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## PETERBOROUGH CATHEDRAL: THE NAVE CEILING

### PHASE 5: ROWS 0 - 7



MAY - OCTOBER 2003

CONDITION SURVEY AND CONSERVATION TREATMENT

VOLUME II PLATES

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## 1. THE CEILING STRUCTURE

## TECHNICAL SURVEY:

THE ORIGINAL CEILING STRUCTURE, UPPER SIDE

**Plate 1** *Panel 3 I*, another example of the original boards originally stopping approximately 100mm short of the ashlar boards. The same feature is reflected in the 1740s boards in *Panel 0 IV* which also stop well short of the ashlar boards. The irregularity of this feature can be understood when comparing the substantial distance in Rows 0 south side, and 3-5 north side, with Rows 6 and 7 north side where the original boards extend right down to the ashlar boards.

This plate is inserted at the beginning of the List of Plates because it could demonstrate the movement of the building as a whole. The plates referring to this can therefore neither be classified as ceiling structure or is related to the boards or their subsequent restorations.

Width of nave

Row 17	10.922
Row 12	10.861
Row 8	10.803
Row 0	10.580

**Plates 2 –17** Upper side of the ceiling before treatment. **Plates 2-5** show *Panel I*, rows 7 to 0; **Plates 6-9** show *Panel IV*, rows 7 to 0; **Plates 10-13** show *Panel II*, rows 7 to 0; and **Plates 14-17** show *Panel II*, rows 7 to 0.

**Plate 18** North end of sloping joist 70, showing the mortice for the original ashlar post.

At the time of sorting the photographs, it was not understood that joist 81 was an 1830s replacement. Plates 22 – 23 relating to this joist are therefore described in the 1830s section. Similarly it was not realised that joist 73 was original so Plates 63 and 65 put in the 1830s section are described below in their correct place.

**Plates 19-20,** These plates are of flat joist 73. This joist is unique. The size of the timber is quite different to all others being 6" x 6" (150mm x 150mm) in comparison to 7" x 5" (175mm x 125mm) for all other flat joists. It is also straight cut not cambered. **Plate 63** shows there to have never been a halving joint at the junction with south sloping joist, though the mark on the upper face looks to show that the original sloping joist was halved on its west face. On the other hand, **Plate 65** shows that the flat joist is halved at the north junction but as there are marks of a timber passing the joist on the east side, I am wondering if the halving joint was made after the flat joist was first installed, and that when originally erected, both scissor braces were halved over and pinned to the east side of this flat joist. **Plate 19** shows the wide dovetail in the middle of joist 73 with normal round pin. The unusual width dovetail is therefore significant in emphasising the individuality of this joist. Compare with **Plate 31** Phase 4 Report, and **Plate 30** Phase 3 Report.

The empty birds beak for the panel noggin (now missing) in the underside of joist 73 can be seen in **Plate 20**. Note also the semi circular cut out (notch) in the edge of the board. As this is a repositioned original board, the cut out may not be a notch (the term as used for these radiused cut-outs) but only a loss where the board was decayed before it was moved, this loss now being covered by the adjacent board.

**Plate 21** The south scissor brace joint of joist 75 showing a beautifully fashioned pin securing the joint driven from the east side. Note the pin emerging in the centre of the sloping face of the halving joint (it must have been driven from the underside) and the pale patch in the

- top edge of the halving joint in the ceiling joist which is a hole bored for a dendrochronological core.
- Plates 23 – 23** See under **Plates 62 – 66**.
- Plates 24-25** These two plates are record shots to show the pit at the west end of the north side of the roof which is much shorter than the normal because the west wall returns beneath the quoin of the north tower. **Plate 24** shows the end of joist 78 which has much of the side lap still surviving, and is cut short of the ashlar so is supported by a sprocket piece bearing on the stone plinth for the truss shoe.
- Plates 26-27** These two plates show the over-sailing stonework for the original roof. Note how the eaves detail, can be traced in the discoloured stonework below. The short post and beam in line with the inside face of the wall support the rafter feet along to the west end of the roof.
- Plates 28-29** **Plate 28** is a record of a nail in an empty birds beak joint in *Panel 2 I (e)*. In the very centre of **Plate 29** in the gap between the two boards in *Panel 3 I (q)*, a nail head can just be seen which is attaching a noggin to the joist above. Note the tight joint of the noggin within the birds beak.
- Plate 30** A typical example of the profile of a curved edged board board (*f*) *Panel 7 IV*. Note the shallow chamfer made to accommodate the adjacent board running out from the empty nail hole to the right side of the board (as seen in this plate).
- Plate 31** *Board z, Panel 2 II*. Note the radiused cut out of the board.
- Plate 32** A typical square pin in the butt joint of the base boards.
- Plate 33** Judder marks probably caused by the scratch stock catching in the hard and soft grain between medullary rays, note also **Plate 39**.
- Plate 34** Occasionally boards just short of the required length were not extended with scarfed pieces, but this was rare and confined normally to pieces not more than 1" (25mm) long. Either they were apparently left short or as it appears in this case extended with another piece nailed separately. There is a composite joist above this joint so it is likely that in the course of renewing the joist the original extension was lost. Note the close grain exposed.
- Plate 35** Note the scratch line in the grooved board just to the right of the round edged board. This can only have been made when the ceiling was originally assembled and appears to show that the boards were part assembled, then taken down and then final fixed as a separate operation.
- Plates 36 - 38** Further examples of torn grain (**Plate 37**) and rough conversion (**Plates 36 and 38**). The frequency of use of these boards damaged at the time of their original production is similar in this Phase of work as in the previous. It is still worth pointing out that these damaged boards were used, in contrast with the care taken to fit them into the ceiling. It may of course merely point to the value of the timber and the fact that none could be wasted, although one cannot see why the affected boards could not have been cut into two short boards, therefore allowing the damaged piece to be discarded at the end of a board. It is also surprising for so many of the surfaces of the boards to be perfectly flat, and to then come across isolated examples of really poor workmanship.
- Plates 39 - 42** This group of plates illustrates different types of scarf joint and varying nailing patterns used to attach them. **Plate 39** shows a beautifully fitted scarf, with both boards moulded to the same profile as though they are temporarily fixed together and moulded and then fixed on site presumably as two separate pieces. **Plate 40** shows a scarf fixed with three nails with obviously no attempt to run the moulded edge along both boards



simultaneously. The top board (*i Panel 2 II*) has a regular slow rounded profile, whilst the adjoining board (*j Panel 2 II*) that at the bottom of the photo has a rather rough quick round hardly more than a pencil round. In **Plate 42** the upper scarf is quite standard but with only one nail, but the lower has two nails one standard original and one small headed original. Here the right hand board (*q Panel 4 I*) has been crudely chamfered, but it seems that after fixing on site, a further chamfer does run across the joint of both boards (*q* and *p*) in an attempt to run the mould across the scarf. **Plate 41** is a good example of standard nailing of original board ends with two standard original nails per board.

**Plate 43** Note the unused pre-drilled nail hole in the left hand lower base board. The hole immediately beneath looks to have been used but without the nail being driven home as there is no mark from the nail head, the hole has been opened slightly as can be seen by the splits in the board on either side of the hole. Note the other unused pre-drilled nail hole in **Plate 40** in the right hand edge of the grooved board opposite the scarf.

Note the frass edges in Plates 40 and 43.

**Plate 44** An example of double nails, there is no evidence below the ceiling of why two nails were driven side by side.

#### 1740's / 1830's RESTORATION

**Plates 45 - 60** **Plates 45 to 52** show the junction of the flat ceiling with the sloping ceiling on the south side, and **Plates 53 to 60** show the same junction on the north side on the ceiling. Each pair of photographs consists of one taken obliquely facing west (first) and east (second). These photographs demonstrate a much more thorough and logical repair strategy carried out in the 1920s. ALL the junctions are now linked either with 1920s laminate system or are complete original joints or those made in the 1830s when 8 sloping joists and one flat joist were renewed with reused ceiling/roof timbers.

<b>Plates 45/46</b>	South sloping joists 67, 68, 69
<b>Plates 47/48</b>	South sloping joists 70, 71, 73
<b>Plate 51</b>	South sloping joist 81
<b>Plate 59</b>	North sloping joist 81

The 1920s link repairs between the flat and sloping joist are interesting for showing the laminated system used, and the apparent desire to hide them with covers.

**Plate 61** Evidence of a reused piece to make an ashlar post as the pin hole in the ashlar post has no matching hole in the sloping joist which it is meant to be supporting.

At the time of sorting the Plates, it was not understood that joist 73 was an original joist, so photographs relating to it were put under the 1830s section. Plates 63 and 65 are therefore described earlier in the Original Construction section with Plates 19 and 20. Similarly it was not realised that joist 81 was an 1830s replacement, so Plates 23 and 213 relating to it are described below in their correct position.

**Plates 62, 22, 64** Halving joints cut out of joist 71 (**Plate 62**), joist 81 (**Plate 22**). Note the halving joint, the hole bored for the pin and a 1920s laminated infill and joist 73 (**Plate 64**) showing that they are reused scissor truss timbers.

**Plates 63, 65** See under **Plates 19 – 20**.

**Plates 23, 66** South sloping joist 81, again a replacement by Blore. The evidence of the remnant of noggin still nailed in the birds beak in the top of the joist seems to indicate that this timber was a ceiling joist, and has been merely turned over. The pattern of nailing on this face has been recorded and is shown on **Drawing 2**.

**Plate 67** Alignment line drawn on adjacent original board from edge of 1740s board.

- Plate 68** The left hand board with the underpainted greek key is a 1740s board in a whole panel of 1740s boards. There is no evidence of nail holes showing that these boards have been moved in the 1830s so it can be assumed that the nails are also 1740s. This is a good example of nails of this date showing that they have faceted heads that come to a point in the middle of the head just like the flat headed 1830s nails. Here all similarity stops as the 1740s nails are irregular in size and shape, note the two small headed nails and the three large headed.
- Plate 69** An unprepared 1830s softwood board similar to those found previously, note **Plate 64** Phase I.
- Plates 70 - 71** All these nail heads are 1830s flat headed nails. Note the faceted heads and regularity of shape and size. It is interesting to see the partly planed surfaces of both boards in the upper part of **Plate 70** and the left board in **Plate 71** where the rough surface similar to that shown in **Plate 69** is still partly visible.
- In addition, **Plate 70** shows some long splits emanating from nails driven from above in the extended chevron board. There is also a very long split from the original nail in the edge of the same board. The first mentioned splits look to have been made when the nails were driven, and the long one has formed as the board has shrunk following the introduction of heating. **Plate 71** shows in addition incision marks made in the 1830s when they were setting out the extended chevron. Note also the very clear raised linear “underpaint”.
- Plates 72 – 73** Further examples of impact damage from careless use of hammers. This damage is less common in this phase, so no doubt the damage was made by one or two workmen only rather than the whole gang. The hammer marks in **Plate 73** are unexplained as there are no nails near where the hammer marks are.
- Plate 74** 1830s nails presumably originally driven into a patch above and then clenched over the top of the patch, driven back down by Moore when the patches were removed and now hang from the clenching.
- Plates 75 – 78** In previous phases 1830s repairs have been criticised for poor workmanship. In this phase there is one example of a very sympathetic 1830s repair (**Plate 75**), and one of a repair of good intent even if not terribly well finished (**Plate 76**). **Plate 77** is interesting because it shows a 1740s repair carried out very sympathetically.
- Plate 75** shows where the whole left panel (as seen in the plate) was renewed taking care to scribe the new boards over the existing sloping boards. This seems to have included springing the ends of two of the sloping boards so that the new boards would fit behind/above them. An extraordinary feature of the half lozenge board is that a single board was curfed on the line where the angle of the flat ceiling becomes sloping, and then bent on the curf line to accommodate the change in angle. In **Plate 77** we see an insert scarfed at both ends let into an original board also scarfed twice to receive the insert. This would be unusual for an 1830s repair which is why it is an important example of a 1740s repair, of which there are very few similar. Note the length of the scarves which are much longer than original scarves in original boards. **Plate 76** shows an insert that has no apparent fixing and must be rebated over the board in which it is inserted. Although the original board was cut out rather crudely, the new piece was inserted sensitively. The grooved incision line in **Plate 78** marks a patch of boards renewed with reused original boards and one 1830s board. This type of patch has rarely been seen except in Bay 1. In the reassessment written following the fire, it was strongly suggested that the vertical saw cuts were associated with 1740s work as they always marked patches of 1740s boards or reused original boards. These latter were far more frequently associated with 1740s repairs than 1830s. It is suggested that this patch of inserted boarding is therefore 1740s and the incision line must be the same date.

**Plates 79 – 81** The west wall boarding was fairly consistently nailed with two nails per board at the top middle and bottom of each board. Boards 17-21 were nailed with three nails instead of two. **Plate 79** shows some boards with three nails (flat heads) and **Plate 80** two nails (uncategorized, but more like square heads). **Plate 81** shows a curious cut out in the bottom of boards 8-9, a similar cut out is found at the other end of the boarding in board 45, and another in the centre of the boarding in board 21. There is no surviving evidence for the reason for these cut outs.

## 1926 REPAIRS

**Plates 82 – 84** Examples of laminated joists. **Plate 82** is the junction of a laminated joist to the reused sloping joist 68. **Plate 83** shows the carefully fitted laminates, which must be purely cosmetic? **Plate 84** shows the laminated construction inside a Composite joist.

**Plate 85** Another noggin variant. In this case the centre noggin is supported on bearers which are nailed to battens fixed to the sides of the joists. The bearers are recessed below the top laminate.

**Plate 86** A record plate showing an original noggin supported by angle brackets fixed to the side of an original joist.

## CONDITION

**Plate 87** A typical Intended wood loss in *Panel 2 III (x)*. This cut out is contiguous with many others discussed previously.

**Plates 88 - 89** Another example of the so far unexplained pattern of “weathering” to the baseboards. In many cases, the wide part of the baseboard is deeply weathered but the narrow tapered end is quite flat. These two plates show the difference along the same board, **Plate 88** being at the wide part and **Plate 89** at the narrow.

**Plates 90 - 91** Examples of weathering to the surface. Both plates are excellent examples of alternative weathering on the same board in adjacent areas. The extent of the weathering is seemingly determined by the colour on the surface. In both plates, the dark areas are deeply weathered whereas the white areas are almost smooth.

Even more noteworthy is the fact that the line itself is raised above both the black surfaces and the white surfaces. On the basis that present research shows that no areas of the surface were ever painted (in the areas of the pattern) it would seem that the original lines have protected the original surface the most, and that either the white areas were painted next and many centuries later the black were painted. Or both the black and white areas were painted simultaneously and the white paint protected the surface well whereas the black did not. Alternatively, the black paint might even have attacked the timber surface due to some ingredient which proved to be damaging to the timber substrate. See also **Plate 71** for raised linear decoration.

**Plates 92 – 95** These plates display various types and levels of beetle infestation. **Plate 92** shows the timber loss due to infestation by Death watch beetle of a sap edge. **Plate 93** is a good example of the typical infestation of the sap edge of a board. Cathy Groves has identified these edges not actually as sap but as the boundary between the sap and the heartwood. See also **Plates 40** and **43**.

**Plates 94** and **95** show general quite intense levels of infestation in original boards, with greater than expected levels of Common furniture beetle infestation only in **Plate 94** and mixed with DWB in **Plate 95**.

**Plates 96 - 100** These plates all show varying types of commonly found split. Each example appears to be the result of subsequent shrinkage rather than due to the force of a nail being driven into the wood. (See also **Plate 70** where splits are discussed) **Plate 96** shows an 1830s nail driven from above through an original board, the black painted part of the board has shrunk away from the grooved section, which being restrained by the nail has caused the board to split. In **Plate 97** the edge of the raised board has split off completely allowing the board to shrink away from the nail, the extent being easy to gauge as the position of the nail pre the last repaint being clearly visible. **Plate 99** shows a split in a 1740s board which being heavily infested with CFB has crumbled along the split line.

Note the stainless steel screw inserted to hold the split fragment.

The long split in the Greek key painted board in **Plate 100** shows the shrinkage of a softwood board restrained by nails across its width.

**Plate 98** A crude wood loss of indeterminate age. The loss of paint on some edges would indicate that this is cut out has been made since the 1830s, but the blue paint in the right hand chisel cut in the bottom board seems to contradict this.

**Plate 101** A large knot in a 1740s softwood board, with a shrinkage split caused by the nail nearby.

## REPAIRS

**Plate 102** A temporary ceiling bolt with plasterzote protective washer, note the earlier paint layer revealed.

**Plate 103** Bob Chappell removing a hanging bolt prior to conservation. Self adhesive dots were applied to both the bolt head and washer to ensure they both returned to their original orientation.

**Plate 104** A stainless steel rod fitted and shaped to hold the fractured board end. The rod is held by the screw beyond the end of the board (below it the photograph).

**Plate 105** Fills inserted in decayed edges of boards before retouching.

**Plate 106** In several instances the screws fixing the top carrying-noggin to the noggin laminates fixed to the ceiling were too short so there was no attachment between the two. These noggins were well designed so that the top carrying-noggin did pick up the weight of the laminates and the ceiling and pass it back to the joists. For there to be no attachment between the carrying-noggin and the noggin laminates therefore completely negates the structural design of the noggin. The short screws were taken out and normally exchanged for stainless steel. In this case the bigger gauge stainless screws were not available, so the original screws were reinserted more deeply countersunk to achieve the connection required.

**Plate 107** Two screws are shown removed and replaced with stainless steel. The third was incorrectly located and was not projecting, so it was not replaced. A small sailcloth patch is shown.

**Plate 108** In places where screws had been removed near a roof light, light could sometimes be seen twinkling through the hole even from the floor. These holes were covered with Plasterzote tabs.

## TIMBER INSERTS

**Plates 109 – 111** *Lozenge 6/5 I/II* Before and after fitting and inpainting timber insert.

**Plates 112 – 114** *Panel 6 II* Before and after fitting and inpainting timber insert.



<b>Plates 115 – 116</b>	<i>Panel 4 I</i>	Before and after fitting and inpainting timber insert.
<b>Plates 117 – 119</b>	<i>Panel 3 II</i>	Before and after fitting and inpainting timber insert.
<b>Plates 120-121,119</b>	<i>Panel 3 II</i>	Before and after fitting timber insert ( <b>Plates 120-121</b> )and inpainting ( <b>Plate 119</b> ).
<b>Plates 122 – 124</b>	<i>Panel 3 III</i>	Before and after fitting and inpainting timber insert.
<b>Plates 125 – 126</b>	<i>Panel 3 IV</i>	Before and after fitting and inpainting timber insert.
<b>Plates 127 – 129</b>	<i>Panel 2 IV</i>	Before and after fitting and inpainting timber insert.
<b>Plates 130 – 132</b>	<i>Panel 1 III</i>	Before and after fitting and inpainting timber insert.
<b>Plates 133-134</b>	<i>Panel 1 III</i>	Before and after fitting and inpainting timber insert.

## GENERAL

<b>Plate 135</b>	Dennis Burrows filming Bob Chappell
<b>Plate 136</b>	Cameron Stewart vacuuming at the bottom of the ceiling with vacuum cleaner suspended from roof purlin.
<b>Plate 137</b>	Joist carrier set up with joist held in clamp.

## 2. THE PAINTED DECORATION

### CONDITION SURVEY AND TREATMENT RECORD

<b>Plates 138 to 297</b>	Sections of the Ceiling structure lower side and painted decoration in before and after treatment sequence. Refer to Plate Reference Sheets for locations.
<b>Plates 298 to 335</b>	The thirteen full figurative lozenges and four half lozenges within Bays 6b, 7 and 8 in before and after treatment sequence. All ultra-violet (UV) illumination photographs taken before treatment. Refer to Plate Reference Sheets for locations.
<b>Plates 336 to 351</b>	Sections of the Ashlar boards and painted decoration in before and after treatment sequence. Refer to Plate Reference Sheets for locations.
<b>Plates 352 to 359</b>	Sections of the West End Vertical boards and painted decoration in before and after treatment sequence. Refer to Plate Reference Sheets for locations.

### VISIBLE UNDERPAINT & ALIGNMENT MARKS

<b>Plates 360 to 363</b>	Examples of the original scheme visible in raking light beneath the 1740s and 1830s overpaint. It is now generally agreed that the receded background is the result of 'weathering' of the wood surfaces not protected by oil paint prior to the 1740s restoration. From this we must conclude that the oil-based paint layer did not extend overall the central lozenge boards. <b>Plate 360</b> , detail of a heavily weathered stepped chevron board with the original linear pattern out of phase with the overpainted decoration. Generally, the black areas on stepped chevron boards are more weathered than the white; although both sides have receded more than the surface protected by the oil painted linear stepped chevron pattern. This is significant as it suggests that the white areas on these boards may have been partially protected by a non oil-based paint while the black areas were unpainted. For some reason difference in weathering between the white and black areas is
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particularly exaggerated on a number of boards at the west end of the Ceiling (see also **Plates 90 and 91**). **Plate 361 and 362** are raking light details of figurative lozenge boards showing the original outlines of some mandorlas are visible through differential weathering of the board surface. From this we must conclude that the oil-based paint layer did not extend overall the central lozenge boards. We know from tracing the 'visible underpaint' on the central lozenge boards that the C18th and C19th restorers copied closely the original figures. It is difficult to believe that only part of the figures would have been painted in the original scheme so the accumulated evidence suggests the original painting was of mixed media. It had seemed logical to suggest oil-based paints were used for flesh tones and other detailed features of the composition and distemper for the remainder. However the identification of original oil-based paint forming the plain red background to the Rhetoric figure,<sup>1</sup> together with the unpredictable pattern of weathering on central lozenge boards, and the general use of oil-based paints for the linear border decoration do little to corroborate this observation. Paint sample analysis carried out for this project has found no definitive evidence for the use of distemper paint on the ceiling. The incised alignment marks visible in **Plates 361 and 362** are considered to be original because in many instances the boards have C13th nails in place and therefore have not been repositioned. The incised setting out lines describing the wave pattern shown in **Plate 363** appear to have been made in the 1830s.

#### **Plates 364, 365**

Photographs showing original paint under original nail heads (now missing). Numerous examples were found within Bays 6b, 7 and 8 on central lozenge boards and border decoration, while in previous phases very few were found and then only on grooved boards with border decoration. This visual evidence and analysis of the nineteen paint samples taken in Phase 4 from under missing original nail heads has changed our understanding of the original scheme. We had considered it unlikely that the central lozenge boards were painted before being fixed in place but there is now ample evidence in the form of original paint under missing original nail heads to prove that they were. **Plate 364** shows red paint within the outer groove of two key pattern boards. Accumulated evidence suggests the three grooves in these boards were originally painted red white and red. Similar records of sixteen grooved, grey chevron boards indicate the middle groove was red and the inner and outer grooves usually white but on one board red. **Plate 365** shows white paint in an outer groove. A notable finding in our survey of weathering on original ceiling boards is that the raised areas either side of the grooves on grey chevron boards are consistently less weathered than equivalent areas on the coloured bands and key pattern boards. This finding would indicate that in the original scheme the raised areas on this board were painted; however there is no other visual evidence to corroborate this and it has not been substantiated by paint sample analysis.

#### **1740s/1830s REPAINTING**

#### **Plates 366-369**

Examples of the paint layer exposed from under temporarily removed 1830s Ceiling bolts and washers. The 1740s paint has been protected from subsequent overpaint and surface accretions. These examples indicate the condition of the painted decoration immediately prior to the 1830s intervention and provide visible confirmation of the analysis findings and our interpretation of the conservation history. **Plate 366** shows a fragment of original board with 1740s paint inserted as a packer in a hole cut into 1830s boards to accommodate the bolt washer. **Plate 367** shows 1740s red background paint to the Astronomy lozenge. This would suggest the background colour was changed in the 1830s. **Plate 368** shows the 1740s scheme within the Eagle lozenge may have been very different from the 1830s. **Plate 369** shows the 1740s scroll detail on the corner of a wave pattern board. The scroll detail was omitted in the 1830s in this instance only, presumably due to the positioning of the Ceiling bolt.

#### **Plate 370**

Throughout Bays 1-5 of the Nave Ceiling we have identified a number of softwood replacement boards with a scheme very similar to the existing 1830s frieze decoration visible in raking light beneath 1830s overpaint. These we consider to be 1740s Ashlar boards salvaged in the 1830s, and re-used as Ceiling boards. Eight of these boards were

<sup>1</sup> The Perry Lithgow Partnership and Hugh Harrison 2000, Vol II: Plate 561

identified in Bay 1; seven in Bays 2 and 3; eleven in Bay 4 (seven within one panel alone); only four boards in Bay 5; none in Bays 6-9 and one only in Bay 10 shown here.

**Plate 371** Shows a section of 1740s or 1830s painted softwood replacement board used as an insert the 1920s. As there was no access to the underside of the Ceiling in the 1920s the insert was lowered from above and is held by a piece of hessian.

**Plates 372, 373** In Bays 9 and 10 the border pattern on a number of stepped chevron boards, both original and softwood replacement, appears to have been set out in white chalk. The 1830s overpaint paint has flaked from the powdery chalk lines.

**Plates 374, 377** In Bays 9 and 10 there is evidence that the wave pattern design was first set out in white chalk onto the newly painted white background (**Bay 374**); also in pencil (**Plate 375**) and red crayon (**Plate 376**).

#### GRAFFITI

**Plates 367-380** A number of painted inscriptions on the Ceiling boards record the names of at least some of the painters involved in the 1834/5 intervention. Some inscriptions are integrated into the decoration: such as within the archbishop (2) lozenge where 'COBLEY 1834' is painted on the pages of an open book, and 'R<sup>D</sup>. LAYTON 1834 SEXTON' is on the lower border of the archbishop's robe.<sup>2</sup> Other are painted in simple lettering on the plain background. The names W Stallard, R Layton, W Gamlyn and Cobley occur two or three times across the ceiling (**Plates 377, 378, 380**); the names I Shaw C Neal appear once only on an Ashlar board at towards the east end of the Ceiling;<sup>3</sup> similarly, the monogramme "I CO" (Cobley?) which is at the west end (see **Plate 399**). **Plate 379** shows a possible 1740s inscription: "T K" in black paint beneath the off-white overpaint.<sup>4</sup>

**Plate 598** There is a considerable amount of pencilled graffiti at the west end of the Ceiling. Some are simply random lines but others give the names of carpenters and painters working on the ceiling in the 1834/5: for instance "W. Gamlyn 1835" and "J. Duddington Carpenter at this roof 1834". In addition, the centrally placed door in the West End vertical boards allowed limited access to the vertical boards and *Panel 0 III*; hence there are a number of pencilled inscriptions with a post-1830s date. **Plate 381** shows one of these inscription "J. Garwood Bourne at Peterboro (sic) Lincolnshire February 1827". **Plate 382** shows a small naive sketch of an animal, possibly a dog or a mouse.

#### SURFACE ACCRETIONS

**Plate 383** This photograph also belongs in the 'Repainting' item (above) as it shows 1830s white chalk setting out lines for a trefoil on a base board. It also shows the original trefoil in shallow relief, the background having receded through weathering. However it also shows the Patchy white deposits that are associated with the thick resinous 1830s black paint/coating remain unidentified. Initially they were considered to be some form of microbiological growth (MBG) but analysis by Ridout indicates they are accumulations of irregularly shaped, translucent, plate-like crystals. The recent discovery of a list of materials used the 1830s restorers would suggest that the inclusion of sugar of lead (lead acetate) in the paint may be a factor. Sugar of lead was widely used as an ingredient in drying oil preparations from the mid-eighteenth century to the mid-nineteenth century. However, by the time of its use on the Nave Ceiling reservations were expressed that its use could cause certain colours to become dull; also that it could result in '*an immense number of small spots in the paint, sometimes appearing through the surface-varnish in the form of a white efflorescence.*' Towards the end of the nineteenth century the general advice was to avoid sugar of lead altogether. As it is, we remain uncertain whether these patchy white deposits are the result of seepage from the paint layer or a reaction caused by adverse environmental conditions.

<sup>2</sup> The Perry Lithgow Partnership and Hugh Harrison 2000, Vol. II: Plate 414

<sup>3</sup> The Perry Lithgow Partnership and Hugh Harrison 1998, Vol. II: Plate 305

<sup>4</sup> The Perry Lithgow Partnership and Hugh Harrison 1998, Vol. II: Plate 306.

**Plate 384** Prior to surface cleaning the paint surface on the west end vertical boards was partially obscured by a white efflorescence as shown in this photograph. This efflorescence was largely removed during the cleaning process. Nevertheless a characteristic milky or silvery surface sheen which does not respond to surface cleaning with Wishab sponges remained. Analysis of this on other 1830s boards indicates there is a thin pale coating but it remains unidentified. The recent discovery that sugar of lead (lead acetate) was used extensively by the 1830s restorers suggests that material may be a factor responsible for this slightly opaque veil.

**Plate 385** Detail showing small patches of white chalky efflorescence at the junction of central lozenge boards. This moisture related accretion was removed during surface cleaning.

#### **SURFACE GLUE**

**Plates 386, 387** Details before treatment in incidental light (**Plate 386**) and UV illumination (**Plate 387**) showing typical damage caused by thick glue drips over the paint surface before treatment. The water-soluble animal glue was used to adhere hessian to the Ceiling boards upper side during the 1926 intervention. The liquid penetrated between the boards, accumulating on the horizontal board edges and in places running across the surface of the Ashlar boards and canted ceiling boards. In many instances the thick glue had contracted and detached from the surface pulling away the underlying paint.

#### **SURFACE CLEANING, STAIN REMOVAL AND REINTEGRATION**

**Plates 388-391** Details of the Ceiling boards, West End Vertical boards and Ashlar boards during the removal of surface dirt and soot resulting from the 2001 fire in the building. There was a layer of surface dirt overall the painted decoration. Interestingly the layer was conspicuously thicker and more discoloured within the western Bays of the ceiling: possibly due to their proximity to the west doors which act as the main entrance to the building. Bays 9 and 10 were the only bays not treated prior to the 2001 fire in the building. Consequently, within the Phase 5 area, the soot was mingled with and largely indistinguishable from the surface dirt layer.

**Plates 392-401** These images show sections of the Ashlar boars within Bays 9 and 10 during and after surface cleaning, glue/stain removal and reintegration. In Phase 5 particularly there was extensive reintegration necessary following removal of stains and glue trails across the north and south Ashlar boards. All stains on the painted decoration resulted from liquid material penetrating down between the boards or through cracks in deteriorated boards. On the Ashlar boards it was largely water that had run across the paint surface leaving distinctive trails of blanched paint and brown surface deposits. The approach adopted throughout the project has been that stains considered to be particularly distracting and visible from the ground should be removed, reduced or disguised. The 'blanched' or 'cleaner' areas of paint resulting from glue and/or stain removal were toned down with water-colour paints to match the surrounding Wishab cleaned paint.

**Plate 402** Detail of a canted ceiling panel showing extensive patches of staining over several boards.

**Plates 404, 405** Details showing a section of softwood replacement board during stain removal (**Plate 403**) and following reintegration (**Plate 404**).

**Plate 402** Detail of a new timber insert in a grey chevron board following reintegration. For further examples of new timber insert reintegration see **Plates 109-134**.



**NAVE CEILING PROJECT INSCRIPTION**

**Plates 406-409** To commemorate the nine year long Nave Ceiling Conservation Project the following inscription was painted in red onto the reintegrated off-white background of the north side Ashlar boards above the west end stone ledge:

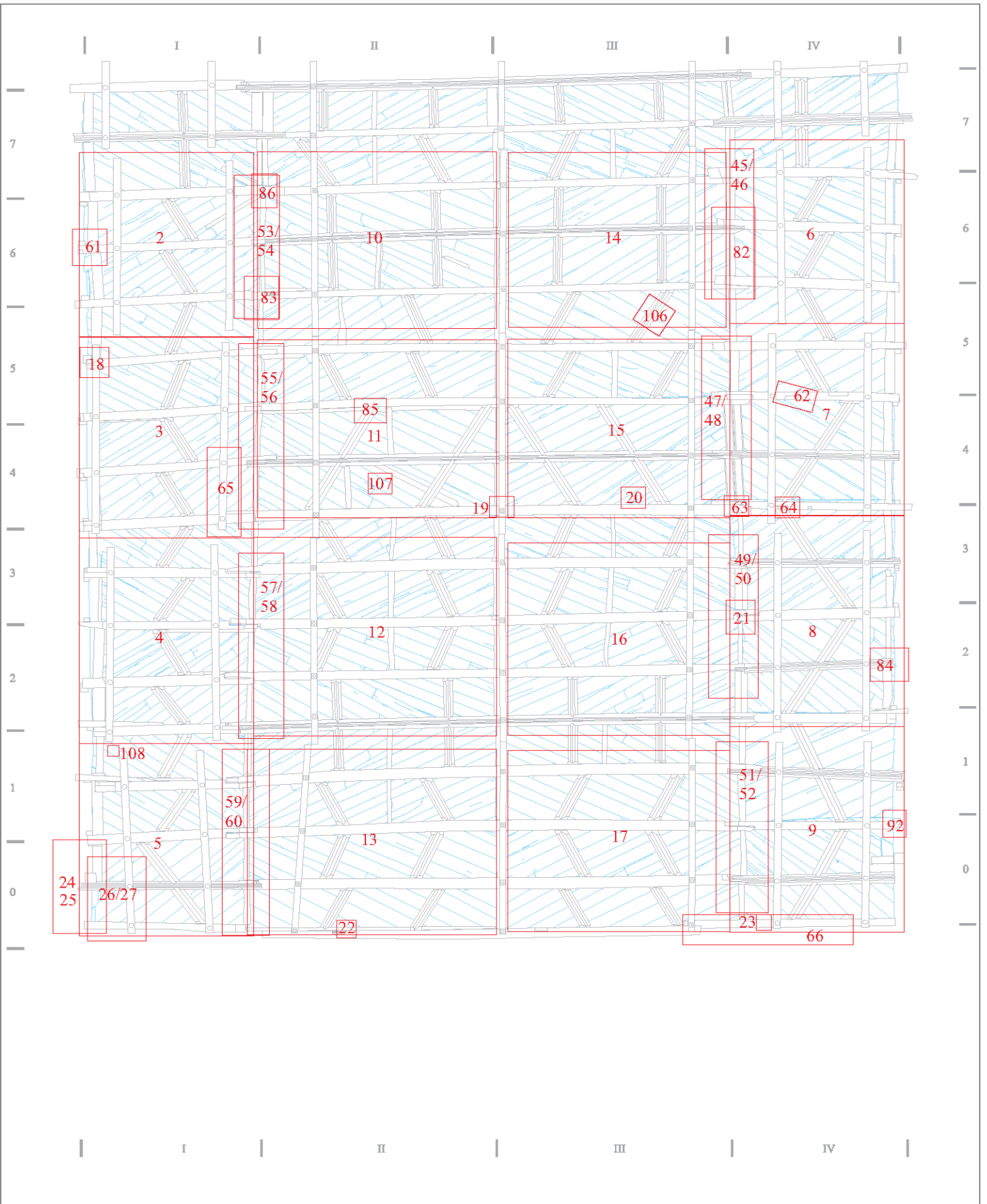
*PETERBOROUGH CATHEDRAL NAVE CEILING CONSERVATION PROJECT  
1994 – 2003*


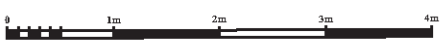
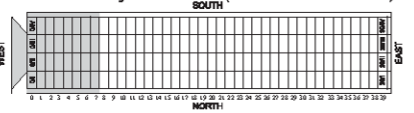
*ARCHITECT: JULIAN LIMENTANI                      ADVISER: GILLIAN LEWIS  
CONSERVATORS: THE PERRY LITHGOW PARTNERSHIP WITH HUGH HARRISON*

*RICHARD LITHGOW, MARK PERRY, DAVID PERRY, PETER MARTINDALE, CRISTINA BERETTA,  
LOUISE BRADSHAW, CAROLINE BAINES, BIANCA MADDEN, NATALIA SEGGERMAN, GREG  
HOWARTH, SASA KOSINOVA, SARAH LIVERMORE.  
HUGH HARRISON, BOB CHAPPELL, CAMERON STEWART, PETER FERGUSON, JONATHAN  
PORTER, BRETT WRIGHT, CLAIRE CULLY, STUART ANDERSON.*

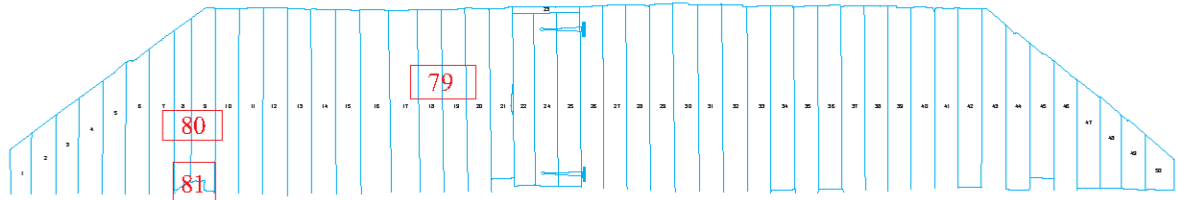
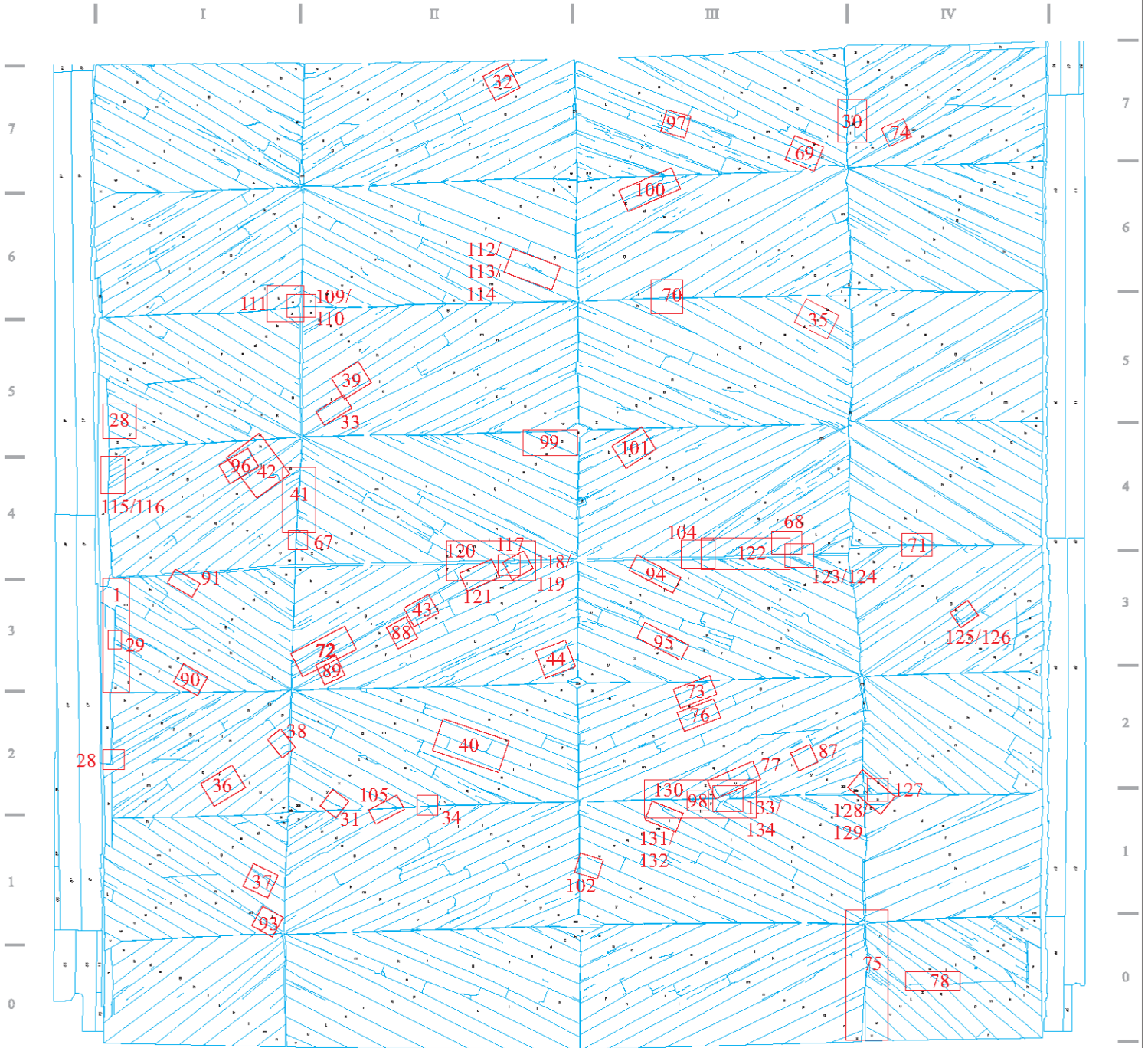
**NAVE CEILING PROJECT PHASE 5 SCAFFOLDING**

**Plates 410, 411** Two views of the Phase 5 scaffolding taken from floor level in the Choir.


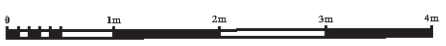
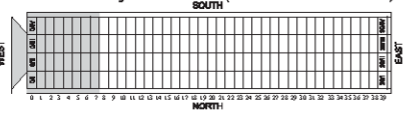


Sheet Number: 1		<b>UPPER SIDE OF STRUCTURE</b>	
Location of Plates: 1-180	SCALE c. 1:70		POSITION <b>Bays 9 &amp; 10 (Reflected View)</b> 
Plates are in before and after treatment sequence. Ultraviolet (UV) illumination photographs taken before treatment.	TITLE <b>PETERBOROUGH CATHEDRAL - NAVE CEILING          Conservation Programme Phase 5 (May - October 2003)</b>		Photogrammetry courtesy of English Heritage Survey Team & Photarc Surveys Ltd.      The Perry Lithgow Partnership 1 Langston Lane, Station Rd., Kingham, Oxon OX7 6UW Tel. 01608 658067
	STAGE CONDITION SURVEY AND TREATMENT	DESCRIPTION PLATE REFERENCE SHEET	

EAST

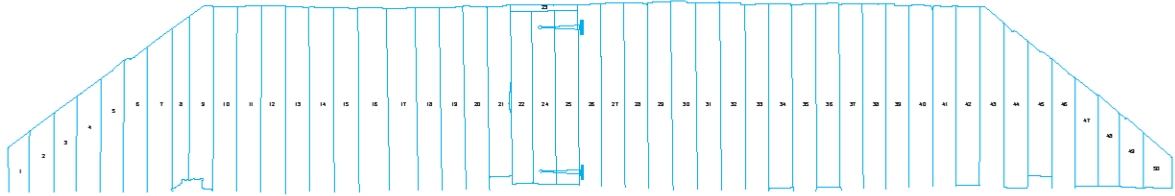
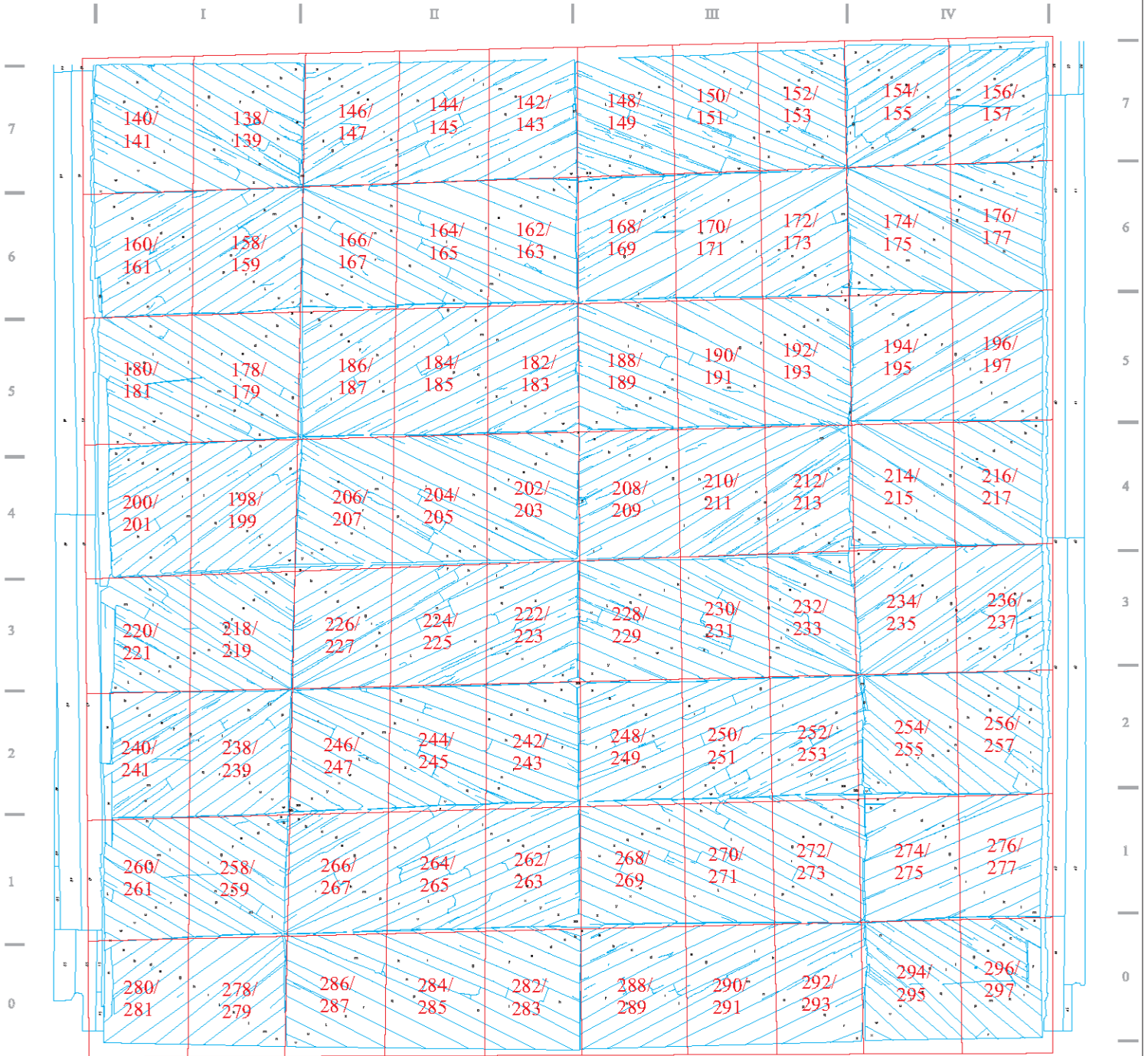


WEST

Sheet Number: 2		<b>LOWER SIDE OF STRUCTURE</b>	
Location of Plates: 18-137	SCALE c. 1:70		POSITION <b>Bays 9 &amp; 10 (Reflected View)</b> 
Plates are in before and after treatment sequence. Ultraviolet (UV) illumination photographs taken before treatment.	TITLE <b>PETERBOROUGH CATHEDRAL - NAVE CEILING                  Conservation Programme Phase 5 (May - October 2003)</b>		PHOTOGRAMMETRY COURTESY OF English Heritage Survey Team & Photarc Surveys Ltd.
STAGE CONDITION SURVEY AND TREATMENT		DESCRIPTION PLATE REFERENCE SHEET	
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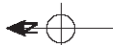


EAST



WEST

Sheet Number: 3



LOWER SIDE OF STRUCTURE

Location of Plates: 138-297

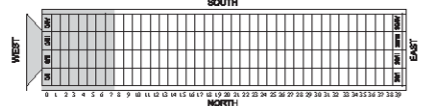
SCALE

c. 1:70



POSITION

Bays 9 & 10 (Reflected View)



Plates are in before and after treatment sequence. Ultraviolet (UV) illumination photographs taken before treatment.

TITLE  
PETERBOROUGH CATHEDRAL - NAVE CEILING  
Conservation Programme Phase 5 (May - October 2003)

STAGE  
CONDITION SURVEY  
AND TREATMENT

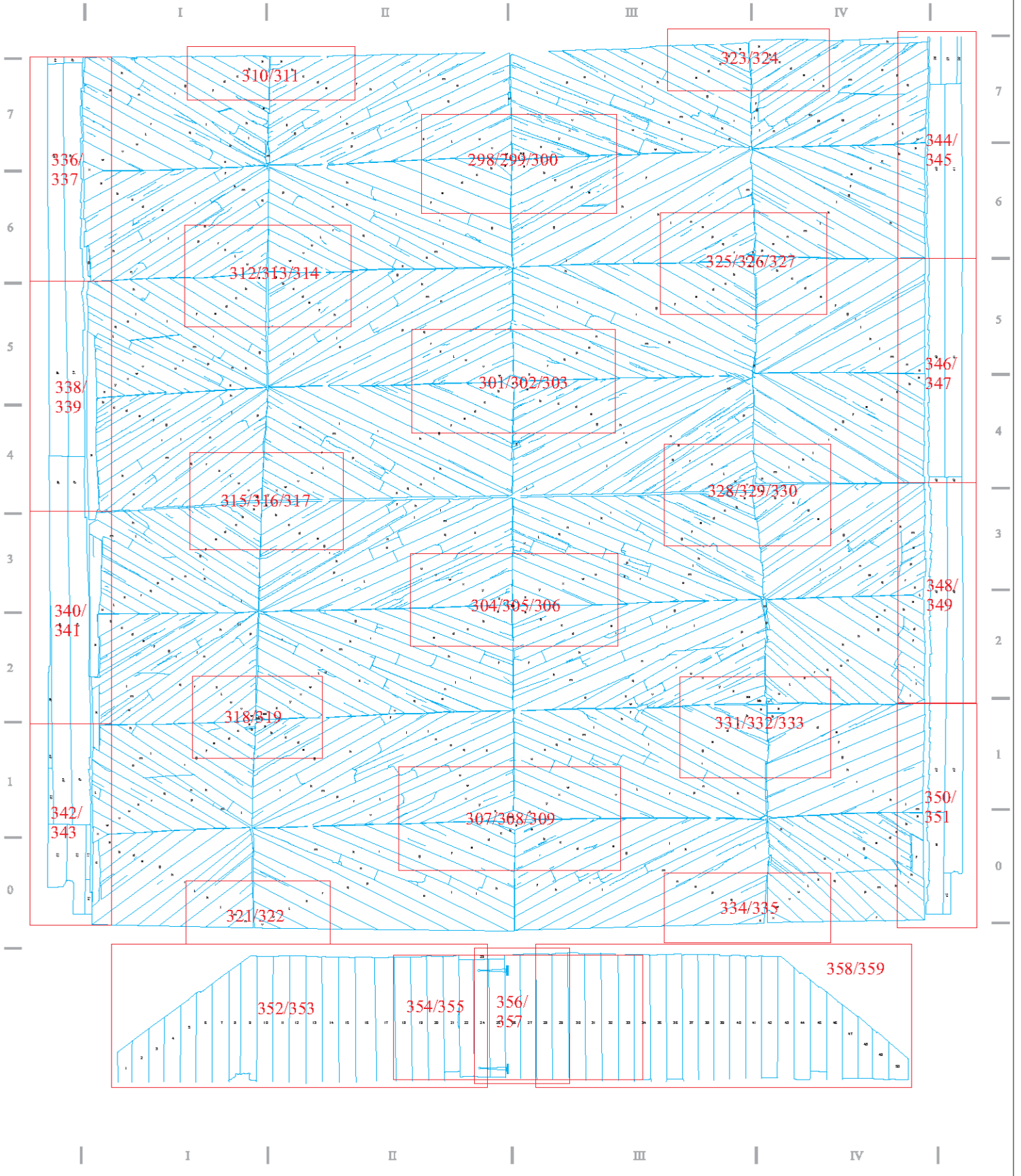
DESCRIPTION  
PLATE REFERENCE SHEET

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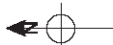


EAST



WEST

Sheet Number: 4



LOWER SIDE OF STRUCTURE

Location of Plates: 298-359

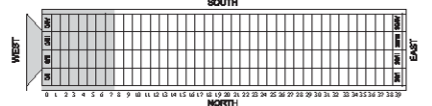
SCALE

c. 1:70



POSITION

Bays 9 & 10 (Reflected View)



Plates are in before and after treatment sequence. Ultraviolet (UV) illumination photographs taken before treatment.

TITLE PETERBOROUGH CATHEDRAL - NAVE CEILING Conservation Programme Phase 5 (May - October 2003)

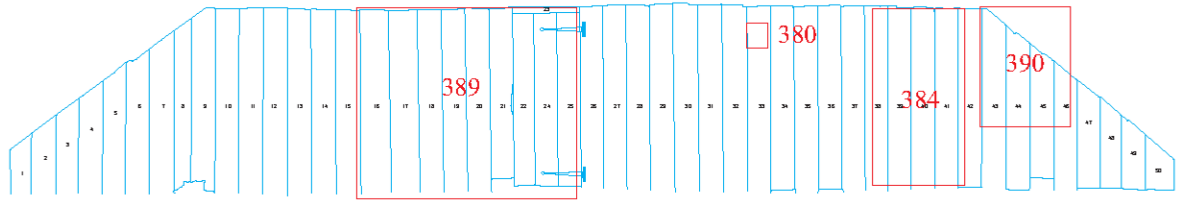
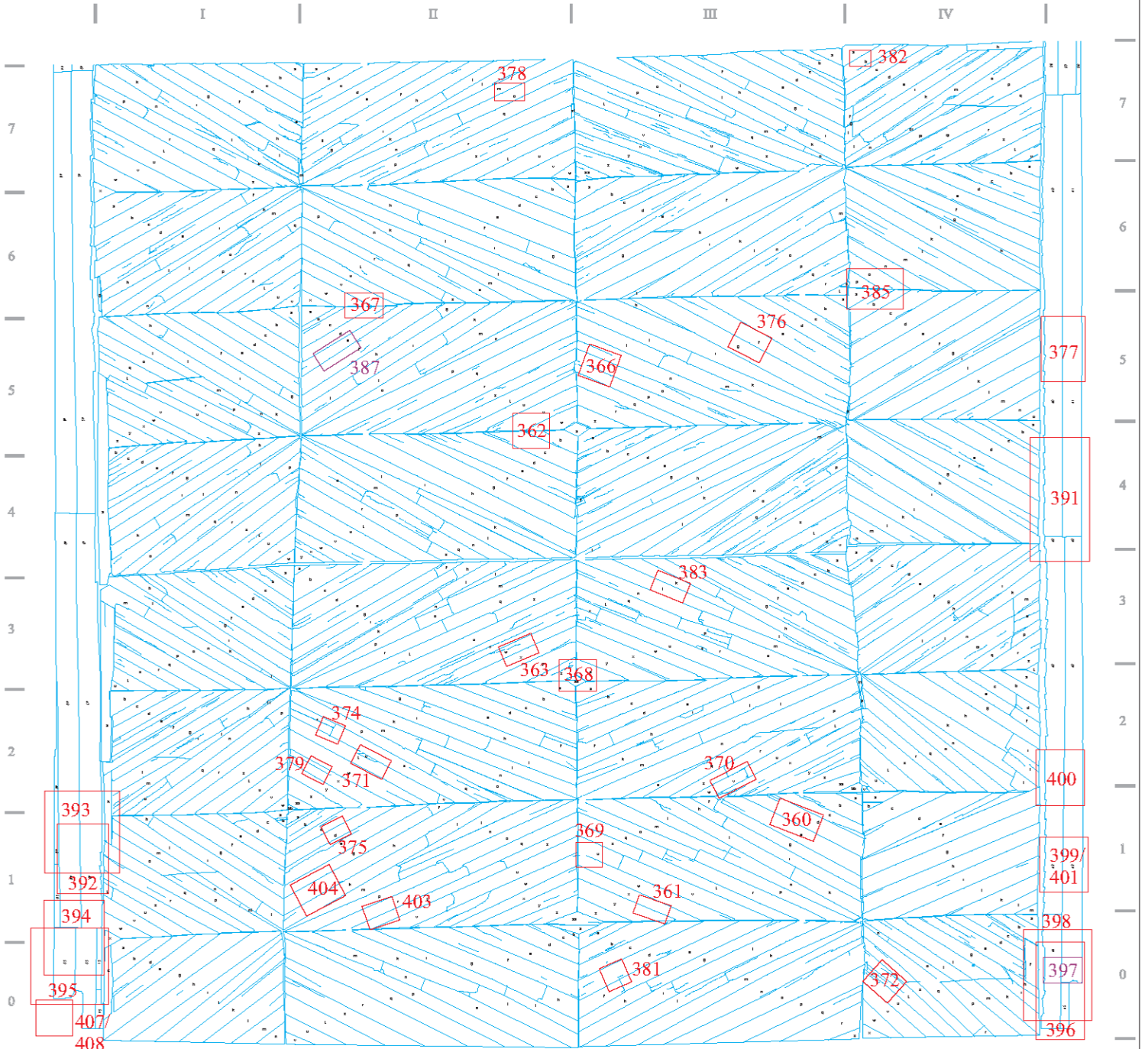
STAGE CONDITION SURVEY AND TREATMENT

DESCRIPTION PLATE REFERENCE SHEET

Photogrammetry courtesy of English Heritage Survey Team & Photarc Surveys Ltd.

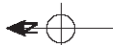
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EAST



WEST

Sheet Number: 5



LOWER SIDE OF STRUCTURE

Location of Plates: 360-408

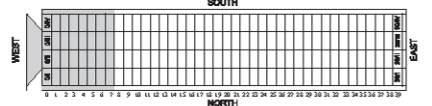
SCALE

c. 1:70



POSITION

Bays 9 & 10 (Reflected View)



Plates are in before and after treatment sequence. Ultraviolet (UV) illumination photographs taken before treatment.

TITLE PETERBOROUGH CATHEDRAL - NAVE CEILING Conservation Programme Phase 5 (May - October 2003)

STAGE CONDITION SURVEY AND TREATMENT

DESCRIPTION PLATE REFERENCE SHEET

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