

The Garland Company UK, Ltd.

Roof Asset Management Programme



**AVISON
YOUNG**

Manchester Royal Exchange Condition Survey

Prepared By
Tom Boon

Prepared For
Fergus Lowry



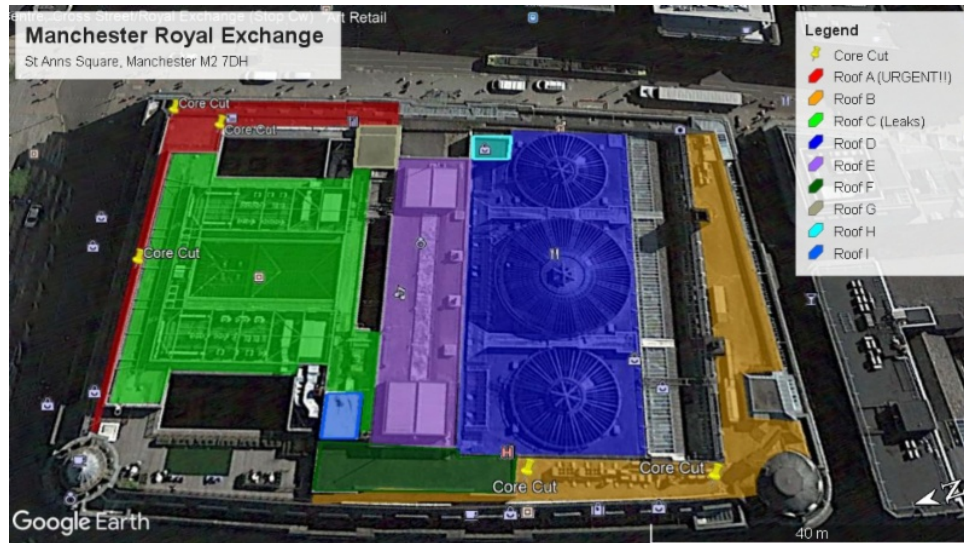
Client Data

Client: Avison Young

Client Data			
Name	Avison Young		
Address 1	Norfolk House	Address 2	7 Norfolk St
City	Manchester	County	Greater Manchester
Postal	M2 1DW	Country	United Kingdom

Client: Avison Young

Facility: Manchester Royal Exchange



Facility Data

Address 1	St Annes Square
City	Manchester
County	Greater Manchester
Postal	M2 7DH
Type of Facility	Retail
Square Meters	4,600

Asset Information

Name	Date Installed	Square Meters	Roof Access
Roof A	Unknown	290	Stairs
Roof B	Unknown	530	Stairs
Roof C	Unknown	1,150	Stairs
Roof D	Unknown	1,250	Stairs
Roof E	Unknown	520	Stairs
Roof F	Unknown	150	Stairs
Roofs G, H & I	Unknown	110	Stairs



Photo Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Title: Phased Plan

Roof Section: Roof A

As discussed in our initial meeting I've put together a ranking of which roof sections need to be prioritised, this will enable you to plan for your future works

I've listed the below areas in order of importance.

1. **Roof Section A** - Urgent attention needed
2. **Roof Section C** - Leaks Present high priority
3. **Roof Section B** - Numerous failures high priority
4. **Roof Section E** - Short term repairs made, defects found, medium priority
5. **Roof Section D** - Remedial works needed, medium priority
6. **Roof Section F** - Minimal defects found, low priority
7. **Roof Sections G, H and I** - Minimal defects found - low priority



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof A

Information

Year Installed	Unknown	Square Meters	290
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Assembly

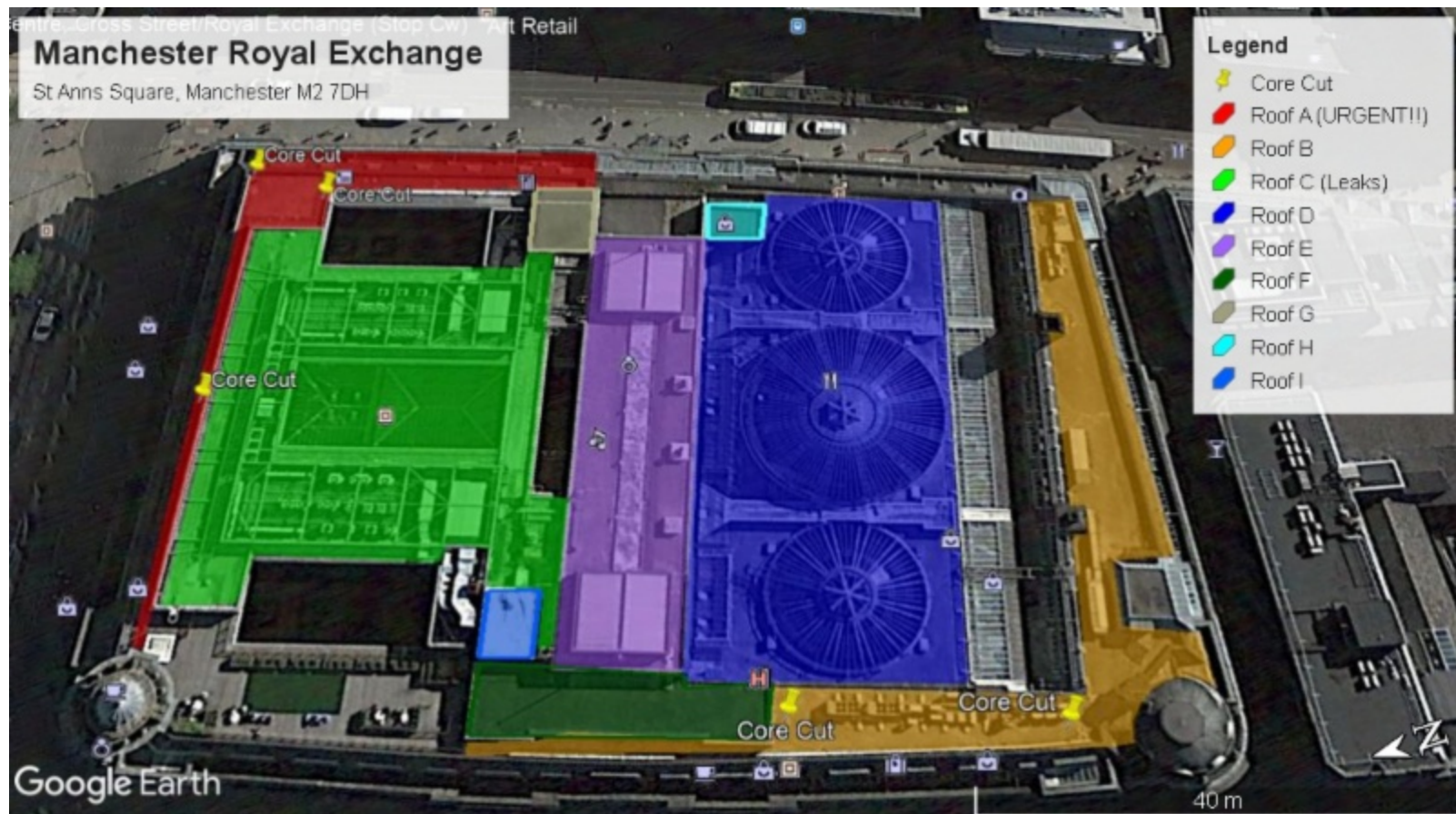
Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	Deck	Concrete	Mechanically attached	-	-
1	System	Mastic Asphalt	Hot applied	-	20mm
1	Insulation	Foamglass	Loose laid	-	40mm
1	System	Mastic Asphalt	Hot applied	-	30mm
1	Surfacing	3/8" gravel	Loose laid	-	-

Details

Perimeter Detail	Parapet Wall
Flashing Material	Mastic Asphalt, Lead
Drain System	Internal Roof Drains
Parapet Wall	Brick, Concrete Block

Inventory

Inventory Type	Quantity
Drain	6
Soil Stack	2





Inspection Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Roof Section: Roof A

Inspection Information

Inspection Date	25/03/2019	Core Data	Yes
Inspection Type	Core Analysis	Leakage	No
Deck Conditions	Unknown		

Flashing Conditions

Perimeter	Failed	Wall	Failed
Projections	Failed	Counterflashing	Failed

Miscellaneous Details

Brick Chases	N/A	Debris	No
Control Expansion Joints	N/A	Ponding Water	Moderate
Parapet Wall	Failed	Coping Joints	Fair

Overall

Rating	Failed
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Condition

Following the examination of the existing roof systems, it is apparent that the present waterproofing has completely broken down and water has completely saturated the system. The insulation has completely broken down leading to the asphalt slumping especially around the perimeters, I would label this roof section as condemned.

I strongly recommend that a structural engineer is brought in ASAP.

The reason for the failure is simply down to the age of the roof, over time UV exposure has deteriorated the asphalt leading to slumping and blisters which in turn create weak spots in the system. I have provided images of numerous blisters and folds in the asphalt around the gutter areas and main field.

The perimeters are also displaying severe slumping of the asphalt leaving large folds in the upstands this will only deteriorate over time and needs to be resolved.

Core cuts were taken in three locations in this section, I have provided images of these to give you an idea of just how severe the water ingress is, I have spoken to the property manager who said that leaks haven't been experienced below, this will be due to a 20mm thick layer of asphalt below the insulation which is acting as the last line of defense, however, the main issue isn't the leaking below it's the damage to the structural integrity of the roof due to the volume of water present and deterioration of the insulation.

I was unable to get a good look at the main field of the roof due to a loose laid aggregate but did find a couple of areas of blistering and cracks in the asphalt

I've highlighted a few problem areas below

- Water has entered into the system
- Foamglass insulation has completely broken down
- Slumping at the perimeters
- Blisters where moisture is present beneath the waterproofing.
- Cracks and splits in the asphalt
- Loss of sealant around the termination bars
- Extremely low current U-Value

If refurbishment is left indefinitely, we can expect water to continue damaging the structural integrity and ultimately the internal fabric of the building, requiring costlier repairs and causing health and safety concerns. It will, therefore, be necessary to upgrade the waterproofing to prolong the life cycle of this building.



Photo 1

Core cut 1, as you can see the water has completely saturated the system this has subsequently degraded the foam glass insulation below leading to slumping and blisters across the whole section. a structural engineer will need to be brought in to determine whether the section is still structurally secure.



Photo 2

Core cut 2, this core was taken at the opposite end of the roof and is also completely saturated below this will need to be addressed ASAP



Photo 3

I found a number of areas where the sealant has failed along this termination bar



Photo 4

Due to the water ingress and UV damage the asphalt around the perimeter of the wall has severely slumped this will continue to get worse until it fails completely



Photo 5

Another example of the above



Photo 6

I've included a number of images of blisters and failures in the system, these are obvious signs of failures across the asphalt due to UV/water damage.



Photo 7

Example of a blister in the asphalt



Photo 8

Example of a blister in the asphalt



Photo 9

Example of a blister in the asphalt, this was found on the main field of the roof which is evidence that water has ingressed across the whole system and will need to be stripped



Photo 10

Large crack found in the asphalt



Photo 11

Example of a blister/slumping in the asphalt



Photo 12

Example of a blister in the asphalt



Photo 13

Another example of slumping around the perimeter of the building



Photo 14

two large blisters found in this area



Photo 15

Example of a blister in the asphalt



Photo 16

Remedial works have been carried out in this section using a liquid coating, this is only a short term fix and will start to peel at the leading edge over time.



Photo 17

I was unable to access this section without edge protection

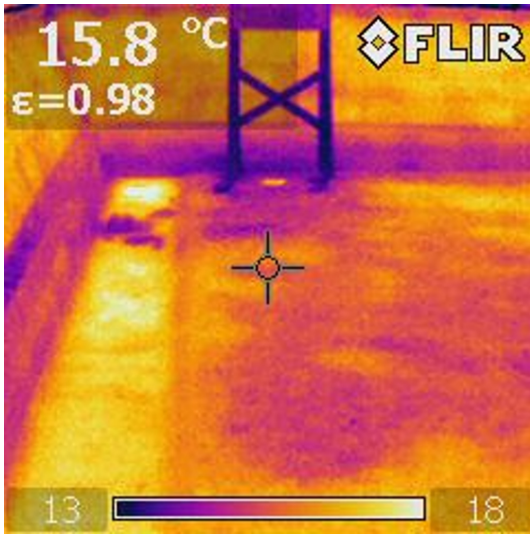


Photo 18

In order to fully understand the extent of water ingress across the site, thermal imaging photos were taken on the roof section. As is very clear to see, the yellow areas are where the roof is emitting a large amount of heat from the facility due to poor thermal capabilities and the purple and black areas are water ingress issues.

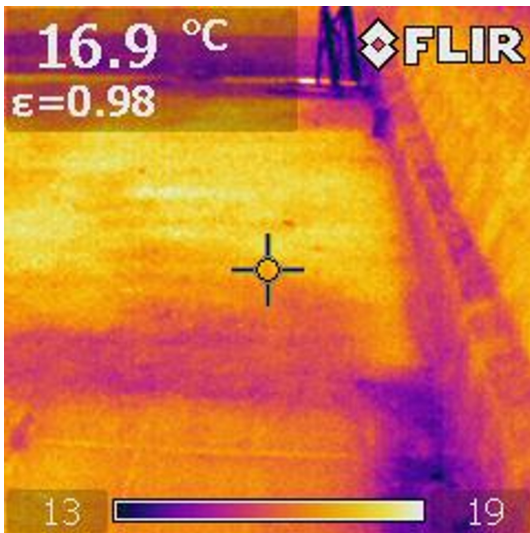


Photo 19

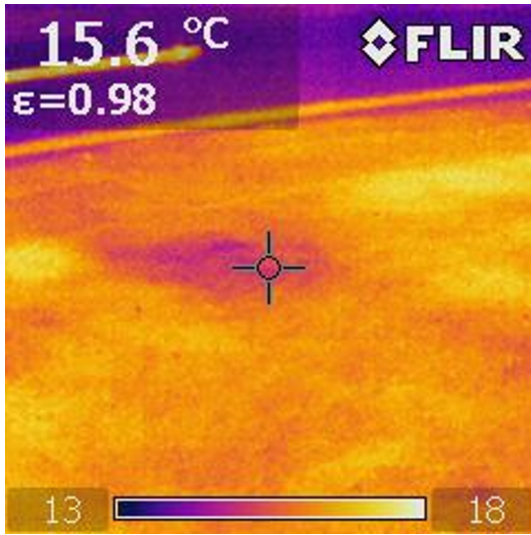


Photo 20

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof A

Replace Options

Solution Option:	Replace 	Action Year:	2019
Square Meters:	290	Expected Life (Years):	20
Budget:	-		

Due to the complete saturation of this section, the best solution is to completely strip the old top layer of asphalt and foam glass insulation and replace with a new fully built up system.

I've chosen to use our Duracoat liquid system for this solution which is an MMA (Methyl Methacrylate) and self-terminating, due to this being a listed building I've been advised that matching the current as aesthetic of the current roof covering is essential this product will allow us to match the current colour and lay loose aggregate without damaging the waterproofing.

Dura-Coat - PUMA Waterproofing System is a liquid waterproofing membrane which provides a durable elastomeric waterproofing system with a variety of coloured finishes.

PRIMER: Quick-Prime Cannister Primer (14.4kg net)

VCL: SA ALU-X Self Adhesive Membrane (50m x 1.04m)

INSULATION: Foil faced 130mm PIR Insulation

INSULATION ADHESIVE: Garland Insul-Bond (1500ml)

INSULATION JOINTS: FixFast AFT-75 aluminum foil tape with Grip Polyester Soft Fabric reinforced joints in Dura-Coat Thix

CARRIER MEMBRANE SA ALU-X Self Adhesive Membrane (50m x 1.04m)

MEMBRANE: Dura-Coat Membrane (25kg pail)

REINFORCEMENT: Grip Polyester Soft Fabric (0.15x100m)

TOP COAT: Dura-Coat Coloured Top Coat (20kg pail)



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof B

Information

Year Installed	Unknown	Square Meters	530
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Assembly

Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	Deck	Concrete	Mechanically attached	-	-
1	System	Mastic Asphalt	Hot applied	-	20mm
1	Insulation	Foamglass	Loose laid	-	40mm
1	System	Mastic Asphalt	Adhesive	-	30mm
1	Surfacing	3/8" gravel	Loose laid	-	-

Details

Perimeter Detail	Parapet Wall
Flashing Material	Mastic Asphalt, Lead
Drain System	Internal Roof Drains
Parapet Wall	Brick
Coping Cap	Metal, Stone

Inventory

Inventory Type	Quantity
HVAC	5
Passive Vent	1
Soil Stack	4
Drain	7



Inspection Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Roof Section: Roof B

Inspection Information

Inspection Date	25/03/2019	Core Data	No
Inspection Type	Core Analysis	Leakage	No
Deck Conditions	Fair		

Flashing Conditions

Perimeter	Poor	Wall	Failed
Projections	Failed	Counterflashing	-

Miscellaneous Details

Brick Chases	N/A	Debris	No
Control Expansion Joints	-	Ponding Water	Substantial
Parapet Wall	Failed	Coping Joints	Failed

Overall

Rating	Failed
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Condition

Following the examination of the existing roof system, I noticed that this section has had a number of short term repairs made to it, these include liquid coatings and felts. A water pump has also been installed in one section due to initial drainage design problems leaving incorrect falls.

Although it's evident that the facilities team have done a great job fire fighting this elevation there is still evidence that the roof section is coming towards the end of its life cycle, I found a number of cracks and blisters around the perimeter of the roof and areas of slumping, unfortunately, I was unable to take a close look at the main field due to the loose-laid aggregate covering up a large amount of the system, I did, however, discover a couple of blisters which is evidence of trapped moisture below. There is also plenty of evidence of UV damage which will deteriorate over time.

I conducted two core cuts in this section, no water was present in these areas which is a good sign and would mean that an overlay is a viable option in the future to extend the life of this roof.

There is an internal parapet wall between roof section B and D where the coping stones have completely failed in places, I have provided images of the failed mortar and some severe cracking below the coping stones, as part of ongoing remedial works I would suggest that these are repaired as soon as possible to prevent water getting permeating the system in this area.

I found a couple of poor detailing around some of the penetrations one is a lighting conductor which is drilled vertically into the wall with no sealant to prevent water from entering the system and a vent which has had an unreinforced liquid coating applied.

There has also been liquid coatings used on a number of the upstands which haven't been reinforced these are only a short terms fix and should be reapplied every six months. As a result of ponding water around the water pump, the felt has started to lose its mineral content, bare felts are common in these sort of circumstances due to UV damage, I would suggest keeping an eye on this area and replace the felts when they start to display blisters none was present at the time of my visit.

I've highlighted a few problem areas below

- UV damage and blister visible in the asphalt
- Cracks and slumping around the perimeters
- incorrectly applied repairs
- Failed mortar and cracks in the coping stones
- Incorrect drainage falls
- Bare felts

If refurbishment is left indefinitely, the areas of slumping and cracking will continue to deteriorate leading to total failure of the roof



Photo 1

I found a number of areas where the asphalt has completely broken down and cracks have formed



Photo 2

Evidence of cracks/slumping around the perimeter



Photo 3

You can clearly see large blisters appearing in this area which is evidence of moisture trapped below



Photo 4

Another example of blisters around the perimeter of the roof



Photo 5

Cracking around the perimeter of the building



Photo 6

Evidence of ponding water which has subsequently lead to UV damage



Photo 7

More evidence of cracking in the asphalt



Photo 8

As discussed in the summary the main field has a loose laid aggregate which made it difficult to find defects, this is one area where blisters are present



Photo 9

Severe cracking of the asphalt on this section which will need to be addressed



Photo 10

As discussed in the summary the ponding water in this area is leading to bare felts of the torch applied membrane this will lead to failure over time and will need to be monitored closely



Photo 11

Cracks are present under the coping stones between roof section B and D



Photo 12

Coping stone failures



Photo 13

Example of the unreinforced liquid coating being used, this will need to be reapplied regularly



Photo 14

Water pump has been installed in this area due to incorrect falls on the roof



Photo 15

Example of remedial works carried out



Photo 16

As discussed in the summary this lightening conductor is incorrectly detailed



Photo 17

Example of temporary repairs made in this section



Photo 18

A core cut was performed on this section, I have provided full details of the build-up on this report

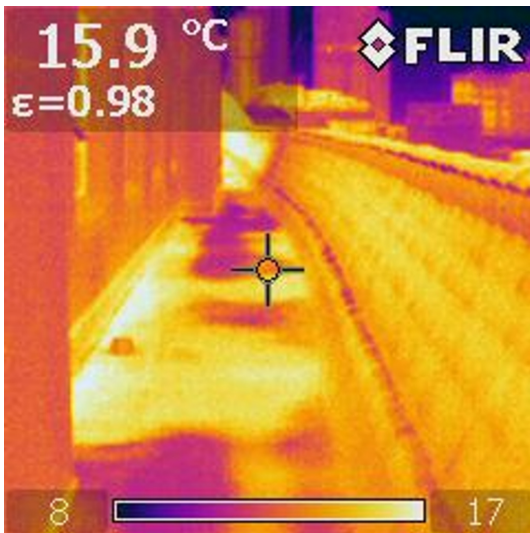


Photo 19

In order to fully understand the extent of water ingress across the site, thermal imaging photos were taken on the roof section. As is very clear to see, the yellow areas are where the roof is emitting a large amount of heat from the facility due to poor thermal capabilities and the purple and black areas are water ingress issues.

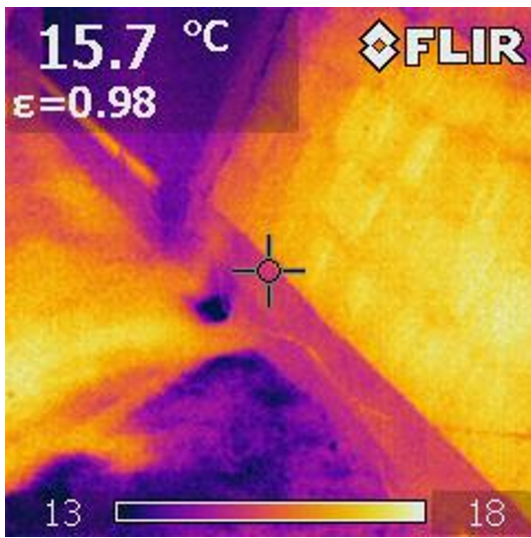


Photo 20

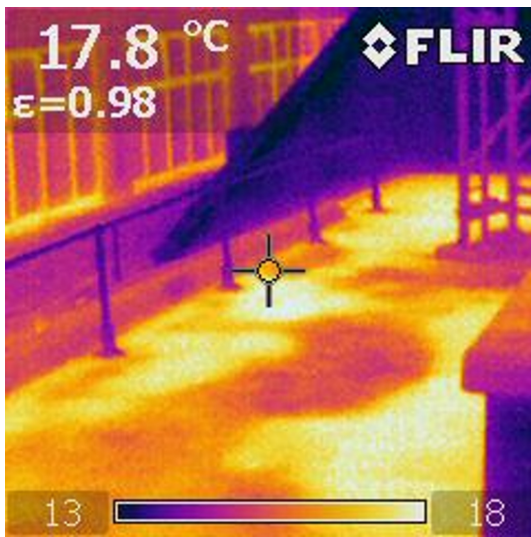


Photo 21



Solution Options

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof B

Restore Options

Solution Option:	Restore 	Action Year:	-
Square Meters:	530	Expected Life (Years):	20
Budget:	-		

After performing my core cut I found minimal water within the system, due to this a restore option would be best suited to this project which will negate the need to bring the insulation up to current regulations and avoid stripping the material from the roof.

Again I have chosen our Dura Coat system which will be able to match the current aesthetic of the roof.

Dura-Coat - PUMA Waterproofing System is a liquid waterproofing membrane which provides a durable elastomeric waterproofing system with a variety of coloured finishes.

SUBSTRATE: Existing Mastic Asphalt

PRIMER: No primer required

MEMBRANE: Dura-Coat Membrane (25kg pail)

REINFORCEMENT: Grip Polyester Soft Fabric (0.15x100m)

TOP COAT: Dura-Coat Coloured Top Coat (20kg pail)

CATALYST: Dura-Systems Catalyst (2kg or 25kg)

CLEANER: Dura-Coat Cleaner (5kg or 10kg pail)



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof C

Information

Year Installed	Unknown	Square Meters	1,150
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Assembly

Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	System	Mastic Asphalt	Hot applied	-	-

Details

Perimeter Detail	Parapet Wall
Drain System	Internal Roof Drains
Parapet Wall	Brick

Inventory

Inventory Type	Quantity
HVAC	
Drain	



Inspection Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Roof Section: Roof C

Inspection Information

Inspection Date	25/03/2019	Core Data	No
Inspection Type	Visual Inspection	Leakage	Yes
Deck Conditions	Unknown		

Flashing Conditions

Perimeter	Failed	Wall	Failed
Projections	Failed	Counterflashing	N/A

Miscellaneous Details

Brick Chases	Poor	Debris	No
Control Expansion Joints	-	Ponding Water	Substantial
Parapet Wall	Failed	Coping Joints	Fair

Overall

Rating	Failed
Condition	This section consists of a large cage which is housing the majority of the plant for the building, after speaking to the property manager he explained that they are experiencing a number of leaks in this area which seem to be located mainly around the perimeters. Due to access being limited I was unable to provide a core cut or get a close look at some of the detailing I did, however, find a number of issues with areas which were accessible. The main issue with the roof consists of poor detailing around the penetrations, insufficient drainage and unreinforced liquid repairs which display an insufficient bond to the substrate ultimately. As discussed above there have been numerous attempted repairs which look to be attempted in various liquid coating and not detailed properly, these areas will need to be the main focus for any future remedial work.



Photo 1

Example of poor detailing you can see that liquids have been used but ultimately the cables haven't been made water tight.

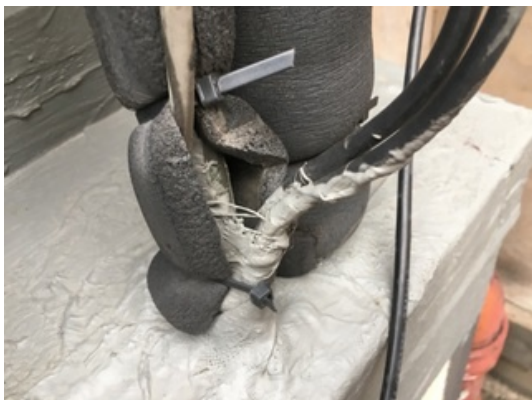


Photo 2

Poorly applied product



Photo 3

Unreinforced liquids used in this area, this perimeter also displays slumping



Photo 4

This liquid coating looks uneven the lightning conductor has also been coated over this will fail due to thermal movement



Photo 5

I would suggest that all drains are cleared of debris



Photo 6

Liquid coating used which haven't been terminated properly



Photo 7

Unreinforced liquid coatings



Photo 8

Poorly detailed repair



Photo 9

Liquid Repair



Photo 10

Roof overview



Photo 11

Roof Overview



Photo 12

These plinths will need to redone I saw a number of failings on these sections



Photo 13

Roof Overview



Photo 14

Example of sagging and blisters around the perimeter



Photo 15

Unterminated liquid repair



Photo 16

Elevation overview



Photo 17

Elevation overview

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof C

Repair Options

Solution Option:	Repair 	Action Year:	-
Square Meters:	1,150	Expected Life (Years):	10
Budget:	£2,019.00		

As discussed this section is going to be a challenge due to access and the loose-laid aggregate below the system.

Ultimately we need to look at a comprehensive repair schedule, after speaking with my colleague we would like to attend site again to draw up a full repair specification for this project. our first thoughts are to look at waterproofing the entire perimeter encapsulating the walls which is where the majority of the problems are occurring this will involve.

- Clearing the drains of any debris
- Waterproofing a minimum of 1 meter inwards from the edge of the cage
- Correctly detailing all the upstands on the metal frame
- We would need to dress the waterproofing under the lead flashings
- Creating new housing for the cable boxes
- Correctly terminate all repairs
- Waterproof all the plinths

in order to achieve this, we will need to ascertain exactly how many of the grates we can raise in order to gain access and plot out the current drainage system, I will liaise with Fergus and Tim to get the ball rolling on this.



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof D

Information

Year Installed	Unknown	Square Meters	1,250
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Assembly

Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	System	Mastic Asphalt	Hot applied	-	-
1	Surfacing	3/8" gravel	Loose laid	-	-

Details

Drain System	Internal Roof Drains, Gutter System
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Inventory

Inventory Type	Quantity
Drain	5
Skylight	3
Soil Stack	3
HVAC	2



Inspection Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Roof Section: Roof D

Inspection Information

Inspection Date	25/03/2019	Core Data	No
Inspection Type	Visual Inspection	Leakage	Yes
Deck Conditions	Unknown		

Flashing Conditions

Perimeter	Failed	Wall	Failed
Projections	Failed	Counterflashing	Fair

Miscellaneous Details

Brick Chases	Fair	Debris	No
Control Expansion Joints	N/A	Ponding Water	Minor
Parapet Wall	Failed	Coping Joints	Failed

Overall

Rating	Fair
Condition	This roof section seems to be relatively free of blisters and cracks in the asphalt, I did find some slumping in one area which was isolated to one section. the main problem I could find was the failed abutment around the second dome which needs to be repaired. As discussed in the summary for section B there is an internal parapet wall which has failed in this section due to mortar failure and cracks, this needs to be addressed to prevent water permeating the system. I walked the gutter section looking for issues with the flashing I didn't find anything in this area and would suggest any issues could be due to the glazing. As part of the phased plan works this section would be deemed a low priority



Photo 1

Example of failed abutment



Photo 2

Example of failed abutment



Photo 3

An isolated area of slumping



Photo 4

All flashings are in good condition



Photo 5

I walked this area looking for defects



Solution Options

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof D

Repair Options

Solution Option:	Repair 	Action Year:	2019
Square Meters:	1,250	Expected Life (Years):	5
Budget:	-		
Minimal requirements for this roof are needed just the repair of the abutment which can be factored into the programme whilst works are being completed in other areas			



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof E

Information

Year Installed	Unknown	Square Meters	520
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Assembly

Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	System	Mastic Asphalt	Hot applied	-	-
1	Surfacing	3/8" gravel	Loose laid	-	-

Details

Perimeter Detail	Parapet Wall
Drain System	Internal Roof Drains

Inventory

Inventory Type	Quantity
HVAC	2
Drain	6



Inspection Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Roof Section: Roof E

Inspection Information

Inspection Date	25/03/2019	Core Data	No
Inspection Type	Visual Inspection	Leakage	No
Deck Conditions	Unknown		

Flashing Conditions

Perimeter	Failed	Wall	Poor
Projections	Failed	Counterflashing	N/A

Miscellaneous Details

Brick Chases	N/A	Debris	No
Control Expansion Joints	N/A	Ponding Water	Minor
Parapet Wall	Failed	Coping Joints	Good

Overall

Rating

Failed

Condition

After walking the area I found the overriding fault with this system is that the asphalt has severely broken down around the perimeter in a number of areas, this will continue to deteriorate leading to failure over time I've provided images of this within this report. I also found several blisters located in the gutter system and on the main field of the roof, this is evidence that water is trapped beneath the system. I was unable to provide a core cut due to noise but have arranged to visit the site again to investigate this area further.

This roof system has had a substantial amount of repairs made to it using a liquid coating, due to these repairs being carried out in isolated locations and not fully encapsulating the area they are only a short term fix and will debond at the leading edges over time.

One area has been repaired using a modified bitumen membrane, I found some areas of the laps have started to debond from the substrate, this is due to the lack of bleed out created when installing, under a Garland specification we always require a minimum of 3mm of bitumen bleed out at the laps for this reason.

I also found a couple of failures around the flashings on the plant towards the back end of the roof, these aren't urgent but will need to be addressed if remedial works are carried out.

- UV damage and blister visible in the asphalt
- Cracks and slumping around the perimeters
- incorrectly applied repairs
- Failed flashing



Photo 1

Overview of roof section



Photo 2

As discussed in the summary a found areas of slumping/blistering around the perimeters



Photo 3

Evidence of folds and blisters in the asphalt



Photo 4

Evidence of UV damage and blistering in this area



Photo 5

More evidence of UV damage in this area which has also caused some cracking



Photo 6

Slumping and blisters were found around the perimeter



Photo 7

Cracks in the asphalt as discussed in the summary



Photo 8

Failures around the perimeter



Photo 9

Deterioration in the asphalt on this upstand



Photo 10

Failed flashing as discussed in the summary



Photo 11

No bleed out created



Photo 12

Laps starting to debond in some areas



Photo 13

Another example of the above

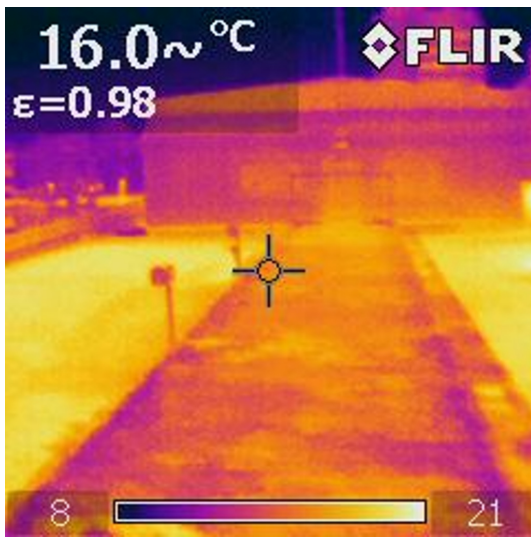


Photo 14

In order to fully understand the extent of water ingress across the site, thermal imaging photos were taken on the roof section. As is very clear to see, the yellow areas are where the roof is emitting a large amount of heat from the facility due to poor thermal capabilities and the purple and black areas are water ingress issues.



Photo 15

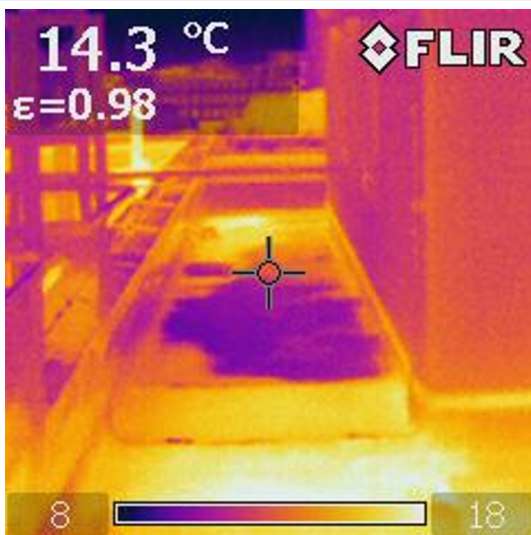


Photo 16

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof E

Restore Options

Solution Option:	Restore 	Action Year:	-
Square Meters:	520	Expected Life (Years):	25
Budget:	-		

A core cut will need to be performed in this section assuming that no water is found in the system a restore option would be best suited to this project which will negate the need to bring the insulation up to current regulations and avoid stripping the material from the roof.

Again I have chosen our Dura Coat system which will be able to match the current aesthetic of the roof.

Dura-Coat - PUMA Waterproofing System is a liquid waterproofing membrane which provides a durable elastomeric waterproofing system with a variety of coloured finishes.

SUBSTRATE: Existing Mastic Asphalt

PRIMER: No primer required

MEMBRANE: Dura-Coat Membrane (25kg pail)

REINFORCEMENT: Grip Polyester Soft Fabric (0.15x100m)

TOP COAT: Dura-Coat Coloured Top Coat (20kg pail)

CATALYST: Dura-Systems Catalyst (2kg or 25kg)

CLEANER: Dura-Coat Cleaner (5kg or 10kg pail)



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof F

Information

Year Installed	Unknown	Square Meters	150
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Assembly

Roof #	Layer Type	Description	Attachment	U-Value	Thickness
1	System	Mastic Asphalt	Hot applied	-	-
1	Surfacing	3/8" gravel	Loose laid	-	-

Details

Parapet Wall	Brick, Concrete Block
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Inventory

Inventory Type	Quantity
Drain	2



Inspection Report

Client: Avison Young

Facility: Manchester Royal Exchange

Report Date: 25/03/2019

Roof Section: Roof F

Inspection Information

Inspection Date	25/03/2019	Core Data	No
Inspection Type	Visual Inspection	Leakage	No
Deck Conditions	Unknown		

Flashing Conditions

Perimeter	Poor	Wall	Poor
Projections	N/A	Counterflashing	N/A

Miscellaneous Details

Brick Chases	N/A	Debris	No
Control Expansion Joints	N/A	Ponding Water	Minor
Parapet Wall	Poor	Coping Joints	Fair

Overall

Rating	Fair		
Condition	This roof section seems to be relatively free of blisters and slumping, I did find cracks in the asphalt in isolated areas around the perimeters which will need to be monitored, I was unable to take a good look at the asphalt on the main field due to the loose-laid aggregate, however, the areas I did check was in good condition as well as the capping details. There is one section that has been repaired using a liquid coating this will peel up at the leading edge over time due to it not being terminated properly and will need to be monitored As part of the phased plan works this section would be deemed a low priority		



Photo 1

Overview of roof section



Photo 2

Cracking in the asphalt around the perimeter of the building



Photo 3

Liquid repairs made in this area



Photo 4

Cracking of the asphalt around the perimeter

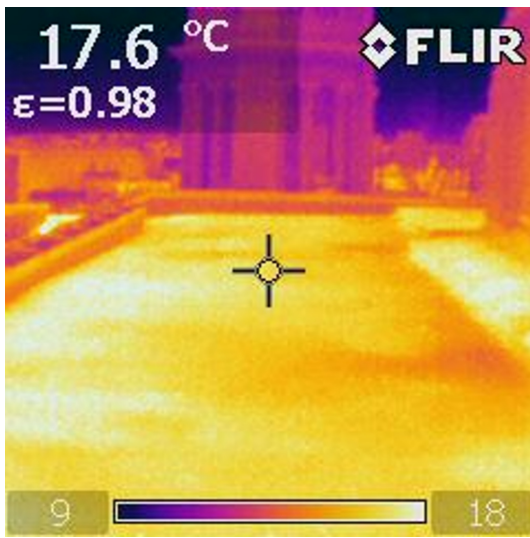


Photo 5

In order to fully understand the extent of water ingress across the site, thermal imaging photos were taken on the roof section. As is very clear to see, the yellow areas are where the roof is emitting a large amount of heat from the facility due to poor thermal capabilities and the purple and black areas are water ingress issues.



Solution Options

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roof F

Maintenance Options

Solution Option:	Maintenance 	Action Year:	2019
Square Meters:	150	Expected Life (Years):	-
Budget:	-		
No urgent action needed the current repair will need to be monitored as well as the cracking around the perimeter			



Construction Details

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roofs G, H & I

Information

Year Installed	Unknown	Square Meters	110
Slope Dimension	-6	Eave Height	6 Storeys
Roof Access	Stairs	System Type	Mastic Asphalt

Photo Report

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roofs G, H & I

Report Date: 25/03/2019

Title: Roof Sections G, H & I

I've included images of roof sections G, H and I within one report all of which I would deem a low priority in regards to phased works, they are all relatively free of blisters and slumping. Roof section G and H have large cracks but the rest of the systems are in good condition.



Photo 1

Roof Section G overview



Photo 2

Missing sealant around the trim



Photo 3

Cracks found around the perimeter of roof section G



Photo 4

Overview of roof section H no issues to report



Photo 5

Roof section I cracking is present

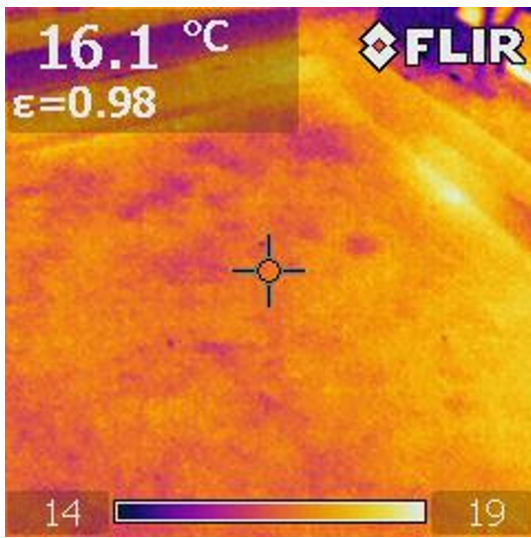


Photo 6

Roof Section G

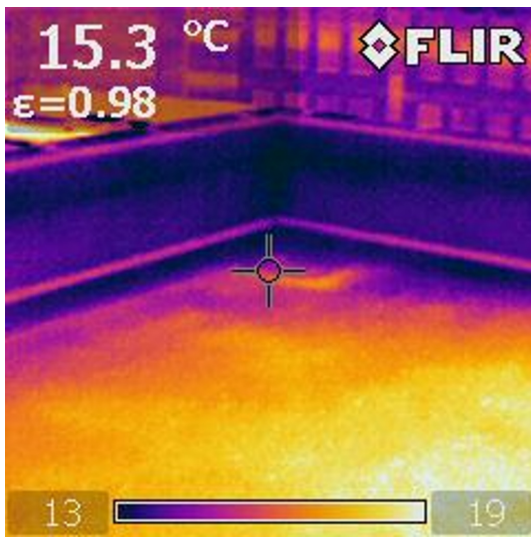


Photo 7

Roof Section H



Solution Options

Client: Avison Young

Facility: Manchester Royal Exchange

Roof Section: Roofs G, H & I

Inspection Options

Solution Option:	Inspection	Action Year:	2019
Square Meters:	110	Expected Life (Years):	5
Budget:	-		

No urgent action needed but a repair should take place on the cracks found in the asphalt again this can be added onto a work programme once work starts on the other sections.

Repair Options

Solution Option:	Repair 	Action Year:	2019
Square Meters:	110	Expected Life (Years):	-
Budget:	-		