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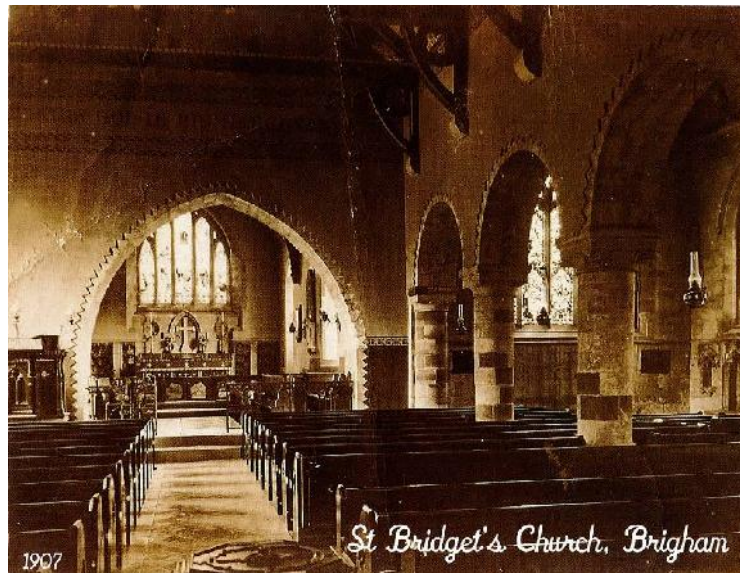


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**Treatment Report for the Nave and South Aisle Ceilings,  
St Bridget's Church, Brigham, Cumbria**

**Diocese of Carlisle**



**November 2013**

**St Bridget's Church  
BRIGHAM**

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## 1. Project Summary

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<b>Scope:</b>	To undertake the conservation and restoration of the painted ceilings to the nave and south aisle of St Bridget's Church, Brigham
<b>List Entry Number:</b>	1145196
<b>Listing:</b>	Grade I
<b>Date first listed:</b>	03-Mar-1967
<b>National Grid Reference:</b>	NY 08582 30921
<b>Name and Address of Client:</b>	Derek Bainbridge St Bridget's CPWG Leader 128 high Brigham Brigham Cumbria CA13 0TJ
<b>Name and address of Conservators:</b>	Hirst Conservation Laughton Sleaford Lincolnshire NG34 0HE
<b>Date of Works:</b>	2 <sup>nd</sup> September – 18 <sup>th</sup> October 2013
<b>Title, author and date of the Conservation Report:</b>	<i>"Condition Assessment and Treatment Recommendations for the Nave and South Aisle Ceilings, St Bridget's Church, Brigham, Cumbria"</i> Hirst Conservation, July 2012
<b>Author and date of post conservation treatment report:</b>	Amanda White, Hirst Conservation, November 2013
<b>Methods Employed:</b>	Consolidation of flaking paint layers; careful dry cleaning of the decorative ceiling using Wishab sponges; wet cleaning of gilded stars using dilute ammonium hydroxide; filling and retouching of losses to ceiling panels using soft distemper; recreation of stencilled design to replacement panels and timber using soft distemper; photographic, diagrammatic and written documentation.

## 2. Introduction

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Following a preliminary visit to the church by Elizabeth Hirst on 12th December 2011, Hirst Conservation was commissioned to undertake a condition assessment of the nave and south aisle ceilings at St Bridget's Church, Brigham. Water had previously ingressed from a valley gutter causing damage to timber and plasterwork; areas of failed plaster and timber had been replaced prior to the inspection.

The condition survey was undertaken by Amanda White and Cassandra Booty of Hirst Conservation, on Tuesday 12<sup>th</sup> June 2012, and the results were presented in our report "*Condition Assessment and Treatment Recommendations for the Nave and South Aisle Ceilings, St Bridget's Church, Brigham, Cumbria*", July 2012.

The parish secured funding for the conservation of the ceilings of the South Aisle and Nave in 2013 and the following document outlines the treatments undertaken as recommended in the above report. The work was undertaken by Lucyna Kaszewska, Kamil Bedkowski, Kris Kaszewski, Aneta Krupnik, Phillipa MacDonald and Amanda White of Hirst Conservation between 2<sup>nd</sup> September and 18<sup>th</sup> October 2013.

### 3. Description, History and Significance<sup>1</sup>

#### 3.1 Description and History



**Figure 1.** St Bridget's Church, Brigham from the south (Hirst Conservation, 12<sup>th</sup> June 2012).

The parish church of St Bridget is located at the far north of the village of Brigham, near Cockermouth, Cumbria. It was Grade 1 listed by English Heritage in 1967.

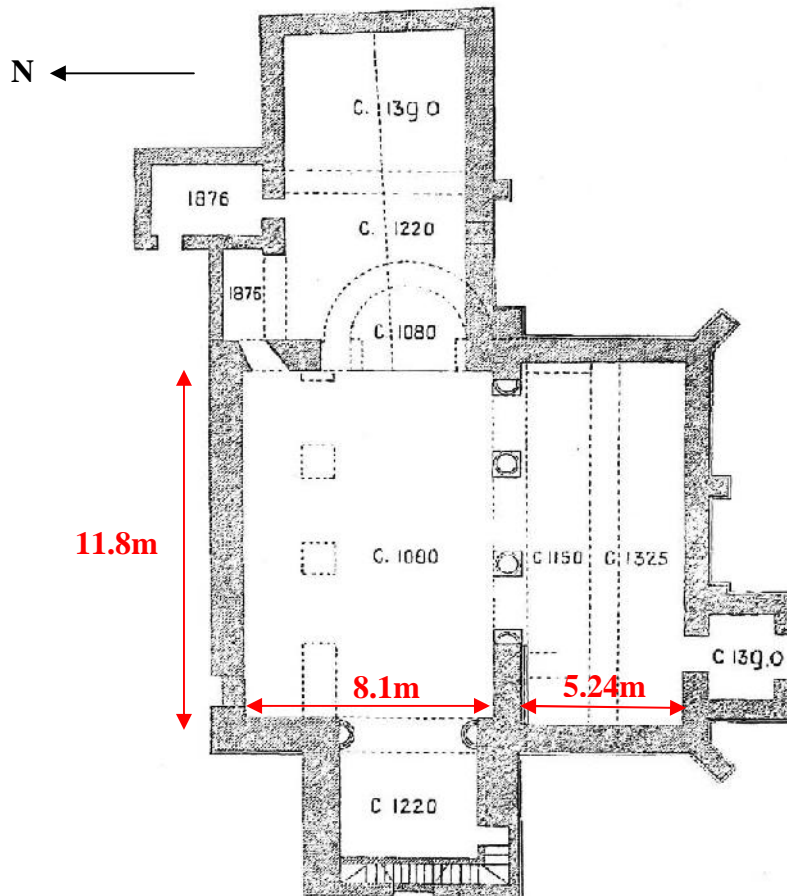


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**Figure 2.** Map showing the location of St Bridget's Church to the north of the village of Brigham<sup>2</sup>.

<sup>1</sup> This section is taken from our July 2012 report "*Condition Assessment and Treatment Recommendations for the Nave and South Aisle Ceilings, St Bridget's Church, Brigham, Cumbria*".

The church, believed to date from the late 11<sup>th</sup> century, has 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup> century additions and alterations, and was largely restored by Victorian architect William Butterfield in 1864-76. It is constructed from calciferous sandstone ashlar, and has a graduated green slate roof with coped gables, cross finials and shaped ridge tiles. The church consists of a 3-bay nave and south aisle, a 2-bay chancel with a north vestry, a square 3-storey west tower and south porch<sup>3</sup>, see figure 3 below<sup>4</sup>. The stencilled roofs in the Nave, south aisle and chancel are part of the Butterfield restoration and date to 1865 and 1875.



**Figure 3:** Plan of St Bridget's Church showing approximate dimensions.

The 3-bay nave has a painted timber. There is a blocked north doorway under a round-headed niche, 19<sup>th</sup> century 2-light windows and a pointed chancel arch.

The south and east chancel walls were partly rebuilt as part of the 19<sup>th</sup> century restoration, but the lower courses retain a small rectangular window and blocked priest's doorway on the south wall. In 1875-6 the chancel was restored by Butterfield, at a cost of approximately £4,000 (paid for by Lord Lonsdale), with a vestry and organ chamber

<sup>2</sup> Taken from website: <http://list.english-heritage.org.uk/resultsingle.aspx?uid=1145196>. Accessed on 26/06/12.

<sup>3</sup> Taken from website: <http://list.english-heritage.org.uk/resultsingle.aspx?uid=1145196>. Accessed on 26/06/12.

<sup>4</sup> Fletcher, I. (1878) '*Brigham Church*', Reprinted by Rev Christopher Goddard, 1996, p3.



added. The purpose was to repair the whole building, preserving old work as much as possible and, where old work had disappeared or been defaced, to replace it as nearly as possible to the original appearance.<sup>5</sup>

The south aisle was rebuilt in the early 14<sup>th</sup> century and the south doorway has a re-used late 13<sup>th</sup> century arch. It is known that in 1323 rector Thomas de Burgh founded a chantry in the chapel of St Mary, which is probably the present aisle. Various sculptured fragments from the medieval and earlier church are located within the aisle, which also contains a piscina, triple sedilia and canopied tomb to Thomas de Burgh, treasurer of Ireland, who died about 1337. It has a characteristic almond shaped west window, with a sunk quadrant moulding and a slight ogee tip. The east and south windows in the aisle are by Butterfield (1864 – 76) as is the 1876 painted timber ceiling<sup>6</sup>.

The tower dates from around 1220, though William Butterfield added the saddle-back top storey during the restoration of 1864-76. There is a blocked 14<sup>th</sup> century west door, which has a medieval cross slab built into it on the interior.

Records held at the CBC library were searched (file CARE 07/316), but very little information on the history of the decoration and previous interventions were found, other than the booklet by I Fletcher. A letter dated 2<sup>nd</sup> February 2001 from William Hughes, Honorable Treasurer, to the CCC requesting funding states: Following the Quinquennial survey, essential repairs were recommended by the architect, including repairs to the gullies and gutters. The following photographs were also on file, showing the church before and after Butterfield's restoration.



**Figures 4 and 5:** Photographs of St Bridget's Church, Brigham dated 1863 (left) and 1876 (right), before and after Butterfield's restoration.

### 3.2 Significance

Painted decoration is not very common in Butterfield's architecture, with about a dozen painted roofs, including Ottery (1849) and Keble (1876), but mostly wooden ceilings picked out with formalised flowers, stars and monograms, such as at Langley, Kent and

<sup>5</sup> Ibid, p24.

<sup>6</sup> Pevsner, N (1980), *Buildings of England: Cumberland and Westmorland*, Penguin Books Ltd, Harmondsworth, pp 78-79.



Brigham.<sup>7</sup> “By far the most attractive tie-beam roof.. is at Brigham in Cumberland, where gay painted patterns set off the foliated principals and posts.<sup>8</sup> These paintings were executed by a variety of artists, including village craftsmen at Brigham, and it is thought that Butterfield must have supervised the work closely.<sup>9</sup>

### ***Statement of Significance by Elaine Blackett-Ord***

The unusual and almost complete painted plasterwork and timberwork ceilings of the Nave, Chancel and Aisle of St Bridget's formed part of the later, extensive restorations carried out between 1864 and 1876, by William Butterfield, (1814-1900), a leading architect of the early Ecclesiological movement of the mid nineteenth century and whose influence is recognised today as one of the forebears of the modern movement in architecture.

Butterfield, a London architect, worked extensively across the north of England during his early to middle period, where he carried out restoration at St Bega's Priory at St Bees (1855), and built new churches at St Mark's Church, Cautley (1847) and St Michael's Church, Lamplugh (1870). His work at Brigham spans the period after the mid-century revolt against pure imitation of early medieval design and the later reaction in the 1870's against robust High Victorian Gothic novelty. However, the glories of High Victorian originality can be seen best at Brigham in this highly significant and important work, where the rich and varied expression of soaring roofs are embellished and decorated on all surfaces. Here the exuberant patterned ceilings set off the foliated trusses, principles and posts of the roof structure and contrast delightfully with the older architecture, but do not overshadow it. The overall effect is light and airy with none of the over-ornamentation and heaviness of his later dark and polychromatic work.

Decorated roofs are not very common in Butterfield's work and mainly comprise painted wooden ceilings picked out with stars, foliage and monograms. Brigham is one of very few painted plaster schemes and has a lightness of touch. He was influenced in this art by his pupil master, the antiquarian scholar and architect, E L Blackburne, the author of a history of applied decoration applied to English architecture, *Decorative Painting of the Middle Ages* (London 1847).

The painting was carried out in 1876 by trusted local village craftsmen, the Robinson family, to Butterfield's full size cartoon designs and under the close supervision of the architect, adding to the home-grown significance of this work of exceptionally high quality.

The roofs and ceilings formed part of a wider scheme of interior design and applied arts, including metalwork, the lectern and low screen at the Chancel arch (now lost), and an extensive joinery scheme of pews, the pulpit and the inner entrance lobby.

The painted decoration in St Bridget's has survived in remarkably good condition for almost 150 years and is one of the glories of this exceptional Grade 1 listed church. Its importance cannot be understated as it remains one of only a handful of examples of

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<sup>7</sup> Thompson, Paul (1971), *William Butterfield*, Routledge & Kegan Paul, London, p457.

<sup>8</sup> Ibid, p196.

<sup>9</sup> Ibid, p457.

painted decoration in Cumbrian churches<sup>10</sup>, as part of a wider scheme of restoration and, conceivably, formed part of a more extensive design, included wall paintings or stencilling, none of which remains except possibly beneath layers of limewash and paint.

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<sup>10</sup> Early examples are rare: Dacre Hall, Lanercost, (1500's) being the most complete, and there are no surviving medieval examples in Cumbrian churches, Kirkby Hall in Furness (1530) being the rare survival in a disused private chapel. Decorated work was painted or stenciled onto plain walls with repetitious patterns and later in richer colours. Early timber ceilings are also rare with only the reused C17 ceiling panels in Topenhow church remaining. Fragments of the Lord's Prayer and other religious texts painted onto wall survive at Ulpha and later examples at Grange, Borrowdale. Most examples, although surprisingly few, date from the mid nineteenth century at Wreay church (1840), Warwick Bridge Our Lady and St Wilfrid by Pugin (1841), St Bees (1855), and the tradition continued with the painted ceiling of Carlisle Cathedral by Phillip Webb (1870's) and later work by Stephen Dykes-Bower at Wigton St Mary and elsewhere in the 1950's.

## 4. Summary of Condition

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Full details on the condition of the ceiling can be found in our July 2012 report *Condition Assessment and Treatment Recommendations for the Nave and South Aisle Ceilings, St Bridget's Church, Brigham, Cumbria*; however, a summary is provided below for ease of reference.

### 4.1 General Condition of the Exterior

The evaluation of the condition of the exterior was based purely on observations made from ground level as no access was available to higher levels of the building. In general, the condition of the exterior of the church does not appear to be having a detrimental impact on the condition of the painted decoration within the church.

However, the following observations were noted:

- Some areas of replacement cement flashing were noted to west end of the nave roof, north side and many of the decorative ridge tiles have lost the upper sections of moulding.
- There is extensive re-pointing to the north side of the nave and to all faces of the tower, some of which is failing. The surface of the stonework to the north and west faces of the tower is particularly weathered.
- There appear to be traces of a previous render in numerous areas on the chancel walls, suggesting it may have been rendered in the past.
- There are large areas of lichen on the stonework of the church, particularly at low level, and localised areas of larger plant life such as ferns and grasses, in several areas. Areas of grass, ferns and mildew are evident, particularly around the steps down to the undercroft/basement, where it is very damp. A holly bush is located against the west wall of the south aisle, beneath which the drain is blocked with leaves.

### 4.2 Interior

The ceilings were visually assessed in diffuse and raking visible light and the condition and visible extent and nature of failure was recorded, see Appendices 2 and 3.

#### *Nave*

The plaster nave ceiling has 4 bays of full panels and 2 bays (one at each end) of part panels, each bay consisting of 6 panels (see Appendix 2). The 6 bays are separated by 5 timber tie beams, and all surfaces are decorated with stencilled designs and applied gold stars.

- Plaster panels and timber trusses/beams have been replaced at the east and west ends of the south side of the nave and have yet to be repainted. A large section of wall plaster has also been replaced at the east end of the south wall.
- 4 part panels that have not had their plaster replaced, all show signs of water ingress; there is a whitish bloom and salts evident.
- There are numerous fine fractures in the plaster panels, but these exhibited no movement and do not sound hollow, so can be presumed to be stable. Some of the fractures in the plaster appear to have been present before the painted scheme was applied, as paint can be seen over the edges of the fractures.
- Initial inspection on site suggested the decoration has been undertaken in a distemper paint; the paint on the timber areas appears to be under-bound as it is powdery and can be wiped away with a dry finger.
- The painted surfaces are heavily soiled: there are cobwebs running along the panels and beams; numerous water stains are evident; there are splashes of plaster on the paint surface and areas of original paint have been lost by wiping away residues during repair, particularly evident on the timber beams.
- Numerous areas of flaking paint are evident, generally along the grain of the wood, which suggests that this flaking is as a result of expansion and contraction of the wood, possibly due to the previous water ingress or condensation events within the church.
- Around the corbel block to the western-most tie beam, on the south side of the ceiling, there is evidence of water ingress. The surface of the paint is disrupted, with some areas of paint loss and evidence of salt efflorescence.
- The gilded stars are made of lead and are attached to the ceiling with brass screws. Although slightly dull in appearance they are in good condition and appear to be reasonably stable.

### ***South Aisle***

The barrel vaulted south aisle ceiling consists of 80 plaster panels (10 bays of 8 panels) separated by timber frames, with applied gilded stars in the corners of the frames.

- The lower four ceiling panels in the far north east corner of the south aisle have been replaced, following extensive damage from water ingressing from the blocked gully, and new timber frames spliced in.
- Several panels towards the west end of the ceiling, and the wall beneath, also show signs of previous water ingress, including staining, disrupted plaster surface and water run off marks.
- On close inspection, some fine fractures in the plaster panels were noted, although these can't be seen from ground level and they appear to be stable.

- There is a large build up of surface dirt, dust and cobwebs. The timber frames surrounding the replacement panels have plaster residue on them and some of the original paint has been removed, seemingly when an attempt has been made to remove the excess mortar.
- There are areas of minor paint loss along the edges of some fractures and some recent impact damage in the form of scratches and there are some holes in the replacement timber frames that have not been filled.

#### **4.3 Summary of Types and Causes of Deterioration**

- Water ingress – assumed to be resolved following repairs to roof in 2010.
- Flaking of paint – As a direct result of historic water ingress. Limited flaking caused by expansion and contraction of wood along the grain, and possible denaturing of the size and paint layers.
- Water staining to ceiling panels – As a direct result of historic water ingress. With water ingress halted, staining will remain but should not increase.

## **5. Technical examination – Paints and Moisture**

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### **5.1 Summary of Results of Paint Analysis**

The conclusion of the analysis of the paint films undertaken as part of the condition assessment was that there is one scheme of decoration to both the nave and south aisle ceilings. The limited sampling undertaken suggests that the decoration of the nave ceiling panels was undertaken in three base coats, with the stencilled design applied over the top in one coat. It appears that only one base coat was used on the timber elements of the nave. Likewise, only one base coat was evident in the sample from the ceiling panel of the south aisle, with the stencilled design applied over the top again in one coat. Testing established that the original paint media is likely to be a glue bound soft distemper.

It is known that the decoration of the nave and south aisle ceilings was undertaken at different times. The quality of the finish to the decoration of the south aisle ceiling does not appear to be as refined as for the nave ceiling, possibly suggesting that they were undertaken by different contractors using different decorative techniques.

### **5.2 Summary of Preliminary Moisture Profiling**

The interior fabric of the Church is essentially in a good condition. However, the previous catastrophic water ingress was extensive, and this, along with the plaster repairs resulted in high levels of moisture penetrating the fabric. Both the capacitance and protimeter readings showed the fabric of the nave and south aisle ceilings and walls (in the areas of repair accessible from the scaffold) to be essentially 'very dry' up to ~4cm depth. The highest capacitance meter readings were 189 in the nave and 190 in the south aisle, with the majority of the protimeter readings below 10.5%.

It was concluded that the fabric of the church (in the areas examined) was essentially dry, with no significant water ingresses or residual moisture, otherwise the air inside the church would have been significantly 'damper', and the capacitance and protimeter readings would be higher. The environmental readings showed that there is minimal chance of condensation events occurring at the time of the site visit, as indicated by the large difference between the recorded temperatures and dew points.

### **5.3 Additional Moisture Profiling**

Whilst on site it was noted that the westernmost stone corbel on the south side of the nave appeared wet, therefore various moisture readings were taken in this area. Readings were taken on 17<sup>th</sup> September 2013; the temperature inside the church was 16°C, dew point was 10.6°C and relative humidity (RH) was 67%. Protimeter readings for this corbel ranged between 21.1 and 23.5% (damp) and capacitance metre readings averaged about 400 (damp). Readings were taken from the surrounding timbers, wall and panels, which were all essentially dry, apart from the west wall of the nave. Capacitance meter readings to this wall ranged between 600 and 850 (very wet), which is the most likely cause of the damage evident to westernmost ceiling panels. These areas should be further investigated to determine the cause of the excessively high moisture levels.

## **6. Treatment Record**

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In general the condition of the building envelope was found to be sound and no major faults were detected during the site visit. Historic water ingress was the largest contributing factor to the deterioration of the paint films; but as the blocked gully had been repaired and areas of failed plaster and timber replaced, and preliminary moisture profiling indicated that the areas of repair were essentially dry; it was concluded that the ceilings were suitable for further treatment.

### **6.1 Initial clean**

All stable surfaces were carefully dry cleaned using soft brushes in conjunction with vacuum extraction to prevent relocation of dirt.

### **6.2 Emergency consolidation**

Given the friable nature of the paint in many areas, some emergency consolidation prior to any further intervention was necessary. A programme of testing was undertaken to determine the most effective and appropriate materials and methods.

Tests with Lascaux® 4176 medium for consolidation indicated that it was not an effective way of consolidating powdering surfaces as it is more suitable as a contact adhesive. In addition, although it is considered a suitable consolidant for matt paint films such as those found on the ceilings of St Bridget's Church, it was found to leave noticeable tide marks around the areas of flaking paint consolidated, and was therefore discounted.

The traditional fish glue, isinglass, was trialled as it is an appropriate consolidant for powdering glue distemper where it is underbound. It has been used extensively with success on similar projects such as All Saints, Cambridge and many European examples, but should only be considered for use where conditions and surfaces are stable, as it is prone to biological attack. Tests indicated that isinglass successfully consolidated areas of both powdering and flaking paint layers. The glue was only used as a very dilute solution (5%) to avoid darkening of the paint films and spray application or localised injection prevented any detrimental impact on the water soluble paint layer, see figures 6, 7 and 23. However, as the isinglass was not suitable to use on the panels and timbers affected by moisture ingress and salts, various synthetic consolidants were tested including Plextol B500 and Paraloid B72 in xylene in varying concentrations.

The spray application of 7-10% solution of Paraloid B72 was found to be particularly effective at consolidating the failing paint on the moisture and salt affected panels and timbers. Paraloid B72 is an ethyl methacrylate/methyl acrylate co-polymer, that (dissolved in xylene or acetone in varying concentrations) has been widely used in conservation over the last 30 years as a consolidant, retouching medium, and as an isolating or final varnish. It remains chemically stable overtime and is not affected by light. Although a slight darkening of the paint surface was noted following spray application, this was considered to be at an acceptable level due to its stability.



Plextol B500 diluted 1:1 with water was used to consolidate areas of flaking white paint as this was found to be too heavy to enable consolidation with isinglass; interestingly the white paint is not distemper but most probably a lead oil paint. The consolidant was carefully applied with a syringe in order to minimise contact with the distemper and avoid staining.

### **6.3 Cleaning**

Further cleaning of the paint surfaces was undertaken to remove hygroscopic dirt deposits and to enable recreation of the lost areas of decoration in the correct colours. Given the extreme sensitivity of the paint films to water and solvents, only dry cleaning methods were used. Initial cleaning trials had suggested that Wishab sponges (AKA pad) provided the most effective clean without causing any damage to the paint films, see figures 8, 24 and 25. This was supplemented with some further cleaning with Artgum erasers to the lighter passages where required (natural gum, non-abrasive eraser with a deep cleaning powder additive). The gilded stars were surface cleaned using a weak solution of ammonium hydroxide pH 8.5, applied with cotton wool swabs, see figures 26 and 27.

### **6.4 Consolidation**

Where required, further consolidation was undertaken using the same methods and materials as for the emergency consolidation.

### **6.5 Surface preparation & filling**

The junction of the new and old plaster was prepared prior to repainting by sanding and filling with fine surface filler (Polyfilla) as appropriate. The filling material was applied using small hand held spatulas and once dry it was levelled using saliva and cotton wool swabs.

To facilitate retouching, filling and making good of localised areas of loss was also undertaken using a fine surface filler (Polyfilla) in areas of plaster loss and wood filler (Ronseal) in areas of timber loss, particularly holes left as a result of the previous timber repairs.

There was an extensive network of fractures to the ceiling panels in both the nave and the south aisle. These were found to be stable, and as the majority are only hairline fractures and not visible from ground level, no filling was undertaken, except to isolated areas of larger loss. The fractures have been mapped onto ceiling plans in Appendix 3.

### **6.6 Re-creation of lost decoration & localised retouching**

Tracings of the stencilled and freehand designs to the ceiling panels and timberwork were taken using a permanent marker pen and acetate sheets. They were then transferred to heavy weight acetate sheets and a separate sheet was cut out for each colour of the stencilled design.

Recreation of the decoration was undertaken (following the application of a coat of claircolle to seal the surface) using various sizes of stencil brushes and distemper paints

in colours matched to the original. Soft distemper (glue-bound distemper paint) is a type of paint consisting of whiting (finely ground calcium carbonate) and pigments suspended in size (a gelatinous substance). One coat of the background colour was applied followed by one coat of the stencilled design. See figures 14-18 and 32-33.

The freehand designs were transferred onto tracing paper and dry pigments pounced onto the reverse of the paper to enable the designs to be traced onto the ceiling panels. Subsequently the lines and colour fields were painted freehand in distemper paint, colour-matched with dry pigments. See figures 14-18 and 32-33.

It was noted at the start of the works that the white flowers in the nave ceiling panels had at some point been crudely overpainted in a buff/ochre colour oil paint, possibly in an attempt to make them less noticeable, see figure 8. Following discussions with the client, it was decided that when the decoration to the missing and damaged westernmost panels was recreated, these flowers would remain white in order to demonstrate how the panels would have looked originally, see figure 11.

The extensive staining and salt damage to panels in both the south aisle and the nave necessitated extensive re-painting in distemper paint, see figures 9-11 and 28-31. These areas are plotted onto the ceiling plans in Appendix 2. Where there were large areas of loss to isolated stencilled designs, such as the red flowers on the undersides of the nave beams, these were re-stencilled, see figures 12 and 13.

Very dark tide marks and staining to the beams in the nave were disguised by the use of dry pastel crayons in matching colours, see figures 19 and 20. In addition, integration of the localised areas of paint loss was then undertaken, without filling of lacunae, using distemper paint and/or watercolours.

## **6.7 Redecoration to walls**

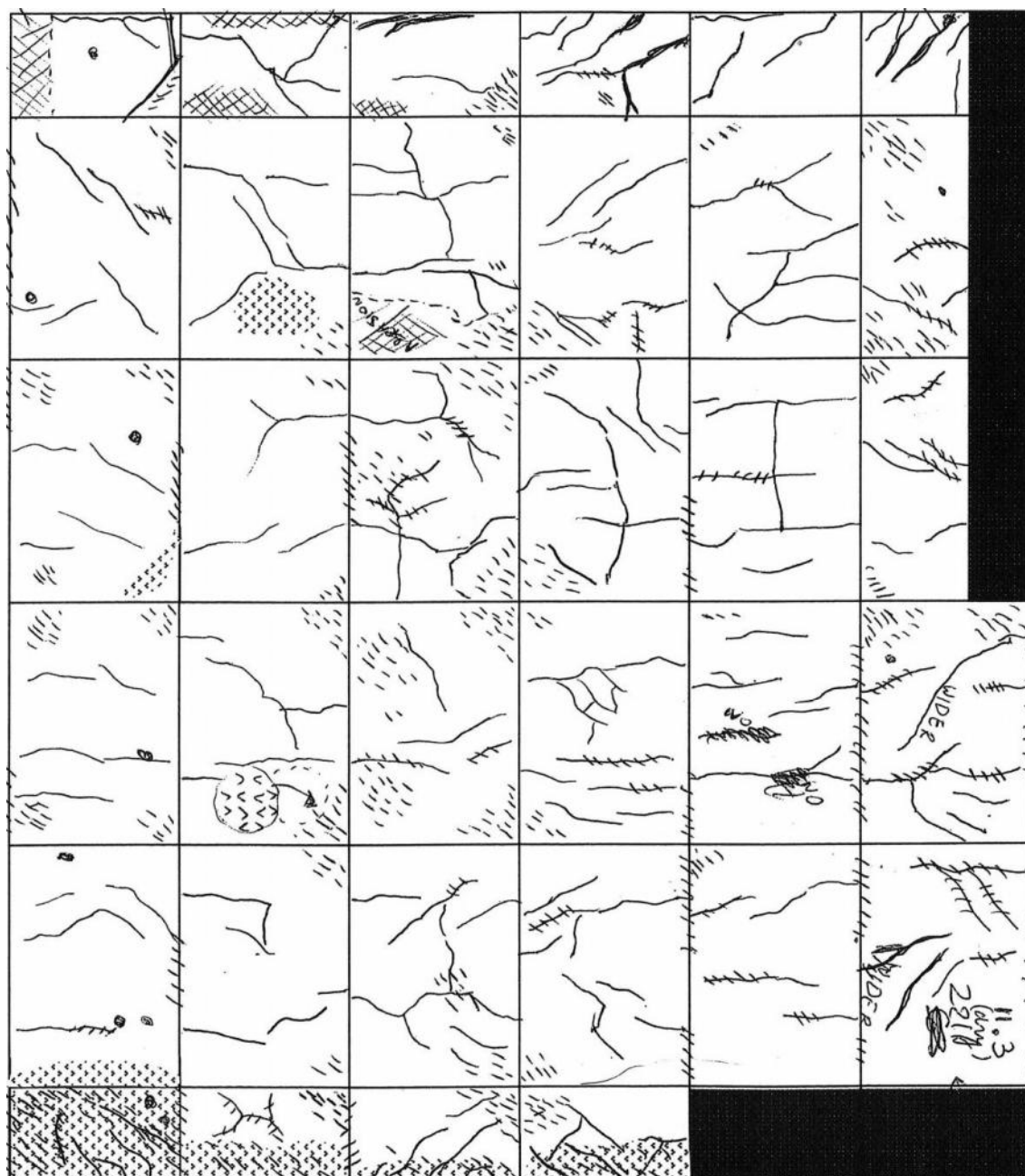
The re-plastered areas of the south wall of the nave and north wall of the south aisle were painted in a single coat of distemper, colour matched to the existing decoration, to integrate with the surrounding, see figure 34. Prior to the application of the distemper, a coat of claircolle was applied to seal/prime the surface.

## **7. Future Maintenance and Care**

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It is understood that roofing works have made the building watertight, and that an inspection has been made of the timbers to ensure they are in sound condition. However, it is clear that there are still issues with moisture ingress to the west wall and tower, resulting in spalling plaster and flaking paint. It is recommended that further investigations in this area are undertaken. Consequently, if redecoration of this area is considered, the impermeable emulsion paints should be stripped prior to redecoration in a breathable paint system, either limewash or distemper.

It is recommended that regular bi-annual inspections of the ceiling are undertaken by the Parish, using the condition reports and this treatment report as a datum level. This should involve visual monitoring for changes in condition and alerting the church architect or conservator of any problems that might affect the condition or stability of the paintings i.e. water ingress, damage to the roof, leaking or blocked rainwater goods etc. The church architect should be alerted if any significant changes are noted by the Parish in-between routine inspections. Any detached flakes, if found, should be retained and stored safely.



## Appendix 1 – Photographic Record

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All photographs are by Hirst Conservation unless stated otherwise.

### *Nave*



**Figure 5:** Overview of nave ceiling before treatment looking east.



**Figures 6 and 7.** Details of an area of flaking paint before (left) and after (right) the spray application of consolidant.





**Figure 8.** Detail of ceiling panel during cleaning with a Wishab sponge.



**Figures 9-11:** Lower westernmost panel on north side of the ceiling before, during and after treatment.



**Figures 12 and 13.** Details of the underside of a beam before and after recreation of missing stencilled design.



**Figures 14 and 15.** Details of replacement beam and truss before and after recreation of decoration.





**Figures 16-18.** Details of repaired panel before, during and after recreation of decoration.



**Figures 19 and 20.** Details of area of tide marks/water staining before and after toning with dry pastels.



**Figure 21.** Overview of ceiling following treatment and removal of scaffolding (Derek Bainbridge).



*South Aisle*

**Figure 22:** Overview of the south aisle ceiling during the condition assessment. Note the replaced plaster panels in the north east corner, with access scaffold beneath.



**Figures 23 and 24.** Detail of injection of consolidant behind loose paint flake (left), and dry cleaning the painted panels using Wishab sponge (right).



**Figure 25.** Section of the ceiling during cleaning – note the cleaned panels on the right hand side.



**Figures 26 and 27.** Details of gilded star before (left) and after (right) cleaning.





**Figures 28 and 29.** Details of water stained and salt damaged panel before (left) and after (right) treatment.



**Figures 30 and 31.** Details of water stained and salt damaged panel before (left) and after (right) treatment.



**Figures 32 and 33.** Details of replaced plaster panels in north east corner before and after recreation of stencilled decoration.

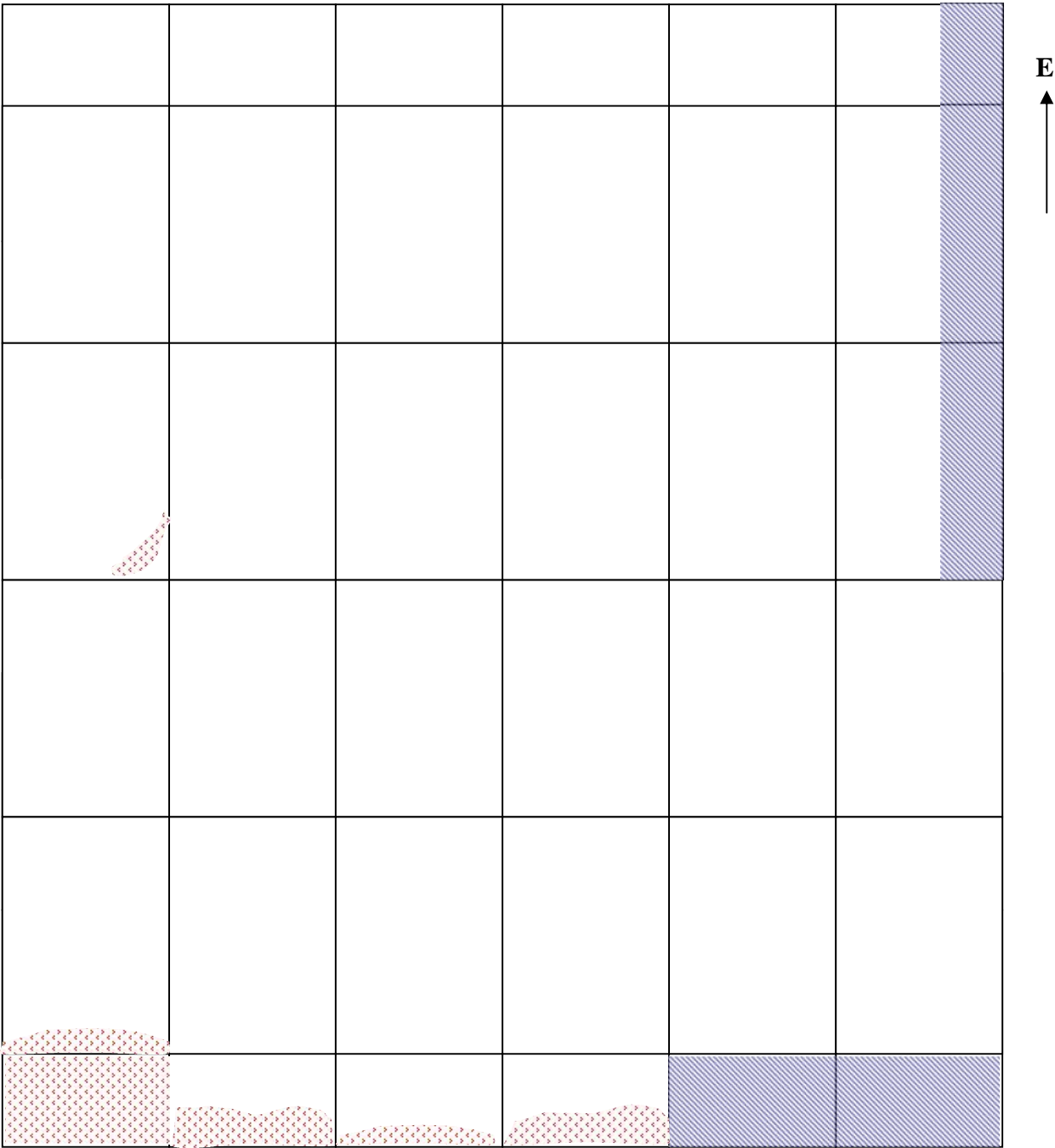


**Figure 34.** Overview of north east corner panels and colour matched distemper to upper wall following removal of scaffolding.



**Figure 35.** Overview of South Aisle ceiling following removal of scaffolding.

Appendix 2 – Ceiling Plans Mapping Retouching

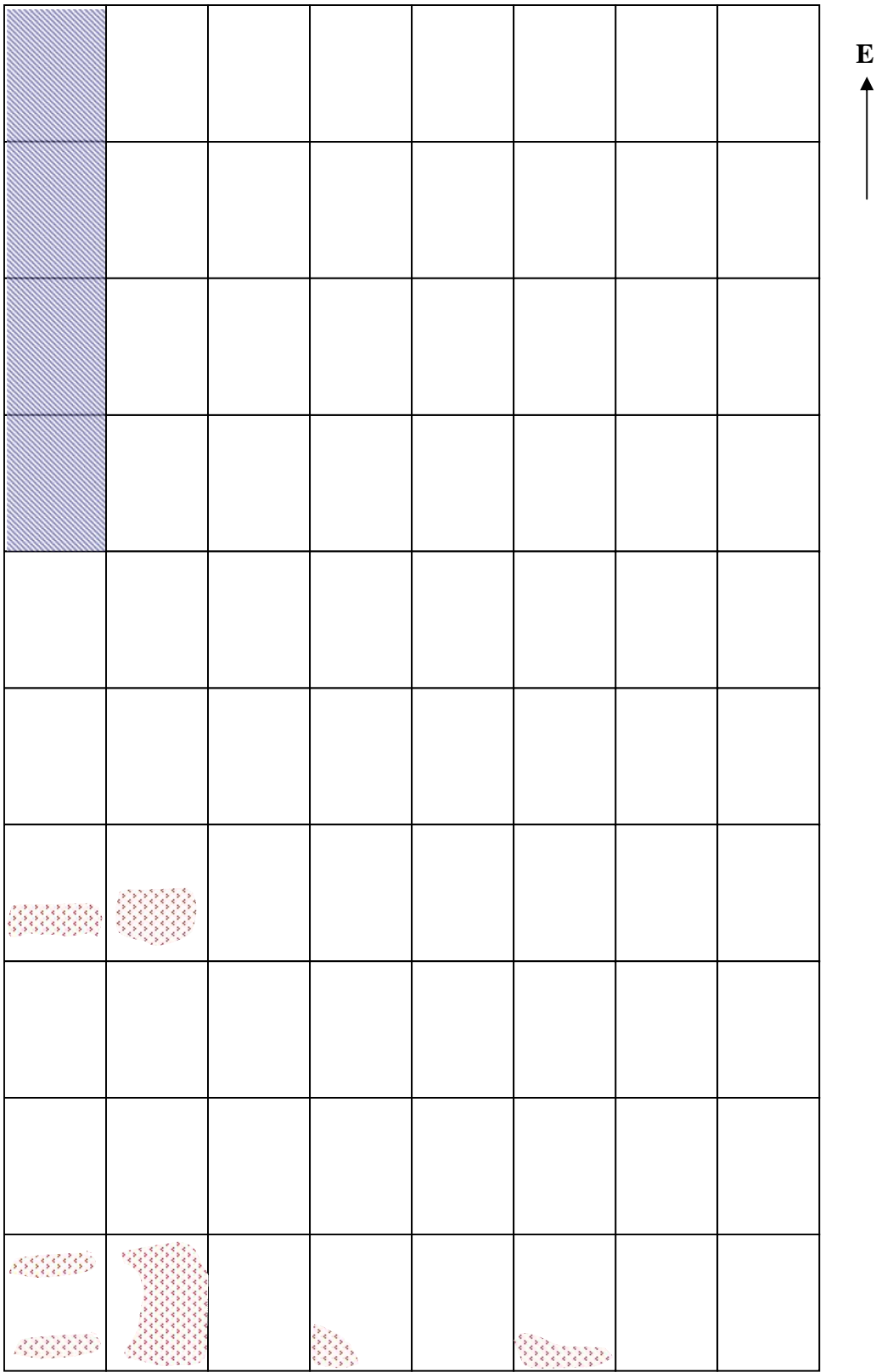


Reflected view plan of the **nave** ceiling showing recreated designs to areas of replaced plaster and areas requiring some re-painting due to salt pustules, staining and water run off marks.


Recreated design


Areas requiring some re-painting due to staining etc.





Reflected view plan of the **south aisle** ceiling showing recreated designs to areas of replaced plaster and areas requiring some re-painting due to salt pustules, staining and water run off marks.



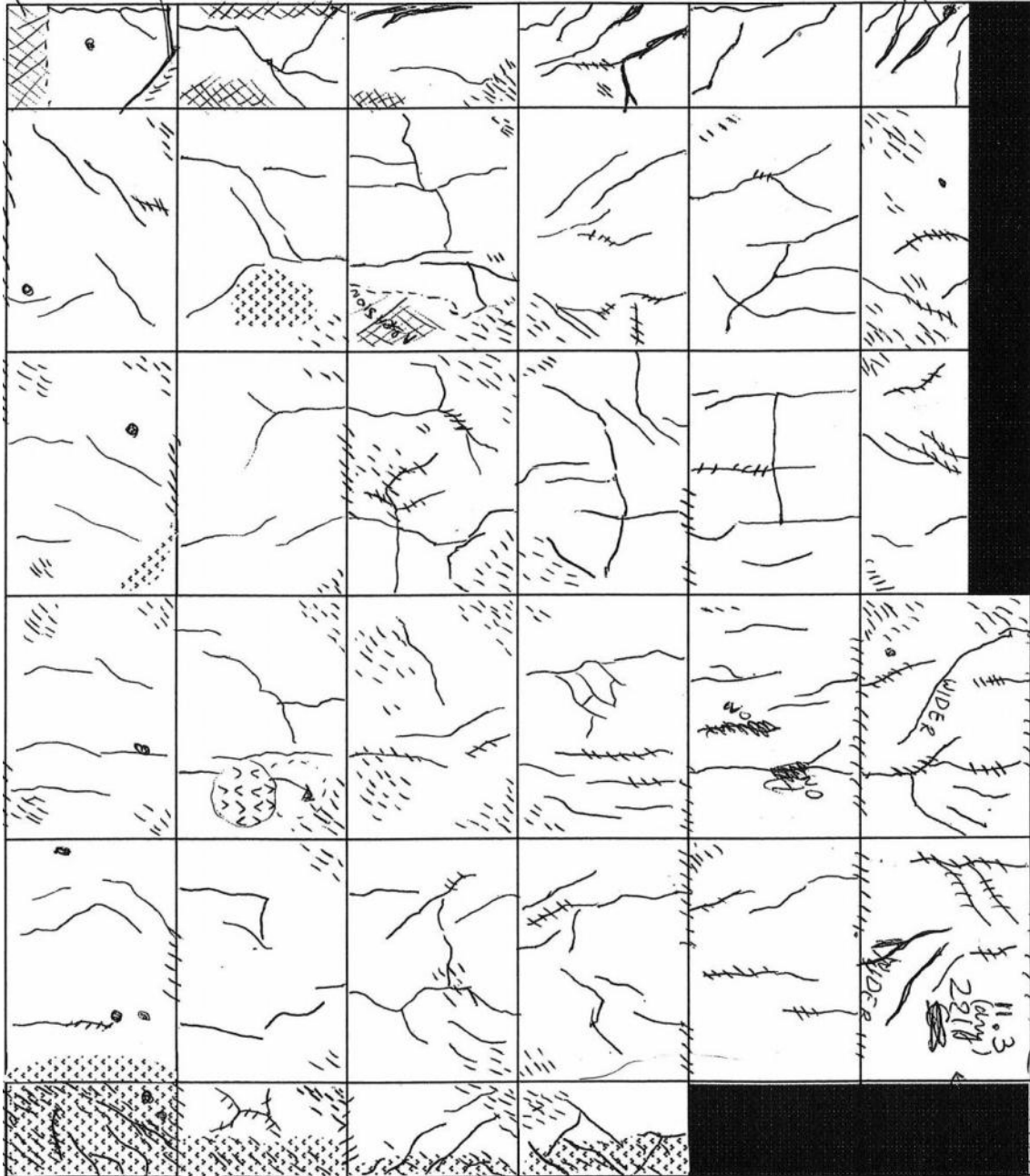
Recreated design



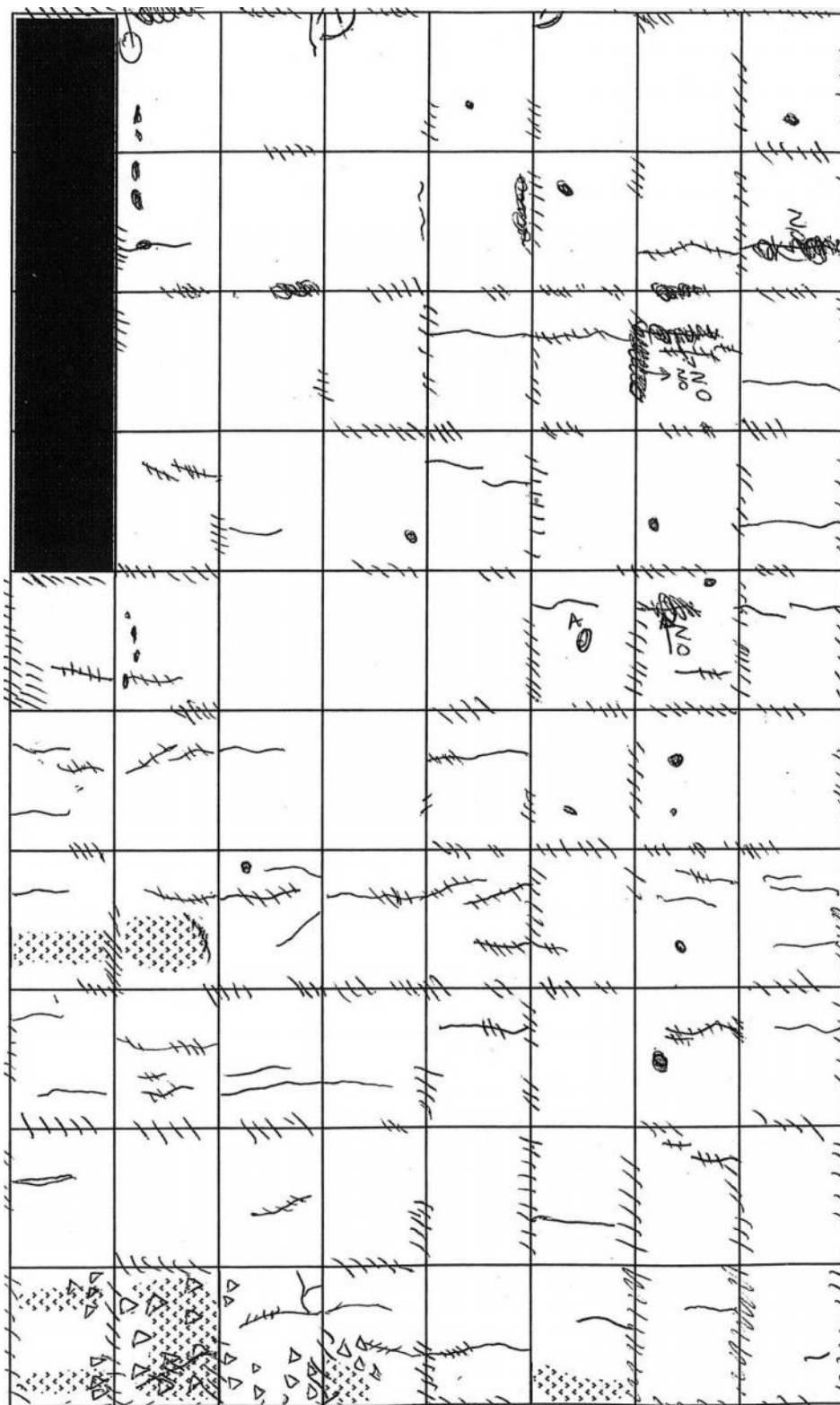
Areas requiring some re-painting due to staining etc.

### Appendix 3 – Ceiling Plans Mapping Fractures

Reflected view plan of the **Nave Ceiling** showing network of hairline fractures.



Reflected view plan of the **South Aisle Ceiling** showing network of hairline fractures.



## Appendix 4 – Glossary of Materials

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### **Ammonium hydroxide**

In water, ammonia is alkaline and becomes ammonium hydroxide, which can be used safely and effectively in the cleaning of oil paintings at pH 8.5. It is often used at 1-3% in de-ionised water to remove surface dirt, and is very effective in the removal of dirt and grease. Ammonia solution is able to wet surfaces more easily than water and acts as a detergent. It has the advantage that the ammonia gas itself will be lost to the atmosphere from the cleaning solution, negating the need for clearing with water. However, the use of ammonia solution carries the risk of alkaline hydrolysis of fatty acids in the oil paint medium, although this is negligible at pH values close to neutral.

### **De-ionised water**

Treated water that contains no ions. Can be used alone to remove surface dirt, and represents the starting point for cleaning tests in the cleaning of paintings. Used as a carrier for reagents such as tri-ammonium citrate or ammonia. Elements of surface dirt may be either solubilised or dispersed by de-ionised water, but it can be difficult to wet out oil-painted surfaces with water alone.

### **Dry pigments**

Pigments are defined as the colouring agent that is mixed with a binding medium to form paint. Often used mediums for retouching include synthetic resins and PVA.

### **Gelatine**

Gelatine is a protein produced by partial hydrolysis of collagen extracted from the boiled bones, connective tissues, organs and some intestines of animals such as domesticated cattle, pigs, and horses. The natural molecular bonds between individual collagen strands are broken down into a form that rearranges more easily. Gelatin melts to a liquid when heated and solidifies when cooled again. It acts as a binder in paint, and has been traditionally used to conserve painted decoration.

### **Isinglass**

Used principally for consolidation, and occasionally for lining and facing, Isinglass is a generic term for gelatinous substances derived from collagen of all or part of the air bladder of various fish. As an adhesive, it has higher tack than animal glues or gelatine and is a good adhesive force. Positive traits of isinglass are its stability to light and thermal ageing, its neutral pH, matt appearance, low surface tension. Negative include its susceptibility to hydrolysis, degradation by UV light and vulnerability to biological degradation. It is not therefore ideal

### **Paraloid B72**

An ethyl methacrylate/methyl acrylate co-polymer, Paraloid B72 (dissolved in xylene or acetone in varying concentrations) has been widely used in conservation over the last 30 years as a retouching medium, and as an isolating or final varnish. It remains chemically stable overtime and is not affected by light.

### **Plextol B500**

An aqueous dispersion of an ethyl acrylate and methacrylate based co-polymer. It is a heat activated adhesive used for consolidating ground and paint layers and remains

flexible and stable. Used for consolidation, facing, lining and tear-mending. After drying it is soluble in organic solvents. Has greater resistance to yellowing when compared to PVAC.

**Polyfilla™ (interior filler)**

White, powdery material which mixes with water to a smooth, creamy consistency. Special binders give guaranteed adhesion and a fill which will not shrink or crack. It is the ideal versatile filler suitable for a variety of jobs, even large areas. Laboratory analysis shows that it doesn't contain cementitious additives.

**Ronseal Multi Purpose Wood Filler** - is a flexible, long lasting filler that can be used straight from the pack. It is recommended for minor repairs. Once dry, can be sanded then stained, varnished or painted over. It is suitable for interior and exterior use and available in range of colours.

**Soft brush or lint free cloth (dry cleaning)**

Used in the dry cleaning of painted and varnished surfaces. The tool gently dislodges loose dirt and/or dust particles, but is ineffectual in removing dirt that has adhered more firmly to the paint or varnish film.

**Soft distemper**

Soft distemper is a water-based paint that primarily comprises a white base pigment (generally powdered chalk) bound with glue size. This basic mix can be tinted with alkali-resist pigments to give a wide range of colours. It has a matt finish and is used almost exclusively internally due to its water solubility but it is unsuitable for high traffic areas. Soft distemper allows the fabric to 'breathe' and does not react ('saponify') on new lime plaster.

**Watercolour**

Paint which is a combination of very finely-ground coloured pigment mixed to a paste with water and gelatine. The moist paste is put in tubes or allowed to dry in small pans. The paint is diluted with water and applied onto supports such as paper.

**Wishab sponges**

The sponges consist of yellow cleaning layer made of vulcanized latex formed onto a stiff blue nylon backing. Cleaning layer restores itself constantly due to the crumb formation process. They are neutral pH sponges available in three degrees of firmness; the soft sponge is used for sensitive surfaces, the hard sponge for less sensitive base surfaces and the extra hard sponge for non-sensitive surfaces such as stone. The surfaces to be cleaned must be absolutely dry.

**Xylene**

Belongs to the aromatic family of hydrocarbons. It is a clear liquid derived from the destructive distillation of coal tar and fractional distillation of the 'light oil' and is frequently used for making and removing varnish. It is highly flammable, and smells strongly of aromatics. Ventilation of the room should be prioritised during its use.