



# **Two Lions Public House, Great Dockray, Penrith, Cumbria**

## **Archaeological Building Investigation**



**Oxford Archaeology North**

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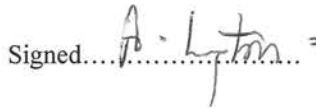
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## CONTENTS

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<b>SUMMARY .....</b>	<b>3</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>5</b>
<b>1 INTRODUCTION .....</b>	<b>6</b>
1.1 Circumstances of the Project.....	6
1.2 Location and Geology .....	7
<b>2 METHODOLOGY.....</b>	<b>8</b>
2.1 Project Design .....	8
2.2 Desk-Based Assessment.....	8
2.3 Building Investigation.....	8
2.4 Watching Brief.....	9
2.5 Paint Analysis.....	9
2.6 Archive.....	9
<b>3 HISTORICAL BACKGROUND .....</b>	<b>10</b>
3.1 Desk-Based Assessment.....	10
<b>4 BUILDING RECORDING .....</b>	<b>14</b>
4.1 Introduction .....	14
4.2 Plaster Ceiling in Room 6 .....	14
4.3 Decorated Joists in Room 24.....	20
4.4 Additional Features .....	24
4.5 The Roof.....	24
<b>5 ASSESSMENT OF THE SIGNIFICANCE .....</b>	<b>34</b>
5.1 Introduction .....	34
5.2 Building Investigation.....	34
5.3 Assessment of the Significance.....	36
5.4 Quantification of Importance .....	36
5.5 Conclusions of Importance .....	38

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<b>6 CONCLUSION.....</b>	<b>39</b>
6.1 Impact Assessment.....	39
6.2 Recommendations .....	40
<b>7 BIBLIOGRAPHY .....</b>	<b>42</b>
7.1 Primary and Cartographic Sources.....	42
7.2 Secondary Sources .....	42
<b>8 ILLUSTRATIONS .....</b>	<b>44</b>
8.1 Figures.....	44
8.2 Plates .....	44
<b>APPENDIX 1: PROJECT BRIEF .....</b>	<b>46</b>
<b>APPENDIX 2: PROJECT DESIGN.....</b>	<b>50</b>
<b>APPENDIX 3: REPORT ON THE PLASTER CEILING.....</b>	<b>59</b>
<b>APPENDIX 4: REPORT ON PIGMENT ANALYSIS OF PAINTED BEAMS .....</b>	<b>63</b>

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## SUMMARY

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The Two Lions Public House, Great Dockray, Penrith, Cumbria, a Grade II\* listed building (LB no 25303, HER 4994), was the subject of a planning application (planning reference 3/05/0956) in 2006 for internal and external alterations to the building, as well as the demolition of a nineteenth-century extension at the rear. This was part of a wider scheme to redevelop land adjacent to Southend Road (planning reference 3/05/0954), that included a superstore with associated car parking, as well as housing and retail units. The wider redevelopment site, known as Penrith New Squares, was subject to an overall desk-based assessment by Oxford Archaeology North (OA North).

As part of the assessment to understand the archaeological potential of the development site, a separate assessment was also carried out of the Two Lions to inform and understand the constraints of the building in the drawing up of proposals for redevelopment or refurbishment. Following this, in June and July 2006, an English Heritage Level III building investigation and supplementary desk-based assessment was carried by OA North in order to inform the planning process, following requirements by English Heritage and Cumbria County Council Historic Environment Service (CCCHES). This work was carried out prior to any redevelopment and a number of recommendations for further archaeological work in mitigation of any proposed development were detailed. This included, specialist conservation and recording of the decorative internal plaster ceiling in the former bar room (Room 6) and detailed recording and analysis of a number of joists with painted decoration revealed below the floorboards in the room above the bar (Room 24). Recommendations were also made for the recording of any historic walls or ceilings below later fabric during scheduled internal soft-strip works. The required archaeological work commenced in 2008, but was halted soon after due to setbacks in the funding of the scheme.

In 2012, OA North was requested to resume the work by Henry Riley LLP, on behalf of their client, Sainsbury's Supermarket Ltd. Consequently, OA North undertook the completion of the record, by survey, of the plaster ceiling in Room 6, the decorated joists in Room 24, together with the roof structure which was revealed during removal of the slates, along with other detail revealed by removal of later fabric in other parts of the building. A watching brief was also carried out during the removal of scaffolding and protective foam from the plaster ceiling in Room 6.

The ceiling was found to be in relatively stable condition and probably remained unchanged since at least the detailed inspection carried out in 2008, which highlighted three main areas of concern; the condition of the ceiling, its substrate and the painted joists; possible effects of building work; treatment and appearance of those features in the renovated building. These concerns are still valid and no work on the ceiling, other than the recording outlined and basic protection from on-going building works, appears to have been carried out. The recording work revealed that the ceiling was still covered with extensive areas of modern paint which, during removal of the protective foam, was pulled or flaked off with the strong adhesive tape used to stick the protective foam to the ceiling. A number of recommendations were made following the 2008 inspection, and the implementation of each one is essential if the ceiling is to be preserved and conserved.

The decorated joists were observed to be in stable, albeit dirty, condition, being protected for the most part by the floorboards. The survey and subsequent paint analysis revealed that the decoration was applied in a single layer with carbon black pigment. It remains unknown if the beams were ever part of a previous decorative ceiling visible in Room 6. Evidence suggest the beams themselves been cut or split possibly indicating reuse from elsewhere and there was no evidence of decoration applied to the underside of the covering floorboards. It remains conjectural whether the beams formed a previous decorative ceiling in the room.

The Two Lions, given its current statutory status as a Grade II\* listed building, is of *national importance*. Individual elements such as the plaster ceiling and decorated beams, which contribute to the statutory status of the building, are also of *national importance*. The building's connection to the Lowther family and the nature of the fabric within reinforce this importance. The parts of the building at most risk from significant impact currently are the plaster ceiling in Room 6, and the decorative joists above it in Room 24. The scale of the impact upon the ceiling and joists, due to future building work on the Two Lions cannot be underestimated and is *substantial*.

Before any further building work, it is recommended that in, the short term, a protective covering be re-instated over the heraldic plaster ceiling in Room 6. A number of longer-term measures are recommended, such as the concealment or conservation of the plaster ceilings (including that in Room 24) and joists. For the most part, the amount of fabric revealed during the current phase of building work added little further significant detail to the main survey carried out by OA North in 2006. Should further significant internal fabric, such as wall finishes, be removed, then the presence of a buildings archaeologist should be considered necessary.

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## ACKNOWLEDGEMENTS

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Oxford Archaeology North (OA North) would like to thank Bob Green of Henry Riley LLP for commissioning the project on behalf of Sainsbury's Supermarkets Ltd. Particular thanks are due to Paul Gadston of Thomas Armstrong Construction for his assistance on site.

The building recording was undertaken by Karl Taylor. The report was written by Karl Taylor, who also compiled the drawings. The project was managed by Emily Mercer, who also edited the report.

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## 1 INTRODUCTION

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### 1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 The Two Lions Public House, Great Dockray, Penrith, Cumbria, a Grade II\* listed building (LB no 25303, HER 4994), was the subject of a planning application (planning reference 3/05/0956) in 2006 for internal and external alterations to the building, as well as the demolition of a nineteenth-century extension at the rear. This was part of a wider scheme to redevelop land adjacent to Southend Road (planning reference 3/05/0954), that included a superstore with associated car parking, as well as housing and retail units. The wider redevelopment site, known as Penrith New Squares, was subject to an scheme-wide desk-based assessment by Oxford Archaeology North (OA North) (OA North 2005a).
- 1.1.2 As part of the assessment to understand the archaeological potential of the development site, a separate assessment was also carried out of the Two Lions to inform and understand the constraints of the building in the drawing up of proposals for redevelopment or refurbishment (OA North 2005b). Following this, in June and July 2006, an English Heritage Level III building investigation (English Heritage 2006) and a supplementary desk-based assessment was carried out (OA North 2006) in order to inform the planning process, following requirements by English Heritage and Cumbria County Council Historic Environment Service (CCCHES; *Appendix 1*). This work was carried out prior to any redevelopment, with a number of recommendations for further archaeological work in mitigation of the proposed development. This included; specialist conservation and recording of the decorative internal plaster ceiling in the former bar (Room 6, Fig 2), and detailed recording and analysis of a number of joists with painted decoration revealed below the floorboards in the room above the bar (formerly Rooms 22, 23 and 24 now just a single room, Room 24, Fig 2). Recommendations were also made for the recording of any historic walls or ceilings concealed by later fabric during scheduled internal soft-strip works. Work began on the required archaeological work in 2008 following acceptance of a project design (*Appendix 2*) submitted by OA North, which also included the commissioning of a specialist report on the condition of the plaster ceiling and decorative joists which provided further recommendations for the treatment of the ceiling (*Appendix 3*). However, funding problems led to the development being halted in 2008.
- 1.1.3 In 2012, OA North was requested to resume the work by Henry Riley LLP, on behalf of their client, Sainsbury's Supermarket Ltd. Consequently, in November and December 2012, OA North undertook several visits to the Two Lions Public House in order to complete the record, by survey, of the plaster ceiling in Room 6, the decorated joists in Room 24, together with the roof structure which was revealed during removal of the slates, and any other detail revealed by removal of later fabric in other parts of the building. A watching brief was also carried out during the removal of scaffolding and protective foam from the plaster ceiling in Room 6.



- 1.1.4 This report sets out the results of the mitigation phase of recording and investigation in the form of a short document outlining the findings, followed by a statement of the impact of the building works and recommendations for any further work.

## **1.2 LOCATION AND GEOLOGY**

- 1.2.1 The development site lies to the south of the town centre of Penrith. The Two Lions Public House is positioned at the rear of a courtyard which fronts onto the southern end of Great Dockray (NGR 51560 29970; Fig 1).
- 1.2.2 Penrith lies on the south-western edge of the Eden Valley, where most of the area is underlain by sandstones and mudstones of Permo-Triassic age, which area generally covered by glacial deposits (Countryside Commission 1998, 40).

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## 2 METHODOLOGY

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### 2.1 PROJECT DESIGN

- 2.1.1 In consultation with CCCHES it was agreed that the latest phase of mitigation investigation and recording would be in accordance with the original project brief (*Appendix 1*) and project design (*Appendix 2*) as the work was a continuation of that originally initiated and halted in 2008.

### 2.2 DESK-BASED ASSESSMENT

- 2.2.1 A detailed desk-based assessment was carried out by OA North in 2005 (OA North 2005a) together with a supplementary desk-based assessment in 2006 (OA North 2006). The results of the desk-based assessments will not be fully reproduced here, only a précis will be provided of those results specific to the parts of the building subject to detailed survey.

### 2.3 BUILDING INVESTIGATION

- 2.3.1 The Two Lions Public House was investigated to an English Heritage Level III-type standard survey, which comprised a descriptive record combined with drawings and a detailed photographic record (OA North 2006).
- 2.3.2 **Descriptive Record:** written records using OA North *pro forma* record sheets were made of structural elements, both internal and external, as well as any features of historical or architectural significance. Particular attention was also paid to the relationship between areas where development and any alterations could be observed. These records are essentially descriptive, although interpretation is carried out on site as required.
- 2.3.3 **Site drawings:** drawings of the plaster ceiling and plans of the decorative joists were produced using a *Leica 805* reflectorless total station and *TheoLT* plugin software running within *AutoCAD* on a portable tablet computer.
- 2.3.4 **Photographs:** all survey photographs were taken in both monochrome print and high-resolution digital format using SLR Cameras. A range of lenses were used including wide angle, telephoto and shift lenses. The digital photography was undertaken with a 'full-frame' *Canon EOS 5D* 12.8 megapixel DSLR camera and saved as both CR2 and JPEG files and a 'APS-C' *Canon EOS 550D* 18 megapixel DSLR camera. A rectified photographic survey of the plaster ceiling and decorative joists was carried out, which involved surveying of temporary survey targets attached to the ceiling and joists. Photographs were then captured using the DSLR camera and the rectification was carried out with *Kubit PhoToPlan* plugin software running within *AutoCAD*. The roof structure was subject to a very detailed photographic record from multiple viewpoints including aerial images taken from a pole-mounted DSLR.

## 2.4 WATCHING BRIEF

- 2.4.1 In order to record the plaster ceiling in Room 6, protective foam padding and supporting structure needed to be removed in order to provide a clear view. A date for the removal of the structure was agreed with the main contractors and a buildings archaeologist was present during the procedure in order to ensure the safe removal of the foam without damaging the ceiling. The work was constantly monitored and supervised in order to detect damage, the condition of the ceiling being unknown as it had remained covered for two years. The procedure would be halted and the protection refitted if the ceiling exhibited any signs of structural failure. A general photographic record of the procedure was compiled using the same equipment as outlined in *Section 2.3.4*.
- 2.4.2 Following completion of the recording of the ceiling and during following repeat visits to record other parts of the building, the ceiling was observed to have been left uncovered and unprotected.

## 2.5 PAINT ANALYSIS

- 2.5.1 Samples of approximately 1cm square were removed of the paint and wood substrate from a number of joists below the floor in Room 24 using a scalpel. These were bagged and packed into padded crystal sample boxes, and labelled as to their origin.
- 2.5.2 The samples were examined under x16 light microscopy to determine the number of paint layers present, and to test the solubility of the pigment. The paint was tested with a range of solvents to determine solubility. The fragments selected for analysis were then surface cleaned using industrial methylated spirits (IMS) to remove loose dust contamination.
- 2.5.3 The cleaned samples were cut to a suitable size (<5x5mm), using a razor blade and scalpel, with as much of the wood substrate removed as possible. Samples were mounted on aluminium stubs using double sided tape for scanning electron microscope (SEM) examination and energy dispersive X-ray spectroscopy (EDS) analysis. SEM examination used an Hitachi TM3000 facility and EDS used an Oxford Instruments Swift ED3000 facility, operated alongside the SEM system. A report on the results was produced (*Appendix 4*), a précis of which has been included below (*Section 5.2*).

## 2.6 ARCHIVE

- 2.6.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with current IfA (IfA 2009) and English Heritage guidelines (English Heritage 1991). The paper and digital archive will be deposited with the Carlisle Record Office, with the Penrith New Squares development archaeological work archive, on completion of the project, and a paper copy will be sent to the Cumbria Historic Environment Record, Kendal.

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## 3 HISTORICAL BACKGROUND

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### 3.1 DESK-BASED ASSESSMENT

- 3.1.1 **Introduction:** the following historical background is a summary of the desk-based assessment results from the previous OA North reports of 2005 and 2006 (OA North 2005a and 2006). Only those elements of the background pertinent to the areas recorded as part of this current phase of work are included.
- 3.1.2 **Origin of the Two Lions Public House:** the earliest probable reference to the building now known as the Two Lions Public House appears in deeds dated to 21<sup>st</sup> August 1584, when Gerard Lowther purchased a house called 'Newhall' together with several plots of land (Watson 1901, 97). The plaster ceiling in Room 6 (Fig 2) exhibits the date of 1585. The bedroom above (Room 24) exhibits a date of 1586; the arms of Lowther; and the letters 'G L L' (Gerard and Lucie Lowther) suggesting that soon after purchase the Lowthers made some alterations to their new property.
- 3.1.3 Lucie Lowther died in December 1596, Gerard Lowther died in July 1597 (*ibid*) and the property was sold by a different Gerard Lowther (nephew of Gerard the elder) to a Mrs Mary Grame (Graham) in 1626 (*op cit*, 99). The house was sold in two parts, although it is not understood how, in 1656 and 1659, by the heirs of Mrs Graham to a Mr Thomas Langthorne, during which time the house had changed names from Newhall to Dockray Hall (*op cit*, 100). However, Pevsner suggested that the Gloucester Arms (dated to the late fifteenth century) was formerly known as Dockray Hall, adding some confusion (Pevsner 1967, 177).
- 3.1.4 Langthorne acted as Justice of the Peace for Penrith, and one of his duties was to carry out marriages. Watson suggests that marriages would have taken place under Langthorne's roof at Dockray Hall '*where the nuptial knots would be tied under the heraldic ceiling displaying the great marriage alliances of the ancient Lowthers*' (Watson 1901, 103). These shields have an apparent flaw and it has been suggested that the workmen who modelled them for the parlour (Room 6) in 1586 were to blame. The error was that they were carved direct, instead of reversing the design for the mould in which the shield was to be cast, with the result that the design on the moulded shield appeared reversed, the wife's family arms 'impaling' (coming before) the husband's (Jackson 1880, 416; Plate 2; Figs 2 and 3).
- 3.1.5 The first available cartographic evidence for a building on the site of the Two Lions dates to 1787 when four separate buildings with a central courtyard are depicted on Clarke's map (Plate 1). This is not particularly representative of the current layout of the Two Lions. Successive maps depict various changes but it is not until the General Board of Health map of 1852 that the composition of the site is clearly represented (Plate 2).

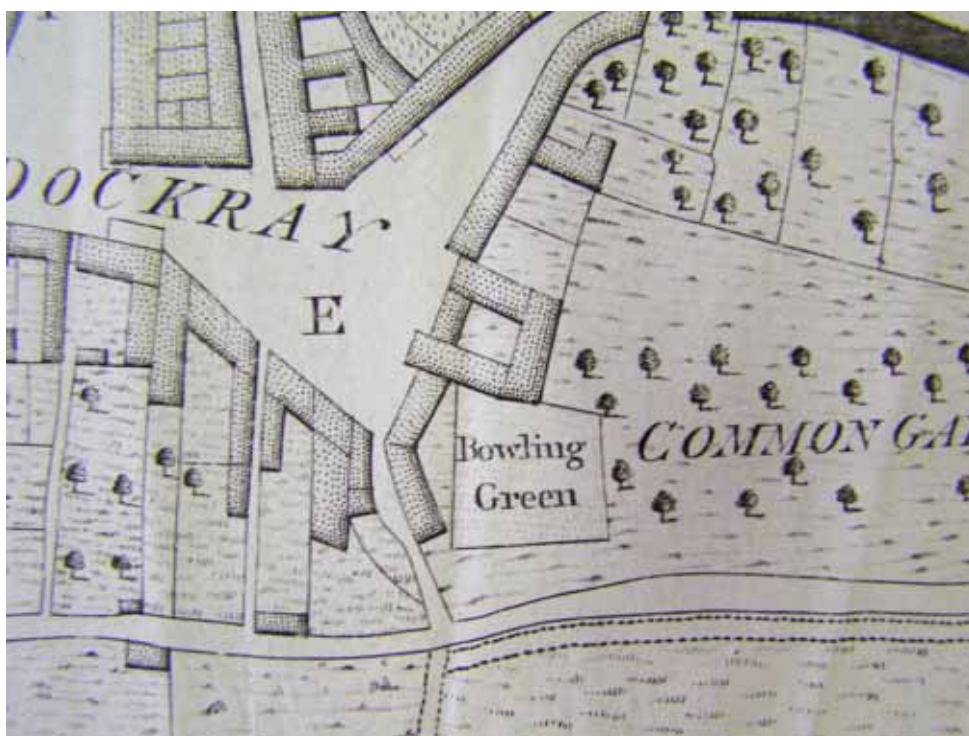


Plate 1: Clarke's map of 1787 showing the layout of the buildings (east is at the top)

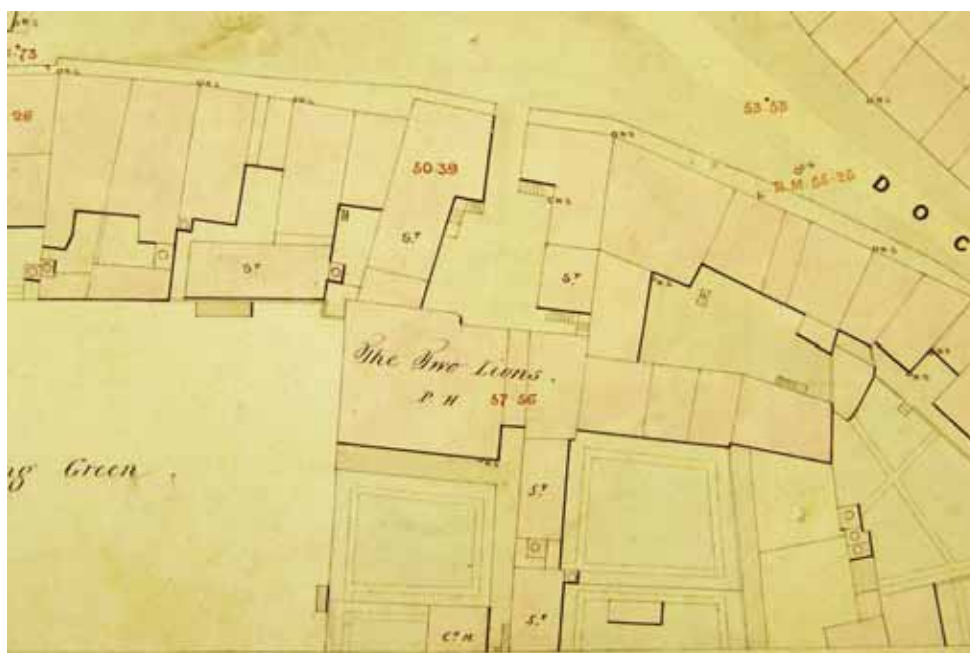


Plate 2: 1952 Board of Health map showing the changes in the layout of the buildings

3.1.6 The Two Lions is first named directly as 'The Two Lions P.H.' on the General Board of Health map (Plate 2). Only three years prior to this, in 1849, the property was described on the tithe apportionment as a house belonging to a John Atkinson (CRO(C) DRC/8/150). He was listed under 'chair makers and turners' in an 1829 trade directory (Parson and White 1829). The house must have been converted to a public house very soon after the tithe map was

published, and was apparently named after Gerard Lowther's wife Lucie Dudley's family arms of a lion rampant with forked tail (Jackson 1880, 417). This was represented on an internal shield, as a single lion with two tails, not a single forked tail, thus the original person who named the public house mistakenly thought there were two lions present not one (Watson 1901, 100).



Plate 3: 1900 Ordnance Survey map, showing the addition of the extension

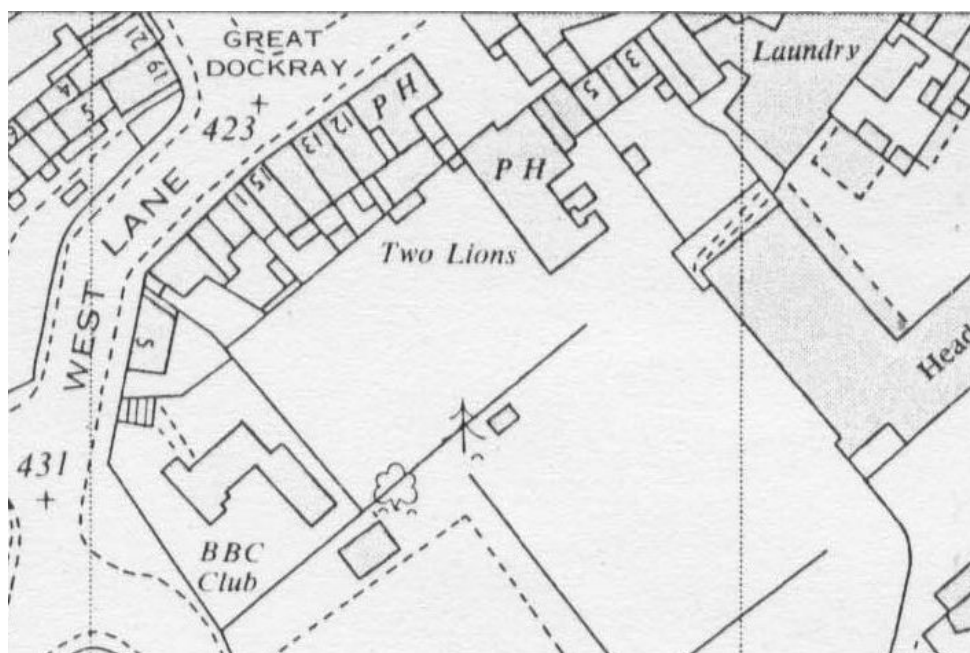


Plate 4: Ordnance Survey map of 1967-71 showing alterations

3.1.7 The mapping evidence shows that there was relatively little change to the majority of the site between the publication of the Board of Health map in 1852 and the Ordnance Survey Map of 1957. The main change which was first depicted on the 1900 Ordnance Survey map was the addition of a large extension to the rear (recently demolished as part of the redevelopment). This must have been added between 1865 and 1900 as it is not depicted on the 1865 Ordnance survey map. The layout remains relatively stable until the Ordnance Survey map of 1967-71 (Plate 4). This map depicts several changes, mainly the demolition of numerous buildings surrounding the Two Lions, most visibly, the removal of one of the buildings fronting Great Dockray which opened up the courtyard at the front of the building.

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## 4 BUILDING RECORDING

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### 4.1 INTRODUCTION

- 4.1.1 The Two Lions Public House was subject to a detailed building programme of building investigation by OA North in 2006 (*ibid*). A full descriptive record and analysis of the results is presented in the 2006 report. The results of the current phase of work, outlined below, are a continuation of the 2006 building investigation, recording detail hidden from view in 2006. It is not, therefore, within the scope of this phase of recording to re-investigate those areas already recorded.
- 4.1.2 This phase of work comprised the watching brief and subsequent recording of the plaster ceiling in Room 6 (the bar area); the decorated joists in Room 24 (the room above the bar); the roof structure, including stripped internal partitions between Rooms 30 and 31; and a fireplace in Room 20. The positions of the rooms are presented in Figure 2.

### 4.2 PLASTER CEILING IN ROOM 6

- 4.2.1 At the commencement of the redevelopment of the Two Lions, a protective cover was fitted below the plaster ceiling in order to shield the ceiling from any potential damage. This comprised a layer of foam covered by plywood sheets supported by acro props. Prior to recording of the plaster ceiling, the removal of props supporting the protective foam was required. During this, a watching brief was maintained, as outlined in *Section 2.4*. Each prop and plywood board was taken down and the foam then removed (Plate 5).



Plate 5: Removal of the protective covering on the plaster ceiling



- 4.2.2 Following the removal of the plywood sheets, it became apparent that the protective foam pieces were fixed to the ceiling with black, cloth-backed adhesive tape. (Plate 6). Removal of the foam pieces led to the adhesive tape removing the paint from the plaster ceiling (Plate 7).



Plate 6: Protective foam *in situ*



Plate 7: Removed foam piece showing adhered paint and self adhesive tape

- 4.2.3 Consequently, further removal of the pieces was halted, and the ceiling was inspected by the OA North buildings archaeologist. The inspection revealed that there was no resultant damage to the plasterwork where the paint had been removed, and the paint was found to be a modern 'gloss' type, which was not very well adhered to the ceiling. Removal of the foam blocks therefore continued, with no apparent structural damage, although many areas of paint had come away.

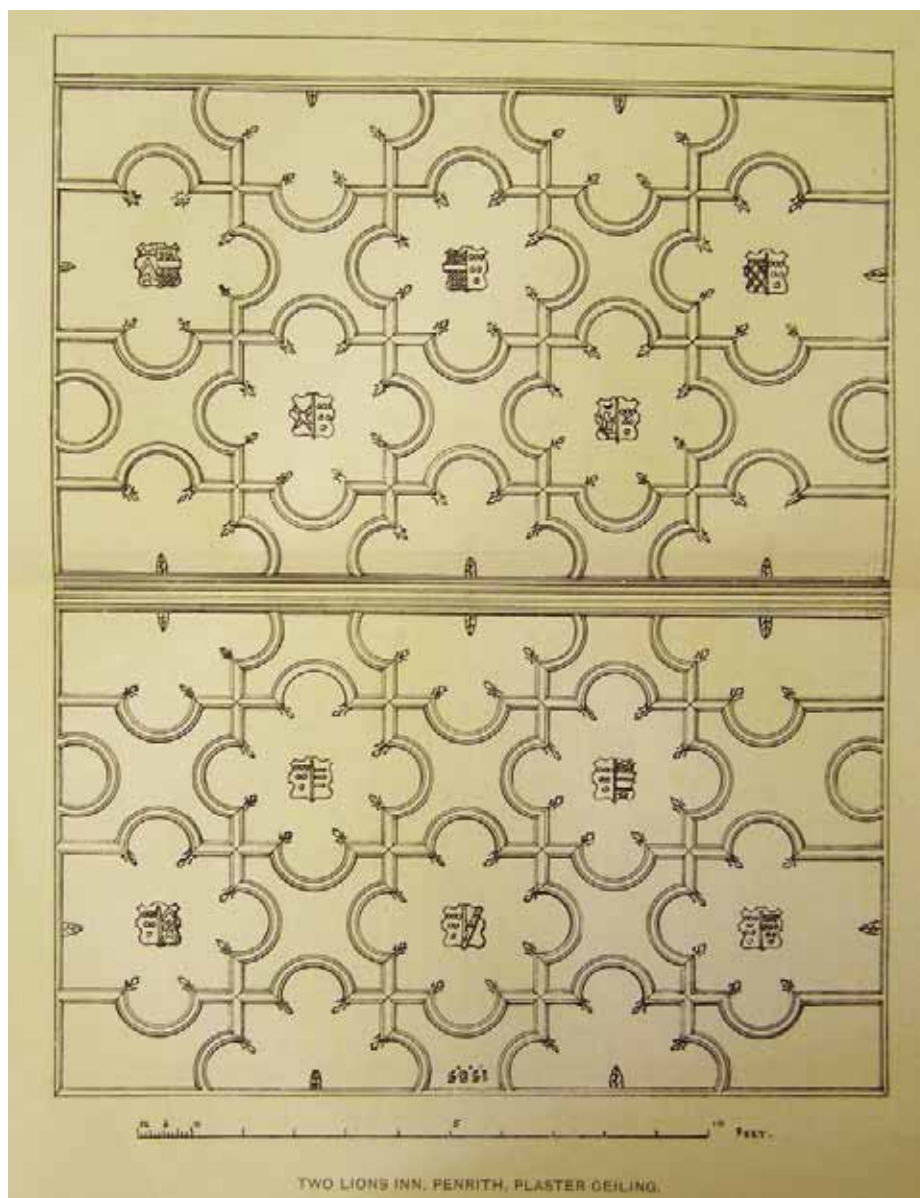


Plate 8: Plan of the ceiling drawn by Mr Hippolyte Blanc (in Jackson 1880)

- 4.2.4 A detailed description of general appearance of this room is outlined in *Section 5.3* of the previous OA North report (2006). The heraldry of the ceiling has already been described in some detail (Jackson 1880, Watson 1901), and plans of the ceiling were produced by both Jackson (although drawn by a Mr Hippolyte Blanc of Edinburgh) (Jackson 1880, 418 – 419), and Watson (Watson 1901, 96 – 97). Jackson's plan is the most accurate of the two, with all of the moulded plasterwork being outlined (albeit not in great

detail), including the leaves and fleur-de-lys (Plate 8). The date is upside down and, perhaps as an attempt to create a reflected ceiling plan, the shields are mirrored but drawn as though visible from below, not above. The plan of the ceiling illustrated in Watson is more simplistic, with the moulded plasterwork being incorrectly depicted and, perhaps more importantly, the outlines of the shields are not correct, together with reconstructions rather than accurate representations of the heraldry (Plate 9). It appears that the plan in Watson is a reproduction of the earlier plan drawn by Blanc, with the coats of arms being ‘restored to their proper Blazonry’ (Watson 1901) by drawing the ceiling as a reflected ceiling plan.

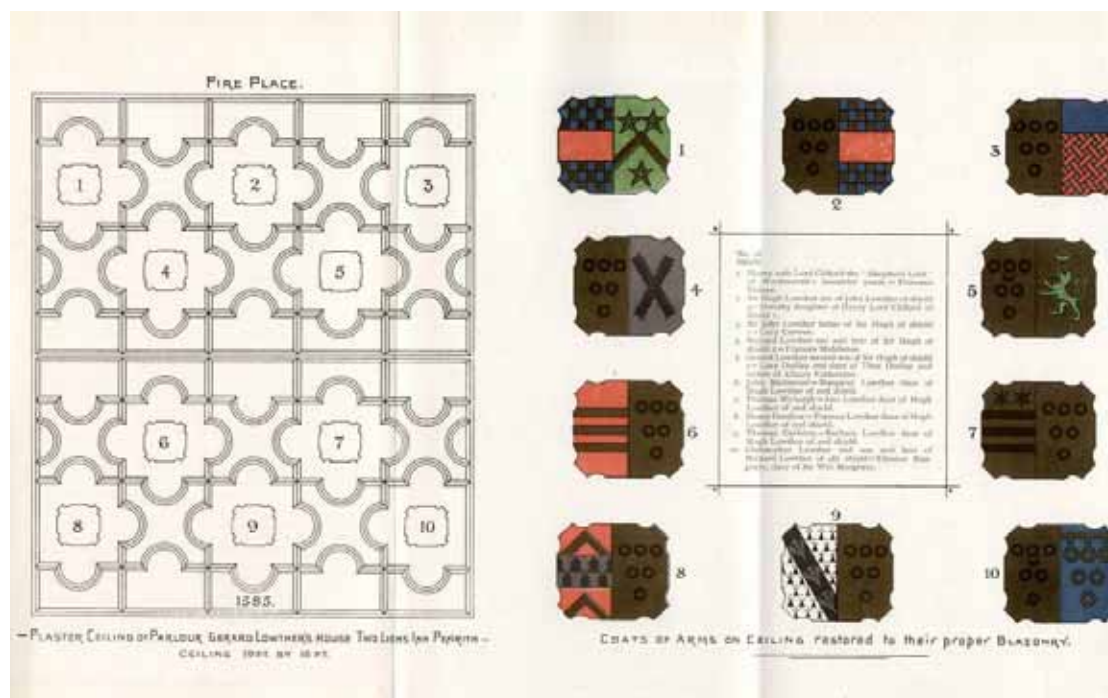


Plate 9: Plan of the ceiling and coats of arms (after Watson 1901)

4.2.5 Figure 3 is an accurate plan of the layout of the plaster ceiling, including the details of the mouldings and the location of the shields. The shields are numbered from 1 to 10, each of the shields being given the same number as those in the plan illustrated in Watson 1901. The plan is not reflected, rather a true representation of the ceiling as seen from below, Figure 4 is a reflected ceiling plan (drawn as if looking down on a ceiling through the floor from above, reflected in an imaginary mirror just below the ceiling) and shows the correct intended appearance of each of the shields.

4.2.6 The ceiling for the whole of Room 6 comprises three separate sections, two of which are decorative, and are divided by a moulded beam that rests on a corbel set within the west elevation (this beam is visible from above in Room 24, see Section 4.3.2) (Fig 2). The third section at the south end of the room is plain and not described here. Two further, plain beams, are present at the north and south ends of the decorative ceiling. The two decorated ceiling sections are symmetrical about the moulded beam and are mirror images of each other (apart from the shields). Each decorative ceiling section measures 4.9m by 3m. There are 22 panels, divided by simple mouldings, within each of the ceiling

sections. The panels are full or parts of barbed quatrefoils, there being three full barbed quatrefoil panels. At each internal point between the barbs and petals of each quatrefoil, are moulded fleur-de-lys, there being eight within each full quatrefoil (Plate 10). Each full quatrefoil measures approximately 1.45m by 1.45m.



Plate 10: Example of a barbed quatrefoil panel showing fleur-de-lys and the shield

- 4.2.7 Along the long edges of each section of ceiling, are eight moulded palmette motifs that may represent anthemion leaves (Fig 3, Plate 10). There are three along the central long edges of both ceiling sections and two along the outer long edges (Fig 3). In addition to these, there are three fleur-de-lys motifs on the short edges that project inwards. There are two on the south section and one on the north section. In the middle of the north long side of the northern section of ceiling the date 1585 is moulded in relief (Plate 11). There are three full stops between the numerals (Plate 11).
- 4.2.8 In 2008, the ceiling was inspected by Durham University Conservation Services, the detailed results of which are in *Appendix 3*. The inspection concentrated on the condition of the plaster ceiling as well as the painted joists in the Room 24 above. The inspection revealed the plaster to be fairly sound with no loss of the pargetting. There were some cracks below the paint, but the main detriment to the ceiling's condition was deterioration, peeling and cracking of modern layers of paint.
- 4.2.9 It was revealed that the ceiling had been painted many times, latterly with oil-based paint, which was peeling and flaking. A fragment of the peeling paint was removed and examined under X16 magnification and evidence of at least eight layers of paint. There were three layers of oil-based paint; a layer of

red/brown scumble; two layers of water-based emulsion; and at least two layers of distemper.



Plate 11: Date on the east section of the plaster ceiling



Plate 12: Example of moulded motif on one of the long edges of the ceiling

4.2.10 The whole ceiling was, at the time of the survey, still painted with gloss paint, that obscured much of the definition and detail of the shields, fleur-de-lys and palmette decoration. Much of the paint appeared not to be firmly adhered to plaster work; indeed, a significant amount of the paint, particularly on the mouldings, was flaking off. As already outlined in *Section 4.2.2*, some of the

paint came away when the protective foam was removed. At the time of inspection, many cracks were still evident, most of which appeared to be old and none of which appeared to have developed since 2008.

### 4.3 DECORATED JOISTS IN ROOM 24

4.3.1 This part of the building was once divided to form three smaller rooms: Rooms 24, 25, and 26. The dividing partitions have been removed to form a single larger room (Fig 5), which will be called Room 24 from here on. The three rooms have already been described in some detail previously (OA North 2006). The following section outlines the nature of the decorated joists. During the building investigation carried out by OA North in 2006 (*ibid*), a section of floorboard in smaller Room 24 had been removed during previous building work (Plate 13). This revealed the existence of several north/south-aligned ceiling joists approximately 0.46m apart, the vertical faces of which were decorated (Plate 14). These were not recorded in detail at the time but following recommendations made in the report, were inspected in 2008 by Durham University Conservation Services (*Appendix 3*)



Plate 13: Removal of a floorboard revealed several decorated joists

4.3.2 At the time of the survey, the removal of the internal partition walls to form the current large Room 24 had already been carried out, and a further floorboard was found to have been removed revealing further examples of decorated joists (Fig 6). In total, 16 joists were visible, of which 14 were able to be recorded, each visible vertical face being recorded with a rectified photograph (Figs 7-11). A removed floorboard in the middle of the room revealed the existence of a central east/west cross-beam (Fig 11, Plate 15) to which it appears the joist ends were fixed, there may, therefore, be a total of 24 separate joists, 12 on each side of the cross-beam. This cross-beam is in the same position as the moulded beam separating the two sections of decorative

ceiling in Room 6 below, thus implying that this is the top face of the beam (see *Section 4.2.6*).



Plate 14: Example of a decorated joist below the floorboards in Room 24



Plate 15: Central beam showing the ends of the decorated joists

4.3.3 The longest section of removed floorboard spanned the whole width of the room from the east and west walls, below which were 12 north/south-aligned joists. Each of the joists was numbered, commencing with Joist 1 at the west side (Fig 6), and each measured approximately 0.19m (7.5 inches) wide by 0.076m (3 inches) deep, except for Joists 10 and 12 that measured 0.139m (5.5 inches) by 0.09m (3.5 inches). Most of the joists were between 0.2m and 0.27m apart. There is some evidence of adze marks on the upper faces of some of the joists, Joist 11 being a particularly good example (Plate 16).

4.3.4 The soffits all of the joists were obscured by the ceiling of Room 6 below which is the decorative plaster ceiling dated to 1585 (see *Section 4.2*). The

ceiling was firmly fixed to the joists. The floor had been levelled out at some stage by the insertion of packing pieces between the boards and the joists.



Plate 16: Example of adze marks on the upper face of Joist 11

- 4.3.5 The decorative pattern is relatively consistent on each of the joists and comprises a sinuous, undulating band of one thick and two thin lines with leaf-like or palmate foliar patterns either side (Figs 7-10). The pigment is all the same colour, very dark brown or black, and the application and style is quite fluid, most of the design having the appearance of being applied in single brush strokes. Most of the visible decoration is in fairly good condition, with just a few joists exhibiting deterioration.
- 4.3.6 The pattern continues off the both the top and bottom edges of decorated face on all of the joists, which suggests that either; the pattern once carried on to the soffits of the floorboards (no pattern is visible on the current floorboards); or the joists have been reduced in thickness and the decoration has been truncated. The second hypothesis may be valid if the joists were reused from elsewhere and they needed to be resized in order to fit in preparation for attachment of the ceiling. If the joists were reused, then it is apparent that they have all come from a single source. A floorboard was removed from the floor of the adjacent Room 20 (Fig 2) revealing plain joists without painted patterns. This means that the decorated joists are restricted to the area above the decorative plaster ceiling.
- 4.3.7 Inspection of the substrate of the plaster ceiling below, revealed a large amount of accumulated debris that obscures the ceiling keys and supporting laths. The keys that were visible were around 0.025m deep and together with a visible lath appeared to be sound.



- 4.3.8 **Paint Analysis:** in order to determine the type of paint used for the decoration, a number of paint samples were taken from four joists, which were amongst those with the most visible and undamaged pattern; Each of the joists was numbered (see Fig 6) from 1 to 16. Samples of paint were taken from the east faces of Joists 3, 13, and the west faces of 8 and 12. A report outlining the results is in *Appendix 4*.
- 4.3.9 The samples were first examined under x16 light microscopy to determine the number layers present, revealing a single layer applied directly to the wood. They were then exposed to several solvents, including water and IMS and acetone. Only the acetone began to dissolve the paint. The samples were then cleaned with IMS in order to remove surface dust. Following examination with SEM, all four samples were found to be visually similar, with an uneven surface due to the paint being directly applied to the wood. The EDS analysis revealed that the paint contained large quantities of carbon with smaller quantities of other earth elements such as calcium-rich material. Low levels of sulphur were also detected, which is probably evidence of atmospheric pollution.
- 4.3.10 The black pigment used for the paint was probably obtained exclusively from a carbon-based source, as no other elements were detected that could produce this colour. Carbon black pigment has been identified amongst pigments used in prehistoric cave paintings (Brunel *et al* 1982), and can easily be obtained from readily available sources such as wood, burnt bone and ivory. It appears that an organic binder was used in the paint due to it being insoluble in water, with binders such as egg, blood, animal fat and plant oils known to have been used in the past (Duran *et al* 2010).



Plate 17: Fireplace revealed following stripping of Room 20

#### **4.4 ADDITIONAL FEATURES**

- 4.4.1 Other more general areas subject to internal stripping and removal of later material were also inspected during the recording fieldwork in order to complete the mitigation recording that commenced during the survey in 2006. Ultimately, during the site visits, very little fabric, other than internal partitions and false walls was removed. The only significant feature revealed following internal stripping in Rooms 20 and 21 was a previously unrecorded fireplace (Plate 17). The fireplace is situated in the west wall of Room 20 (Fig 5). The reveal is moulded, and is 1m high by 0.7m wide; the surround is of sandstone construction. Above the opening, at a height of 1.37m, is a substantial sandstone mantle shelf, possibly indicative of a former fireplace. The grate is cast-iron hob grate, probably of nineteenth century origin, with foliate designs on both the grate and the panels.

#### **4.5 THE ROOF**

- 4.5.1 The Two Lions comprises two main buildings, a three-storey late medieval merchant's house (the west wing), with the principal elevation facing west, and a two and a half-storey extension with cross-passage (the east wing). The roof structure is made up of three principle section; the western section, which is north/south aligned and is over Rooms 25, 26, 27 and 28 (Plate 18); the central section which is east/west aligned over Rooms 29, 30, 31 and 33; and the east section, which is also east/west aligned but with a lower ridge, over Room 32 (Plate 19). All three roof sections are of pitched construction and, prior to stripping, were covered with Welsh slate laid in regular courses.



Plate 18: View of the western section of the roof, facing south

- 4.5.2 **The Western Section:** is a common rafter roof, with 25 pairs of rafters, each one with a collar. All the members are bolted together to form trusses and the whole roof is made of softwood (Plate 18). The rafters are joined at the ridge by a bolted lap joint. There is no ridge piece, nor are there any purlins, just a simple (modern) plank screwed to the rafters on the west side just below the ridge. Each of the members, including all the rafters and beams, measure 7 inches (0.18m) by 2.5 inches (0.063m). There is no access to the roof space due to the small dimensions of the available space.



Plate 19: General view of the eastern and central sections of the roof, facing south-east

- 4.5.3 Detailed inspection of the members revealed the presence of several examples of inscribed, assembly, or ‘carpenter’s’ marks at the joins of the common rafters at the ridge and the collars lower down (Plate 20). Many of the joins are unmarked although some are just visible on the central trusses, but are impossible to inspect. Those joins with marks always exhibit a matching pair of Roman numerals, probably incised into the timber with the end of a chisel, the same number being present on both of the joined members. The numbering system on adjacent trusses is not sequential however, for example, the numbers on a row of adjacent trusses reads XXIII, IIVI, IXX and VIII. There is then a row of unmarked trusses before the next set of numbers.
- 4.5.4 There are three dormers with a gable pitched roof on the west-facing slope of the roof that appear to be contemporary with structure. At the time of the inspection, the dormers were being partially rebuilt and all of the valleys had been replaced. The gables of the dormers were of squared stone, although this was not present at the time of current inspection. Each gable of the main roof has a projecting chimneystack at the apex, both of which are of stone construction with a drip course of thin stone and oversailing course of moulded ashlar. The flaunching of both chimneys is cement-set, into which are plain square pots, and four on the south side and three on the north.

- 4.5.5 The upper side of the ceiling of Rooms 25, 26, 27 and 28 is visible, which is fixed to the collar and the lower half of the rafters to form a garret. This is of lath and plaster construction.



Plate 20: Detailed view of assembly marks on the trusses of the western roof



Plate 21: View of the join between the west and east roof sections

- 4.5.6 **The Central Section:** this section of roof lies on an east/west axis and simply butts against the east slope of the western roof section (Plate 21). The structure of the west roof does not appear to have been altered at all to accommodate the central roof section, the rafters of the central section simply rest on the rafters of the east slope of the west section. The purlins and ridge purlin extend to the

east slope of the west roof. There are no valley rafters present. The external appearance of this central section of the roof is clearly different to that of the west section, in that it is not as regular in its construction (Plate 22)



Plate 22: General view of the central and eastern roof sections

- 4.5.7 There are two trusses, each with a king post (Plate 23). The tie beams form part of the ceilings of Rooms 17 and 18 but are not visible from within these rooms. The east truss has a strut close to the foot of the principal rafters, which is bolted to the rafter. The trusses are not clearly visible as much of the roof structure is occupied with garret rooms (Rooms 29, 30 and 31). Assembly marks are visible at the apex of each truss in both the king post and principal rafters. These are simple numerals punched in to the east face of the members with the blade of a chisel. The trusses are numbered with the west truss being truss number I. A further, smaller, truss is present close to the join with the east slope of the west roof section. This sits atop a section of the wall frame that forms the west wall of Room 30. Due to the inaccessible nature of the space, this was unable to be inspected. The feet of the trusses are set into the top of the walls on both sides, the common rafters rest upon sandstone tiles. There is a substantial step down to this roof space from the central roof section and there is no evidence present of any garret rooms within this area of the roof.
- 4.5.8 There are four rows of trenched purlins on each side of the trusses together with a ridge purlin. Most of the purlins appear to be of the same or similar dimensions and are discontinuous, the joints between lengths of purlin being of simple lap joints. Each purlin is around 2m long (6 feet) which reflects the width of each bay. The ridge purlin is supported by the king posts, and each principal rafter is tenoned into the king post head. Most of the main members of the roof frame exhibit tooling such as axe or adze marks to a certain degree, some of the common rafters are clearly sawn and exhibit both circular and straight saw marks. The king post measures approximately 0.15m by 0.14m (6

inches by 5.5 inches). There are four rows of common rafters, each end of which being nailed to the purlins (Plate 26). Some are obvious recent replacements but most appear to be of split timber (some with bark attached), although a substantial number exhibit saw marks. Most of the nails are square-section rose-headed, and are approximately 0.13m (5 inches) long. The lower rafters have oak laths nailed to the soffits, which form the ceilings of the garret rooms (Rooms 29, 30 and 31).



Plate 23: Visible king post above Rooms 30 and 31

4.5.9 The garret rooms are accessed from the first floor via a flight of stairs and a short corridor. They are formed by partition walls of either lath and plaster or timber panelling (Plate 24), and are quite small. The rooms are lit by dormer windows which, at the time of the survey, were being replaced with new plywood and softwood constructions (Plates 21 and 23). The partition walls of these rooms are attached to a timber frame, the main members of which exhibit some tool marks such as axe and adze marks. Several beams have been inserted in between the trusses in order to form the frame. Most of the panelling of the partition walls that is visible appears to be reused, it having been cut to fit the frame.

4.5.10 The timber panelling is quite plain in appearance (Plate 25) and is of rail and muntin construction, without any decoration whatsoever. The rails span the

whole width of the panel, with the shorter muntins in between. Braces have been added, probably in order to provide more support for the wall covering and to support a vertical member that appears to support the ceiling joist. The braces are overlapping, the joint being a halved lap joint (Plate 27). The panelling was concealed beneath lath and plaster, the scars for the laths being immediately visible, that was fixed to vertical battens, in turn fixed to the panels.



Plate 24: Example of a garret room (Room 30) in the central section of roof



Plate 25: Timber panelling revealed in the wall between Rooms 30 and 31



Plate 26: Detail view of the braces and upright member in the panelled wall

4.5.11 There are other timber panels of very similar appearance to those already described, that form lower walls set close to the eaves of the Rooms 30 and 31 on both sides (Plate 27). These too appear to have been reused the panelling on the south side of the roof (Room 31), exhibiting a moulding strip attached to one side (Plate 27).



Plate 27: Section of timber panelling situated on the south side of the roof forming the south wall of Room 30

4.5.12 ***The East Section:*** the construction of this section of the roof is very similar to that of the central roof section. The main difference being that in the north



slope, the ridge and internal floor are stepped down from the central section (Plate 28). There is no evidence present for any garret rooms within this area of the roof.



Plate 28: View of the step down on between the central and east roof sections

- 4.5.13 Dividing the central and east roof sections, is a stone-built gable with projecting chimneystack at the apex (Plate 28). The chimneystack is covered with harling and differs slightly from those on the gables of the west roof section. There is a thin drip course and plain coping, the harling also carries on over to the flaunching. There are three plain square chimney pots and a concrete cowl. The gable wall is of similar appearance to the gables on the west roof section and is constructed of coursed, flat sandstone construction, with both cement and lime mortar. On the south side of the roof slope there is an exposed section of gable wall, at the base of which there is the inscribed date of 1838 (Plate 29). The inscription was made on a substantial stone block into which notches have been made.
- 4.5.14 The east end of the roof space is also defined by a gable with a projecting chimneybreast. Internally, this is plain with no distinguishing features. A chimneystack of similar appearance to that described above straddles the ridge (slightly offset). At the time of the survey the flaunching had been removed and a slate weighed down with stones covered the flue.
- 4.5.15 This section of roof contains two trusses, both of which were in the process of being repaired at the time of the survey (Plate 30). Both trusses are similar in their construction, each being a king post truss, the king posts being bolted to a collar that is itself bolted to the principal rafters at each end. The foot of each of the principal rafters is set within the wall on each side. There are three rows of purlins on each side of the trusses that rest on new cleats. It is apparent that the purlins were formerly trenched into the foot of each of the principal rafters, as there are visible notches. A single queen post supports the north rafter of the

west truss. Both of the trusses exhibit assembly marks at the major joins in the form of simple punched numerals on the east faces. The west truss is numbered I, and the east truss is numbered II. Both of the principal rafters of truss I exhibit evidence of reuse in the form of several square holes (Plate 31). The holes/slots within the north rafter pass all the way through the timber but those on the south truss, although in exactly the same positions, do not. Within each slot are three or four drill or auger holes, indicating how the slots were made. It is possible that the rafters were for use elsewhere before being installed in this roof.



Plate 29: Inscribed date of 1838 in the east-facing gable of the central roof section



Plate 30: East roof section showing the truss construction



Plate 31: The west truss with holes clearly visible in the principal rafters

4.5.16 The purlins and common rafters are of similar appearance and dimensions to those in the central roof section with the timbers exhibiting similar details. All of the surviving rafters are nailed to the purlins. At the time of the survey, the roof was in the process of being repaired and many of the common rafters were being replaced.

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## 5 ASSESSMENT OF THE SIGNIFICANCE

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### 5.1 INTRODUCTION

5.1.1 Following the extensive building survey and desk-based assessment carried out in 2006 (OA North 2006), a detailed discussion of the results was presented in the report. Those results remain largely unaltered as the results of the current phase of work merely add further detail to the corpus of information for the decorative plaster ceiling, painted joists and roof. A discussion of the results of this phase of survey, in terms of the significance of the features and of the buildings, together with appropriate recommendations is presented in the following section.

### 5.2 BUILDING INVESTIGATION

5.2.1 The building investigation carried out in 2006 (*ibid*), prior to any redevelopment, revealed that the Two Lions Public House was a complex multi-phase structure, as suggested by the initial assessment carried out in 2005 (OA North 2005b). The results of the 2006 survey enhanced the initial phasing of the building's development, outlined by the work carried out in 2005 (*ibid*), although much remained conjectural, and this still remains even with this recent investigation, as many of the later wall finishes still remain *in situ* obscuring key relationships.

5.2.2 **Plaster Ceiling:** the ceiling was found to be in relatively stable condition and probably remained unchanged since at least the detailed inspection carried out in 2008 (*Appendix 3*). The (2008) inspection highlighted three main areas of concern; the condition of the ceiling, its substrate and the painted joists; possible effects of building work; treatment and appearance of these features in the renovated building. These concerns are still valid and no work on the ceiling, other the recording outlined in *Section 4.2* and basic protection from on-going building works, appears to have been carried out. At the time of the recording, all protection had been removed and the ceiling remained uncovered.

5.2.3 The recording work revealed that the ceiling was still covered with extensive areas of modern paint which, during removal of the protective foam, was pulled or flaked off relatively easily due to the strong adhesive tape used to stick the protective foam to the ceiling. A number of recommendations were made following the 2008 inspection (*Appendix 3*), and the implementation of each one is essential if the ceiling is to be preserved and conserved.

5.2.4 **Decorated Joists:** during the recording of the joists, they were observed to be in a stable condition, being protected for the most part by the floorboards. They were quite dusty, however, and there was debris between the joists, lying directly on the top of the decorated ceiling substrate. The survey and subsequent paint analysis revealed that the decoration was applied in a single layer with carbon black pigment, commonly used throughout the ages.

Although unable to be inspected, it is reasonable to assume that the decoration covers the whole length of the joist elevations. The soffits of the joists were unable to be inspected, and it remains unknown if the joists were ever part of a previous decorative ceiling visible in Room 6. Much of the decorative elements are truncated, suggesting the decoration either carried on to adjacent timbers, or the joists have themselves been cut or split possibly indicating reuse from elsewhere. In addition, there was no evidence of decoration applied to the underside of the floorboards, but these are probably from a later phase. There is evidence of adze marks on some of the upper faces of the joists, but this may be from initial shaping. No assembly or carpenters marks were discovered during the survey, and the original order of the joists is unknown.

- 5.2.5 The visible central cross-beam (Plate 13) under the floor in Room 24 is the upper face of the large moulded beam dividing the two plaster ceiling sections in Room 6, into which the ends of the decorated joists are slotted. In the short length inspected, there was no evidence of former joins or slots, and all the timbers may be of a single phase. Their original function is unknown but in any case, the joists are certainly from an earlier phase than the ceiling below. They may have originally been decorative beams to adorn the original, first phase merchant's house (OA North 2005b, 2006), prior to Lowther's refurbishment and installation of the heraldic plaster ceiling in Room 6. However, the limited inspection, showing the truncated pattern top and bottom of the joists would imply that they were not painted *in situ* and may be reused from elsewhere, whether this is from within the original building or from another building could not be ascertained during this survey.
- 5.2.6 **Roof structure:** following detailed inspection of the roof, the outline phasing described in *Section 5.2* of the detailed recording survey (OA North 2006, 36) remains unchanged. It was clear from the building investigation carried out in 2006 that; the first phase was T-shaped with several phases of modification and addition over the intervening years (*ibid*, Figs 22-29). The structure of the roof was suggested to have been extensively modified during latter phases of alteration, dating to the mid to late Victorian period. This is borne out by the simple common rafter roof visible above the west wing, the trusses in the central section of the roof, as well as many re-used timbers, including reused trusses in the eastern part of the roof. The date stone of 1838 and scarring visible on the gable between the central and eastern sections of roof adding further evidence of this. Most of the roof (apart from the west section) consists of re-used timbers.
- 5.2.7 The garret rooms situated in the central roof section (Rooms 29, 30 and 31) are divided by lath and plaster covered partition walls. When the lath and plaster was removed, a wooden panel forming the structure of the partition was revealed (*Section 4.5.10*). Given that this section of roof dates to the latter phases of alteration and probably the mid-nineteenth century, it is likely that this panel was installed at this date in order to form the wall. It is probable that the panel is reused and may be of earlier date. It is impossible to deduce the origin of the panel and it may have come from a different building. The north wall of Room 31 is similarly formed of reused panels of similar appearance.

### 5.3 ASSESSMENT OF THE SIGNIFICANCE

5.3.1 In the National Planning Policy Framework (NPPF), the Department of Communities and Local Government (DCLG 2012) sets out the Government’s planning policy and framework for England, and how these are expected to be implemented. It places emphasis on the importance of understanding the significance of any heritage assets affected by the proposed development in order to assess its impact. This would enable the conservation of ‘*heritage assets in a manner suitable to their significance so that they can be enjoyed for their contribution to the quality of life of this and future generations*’ (*op cit*, para 17), or else they can be recorded ‘*and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible*’ (*op cit*, Section 12.141).

5.3.2 Therefore, the following section will determine the nature and level of the significance of the archaeological resource, as detailed in *Sections 3 and 4* of this document, together with the results of previous work carried out in 2005 and 2006. This is an iterative process, beginning with the guideline criteria outlined in Table 1, below. In general terms, the recording of a heritage asset, e.g. a listed building, and any subsequent grading thereafter, by its nature, determines its importance. However, this is further quantified by factors such as the existence of surviving remains or otherwise, its rarity, or whether it forms part of a group. There are a number of different methodologies used to assess the archaeological significance of heritage assets, but that employed here (*Section 5.4*) is the ‘Secretary of State’s criteria for scheduling ancient monuments’ (Annex 1; DCMS 2010).

Importance	Examples of Heritage Asset
National	Scheduled monuments (SMs), Grade I, II* and II listed buildings
Regional/County	Conservation Areas, Registered Parks and Gardens (Designated Heritage Assets) Sites and Monuments Record/Historic Environment Record
Local/Borough	Assets with a local or borough value or interest for cultural appreciation Assets that are so badly damaged that too little remains to justify inclusion into a higher grade
Low Local	Assets with a low local value or interest for cultural appreciation Assets that are so badly damaged that too little remains to justify inclusion into a higher grade
Negligible	Assets or features with no significant value or interest

*Table 1: General guideline criteria used to determine Importance of Heritage Assets*

### 5.4 QUANTIFICATION OF IMPORTANCE

5.4.1 The following section considers the Two Lions building and its architectural features using the DCMS criteria (*ibid*). The information will contribute to the overall assessment in understanding the importance of the Two Lions as a

heritage asset, even though the Two Lions is already deemed to be of national importance, given its status as a Grade II\* listed building.

- 5.4.2 **Period:** the Two Lions building is considered to be highly significant in this respect as it is dated by documentary evidence to at least 1584 when a building called ‘Newhall’ was sold to Gerard Lowther. Several internal features, such as the decorative plaster ceiling dated to 1585 in Room 6, and that in Room 24 (OA North 2005a and 2006), together with the cross passage between Rooms 1 and 2 (*ibid*) attest to this date. However, analysis of the surviving fabric elsewhere in the building suggest a date considerably earlier than this. The decorated joists in Room 24 certainly belong to an earlier phase. Cartographic evidence highlights that buildings have stood on the site since at least 1767.
- 5.4.3 **Rarity:** features such as the plaster ceiling and the decorated joists are exceptionally rare, and have survived the past use of the building as a public house. The Two Lions is considered to be highly significant in this respect.
- 5.4.4 **Documentation:** the Two Lions is inextricably linked to the Lowther family, who are prominent and influential players in both national and regional arena and contributed significantly to the wealth and development of the region. This is borne out by the prominent display of the various Lowther shields. The building has played a prominent role in the history of Penrith, even being used for wedding ceremonies in the 1650s by Thomas Langthorne (Watson 1901, 103). The building finally became a public house in the nineteenth century cementing its important relationship with the town.
- 5.4.5 **Group Value:** the Two Lions is one of a small number of buildings in Penrith that date to at least this period, such as the Pele Tower to Hutton Hall, and the Gloucester Arms. Other buildings occupied or built by the Lowther family for example include Lowther Castle, Lowther, Penrith. Individual features within the building are also of significant group value due to their association with the Lowthers, such as the heraldic plaster ceiling in Room 6 and Room 24 (OA North 2006). The Two Lions is considered highly significant in this respect.
- 5.4.6 **Survival/Condition:** the building has undergone significant alteration since at least 1586, when Gerard Lowther refurbished the once modest merchant’s house (*ibid*), although the core of this first phase has survived relatively well. The most exceptional parts of the fabric to survive are undoubtedly the plaster ceiling and the decorated joists above it. The ceiling and joists have survived to the present day in remarkably good condition. These are considered to be of exceptional importance.
- 5.4.7 **Fragility/Vulnerability:** despite the alteration to the building during its lifespan, a large proportion of the internal fabric was recorded as having been retained. The building as a whole is not considered to be vulnerable to development or demolition presently, as it will remain as a significant structure within the Penrith New Squares development. Certain features, however, are exceptionally vulnerable due to their age and fragility, including the plaster ceilings in Rooms 6 and 24, and decorated joists, and require specialist conservation treatment or protection.

- 5.4.8 **Diversity:** the building has been in existence for approximately 500 years and therefore demonstrates an architectural history rich in significant features from several periods, which together are diverse in range.
- 5.4.9 **Potential:** given that a significant amount of later fabric remains *in situ*, there is a high potential for the discovery of early-phase fabric within the building.

## 5.5 CONCLUSIONS OF IMPORTANCE

- 5.5.1 Using the criteria outlined Table 1, the Two Lions as a whole, given its current statutory status as a Grade II\* listed building, is of national importance. Individual elements such as the plaster ceilings and decorated joists, which contribute to the statutory status of the building, are also of national importance.



## 6 CONCLUSION

### 6.1 IMPACT ASSESSMENT

6.1.1 Heritage assets are considered to be ‘*a finite, irreplaceable and fragile resource*’ (DCMS 2010). Therefore, it has been the intention of this assessment to identify the significance and potential of the Two Lions, and assess the impact of the proposals, thus allowing the advice of National Planning Policy Framework (NPPF) (2012) to be enacted upon. Assessment of impact has been achieved by the following method:

- assessing any potential impact and the significance of the effects arising from the proposals;
- reviewing the evidence for past impacts that may have affected the building or features;
- outlining suitable mitigation measures, where possible at this stage to “*avoid, or minimise conflict between the heritage asset’s conservation and any aspect of the proposal*” (*op cit*, Section 12, 129).

6.1.2 The impact is assessed in terms of the importance, or sensitivity, of the site to the magnitude of change or potential scale of impact during the proposed redevelopment. The magnitude, or scale, of an impact is often difficult to define, but will be termed substantial, moderate, slight, or negligible, as shown in Table 2, below.

Scale of Impact	Description
Substantial	Significant change in environmental factors; Complete destruction of the site or feature; Change to the heritage asset resulting in a fundamental change in ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.
Moderate	Significant change in environmental factors; Change to the heritage asset resulting in an appreciable change in ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.
Slight	Change to the heritage asset resulting in a small change in our ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.
Negligible	Negligible change or no material changes to the heritage asset. No real change in our ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.

Table 2: Criteria used to determine Scale of Impact

6.1.3 The parts of the building at most risk from significant impact currently is the plaster ceiling in Room 6, and the decorative joists above it in Room 24. As outlined in the 2008 inspection report (*Appendix 3*), several factors, such as vibration, mechanical damage, environmental factors and water damage are

relevant when assessing the impact upon the fabric. Prior to the current recording programme, the ceiling has been covered with protective foam, although as outlined, this has adversely impacted upon the ceiling. The ceiling was left uncovered following the survey, so any further building works may have an effect on the ceiling. The decorative joists are mainly covered and therefore, protected to an extent, although the paint is at risk from deterioration. As such, the scale of impact upon the ceiling and joists, due to any further renovation or exposure without adequate conservation is considered to be *substantial*.

6.1.4 Due to the roof being largely altered and remodelled in the nineteenth century, the scale of the impact of building works on the fabric of the roof is considered to be *slight*.

6.1.5 As a significant amount of later fabric remained *in situ* at the time of the survey, the potential for further, hidden, historic fabric remaining is high. Therefore the scale of impact of building works on the remaining fabric of the building is considered to be *substantial*.

## 6.2 RECOMMENDATIONS

6.2.1 Recommendations made in the OA North report of 2006 (OA North 2006, 46) regarding the plaster ceiling are still valid, and perhaps even more pressing given the recent damage to the ceiling caused by the removal of the protective covering. The inspection of the ceiling carried out in 2008 outlined two different courses of action when planning its future in the refurbished building. These were complete conservation of the ceiling to use it as a prominent feature, or conceal the ceiling beneath a protective suspended ceiling. The specifics of both of these courses of action are outlined in *Appendix 3*. In the meantime, immediate recommendations following the recording of both the plaster ceiling and painted joists are outlined in the following section.

6.2.2 ***Plaster Ceiling and Decorated Joists:*** before any further building work, a number of measures should be carried out which are outlined in the recommendations section of *Appendix 3*. If the protective covering on the plaster ceiling needs to be re-instated, it should not be fixed to the ceiling using adhesive tape. There should be a layer of acid-free tissue between the ceiling and supportive material. Both the flat panels and mouldings need to be protected and supported, unlike the previous protective covering which did not support the panel mouldings.

6.2.3 Following completion of the building work, the long term future of both the plaster ceilings and decorative joists will need to be decided upon and the relevant course of action taken, as outlined in *Appendix 3*. The statutory Grade II\* listing of the Two Lions depends, to a great extent, on the survival and condition of features such as the plaster ceiling in Room 6, and its conservation is of the utmost importance, in terms of national significance. In any case, further work to either preserve by concealing, or leaving visible and

conserving the heraldic plaster ceiling and joists should be carried out by suitably qualified conservation professionals.

- 6.2.4 ***Other recommendations:*** for the most part, the amount of fabric revealed during the current phase of building work added little further significant detail to the main survey carried out by OA North in 2006. Nevertheless, given the potential for uncovering of further detail, should further significant internal fabric, such as wall finishes, be removed, then the presence of a buildings archaeologist is recommended.

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## 8 ILLUSTRATIONS

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### 8.1 FIGURES

Figure 1: Site location

Figure 2: Plan showing the locations of room numbers

Figure 3: Ceiling plan of the decorative plaster ceiling in Room 6 as viewed from below showing incorrect heraldry

Figure 4: Reflected ceiling plan of the decorative plaster ceiling in Room 6 as viewed from above showing correct heraldry

Figure 5: First floor plan (revised) showing alterations

Figure 6: Locations of decorated ceiling joists

Figure 7: Rectified Images of Joists 1-4

Figure 8: Rectified Images of Joists 5-8

Figure 9: Rectified Images of Joists 9-12

Figure 10: Rectified Images of Joists 13-14

Figure 11: Rectified Image of spine beam

### 8.2 PLATES

Plate 1: Clarke's map of 1787 showing the layout of the buildings (east is at the top)

Plate 2: 1952 Board of Health map showing the changes in the layout of the buildings

Plate 3: 1900 Ordnance Survey map showing the addition of the extension

Plate 4: Ordnance Survey map of 1967-71 showing alterations

Plate 5: Removal of the protective covering on the plaster ceiling

Plate 6: Protective foam *in situ*

Plate 7: Removed foam piece showing adhered paint and self adhesive tape

Plate 8: Plan of the ceiling drawn by Mr Hippolyte Blanc (in Jackson 1880)

Plate 9: Plan of the ceiling and coats of arms (after Watson 1901)

Plate 10: Example of a barbed quatrefoil panel showing fleur-de-lys and the shield

Plate 11: Date on the east section of the plaster ceiling

- Plate 12: Example of moulded motif on one of the long edges of the ceiling
- Plate 13: Removal of a floorboard revealed several decorated joists
- Plate 14: Example of a decorated joist below the floorboards in Room 24
- Plate 15: Central beam showing the ends of the decorated joists
- Plate 16: Example of adze marks on the upper face of Joist 11
- Plate 17: Fireplace revealed following stripping of Room 20
- Plate 18: View of the western section of the roof facing south
- Plate 19: General view of the eastern and central sections of the roof, facing south-east
- Plate 20: Detailed view of assembly marks on the trusses of the western roof
- Plate 21: View of the join between the west and east roof sections
- Plate 22: General view of the central and eastern roof sections
- Plate 23: Visible king post above Rooms 30 and 31
- Plate 24: Example of a garret room (Room 30) in the central section of roof
- Plate 25: Timber panelling revealed in the wall between Rooms 30 and 31
- Plate 26: Detail view of the braces and upright member in the panelled wall
- Plate 27: Section of timber panelling situated on the south side of the roof forming the south wall of Room 30
- Plate 28: View of the step down on between the central and east roof sections
- Plate 29: Inscribed date of 1838 in the east-facing gable of the central roof section
- Plate 30: East roof section showing the truss construction
- Plate 31: The west truss with holes clearly visible in the principal rafters

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## APPENDIX 1: PROJECT BRIEF

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### SITE DESCRIPTION AND SUMMARY

**Site Name:** Two Lions Public House, Great Dockray, Penrith

**Grid Reference:** NY 51560 29980

**Planning Application Reference No.:** 3/05/0956

Detailed specifications are invited from appropriately resourced, qualified and experienced archaeological or architectural specialists to undertake the archaeological project outlined by this Brief and to produce a report on that work. The project team must be led by a member of the Institute of Field Archaeologists or equivalent. No fieldwork may commence until approval of a specification has been issued by the County Historic Environment Service.

### 1. PLANNING BACKGROUND

- 1.1 Planning consent has been granted for internal and external alterations and the demolition of extensions at the Two Lions Public House, Great Dockray, Penrith. This application forms part of a wider scheme to develop an area of land around Southend Road in a mixed use development (05/0954, 05/0957 & 05/0961). The scheme affects a grade II\* listed building probably dating to the late medieval period (County Historic Environment Record no. 4994). The proposal will affect some of the historic fabric of the building and may disturb archaeological deposits below ground. As a result, three elements of mitigation are required: a programme of analysis and recording of the decorated ceiling beams in room 24, to be undertaken prior to construction commencing; a programme of building recording, to be undertaken during the course of construction works; and an archaeological watching brief, to be undertaken during the course of the ground works of the development.
- 1.2 This advice is given in accordance with guidance given in Planning Policy Guidance note 15 (Planning and the Historic Environment), Planning Policy Guidance note 16 (Archaeology and Planning), and policies BE9 & BE14 of the Eden Local Plan.

### 2. ARCHAEOLOGICAL BACKGROUND

- 2.1 The building has been the subject of an archaeological building investigation (Oxford Archaeology North, 2006, *Two Lions Public House, Great Dockray, Penrith, Cumbria, Archaeological Desk-Based Assessment and Building Investigation*, unpublished document) and this brief should be read in conjunction with that report. The investigation has identified that the earliest documentary reference to the building is in 1584. Shortly after this date, the building was altered and extended from a possible high status merchant house into a hall for the Lowther family. It was probably during the mid 19<sup>th</sup> century that it was converted from a residence to a public house.

### 3. SCOPE OF THE PROJECT

#### 3.1 Objectives

- 3.1.1 To analyse and make a record of the decorated ceiling beams in room 24 (as numbered in OAN's 2006 report) in order to provide further information on the nature, function and date of the original phase of the building. This information will inform Eden District Council's decision on the appropriate treatment of the beams.
- 3.1.2 To identify and record any features of historic, architectural or archaeological importance that are uncovered during works to the upstanding fabric of the building. The treatment of any such significant features will need to be agreed with Eden District Council



3.1.3 To identify, investigate and record any surviving archaeological remains revealed within the development ground works.

### 3.2 Work Required

3.2.1 A measured survey should be undertaken of the decorated ceiling beams and associated superstructure of the floor of room 24. The survey should include the requirements of a 'Level 4' Survey, as described by English Heritage *Understanding Historic Buildings A Guide to Good Recording Practice, 2006*.

3.2.2 Suitable specialists will need to be consulted and, where appropriate, a programme of dendrochronological analysis or radiocarbon dating should be undertaken on a sample from the decorated ceiling beams in room 24, prior to construction works commencing. Advice on the suitability of analysis of the paint from the decorated ceiling beams in room 24 should also be sought and, where appropriate, a programme of such an analysis should be undertaken, prior to construction works commencing. The results of the analyses will need to be submitted to the conservation officer of Eden District Council prior to construction works commencing so that informed decisions can be agreed on the appropriate treatment of the beams.

3.2.3 Any alterations to the upstanding historic fabric of the building should be carried out under archaeological supervision. Any features of historic, architectural or archaeological importance revealed during the alterations should be recorded in line with the requirements of a 'Level 4' Survey, as described by English Heritage *Understanding Historic Buildings A Guide to Good Recording Practice, 2006*. Should any features of historic, architectural or archaeological significance be affected by the proposed works then the conservation officer of Eden District Council, the applicant and the construction contractor will all need to be notified and work will need to cease until an appropriate course of action is agreed.

3.2.4 All topsoil stripping, ground reduction, and excavation of footings and services trenches must be carried out under archaeological supervision. Any putative archaeological features must then be cleaned by hand and if possible a stratigraphic record made. Finds and environmental samples should be retrieved as appropriate. A reasonable period of uninterrupted access should be allowed to the archaeologist for all necessary archaeological recording.

## 4. PROJECT DESIGN

4.1 Before the project commences a specification must be submitted to, and approved by, the County Historic Environment Service.

4.2 Proposals to meet this Brief should take the form of a detailed specification prepared in accordance with the recommendations of *The Management of Archaeological Projects*, 2<sup>nd</sup> ed. 1991, and must include:

- A description of the methods of observation and recording system to be used
- A description of the finds, environmental and dating sampling strategies to be used
- A description of the post excavation and reporting work that will be undertaken
- Details of key project staff, including the names of the project manager, site supervisor, finds and environmental specialists and any other specialist sub-contractors to be employed
- Details of on site staffing, e.g. the number of people to be employed on site per day
- A projected timetable for all site work and post excavation work (through to final publication of results)

4.3 Any significant variations to the proposal must be agreed by the County Historic Environment Service in advance.

## 5. REPORTING AND PUBLICATION

- 5.1 The archaeological work should result in a report which should include as a minimum:
- A site location plan, related to the national grid
  - A front cover/frontispiece which includes the planning application number and the national grid reference of the site
  - A concise, non-technical summary of the results
  - A date when the project was undertaken and by whom
  - A description of the methodology employed, work undertaken and the results obtained
  - Plans of the building showing where alterations to the fabric have taken place and the location of each recorded feature of historic, architectural or archaeological importance
  - Plans, section drawings and photographs at an appropriate scale and accompanied by an appropriate description
  - A list of, and dates for, any finds recovered and a description and interpretation of the archaeological deposits identified
- 5.2 Two copies of the report should be deposited with the County Historic Environment Record and with Eden District Council within two months of completion of fieldwork. This will be on the understanding that the report will be made available as a public document through the County Historic Environment Record.
- 5.3 A summary report should be submitted to a suitable regional or national archaeological journal within one year of completion of fieldwork. If archaeological remains of significance are identified, one or more full reports should also be submitted to a suitable journal or other publication in due course.
- 5.4 Cumbria HER is taking part in the *Online Access to Index of Archaeological Investigations* (OASIS) project. The online OASIS form at <http://ads.ahds.ac.uk/project/oasis> must therefore also be completed as part of the project. Information on projects undertaken in Cumbria will be made available through the above website, unless otherwise agreed.

## 6. THE ARCHIVE

- 6.1 An archive must be prepared in accordance with the recommendations of *The Management of Archaeological Projects*, 2<sup>nd</sup> ed. 1991, and arrangements made for its deposit with an appropriate repository. A copy shall also be offered to the National Monuments Record.
- 6.2 The landowner should be encouraged to transfer the ownership of finds to a local or relevant specialist museum.
- 6.3 The County Historic Environment Service must be notified of the arrangements made.

## 7. FURTHER REQUIREMENTS

- 7.1 It is the contractor's responsibility to establish safe working practices in terms of current health and safety legislation, to ensure site access and to obtain notification of hazards (eg. services, contaminated ground, etc.). **The County Historic Environment Service bears no responsibility for the inclusion or exclusion of such information within this Brief or subsequent specification.**
- 7.2 All rooms should be clear of obstructions as far as practically possible in order to provide an adequate record to be made.
- 7.3 The involvement of the County Historic Environment Service should be acknowledged in any report or publication generated by this project.
- 7.4 English Heritage's regional Archaeological Science Advisor (Sue Stallibrass, email: [Sue.Stallibrass@liverpool.ac.uk](mailto:Sue.Stallibrass@liverpool.ac.uk) telephone: 0151 794 5046) must be consulted to allow for an opportunity to comment on all the scientific elements of the project.

8. FURTHER INFORMATION

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*As part of our desire to provide a quality service to all our clients we would welcome any comments you may have on the content or presentation of this design brief. Please address them to the Assistant Archaeologist at the above address.*

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## APPENDIX 2: PROJECT DESIGN

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### 1. INTRODUCTION

#### 1.1 PROJECT BACKGROUND

1.1.1 The Two Lions Inn, Great Dockray, Penrith, Cumbria (centred NY 5156 2998) is positioned within the southern edge of the Conservation Area for Penrith, and is a Grade II\* listed building (LB SMR 25303, HER 4994). The earliest recorded date of existence is from documents dated to 21<sup>st</sup> August 1584, when Gerard Lowther purchased a house called 'Newhall' from a Mr Thomas Brisbie (Watson 1901). Many of the original features are preserved, despite its use until very recently as a public house. It is separated from the street by a front courtyard that was formerly enclosed by a gateway onto Great Dockray and flanked by gate lodges. Towards the end of the nineteenth century an extension was added to the back of the building. The building currently stands empty and is boarded up. Planning consent has been granted for internal and external alterations and demolition of extensions (planning reference 3/05/0956), and it forms part of a wider scheme to develop land around Southend Road (planning reference 3/05/0954, 05/0957 and 05/0961).

1.1.2 Previous work includes a desk-based assessment of the wider development scheme (OA North 2005a). A basic examination and assessment of the building was carried out in June/July 2005, to approximately a RCHME Level I-type survey (OA North 2005b). The purpose was to provide information on the features of historical significance to aid the client in drawing up their planning proposals prior to the submission of a planning application to Eden District Council (EDC). In 2006, an English Heritage Level 3-type building investigation and a more specific desk-based assessment focusing on the Two Lions was carried out by OA North, at the request of English Heritage in order to inform the planning process due to the statutory designated status of the building (OA North 2006). The results of the two investigations showed that the origins of the house are probably earlier than the first recorded date of 1584; Watson (1901) reports that Gerard Lowther purchased a property called 'Newhall' and evidence survives (such as decorated ceilings and arms bearing the dates 1585 and 1586) suggesting that Lowther made alterations and additions soon after. Eight phases of construction/alteration were identified and the building is thought to have first become a public house around the mid-nineteenth century.

1.1.3 Cumbria County Council's Historic Environment Service (CCCHES) was consulted by EDC, following submission of the planning application, who advised that further work was required in mitigation of the development. A formal brief to this effect was issued requesting that an investigation to English Heritage Level 4 guidelines be carried out in order to analyse and record the decorated ceiling beams in Room 24 (see OA North 2006), to identify and record any features of importance that are uncovered during works to the upstanding fabric, and to identify, investigate and record any surviving archaeological remains revealed within the development groundworks. All this work will then inform EDC's decision for the appropriate treatment of the features.

#### 1.2 OXFORD ARCHAEOLOGY NORTH

1.2.1 Oxford Archaeology North has considerable experience of sites of all periods, having undertaken a great number of small and large scale projects throughout Northern England during the past 24 years. Evaluations, assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.

1.2.2 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute of Field Archaeologists (IFA) registered organisation, registration number 17, and all its members of staff operate subject to the IFA Code of Conduct (1994).

### 2. OBJECTIVES

2.1 The following programme of works aims to provide a more detailed record of certain known features from the previous surveys (OA North 2005b and 2006) and any historical fabric uncovered during works both internally and externally;

- **Measured Survey:** the beams and associated structure located within Room 24 will be subject to an English Heritage Level 4 measured survey (English Heritage 2006).
- **Analysis of Beams:** where appropriate a programme of dendrochronological or radiocarbon dating will be undertaken on a sample from the decorated beams prior to the commencement of works. Analysis of paint from the beams should be carried out where appropriate and where suitable. The results will be submitted to the conservation officer at EDC before commencement of development works.
- **Fabric Recording:** any alterations to or removal of the upstanding fabric of the buildings will be carried out under archaeological supervision. Any features of historic, archaeological or architectural importance will be recorded to English Heritage Level 4 guidelines (*ibid*). If significant features are to be affected, works will cease until the conservation officer, CCCHES, the client and construction contractor are all notified/consulted and work will cease until an appropriate course of action is agreed.
- **External Works:** all topsoil stripping, ground reduction and excavation of footings and service trenches within the outlined area of the planning application around the building will be carried out under archaeological supervision. Any features will be cleaned by hand and appropriate records made. Finds and environmental samples will be retrieved and processed as appropriate. Uninterrupted access should be allowed in order for the archaeologist to carry out the recording.
- **Report Production:** a written report will be produced following completion of the fieldwork, and will assess the significance of the data generated by this programme within the context of the previous investigations. A site archive will be produced to English Heritage guidelines (1991) and in accordance with the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990).

### 3. METHODS STATEMENT

#### 3.1 MEASURED SURVEY OF DECORATED BEAMS

- 3.1.1 **Introduction:** measured survey of the ceiling beams and associated superstructure will be carried out to English Heritage Level 4 guidelines (English Heritage 2006). This provides a comprehensive analytical record appropriate for buildings of special importance (i.e. in this case Grade II\* Listed). Level 4 analysis draws on the full range of available resources and discusses the building's significance in terms of architectural, social, regional or economic history.
- 3.1.2 **Descriptive Record:** visual inspection of the floorboards **before** their removal and the subsequent beams uncovered, will be carried out and written records using OA North *pro forma* record sheets will be produced. These will be carried out to English Heritage Level 4 guidelines and will supplement and provide additional detail to the inspection already carried out (OA North 2006) to English Heritage Level 3 standard. A Level 4 record is a comprehensive analytical account for buildings of special importance, therefore the Level 3 descriptions will need to be amended as and when appropriate. The developmental history of the building may need to be revised in the light of any new discoveries.
- 3.1.3 **Survey Drawings:** a measured scale plan of the beams in Room 24 (OA North 2005b and 2006) will be produced at a scale to be determined on site, but will provisionally be 1:50. In conjunction a cross-section through the beams (the position of which will be determined on site) will be produced, together with an elevation drawing illustrating the nature and extent of a representative decorated surface. The drawings will illustrate any decorative and structural detail; although small-scale detail not easily represented on these plans will be subject to additional scaled drawings.
- 3.1.4 The survey drawings will be produced by a combination of techniques, which will entail either the enhancement of existing drawings or the provision of new survey by means of hand planning techniques. The floor plans were checked as part of the assessment phase of the project and were found to be of sufficient accuracy. It is, therefore, proposed to enhance the drawings by manual survey. The plans will be digitised and presented using an industry standard CAD package.

- 3.1.5 In order to gain access to carry out the survey of the decorated beams it will be necessary to remove the floorboards from above which conceal most of the beams. **NB Survey of the beams from below is impossible due to the presence of 1586 decorated plaster ceiling.** To achieve this, any modern material will need to be removed under archaeological supervision and the floorboards must be then lifted carefully also under archaeological supervision (following recording see 3.1.2 above). Preferably, the floorboards should be lifted by an OA North buildings archaeologist in order to minimise disturbance to the decorative plaster below and to fully investigate the space below the boards in order to retrieve any finds or features of archaeological importance.
- 3.1.6 **Photographic Archive:** a detailed photographic archive will be produced to English Heritage Level 4 guidelines using both 35mm black and white and digital SLR cameras. General scaled views from multiple angles of the room will be taken together with detailed scaled views of relevant details of construction and/or decoration. As far as is practicable, the decoration on the beams will be photographed with cameras parallel to the face of the beam. The full length of the beams will be photographed in order to record all of the decoration. A full photographic index will be produced and the position of photographs will be marked on the relevant plans.
- 3.1.7 **Specialist Investigation:** it is proposed that a suitably qualified archaeological timber specialist will be consulted who will advise on the suitability of the beams for dating. If dating of the beams is appropriate then the specialist will also advise on the most appropriate technique and a programme of investigation will be undertaken **before** any construction works commence.
- 3.1.8 Similarly, a programme of paint analysis will be carried out if necessary, which a suitably qualified specialist will conduct **before** any construction works commence. The results of both analyses will be submitted to the conservation officer at EDC and CCCHES **prior to the commencement** of any construction works, so that informed decisions regarding the treatment of the beams can be agreed upon.
- 3.2 FABRIC WORKS**
- 3.2.1 **Introduction:** in mitigation of the construction/development works the recording of any archaeological or architectural features uncovered during fabric works will be carried out to English Heritage Level 4 guidelines (English Heritage 2006). This provides a comprehensive analytical record appropriate for buildings of special importance. Level 4 analysis draws on the full range of available resources and discusses the building's significance in terms of architectural, social, regional or economic history. Any alterations to the upstanding fabric must be carried out under the supervision of an archaeologist. If any features of historic, architectural or archaeological importance are likely to be affected then work will need to cease until an appropriate course of action is agreed between the conservation officer, CCCHES and the client.
- 3.2.2 **Descriptive Record:** visual inspection of the areas uncovered during works will be carried out and written records using OA North *pro forma* record sheets will be produced. These will supplement and provide additional detail to the inspection already carried out (OA North 2006) to English Heritage Level 4 guidelines. A Level 4 record is a comprehensive analytical account for buildings of special importance, therefore the Level 3 descriptions will need to be amended as and when appropriate. The developmental history of the building may need to be revised in the light of any new discoveries.
- 3.2.3 **Survey Drawings:** features uncovered during works to any upstanding fabric will be added to existing floor plans produced during the previous investigation (OA North 2006). These will be produced using hand-planning techniques, which will be digitised using an industry standard CAD package. Any features of significance not easily represented on these plans will be subject to additional scaled drawings.
- 3.2.4 **Photographic Archive:** a photographic archive will be produced utilising both 35mm black and white and digital SLR cameras. All features of historical, archaeological and architectural significance revealed during any works will be photographed in detail together with general views of rooms and areas if significant differences from the existing photographic record are evident. Any changes to the elevations and appearance to the exterior of the building will be captured using medium format photography (rectified as

necessary) in addition to 35mm and digital. A full photographic index will be produced and the position of photographs will be marked on the relevant floor plans

- 3.2.5 Any rectified photographs will be adjusted using Archis software to take out any residual distortion, and then the images will be digitised within CAD software to produce accurate representative elevation drawings. Additional detail will be added to the existing elevation drawings.

### 3.3 WATCHING BRIEF OF GROUND WORKS

- 3.3.1 **Introduction:** a programme of field observation will accurately record the location, extent, and character of any surviving archaeological features and/or deposits during any topsoil stripping, ground disturbance, ground reduction and excavation of footings and service trenches within the application boundary around the Two Lions buildings. These groundworks will be carried out under constant archaeological observation. All archaeological recording will require a period of uninterrupted access during which all works must cease to allow the archaeologist on site to record any features.
- 3.3.2 **Methodology:** this work will comprise archaeological observation during the excavation for these works, the systematic examination of any subsoil horizons exposed during the course of the groundworks, and the accurate recording of all archaeological features and horizons, and any artefacts, identified.
- 3.3.3 Discovery of archaeological remains will require stoppage of the construction/excavation work. Areas of potential archaeological remains will require fencing-off from any construction works with netlon-type fencing to allow OA North archaeologists sufficient time to undertake adequate recording under safe conditions. This will be carried out as efficiently as possible in order to minimise disruption. Depending on the deposits revealed, it is anticipated that the average time for the suspension of works will be approximately 2-4 hours.
- 3.3.4 Clearance will be given for construction to proceed once the archaeologist is satisfied that either no remains are present, or that they have been adequately recorded, or that the level of impact will not disturb any deeper remains that can be preserved *in situ*.
- 3.3.5 **Complex or extensive remains:** should the remains be too complex or extensive to be investigated and recorded under watching brief conditions, then the area will be fenced-off with netlon-type fencing and the client and CCCHES will be immediately contacted in order to determine the requirements for further investigation. All further construction works within the marked area will cease until clearance is given to proceed. All further works would be subject to a variation to this project design.
- 3.3.6 **Investigation and recording:** putative archaeological features and/or deposits identified, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and where appropriate sections will be studied and drawn. Any such features will be sample excavated (i.e. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).
- 3.3.7 During this phase of work, recording will comprise a full description and preliminary classification of features or materials revealed, and their accurate location (either on plan and/or section, and as grid co-ordinates where appropriate). Features will be planned accurately at appropriate scales and annotated on to any large-scale plans provided by the client. A photographic record will be undertaken simultaneously.
- 3.3.8 Levels will be recorded and reduced to their OD heights, with all benchmark and TBMS to be shown. The location of all features excavated will be recorded by Total Station with appropriate spot heights and tied into the OS grid. Altitude information will be established with respect to OS Datum. The location of the remains within the areas of construction will be based on site plans provided by the client containing OS information.
- 3.3.9 A plan will be produced of the areas of groundworks showing the location and extent of the ground disturbance and one or more dimensioned sections will be produced.

- 3.3.10 **Recording:** all information identified in the course of the site works will be recorded stratigraphically, using a system, adapted from that used by Centre for Archaeology Service of English Heritage.
- 3.3.11 Excavated material must not be backfilled until the archaeological recording has taken place. In the event that this cannot be carried out the same day, secure overnight storage of excavated material must be available.
- 3.3.12 **Contingency plan:** a contingency costing may also be employed for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This would be in agreement with the client.
- 3.4 GENERAL PROCEDURES**
- 3.4.1 **Environmental Sampling:** environmental samples (bulk samples of 40 litres volume, to be sub-sampled at a later stage) will be collected from stratified undisturbed deposits as and when is appropriate and will particularly target negative features (gullies, pits and ditches). Deposits of particular interest may incur additional sampling, on advice from the appropriate in-house specialist.
- 3.4.2 The location of all samples will be recorded on drawings and sections with heights OD etc.
- 3.4.3 An assessment of the environmental potential would include soil pollen analysis and the retrieval of charred plant macrofossils and land molluscs from former dry-land palaeosols and cut features. In addition, the samples would be assessed for plant macrofossils, insect, molluscs and pollen from waterlogged deposits.
- 3.4.4 In order to achieve the aims of the programme of work, it may be required to obtain dating evidence through radiocarbon dating, dendrochronological or other such techniques. This would only be undertaken in consultation with interested parties.
- 3.4.5 **Faunal remains:** if there is found to be the potential for discovery of bones of fish and small mammals a sieving programme will be carried out. These will be assessed as appropriate by OA north's specialist in faunal remains, and subject to the results, there may be a requirement for more detailed analysis.
- 3.4.6 **Human Remains:** any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. The client, CCCHES and the local Coroner will be informed immediately. If removal is essential the exhumation of any funerary remains will require the provision of a Home Office license, under section 25 of the Burial Act of 1857. An application will be made by OA North for the study area on discovery of any such remains and the removal will be carried out with due care and sensitivity under the environmental health regulations. Any delays caused by unforeseen and complex excavation of inhumations may be subject to a variation to the cost of the contract and will be agreed with the client.
- 3.4.7 **Finds:** all finds recovered during the evaluation investigation (metal detecting and trial trenching) will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.
- 3.4.8 Finds recovery and sampling programmes will be in accordance with best practice (current IFA guidelines) and subject to expert advice. OA has close contact with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who are readily available for consultation. Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham.
- 3.4.9 Neither artefacts nor ecofacts will be collected systematically during the mechanical excavation of the topsoil unless significant deposits are encountered. In such an eventuality, material will be sampled in such a manner as to provide data to enhance present knowledge of the production and dating of such artefacts, although any ensuing studies will not be regarded as a major element in any post-excavation analysis of the site. Other finds recovered



during the removal of overburden will be retained only if of significance to the dating and/or interpretation of the site. It is not anticipated that ecofacts (e.g. unmodified animal bone) will be collected during this procedure.

- 3.4.10 Otherwise, artefacts and ecofacts will be collected and handled as per specification. All material will be collected and identified by stratigraphic unit during the evaluation trenching process. Hand collection by stratigraphic unit will be the principal method of collection, but targeted on-site sieving could serve as a check on recovery levels. Objects deemed to be of potential significance to the understanding, interpretation and dating of individual features, or of the site as a whole, will be recorded as individual items, and their location plotted in 3-D. This may include, for instance, material recovered from datable medieval pit groups.
- 3.4.11 All finds will be treated in accordance with OA standard practice, which is cognisant of IFA and UKIC Guidelines. In general this will mean that (where appropriate or safe to do so) finds are washed, dried, marked, bagged and packed in stable conditions; no attempt at conservation will be made unless special circumstances require prompt action. In such case guidance will be sought from OA North's consultant conservator.
- 3.4.12 All waterlogged finds will be treated as appropriate. In the case of large deposits of waterlogged environmental material (e.g. unmodified wood), advice will be sought with the OA North consultant with regard to an appropriate sampling strategy.
- 3.4.13 Where possible, spot dates will be obtained on pottery and other finds recovered from the site. Artefacts will be examined and commented upon by OA North in-house specialists. Initial artefact dating shall be integrated into the site matrix.
- 3.4.14 Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

### 3.5 REPORT PRODUCTION

- 3.5.1 **Interim Report:** following the specialist analysis of the decorated beams (*see Section 3.1.7*), an interim report summarising the finding will be produced. The results of the specialist investigation will determine the treatment of the beams (*see Section 3.1.8*).
- 3.5.2 **Final Report:** one bound and one unbound copy of a written synthetic report, together with a digital copy supplied on CD, will be submitted to the client, and a further three copies submitted to the Cumbria HER within eight weeks of completion. A copy will also be supplied to English Heritage and the Penrith Conservation Officer for consultation purposes. The report will include;
- ◆ a site location plan related to the national grid,
  - ◆ a front cover to include the planning application number and the NGR,
  - ◆ the dates on which the fieldwork was undertaken and by whom,
  - ◆ a concise, non-technical summary of the results,
  - ◆ the precise location, address and NGR will be provided,
  - ◆ a description of the methodology employed, work undertaken and results obtained,
  - ◆ plans, sections drawings and photographs at an appropriate scale,
  - ◆ the report will also include a complete bibliography of sources from which data has been derived,
  - ◆ a copy of the CCCHES project brief will be included in the appendices,
  - ◆ a copy of this project design in the appendices, and indications of any agreed departure from that design.
- 3.5.3 This report will be in the same basic format as this project design; a copy of the report can be provided on CD, if required.

### 3.6 ARCHIVE

- 3.6.1 The results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2<sup>nd</sup> edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. OA North conforms to best practice in the preparation of project archives for long-term storage.
- 3.6.2 This archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the Cumbria HER (the index to the archive and a copy of the report). OA North practice is to deposit the original record archive of projects with the appropriate County Record Office, in this case Carlisle.
- 3.6.3 The Arts and Humanities Data Service (AHDS) online database project *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.
- 3.6.4 **Confidentiality:** all internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project brief and project design, or for any other explicit purpose, can be fulfilled, but will require separate discussion and funding.

## 4 HEALTH AND SAFETY

- 4.1.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A risk assessment will be completed in advance of any on-site works and copies will be made available on request to all interested parties. The principal archaeologist on site will hold a copy of the risk assessment at all times. It has been assumed that the client and/or principal contractor will have produced risk assessments and any induction procedures must be made available to OA North prior to commencement of work. All project staff will be CSCS qualified.
- 4.1.2 **Interior works:** OA North staff will assess the risks during any internal works and if unacceptable health and safety risks arise, the OA North project manager will be informed and work will cease until measures are taken to negate those risks can be arranged. Many areas of the building are in complete darkness, therefore adequate lighting for both health and safety and recording purposes must be available. OA North will be able to provide portable 110v lighting systems but will require static power generation facilities. OA North would be able to arrange this at additional cost.
- 4.1.3 **Welfare Facilities:** health and safety requirements stipulate that suitable welfare facilities must be provided. This must include provision of a toilet with hand washing facilities, and a messing and laying out area is also required. Should the client not wish to provide this, it can be costed as a variation.
- 4.1.4 **Contamination:** any contamination or asbestos issues must also be made known to OA North in order that adequate PPE can be supplied prior to commencement. Should any presently unknown contamination be discovered during works, it may be necessary to halt the works and reassess the risk assessment. Any specialist safety requirements may be costed as a variation.
- 4.1.5 **Fencing requirements:** any areas of archaeological sensitivity discovered during the ground works will be protected with netlon-style fencing whilst open, and adequate and appropriate signage. It is assumed that the client will be responsible for general fencing of all areas and will also be responsible for the safety of the general public.

## 5. WORK TIMETABLE

- 5.1 **Measured Survey of Beams:** approximately **two to five days** will be required to record the decorated beams. This will include the recording of the floorboards prior to their removal and detail revealed by removal of modern fabric and recording the beams themselves. This will be dependant upon the contractor's schedule of work.
- 5.2 **Fabric Works:** recording of the fabric during alterations and/or removal of upstanding fabric will take approximately **four weeks** to carry out and is dependant upon the outcome of the beam analysis. This is also dependent upon the nature and timetable of works and takes into account additional time needed to record features to the required standard.
- 5.3 **Watching Brief:** the duration of the archaeological presence for the watching brief of the groundworks is as yet unknown, being dictated by the schedule of works.
- 5.4 **Final Report:** the final report will be completed approximately **eight to twelve weeks** after the final phase of site works.

## 6. OTHER MATTERS

- 6.1 **Access:** liaison for access to the buildings during the assessment will be arranged with the client, unless otherwise instructed prior to commencement of the archaeological investigation.
- 6.2 **Project Monitoring:** whilst the work is undertaken for the client, the Penrith conservation officer and CCCHES will be kept fully informed of the work and its results, and will be notified in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with the conservation officer, CCCHES and the client.

## 7. STAFFING PROPOSALS

- 7.1 The project will be under the direct management of **Emily Mercer BA MSc AIFA** (OA North senior project manager) to whom all correspondence should be addressed.
- 7.2 The project will be supervised in the field by **Chris Wild BSc** (OA North project officer). Chris has a great deal of experience in the recording and analysis of historic buildings throughout the North West and undertook the previous recording of the Two Lions and provided the recommendations forming the current proposed works. He will be assisted on site by **Karl Taylor BSc AIFA** (OA North project officer) who also has a great deal of historic building recording experience, and has also been involved in the proposed development, namely the recording of the Former Sunlight Laundry Buildings, Princes Street.
- 7.3 The watching brief will be supervised in the field by either an OA North project officer or supervisor experienced in this type of project. All OA North project officers and supervisors are experienced field archaeologists capable of carrying out projects of all sizes. Present timetabling constraints preclude detailing at this stage exactly who will be undertaking the watching brief element of the project.

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## APPENDIX 3: REPORT ON THE PLASTER CEILING

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### THE PLASTER CEILING IN ROOM 6, THE TWO LIONS, PENRITH : A REPORT FOR OAN

Jennifer Jones, Conservation Services, Dept of Archaeology, Durham University

#### 1. DESCRIPTION and EXAMINATION

The ceiling is in Room 6 on the ground floor of the former Two Lions public house. Room 6 was the Public Bar, and the 16th century plastered ceiling survives over an area of c6 x 4.5m. This room was found to be part of the earliest phase of the building, and the ceiling's decoration incorporates a date of 1585. Ceiling decoration is in the form of geometric and curvilinear pargetting, interspersed with five small heraldic plaster bosses.

The ceiling was hung from, and therefore post-dates, an earlier wooden beamed ceiling with painted floral decoration, which was found below the floor boards in the room above.

All observations regarding the protection, safety and conservation of the pargetted plaster ceiling should also be considered to apply to the earlier painted beams above it.

From a limited examination, the plaster ceiling appears to be fairly sound, and there is no loss of pargetting. There are some cracks in the exposed areas of plaster below the modern paint, but the main detriment to the ceiling's present observable condition is deterioration, peeling and cracking of the modern layers of applied paint.

The whole of the ceiling has been painted many times, latterly with oil-based paint. This has resulted in a loss of definition to the pargetting and to the bosses. The bosses are painted in inappropriate colours. Several areas of the modern paint have been lost, and there is peeling and flaking of what remains. A fragment of the modern paint was detached from the edge of a peeling area, and examined later under X16 magnification. Evidence was found for at least eight layers of paint : three layers of oil-based paint – the top layer slightly textured – ; a layer of red/brown scumble; around two layers of a water based paint (emulsion); and at least two layers of probable distemper. The detached flake did not necessarily contain the full range of paint layers back to the original decoration of the pargetting.

A very limited examination was made of the substrate of the pargetted ceiling, lying below the floor of the room above. There is currently a large amount of debris between the painted wooden beams, obscuring the plaster ceiling keys and the supporting laths. However, the few plaster keys examined appeared to be sound and around 2.5cm deep. The single wooden lath examined was also sound.

The observed painting on the wooden beams appeared to be in good condition, with little fading of the colours. Painted parts of the beams seem fortunately to lie above the level of accumulated debris.

#### 2. CONCERNS

There are three major areas of concern regarding the pargetted ceiling and the painted beams above it :

- ◆ The present condition of the ceiling, its substrate and the painted beams
- ◆ Possible effects of building work
- ◆ Treatment and appearance of the ceiling, its substrate and the painted beams in the renovated building

#### *Present condition*

Though the pargetted ceiling appears to be largely intact, with visible damage confined to the later paint layers, the true condition of the plaster and its substrate cannot easily be determined while the modern paint layers are still in place, and debris lies between the overhead beams. Much instability in

plaster ceilings is caused by problems with the substrate. Damage to and loss of the plaster keys which hold the ceiling's weight, and damage and deterioration of the wooden laths which hold the keys in place, can cause plaster to fall even when it appears to be in good condition. Failure of the ceiling can also be caused by the plaster layers becoming partly detached from the wooden lath substrate.

### ***Effects of the proposed building work***

Building work could affect the plaster in several ways :

- ◆ Vibration
- ◆ Mechanical damage
- ◆ Environmental factors
- ◆ Use of water on site

Continuous low level vibration, through the use of electrical tools, or more sporadic but intense vibration caused, for instance, by hammering are both major concerns. Vibration could cause separation of the plaster from its substrate or dislodge plaster keys from the wooden laths, causing the ceiling to fall.

Mechanical damage to the ceiling could be caused if insufficient care is taken while moving tools and large pieces of building equipment, such as ladders and scaffolding, around Room 6.

Plaster and paint can be susceptible to sudden and dramatic changes in temperature and relative humidity (RH). At present, the building does not appear to suffer from extensive problems with damp, and no mould or damp patches were observed on the ground floor. The plaster ceiling and the painted boards above it currently therefore have environmental conditions which are fairly favourable to their preservation. Building work will inevitably disturb the equilibrium of temperature and RH inside the building, and may expose the plaster and painted beams to sudden and possibly prolonged environmental extremes, while windows, walls and doors are removed and replaced, and during subsequent re-plastering and decoration.

Use of water on site will always be a concern, as accidental spillage in the rooms above the pargetting could have catastrophic consequences, both for the painted beams and for the stability of the ceiling.

### ***Treatment and appearance***

The two extremes of choice for the future of the ceiling are either complete conservation and its use as a prominent feature in the renovated building, or to ensure the stability of the plaster, and to use a suspended ceiling in Room 6 to conceal it from view. It is appreciated that the chosen course of action, as determined by costs and listed building restrictions and recommendations, is likely to lie somewhere between these two extremes.

It is unlikely that a feasible scheme could be devised to expose the painted beams in the room above, and it would never be possible to expose both the beams and the renovated plaster.

### ***Conservation***

Complete conservation of the ceiling would entail detailed examination of the plaster and its substrate in its present state, using drawings, plans and photography to record it and establish the true state of its stability. The findings of this examination would determine the subsequent course of action.

Removal of modern paint layers back to the 'original' surface would be required, and this would be done by hand. Cleaning of the plaster would be required, and also possible consolidation. Sympathetic repairs to the flat and pargetted areas, using an appropriate plaster mix may be needed. A suitable finish would have to be decided upon and applied.

Central to the conservation of the plaster ceiling would be a detailed examination of the plaster keys and substrate above. Debris would have to be completely removed from between the ceiling beams. This may be problematic, as it could easily result in soiling and damage to the painted beams. All plaster keys and wooden laths would be examined for signs of deterioration or damage, and repaired or replaced as necessary.

As the building is listed, all repair and conservation work would have to have English Heritage approval.

#### *Concealment*

Even if it is decided that the ceiling is to be hidden from view, detailed recording of its present state should be carried out. Again, this would include examination of the substrate and the removal of debris from between the painted ceiling beams. It may be found necessary to carry out repairs to the plaster keys, wooden laths or to the pargetted plaster itself, if it is found to be unstable, before the suspended ceiling is constructed. It is likely that some conservation work on the ceiling would be deemed necessary. Loose paint should be removed, and surface cleaning and the sympathetic filling of cracks in the plaster may be required.

Materials used for the construction of a suspended ceiling must have English Heritage approval. It will be important to maintain stable and suitable environmental conditions (temperature and RH) in the space between the suspended ceiling and the pargetted plaster. Failure to do so could result in condensation and mould growth, which would affect both the plaster and the painted timbers above. Therefore, the space above the suspended ceiling must have adequate ventilation. It is often considered wise to incorporate inspection hatches in a suspended ceiling, which may be used to periodically inspect the condition of the concealed plaster above.

### **3. RECOMMENDATIONS**

**The immediate needs of the ceiling and its substrate are that they are examined and recorded to assess condition and stability, and then protected from the effects, outlined above, of any proposed building work.**

Conservation work, either extensive or limited, is likely to be carried out after the major building work is completed, but before the final finishing of the rooms.

#### **Therefore, before building work begins :**

- ◆ A detailed examination and recording of the ceiling should be made, using photography and drawings, with the extent of the modern overpainting indicated.
- ◆ Very loose fragments of modern paint should be removed, so that subsequent loss of paint or plaster can be accurately monitored.
- ◆ All debris should be removed from between the painted beams above the ceiling, so that all plaster keys and wooden laths can be examined for damage and deterioration, and the stability of the plaster against its substrate can be assessed. If necessary, suitable and sympathetic repairs should be carried out to the laths and the plaster keys, and areas of plaster re-attached to the substrate.
- ◆ Unless absolutely unavoidable, it would be unwise to carry out consolidation of the uncleaned plaster while the modern paint layers remain in place. Consolidation would make any subsequent removal of the modern paint layers much more difficult.
- ◆ Protection should be applied around the painted beams to prevent physical damage or soiling. This could be a suitable material such as wadded acid-free tissue, which would not completely hinder air flow around the beams. Protection against water damage from above would be highly desirable for both the ceiling and the painted beams, if this could be achieved without creating an unsuitable micro-environment.

◆ Following all the above precautions, the ceiling should be physically supported from below for the duration of the building work. Support should be in the form of a series of adjoining boards made from a rigid material such as plywood, which essentially support the weight of the plaster and help to absorb some of the unavoidable vibration caused by the building work.. Boards should not be applied directly to the plaster surface. The plaster itself should only be in contact with a non-reactive layer such as acid-free tissue. Over the tissue should be layers of a cushioning material soft enough to be capable of some contouring, such as carpet underfelt. Pargetting makes the ceiling very far from flat, and to be effective, the cushioning material must be in contact with both the raised and the flat areas of the ceiling. The boards may form the top surface of a series of open wooden 'boxes' constructed in the room, or they could be supported on a series of acro props, with the load at the point of contact between the prop and the board suitably spread. Whatever the chosen means of holding up the support boards, it is clear that movement and space in Room 6 is going to be restricted. Therefore, the sequence of the necessary building tasks must be very precisely worked out. It is obviously essential that construction of the ceiling support itself is done very carefully.

◆ It is suggested that the examination, recording and protective support of the ceiling and its substrate are carried out or supervised by suitably qualified and experienced conservation personnel.

**As the building is listed, all recommendations and suggestions will require approval by English Heritage.**

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## APPENDIX 4: REPORT ON PIGMENT ANALYSIS OF PAINTED BEAMS

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### REPORT ON SEM EXAMINATION AND EDS ANALYSIS OF PAINT ON WOODEN BEAMS FROM THE TWO LIONS INN, PENRITH

Jennifer Jones, Conservation Services, Dept of Archaeology, Durham University

#### Summary

Paint samples taken from four wooden beams exposed by work in the Two Lions Inn public house, Penrith, were received for examination and analysis. Visual and x16 light microscopy examination suggested the samples each have a single layer of black paint. Scanning electron microscope (SEM) examination alongside energy dispersive X-ray spectroscopy (EDS) analysis found the paint to be carbon black.

#### Methodology

Samples were taken from painted surfaces on four different beams, and labelled as to their origin. Samples from beams 3E, 13E, 8W and 12W were analysed. The samples were examined under x16 light microscopy to determine the number of paint layers present, and to test the solubility of the pigment. Only one paint layer was observed, applied directly onto the wood. The paint was tested with a range of solvents : water had no effect, nor did industrial methylated spirits (IMS), but acetone caused the pigment to begin to dissolve. The fragments selected for analysis were then surface cleaned using IMS to remove loose dust contamination.

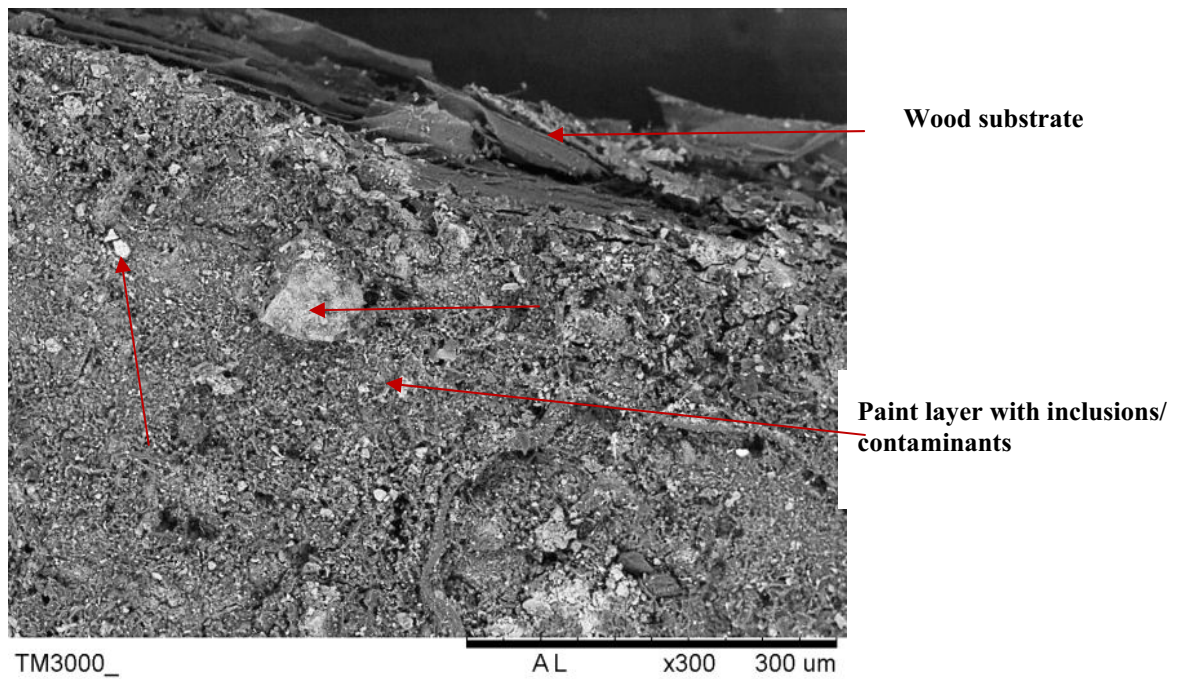
The cleaned samples were cut to a suitable size (<5x5mm), using a razor blade and scalpel, with as much of the wood substrate removed as possible. Samples were mounted on aluminium stubs using double sided tape for SEM examination and EDS analysis. SEM examination used an Hitachi TM3000 facility and EDS used an Oxford Instruments Swift ED3000 facility, operated alongside the SEM system.

#### Results

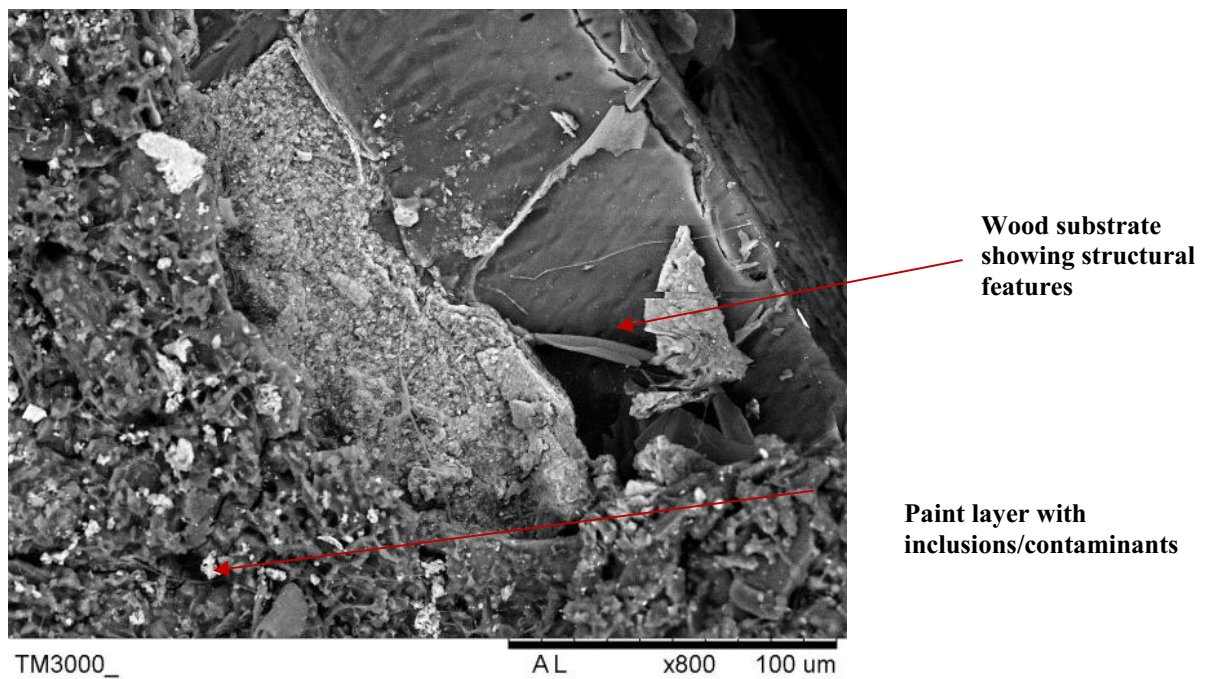
##### SEM examination

SEM examination found the four samples to be visually similar. The paint, as would be expected at magnifications up to x800, was less smooth and homogenous than it appears to the naked eye. This is partly because it has been applied directly onto the wooden beams, which though shaped, have not been smoothly finished, so that the imperfections of the underlying wood surface are reflected in the paint. Only one layer of paint was observed, confirming visual examination.

The SEM images below, taken at magnifications of x300 and x800 show the uneven surface of the paint layer, together with evidence of the surface contamination which remains after solvent cleaning. It is likely that the uneven surface of the paint has helped to attract and retain contaminants throughout its life.



SEM image (x300) of paint and wood substrate from beam 13E



SEM image (x800) of paint and wood substrate from beam 8W

### EDS analysis

EDS analysis at magnifications between x600 and x800 was carried out on the paint samples during SEM examination. Analyses were done as line scans to maximise the chance of picking up the full range of elements present. A summary of the results is shown below.

#### Beam 3E

Element	Weight %	Atomic %
Carbon	69.175	77.057
Oxygen	24.353	20.366
Aluminium	1.120	0.555
Silicon	0.912	0.435
Sulphur	1.257	0.525
Calcium	3.183	1.063

#### Beam 13E

Element	Weight %	Atomic %
Carbon	63.075	71.159
Oxygen	31.427	26.617
Silicon	1.881	0.908
Sulphur	1.111	0.470
Calcium	2.505	0.847

#### Beam 8W

Element	Weight %	Atomic %
Carbon	62.747	70.735
Oxygen	31.351	26.532
Aluminium	1.484	0.744
Silicon	2.783	1.342

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Sulphur	1.057	0.446
Potassium	0.579	0.200

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#### Beam 12W

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Element	Weight %	Atomic %
Carbon	71.399	78.232
Oxygen	24.233	19.933
Aluminium	0.938	0.458
Silicon	1.122	0.526
Sulphur	1.139	0.468
Calcium	1.169	0.384

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#### Summary of EDS analysis of the four paint samples

Analyses of all four paint samples detected large quantities of carbon, alongside a restricted range of earth elements. All the samples except Beam 8W have traces of calcium present. As no other elements were detected which could create a black pigment, we must conclude that the black paint is carbon based, possibly with a small amount of calcium-rich material such as powdered chalk. An organic medium was likely mixed with the pigment to assist with the spreadability and adherence of the paint. Whilst an organic component may have contributed to the total level of carbon detected, the fraction deriving from this source cannot be separated from the carbon black pigment or identified by EDS analysis. Low levels of sulphur were detected in all four samples. Though the painted beams have been protected to a certain extent below floor boarding in recent years, the sulphur is probably evidence of atmospheric pollution from the burning of fossil fuels.

#### Discussion

Carbon black has a very long history of use, and has been identified among pigments used in prehistoric cave paintings (Brunet et al, 1982). An intense black colour can easily be obtained from readily available sources such as wood or other plants, or from burnt bone and ivory. Other methods of creating black pigments were certainly known by early historic times, employing elements such as iron and manganese.

Though it might be conjectured that the carbon detected here derives from the wood substrate, this is unlikely as no other elements were detected which could produce a black pigment. An organic binder was used in the preparation of the paint, as water alone failed to dissolve it. Numerous organic binders are known to have been used in the past, including egg, blood, animal fat and plant oils (Duran et al, 2010).

#### Conclusion

The pigment was applied in a single layer, directly onto the minimally prepared wood surface. Only evidence for black pigment was observed or detected, and this was identified as carbon black in each of the four samples. It is likely that an organic binder was used in the preparation of the paint. The paint appears to be stable and in good condition, though dirty.

## **Sources**

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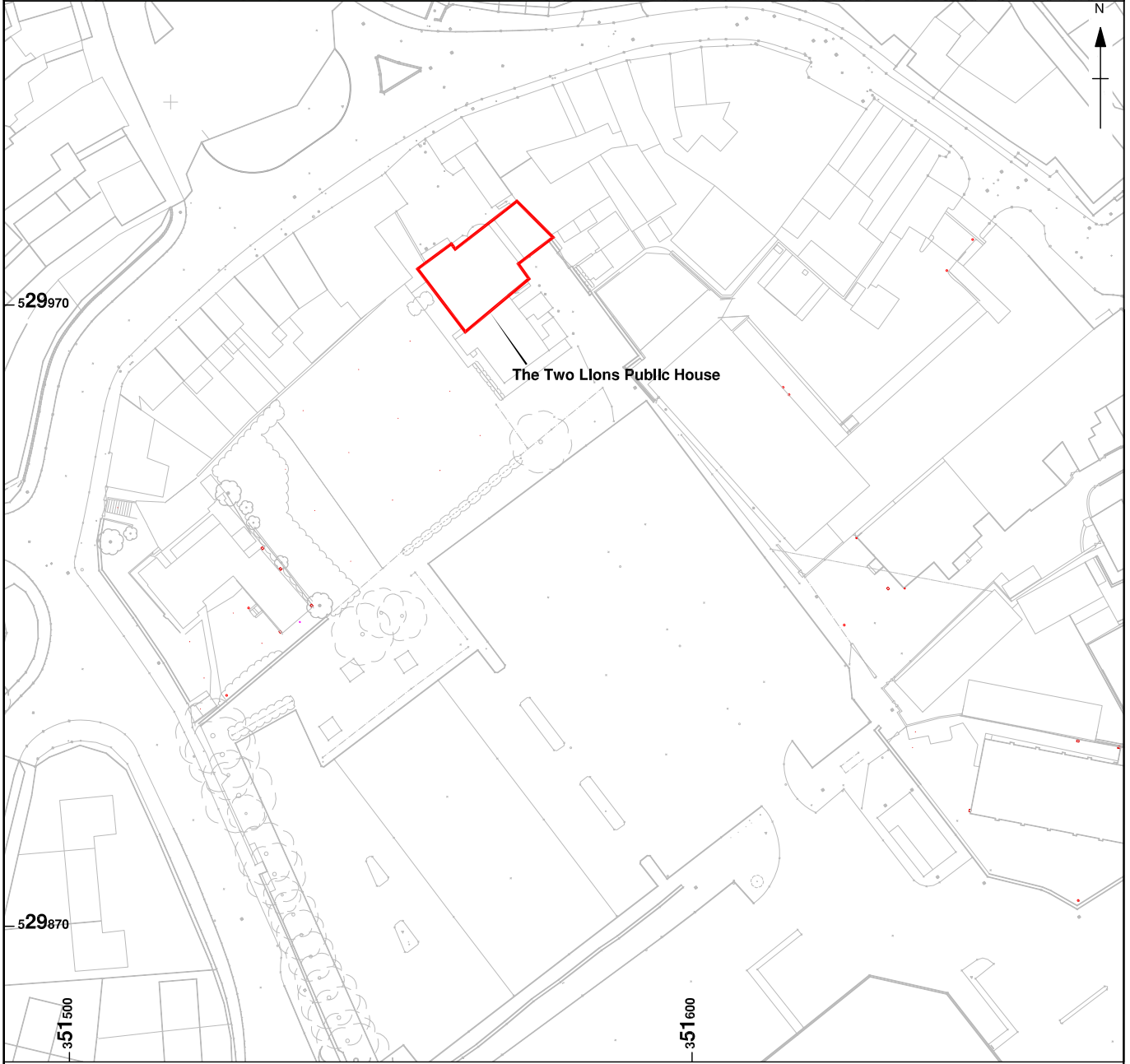
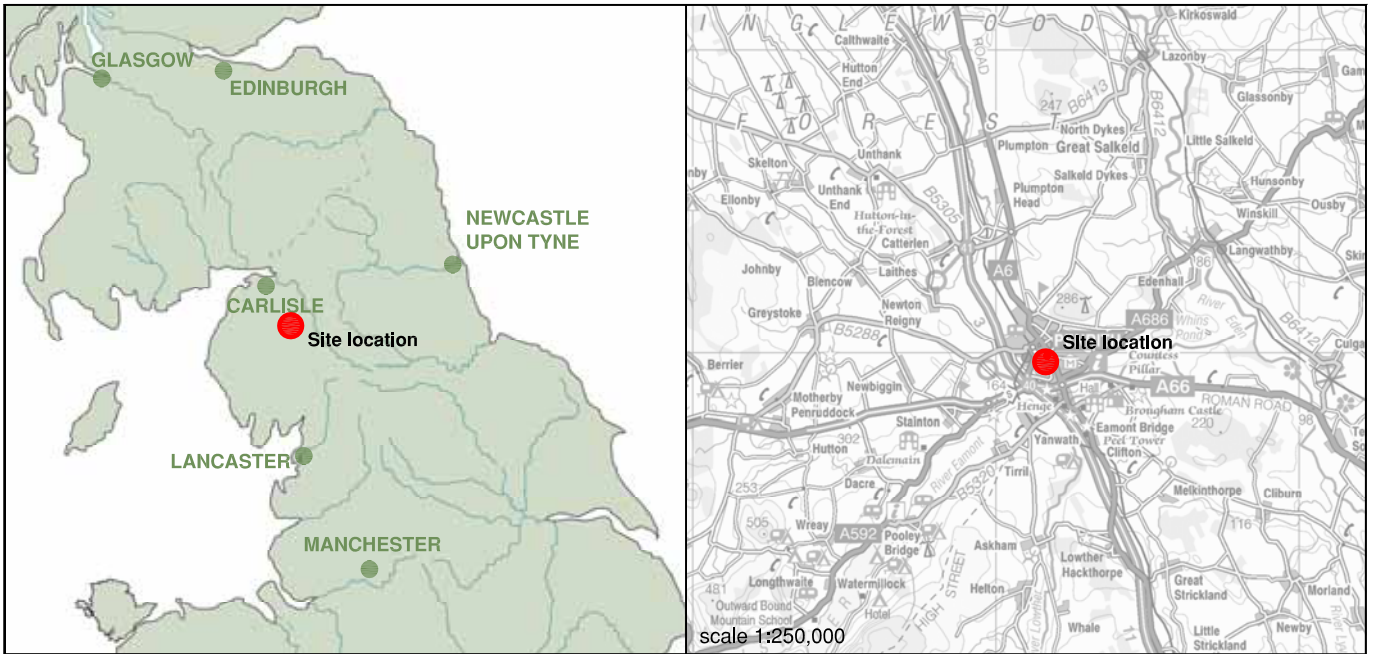
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*UK*



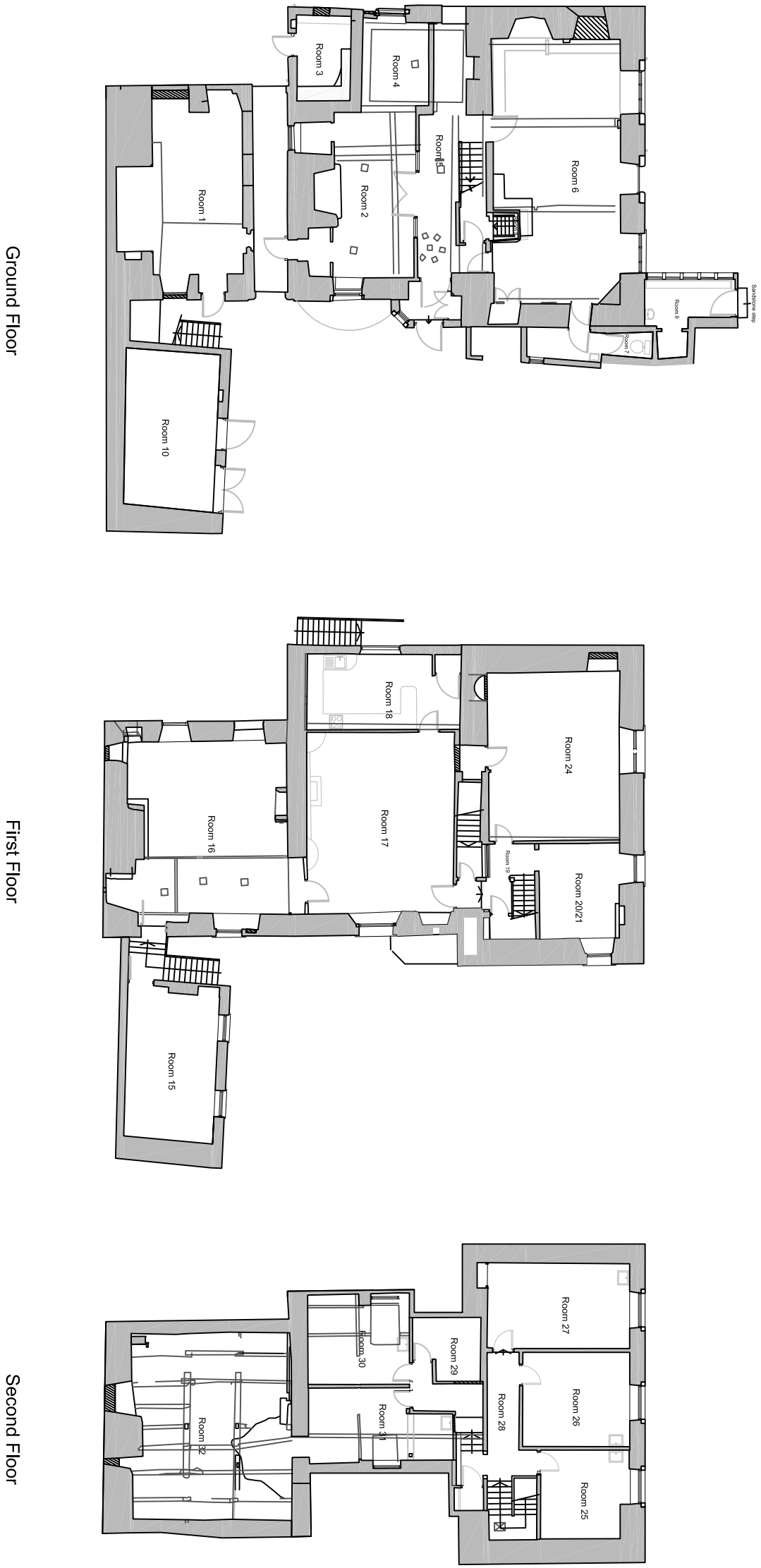
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0 25 m  
1:1,000 @ A4



EM\*L10371\*MAT\*Oct 2011

Figure 1: Site location



Ground Floor

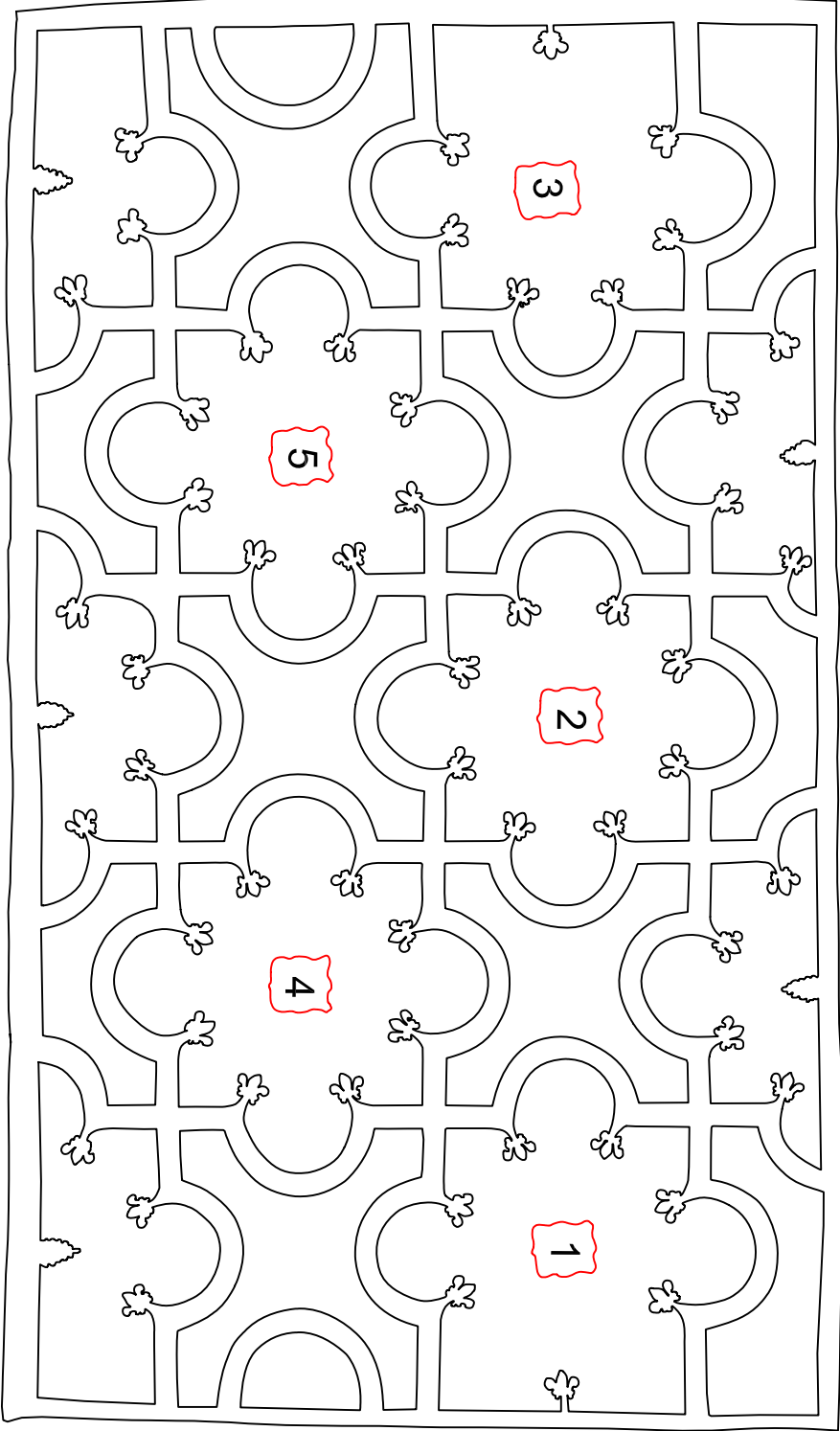
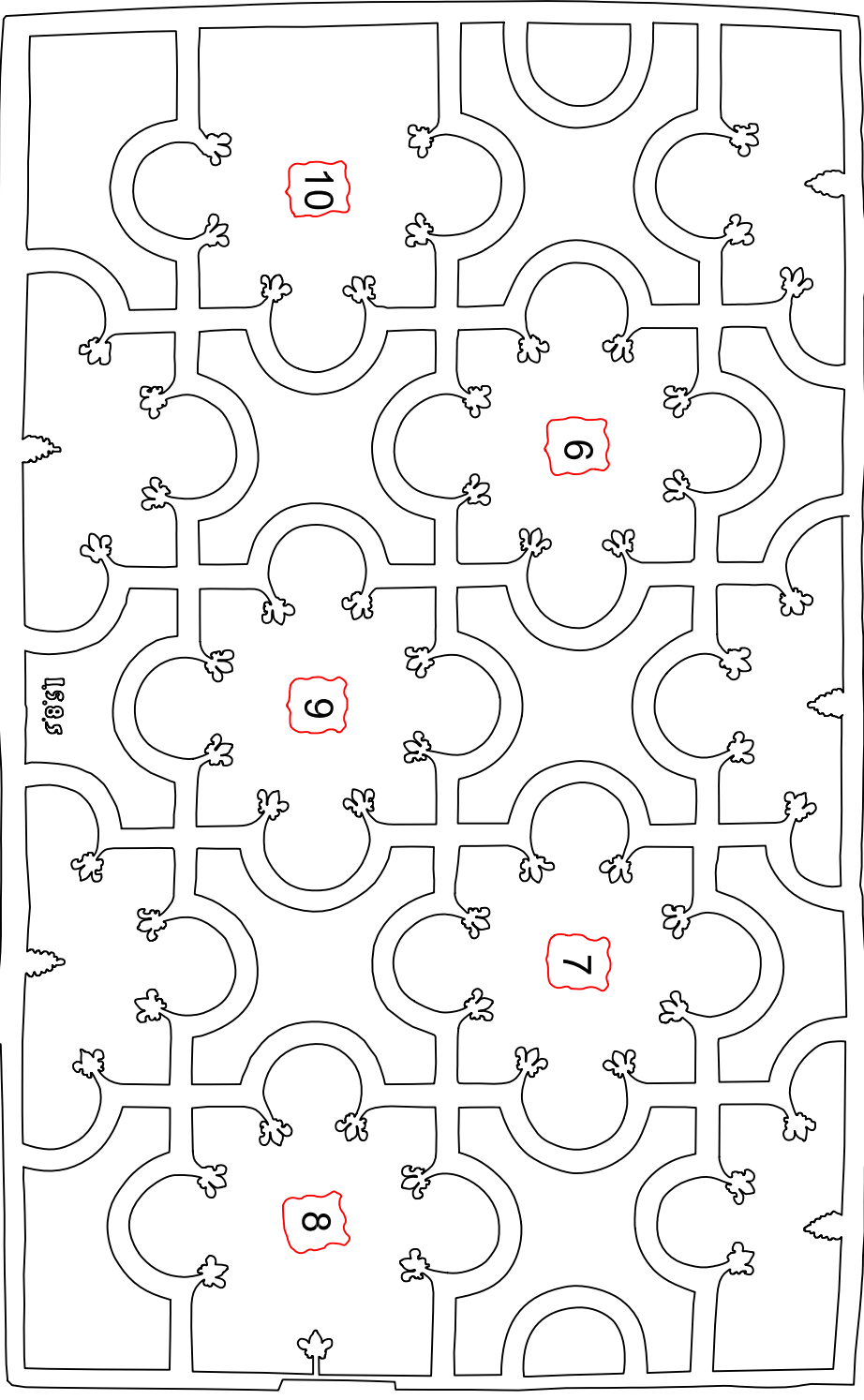
First Floor

Second Floor

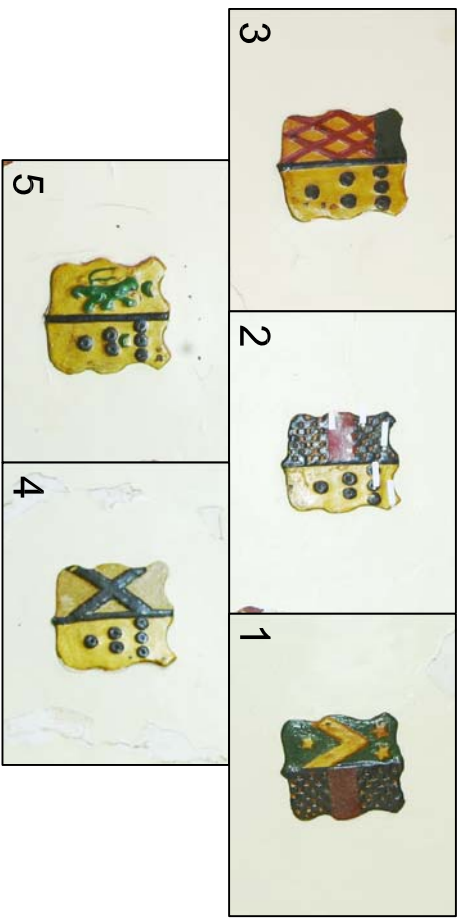


Figure 2: Plan showing locations of room numbers

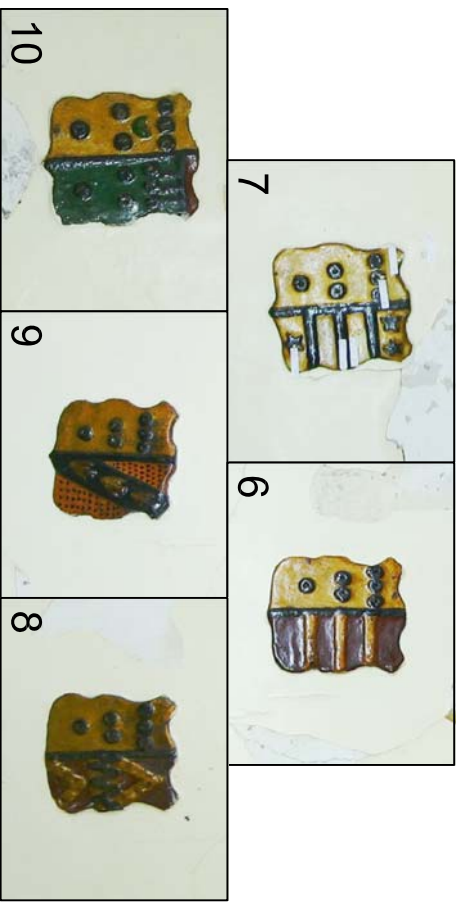
Plaster work  
 Shield  
 Shield number



Fireplace



Shields not to scale

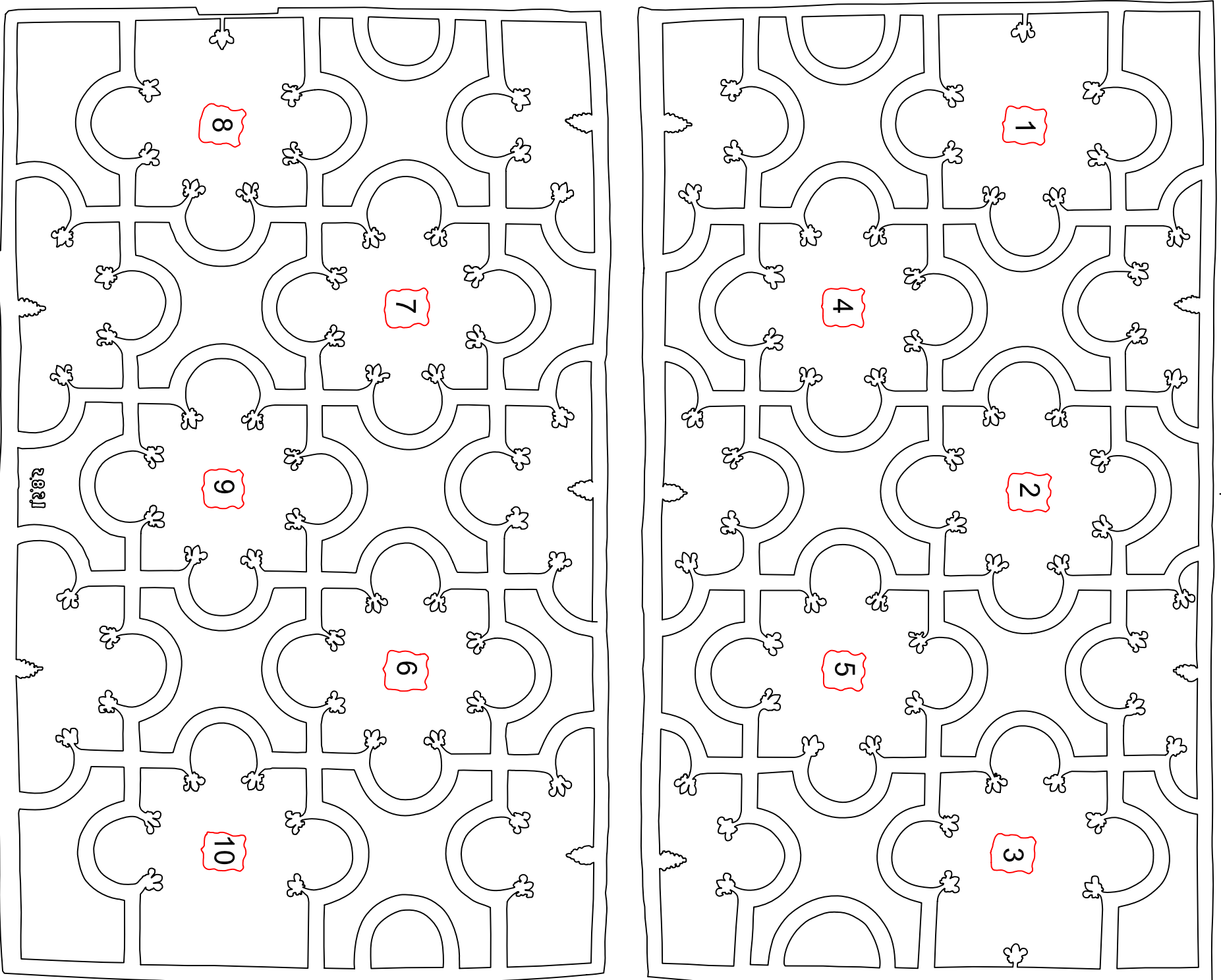


0 0.5 m  
 1:25 @ A3

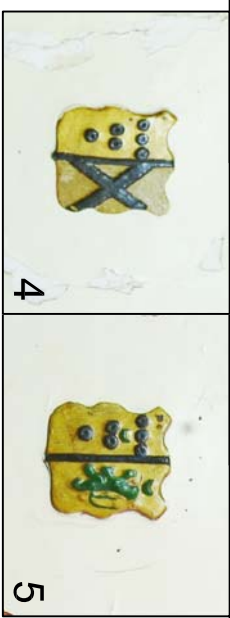
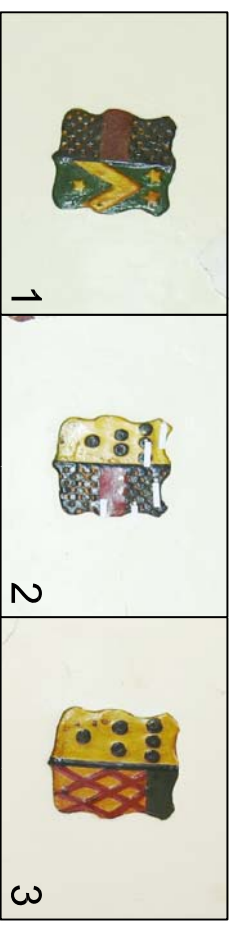
Figure 3: Ceiling plan of the decorative plaster ceiling in Room 6 as viewed from below showing incorrect heraldry



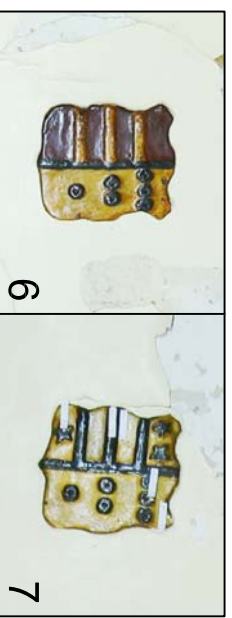
Fireplace



Plaster work  
 Shield  
 1 Shield number

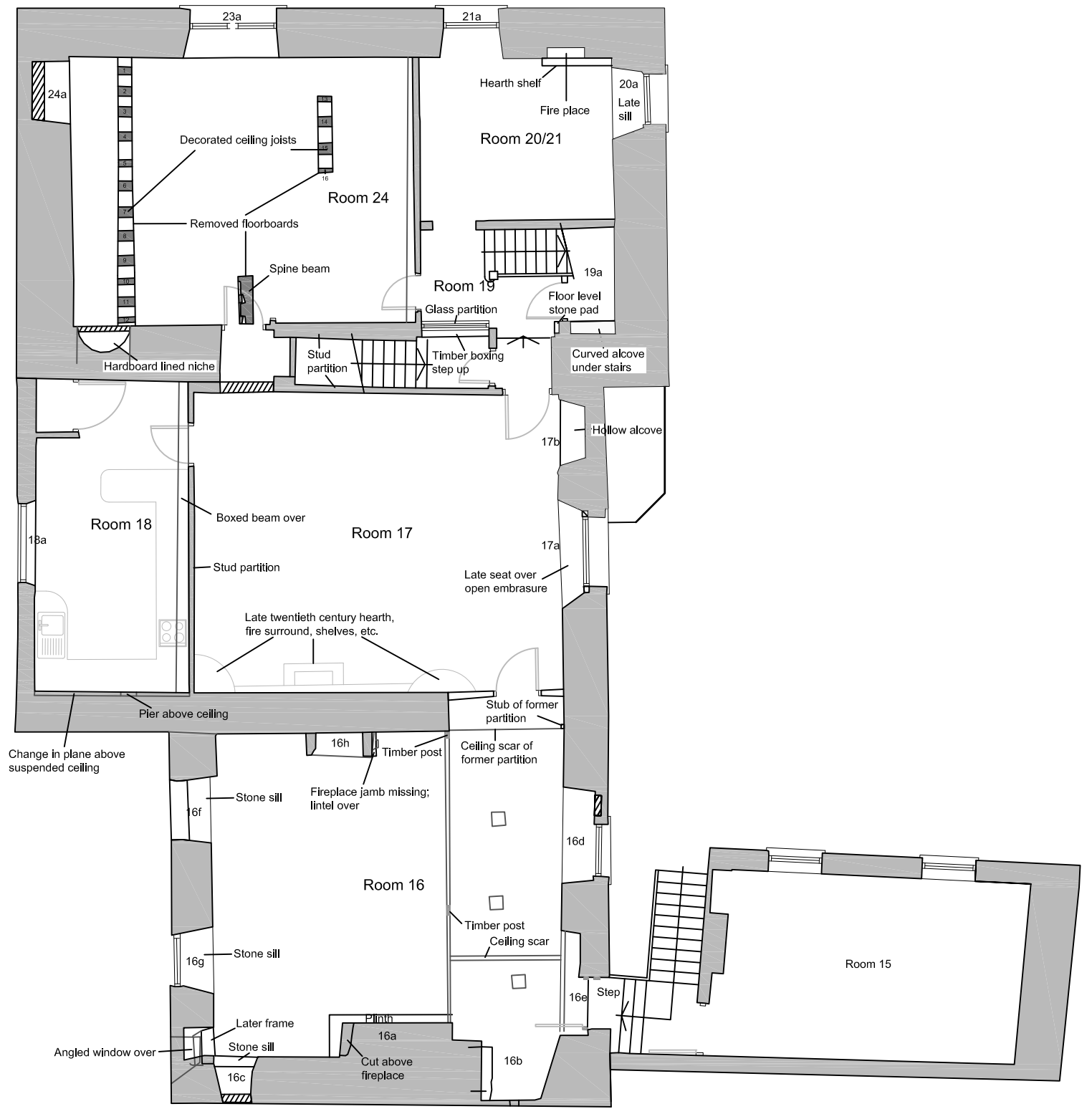


Shields not to scale



0 0.5 m  
 1:25 @ A3

Figure 4: Reflected ceiling plan of the decorative plaster ceiling in Room 6 as viewed from above showing corrected heraldry



- Principal Material
- Timber
- Blocked area
- Uncertain edges
- Beam over/ceiling decoration
- Room contents inc doors

0 2.5m  
1:100 @ A3



Figure 5: First floor plan (revised) showing alterations

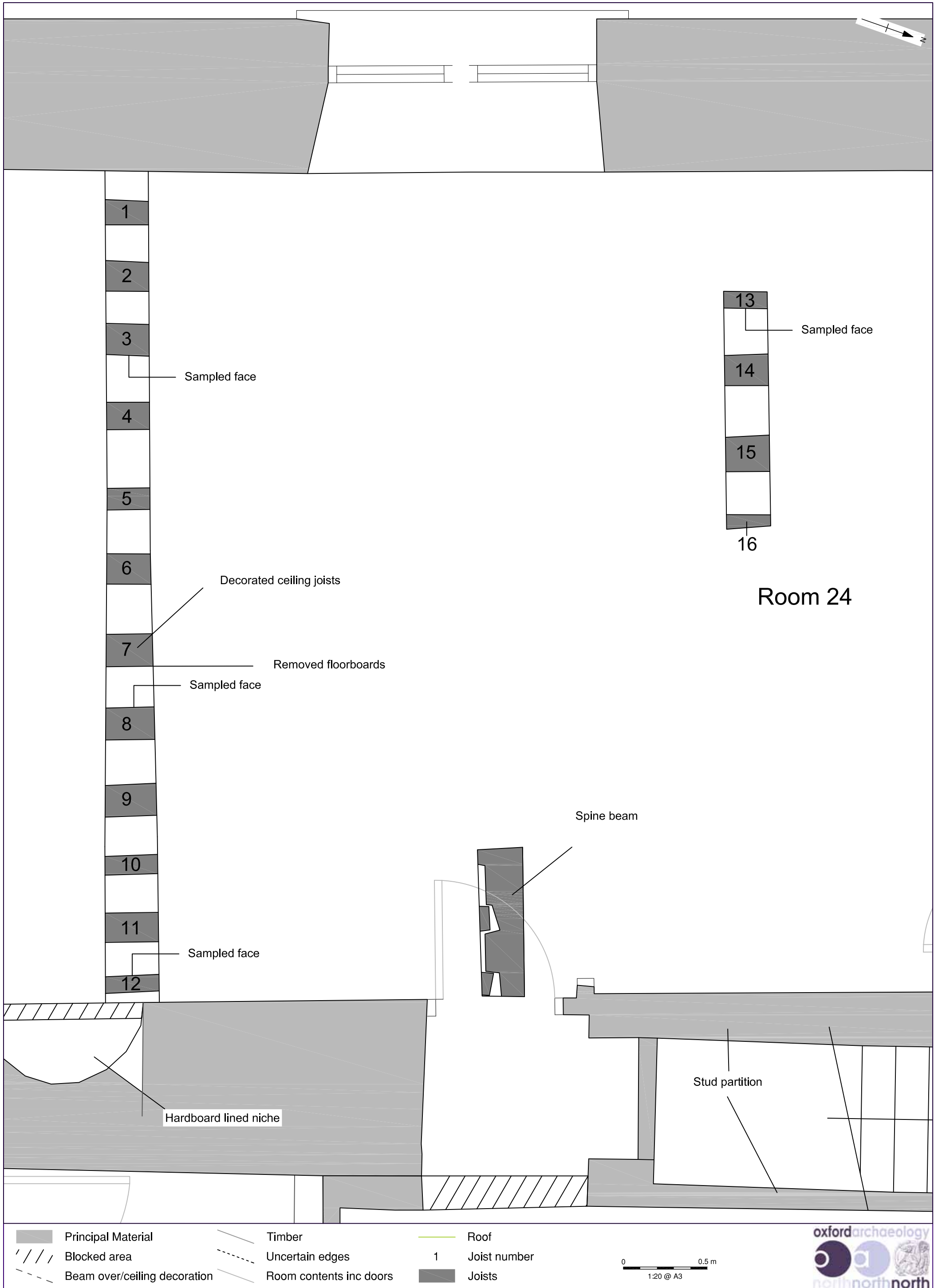
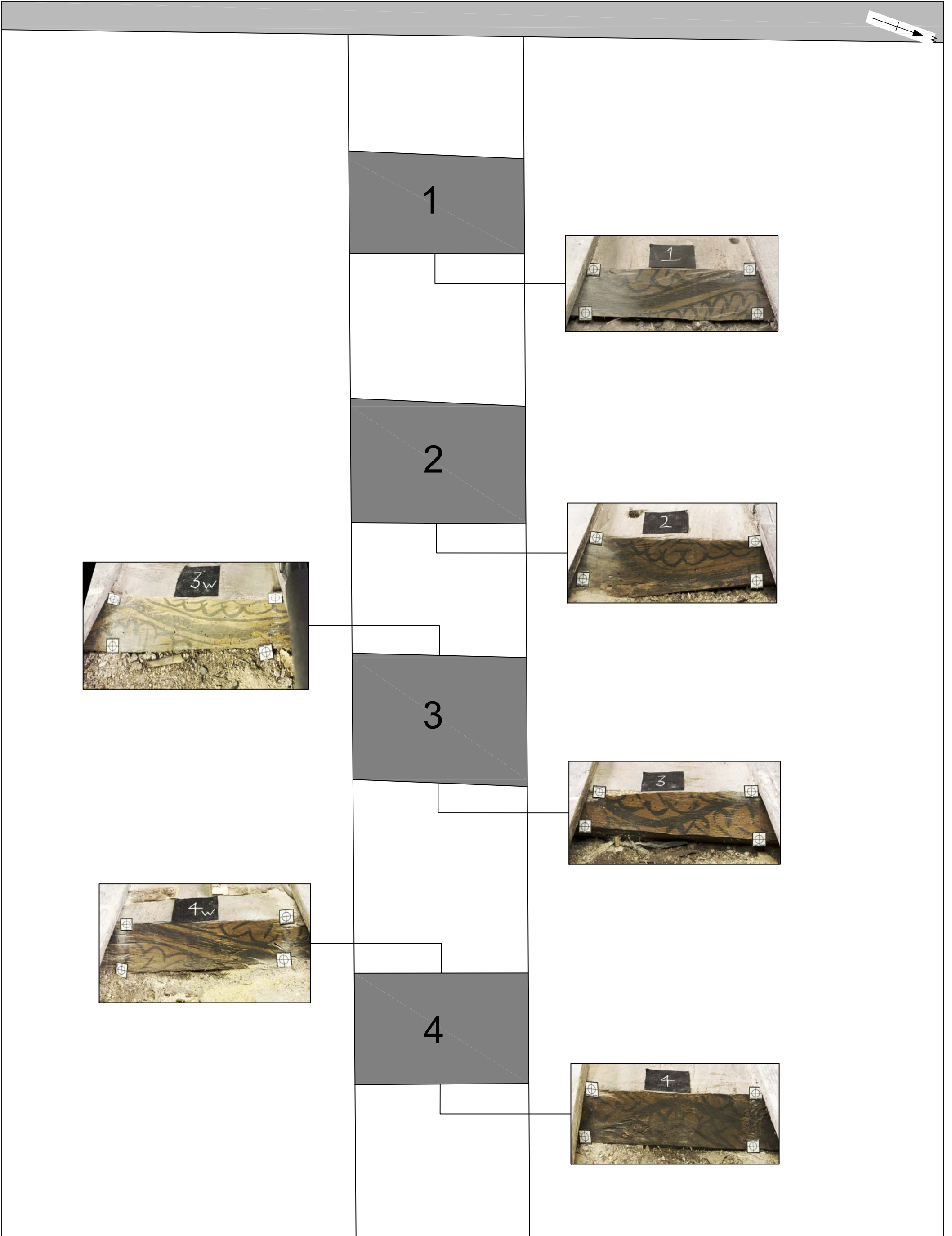
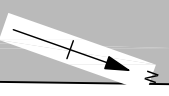


Figure 6: Locations of decorated ceiling joists



1 Joist number  
 ■ Joists

0 0.125 m  
 1:5 @ A3

Figure 7: Rectified images of Joists 1-4

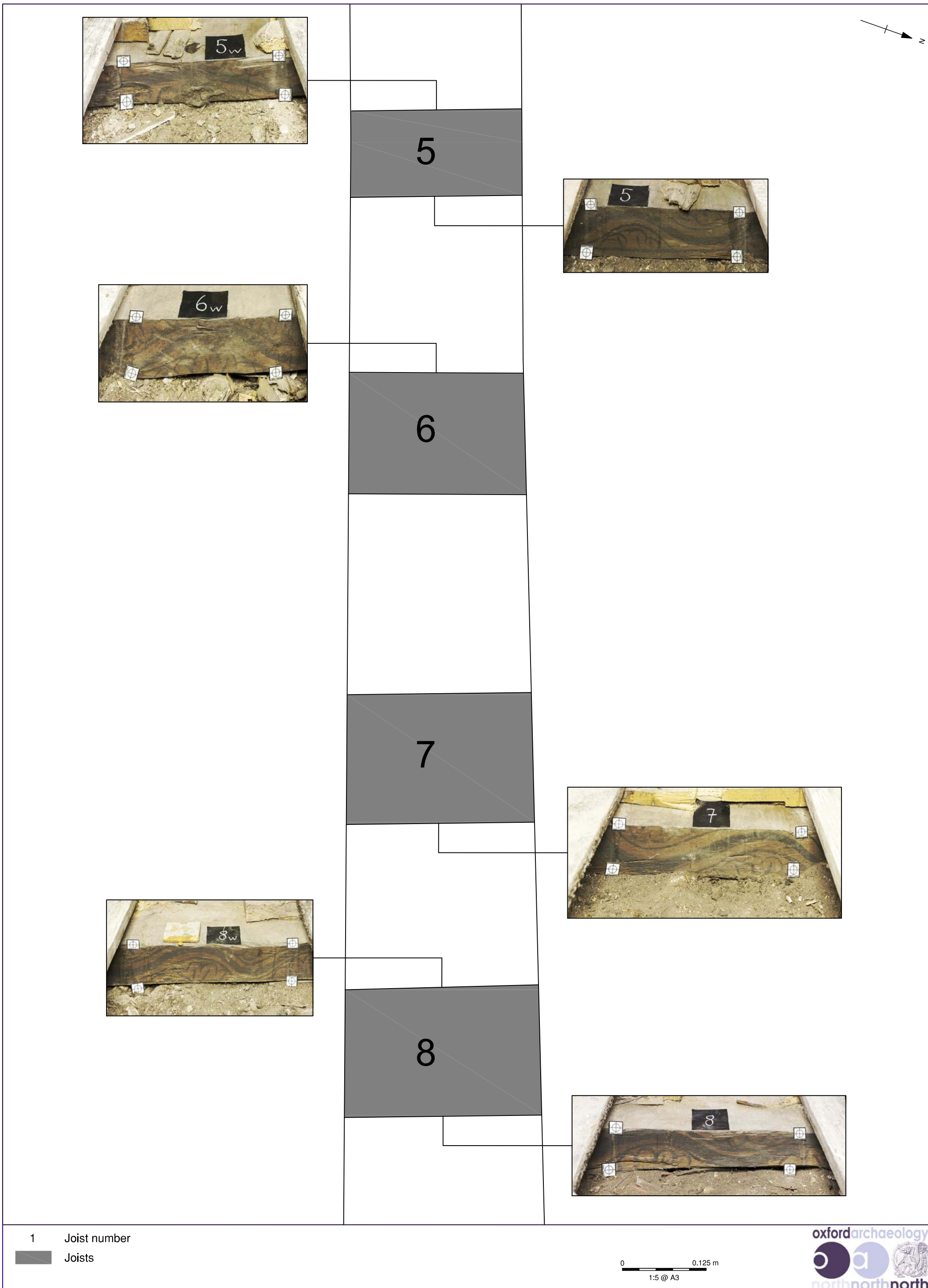
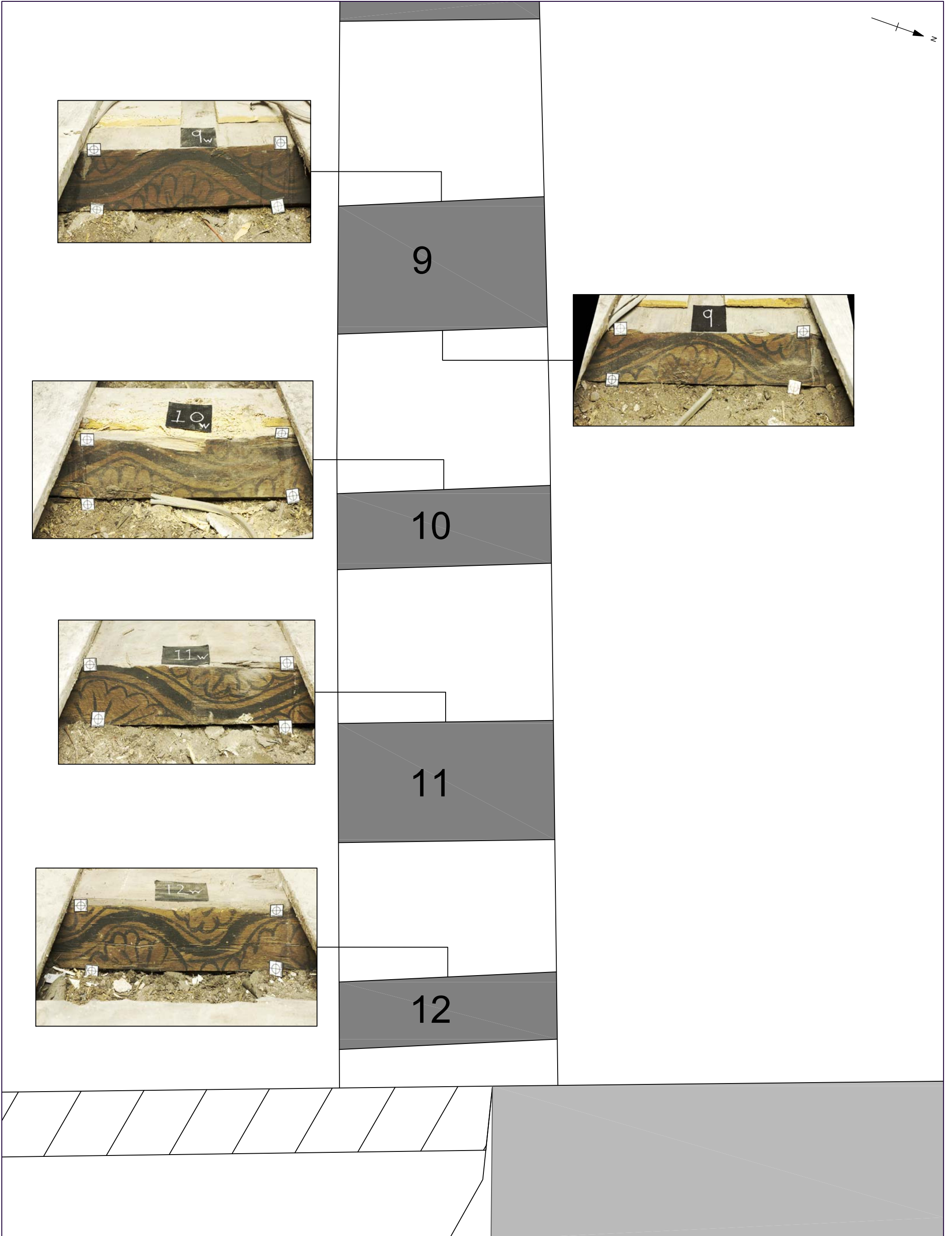


Figure 8: Rectified images of Joists 5-8

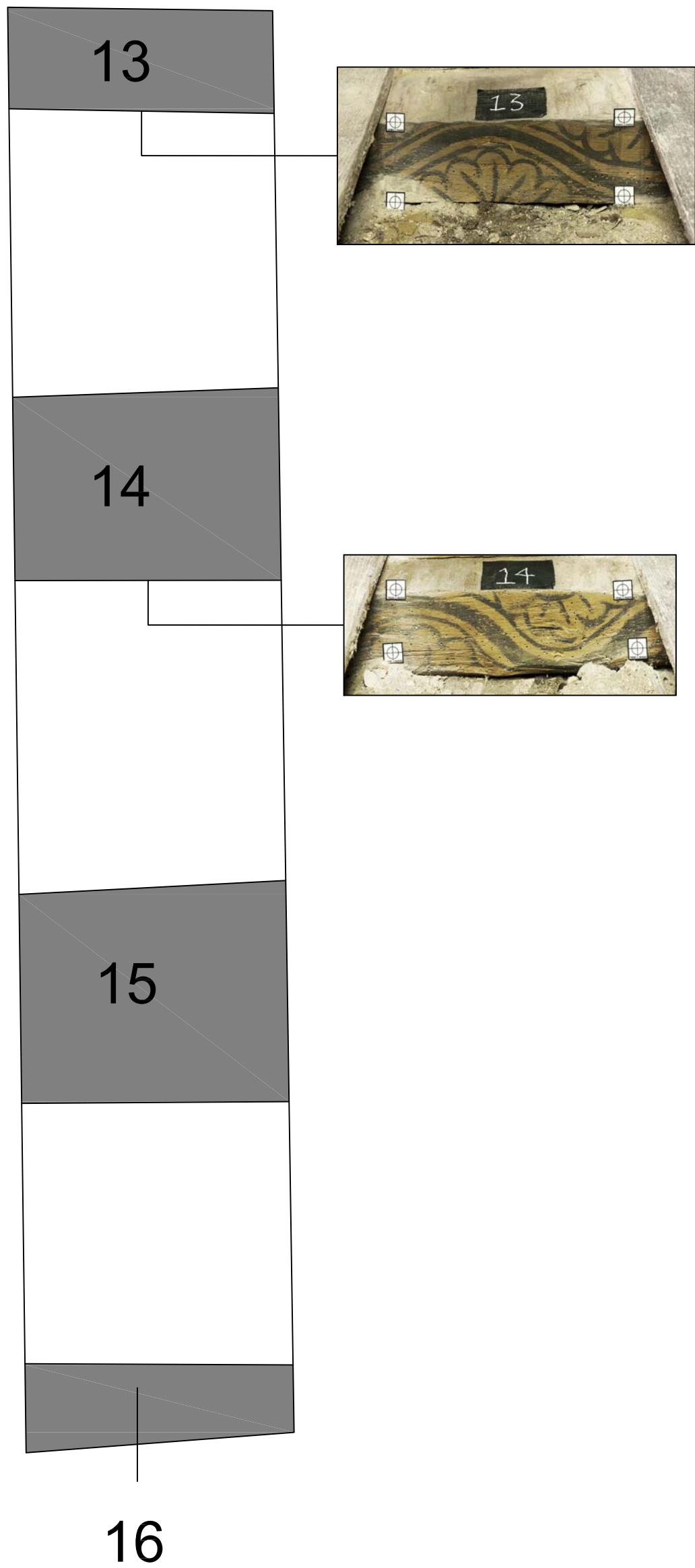


1 Joist number  
Joists

0 0.125 m  
1:5 @ A3

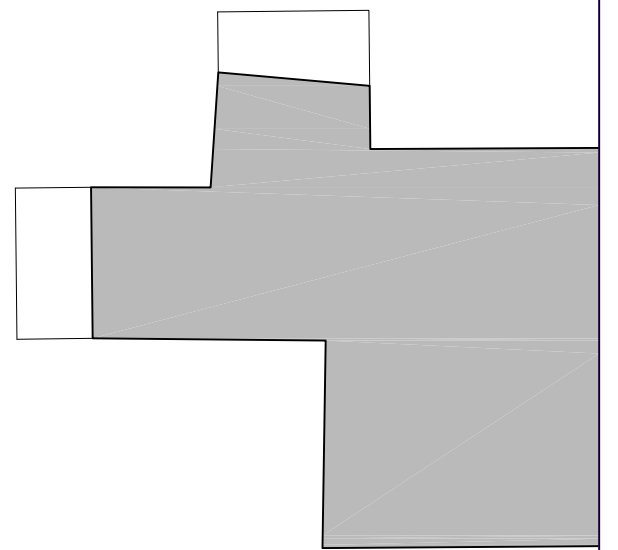
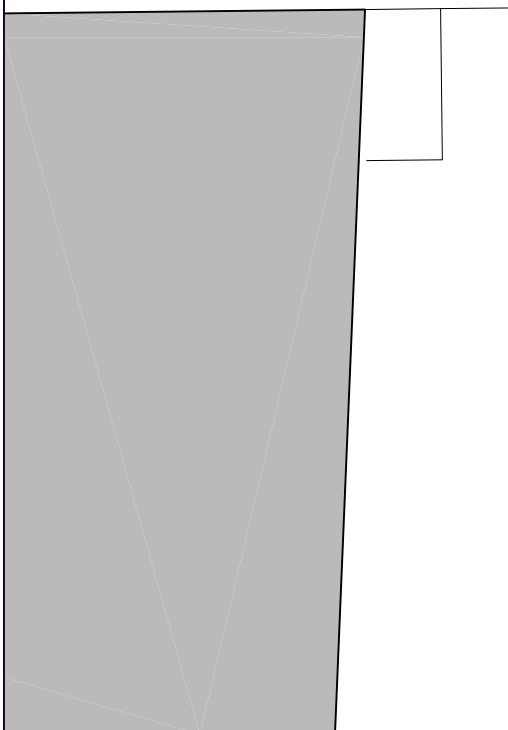


Figure 8: Rectified images of Joists 9-12



1 Joist number  
Joists

Figure 10: Rectified images of Joists 13-14



1 Joist number  
Joists

0 0.125 m  
1:5 @ A3

Figure 11: Rectified images of spine beam