

Our Ref: 02C300227

Your Ref:

14 February 2023

Ms Anne Webb  
Environment Agency  
Kings Meadow House  
King's Meadow Rd  
Reading RG1 8DQ

Dear Ms Webb

**KINGS MEADOW HOUSE, KING'S MEADOW ROAD, READING  
DEFECT LETTER REPORT**

Avison Young were instructed to undertake a visual inspection of Kings Meadow House, Reading to investigate water ingress issues to various locations, including the west wing stairwell, rooftop and 5<sup>th</sup> Floor plant rooms, and the 5<sup>th</sup> and 4<sup>th</sup> Floor offices.

We undertook a visual inspection of the property on 2 February 2023, utilising a drone with a mounted high definition camera to inspect the roofs. At the time of our inspection the weather was cool, dry and overcast.

We present our findings below, together with options for remedial works.

**1.0 Building Description**

The building is located to the north of Reading town centre, close to the south bank of the River Thames. It provides office accommodation over ground floor level and five upper floors, plus 5<sup>th</sup> floor and rooftop plantrooms. The building is L shaped in plan, with one wing to the west and one to the north

The property is of framed construction with the east and south elevation clad in brick with glazed curtain walls to the main stairwell on the corner of the building. To the rest of the elevations are double glazed windows. The rear, (west and north) elevations have glazed curtain wall systems.

At 5<sup>th</sup> Floor level, the footprint of the floor steps in along the east and south elevations, forming a parapet wall with a narrow section of roof behind. Plant rooms along the lines of the elevations are set behind curved steel cladding sheets. The parapet roof has an inverted roofing system with shingle ballast holding down insulation above the waterproofing layer. The roof carried rails for the cleaning cradle (currently out of use) and a mansafe system.

The main roof also has an inverted roof system, with stones and paving slabs acting as ballast. Rails for another cleaning cradle system, serving the west and north elevations,

as well as the smaller return elevations of the wings, are also present and also out of service. There is a freestanding edge protection barrier system, mansafe system, as well as free standing weighted anchor points.

The roof top plant room has sloping elevations with a flat panel cladding system. Its flat roof is weathered in mineral faced bitumen felt. The roof carries and solar hot water array and is fitted with a mansafe system.

Internally the main stair and lift core is to the south west corner of the building, with two further fire escape stairwells, one to the end of each wing.

We understand that the property was constructed in the early 1980s. It is not listed and does not lie in a conservation area.

## **2.0 Defects**

We were shown to a variety of instances of damp and possible water ingress. These included:

- 1) Damp staining to the bottom of the west wing stairwell. We were informed that the damp is at its worst during spells of heavy rain. The staining is located around the base of a riser. Original construction plans held on site record the presence of 100mm rainwater downpipe within the riser that serves the main roof. It was not possible to see in the riser as pressed steel radiators have been installed across the riser's access hatches.
- 2) Lines of damp stained mineral fibre ceiling tiles in the canteen at 4<sup>th</sup> Floor level. The worst staining was along the east elevation towards the south east corner of the building. However, other more minor damp patches were noted along the south elevation. Other damp stained tiles were noted further into the floor plate, but we were informed that this may be the result of leaks from the boiler in the plant rooms above.
- 3) To the north wing office at 5<sup>th</sup> Floor level there is damp staining to the ceiling close to the north west corner where the two wings meet.
- 4) Within the rooftop plant room we were shown water staining to woodwool slabs behind the angled cladding and adjacent to a ventilation grille in the cladding.
- 5) Within the main plant room we were shown water staining to the south east corner of the room. The staining is in the vicinity of a blocked off penetration through the roof deck relating to a flue, now removed. However, it was reported that water ingress also occurs to the plant room away from this

## **3.0 Survey Findings**

### West Wing Stairwell Damp

Given that the damp staining to the west wing stairwell is at the bottom of a riser that accommodates a rainwater down pipe, the most likely cause is a leaking joint or crack to the pipe, possibly exacerbated if the pipe is partially blocked causing water to back up beyond the location of the defect. Alternatively, it is possible that the waterproofing has split between the roof and the outlet and water in running down the outside of the pipe.

However, the original construction drawings suggest that the downpipe is underslung under the roof slab for a distance of about 2.2m before it enters the riser. We would expect that any water running on the outside of the pipework would be shed where brackets hold the underslung pipe before it enters the riser.

#### Rooftop Plantroom's South Grille Leak

The drone survey did not definitively identify a defect around the ventilation grille that would be the source of the water ingress. However, some of the mastic seals to the cladding and grille look aged and shrunk. The cause of the water ingress to this location could also be hidden behind the grille and/or cladding and further investigations are required.

#### Main Plantroom Leaks

The leak into the main 5<sup>th</sup> Floor plant room may be associated with the gutter than runs between the main roof and the curved cladding. The gutter lining does not appear to have any significant defects, but there are debris present which may be obstructing water flow, possibly leading to the gutter and drainage points being overwhelmed in heavy downpours of rain.

We noted that many of the foam profile fillers to the joints in the curved cladding are loose and some are missing. This may also be a possible route for the water ingress.

We also noted that while the redundant flue penetration has been infilled, the flue to the exterior of the cladding remains. This may be a weak point, where water is entering the plantroom.

#### 4<sup>th</sup> and 5<sup>th</sup> Floor Office Leaks

The general life expectancy for inverted roofs tends to be given as 25-35 years, so given the age of the roof it is not surprising that issues have occurred.

The source of the water ingress into the 5<sup>th</sup> and 4<sup>th</sup> Floor offices may not necessarily be located above where the internal staining is present. Water will often track along a concrete floor slab until it finds a path through the slab. Where ceiling tiles have been removed towards the south east corner of the 4<sup>th</sup> Floor we noted a row of holes in this area, which may be providing a path for the water to come through in to the ceiling void in this area. As such, there is a range of possible pathways where water may be entering the building.

We noted buddleia bushes growing in the ballast of the east parapet inverted roof, and their roots may have damaged the waterproofing. While we were informed that the leaks predate the growth of the bushes, the buddleia may be exacerbating the issue, or may lead to further issues in the future.

Other roof issues were noted which may be causing water ingress. We identified that the asphalt upstands to perimeter walls and to the roof top plant room are slumped and cracked. We also noted that the asphalt upstands to the cleaning cradle supports are also slumped and cracked. The slumping and cracking may have breached the asphalt waterproofing layer, allowing water to percolate through to the interior.

The steel sheet parapet wall cappings above the 4<sup>th</sup> Floor to the south and east elevations are also in poor condition, with mastic seals that have shrunk and are split. We also noted that the cappings to the south west corner have been inappropriately repaired using zinc foil back “flashband” type tape.

Appended to this letter is a photographic schedule illustrating the key finding of our survey. Should you wish to review the drone photographs they are available via this link:

<https://avisonyoung.box.com/s/dko7tpgalkee2efo00yybmovlnegn59t>

#### **4.0 Recommendations**

##### West Wing Stairwell Damp

There are initial investigations that can be undertaken into the suspected downpipe leak before you commit to the expensive and disruptive removal of the radiators blocking the access hatches. We first recommend removing the section of inverted roofing around the rooftop drainage outlet to check the integrity of the waterproofing in this area, and ensure that the outlet is still firmly fixed in position.

A specialist drainage CCTV survey company may be able to check the integrity of the downpipe by using a push CCTV camera, sent down into the pipe from the rooftop outlet. If the defect is in a difficult to access location it may be possible to effect a repair using a downpipe relining system inserted from above.

##### Rooftop Plantroom's South Grille Leak

The mastic seals to the cladding and grille should be renewed, and it may also be necessary to dismantle the cladding around the grille to confirm the issue and fully remedy it.

##### Main Plantroom Leaks

The gutter above the curved cladding should be cleared and the gutter overhauled. It may be worth relining the gutter to extend its life expectancy. The loose and missing foam profile fillers to the curved cladding should be replaced and secured, and any joint sealant checked and replaced where necessary.

Consideration should also be given to removing the flue above the redundant flue penetration and ensuring the former penetration is fully waterproofed.

##### 4<sup>th</sup> and 5<sup>th</sup> Floor Office Leaks

One of the main drawbacks of inverted roof systems is that it can be difficult to identify the route of water leaks without intrusive investigations. We therefore recommend that sections of the inverted roof ballast and insulation are lifted, and the condition of the waterproofing laying is examined, particularly where buddleia bushes are growing. We also recommend that the exposed roof membrane is tested by specialists using a system such as earth leakage leak detection as any breaches in the waterproof layer may be small and hard to identify via a visual inspection alone.

We have allowed for repairs to defective asphalt upstands as well as a provisional sum for general repairs to the membranes. As the window washing cradles have been out of

use for some time consideration should be given to removing the systems entirely to remove an ongoing maintenance liability.

For the main roof, where access is easier and edge protection is in place, you could adopt a trial and error approach, exposing sections of the roof membrane and undertaking patch repairs until the water ingress to the 5<sup>th</sup> Floor office stops. For the parapet roofs, however, it is likely that scaffold will be required for safe access and to protect pedestrians below. The cost of this would make a trial and error approach unfeasible and so the whole section of inverted roof should be stripped off.

The steel sheet parapet wall cappings should be also repaired/ replaced, as necessary.

## 5.0 Main works required and cost estimates

We have provided costs based on all works being undertaken as a single project, but it is possible for the works to be completed as distinct, separate projects. However, these would need careful planning to ensure that duplicate access costs are not unduly incurred.

Item	Description	Budget cost
1.	Refurbishment and demolition asbestos survey prior to commencing works (no allowance for remedial works)	£ 1,000
2.	Inspection of outlet and CCTV survey of downpipe.	£ 1,500
3.	Repairs and clearance of downpipe (Prov. Sum).	£ 3,000
4.	Make good damp damage to west wing stairwell	£ 200
5.	Renewal of mastic seals to the rooftop plant room cladding and grille via mansafe system. Includes dismantling of cladding and grille and allowance for repairs.	£ 450
6.	Clearance of gutter behind the curved cladding.	£ 200
7.	Re-lining system to gutter.	£ 1,950
8.	Remove redundant flue and make good cladding. Replace missing or damaged foam profile fillers (assume utilising scaffold for parapet roof repairs).	£ 500
9.	Take up inverted roof over the 5 <sup>th</sup> Floor (assume limited to north wing only), inspect and test waterproof membrane and repair upstands, plus prov. sum for general repairs to the membrane. Lay new insulation and re-install ballast.	£19,125
10.	Remove the cleaning cradle from the main roof and make good the waterproofing (option – assumed in conjunction with above item).	£10,340

11	Take up inverted roof over the 4 <sup>th</sup> Floor (the parapet roof), inspect and test waterproof membrane and repair upstands, plus prov. sum for general repairs to the membrane. Lay new insulation and replace ballast.	£11,900
12.	Remove the cleaning cradle from the parapet roof and make good the waterproofing (option – assumed in conjunction with above item).	£ 4,500
13.	Repair the parapet wall clapping sheets, including new mastic seals and replacement sections to the south west corner.	£ 1,400
<b>Totals</b>		
	<i>Construction sub-total</i>	<i>£56,065</i>
14.	Scaffold to the property (assume only south and east elevation require scaffold).	£36,000
15.	Preliminary costs at 18%	£10,092
16.	Contingency	£ 6,000
	<b>Construction total</b>	<b>£108,157</b>

Note the above budget costs above exclude:

- VAT;
- Professional fees including for design, specification, project management, quantity surveying, contract administration etc;
- Asbestos remedial works in connection;
- We have estimated costs based on typical tendered prices and not for framework management contractors;
- Costs are estimated as at Q1 2023 and we have not included for material cost fluctuations, tender price inflation, etc;

## 6.0 Outline Programme

–	At this stage we estimate a programme duration as follows:	
–	Design & Specification	3 weeks
–	Tender	2 weeks
–	Tender analysis	2 weeks
–	Client approval and award of contract	2 weeks
–	Lead in period	3 weeks
–	Construction period on site	6 weeks
–	<b>Total</b>	<b>18 weeks</b>

## 7.0 Summary

Following our site inspection we have a number of different maintenance and repair issues that may be causing the current water ingress and damp issues. Further investigations, however, are required to the rooftop plantroom grille, west wing stairwell riser and the inverted roofs to identify the exact nature and extent of the defects.

We have included for all works to be completed as a single project, but the different water ingress issues could be remedied as separate projects depending on budget and urgency, although attention is required to ensure that duplicate access costs are not unduly incurred.

We are able to liaise with suitable contractors to investigate further and provide more detailed budget costs should you wish to pursue with these recommendations. In the meantime, please do not hesitate to contact us should you have any queries.

Yours sincerely

A handwritten signature in black ink, appearing to read 'A. Nash', with a long horizontal stroke extending to the right.

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**Building Consultancy**  
**For and on behalf of Avison Young (UK) Limited**



## Photographic Schedule




Photo No	Photograph Description	Photograph
1.	Kings Meadow House, showing the main entrance to the south east corner.	
2.	View of the roofs, looking from the south east.	
3.	View of the roofs: north wing to the top, and west wing to the left.	





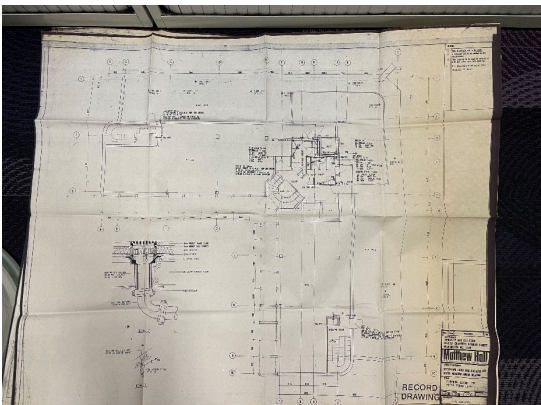
Photo No	Photograph Description	Photograph
4.	Damp damage to the west wing stairwell at Ground Floor level.	
5.	Riser access hatch with radiator over.	
6.	Original construction drawing details that the riser to the west wing stairwell riser includes a 100mm rainwater downpipe, and detail of rooftop outlet.	

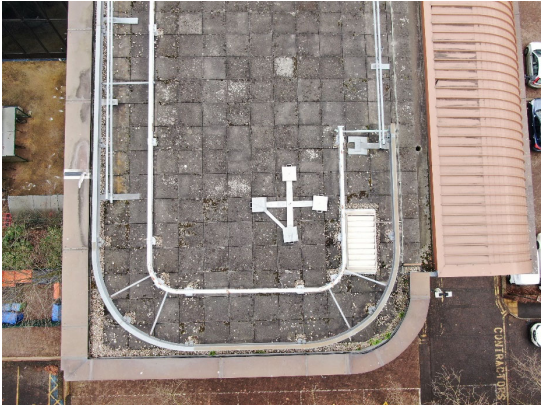


Photo No	Photograph Description	Photograph
7.	West wing – roof top drainage outlet leading to the internal downpipe situated to the centre right of the picture.	
8.	Rooftop plantroom duct and grille, with water staining evident to the right of the duct.	
9.	South facing grille to the roof top plant roof. Mastic seals, particularly to the top of the grille and the top line of cladding panels are aged and split.	




Photo No	Photograph Description	Photograph
10.	Infilled redundant flue penetration to the south west corner of the main plant room at 5 <sup>th</sup> floor level. Water staining is evident around the penetration.	
11.	Water staining also evident in other locations in the south east corner of the plant room.	
12.	Some debris to the gutter between the main roof and the curved cladding over the main plant room.	






Photo No	Photograph Description	Photograph
13.	Redundant flue (to the right) through the curved cladding, the penetration for which has been infilled internally. Note loose foam profile fillers.	
14.	Loose foam profile fillers.	
15.	Water staining to the ceiling tiles in the 4 <sup>th</sup> Floor canteen.	


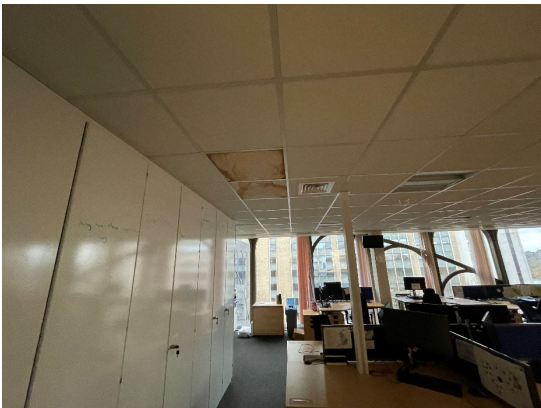
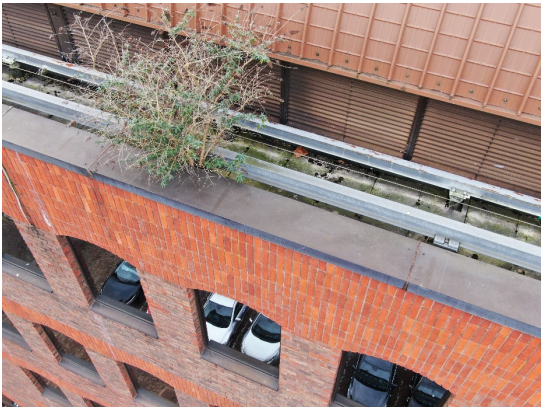
Photo No	Photograph Description	Photograph
16.	Holes to roof slab to the south east corner of the 4 <sup>th</sup> floor. Water staining has occurred beneath the holes.	
17.	Water staining to the ceiling of the north wing at 5 <sup>th</sup> floor level.	
18.	Buddleia bush growing in the ballast of the parapet roof over the 4 <sup>th</sup> Floor.	






Photo No	Photograph Description	Photograph
19.	Slumped asphalt upstand to the main roof.	
20.	Damaged asphalt upstand to a window washing cradle's rail support.	
21.	Cracked asphalt upstand to a window washing cradle's rail support.	



Photo No	Photograph Description	Photograph
22.	Slumped and cracked asphalt upstand to a window washing cradle's rail support.	
23.	Damaged parapet wall capping inappropriately repaired with tape.	
24.	A split mastic seal to a joint in the parapet wall cappings.	