be waterproofed independently to ensure full waterproof security and drainage will be changed to external, removing the problematic internal outlets.
With all combustible materials, a self-adhesive vapour control layer must be installed as no combustible materials can be installed with torch on membranes. Garlands bespoke Safe2Torch specification will design out all fire risks so that contractors are pricing self-adhesive membranes at all high risk details.

Proposed system
- New insulation should be installed to improve the thermal performance of the roof.
- Localised tapered insulation is required to improve the roofs drainage.
- Rooflights to be removed and are to be installed with a new deck before insulated and waterproofed.

- A new roofing system should incorporate a 25-year manufacturer warranty to protect the roof from future repair costs.

A new high performance SBS modified built up felt roof is the waterproofing system of choice for the roof, this system has been tested within the market against other products and systems and overall gives the best value for the life cycle of the building. The system selected has options for non-naked flame working for all high-risk areas.

The system selected has a full-service manufacturer aligned to partner on the project to insure:

- Quality approved contractors are used for a guaranteed installation
- A minimum of 2 Quality Assurance inspections a week during the project install• BBA approvals
- A proven history and track record
- A 25 year warranty for design, installation and materials
- Independent PI insurance to cover design liability

3.0 Photo Report Sep 20, 2023 – Condition Report

Photo 1

A look from inside at the fragile rooflights. They have degraded over the years and are now letting in reduced ammount of natural light

Photo 2

Evidence of water ingress at the rooflights

Photo 3

Evidence of water ingress around the rooflights

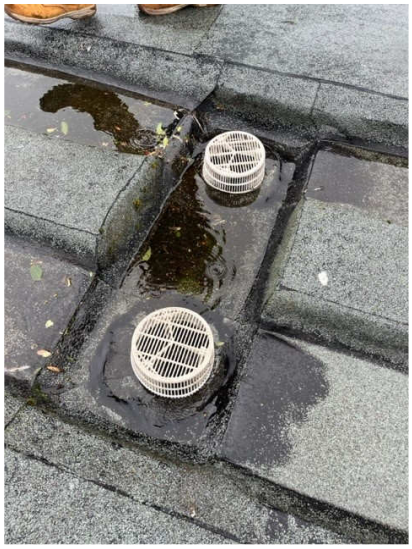

Photo 4

A look at the the two outlets at the central box gutters above the red kites classroom. Leaks are occurring around these failing outlets due to failing felts which are now nearing the end of their useful life

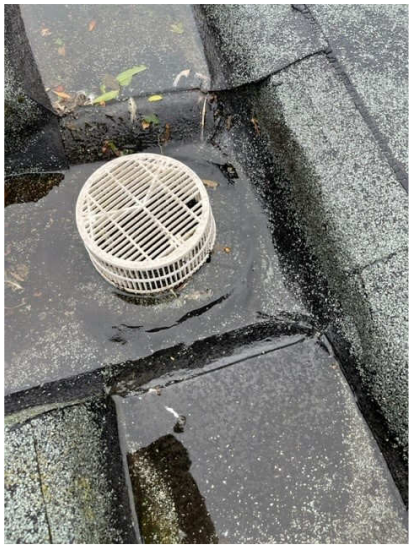

Photo 5

Outlets are well maintained but the felts are poorly bonded leading to water ingress. As part of major works it is recommended that the roofs drainage is changed to external

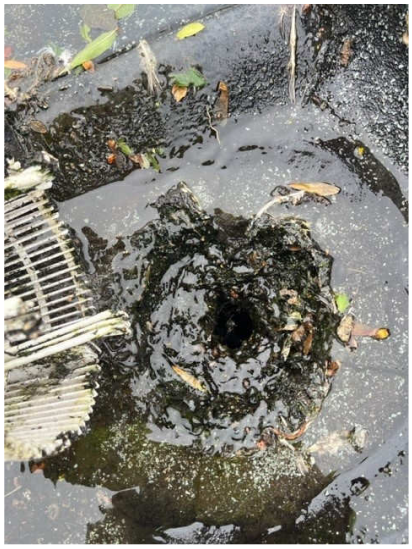

Photo 6

Felts poorly bonded into the outlets

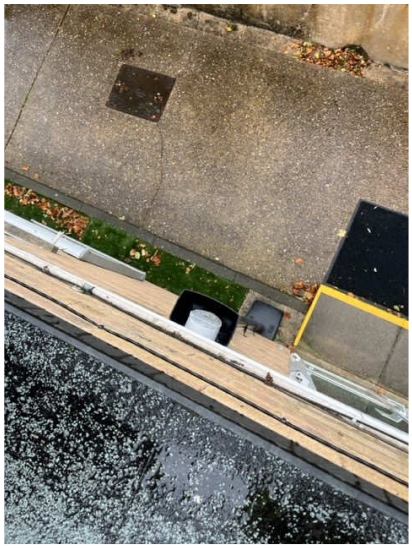

Photo 7

The outlets drain inside the roof space and exits externally via a chute and downpipe

Photo 8

A look at the ponding water at the box gutters due to poor falls. The new roof system will be designed with cut to falls insulation which will drain water efficiently from the box gutters and externally via new chutes and downpipes

Photo 9

Chimney is in a poor condition with cracks evident, these should be repaired during major roofing works to prevent any water ingress into the new roof system

Photo 10

Cracks at the chimney

Photo 11

Cracks at the chimney to be repaired

Photo 12

Lead flashing to the chimney upstands is in a poor condition

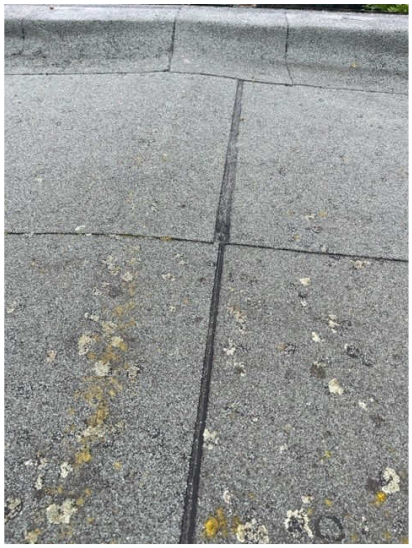

Photo 13

Some slippage at the cap sheets head laps

Photo 14

Repair to the roofs perimeter following water ingress

Photo 15

An overview of the hall roof which drains efficiently to the eaves where box gutters are situated. Leaks are being experienced at the failed waterproofing to the gutters and outlets

Photo 16

Box gutters at the roofs eaves, ponding water is evident leading to leaks at the failing laps

Photo 17

Evidence of water being squeezed from the gutters

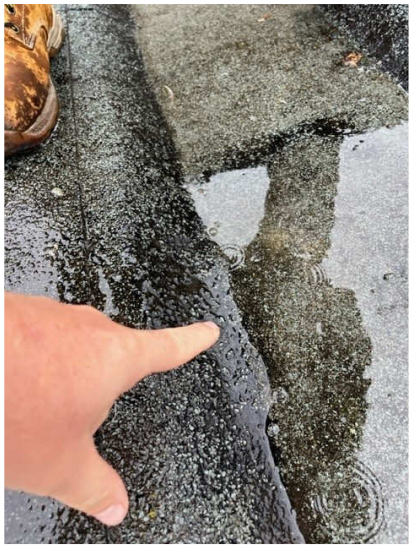

Photo 18

Water being squeezed out of the failing felts in the gutters

Photo 19

A look at the fragile degraded rooflights

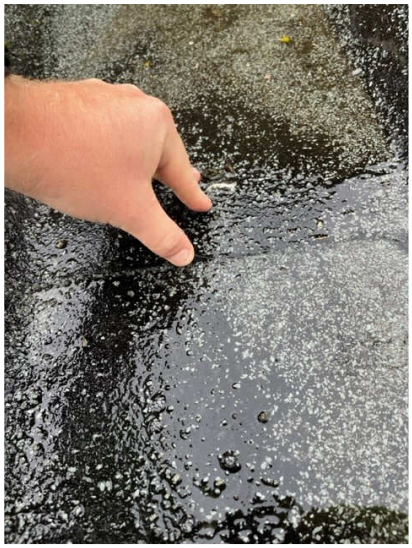

Photo 20

Failing laps at the felts leading to water ingress at gutters

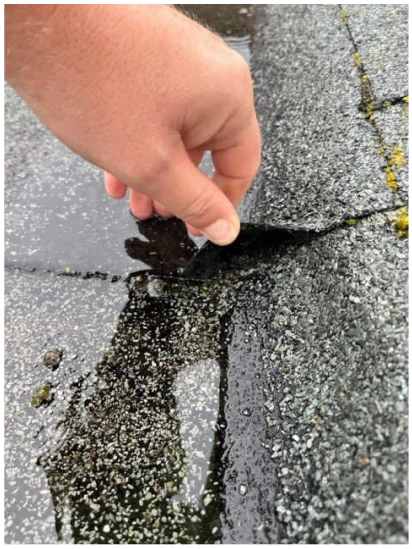

Photo 21

Failing laps at the felts leading to water ingress at gutters

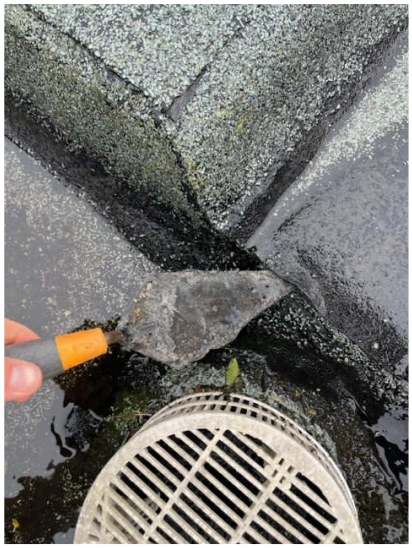

Photo 22

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Photo 23

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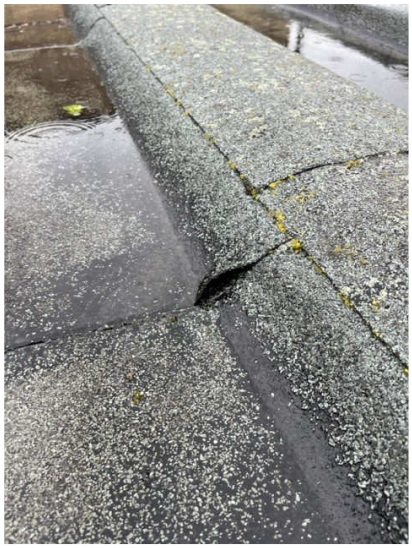

Photo 24

Failing laps at the felts leading to water ingress at gutters

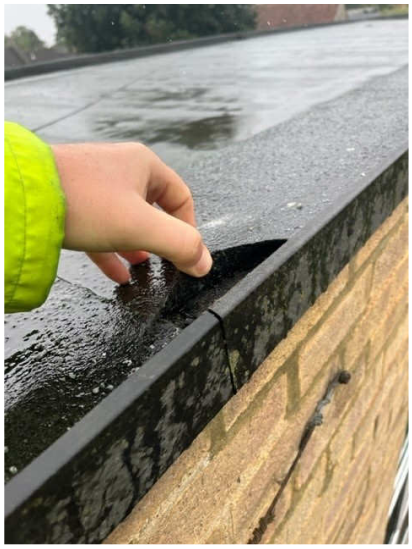

Photo 25

Lap failure is evident around the entire roofs perimeter where the aged felts have become deboned from the edge trim. Moss growth is evident which confirms water ingress under the trim and felt

Photo 26

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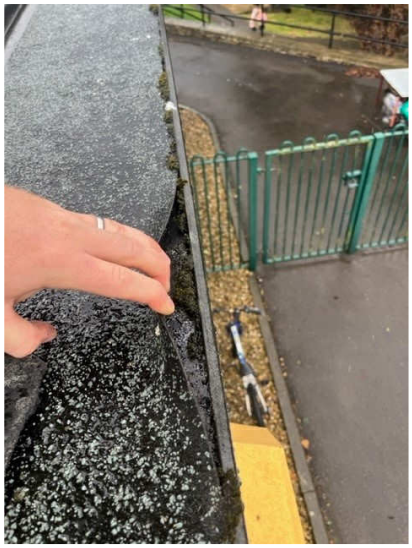
Photo 27

Blister at the roofs field



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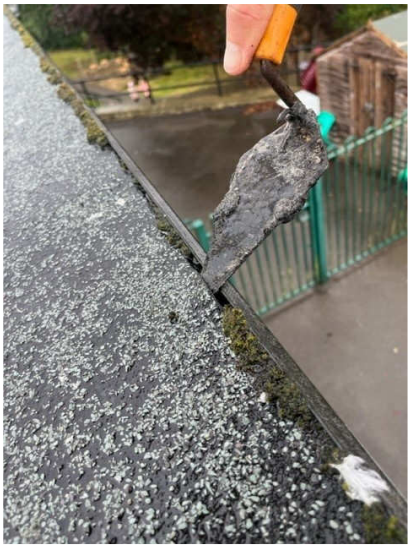

Photo 30

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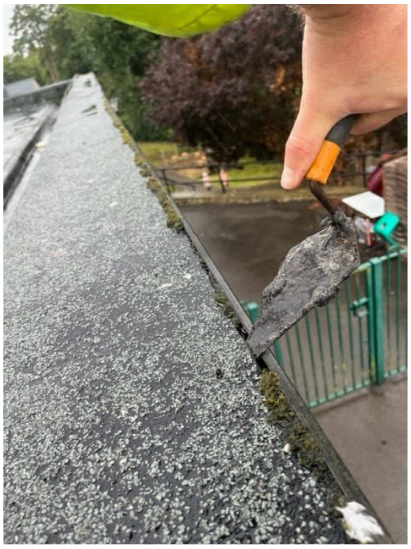

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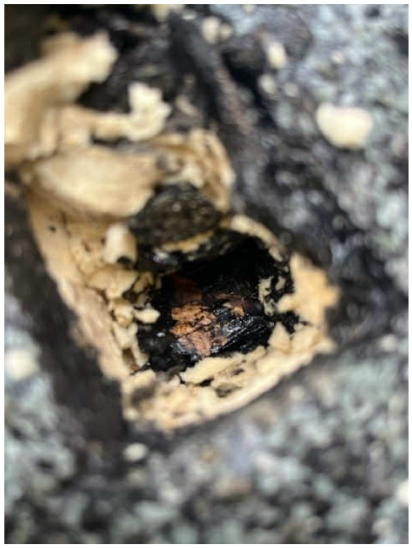

Photo 34

Core samples confirm the same build up with falls in the timber deck. The roofs have a poor thermal performance

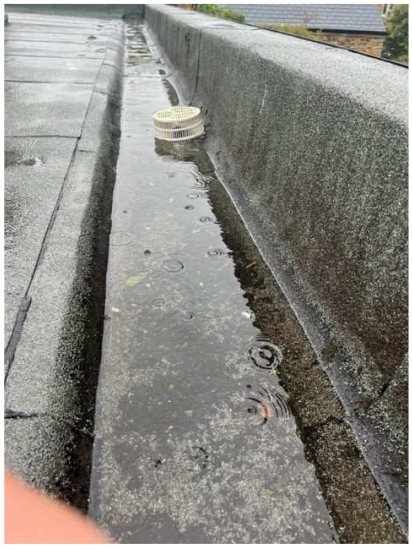

Photo 35

A look at the ponding water at the halls gutters, the gutters have a poor fall. Failing laps to the gutter and outlet leading to roofs leaks.

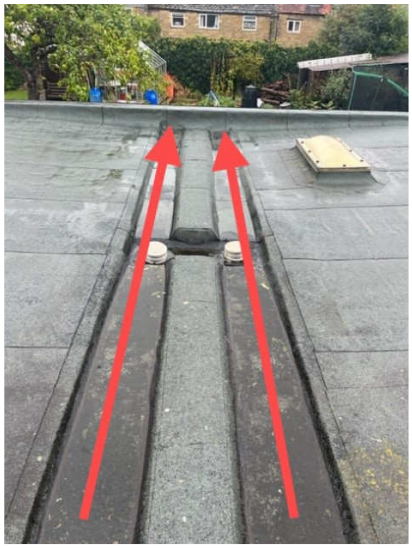

Photo 36

A look at the double box gutters to the lower roof which hold water and are leaking. Garland would design the gutters to drain externally, upgrading the existing hopper and downpipe to ensure it can cope with the ammount of rainwater discharged

Photo 37

Felts poorly bonded into the edge trim, a source for water ingress

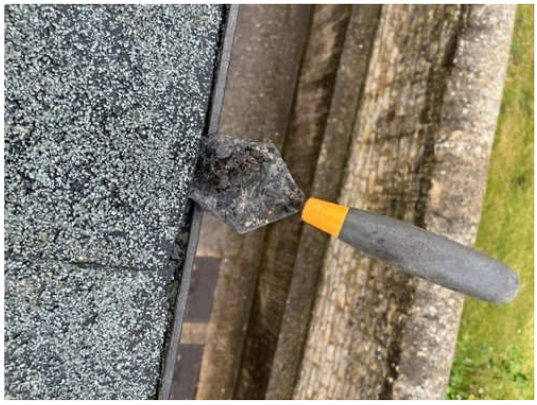

Photo 38

Failed felt to the edge trims

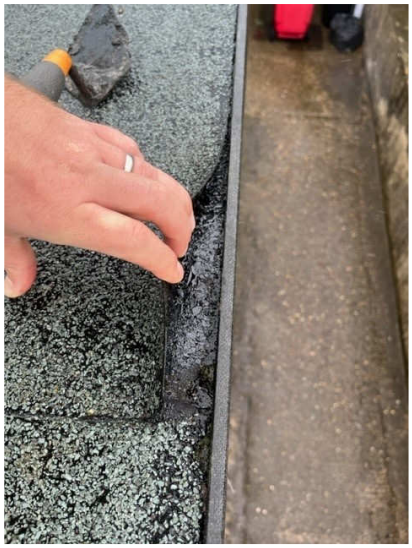

Photo 39

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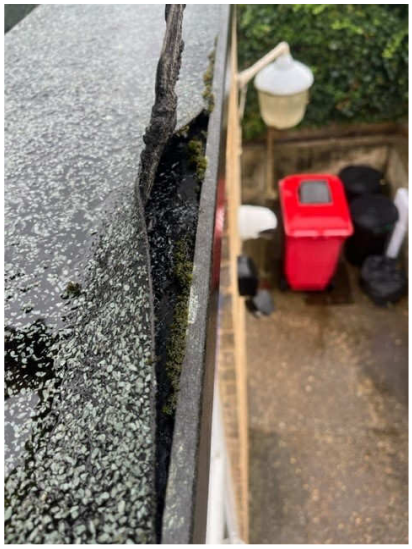

Photo 40

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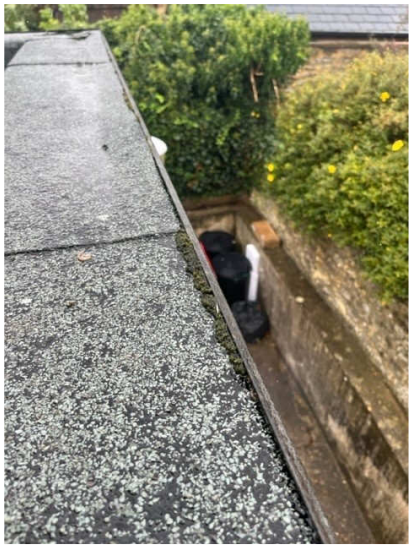

Photo 41

Moss growth at the edge trim suggesting water ingress under the felts

Photo 42

Fully bonded patch repair to the core sample

Photo 43

Water sitting on the top of the parapet wall leading to water ingress under the failing felts at the edge trim

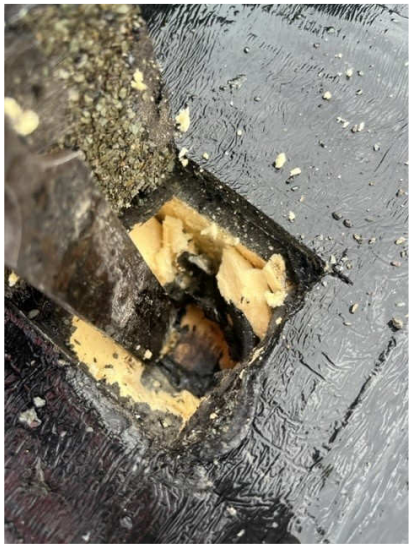

Photo 44

Core sample at the hall roof confirms the same build up throughout

Photo 45

A look at the ponding water in the gutters, the gutters and outlets are failing resulting in water ingress into the classroom below which has taken the lights out

Photo 46

Lighting taken out following roof leaks

Photo 47

Red kite suffering roof leaks which has taken the lighting out

Photo 48

Hall sealed off following roof leaks at the asbestos ceilings

4.0 Flat Roof Solution Sep 21, 2023

Restore Options

Solution Option:	Restore	**Action Year:**	2023
Square Meters:	360	**Expected Life (Years):**	25
Budget:	£77,823.00		

PRELIMS
SITE WELFARE AND MANAGEMENT £6,205.00
SCAFFOLDING & PRELIMS £5,475.00

PREPARATION
STRIP ALL WATERPROOFING & DECK REPLACEMENT £3,650.00
SUB TOTAL £3,650.00

MAIN FLAT ROOF AREAS
PRIME AND PREPARE SUBSTRATE £3,650.00
INSTALL VAPOUR BARRIER £3,800.00
INSTALL FLAT BOARD INSULATION £14,782.50
INSTALL TAPERED INSULATION TO GUTTERS AND DRAINER BOARDS £2,190.00
INSTALL UNDERLAY £10,950.00
INSTALL STRESS PLY FLEX PLUS CAP SHEET £14,965.00
SUB TOTAL £50,337.50

ADDITIONS
INSTALL ROOFLIGHTS £5,400.00
FASCIAS AND TRIMS £2,250.00
ASBESTOS R & D SURVEY £800.00

PRELIM COSTS £11,680.00
WATERPROOFING COSTS £53,987.50
ADDITIONS £8,450.00
CONTINGENCY at 5% £3,705.50
Sub Total £77,823.00

TOTAL BUDGET £77,823.00

Pros
- 25 year single point guarantee
- Thermal upgrade to current regulations

- Internal drainage removed
- Fragile rooflights replaced
- Solar ready

Cons

- initially more expensive but cheaper over the roofs life cycle than a repair - longer project duration

5.0 Flat Roof Solution Sep 21, 2023

Repair Options

Solution Option:	Repair	**Action Year:**	2023
Square Meters:	360	**Expected Life (Years):**	5
Budget:	£17,250.00		

- Full scaffold to allow perimeter works to the edge trims.
- Liquid overlay repair to 55m2 of gutters, install new refurb outlets.
- Strip felts, replace edge trim and install new cap sheet flashings to the edge trim - 120lm.
-
- **Pros**

- Cheaper
- Quicker than a full restoration

- **Cons**

- Short term fix, no guarantee how long repairs will last or if the roof is going to fail in other areas
- Still requires full scaffold due to perimeter works
- No thermal upgrade
- Roof will still need to be replaced in the coming years which could be more costly if the insulation become wet
- No guarantee
- Internal outlets remain