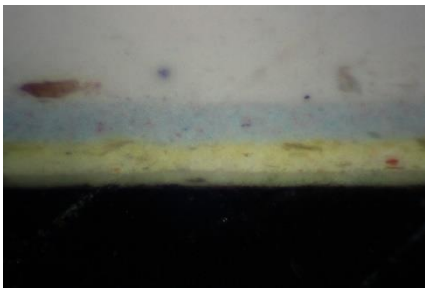


Tootal Building, Manchester Paint Analysis



Report on Findings Report No HPM48MS01

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1.0 Introduction

Heritage Project Management were requested to undertake paint analysis to a number of internal rooms of the Grade II* listed Tootal Building located on Oxford Street in Manchester.

The analysis was to identify the paint schemes that had originally been applied to the heritage fabric of the building. The analysis will be used to inform the development of new decorative paint coatings as part of the refurbishment works being undertaken.

The samples were taken on site on the 8th October 2024, the area in question was an active construction site at that time and full access was available.

The sample works were intrusive although this was very minor and only very small samples of the exiting paint finishes were removed for analysis.

The works were deemed not to fall under the definition of *demolition*, *alteration* or *extension*, in terms of Section 7 of the Planning (Listed Buildings and Conservation Areas) Act 1990, as they will not affect the character, architectural or historic interest of the listed building.

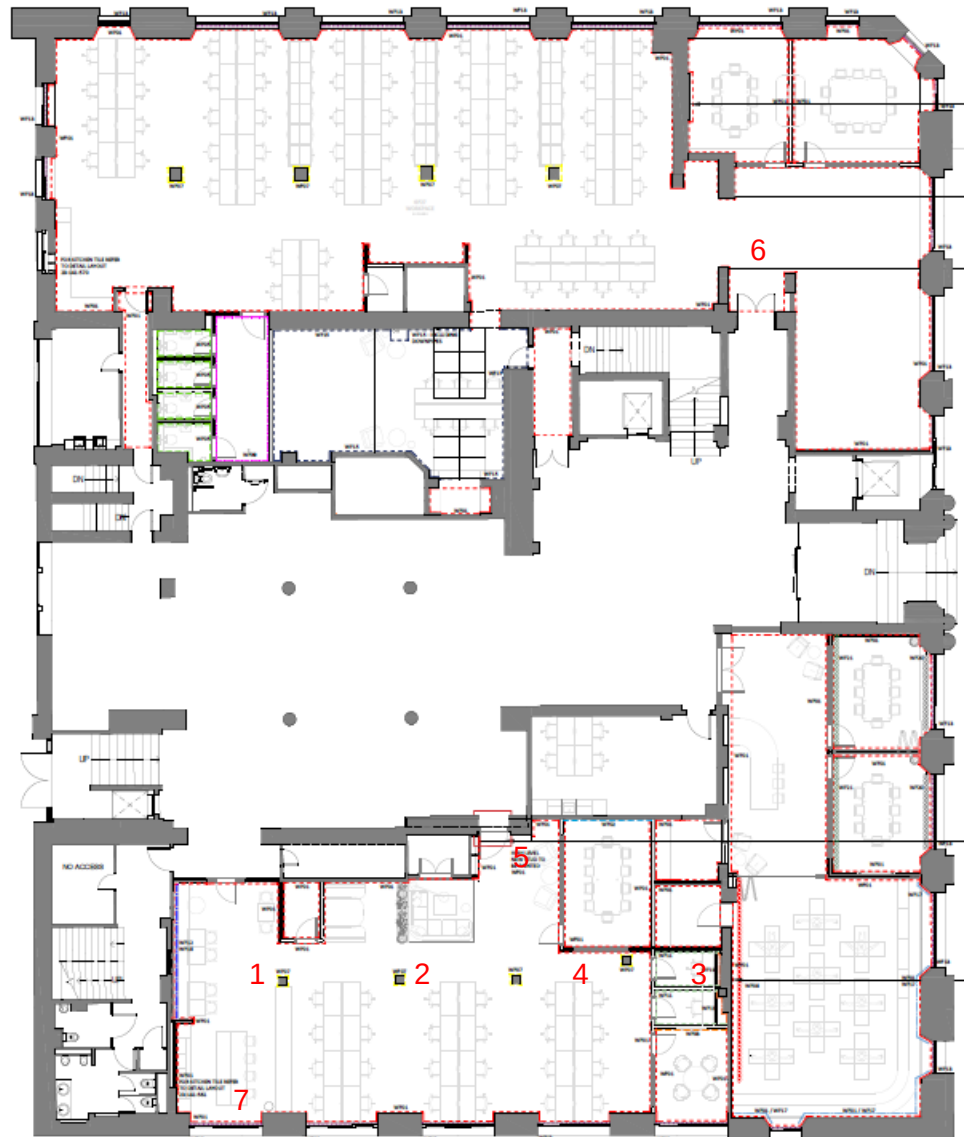
2.0 Sample Locations

A total of 6 paint samples were taken from the external elevations of the buildings. The following schedule notes the locations of the samples:

Sample Ref:	Location:	Comment
01	Canal Side Suite – Column Casing 1	
02	Canal Side Suite – Column Casing 2	
03	Canal Side Suite – Beam Cornicing 1	
04	Canal Side Suite – Beam Cornicing 2	
05	Canal Side Suite – Glazed Tiles	
06	GBS Suite - Cornicing	
07	Canal Side Suite – Wall Area (below dado).	

The location of the samples is noted on the following drawings:

Sample Locations



3.0 Analysis Methodology

Samples were collected from the walls, ceilings and tile elements.

Each sample was removed by the most appropriate methods to retain as far as practicable all paint layers within the sample. Each sample location was photographed, sample identified and bagged for analysis.

4.0 Sample Preparation

Each sample was visually inspected in the workshop to identify any salient features and pieces selected for sectional analysis.

The samples were set in a clear coat polyester resin and then cut and polished to enable them to be inspected under microscope. The resin holds

the paint layers together and allows a polished flat plane for viewing at high magnification.

Samples were also viewed under UV magnification to identify high fluorescent materials such as historic resins and zinc oxide-based paints.

In addition, a proportion of the samples were physically tested for lead content. Samples were tested with a solution of Sodium Sulphide which in the presence of lead turns dark brown in colour.

The interpretation was carried out by Richard Baister of Heritage Project Management.

5.0 Historical Context

Given the age of the building (1896) there would have been a limited choice of materials that could be used for the decorative coatings and the majority of original paints would have been individually mixed by the painters based on traditional recipes and techniques.

Coating systems typically available for the early decorative coatings were:

Lime Washes – these are made from pure white lime mixed with water. They were used for common walls and ceilings especially where for sanitary reasons a frequent fresh application was required. Lime washes were readily removed when rubbed, will not stand rain and do not adhere well to smooth or non-porous surfaces.

Distempers – were made of whiting (lime whiting - limewash with added tallow) mixed with size which was allowed to become jellylike before application. Although more durable this coating was easily removed and used for interior decoration. Prior to redecoration the distempers would typically be fully removed before new coats were applied. The addition of oil with an emulsifier such as borax (sodium borate) created a more durable and often washable distemper depending on its formulation, which can be considered a predecessor of modern resin based emulsions. It became popular as an interior paint in the early 19th century when a number of manufacturers began to produce it commercially, and it remained in common use until after the Second World War when it was finally superseded by vinyl and acrylic emulsion paints.

White Lead Based Paints – Lead carbonate (white lead) was extensively used as the basis for white and light coloured paint coatings. Being either mixed with Whiting or Linseed oil it was a more durable coating than distempers and was able to provide good coverage and opacity.

Red Lead Based Paints – Lead tetroxide (red lead) paints were also extensively used for darker colours where they offered good opacity and the ability to carry darker pigments well. Typically mixed with oils including

linseed, they were used on metalwork and joinery. Also often used as a primer coat on metalwork.

Iron Oxides – Red iron oxide was also seen in the period as a good protective coating for ironwork over lead based paints as they did not set up any perceived galvanic action as was believed to occur between lead paints and iron surfaces. Often cheaper than lead tetroxide due to it being extracted and processed in the UK it was very popular for metalwork and joinery.

Zinc oxides – these were being introduced in the 1870's as a replacement for the more injurious white lead bases as they provided a good level of whiteness and were comparable in cost. They were however, considered not to combine so well with oils and were not favoured by many decorators.

Lithopones (Barium Sulphide) – these were introduced at the turn of the twentieth century as alternative to white lead due to its good covering properties however it was only used internally as it is not durable externally as it darkens and rapidly chalks away.

Varnishes – these were a solution of resin in either oil, turpentine or alcohol. The oil dries, the alcohol evaporates leaving a solid transparent film of resin over the surface varnished.

Lead based paints were known to be injurious to health. However, their use was extensive until alternative materials such as zinc oxides could offer the same workability and coverage to that of the traditional lead paints. Even after this time the lead paints were preferred by traditional decorators.

In addition to the paint coatings, wall papers were also extensively used at this time. These were typically pre-finished with a raised pattern.

The investigations took a total of 27 samples of paint from the building. These have been analysed to identify the nature and colours of the original and subsequent paint layers that have been applied.

6.0 Summary of Findings

General:

The building was originally constructed in 1896 and has undergone a number of alterations since that time.

Paint samples have been taken that best detail the different paint layers that have been applied to the building features and where possible these show the most original / earliest paint coatings that were applied.

It should be noted that many of the sample areas noted that walls and ceilings had been replastered with a modern pink gypsum plaster. This was either as an additional skim over the wall / ceiling or replaced an earlier plaster finish in

its entirety. The building was originally constructed with lime plaster finishes and any use of pink gypsum was likely to be after WW2.

Canalside Suite

The samples taken from the two columns (samples 1 and 2) had only 8 separate paint layers present with all of these being based on modern Titanium white pigments. The plaster substrate of these samples was also pink gypsum indicating that the plaster and paint layers were post WW2. It is likely that the columns have been replastered in their current square configuration at some time. All of the paint layers were light in colour with the majority being white although there was also a very light pink and light grey paint scheme being used at some time.

Both of the samples taken from the corncicing indicated that 14 separate paint layers were present. The earliest decorative scheme was an off-white coloured oil paint that was based on zinc oxide pigments. This was followed by a further 8 off-white or light stone decorative schemes. None of these early scheme were true lead-based paints although lead carbonate was present in one of the off-white paint schemes (layer #4).

The later paint schemes applied to the cornices are based on Titanium white pigments which were much lighter in colour. Four separate Titanium white paint schemes are present with one of them having a slight pink hue.

The 14 separate paint layers indicates that the rooms were painted on average once every 9 years.

The paint sample taken from the glazed tiles (sample 5) indicated that 6 separate paint layers were present. All of these paint layers were based on Titanium white pigments indicating that they were likely to have been applied post WW2.

The earliest paint layer was a light green oil paint that was applied directly onto the red glazed tiles, this was then overcoated with a bright yellow and later a light blue scheme before three separate Titanium white schemes were applied.

A further sample taken from the wall areas (sample 7) provided further evidence of the original decorative scheme for this room area. This sample indicated that four separate red / brown oil paints had been applied to the walls in this area. This would have matched the colour of the dark red glazed tiles that were present in this room ie as found under sample 5.

These red / brown colours were then redecorated with the light green, yellow and light blue colour schemes that were present in sample 5 before the application 10 separate Titanium white schemes one of which was tinted to a light brown colour. A total of 19 separate paint layers were visible in the sample.

GBS Suite

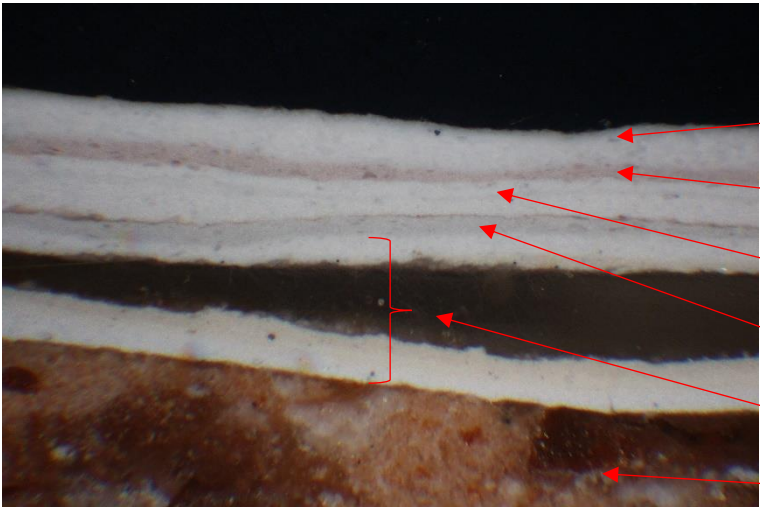
A single sample was taken from the cornice above the entrance doors into this room area from the lobby (sample 6). The sample indicated that 10 separate paint layers were present with all of these being white / off-white in colour.

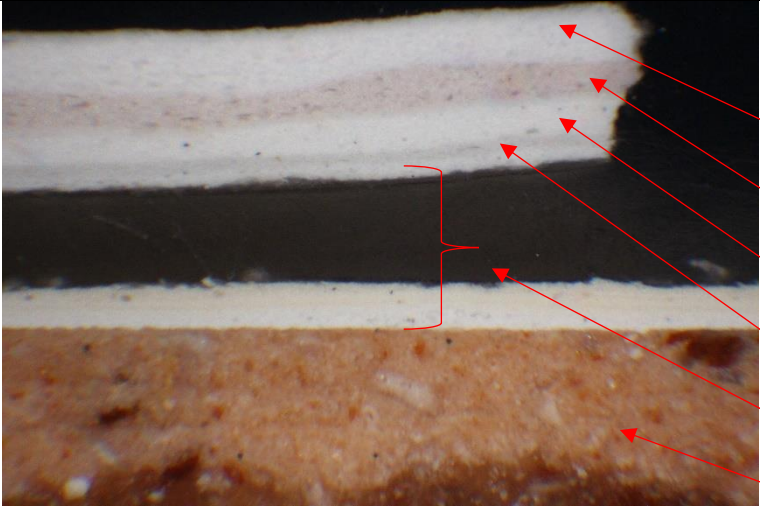
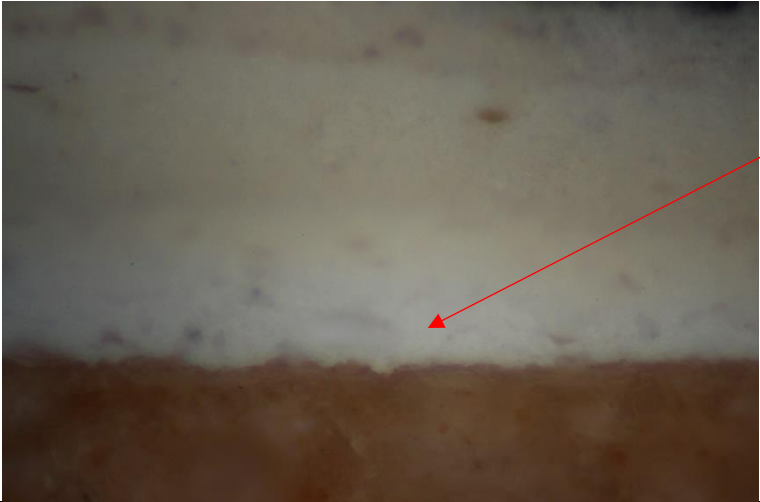
Only the most recent paint layer was based on Titanium white with all the earlier layers being based primarily on zinc oxide pigments. Given the lack of modern pigments it is likely that this ceiling area was covered sometime after WW2. No lead carbonate paints were present in the sample.

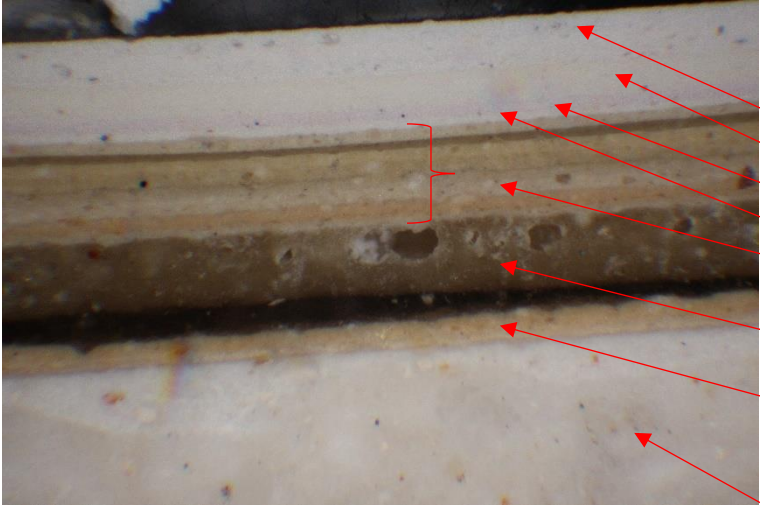
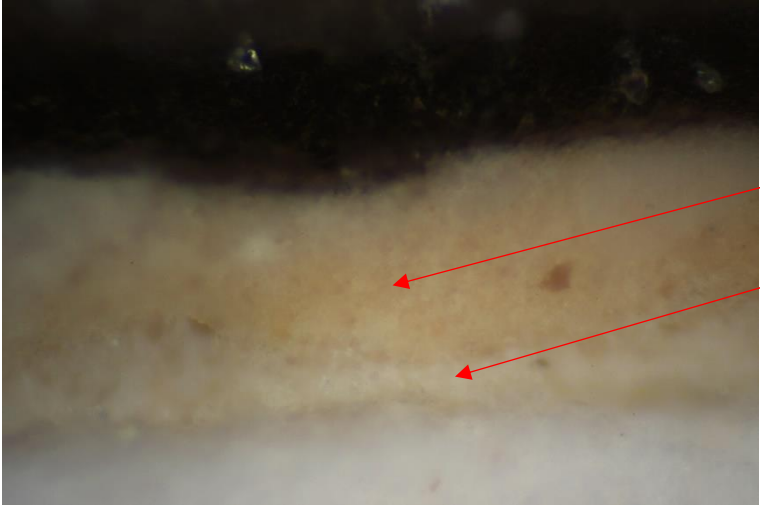
7.0 Lead Based Paints

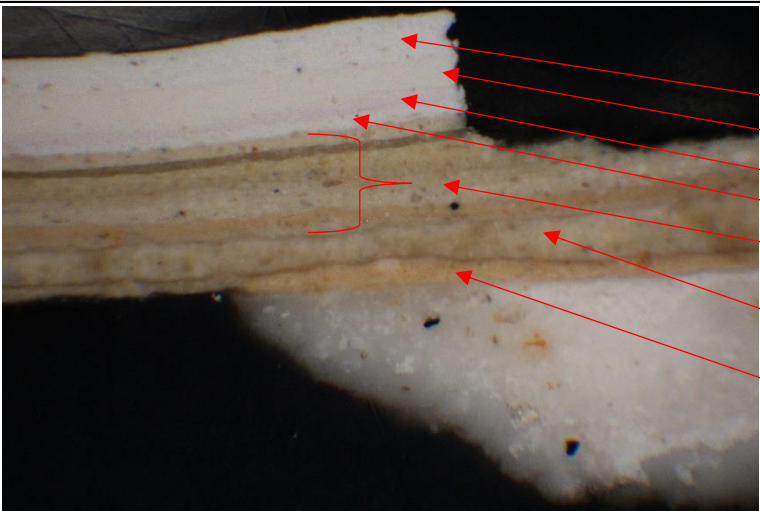
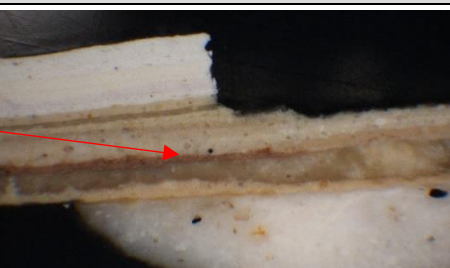
There was very little evidence of lead-based paints in the samples taken with only the cornice (samples 3 and 4) testing positively for lead in a single paint layer. However, lead carbonates and oxides were used in small quantities as driers in paint until they were finally banned in 1992. Even at these small concentrations the total lead content may exceed the 1% threshold noted within the CLAW (Control of Lead at Work) Regulations and all necessary control measures should be implemented whilst working with these materials.

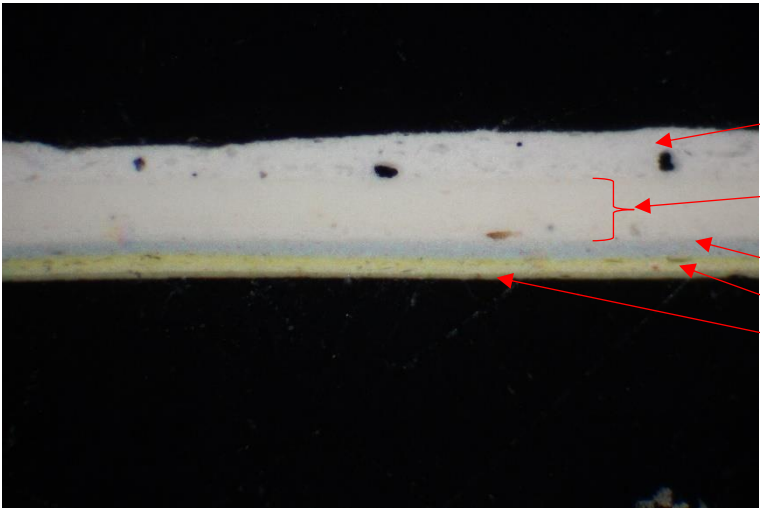
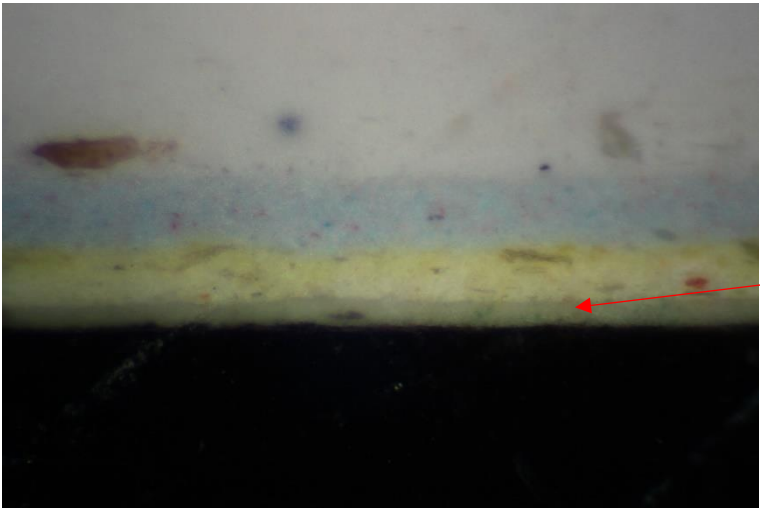
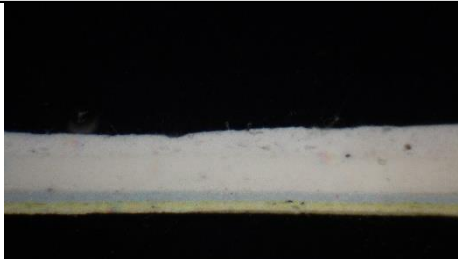
Appendix A – Sample Analysis Sheets

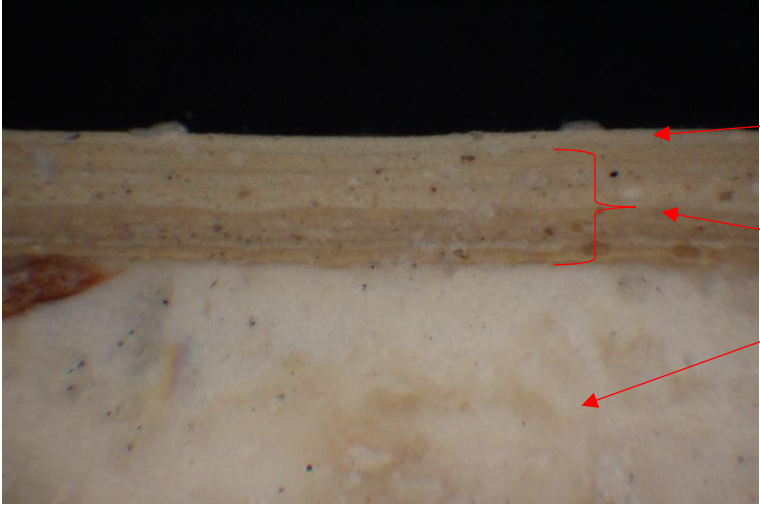
Sample Ref: 01	Location: Tootal Building
Paint sample removed from: Location: 01 – Canalside Suite, Column No 1 A total of 8 separate paint layers were found.	
Sectional Photographs	Description
 	X50 Magnification – Current visible paint coating – Titanium white. Single pink paint coating 2No Titanium white paint layers. Single light grey paint coating 3No Titanium white paint layers. Gypsum plaster X400 Magnification - Earliest paint layers. Modern Titanium white paint layer over gypsum plaster. Note: The gypsum plaster is a later plaster material and likely post WW2.
Lead Test	
Early schemes tested for lead Yes – no evidence of lead based paints.	

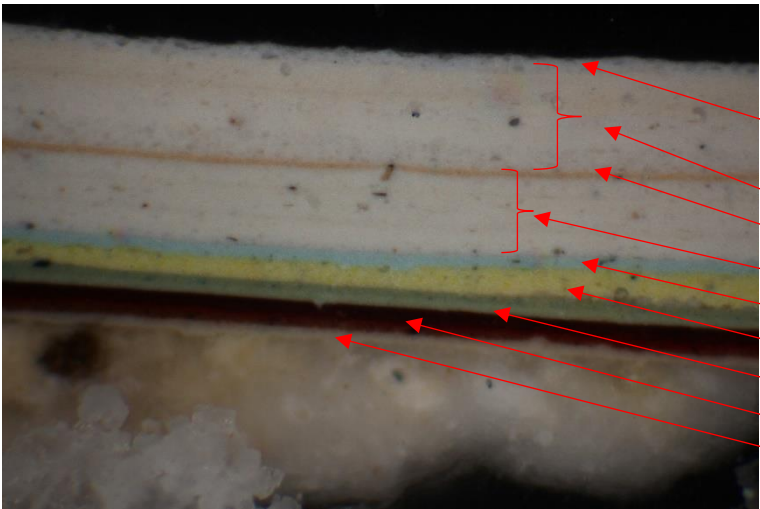
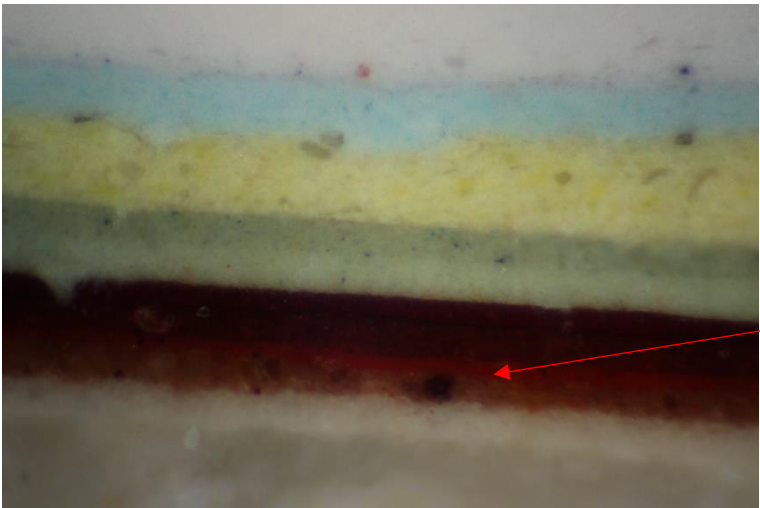
Sample Ref: 02	Location: Tootal Building
Paint sample removed from: Location: 02 – Canalside Suite, Column No 2 A total of 8 separate paint layers were found.	
Sectional Photographs	Description
 	X50 Magnification – - Current visible paint layer – Titanium white. - Single light pink paint layer 2No Titanium white paint layers - Single light grey paint layer 3No Titanium white paint layers - Gypsum plaster X400 Magnification - - Earliest paint layer. - Modern Titanium white paint layer. Note: All paint layers are modern based on Titanium white. The plaster substrate is gypsum plaster and likely to be post WW2.
Lead Test	
Early schemes tested for lead Yes – no evidence of lead based paints.	

Sample Ref: 03	Location: Tootal Building
Paint sample removed from: Location: 03 – Canalside Suite, Beam cornice No 1 A total of 14 separate paint layers were found.	
Sectional Photographs	Description
 	X50 Magnification – - Current visible paint coating – Titanium white - Earlier Titanium white paint coating - Light pink (off-white) paint coating - Titanium white paint coating 7No stone / off white paint coatings based on zinc oxide. - Single thick layer of stone coloured paint based on zinc oxide. - Single layer of off-white paint coating based on zinc oxide. Plus trace mist coat. - Lime plaster X400 Magnification - - Earliest paint layers. - Off-white oil paint based on zinc oxide. - Mist coat (off-white).
Lead Test	
Early schemes tested for lead Yes –Some evidence of lead carbonate pigments within paint layer #4.	

Sample Ref: 04	Location: Tootal Building
Paint sample removed from: Location: 04 – Canalside Suite, Beam cornice No 2 A total of 14 separate paint layers were found.	
Sectional Photographs	Description
 	X50 Magnification – - Current visible paint coating – Titanium white - Earlier Titanium white paint coating - Light pink (off-white) paint coating - Titanium white paint coating 7No stone / off white paint coatings based on zinc oxide. - Single thick layer of stone coloured paint based on zinc oxide. - Single layer of off-white paint coating based on zinc oxide. Lime plaster X400 Magnification - - Earliest paint layers. - Off-white oil paint based on zinc oxide. Lime plaster
Lead Test	
Early schemes tested for lead Yes – some evidence of lead carbonate pigments on within layer #4.	

Sample Ref: 05	Location: Tootal Building
Paint sample removed from: Location: 05 – Canalside Suite, Glazed Tiles A total of 6 separate paint layers were found.	
Sectional Photographs	Description
 	X100 Magnification – - Current visible paint layer – modern Titanium white. 2No earlier Titanium white paint layers - Single light blue paint layer. - Single yellow paint layer - Single light green paint layer. X400 Magnification - Earliest paint layers. - Earliest decorative paint layer – modern light green based on Titanium white. Note: Paint layers were applied over a glazed tile element.
Lead Test	
Early schemes tested for lead Yes – no evidence of lead based paints.	

Sample Ref: 06	Location: Tootal Building
Paint sample removed from: Location: 06 – GBS Suite, Cornice A total of 10 separate paint layers were found.	
Sectional Photographs	Description
 	X50 Magnification – Current visible paint layer – modern Titanium white. 9No layers of off-white paint coatings. Lime plaster X400 Magnification - Earliest paint layer. Off-white oil paint based on zinc oxide. Lime plaster. Note: The sample is missing the later Titanium white paint layers that were present in the other samples. It is possible that this particular area has been covered or not painted in recent times.
Lead Test	
Early schemes tested for lead Yes – no evidence of lead based paints.	

Sample Ref: 07	Location: Tootal Building
Paint sample removed from: Location: 07 – Canalside Suite, wall area. A total of 19 separate paint layers were found.	
Sectional Photographs	Description
 	X100 Magnification – - Current visible paint layer – modern Titanium white paint layer. 4No Titanium white paint layers. - Single light brown paint layer. 4No Titanium white paint layers. - Single light blue paint layer. - Single yellow paint layer. 2No green paint layers 4No red / brown paint layers. - Single white (Lead carbonate layer). X400 Magnification - Earliest paint layers. Earliest decorative scheme – red paint scheme. Note: The gypsum plaster.
Lead Test	
Early schemes tested for lead Yes – Layer #1 tested positive for lead carbonate.	