

Prescot Picture House
8-14 Kemble Street, Prescot



**Mortar and Paint analysis results and an assessment
of the historic render, plaster and paint schemes used
on the front elevation and within the main
auditorium space**

December 2022

Prepared by



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Introduction

M Womersleys have been instructed by the Major Development Team at Knowsley Council to provide a Paint and Render Analysis Survey for 8-14 Kemble Street, Prescott. Based upon taking 6 samples externally from the front elevation (facing onto Kemble Street) and taking 10 paint and plaster samples internally in the main auditorium area and at the mezzanine level, including from internal walls, decorative features, and from the fibrous plaster ceiling.

This initial number of samples provided some answers about the likely decorative colour schemes, but also raised many more questions about the interior's previous design, and more paint samples were taken and an analysis of them are also included within this report. The detailed results of the sample paint analysis can be found in appendix 1, and those from the mortar analysis in appendix 2.

The interpretation of the results will be set out below, illustrating which renders and plasters were used to clothe the building, and which paint finishes decorated the Picture House in its hey days. These are based upon the samples taken and the historic context of this building, but with unfortunately very limited archival material, it will not be possible to date the various coloured layers with any accuracy.

The renders and paint finishes to the front elevation of the picture house and adjacent shops and the story they tell.

It appears from looking at both the render composition and the number of paint layers applied to the surface of the samples, that the original flat rendered areas may be represented by mortar analysis sample 'vii' (see appendix 2) and be comprised of a hydraulic lime or natural cement render. With the original decorative elements such as the run in situ panel moulding, (sample vii, appendix 2), being formed from an early OPC/Lime/Fine Sand mix. The planted on decorative elements, such as the swags, are likely to be the same build up as the scroll above the central bay of the main Picture House façade, which is comprised of almost neat cast early OPC, (sample ii. appendix 2). The use of a strong Portland cement

mix was advised for cast external work from at least 1903,¹ and described in more detail by Millar, the decorative plaster specialist.²

We should not be surprised, as Picton describes how Roman Cement was first used in Liverpool as external plain rendered coatings to the front of buildings in about 1820,³ and was used by Liverpool Corporation on their buildings from 1834,⁴ with two Roman Cement dealers in Liverpool, listed in Gore's Directory from 1834.⁵ This natural cement appears to have arrived by ship into the port, and the author has come across other examples of its use in Liverpool, upto the late nineteenth century. Its use also extended to Lancaster in the same period, based on render analysis by the author at Lancaster Grand Theatre

We also know that more modern OPC had started to be produced in this region with 290,000 tonnes of cement clinker manufactured between 1907 – 1929 at Crosfield's in nearby Warrington, (whose main business was soap manufacture).⁶ Cement was also available from December 1912 from the Ship Canal Portland Cement Manufacturers Ltd., who produced 75 tons of cement clinker per day at the Ship Canal Works on Ellesmere port.⁷

Later cement-lime bound renders were used in repairing or renovating this building and can be seen in mortar samples, (samples i, iii, vi, viii, in appendix 2) but it is unclear when they date from. Although in the late 1920's it was not unusual for plain backing coats of cement render to be comprised of one part Portland cement to two parts of washed sand.⁸

The areas of original rendered surfaces that remain, that is samples ii, iv, and vii, shown on diagram A, appear to have originally been coated with staining water based paints, (see paint references No.1, diagram A), as oil paints could not be applied within at least the first year to

¹ Mitchell, 35–35.

² William Millar, *Plastering Plain & Decorative*, 4th ed. (London: B. T. Batsford, 1927).

³ Sir James Allanson PICTON, 'The Architectural History of Liverpool ... Papers Read Before the Liverpool Architectural and Archæological Society' (The Liverpool Architectural and Archæological Society, 1858), 61.

⁴ J. and J. Mawdsley, 'The Account of the Corporation of Liverpool, with Their Treasurer from the 18th of October 1832 (to the 31st of August, 1834).' (Liverpool Corporation, 1834).

⁵ 'Gore's Directory of Liverpool and Its Environs for the Year' (Gore's Directory Liverpool, 1834).

⁶ Dylan Moore, 'Cement Kilns: Crosfields', Private, *Crosfield's* (blog), Dylan Moore: commenced /12/2010: last edit 18/03/2022 2010, https://www.cementkilns.co.uk/cement_kiln_crosfield.html.

⁷ Dylan Moore, 'Cement Kilns: Ellesmere Port', Private, *Ellesmere Port* (blog), Dylan Moore: commenced /12/2010: last edit 18/03/2022 2010, https://www.cementkilns.co.uk/cement_kiln_ellesmere.html.

⁸ Charles F. Mitchell, *Building Construction. Advanced and Honours*, 4th ed. (London: B. T. Batsford, 1903), 37–38.

a new cement stucco.⁹ Although, the red brown colour may also be from iron rich roman stucco or an iron rich lime-cement render. This has then later been followed with a priming coat, (references 'P' on Diagram A) of red lead and boiled linseed oil,¹⁰ or of a combination of white and red lead, boiled oil, and turpentine.¹¹

The next three coats may comprise of two undercoats, see reference numbers 2 & 3, diagram A, consisting of pigment carried in white and red lead, boiled oil and turpentine with some patent driers added, followed by a finish coat on flat rendered areas, see reference numbers 4, diagram A, which was tinted by pigments giving a medium stone brown-red colour. The panel moulding forming the edge pilasters seemed to use the same colour but some decorative details, such as the scroll, see reference number 5, sample ii on diagram A, were apparently picked out in a lighter blue. This combination may represent the first full colour scheme, dating to within the first five years of the buildings opening. The flat areas then appear to have been coated in a subdued olive green, see references 6 on diagram A.

It appears from an advert for the Picture House, that may date to the early to mid-1920's, based upon the telephone number '39 Prescott', shown on the flyer, that the next paint layers date to this period, and these are circled blue on diagram B below. They include a cream stone coloured plain render base, see reference numbers 9 on diagram A, with the panel moulding to the pilaster details at the corners of the building and at the edge of the central projecting bay, being in a red brown colour, see references 10 on diagram A, together with the corbel to the adjacent shop front. The decorative scrolls, and perhaps also the swags, being in an olive green colour, see reference numbers 11 on diagram A.

After which all the wall areas and decorative details were coated in a bright cream colour, perhaps using Titanium Oxide based paints, which were mass produced after 1916,¹² and mentioned in decorating guides for some applications in 1938.¹³ After this, the whole building appears to have been decorated in modern cream and white coloured paints.

⁹ John P. Parry, *Painting and Decorating - A Comprehensive Manual for the Craftsman with a Glossary to Technical Terms*, Paper back reprint of 1938 original (Porter Press, 2012), 67.

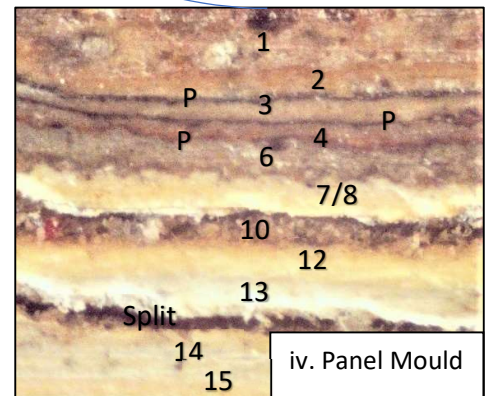
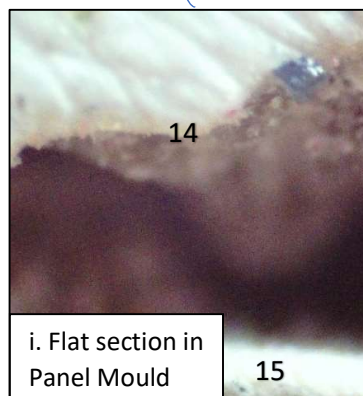
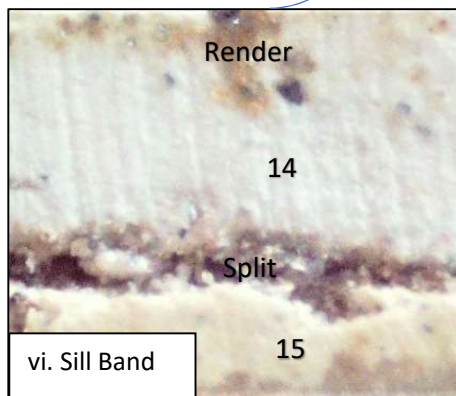
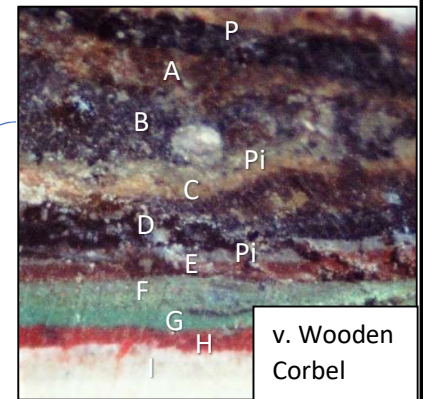
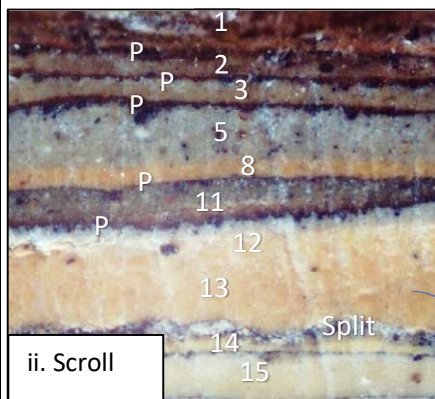
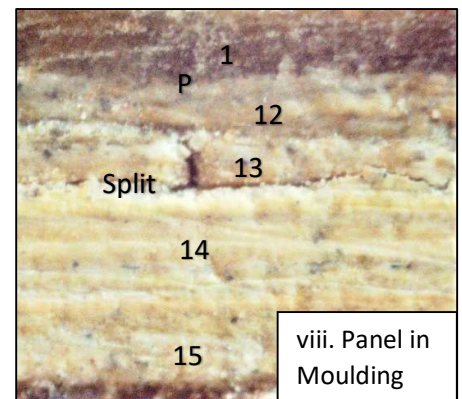
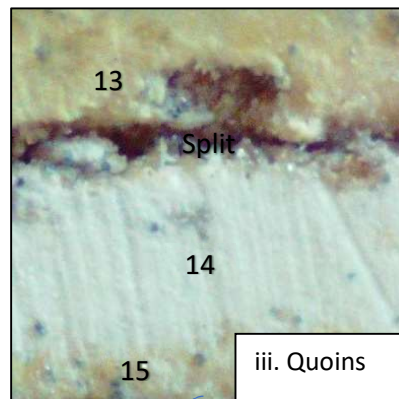
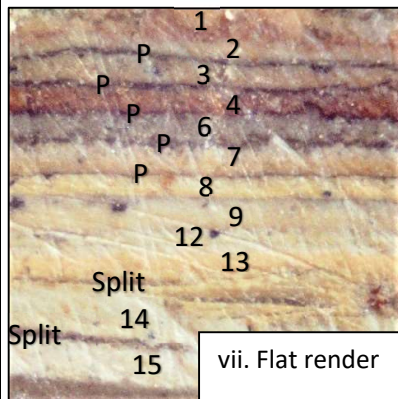
¹⁰ Parry, 67.

¹¹ Walter Pearce, *Painting and Decorating* (London: Chas Griffin & Co. Ltd., 1898), 114–15.

¹² Kassia St Clair, *The Secret Lives of Colour* (London: John Murray, 2016), 40.

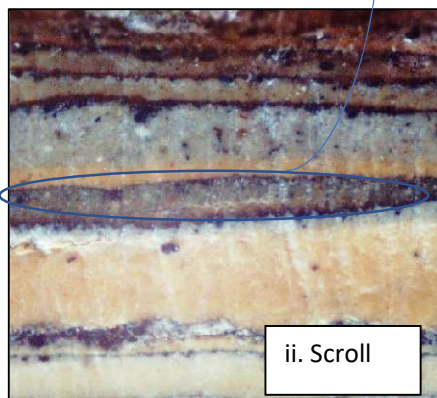
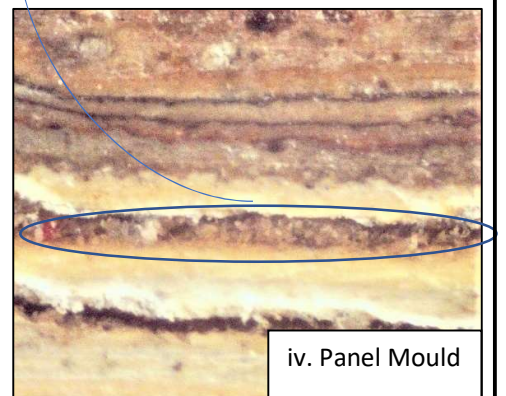
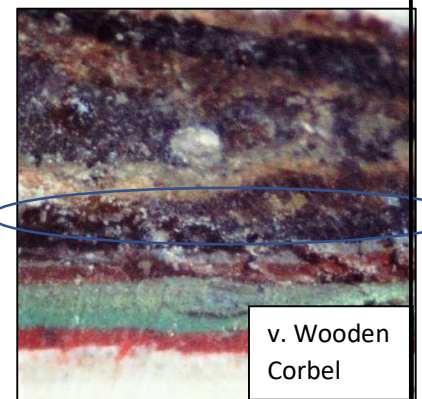
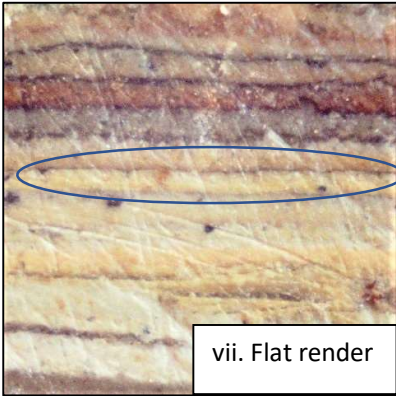
¹³ Parry, *Painting and Decorating - A Comprehensive Manual for the Craftsman with a Glossary to Technical Terms*.

Diagram A: The Paint Layers of samples that were taken and their location



KEY		
1 = Render finish coat perhaps with a water based paint applied shortly after completion		
P = Primer, usually red lead, and boiled linseed oil		
2 = Stone Colours	3 = Light Stone	4 = Light Red Brown Stone
5 = Light Blue-Grey	6 = Light Red Brown Stone	7 & 8 = Cream
9 = Cream Magnolia	10 = Medium Red Brown Stone	11 = Medium Green Blue
12 = Cream	13 - 15 = Modern Creams/off whites/White	Pi = White Lead Primer
A = Medium Brown	B = Purple	E = Medium Red Brown
C = Cream	D = Dark Brown	H & I = Modern Red and White
F = Olive Green	G = Modern Bright Olive Green	

Diagram B: Paint Layers that may correspond with the photo, from the mid. 1920's



The plasters and paint finishes used Inside the Bioscope and early picture house and the story they tell.

The wall and ceiling plasters, see appendix 2 for the mortar analysis results, are what you would expect in the auditorium's original construction, with a combination of sawn lath and lime plaster, gauged with gypsum just before use, above the proscenium arch, see mortar analysis sample 29, and also forming the proscenium's flat beam 'arch'. Lath and plaster is also found right at the back of the auditorium. The cast fibrous slightly curving plain ceiling panels, made up of plaster of Paris, hessian, and thin laths, decorated with fibrous gypsum plaster ribs and panel moulds and similar fibrous plaster decoration applied to the walls, may also date to the first constructional phase but could also be a little later, after a possible earlier lath and lime plaster barrel vaulted ceiling.

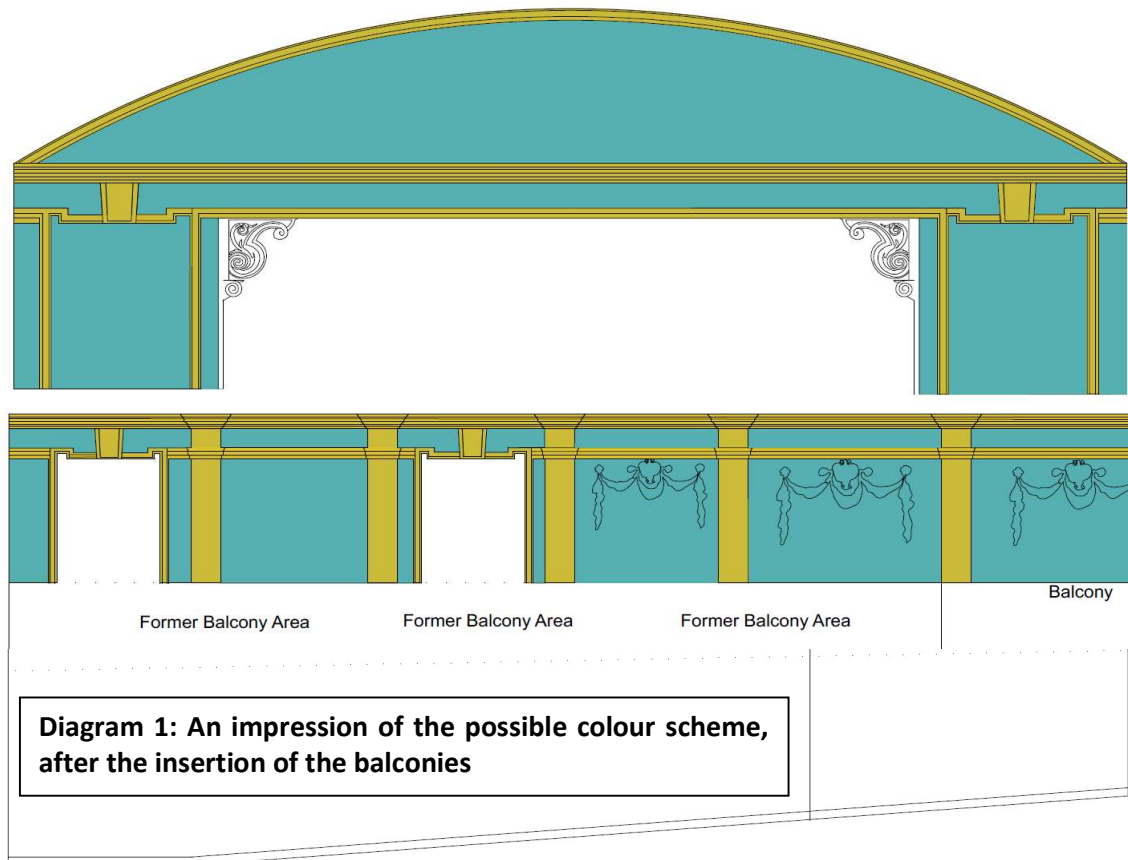
Some of the walls' freeze bands retain original 1:1:6, cement-lime-sand plasters, used in this period,¹⁴ and later earlier cement plasters below, mortar analysis samples 20 and 14, later over skimmed with modern plasters, perhaps when the balconies were removed in the 1990's to create an interior for a Pentecostal church. There are also more modern cement lime mixes apparent in mortar analysis samples 9 and 24.

The plastered walls above the original balcony areas may have been painted in stone cream colours within the first period as a Bioscope Picture House cinema, as at the Majestic in Aberdeen, 1914.¹⁵ In the second re-decoration period, after the insertion of new balconies in 1913, they were perhaps painted blue, with the pilasters picked out in stone, (looking in particular at paint samples 20 and 23, in appendix 1), and the cornice, freeze band, (see samples 7 & 21, appendix 1), and even perhaps the freeze itself painted in a finish of gold powder,¹⁶ (see paint samples 1-5 and 15,16,18 & 19). After which the main wall below the freeze was coated in a strong rose colour. Later the areas immediately above and below the freeze bands are again painted both the same, with a golden orange colour being followed with a medium pink and then later more modern layers. An idea of the likely second decorative colour scheme, after the insertion of the balconies, and the possible third colour scheme from the later 1920's, are illustrated on diagrams 1 and 2 below.

¹⁴ Mitchell, *Building Construction. Advanced and Honours*, 46–48.

¹⁵ David A Ellis, 'Majestic Aberdeen', *Cinema Theatre Association - Bulletin*, December 2022.

¹⁶ Ian C. Bristow, *Interior House-Painting Colours and Technology 1615-1840* (New Haven and London: Yale University Press, 1996), 140.



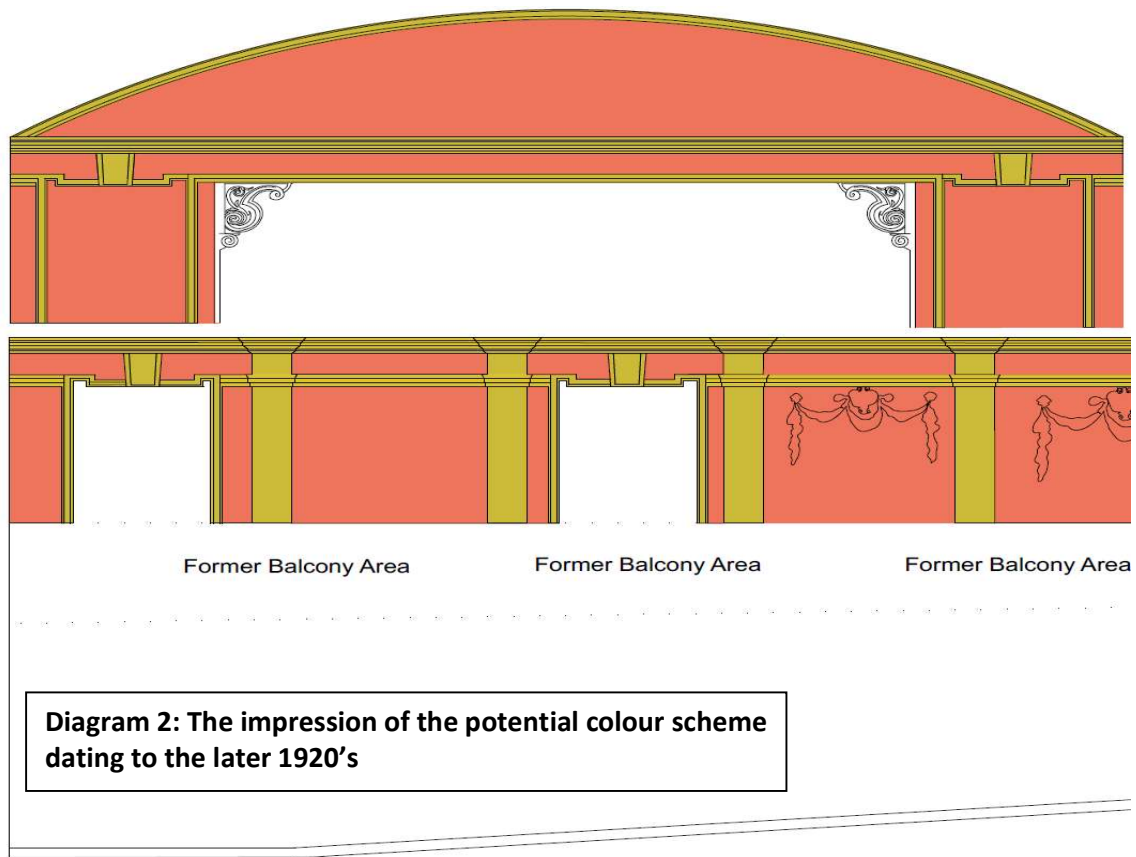
A similar combination of the second set of light blue, stone, and gold colours, perhaps dating to after the insertion of the balconies can be found at Coolidge Corner Theatre, Massachusetts which became a cinema in 1933,¹⁷ and is illustrated in photo 1 below. The slightly later rose and stone colour combination found at Prescott Picture House could be seen at the Regent Centre In Christchurch, in 1936, five years after it was built, when it was given a plush makeover, featuring a deep rose, gold and silver colour scheme and art deco signage.¹⁸ This decorative scheme has recently been recreated and is shown in photo 2.

The ceiling colours, based upon the cross sections of paint samples A and C in appendix 1, were light yellow green (almost blue) on the outer edges of the ceiling panels, with stone colours covering the main body of the panels as defined by the panel moulding, which may also have been decorated with the same stone colour, see sample B. But as noted above, the ceiling plasters may not be original to the first construction phase.

¹⁷ Time Out editors, 'The 50 Most Beautiful Cinemas in the World: Planet Earth's Most Heavenly Picture Palaces and Movie Houses', 26 February 2021, <https://www.timeout.com/film/the-50-most-beautiful-cinemas-in-the-world>.

¹⁸ Harriet Sherwood, 'Dorset's Art Deco Cinema Jewel Returns to Its 1930's Splendour', *The Guardian Online*, 25 October 2020.

The original paint colours and plaster below the level of the original balconies appear to be lost, although they could have been originally panelled. In the same way as the lower part of the auditorium walls at the Walton Vale Picture House (1922) and the Coliseum Cinema, Walton (1922) were covered by dark wood dados.¹⁹



The pilasters that divide the wall into bays were originally painted in a rose colour, over at least two decorative cycles and then later with stone colours, (see sample 7, appendix 1). Perhaps originally standing out from the first cream/stone background colours, used in the main auditorium area before the insertion of the balconies. After which they were painted in as stone colour, although it is possible that they retained a rose colour above the level of the freeze band.

¹⁹ Harold Ackroyd, *Picture Palaces of Liverpool* (Liverpool: The Bluecoat Press, 2002), 99-100.



Photo 1: The Coolidge Corner Theatre



Photo 2: The Regent Centre

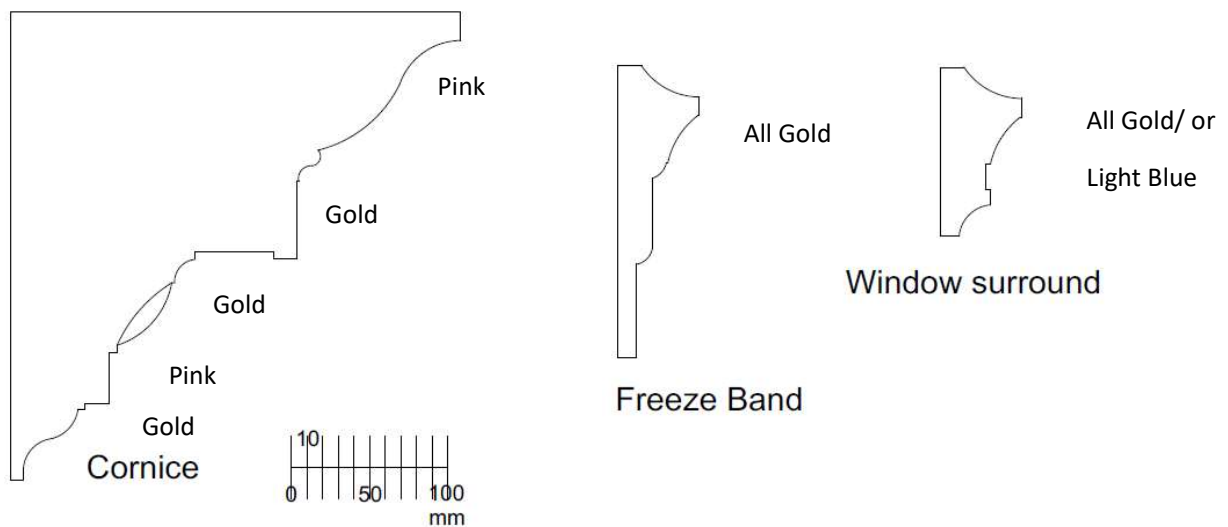


Diagram 3: A later Colour Scheme, applied to the cornice, freeze band and window surrounds (perhaps dating to the insertion of the balconies)

Analysis of additional paint samples would provide a more detailed picture of the auditorium's appearance during the first 40 years of its life as a thriving cinema. However, it is clear that the early colour schemes sought to adopt the style of contemporary theatres to confer respectability and refinement.²⁰ Just before the Prescott Picture House opened it was described as "going to present a very palatial appearance",²¹ and from the paint analysis the Picture House owners appear to have achieved this.

²⁰ Gomes Maryann, *The Picture House. A Photographic Album of Film and Cinema in Greater Manchester, Lancashire, Cheshire, and Merseyside from the Collections of the Northwest Film Archive*. (Manchester: Northwest Film Archive, Manchester Polytechnic, 1988), 22.

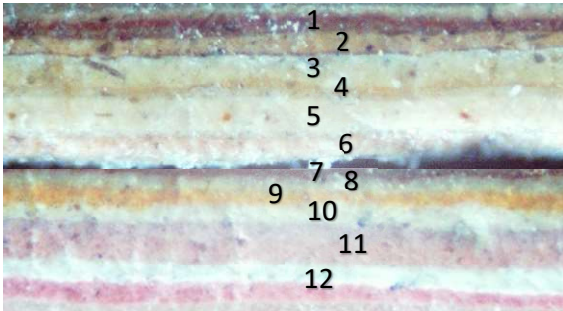
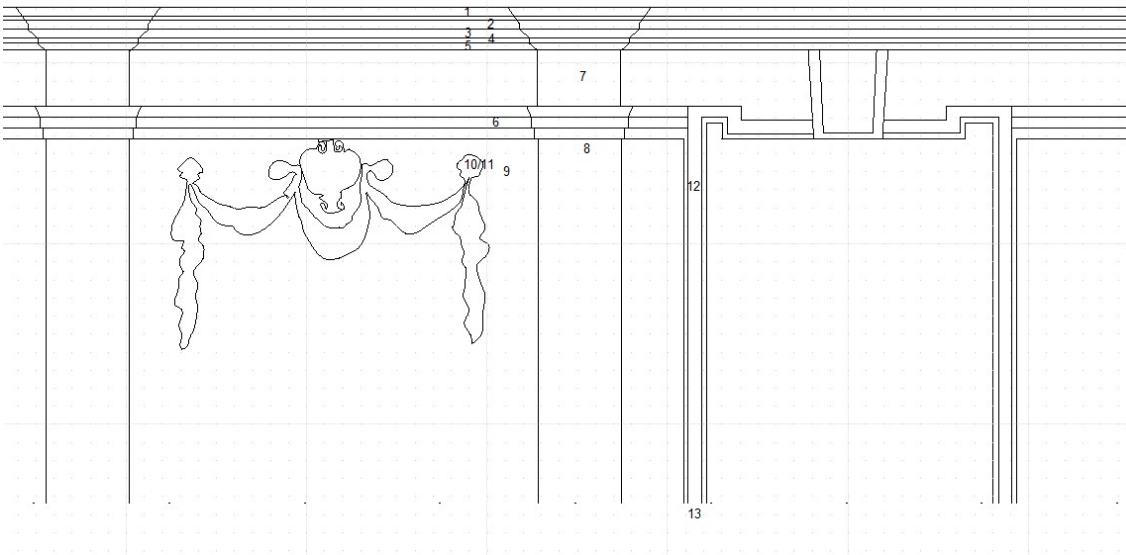
²¹ Bioscope Correspondent, 'In The Liverpool District', *The Bioscope*, 18 July 1912.

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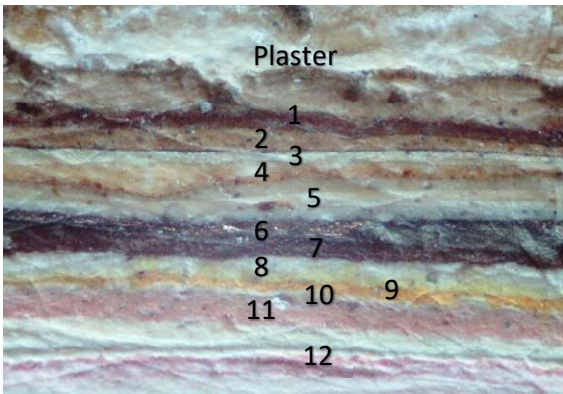
APPENDIX 1: RESULTS OF PAINT ANALYSIS

Within main auditorium space, east wall



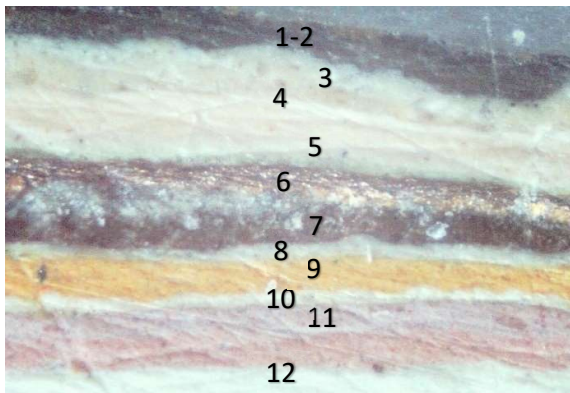
Sample 1: Top cyma-recta moulding to the fibrous cast cornice (now dark pink)

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/Stone
5. Magnolia x2
6. Medium Pink
7. Priming Coat
8. Undercoat
9. Yellow-Orange or Golden Yellow
10. Magnolia
11. Dark Pink
12. Modern white and pink paints



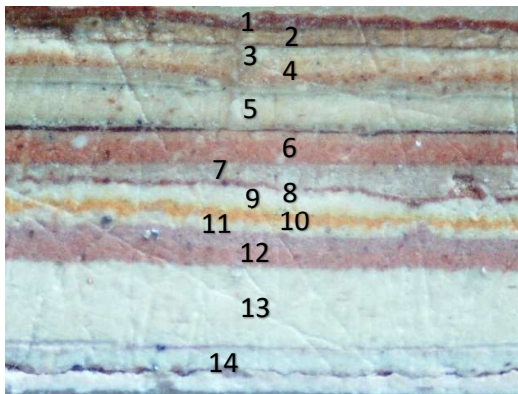
Sample 2: Upper rectangular (light pink) band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/stone
5. Magnolia x2
6. Gilding /'Gold Powder'
7. Red Brown
8. Undercoat
9. Yellow-Orange or Golden Yellow
10. Magnolia
11. Dark Pink
12. Modern white and pink paints



Sample 3: Egg and dart band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/stone
5. Magnolia x2
6. Gilding /'Gold Powder'
7. Red Brown
8. Oil rich undercoat
9. Yellow-Orange or Golden Yellow
10. Magnolia
11. Dark Pink
12. Modern white and pink paints



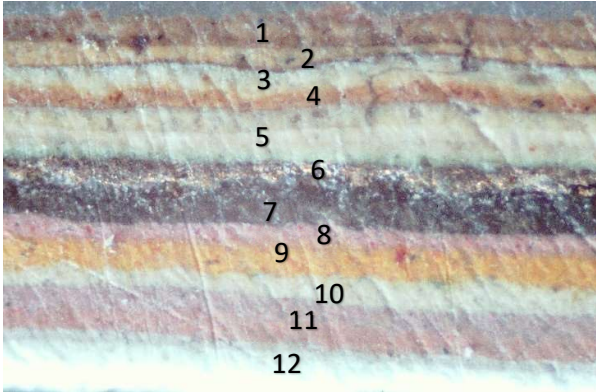
Sample 4: Lower flat (light pink) band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/stone
5. Magnolia x2
6. *Priming and Rose*
7. *Pink Gray*
8. Red Brown
9. Oil rich undercoat
10. Yellow-Orange or Golden Yellow
11. Magnolia
12. Dark Pink
13. Creams
14. Modern white paints



Sample 5: Lowest convex (light pink) band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/stone
5. Magnolia
6. Gilding/'Gold powder'
7. Red Brown
8. Oil rich undercoat
9. Yellow-Orange or Golden Yellow
10. Magnolia/undercoat
11. Dark Pink
12. Creams
13. Modern white and pink paints



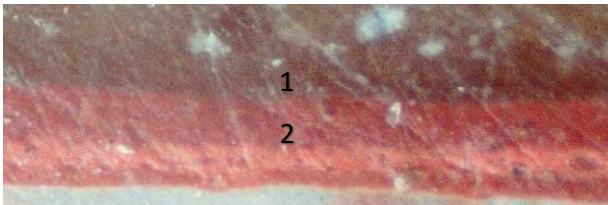
Sample 6: Freeze band (now white) made of fibrous plaster

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/stone
5. Magnolia x2
6. Gilding /'Gold Powder'
7. Green stained split prep coat
8. Dark Pink
9. Yellow-Orange or Golden Yellow
10. Magnolia
11. Dark Pink
12. Modern white paints



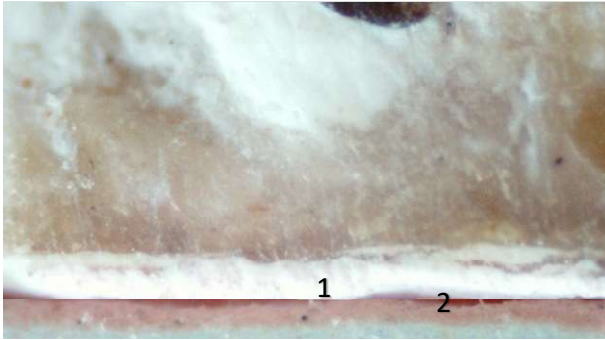
Sample 7: Top of fibrous plaster pilaster, above freeze moulding

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Rose, 2 coats
5. Stone
6. Prep Coat
7. Stone
8. Salmon
9. Prep Coat
10. Light Blue
11. Medium Violet Blue
12. Red Brown
13. Pink
14. Medium Ultra blue
15. Prep Coat
16. Modern Magenta and Pinks



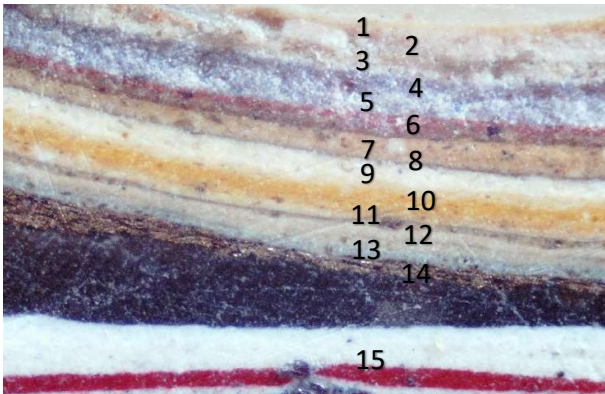
Sample 8: Fibrous plaster pilaster, below freeze moulding

1. Prep Coat
2. Modern Magenta and Pinks



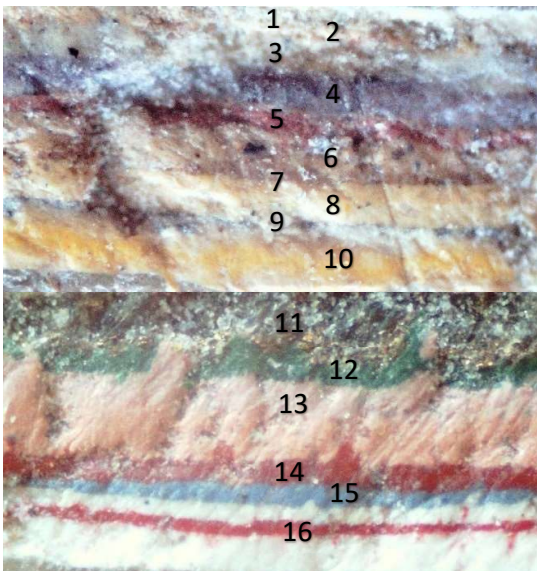
Sample 9: Solid plastered wall below freeze band

1. Modern Prep Coat
2. Modern Magenta and Pinks



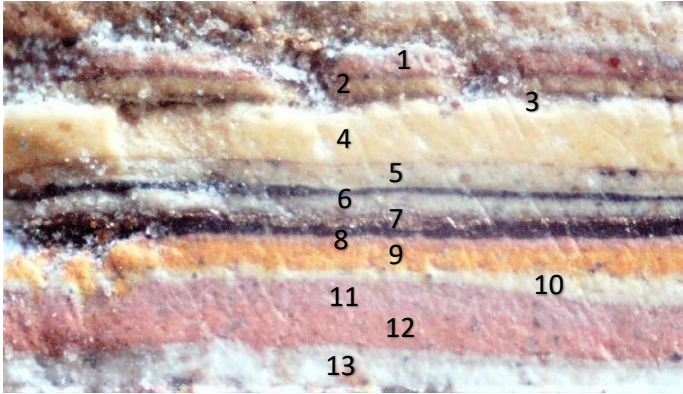
Sample 10: Fibrous swag (First Sample)

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Violet Blue
5. Prep Coats
6. Rose
7. Salmon
8. Prep Coat
9. Cream 2 coats
10. Yellow-Orange or Golden Yellow
11. Prep Coats
12. Stone Cream
13. Light Blue
14. Gilding/"Gold powder"
15. Modern white and pink paints



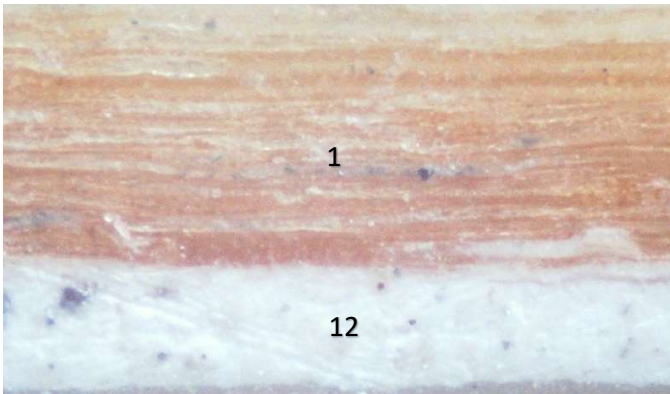
Sample 11: Fibrous swag (Second Sample)

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Violet Blue
5. Rose
6. Salmon
7. Prep Coat
8. Cream 2 coats
9. Prep Coat
10. Yellow-Orange or Golden Yellow
11. Gold
12. Yellow Green
13. Salmon Pink
14. Modern Red
15. Modern Medium Blue
16. Modern white and red paints



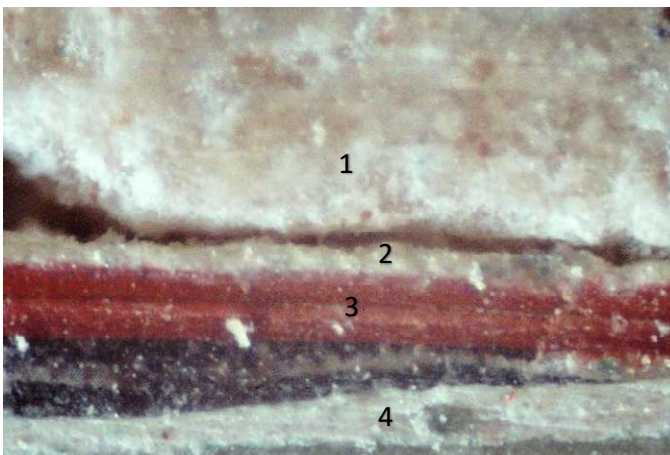
Sample 12: Upper window surround in fibrous plaster, (wooden later addition extends down the wall).

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy White/stone
5. Magnolia
6. Prep Coats
7. Gilding/"Gold powder"
8. Medium Pink
9. Yellow-Orange or Golden Yellow
10. Magnolia/undercoat
11. Rose
12. Dark Pink Salmon
13. Modern white



Sample 13: a continuation of the window surround but as in wood as it extends down.

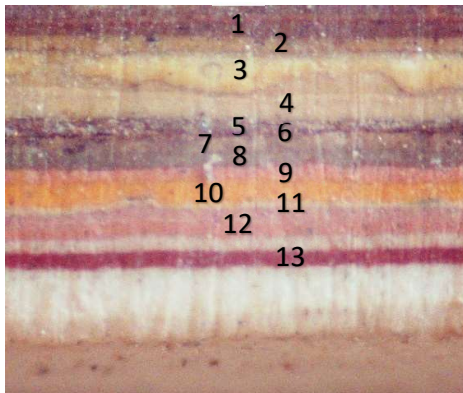
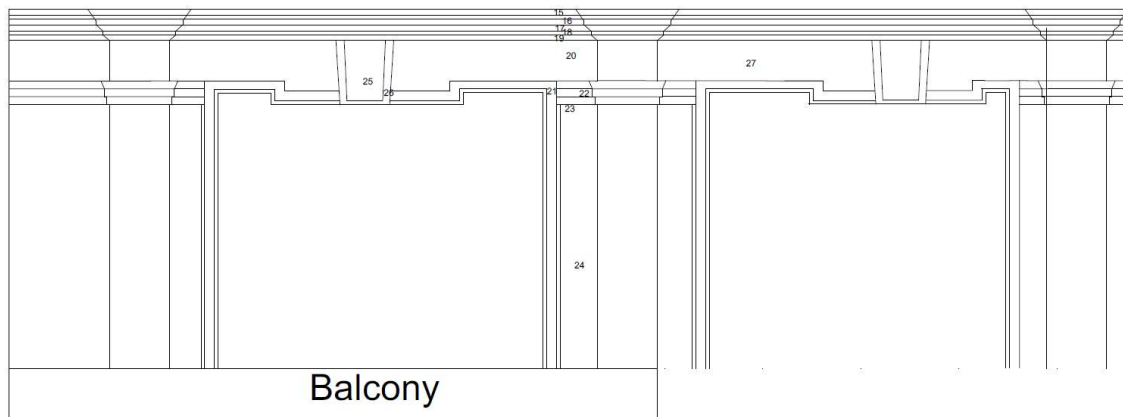
1. Wood
2. Modern white primer and 2 coats



Sample 14: Outer layer of filling coat, over thinly painted plaster, in radiator reveals

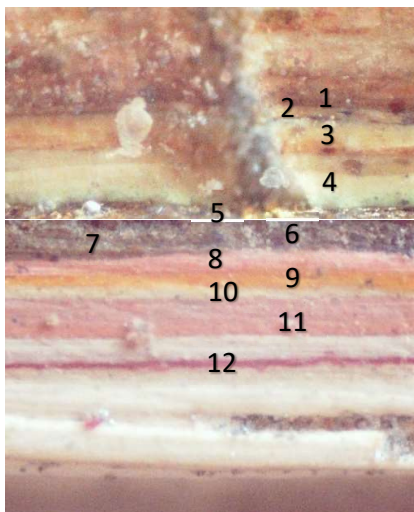
1. Filler
2. Prep Coat
3. Red Brown 2 coats
4. Delaminating stone white

Balcony Area, originally within auditorium space, east wall



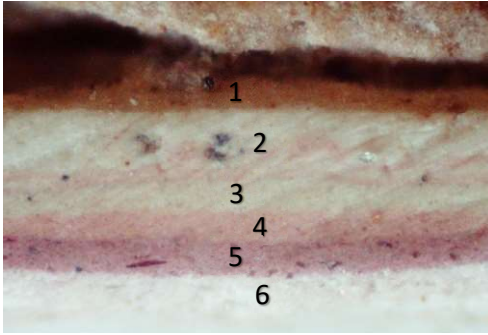
Sample 15: Top cyma-recta moulding to fibrous cast cornice (now dark pink)

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Creamy White/stone
4. Magnolia x2
5. Gilding /'Gold Powder'
6. Red Brown
7. Rose
8. Yellow Green
9. Dark Pink
10. Yellow-Orange or Golden Yellow
11. Prep Coat
12. Dark Pink
13. Modern white and Magenta paints



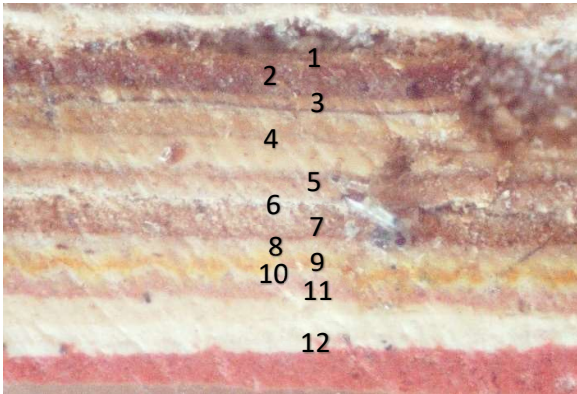
Sample 16: Upper rectangular (light pink) band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Creamy White/stone
4. Magnolia x2
5. Gilding /'Gold Powder'
6. Red Brown
7. Yellow Green
8. Dark Pink
9. Yellow-Orange or Golden Yellow
10. Prep Coat
11. Dark Pink
12. Modern white and Magenta paints



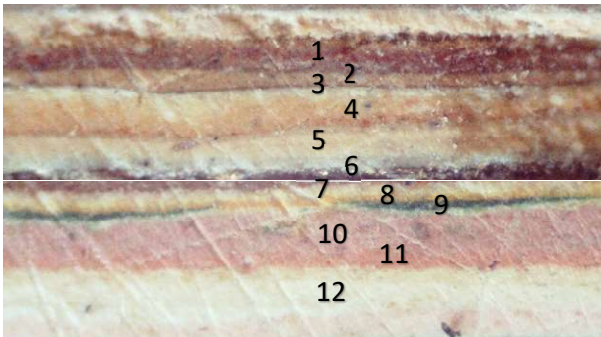
Sample 17: Egg and dart band to fibrous cast cornice

1. Prep Coat
2. Light Pink x 2 coats
3. Cream Stone
4. Salmon Pink
5. Dark Pink
6. Modern white



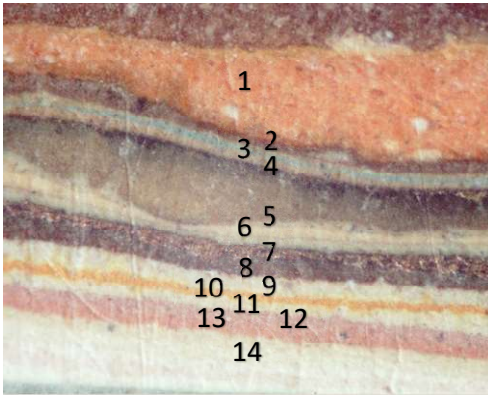
Sample 18: Lower flat (light pink) band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Creamy Stone 2 coats
5. Magnolia
6. Gilding /'Gold Powder'
7. Red Brown
8. Prep Coat
9. Yellow-Orange or Golden Yellow
10. Magnolia/undercoat
11. Dark Pink
12. Modern white and Magenta paints



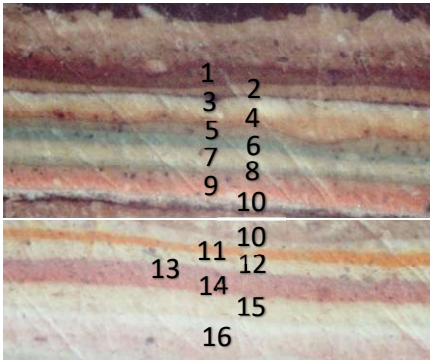
Sample 19: Lowest convex (light pink) band to fibrous cast cornice

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Stone
5. Magnolia
6. Gilding /'Gold Powder'
7. Prep Coat
8. Yellow-Orange or Golden Yellow
9. Yellow Green
10. Dark Pink
11. Rose
12. Modern primer white and pink paints



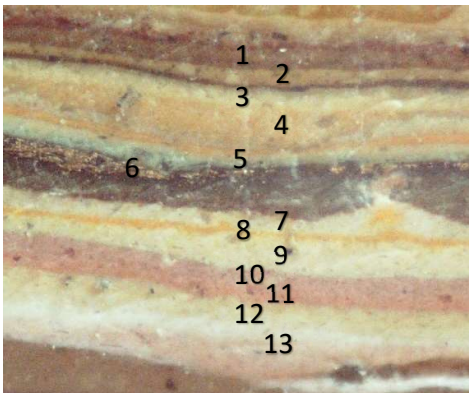
Sample 20: Freeze on gauged lime plaster to lime based plaster backing coats

1. Filler
2. Prep Coats
3. Light Blue
4. Stone
5. Prep Coat
6. Magnolia
7. Gilding /'Gold Powder'
8. Green or green stained Prep Coat
9. Undercoat
10. Yellow-Orange or Golden Yellow
11. Undercoat
12. Dark Pink
13. Rose
14. Modern primer white and pink paints



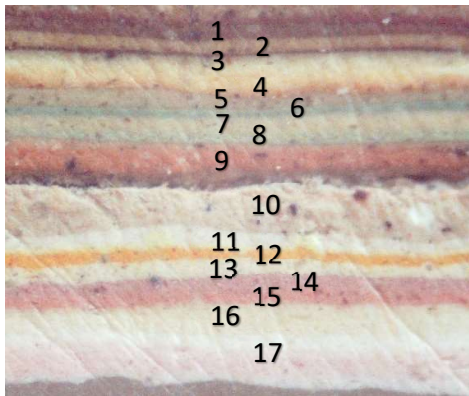
Sample 21: Upper window surround in fibrous plaster, (wooden later addition extends down the wall).

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Stone
5. Prep Coat
6. Light Blue
7. Stone
8. Yellow Green
9. Medium Pink
10. Undercoat
11. Yellow-Orange or Golden Yellow
12. Undercoat
13. Dark Pink
14. Rose
15. Cream Stone
16. Modern primer white and pink paints



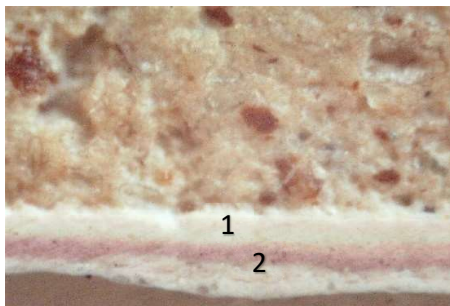
Sample 22: Freeze band (now white) made of fibrous plaster

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Golden Yellow 2 coats
5. Stained Prep Coat
6. Gilding /'Gold Powder'
7. Undercoat
8. Yellow-Orange or Golden Yellow
9. Undercoat
10. Dark Pink
11. Rose
12. Cream Stone
13. Modern primer white and pink paints



Sample 23: Wall plaster (gauged lime plaster to lime based plaster backing coats) just below freeze band.

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Stone
5. Prep Coat
6. Light Blue
7. Stone
8. Light Blue Green
9. Medium Pink
10. Magnolia 2 coats
11. Undercoat
12. Yellow-Orange or Golden Yellow
13. Undercoat
14. Dark Pink
15. Rose
16. Cream Stone
17. Modern primer white and pink paints



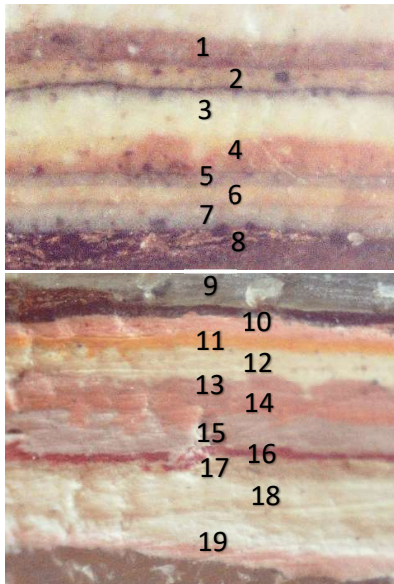
Sample 24: Paint to more modern cement render 1 metre down, from freeze band.

1. Modern primer
2. Modern Pink paints



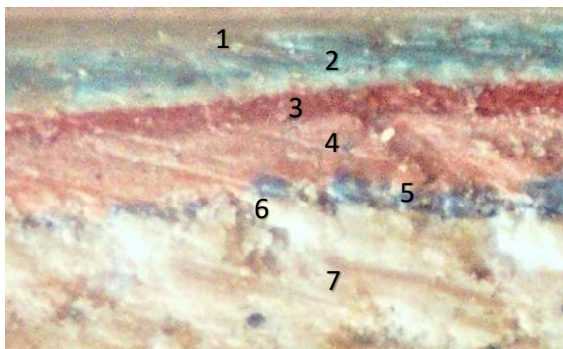
Sample 25: Central part of the fibrous plaster Keystone

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Brown-Red Stone
5. Blue Grey
6. Prep Coat
7. Blue Grey
8. Gilding /'Gold Powder', split below
9. Light Blue
10. Red Brown
11. Salmon Pink
12. Rose
13. Light Violet
14. Red Brown
15. Cream Stone
16. Modern white and pink paints



Sample 26: Right hand stepped back edge of the fibrous plaster keystone

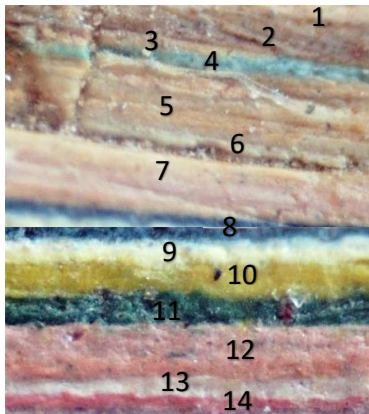
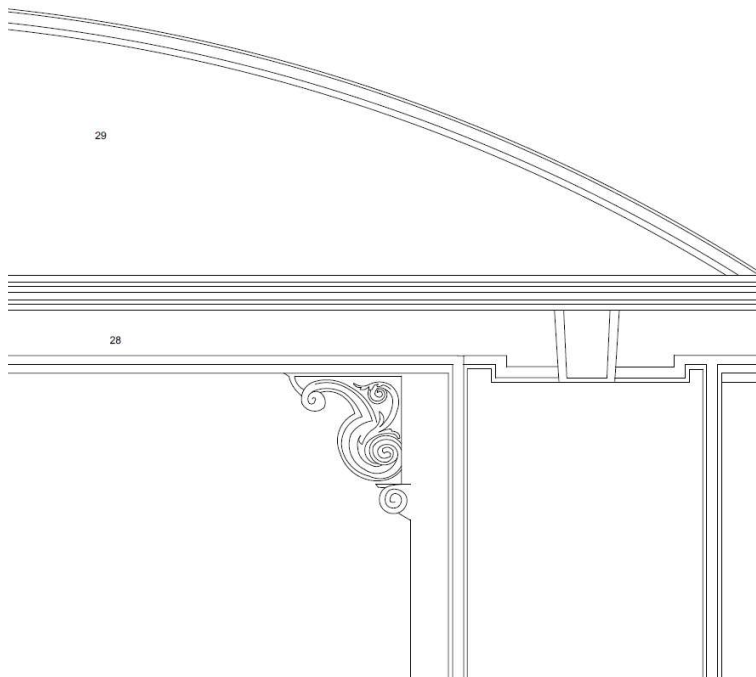
1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Brown-Red Stone
5. Blue Grey
6. Prep Coat
7. Blue Grey or stained undercoat
8. Gilding /'Gold Powder', split below
9. Grey Blue
10. Medium Pink
11. Golden Yellow
12. Cream Stone
13. Salmon Pink
14. Rose
15. Light Violet
16. Red Brown/ Magenta
17. Prep Coat
18. Cream Stone
19. Modern white and pink paints



Sample 27: Freeze, rear bay, eastern wall, main auditorium space

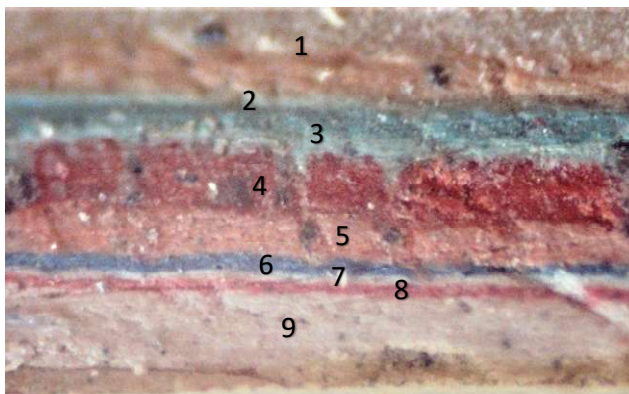
1. Flatting coat, white lead, driers, and turpentine
2. Light Blue
3. Prep coat and Strong Rose Colour
4. Medium Pink
5. Royal Blue
6. Undercoat
7. Modern primer white and pink paints

Proscenium arch above the stage area



Sample 28: Front of proscenium arch beam, onto lath and lime plaster background

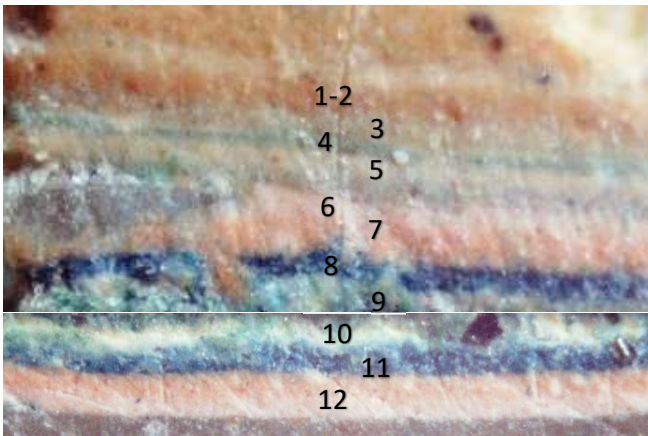
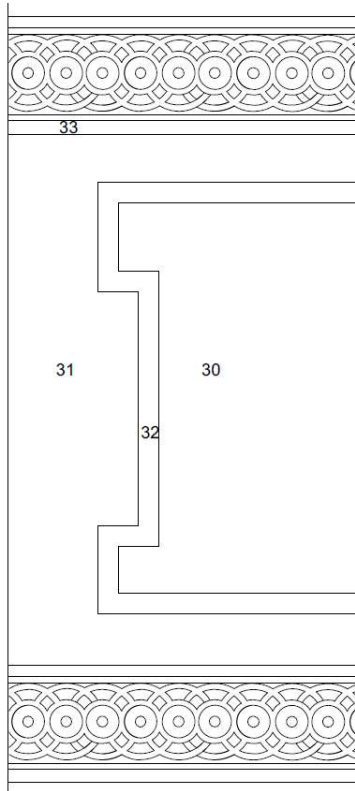
1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Light Blue
5. Light Red Brown Stones
6. Prep Coats
7. Medium Pink Stone
8. Royal Blue
9. Undercoat
10. Yellow-Orange or Golden Yellow
11. Dark Green
12. Rose
13. Cream Stone
14. Modern primer white and pink paints



Sample 29: Filled in arch over proscenium beam

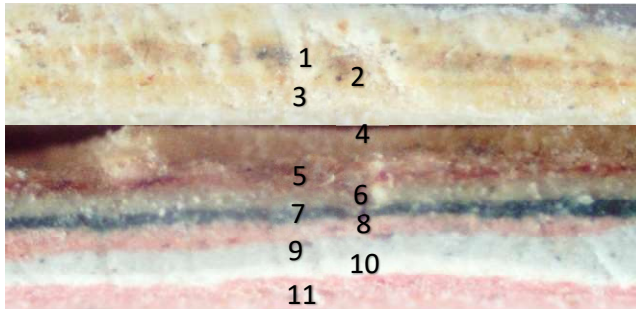
1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Flatting coat, white lead, driers, and turpentine
3. Light Blue
4. Strong Rose Colour
5. Medium Pink
6. Royal Blue
7. Undercoat
8. Rose
9. Modern primer white and pink paints

Main Auditorium Ceiling



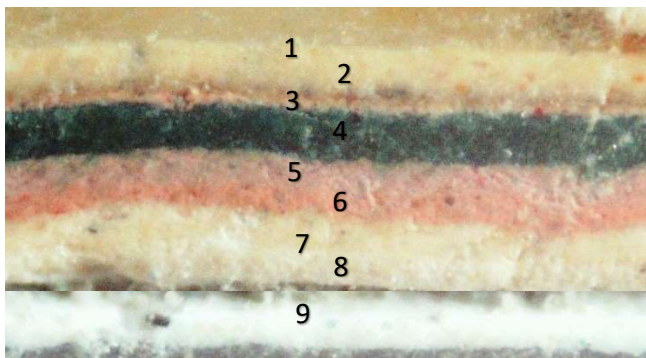
Sample 30: Light Pink painted plain fibrous ceiling panel

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Yellow Green
5. Stone Cream
6. Stone Pink
7. Dark Pink
8. Blue Violet
9. Perhaps Lighter Blue
10. Undercoat
11. Grey Blue Violet
12. Modern pink paints



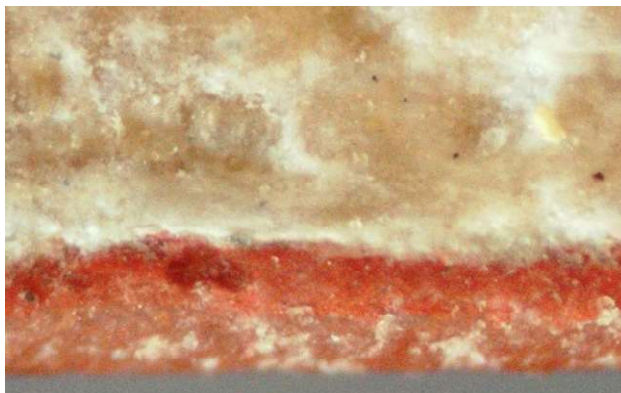
Sample 31: Dark Pink painted plain fibrous ceiling panel

1. First Prep Coat, red and white lead with a larger portion of linseed oil and turpentine
2. Second Prep Coat, similar to 1 above
3. Flatting coat, white lead, driers, and turpentine
4. Dark Stone
5. Priming coats
6. Stone Cream
7. Dark Blue Green
8. Dark Pink
9. Lighter Blue Grey
10. Undercoat
11. Modern pink paints



Sample 32: Fibrous plaster panel mould to the ceiling.

1. First Prep Coat, white lead with a larger portion of linseed oil and turpentine
2. Stone Cream x2
3. Priming coats
4. Dark Green
5. Pink
6. Dark Pink
7. Stone Cream
8. Stone Pink
9. Modern White paints



Sample 33: Ceiling rib as it leaves the East Wall, the closest one to stage

Modern paints

APPENDIX 2: RESULTS OF MORTAR ANALYSIS

Sample i

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample i
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Plaster within the panel moulding that forms a pilaster detail at the right hand edge of the main picture house façade, at 1 st floor level.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected from this wall

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 2 parts hydrated lime to 3 parts fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a roman stucco. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A cream coloured render with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0.42	30	0.29	n/a	Clear, cream, pink quartz, and clinker
1.18 mm	0.55	30	0.39	n/a	Clear, cream, pink quartz, and clinker
0.60 mm (600µm)	0.63	30	0.44	n/a	Clear, cream, pink quartz, and clinker and brick fragments
300 µm	8.11	20	6.5	n/a	Cream, clear, and iron-stained quartz, and clinker
150 µm	3.03	5	2.87	n/a	Clear, cream, pink quartz, and clinker
< 150 µm including filter residue	2.16	95	0.11	n/a	Cream, clear, and iron-stained quartz, and ash

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Clear, and pink silica aggregate and clinker ash from cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

<i>MATERIAL</i>	<i>WEIGHT (g)</i>	<i>COMMENTS</i>
A: DRY WEIGHT OF- ANALYSIS SAMPLE	21.7	
B: DRY WEIGHT OF ALL INSOLUBLES	14.9	
C: DRY WEIGHT OF INSOLUBLE BINDER	4.3	Mainly Belite, perhaps from a white cement
D: (B-C) DRY WEIGHT OF AGGREGATE	10.6	
E: (A-D+C)) DRY WEIGHT OF LIME & Binders	11.1	
FREE LIME	6.8	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

**CEMENT: LIME: AGGREGATE RATIO:
1:1.6:2.5**

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 2 parts hydrated lime to 3 parts fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample ii

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample ii
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	From the scroll above the sill band at the right hand edge of the centre of the main picture house façade, at 1 st floor level.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from almost neat cement from the early 20th century.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a ‘cast’ roman stucco. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dense light grey mortar with visible lime inclusions and clinker
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a dominating cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0.18	50	0.09	n/a	Clinker, cream, & pink quartz
1.18 mm	0.28	50	0.14	n/a	Clinker, cream, & pink quartz
0.60 mm (600µm)	0.48	50	0.24	n/a	Clinker, cream, & pink quartz
300 µm	1.08	50	0.54	n/a	Clinker, cream, & pink quartz
150 µm	0.48	30	0.34	n/a	Clinker, cream, & pink quartz
< 150 µm including filter residue	0.37	80	0.07	n/a	Clinker, cream, & pink quartz

All the quartz aggregate is sub-angular

AGGREGATE CHARACTERISTICS

Mainly clinker from the cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	3.11	
B: DRY WEIGHT OF ALL INSOLUBLES	2.87	
C: DRY WEIGHT OF INSOLUBLE BINDER	1.45	
D: (B-C) DRY WEIGHT OF AGGREGATE	1.42	Mainly clinker from the cement
E: (A-D+C)) DRY WEIGHT OF LIME & CEMENT Binders	1.69	
FREE LIME	0.24	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

CEMENT: AGGREGATE RATIO:
1:0.25

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from almost neat cement from the early 20th century.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample iii

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample iii
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	From the rusticated block column pilaster at the right hand edge of the centre of the main picture house façade, at 1st floor level.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected

GENERAL COMMENTS/ SUMMARY

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 3 parts lime, (a large proportion of which would be inert), to 2 parts fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a roman stucco. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dense grey render with small visible lime inclusions and clinker
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0.64	35	0.42	n/a	Clinker, and clear, cream, & pink quartz
2.36 mm	3.15	35	2.05	n/a	Clinker, and clear, cream, & pink quartz
1.18 mm	1.38	35	0.9	n/a	Clinker, and clear, cream, & pink quartz
0.60 mm (600µm)	1.27	30	0.89	n/a	Clinker, and clear, cream, & pink quartz
300 µm	3.02	15	2.57	n/a	Clinker, and clear, cream, & pink quartz
150 µm	0.35	10	0.32	n/a	Clinker, and clear, cream, & pink quartz
< 150 µm including filter residue	0.20	50	0.1	n/a	Clinker, and clear, cream, & pink quartz

All the quartz aggregate is sub-angular

AGGREGATE CHARACTERISTICS

Fine silica sand, ash and clinker from the cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	16.25	
B: DRY WEIGHT OF ALL INSOLUBLES	10.01	
C: DRY WEIGHT OF INSOLUBLE BINDER	2.76	
D: (B-C) DRY WEIGHT OF AGGREGATE	7.25	
E: (A-D+C)) DRY WEIGHT OF LIME & CEMENT Binders	9	
FREE LIME	6.24	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

CEMENT: LIME: AGGREGATE RATIO:
1 :2.3: 2.6

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 3 parts lime, (a large proportion of which would be inert), to 2 parts fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample iv

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample iv
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	From the panel mould forming the pilaster decoration at the right hand side of the main picture house façade, at 1st floor level.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected

GENERAL COMMENTS/ SUMMARY

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 2 parts lime, (a large proportion of which would be inert), to 2 parts fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a roman stucco. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dense grey render with small visible lime inclusions and clinker
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0.38	30	0.27	n/a	Clinker, and clear, cream, & pink quartz
1.18 mm	0.12	30	0.08	n/a	Clinker, and clear, cream, & pink quartz
0.60 mm (600µm)	0.29	30	0.2	n/a	Clinker, and clear, cream, & pink quartz
300 µm	1.82	30	1.27	n/a	Clinker, and clear, cream, & pink quartz
150 µm	1.32	20	1.06	n/a	Clinker, and clear, cream, & pink quartz
< 150 µm including filter residue	0.35	50	0.18	n/a	Clinker, and clear, cream, & pink quartz

All the quartz aggregate is sub-angular

AGGREGATE CHARACTERISTICS

Fine silica sand, ash, and clinker from the cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	10.56	
B: DRY WEIGHT OF ALL INSOLUBLES	4.28	
C: DRY WEIGHT OF INSOLUBLE BINDER	1.22	
D: (B-C) DRY WEIGHT OF AGGREGATE	3.06	
E: (A-D+C)) DRY WEIGHT OF LIME & CEMENT Binders	7.5	
FREE LIME	6.28	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

CEMENT: LIME: AGGREGATE RATIO:
1 :5.2: 2.5

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 2 parts lime, (a large proportion of which would be inert), to 2 parts fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample vi

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample vi
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	First floor sill band to the main picture house façade.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected

GENERAL COMMENTS/ SUMMARY

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 2 parts lime, (a large proportion of which would be inert), to 2 parts fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a roman stucco. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A crystalline medium grey dense render with small visible lime inclusions, clinker, and aggregate
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a grey-cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0.43	30	0.30	n/a	Clear, cream, red & pink quartz, and clinker
1.18 mm	0.43	30	0.30	n/a	Clear, cream, red & pink quartz, and clinker
0.60 mm (600µm)	1.33	20	1.06	n/a	Clear, cream, red & pink quartz, and clinker
300 µm	2.86	15	2.43	n/a	Clear, cream, red & pink quartz, and clinker
150 µm	0.76	50	0.38	n/a	Clear, cream, red & pink quartz, and clinker
< 150 µm including filter residue	0.45	50	0.23	n/a	Clear, cream, red & pink quartz, and clinker

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Fine silica sand, ash, and clinker from the cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	15.6	
B: DRY WEIGHT OF ALL INSOLUBLES	6.26	
C: DRY WEIGHT OF INSOLUBLE BINDER	1.56	
D: (B-C) DRY WEIGHT OF AGGREGATE	4.7	
E: (A-D+C)) DRY WEIGHT OF LIME & CEMENT Binders	10.09	
FREE LIME	9.34	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

CEMENT: LIME: AGGREGATE RATIO:
1 :6: 3

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 2 parts lime, (a large proportion of which would be inert), to 2 parts fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample vii

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample vii
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Flat render to the right of the right hand side first floor window on the main picture house façade.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected

GENERAL COMMENTS/ SUMMARY

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1.5 parts hydraulic lime, (a large proportion of which would be inert lime), to 1 parts fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime render. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A crystalline medium grey dense render with small visible lime inclusions, clinker, and aggregate
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0.11	30	0.08	n/a	Clear, cream, red & pink quartz, and clinker
1.18 mm	0.11	30	0.08	n/a	Clear, cream & pink quartz, and clinker
0.60 mm (600µm)	0.25	25	0.19	n/a	Clear, cream & pink quartz, and clinker
300 µm	2.20	10	1.98	n/a	Clear, cream, & pink quartz, and clinker
150 µm	1.22	5	1.16	n/a	Clear, cream, red & pink quartz, and clinker
< 150 µm including filter residue	0.29	50	0.15	n/a	Clear, cream, red & pink quartz, and clinker

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Fine silica sand, ash, and clinker.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	9.93	
B: DRY WEIGHT OF ALL INSOLUBLES	4.18	
C: DRY WEIGHT OF INSOLUBLE BINDER	0.54	
D: (B-C) DRY WEIGHT OF AGGREGATE	3.64	
E: (A-D+C)) DRY WEIGHT OF LIME & CEMENT Binders	6.29	
FREE LIME	5.75	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

**LIME: AGGREGATE RATIO:
1.5: 1**

& 9.4% HYDRAULIC BINDER to the weight of lime.

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1.5 parts hydraulic lime, (a large proportion of which would be inert lime), to 1 parts fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample viii

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample viii
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Flat render to the panel, surrounding by a moulding on the right edge of the shop to the right hand side of the main picture house façade.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from 1 part cement to 3 parts lime, (a large proportion of which would be inert), to 1 parts fine sand. This may have been a re-skim in a strong cement lime mix.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime render. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A crystalline medium grey dense render with small visible lime inclusions, and clinker
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Fine quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0				
1.18 mm	0.05	30	0.04	n/a	Clear, cream & pink quartz, and clinker, and hair
0.60 mm (600µm)	0.15	40	0.09	n/a	Clear, cream & pink quartz, and clinker, and hair
300 µm	0.68	50	0.34	n/a	Clear, cream, & pink quartz, and clinker
150 µm	0.59	50	0.3	n/a	Clear, cream, & pink quartz, and clinker
< 150 µm including filter residue	1.85	90	0.19	n/a	Clinker

All the quartz aggregate is sub-angular

AGGREGATE CHARACTERISTICS

Fine silica sand, inert lime, and clinker.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	8	
B: DRY WEIGHT OF ALL INSOLUBLES	3.32	
C: DRY WEIGHT OF INSOLUBLE BINDER	2.36	
D: (B-C) DRY WEIGHT OF AGGREGATE	0.96	
E: (A-D+C)) DRY WEIGHT OF LIME & CEMENT Binders	7.04	
FREE LIME	4.68	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

CEMENT: LIME: AGGREGATE RATIO:
2.5: 4.5: 1

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from 1 part cement to 3 parts lime, (a large proportion of which would be inert), to 1 parts fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample 6

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample 6
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Plaster forming freeze on the eastern wall of main auditorium
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected from this wall

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part early cement, 1 part hydrated lime to 6 parts, fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime plaster. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dirty buff coloured plaster with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0			n/a	
1.18 mm	0.16	25	0.12	n/a	Wood fibres, and clear, iron stained, & pink quartz, and clinker
0.60 mm (600µm)	0.39	35	0.51	n/a	Wood fibres, and clear, iron stained, & pink quartz, and clinker
300 µm	5.83	4	5.6	n/a	Iron stained, clear, and pink quartz, and clinker
150 µm	3.77	4	3.62	n/a	Cream, clear, and iron-stained quartz, and clinker
< 150 µm including filter residue	1.39	85	0.21	n/a	Cream, clear, and iron-stained quartz, brick, and ash

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Clear, iron stained and cream silica aggregate, and clinker ash from cement manufacture.

Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

<i>MATERIAL</i>	<i>WEIGHT (g)</i>	<i>COMMENTS</i>
A: DRY WEIGHT OF- ANALYSIS SAMPLE	13.34	
B: DRY WEIGHT OF ALL INSOLUBLES	11.54	
C: DRY WEIGHT OF INSOLUBLE BINDER	1.48	Belite
D: (B-C) DRY WEIGHT OF AGGREGATE	10.06	
E: (A-D+C)) DRY WEIGHT OF LIME & Binders	3.28	
FREE LIME	1.8	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

**LIME: AGGREGATE RATIO:
1: 5.6**

& 82% HYDRAULIC BINDER to the weight of lime.

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 1 part hydrated lime to 6 parts, fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample 9

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample 9
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Internal plaster backing coats below the freeze band of the east wall in the main auditorium space.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected from this wall

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 1 part hydrated lime to 4 parts, fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime plaster. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A grey cream coloured plaster with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0				
1.18 mm	0.07	30	0.05	n/a	Clear, cream, pink quartz, and bound clinker and brick fragment
0.60 mm (600µm)	0.13	30	0.09	n/a	Clear, cream, pink quartz, and clinker and brick fragments
300 µm	4.73	15	4.02	n/a	Cream, clear, and iron-stained quartz, ash, and shale
150 µm	1.62	4	1.56	n/a	Cream, clear, and iron-stained quartz, and ash
< 150 µm including filter residue	1.82	80	0.36	n/a	Cream, clear, and iron-stained quartz, and ash

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Clear, and pink silica aggregate and clinker ash from cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	12.01	
B: DRY WEIGHT OF ALL INSOLUBLES	8.37	
C: DRY WEIGHT OF INSOLUBLE BINDER	2.29	Mainly Belite
D: (B-C) DRY WEIGHT OF AGGREGATE	6.08	
E: (A-D+C)) DRY WEIGHT OF LIME & Binders	5.93	
FREE LIME	3.64	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

LIME: AGGREGATE RATIO:
1: 1.7

& 62% HYDRAULIC BINDER to the weight of lime.

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 1 part hydrated lime to 4 parts, fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample 14

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample 14
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Internal plaster backing coats near radiator reveal on the lower part of the east wall in the main auditorium space.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected from this wall

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1-part early cement: 2 parts lime (containing a large amount of inert within it) to 5 parts, fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime plaster. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dirty buff coloured water damaged plaster with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0.12	30	0.84	n/a	Clinker bound dense piece and more open textured bound quartz and ash
1.18 mm	0.09	30	0.06	n/a	Clear, cream, pink quartz, and bound clinker
0.60 mm (600µm)	0.35	25	0.26	n/a	Clear, cream, pink quartz, and clinker
300 µm	14.32	10	12.89	n/a	Cream, clear, and iron-stained quartz, ash, and shale
150 µm	3.71	5	3.52	n/a	Cream, clear, and iron-stained quartz, and ash
< 150 µm including filter residue	1.82	70	0.55	n/a	Cream, clear, and iron-stained quartz, and ash

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Clear, and pink silica aggregate and clinker ash from cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

<i>MATERIAL</i>	<i>WEIGHT (g)</i>	<i>COMMENTS</i>
A: DRY WEIGHT OF- ANALYSIS SAMPLE	28.45	
B: DRY WEIGHT OF ALL INSOLUBLES	20.41	
C: DRY WEIGHT OF INSOLUBLE BINDER	2.29	This is likely to be an early cement silicate and aluminate binder
D: (B-C) DRY WEIGHT OF AGGREGATE	18.12	
E: (A-D+C)) DRY WEIGHT OF LIME & Binders	12.62	
FREE LIME	8.04	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

**LIME: AGGREGATE RATIO:
1: 2.25**

& 28% HYDRAULIC BINDER to the weight of lime.

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1-part early cement: 2 parts lime (containing a large amount of inert within it) to 5 parts, fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample 20

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample 20
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Plaster forming freeze on the eastern wall of main auditorium
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected from this wall

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1-part early cement: 2 parts lime (containing a large amount of inert within it) to 6 parts, fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime plaster. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dirty buff coloured plaster with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0			n/a	
1.18 mm	0.03	0	0.03	n/a	Brick fragment
0.60 mm (600µm)	0.05	25	0.04	n/a	Brick Fragments and clear, iron stained, pink quartz, and clinker
300 µm	1.61	4	1.55	n/a	Iron stained, clear, and pink quartz, and clinker & brick fragments
150 µm	0.79	0	0.79	n/a	Cream, clear, and iron-stained quartz, and shale
< 150 µm including filter residue	0.08	50	0.04	n/a	Cream, clear, and iron-stained quartz, brick, and ash

All the quartz aggregate is sub-rounded

AGGREGATE CHARACTERISTICS

Clear, iron stained and cream silica aggregate, shale, brick, and clinker ash from cement manufacture.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

<i>MATERIAL</i>	<i>WEIGHT (g)</i>	<i>COMMENTS</i>
A: DRY WEIGHT OF- ANALYSIS SAMPLE	3.41	
B: DRY WEIGHT OF ALL INSOLUBLES	2.56	
C: DRY WEIGHT OF INSOLUBLE BINDER	0.11	
D: (B-C) DRY WEIGHT OF AGGREGATE	2.45	
E: (A-D+C)) DRY WEIGHT OF LIME & Binders	0.96	
FREE LIME	0.85	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

LIME: AGGREGATE RATIO:
1: 2.9

& 13% HYDRAULIC BINDER to the weight of lime.

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1-part early cement: 2 parts lime (containing a large amount of inert within it) to 6 parts, fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample 24

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample 24
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples and suggest specification for replacement
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Internal plaster backing coats below the freeze band of the east wall in the balcony space.
CONDITION OF SAMPLE RECEIVED/ COLLECTED	A representative bound sample was collected from this wall

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 2 parts hydrated lime to 6 parts, fine sand.

SUGGESTED REPLACEMENT MORTAR (Taking account of prevailing site conditions, building materials and condition, location, and function of the new mortar, building details, exposure, seasonal working etc.)

We would suggest that this plaster should be repaired or replaced with a moderately hydraulic lime plaster. This is available from womersleys.co.uk.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A grey coloured plaster with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Quartz and clinker in a cream binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Difficult to crush. Upon dissolution an initial vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate weight %	Comments
4.75 mm	0				
2.36 mm	0				
1.18 mm	0.05	25	0.04	n/a	Pink and clear quartz and clinker
0.60 mm (600µm)	0.29	20	0.23	n/a	Pink and clear quartz and clinker
300 µm	3.44	10	3.1	n/a	Pink and clear quartz and clinker
150 µm	1.61	4	1.55	n/a	Pink, cream, and clear quartz and clinker
< 150 µm including filter residue	1.21	4	1.16	n/a	Cream, clear, and iron-stained quartz, and ash

All the quartz aggregate is sub-angular

AGGREGATE CHARACTERISTICS

Clear, and pink silica aggregate and clinker ash.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	WEIGHT (g)	COMMENTS
A: DRY WEIGHT OF- ANALYSIS SAMPLE	9.56	
B: DRY WEIGHT OF ALL INSOLUBLES	6.6	
C: DRY WEIGHT OF INSOLUBLE BINDER	0.52	
D: (B-C) DRY WEIGHT OF AGGREGATE	6.08	
E: (A-D+C)) DRY WEIGHT OF LIME & Binders	3.48	
FREE LIME	2.96	

PROPORTIONS OF ANALYSIS SAMPLE AFTER ACID DISSOLUTION

The sample proportions gives the relative weights of aggregate and carbonated or set lime.

LIME: AGGREGATE RATIO:
1: 2

& 18% HYDRAULIC BINDER to the weight of lime.

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar was made from 1 part cement, 2 parts hydrated lime to 6 parts, fine sand.

Sample analysis, interpretation and report carried out by: Mark Womersley

Sample 29

ANALYSIS DATE	December 2022
SITE	Prescot Picture House: Sample 29
CLIENT	Knowsley Council
DATE/ TAKEN RECEIVED	December 2022
CLIENT REQUIREMENTS	Analyse mortar samples
MORTAR DATING	No
LOCATION/ FUNCTION IN BUILDING	Internal plaster from lath work forming filled in proscenium arch, over proscenium beam.
ENCLOSURES	None
CONDITION OF SAMPLE RECEIVED/ COLLECTED	Bound aggregate

GENERAL COMMENTS/ SUMMARY

From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar is made up by volume from a combination of 2 parts slaked lime (much of which was found as inert lime in the mix) to 1 part sand and hair, and it was gauged with gypsum just before use.

SUGGESTED REPLACEMENT MIX

It is suggested for internal replastering that haired lime putty based plaster, 'Coarse Stuff', gauged with fine casting plaster just before use, be used for the undercoats and gauged lime putty based, 'Fine Stuff', be used for the finish coat.

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	DESCRIPTION / COMMENTS
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A very lime rich, cream mortar, with visible hair
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Fine grained silica sand and ash, in a rich creamy binder

ACID DISSOLUTION

PROCEDURE	DESCRIPTION ~ COMMENTS
10% HCL ACID DISSOLUTION	Easy to crush. Upon dissolution there was a strong reaction
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	Residue Retained in g's	Undissolved binder %	Aggregate wt excluding undissolved binder - gs	Aggregate %	Comments
4.75 mm	0				
2.36 mm	1.01	30	0.71	n/a	Clear quartz; shale and ash pieces; and fine hair and wood shavings
1.18 mm	3.03	30	2.12	n/a	Clear and iron stained quartz; and ash pieces; and fine hair
0.60 mm (600µm)	5.60	30	3.92	n/a	Clear, pink, and iron stained quartz; shale and ash pieces; and fine hair; and gypsum
300 µm	19.81	15	16.84	n/a	Clear and iron stained quartz; and shale pieces; and fine hair; and gypsum
150 µm	0.97	30	0.68	n/a	Clear, pink, and iron stained quartz; and ash pieces; and fine hair; and gypsum
< 150 µm including filter residue	0.94	10	0.85	n/a	Clear, pink, and iron stained quartz; and gypsum

All the quartz aggregate is sub-angular

AGGREGATE CHARACTERISTIC

Fine quartz sand, ash, and inert lime formed the main aggregate.
Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

<i>MATERIAL</i>	<i>WEIGHT (g)</i>	<i>COMMENTS</i>
A: DRY WEIGHT OF- ANALYSIS SAMPLE	55.53	
B: DRY WEIGHT OF ALL INSOLUBLES	31.36	
C: DRY WEIGHT OF INSOLUBLE BINDER	6.24	
D: (B-C) DRY WEIGHT OF AGGREGATE	25.12	
E: (A-B+C)) DRY WEIGHT OF LIME & BINDERS	30.41	
Free Lime	24.17	

PROPORTIONS OF ANALYSIS SAMPLE

The sample proportions give the relative weights of aggregate and carbonated or set lime.

GYPSUM RESIDUE: LIME: AGGREGATE RATIO

0.25: 1: 1

PROBABLE ORIGINAL MIX

The probable original mix set out below gives the relative weights of the mortar constituents as mixed on site and before carbonation. From the nature of the binding matrix of the mortar sample and from information gained from the analysis, it is probable that the mortar is made up by volume from a combination of 2 parts slaked lime (much of which was found as inert lime in the mix) to 1 part sand and hair, and it was gauged with gypsum just before use.

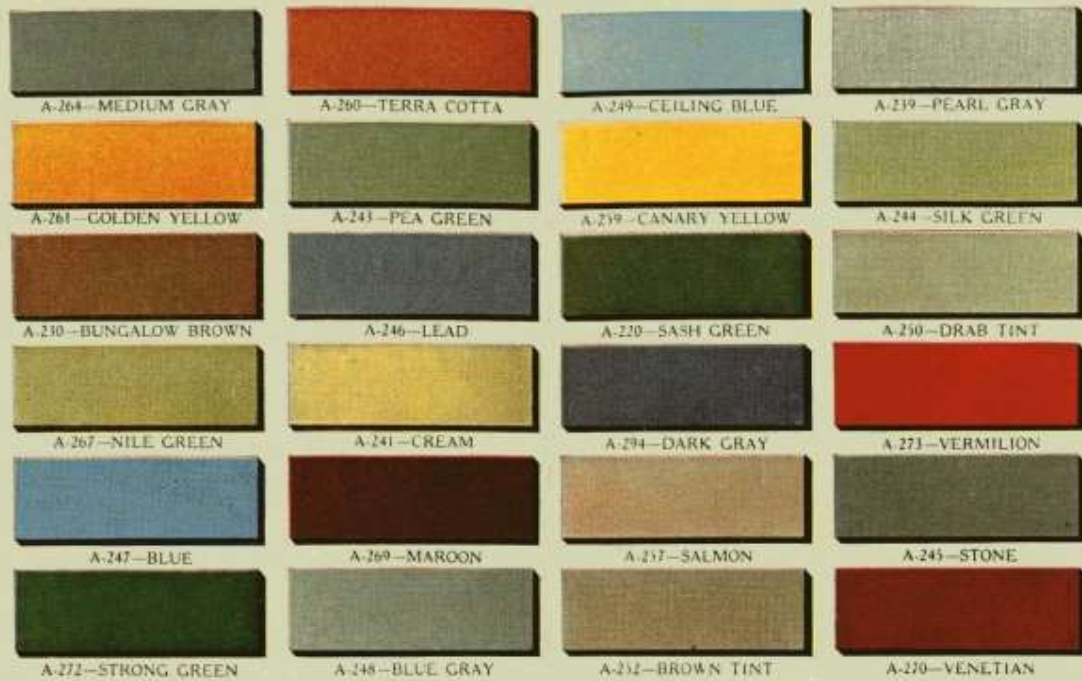
Sample analysis, interpretation and report carried out by: Mark Womersley

APPENDIX 3: EXAMPLES OF HISTORIC COLOUR CHARTS



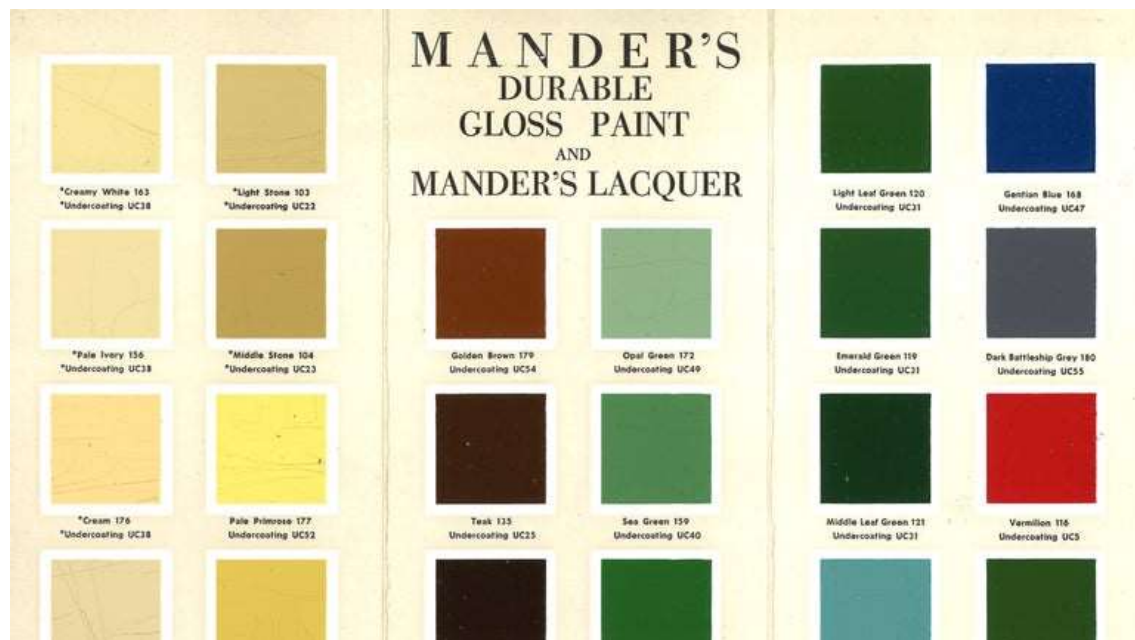
Color," *The World Book*, 1920. "

ALADDIN READY MIXED HOUSE PAINT



Also Outside White, Inside White and Black. A-220, A-272, A-273, Extra Priced.

From 1910-1920



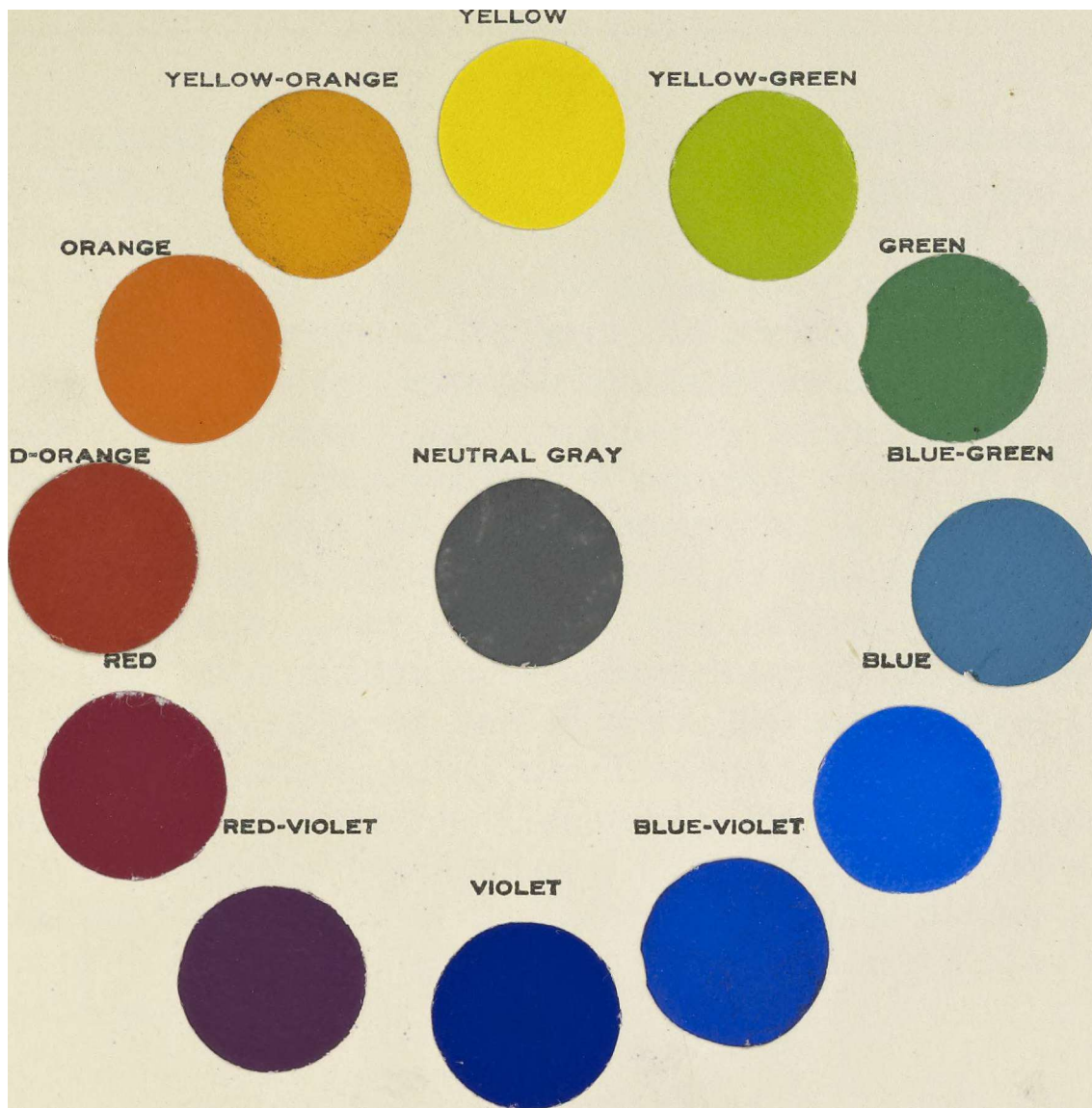
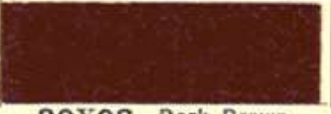
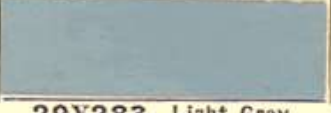
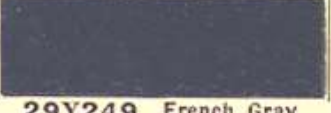
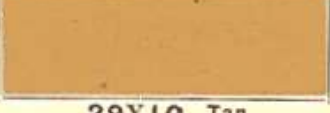


Image from page 44 of "The theory and practice of color" (1920), Authors: Snow, Bonnie E., d. 1925 Froehlich, Hugo B., 1862-1925, Publisher: New York: Prang

Here they are. Twelve of the most popular colors of Evercote House Paint for either inside or outside work. It can also be had in Outside White No. 29Y246, Inside White No. 29Y209 and Black No. 29Y201. Shipping weight, per gallon, 15 pounds.

When Ordering Mention Catalog Number

	
29Y8 Cream	29Y7 Drab
	
29Y213 Dark Yellow	29Y20 Slate
	
29Y39 Terra Cotta	29Y4 Leaf Green
	
29Y98 Dark Brown	29Y18 Shutter Green
	
29Y283 Light Gray	29Y14 Brick Red
	
29Y249 French Gray	29Y10 Tan

1-Qt. Can	1/2-Gallon Can	1 Gal. Can	5 Gal. Can	25-Gallon Half Bbl.	50-Gallon Bbl.
40c	78c	\$1 ⁵⁰	\$1 ⁴²	\$1 ³⁸	\$1 ³⁵
		Per Gal.	Per Gal.	Per Gal.	Per Gal.

The Charles William Stores New York City

APPENDIX 4: IMAGES OF THE BALCONIES IN THE 1980'S BEFORE THEY WERE REMOVED

