

# THE PERRY LITHGOW PARTNERSHIP

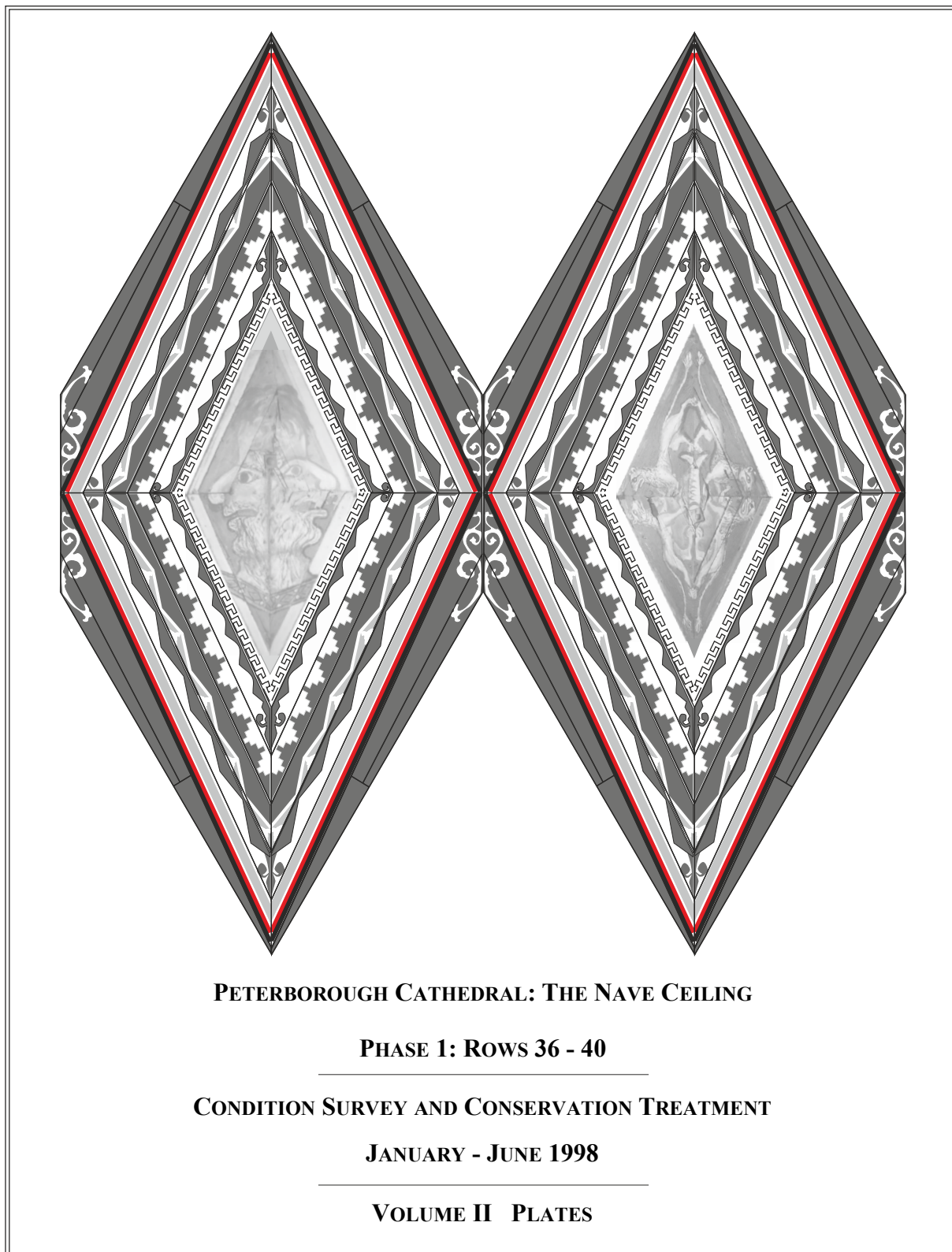
CONSERVATORS OF WALL PAINTINGS AND POLYCHROME DECORATION

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**PETERBOROUGH CATHEDRAL: THE NAVE CEILING**

**PHASE 1: ROWS 36 - 40**

**CONDITION SURVEY AND CONSERVATION TREATMENT**

**JANUARY - JUNE 1998**

**VOLUME II PLATES**

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**Plates 1 to 4** Nave Ceiling after Phase 1 treatment. **Plate 1** three easternmost bays; **Plate 2** two easternmost bays ; **Plate 3** Eastern Bay; **Plate 4** detail of Phase 1 section and adjacent untreated area.

### 2. DOCUMENTATION

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### 3. THE CEILING STRUCTURE

#### TECHNICAL SURVEY: THE CEILING STRUCTURE, UPPER SIDE

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**Plates 29 to 31** The north Narthex roof structure, although later than the Nave roof, it could be similar to the original Nave roof.

#### Dendrochronology

**Plate 32** The lap joint at the north end of Joist 3. This Plate shows the similarity of this joint in the Nave roof and in the north Narthex roof. Note also the holes drilled for dendrochronology.

#### Noggins

**Plates 33 to 37** **Plate 33** shows the junction of noggins below the centre of Joist 3. Note the birds beak joint and two nails to each joint. **Plate 34** shows a noggin to the west of the north lap joint in Joist 8. **Plates 35 & 36** show the only evidence (in this Phase) of a noggin at the foot of the sloping ceiling where it meets the vertical boarding in *Panel 38 IV*. **Plate 36** shows the same joint with two nails on the west side of Joist 3. See also drawing by P.F.

#### TECHNICAL SURVEY: THE CEILING STRUCTURE, LOWER SIDE

**Plates 38 to 42** **Plate 38** shows the base board. **Plate 39** shows the three different board edge details, with grooved at top fight, square in the centre, and rounded on the left side. **Plate 40** shows the grooved design with the surface of the board recessed inside the fourth raised strip. **Plate 41** shows a round bottomed groove inside the fourth strip, with the surface level with the strips. **Plate 42** shows the "flattened

"profiles to the centre boards to produce the least distracting ground for the centre paintings that could be achieved with the riven boards at their disposal. See also drawing by P.F.

### Dendrochronology

**Plate 43** Cathy Groves of University of Sheffield preparing the end of a board, before taking a mould for analysis.

### Scarf Joints

**Plates 44 to 49** **Plate 44** shows a typical scarf joint as described in the Report. **Plate 45** shows a different type (also quite frequently found) where the top board has been chamfered. **Plates 48 & 48** show the same very short piece scarfed on, with, and without, a tape measure. **Plate 49** shows the internal face of a scarf where the top board has been considerably displaced.

### Fixings

**Plates 50 to 55** **Plates 50 and 51** show original nails which have caused the boards to split with subsequent shrinkage. **Plate 52** shows three common types of nail, the lower one being the original. **Plate 53** shows a nail driven from above (through a patch) and clenched over underneath the ceiling. **Plate 54** shows a variety of nail holes, some apparently rounded (on the oak board to the left), some definitely square/rectangular (in the softwood board in the centre). **Plate 55** shows hammer marks on a replacement board where the carpenter has missed the head of the nail. None have been seen adjacent to the original nails.

### Drawings

**Plates 56 to 62** **Plate 56** shows Peter Ferguson recording all patches and details of the 1926 restoration, and any other additional woodwork to the main ceiling structure. Problems of accurately plotting items on the sloping sides proved extremely difficult due to poor access and lack of datum points relating to the boards. **Plate 57** is a drawing by Julian Limentani of the roof construction.

**Plates 58 to 62** These are drawings by Peter Ferguson, and show the position of the original noggins in **Plate 58**, the construction of the ceiling boards and their section in **Plates 59-60**, and details of the 1926 reinforcement work in **Plates 61-62**.

### Replacement Boards

**Plates 63 to 69** **Plate 63** shows a softwood replacement board scarfed to an original board. **Plate 64** shows a replacement board with a sawn finish. If other similar boards are found in the next Phase, they should be assessed for method of sawing to see if this can prove or strongly point to a date, to help date all the replacement boards. **Plate 65** shows another sawn board, but this may have been inserted when the Tower was rebuilt in the 1880s. **Plate 66** shows a crude patch on an Eastern Infill board using a fragment from another similar board. **Plate 67** shows another patch, this time using part of an original oak board as a patch over a replacement softwood board. **Plate 68** shows the reuse of a softwood board from either an Ashlar panel or from the Eastern Infill panels as a replacement board. This is shown by the fragment of under-painting revealed as the board has shrunk. **Plate 69** shows a typical patch of unknown date fixed above the ceiling boards.

## 1926 Repairs

**Plates 70 to 87** All these details are drawn and can be seen on P.F. drawings 4&5. **Plate 70** shows a typical 1926 noggin and 1926 laminated joist. **Plate 71** shows the same joist with the triangular side piece removed. **Plates 72-74** show different design noggins and different design attachments of the noggins to the original joists. **Plate 75** shows the laminated construction at the north angle in Joist 6. **Plates 76-77** show different types of patch revealed when the hessian was removed for investigative purposes. The patch in **Plate 76** is formed from two 1/2" softwood boards laid side by side, **Plate 77** shows a solid oak patch approx. 1" thick. The sequence of **Plates 78-81** show the dismantling of one noggin for investigative purposes, starting with Bob Chappell unscrewing the top laminate, and finishing with a view of the newly revealed hessian. The letter "A" in the last Plate is to denote the sequence of laminates to ensure they were replaced correctly. **Plates 82-86** show the progressive dismantling of a centre noggin support; showing it complete with the hessian removed, in **Plate 82**, then in **Plate 83** with the centre cover laminate removed, then with each north side laminate removed (**Plates 84-86**), to reveal the tops of the original boards and centre noggin in **Plate 86**. **Plate 87** shows a coach bolt removed for investigative purposes from a binder and sloping joist. A joist was chosen which had a solid joint at the top and bottom.

## Screws and Splinters

**Plates 88 to 98** **Plates 88-89** show a typical array of screws projecting through the ceiling boards, note the mix of galvanised/coated screws and bare steel screws used. **Plate 90** shows a selection of screws and one wire nail (taken out of a 1926 noggin or joist), with a tape measure. **Plates 91-92** show boards displaced vertically by screws not entering the board but pushing it down. **Plate 93** shows Cameron Stewart using a detector for finding hidden electric wiring and plumbing to find screws beneath the hessian, whilst conferring with his colleague below using a walkie-talkie. **Plates 94 and 96** show splinters in the face of original ceiling boards after removal of the screws, and **Plates 95 and 97** show the splinters re-fixed. **Plates 98-99** show the same sequence in a softwood replacement board, but due to the resilience and fibre length of the wood, the splinter is extraordinarily long (approx. 100mm). **Plate 100** shows a prop made from a telescopic light standard to put gentle pressure on a splinter whilst the Plectol B500 adhesive is curing.

## CEILING BOARDS: CONDITION AND TREATMENT

### Decay and Woodworm

**Plates 74, 86,126** These Plates show the extent of surface decay to the upper sides of the boards.

**Plates 101 to 109** **Plates 101-102** show sporadic infestation by Common Furniture Beetle and Death Watch Beetle and cross checking which is invariably associated with fungal attack. **Plate 103** shows complete losses of wood due to severe infestation. **Plates 104-105** shows a small area of wood loss resulting from insect attack before and after repair. To prevent further wood loss from these unstable areas the exposed wood was consolidated with Paraloid B72 (10% in xylene) and repaired with a filler of: 1 part Polyfilla, 1.5 parts fine oak dust, 1 part Plectol B500 (10% solution).. **Plates 106-107** show losses of edges due to infestation, possibly because they contain sapwood. **Plate 106** shows infestation by Common Furniture Beetle, and **107** Death Watch Beetle. **Plate 108** shows more severe

infestation and fungal attack that is probably limited to the front surface. **Plate 109** shows cross checking that goes right through the thickness of the board, and indicates more severe fungal attack.

### Micro Surface Decay and Gunshot

**Plates 110 to 113** **Plate 110** shows differential in micro fungal decay on the surface between the "background" black area and the "foreground" white painted area. **Plate 111** shows what looks to be an original board that somehow escaped over-painting. Note the surface degradation that is similar to the black area on the previous Plate. **Plate 112** and **113** show areas of gun shot. The interesting point to note is that only the left hand board has shot in it, so if the style of painting is also taken into account, it would seem likely that this shot is between 1740 and 1830.

### Repairs

**Plates 114 to 139** **Plates 114-121**, and **129-131** show the sequence for two typical repairs. Plates **114-116** and **129** show the areas before treatment, (**Plate 115** is the same as **Plate 114** but taken with ultra-violet (UV) illumination). **Plates 117-119** and **130** show the stainless steel support angle bolts in place, **120** shows the angles being touched in, and **121** and **131** the finished work. Note the slight reflection from the Melinex sandwiched between the stainless steel angle bolts and the painted boards. **Plates 122-128** show the sequence of refitting a fragment from the original centre board in its correct relationship to the centre board, and refitting the washer for the hanging bolt so that it matches the paint lines. For an overall view of the finished work see **Plate ??**. **Plates 132-133** are of a situation where a long fragment required support, yet where it was not possible to fit a two legged stirrup, so a double angle on a single leg was fashioned. **Plates 134-135** show an unstable end of a board, and how existing holes were used for new supporting screws and washers. For other examples of the use of old nail holes for new screws see also **Plates 136-138** (**136-137** after touching in, **138** before). **Plate 139** shows the tops of the angle bolts above the boards with nuts and washers.

**Plate 140** Show a section of deteriorated and damaged wave pattern board following repairs to small areas of wood loss resulting from insect attack. To prevent further wood loss from these unstable areas the exposed wood was consolidated with Paraloid B72 (10% in xylene) and repaired with a filler of: 1 part Polyfilla, 1.5 parts fine oak dust, 1 part Plextol B500 (10% solution).

### HANGING BOLTS: CONDITION AND TREATMENT

**Plates 141 to 156** **Plate 141** shows the joist supporter resting on two adjacent tie beams. **Plate 142** shows the clamp which grips the joist with adjustable spikes. This has tightened from one side only because of the closeness of some of the ancient joists with the 1830s tie beams. Note the lifting bar which can be moved to screw locations provided at 300mm centres. **Plates 143-144** show bolt grips for holding the original hanging bolts without turning as the hanging bolt nuts are loosened. **Plate 145** shows the specially made bolt pusher in position. The purpose of this is to push the hanging bolts down without having to hit them with a hammer, which causes unacceptable vibrations. **Plate 146** shows a tell-tale to monitor any deflection of the joist whilst the hanging bolt is extracted. **Plates 147-148** show the hanging bolt at the south end of Joist 1 selected for trial removal, and with cotton wool to prevent any lubricating oil running down the bolt and onto the painted surface. On consideration that this bolt may have been loosened at the

time of the Tower rebuilding, and may not therefore be representative, trials on extracting the first bolt were carried out on the north bolt on Joist 8. **Plate 149** shows Hugh Harrison holding the bolt as it was wound down, note the use of the walkie-talkie to maintain contact with colleague working above. **Plates 150-151** show the bolt when first extracted and a temporary stainless steel bolt alongside it, also the Plate with the detail of the square forged shaft below the head of the hanging bolt. **Plates 152 and 153** show the temporary stainless steel bolt in position from above and below. **Plate 154** shows two hanging bolts after painting, and **Plate 155** shows a simple guide that is placed by each hanging bolt to record future movement in the ceiling. Note also the spring washer between the nut and washer. **Plate 156** shows the Plasterzote pad between the washer and the painted surface beneath the ceiling. Note also the head and lower side of the washers left with their existing finish.

#### HESSIAN: CONDITION AND TREATMENT

**Plates 157 to 161** **Plate 157** shows part of the west bay of *Panel 37 II* after vacuuming, compared with the east bay of *Panel 36 II* still with its surface dirt. **Plate 158** shows the panel of hessian removed by Hirst Conservation. Note the lower narrow bands of hessian. **Plate 159** shows a window opened to reveal a screw which needed to be removed. **Plate 160** shows *Panel 37 II* after the areas of hessian that had been opened up for investigative purposes or to remove screws, had been recovered with sailcloth and Beva 371. **Plate 161** is a general view of the top of the ceiling after treatment.

#### TESTING

##### X-Ray Photographs

**Plates 162 to 165** The value of these plates is substantial in view of the obliteration of all detail above the ceiling because of the hessian. **Plate 162** shows the laminated construction of the 1926 joists, and it can be clearly seen that the noggin is continuous right through the joist. In **Plate 163** one can see that nails are clenched over above scarf joints. If one compares **Plate 164** with **Plate 133**, one can see how many screws exist in the back of this board. **Plate 165** highlights the fact that original nails in the edges of boards are clenched over above the top board.

#### 4. THE PAINTED DECORATION

##### CONDITION SURVEY AND TREATMENT RECORD

**Plates 166 to 249** Sections of the Ceiling structure lower side and painted decoration in before and after treatment sequence. All ultra-violet (UV) illumination photographs taken before treatment. Refer to Plate Reference Sheets for locations.

**Plates 250 to 266** Sections of the Ashlar boards and painted decoration in before and after treatment sequence. **Plate 311** shows *Panel 36 IV* and associated Ashlar boards after treatment contrasted with the untreated *Panel 35 IV*. All ultra-violet (UV) illumination photographs taken before treatment. Refer to Plate Reference Sheets for locations.

**Plates 267 to 285** The eight figurative lozenges in before and after treatment sequence. All ultra-violet (UV) illumination photographs taken before treatment. Refer to Plate Reference Sheets for locations.

#### VISIBLE UNDERPAINT

**Plates 286 to 289** Examples of trefoil pattern visible in raking light beneath the extended chevron pattern on many original oak boards. **Plates 286, 287** show variations in the trefoil shape and end scroll design on different boards. Visual examination suggests that the relief is in many places too pronounced for the thickness of the underlying paint alone to be responsible. **Plates 288, 289** depict an example and a drawing of the end scroll design. Also, in **Plate 288** the obvious replacement board has as underpainting the bold floral scheme on the Ashlar boards.

**Plates 290 to 295** The stepped chevron and dog-tooth pattern underpaint photographed in raking light, **Plates 290, 291 (UV), 292**, appears to have been painted in outline only. **Plate 290** depicts also the opaque metallic sheen that occurs in patches on the shiny, 1830s black paint. **Plate 293** shows a re-used original board with the key pattern design visible in raking light beneath what appears to be 1830s paint. Notice that this board is round-edged and un-grooved, also that the key pattern is painted on the inside half of the board. The 1740's scheme has the key pattern is painted on the outer half of grooved, straight-edged boards. **Plate 293** also depicts an example of efflorescence on the black paint surface. **Plate 294** detail of an original board in raking light showing the keyhole pattern just visible beneath the 1740s overpaint. **Plate 295** detail of the south frieze in raking light showing the more complex scrollwork (possibly dating from the late 17th or early 18th century) beneath the 1830s design.

#### WATERCOLOUR WASHES

**Plates 296 to 297** **Plate 296** shows a wider area of **Plate 301** with a moderately angled flash, after treatment. There is a light 'tide mark' on the background paint around the floral designs; this occurs overall the Eastern Bay frieze decoration. It appears that a tinted watercolour wash was applied to darken down the 1840s design. The wash being repelled by the medium rich paint; hence the tide marks. The keyhole and key pattern boards in **Plate 297** appear also to have been painted with the lighter background paint on the frieze and then darkened down with a tinted, watercolour wash. Paint sample analysis is required to confirm this theory.

#### 1740S/1830S REPAINTING

**Plates 298 to 307** It appears that the 1830s restoration was less inventive consisting mainly of a rather crude repainting of the blacks and highlights across the Ceiling. **Plate 298** shows clearly the different black paints: the darker 1830s paint was applied in a slapdash manner over the lighter 1740s paint. **Plates 299, 300, 301** - before treatment, with ultra-violet illumination, and after treatment - show the slightly darker off-white 1830s paint was applied without precision.

**Plates 302 to 304** **Plate 303** shows the paint layer exposed from under a temporally removed 1830s Ceiling bolt and washer (**Plate 302**). What must be 1740s repaint (with a surface residue of rust) continues under the bolt on the original, grooved board; however, the small section of 1830s replacement board covered by the washer is unpainted. **Plate 304** shows the grey chevron design along with the lighter brown/black paint layer continues beneath a temporally removed Ceiling bolt. These



photographs show the areas after surface cleaning so illustrates the extent of surface discoloration still remaining on both the 1730s and 1840s repaint.

### GRAFFITI

**Plates 305 to 308** **Plate 305** the names of I Shaw and C Neal are painted on the south frieze decoration. **Plate 306** at the east of the south frieze the name W Stallard and the date 1838(?) is just visible beneath the off-white overpaint. **Plate 307** overpainted in red preparatory drawing, again the name Stallard, this time on the north frieze. **Plate 308** depicts the letters 'BLEY' painted on the extreme north end of *Panel 40 I*. This may refer to Cobley & Co., the firm thought to have been responsible for the 1830s restoration. **Plate 308** shows also the whitish veil or surface bloom that occurs on some 19th-century figurative boards. **Plate 309** an example of pencilled graffiti dated 1885(?) on *Panel 37 IV*.

### REPLACEMENT BOARDS

**Plates 310 to 317** Series of photographs comparing paint on replacement and original boards under ultra-violet illumination. **Plates 310, 311** showing original and replacement boards from different restorations joined along a joist line: the UV light emphasises the different repaints. **Plates 312, 313** detail of a figurative lozenge with an 1830s replacement board and repaint surrounded by original boards with 1740s repaint. **Plates 314, 315** an original grooved board with 1740s grey chevron pattern repaint next to a replacement board which appears to have at least two layers of repainting. The uppermost paint layer appears much thicker than elsewhere (for detail see **Plate 336**). **Plates 316, 317** show a replacement board with an opaque white surface bloom on an applied coating over the black paint. No other board within the Eastern Bay has this surface effect.

### FLAKING PAINT

**Plates 318 to 325** In many instances loose paint on the figurative lozenge boards was difficult to identify even with raking light. **Plates 318, 319** detail before and after paint re-attachment and surface cleaning. Here much of the red and green background paint was detached from the support but had not lifted to form the much more easily identifiable flakes shown before and after treatment in **Plates 320, 321**. **Plate 222** depicts another example of delaminated green background paint before reattachment: although hard to illustrate even with close detail in severely raking light, much of this section of granular green paint was detached. **Plate 323** shows a typical instance of micro-flaking of thin repaint on an original board: this deterioration probably caused by localised water infiltration. **Plates 324, 325** details, before and after paint re-attachment, a section deteriorated original board: the relatively thick 1740s paint layer had lifted from the decayed timber surface. Notice the adjacent, much darker black 1830s repaint covering the 1740s layer.

**Plates 326 to 333** **Plate 326** detail of decoration within the Janus lozenge, before treatment with raking light: it illustrates both the granular paint surface and micro-flaking. **Plate 327** an example of 1740s paint loss from an original board following the pattern of the medullary rays: it suggests the paint surface was perhaps washed down in the 1840s resulting in loss of paint weakly adhered to the smooth, denser wood. **Plate 328** a detail with raking light before treatment of the thin powdering paint layer on *Panel 40 III*. As yet it is not clear when these boards were put in place and decorated.

## PAINT RE-ATTACHMENT

**Plates 329 to 333** **Plates 329, 330, 331** with raking light before, during and after treatment: detail of flaking paint on a nail head. The flaking paint is infused with two applications of Paraloid B72 (10% in acetone); once the solvent had evaporated a localised heat source (Preservation Pencil) was applied to the flakes relaxing them sufficiently and enabling them to be pressed back into place with a small spatula. **Plates 332, 333** small drops of Plextol B500 (5%) being injected behind flaking paint after relaxation of the paint layer and pre-wetting with IMS. The paint flake is pressed back with a small pad of cotton wool wrapped Japanese tissue; this absorbs any excess adhesive.

## SURFACE ACCRETIONS

**Plates 334 to 337** Residues of what may be three forms of microbiological growth were found on the paint surface. These residues are widespread across the Ceiling and will be analysed as part of the Phase 2 investigations. **Plate 334, 335** details before and after surface cleaning: faint traces of these light brown flecks remain after cleaning with a Wishab sponge. **Plate 336** a purplish powder residue on the thick impasto paint (also detailed in **Plates 314, 315**). **Plate 337** shows a white bloom or stain on the paint not removed by surface cleaning with Wishab: the fine tendrils suggest this results from microbiological growth.

**Plates 338 to 339** Before and after surface cleaning and paint re-attachment The 'white chalk line' form of efflorescence depicted here occurs on a number of the original, wave pattern boards with the matte, saturated, black paint from the 1830s.. Localised water infiltration has resulted in extensive micro-flaking and some loss of the black paint; the off-white paint is unaffected except for a tide mark of salts efflorescence at the interface. Preliminary analysis results indicate at least two different salts are present: chloride and sulphate. Further examples of this phenomenon are shown in **Plates 365, 366, 367**.

**Plates 340 to 341** Before and after treatment. The paint layer has been scorched on this one board alone. This damage is on *Panel 39 II*, close to tower wall, and probably occurred during the 1880s rebuilding.

## STAINING

**Plates 342 to 349** There are a number of different categories of staining, all resulting from liquid material penetrating down between the boards or through cracks in deteriorated boards. A number of boards in *Panel 36 I* have whitish opaque drip trails across the paint surface (see **Plate 166**); these appear to be water damage. **Plates 342, 343 (UV)** show a dark stain over the 1830s repaint. It is probably a preservative material used to coat the roof timbers. Analysis results of samples taken from stains are not available at the time of writing. **Plate 334** shows staining from a clear liquid that has penetrated a replacement board. The brown stain shown in **Plate 345** has come through the thickness of the paint. **Plates 346, 347, 348** - before and after treatment and UV - show a major spillage of dark liquid material occurred above these boards. In this instance, much of the residue was removed and the stain reduced using acetone swabs. **Plate 349** shows characteristic light-brown drips on the edge of an original board: these occurred in a number of places across the Eastern Bay.

## SURFACE GLUE

- Plates 350 to 356** **Plates 350, 352** before treatment and with ultra-violet illumination, show glue drips across the surface of canted replacement boards: the glue has contracted causing the underlying paint to flake. **Plate 351** shows the same area after surface cleaning, paint re-attachment, glue removal and reintegration. **Plates 353, 354, 355, 356** before treatment with raking light and ultra-violet illumination, show typical examples of the extent glue - used to adhere hessian to the Ceiling boards upper side - has penetrated between the boards and covered the board edges. Ultra-violet light is particularly helpful when checking for glue residue.
- Plates 357 to 369** **Plates 357, 358, 359, 360** with raking light show areas with thick deposits of glue on the paint surface before treatment and after surface cleaning, glue removal and reintegration. Although the glue had contracted sufficiently in both cases to lift from the surface, the underlying paint had not flaked. Watercolour reintegration on the off-white paint after glue removal is just visible in **Plate 358**. In addition, notice in **Plate 357** the underlying trefoil design in relief as well as the suspected microbiological growth residue on the black paint (this is similar to the residue depicted in **Plate 334**). **Plates 361, 362, 363, 364** before treatment, with ultra-violet illumination, during and after treatment, show a section of deteriorated and damaged wave pattern board with glue drips on the surface. **Plate 363** shows the overcleaned off-white paint before reintegration with watercolour. In **Plate 364** the overcleaned off-white paint has been toned down and small areas of wood loss resulting from insect attack have been filled. **Plates 365, 366, 367** with raking light show stages of glue removal and surface cleaning on a section of original, glue affected, canted boarding: notice the salts efflorescence at the interface of the black and off-white paint. **Plate 368** shows the same area following treatment. **Plate 369** shows overcleaned white paint on the edge of a board following glue removal but before reintegration.
- Plates 370 to 376** Examples of paint flaking caused by surface glue. **Plates 370, 371, 372** a section of the lions lozenge before treatment, with ultra-violet illumination and following treatment. **Plate 373** is a close up detail of the affected area showing the curled up paint flakes and surface glue: **Plate 374** a repeat after glue removal and paint re-attachment. **Plates 375, 376** Detail of curling paint caused by surface glue on the edge of a lozenge board shown before and after treatment.

## SURFACE CLEANING

- Plates 377 to 389** Sections of the Ceiling decoration during surface cleaning using Wishab sponges. This method of cleaning without the use of solvents achieves a uniform and acceptable cleaning level without causing the paint surface to shine. **Plates 386, 388** close up details, with raking light, of the partially cleaned Janus and Lions lozenges and **Plates 387, 389**, the same areas after treatment, show that this cleaning method does not abrade the granular paint surface.

## HIRST CONSERVATION CLEANING TESTS

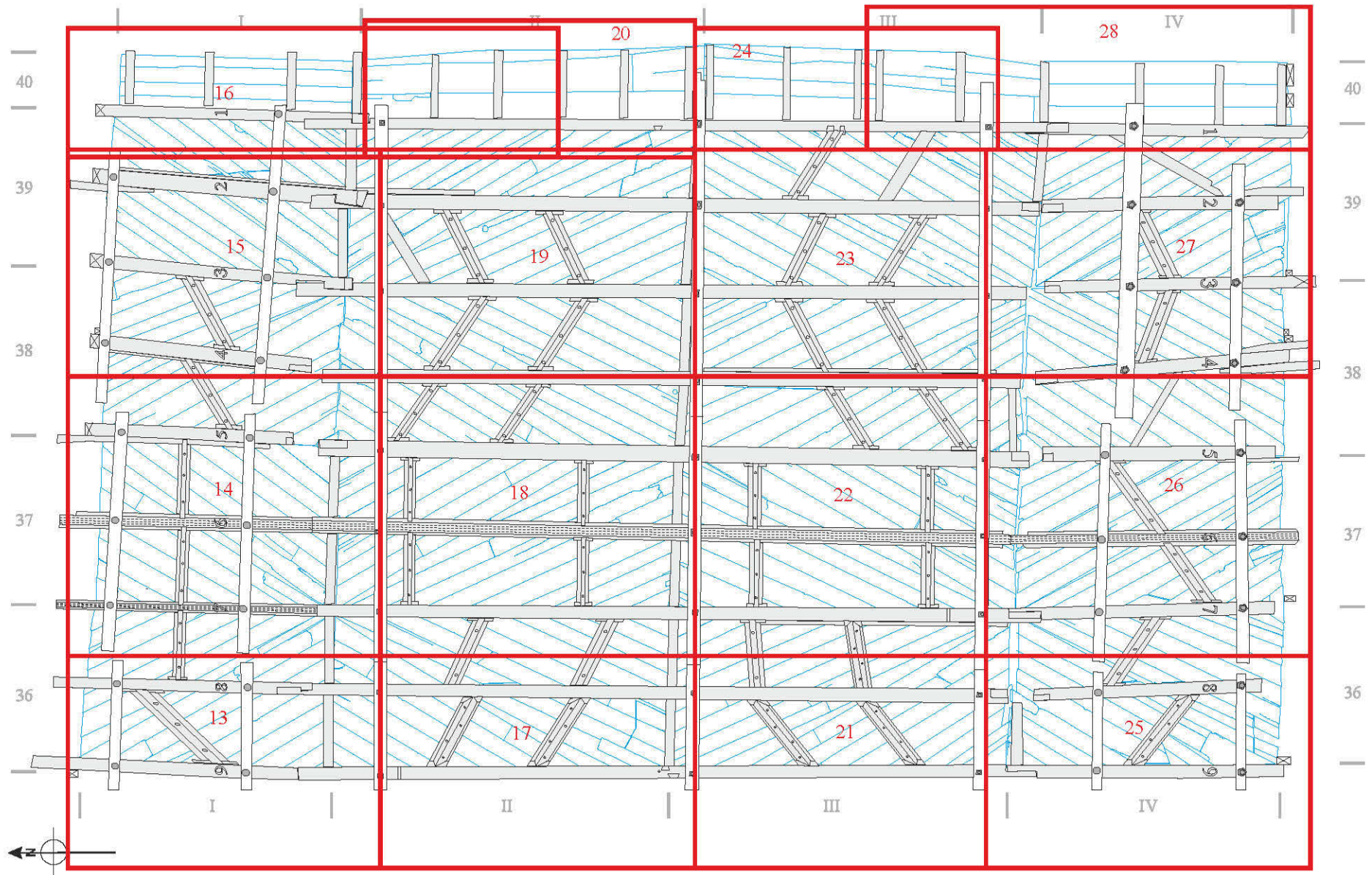
- Plates 390 to 394** Many of the cleaning tests carried out by Hirst Conservation in 1995 using a wide range of solvents were still visible after the paint surface had been cleaned with Wishab sponges. **Plates 390, 391, 392** show the main area of tests before surface cleaning, with ultra-violet illumination, and during cleaning. **Plate 393** the tests had to be reintegrated using watercolour paints. **Plate 394** shows the test area following treatment.

**ASHLAR BOARDS**

**Plates 395 to 406** Surface cleaning using Wishab sponges on the Ashlar board decoration had a pronounced visual effect. **Plates 395, 396, 397, 398** show sections during and after cleaning. Notice the red preparatory drawing in **Plates 397,398**: this was presumably carried out by W Stallard in 1838 (see **Plate 307**). Plates 399, 400, 401 before treatment, with ultra-violet illumination and following treatment depict an area of the north frieze decoration severely stained as a result of water infiltration and across the surface a single thick glue drip causing the underlying paint to peel. The disfiguring stains were resistant to Wishab cleaning and had to be removed with swabs of deionised water. The overcleaned the off-white background paint was then reintegrated using watercolour paint. **Plates 402, 403, 404** a large Hirst cleaning test and surrounding area on the south Ashlar boards: after surface cleaning with Wishab sponges, during reintegration, and following treatment. **Plates 405, 406** another section of decoration on the south wall frieze, after cleaning with Wishab sponges, showing surface staining before removal with deionised water; the same section following treatment.

PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 1

Location of Plates 13 - 28 (Structure Upper Side)

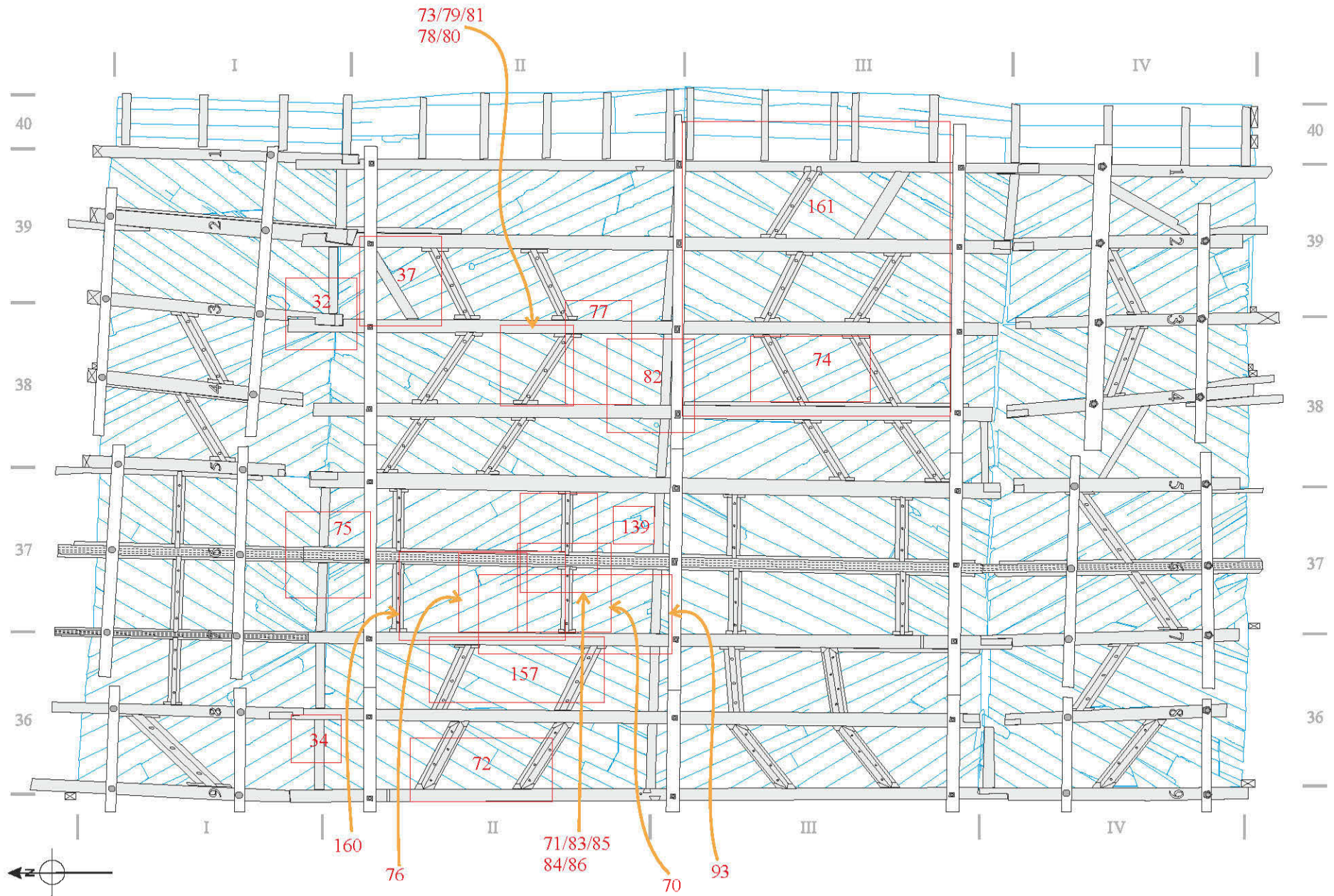




PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1

PLATE REFERENCE SHEET NO: 2

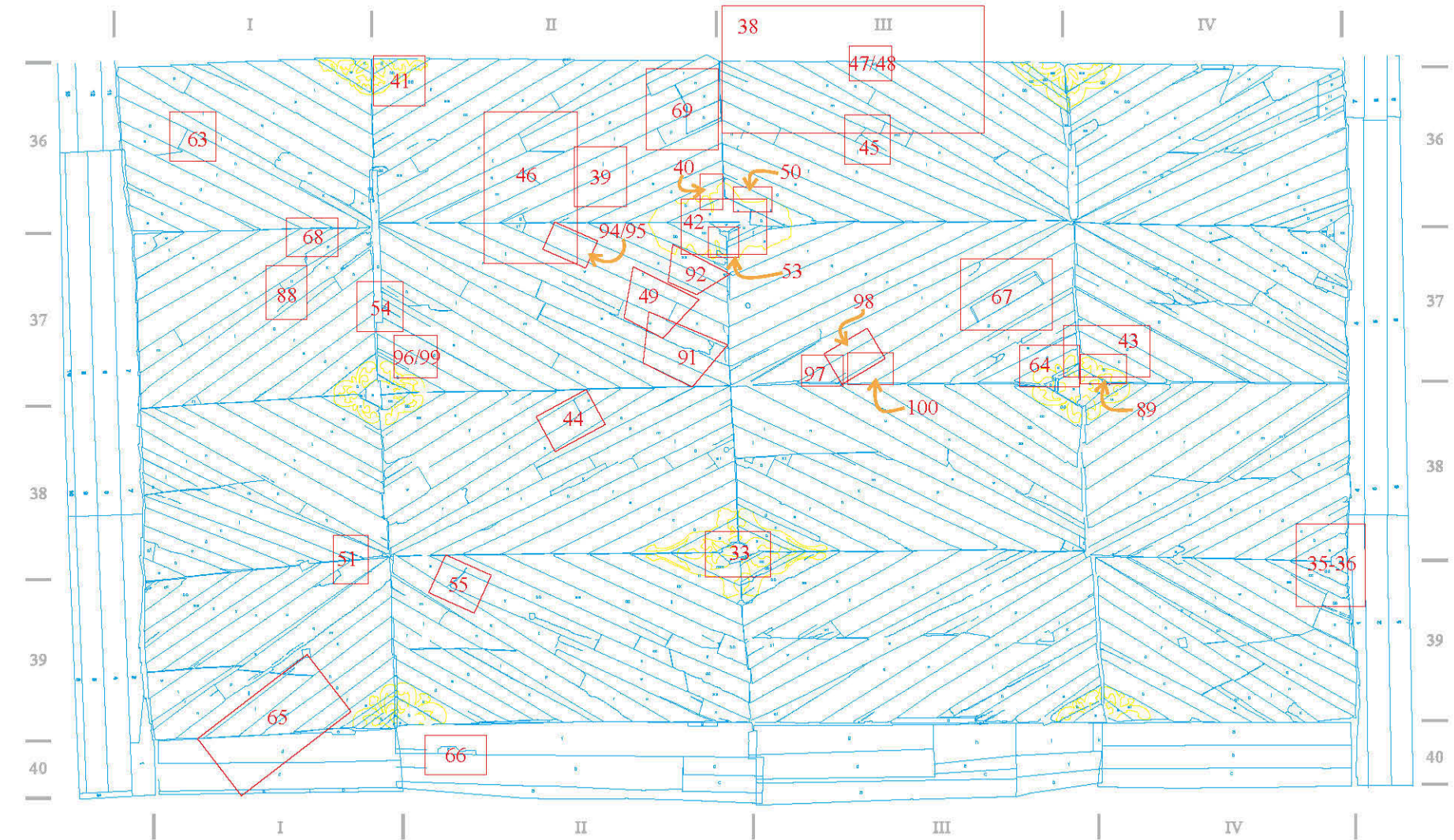
Location of Plates 32 - 161 (Structure Upper Side)





PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 3

Location of Plates 33 - 100 (Structure Lower Side)

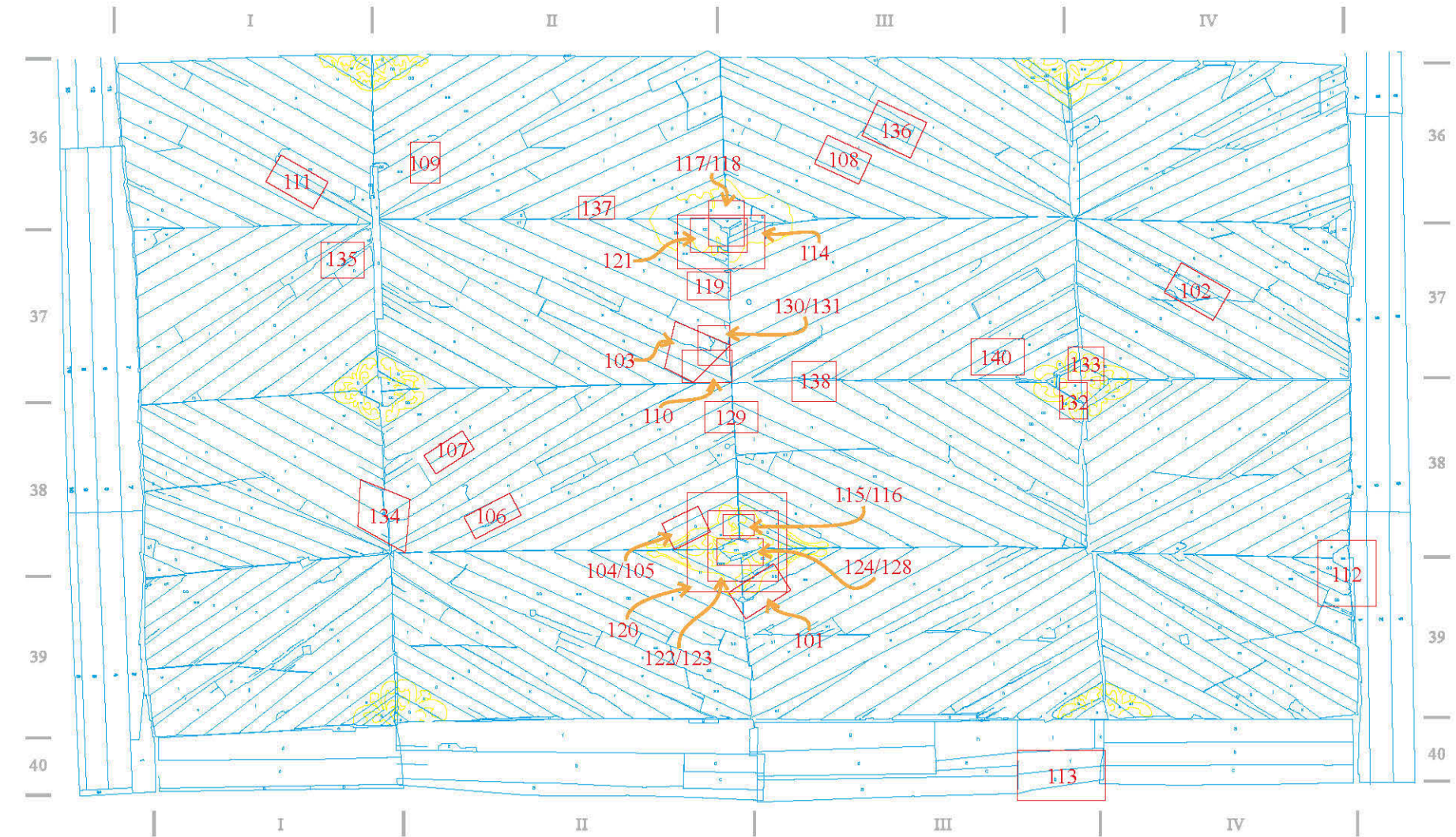




PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1

PLATE REFERENCE SHEET NO: 4

Location of Plates 101 - 140 (Structure Lower Side)



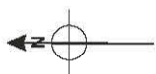
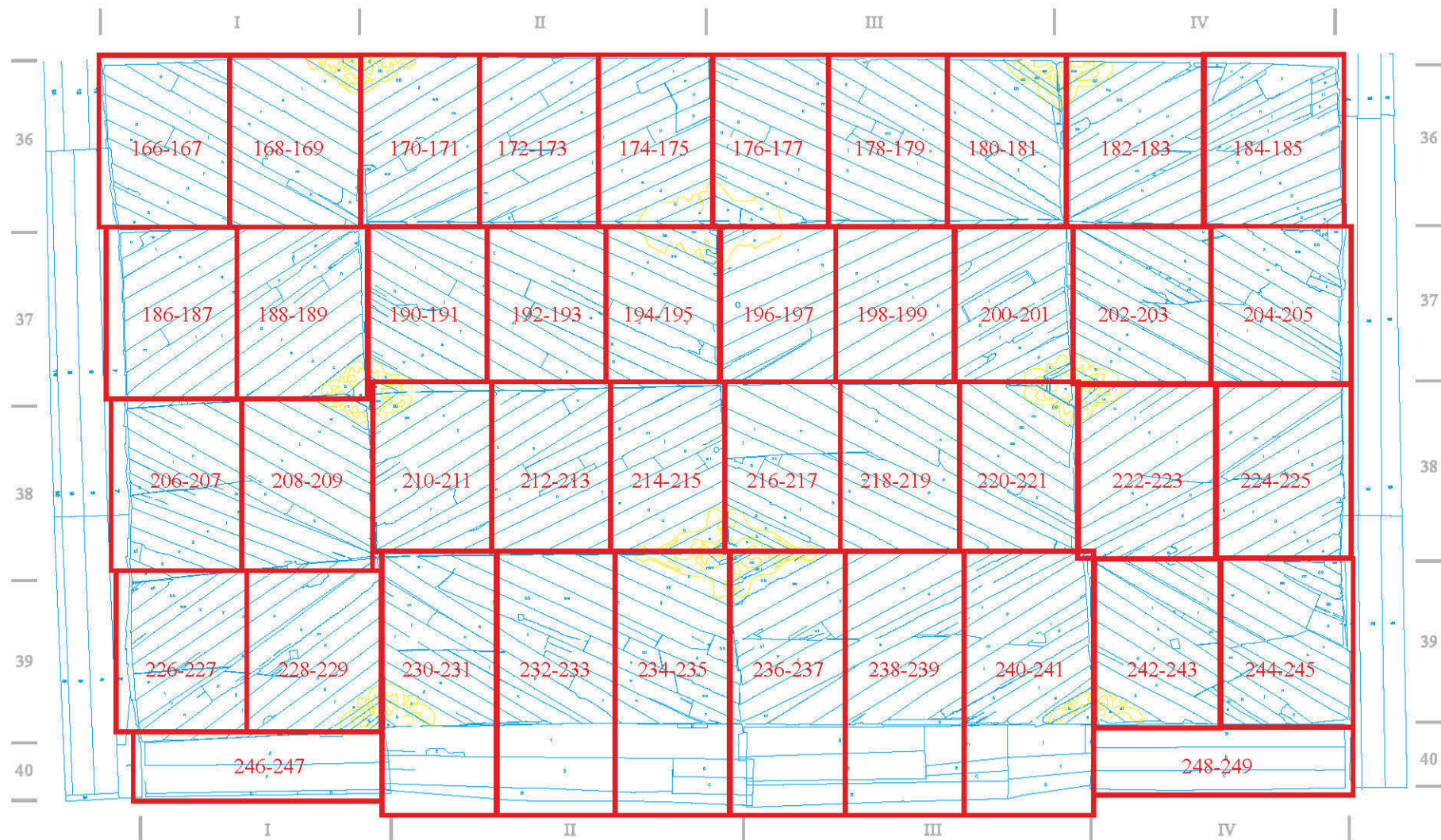


PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 5

Location of Plates 166 - 249

Plates are in before and after treatment sequence.

Ultraviolet (UV) illumination photographs taken before treatment.



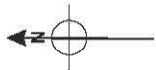
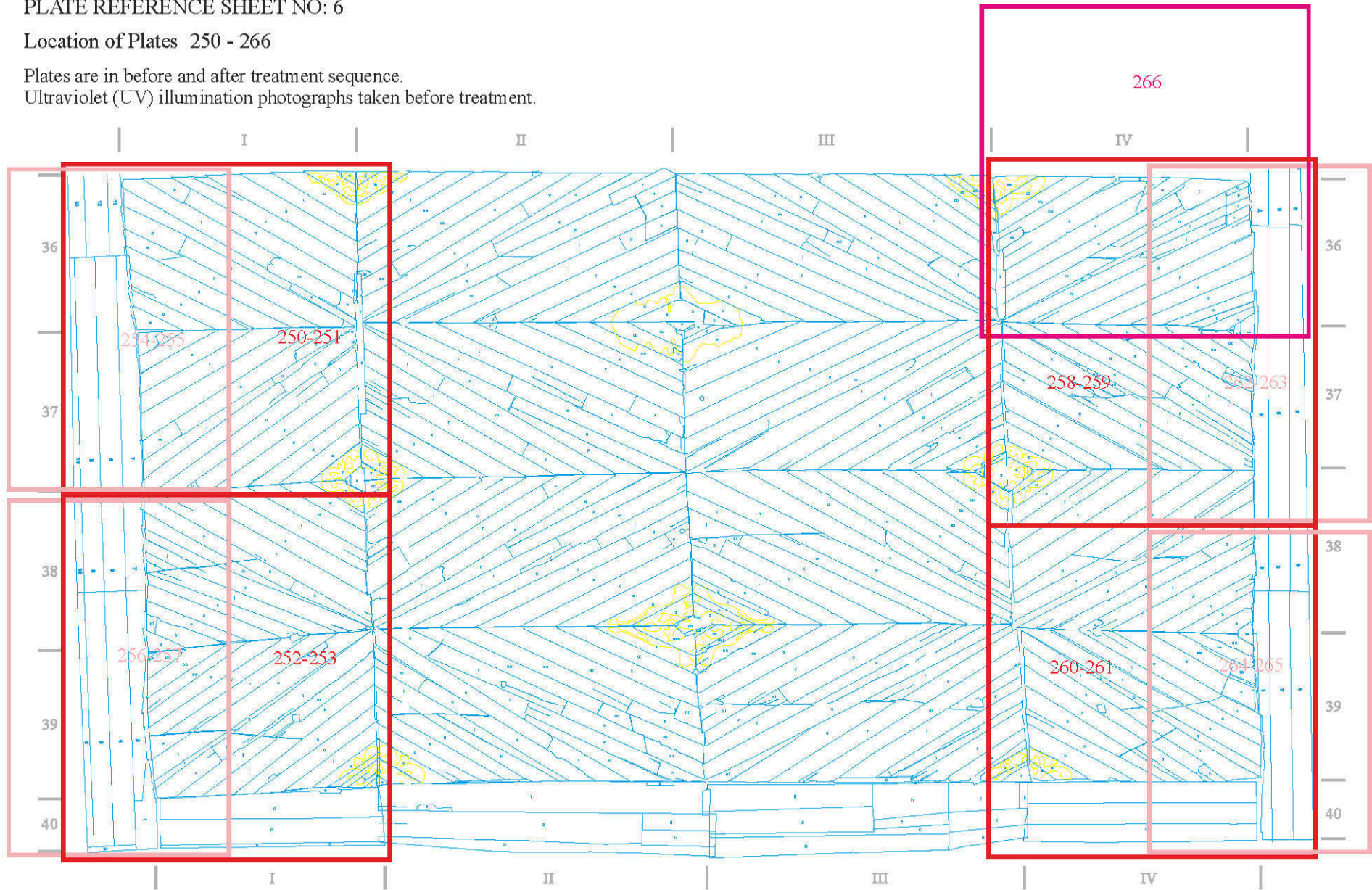


PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 6

Location of Plates 250 - 266

Plates are in before and after treatment sequence.

Ultraviolet (UV) illumination photographs taken before treatment.



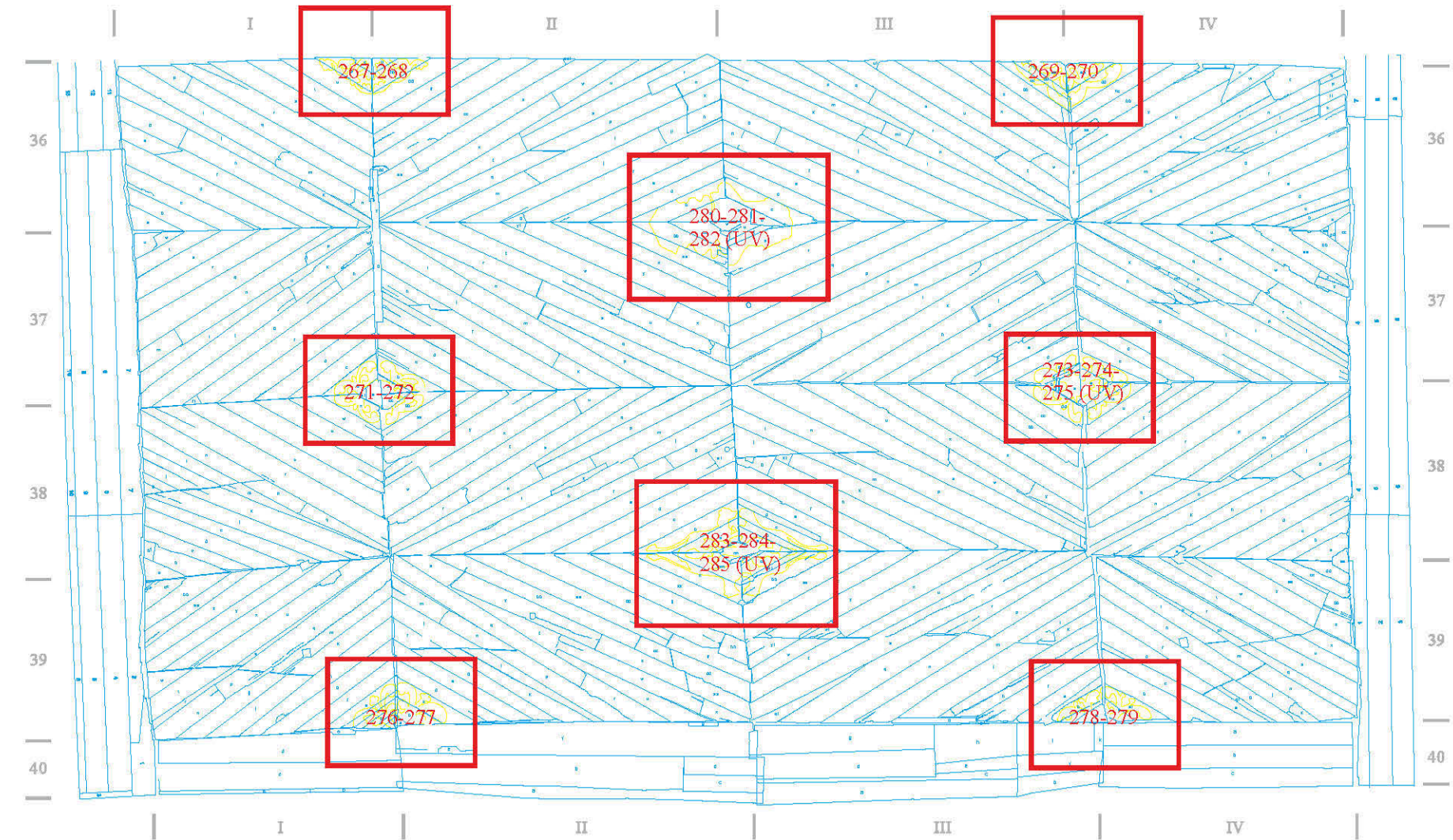


PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 7

Location of Plates 267 -285

Plates are in before and after treatment sequence.

Ultraviolet (UV) illumination photographs taken before treatment.



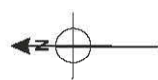
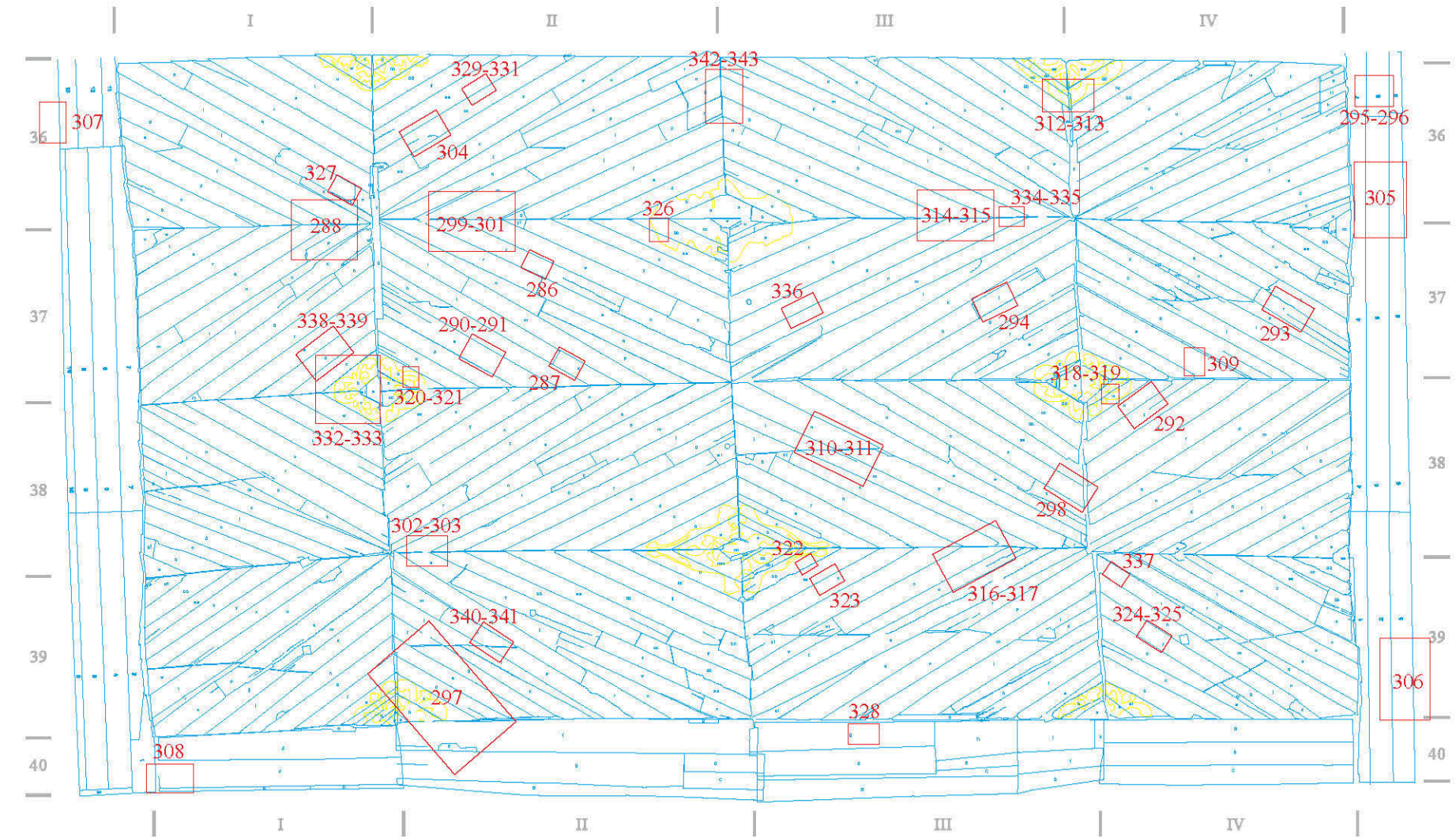


PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 8

Location of Plates 286 - 343

Plates are in before and after treatment sequence.

Ultraviolet (UV) illumination photographs taken before treatment.





PETERBOROUGH CATHEDRAL, NAVE CEILING, PHASE 1  
PLATE REFERENCE SHEET NO: 9

Location of Plates 344 -406

Plates are in before and after treatment sequence.

Ultraviolet (UV) illumination photographs taken before treatment.

