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Report Name:

# **The Conservation of the Plasterworks of Ordsall Hall**

**FINAL REPORT**



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#### **Conservation work:**

- The Italian Ceiling: First Floor
- The Solar: First Floor
- The Overmantle Room: Second Floor
- The Wattle/Earth Panels: Second Floor, West Wing

#### **The Italian Ceiling Room (F2)**

The restored ceiling is now presented with the reinstated oak paneling.

The floorboards in S1 above were lifted to expose the back of the ceiling and the lathwork. This was fully cleaned out from above ready for consolidation which involved reinstating lath and making a plaster trough in the weakest section of the NE corner only (Images 1,2). The two adjacent bays were partially consolidated with lime/ hair and pozzolana (calcined china clay was used as it is white with fine particles).

During the cleaning out in room S1 above the ceiling, a sample of wallpaper was discovered (refer to Overmantle (S1))

#### **North corner.**

The temporary timber supports, coverings and props were removed. New props and a small support board were introduced in order to work on the face and moulding detail. The plaster was in a more deteriorated state than assumed. Therefore the weakest, actual corner section was left propped whilst we could work on the area surrounding it to consolidate and strengthen the adjacent ribs. (Image 3).

The ceiling in this North corner showed signs of 3 older previous repairs all of which had seriously weakened this section (image 4).

Section by section was worked to consolidate the face, and the lath from above, and whilst the lime hair and pozzolana was still fresh, each section was eased up back into position and fixed. Then a richer mix of lime and pozzolana was worked into the deeper cracks. (Image 5). To insure optimum penetration,

the internal cracks were spray wetted with water and dilution of *Isopropanol* (10%) (Image 6). An extra gauging of goat hair was added to the (ready-haired lime mortar) mix on the surface cracks and also above (to provide good keying to the finish). Joist positions were measured to establish the most strategic positions for fixing the sagging plaster portions (Image 7) The strongest plaster sections were drilled in positions to link up with the joists above in order to take the screw fixings. These were done with s/steel countersunk screws and washers (Image 8)

This ceiling section (north) was left for two weeks to harden before attempting to tackle the friable damaged outer corner section. This section had a loss of plaster exactly under the joist (where it had never been keyed) anyway.

The method of holding and further consolidating this section along its sides was to reintroduce keying on both arms of the North corner.

On the NW arm, after removal of the top course of non supportive brickwork, the now-exposed joist behind (running parallel with the wall) was found to be sound and so lath work could be reinstated in its original position in order to run new moulding into the corner quadrant. This gives mechanical strength by providing a sandwich formed from the moulded detail below, and the keying/marrying of materials above.

Exactly the same method was applied to the immediate quadrant detail of the NE arm, where the lath frame had been secured to the wall on s/steel screwed timber supports. A short section of lath frame was constructed which fitted the gap on this side. (see images 9 and 10)

Effectively a new corner detail was formed in traditional, conservatorial methods by planting two short replacement lengths of moulding and finishing by hand-modelling in lime putty (image 11), thereby linking up the wall moulding as it would have been seen in the original scheme.

During the process of removing the non-supportive brick course, a discovery was made in that the moulded detail of the ceiling edge was found to be still in tact. This revealed an extra shadow detail of some 12mm rebated into the moulding profile before the edge dropped into what would have been the old wall plaster (Image 12).

### **South wall (Image 13)**

The rib edge moulding losses on the South (window) wall were patched in with lime/ hair and hand-finished with lime and pozzolana, where the original detail was clear. New sections to complete the run were formed from a **run mould** on the bench (Image 14). The pattern diminished some 380 to 270 mm so each

moulded section was fitted accordingly by bedding in with lime/ hair mortar and finished by hand. The coherence of the ceiling is improved now, as both south and north elevations have a complete moulded edging (Image 15).

### **East Wall**

Apart from both corner edges, the middle portion of the ceiling was seen as a broken rough edge (It had probably been cut to fit the new-build shape of the room from the Victorian restoration). The original lath still showing gave an indication of the amount of plaster loss on the original size of the ceiling (approx. 175mm) (Image 16). The raw edges of the ceiling were consolidated by lime plaster fillets to give a cleaner edge

### **Surface Cracks**

All cracks in the ceiling were consolidated. All losses were made good with lime putty and pozzolana in the form of calcined china clay powder.

### **Decorative detail work**

The construction of the rib work was irregular, especially in the N and E areas of the ceiling (Image 17). The rib details were clogged up throughout the scheme. The profiles were brought back by cleaning and removal of excess distemper and flaking limewash

During this operation, tests for the removal of carbon, limewash and distempers were undertaken. 'Patterning' appeared in two sections (which was surprising) and had to be investigated, causing some delay. The ceiling was cleared of painted significance, however some of the colour coating was found it to be a type of organic lac, probably a red button polish. It was not on all sections of the ceiling. Further investigation showed that it was NOT applied in sections behind the old brickwork, therefore it was post 1800 and probably later (my earlier report states the first coatings applied to the ceiling were limewashes).

Subsequently the overall surface was cleaned down and loose fragments removed in order to get an even suction and clean base for the limewash finish system. (Image 19)

### **Coating Sytem**

Prepared limewash was applied to the Ceiling. This was chosen rather than distemper as firstly it was the original coating, and secondly it serves to marry

and consolidate the lime repairs to the ceiling overall. The first coat was a thin coat. A week later a second coat was applied. Some four weeks after that a third coat was applied.

Certain sections in the NE corner were given an additional thin application.

### **SW Annexe Area**

The small room, a former passageway off SW, had the ceiling gap re lathed and replaced traditionally.

Black cement fillets in the stone wall here were removed.

The remains of limewashes inside this area were consolidated with six applications of lime water over a 3-month period.

A small section of the upper wall corner was treated with lime and hair as it formed part of the beam casing. The section of the beam casing had its 1960s pink finish plaster taken off (Image **19**). It was repaired with oak-riven lath fixed with s/steel screws, and coated with haired lime plaster with a smooth lime finish coat (here, as throughout, 1 lime putty : 1 fine sand) to match the rest of the beam plasterwork.

There are traces of old paint systems in this area. However, the south wall of the annexe is modern render

### The Solar: First Floor Panels (F3)

This room contains historic painting, original fireplace and chimney, and timbers with wattle panels on the west wall. These 6 panels are the subject of the conservation. They are linked back-to-back with the upper part of the Great Hall panels. Image 20)

From previous analysis the composition of the original material was earth (a local silicate-rich clay material), dung and straw and a little reed. The riven support construction for the daub-panel is not a normal wattle but a woven wood lath which is seen in other houses in this region.

Panels are numbered 1-6 in the report *Ordsall Mortars, Plasters and Renders* - Panel 1 being upper left and panel 6 bottom right. As found these were recorded as follows:

Panel 1. Plaster-board;

2 – **daub** below a layer of 20th cent. lime plaster with a lime and hair skim; corner patch of pink plaster

3 – **daub** below layers of plaster.

Bottom:

4 – **daub and lathwork** below plasterboard;

5 – **daub** below lime and hair plaster; 1/3 solid 1920s hard pink mix

6 – all **daub** no plaster. Limewash coating.

**Panel 1** was left untouched.

**Panel 2** was an early mix daub panel with a patch repair on the bottom RH corner. The pink plaster patch was taken out and some losses and separation in the corner of the daub underneath were noted. The daub was repaired (as the method given in Panel 6 below). This corner patch was a poor mix from the 20s or 30s (Image 21)

**Panel 3** was cleaned. This was also an early daub mix with losses around the edges. It was covered with an old lime plaster. The edges were made good in lime plaster for protection.

**Panel 4** was covered with plasterboard which was removed. This panel was one-third lath with the keying from the Great Hall Panel behind showing through. The remaining two-thirds were a woven daub mix with original impressions of the keying and weaving of the missing wide, flat, ribbon-like laths or ledgers (Image 22). One of the staves was completely rotten and was removed. The remainder of this section was cleaned out with gentle suction and all the non-friable earth daub was consolidated with a light spray of *Primal*. The left-hand section of keyed lath was re-lathed from this (Solar) side and given a covering of 3-coat lime and hair. The timber post to the left was

strengthened in order to hold both stable this section of keyed lime and the opposite (Great Hall) section.

The exposed section of this panel has been left open for educational purposes in order to study the method of construction

**Panel 5** has three-quarters original daub which is sound and is covered with an old lime-and-hair coating. The right-hand portion has been subject to more than one past repair. One of these repairs was with a very hard, pink mix from the 1920s which stood proud of the daub (Image **23**). Efforts were made to reduce the pronounced level of this patch repair and to successfully blend the whole piece with a small fillet of lime plaster, so that no rough edges could cause further damage to the original.

**Panel 6:** The modern board covering was removed. This was the most complete and informative panel to view. There are traces of the covering of limewash, staves and both small sections of traditional twig involved in the wattle, as well as the wide, thin, riven, woven lath, typical of the wattle panels at Ordsall. The whole panel was unstable, as is often the case in the deterioration of earth panels due to the shrinkage and loss of adhesion around the edges. The sheer weight of the panel loosens the upright staves pulling them out of their locating holes, which results in a structural weakness at the top of the panel. This dropping of the panel puts additional pressure on the earth at the bottom, and characteristically this can be weakened, as was the case here. Along the bottom of this panel can still be seen a painted darker band, probably from Victorian times.

The two sections of daub back and front had separated from the staves in the middle, due to movement and shrinkage.

### **Daub Repair**

The whole section was lightly vacuum cleaned. The wattle staves were strengthened where necessary, and eased back fractionally into their stable position, after which the consolidation of the daub mix began. This was centred around the actual losses and the weakest top edge of the panel. The mix was to replicate the original as near as possible, therefore a small percentage of the original inner material was added to local dug clay from Ordsall grounds during earthworks. Chopped reed and straw was married with the clay for a day and then added to the old material and a small percentage of haired lime mortar was added to it. (Image **24**)

The areas to take the new mix were thoroughly wetted with a fine spray of limewater with a percentage of alcohol. It is important not to soak the original daub as it will weaken the body. The mixture was pushed into the areas of loss

and indeed it is better by hand than trowel. The purpose of the alcohol was to loosen the surface tension to allow the best marriage of materials. For the larger areas near the top a keying is achieved by pressing in holes with a finger (Image **25**). When the clay daub has gone to its 'green' stage (hard but not dry) the finish coat of daub can be applied .

The rest of the panel - and especially the areas of limewash finish – was given two coats of sprayed *primal* in water (Image **26**). Attention was paid to the fact that this must not appear visible on the surface. Again the *Primal* was taken in by a preliminary coat of *Isopropan2ol*.

### **The Overmantle Room: second floor (S1)**

The overmantle had been subject to both research and reports. At this point in the conservation programme the decision to remove the 19<sup>th</sup> and 20<sup>th</sup> century plasters surrounding the overmantle, to allow exposure around the previously embedded edges, was necessary. It followed that the removal of the mantle shelf construction would remove some of this plasterwork in any event.

As a consequence the original ribbed profile of the edges became clear. A full bead and a right-angled form was seen, thus adding, by opening up, some 25mm all round to the original design (Image 27). The other and most significant finding was that the panel had a section of its original wall face still attached at the top, thereby giving a proportion relating to the original setting and ceiling height (Image 28). Furthermore it revealed that it was originally set in situ into a plaster wall on a lath and stake structure. This whole structure was now set proud of the existing chimney construction by some 25-30mm gap behind it (the chimney being rebuilt in the 19<sup>th</sup> century). (Image 29)

The proportions of the overmantle to the wall area and hearth size do give credence to the view that it is more or less in its original position.

#### **Repair:**

The protective boardings were removed. The wooden mantelshelf was removed and some of the cracked late Victorian and 20<sup>th</sup> century plaster patching along the sides were also removed in order to expose the original structure and the old paint systems which were on the hearth beam (samples of these later plasters have been kept). Indeed the plaster down the right-hand side of the overmantle is still untouched underneath the new lime (Image 30). The now-exposed shaped wooden mantle-beam was many layered with lime washes and later oil-based paints. The hearth was stone and brick. The stone hearth sides were original and the rear of the chimney was rebuilt in the 19<sup>th</sup> century.

The overmantle crest design itself is now clearly detailed as the old distempers were removed, and it was to be re-presented in its new form minus mantle-shelf and fill-ins at the side of the hearth. One small section of loss and cracking, at the bottom LH corner of the overmantle was conserved (Image 31). The area was cleaned out, the surrounding section of original was consolidated. The loose, small section of bead was removed and re-bedded into lime putty with a section of pozzolana. The losses around the profile of this beading were worked to match. The mix for the finish was 1 lime putty : 1 fine sand. The repair is clearly seen as a repair as opposed to the original.

The side-hearth lower portion near the wall, in the section where the original keying had failed, was re-lathed with lime/ hair plaster and a percentage of calcined china clay (Image **32**).

The nails and fixings were checked throughout for oxidation. The original fixings proved sound and were left intact. The only new addition was a full strip of riven oak lath, which was inserted along the timber beam and fixed with s/steel screws and washers (Image **33**). Great attention was given to the location of these screws so as not to damage the beam. This lath was positioned in order to take the plaster for keying purposes.

A 2-coat work of lime and hair (Image **34**), with additional hair (Image **35**) and a percentage of pozzolana was to key up the third and finish coat, which was tamped to give the correct presentation overall (Image **36**).

During the conservation work for the Italian ceiling below, a sample of Victorian wallcovering was found near the East wall below the beam and joist at floor level, close to where the floorboards were taken up. The paper is a 'black and white floral' in design (Image **37**)

**West Wing Second Floor: Timber and Wattle Infill between Trusses (S5, 6, 7, 8, 9)**

There is continuous central passageway under the main roof trusses. Three of these trusses have been infilled with earth and wattle panels dividing this area into bays. These infills show mixed methods of forming. There is some wattle twig weaving (image 38) and (as in the Solar) some riven lath weaving. Lath and plaster panel is used as infill in Bay S9. Seven of the panels were in a delicate state and were consequently consolidated and conserved.

**Infilled Truss S5/S6:** The wattle 'arch' showed the greatest losses, its whole central section was missing and it was also the weakest material body in the wing. The weaving had been from hazel twigs which were completely frazed and rotten and crumbling to the touch (image 39). The vertical wood staves were missing from the central section, probably due to the buckling and shrinkage of the twig. This had left the earth daub in a friable state. The hazel wattles which were hardly sound enough to be cleaned, were sprayed with *Isopropanol* and left to dry and dusted down with a fine brush. Then the woven wattles and earth had to be consolidated together both by injection and gravity grout from the shrinkage gaps above. A week later the daub was dried out and in a consolidated state sufficient for it to be fixed and secured back to a carved, shaped oak lath some 60mm wide made specially to fit the gap between the opposite sides of the daub panel (image 40). This wide oak lath fitted into the original timber stave groove in the beam above it, and was secured by a new peg shaped to fit the original fixing peg-hole through the beam (images 41, 42). Both sides of the daub panels were then fixed to the new oak lath section with s/steel screws and washers. This procedure prevented the earth panel from vibrating and sagging. The gaps between the two panels had been stabilised and fixed and were made good on their upper surface by a thin application of daub (image 43). A Primal spray secured the side surfaces, and after drying out a new daub mix was applied sparingly over the screws and 2 small areas (approximately 500x500mm to give a reasonably flush surface for protection rather than presentation (image 44)..

The loose lower panel to S6 North side was conserved by the method described under the Solar daub restoration (image 45).

**Infilled Truss S7/8:** The 2 bottom north and south side panels near to the lift and stair entrance were extremely unstable, as the vertical fixings had failed. The original staves had been broken and dropped so as to allow the panel to flap (image 46). The panels were strengthened either side with carved wooden shaped oak supports which acted like an extension to the original wooden stake. They were attached to the existing by 2 s/steel screws, enabling enough height in the stakes to reintroduce support in the original position (images 47,48,49). The friable edges of daubs were consolidated with earth daub from the grounds of Ordsall

The incised graffiti from the 20<sup>th</sup> century was left, by request, and therefore the carbon-coated surfaces were not cleaned or consolidated in the infill sections of these Bays.

**Infilled Truss S8/S9:** The lower panels to both sides of the passageway under the beam were unstable. They were of lath and plaster. Two of the others were of earth daub with an old limed hair render some 15mm in places. In the earth panels (west) the body of the earth was not weak but the shrinkage had caused instability (images **50,51**). Therefore these panels were re-attached using methods of conservation and consolidation as previously described

The Bay upper-section arch 'was consolidated in the friable areas using fresh daub (image **52**) In this Bay there are three lath and plaster panels, all in the lower section. On the S9 side they are coated with a very dark, stained distemper, which is even darker due to its proximity to the fireplace (image **53**). The two panels next to the s/steel jointing plates on either side of the passageway have very friable plaster. It was cracked throughout on the surface and was injected and consolidated with *Paraloid B72* (5% in water).

The plaster panel (S9 east) was fixed back where it had de-laminated and its coarse, exposed edges were given fine fillets of lime plaster for protection (image **54**).

The lath and plaster panels either side of the access opening to this end Bay make for a difficult and vulnerable area of passage image **55**).

The specialist conservation work has been in the 4 areas described in the main body of this report. Other areas of replacement plasterwork, referred to in *Ordsall Mortars, Plasters and Renders (2006)* are as follows in the Appendix and were not undertaken by YJA Conservation

Yvonne Adamson.

## **APPENDIX**

### **The Star Chamber: Ground Floor (G3)**

This has two earth panels which appear, on analysis as those in the Solar but with finer straw. They were subject to past shrinkage but are sound. They were left untouched.

Next to the earth panels 2 panels of oak lath and 3-coat traditional lime and hair plaster were put in as new to replace damaged Victorian solid render and to give coherence and improved performance to the timber wall scheme. The mix was 3:1 hair lime plaster readymix (2 coats) and 1 coat finish of lime coarse texture.

The internal replacement lime mixes for solid work were 3:1 x 2 coat and 3:2 for finish coat. Again the texture was generally coarse finish throughout.

### **The Great Hall: Ground Floor (G4)**

The quatrefoils were renewed with oak lath/ hair/lime mortar as 3-coat traditional work.

The East Wall had 2 sections replaced, corresponding with those in the Star Chamber which were similarly replaced with lime plaster.

The North Wall had all its square panels replaced.

The daub readymix (Wormersleys) contained lime straw and hair, applied as one tight coat with a finish tight coat of lime.

### **Bay Ceilings (Ground and First floor)**

These were replaced by traditional method oak lath and 3-coat lime and hair work

### **Mortars**

All 20th century black cement and hard cement pointing has been removed internally and externally. The internal mix for pointing, where the brick is softer are 3:1 NHL (3.5 strength). The significant area of the West Wing (Room G12) which contained a variety of the oldest mortars as not been repointed,

The external mix for the soft old brick of the north face is 3:1 same as the internal repointing mix. This has a mix-graded aggregate and a good colour. The south face and the stronger Victorian brick had a stronger mortar mix and stronger colour of aggregate

The infill external panels were all replaced with daub with a lime finish with the exception of the exposed Victorian gable (South face) which was replaced with an external render which was an external render NHL mix

All significant plaster systems are now working sympathetically, especially as the damaging cements have been removed.

The images presented in this report are to enable an understanding of the text rather than as a complete stage-by-stage visual document.

All images, taken both before and during the contract, are contained in a separate CD.

Yvonne Adamson