AXWELL HALL, BLAYDON, GATESHEAD,

Tyne and Wear

Archaeological Roof Survey and Watching Brief

Oxford Archaeology North

February 2010

Development and Regeneration Excellence (Northern) Ltd (DARE)

Issue No: 2008/09-921
OAN Job No: L9660
NGR: NZ 1911 6204

Document Title: AXWELL HALL, BLAYDON, GATESHEAD, TYNE AND WEAR

Document Type: **Archaeological Roof Survey and Watching Brief**

Client Name: Development and Regeneration Excellence (Northern) Ltd (DARE)

Issue Number: **2008-9/921**
OA Job Number: **L9660**
National Grid Reference: **NZ 1911 6204**

Prepared by:	Christopher Wild	Christopher Ridings
Position:	Project Officer	Supervisor
Date:	October 2009	October 2009
Checked by:	Alison Plummer	Signed.....
Position:	Senior Project Manager	
Date:	February 2010	
Approved by:	Alan Lupton	Signed....
Position:	Operations Manager	
Date:	February 2010	

Oxford Archaeology North
Mill 3
Moor Lane
Lancaster
LA1 1GF
t: (0044) 01524 541000
f: (0044) 01524 848606

w: www.oxfordarch.co.uk
e: info@oxfordarch.co.uk

Janus House
Osney Mead
Oxford
OX2 0EA
t: (0044) 01865 263800
f: (0044) 01865 793496

CONTENTS

SUMMARY **2**

ACKNOWLEDGEMENTS **3**

1. INTRODUCTION **4**

1.1 Circumstances of the Project 4

2. METHODOLOGY **5**

2.1 Project Background 5
2.2 Roof Survey 5
2.3 Watching Brief 5

3. HISTORICAL BACKGROUND **7**

3.1 History of Axwell Park and the Estate 7

4. RESULTS **11**

4.1 Introduction 11
4.2 The Roof Structure - Area A 11
4.3 The Roof Structure - Area B 13
4.4 The Roof Structure - Area C 14
4.5 The Roof Structure - Area D 15
4.6 The Watching Brief 17

5. DISCUSSION **22**

5.1 Introduction 22
5.2 The Roof Structure 22
5.3 The Watching Brief 22

6. BIBLIOGRAPHY **24**

6.1 Primary Sources 24
6.2 Secondary Sources 25

7. ILLUSTRATIONS **27**

7.1 List of Figures 27
7.2 List of Plates 27

APPENDIX 1: GAZETTEER OF ROOF TIMBER ASSEMBLY MARKS **30**

SUMMARY

Development and Regeneration Excellence (Northern) Ltd (DARE) are redeveloping Axwell Hall, a Grade II* listed Palladian mansion (IoE No. 303771), located near Blaydon, Gateshead, Tyne and Wear (NZ 1911 6204). Following a request by the Tyne and Wear archaeologist, a programme of building investigation (OA North 2004), and an archaeological landscape survey of the walled gardens (OA North 2007) was undertaken. Subsequently, a watching brief was maintained during structural works from October 2006, to be followed by a detailed survey of the roof of the Hall in January and April 2007. This report outlines the results from the roof survey and watching brief.

The roof was in a poor state of repair, with frequent and prolonged ingress of water having irreparably damaged some of the constituent timbers. This process, however, does not appear to have been confined to the more recent history of the Hall, as several major episodes of repair were observed.

The archaeological survey of the roof has revealed that the present structure is unlikely to represent the eighteenth century roof in its original form. Many of the roof timbers exhibit significant evidence (such as redundant joist slots and tennon holes) for their re-use or repositioning, which cumulatively suggests that the roof has undergone some rebuilding or repair. However, the style of carpentry, the use of timber pegs, and the apparent method of preparation of the timbers strongly suggests that the major timbers of the present roof, is formed of these original eighteenth century timbers.

The stripping of the floors and walls monitored throughout the duration of the watching brief allowed an insight into the original layout and construction techniques applied to the Hall.

Amongst the more interesting details observed were bases to two of the columns in the basement. These were seen to sit upon stone plinths. Also in the basement, evidence for four cross-passages was exposed. Of particular interest was the presence of the paired RSJ truss located within Rooms 33 and 34. This appears to have been inserted in order to support the vaulted ceiling in room 1 below.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank DARE (Northern Ltd) for commissioning and supporting the project. Further thanks are due to Jennifer Morrison, the Archaeology Officer for Tyne and Wear.

Chris Wild and Pip Haworth carried out the Roof Survey, Karl Taylor undertook the Watching Brief, and Chris Ridings and Chris Wild wrote the report. Mark Tidmarsh produced the illustrations. Alison Plummer managed the project, and also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Development and Regeneration Excellence (Northern) Ltd (DARE) are presently redeveloping Axwell Hall, a Grade II* listed Palladian mansion (IoE No. 303771), located near Blaydon, Gateshead, Tyne and Wear (NZ 1911 6204) (Fig 1). The Hall and its estate are situated on the north-western side of the Derwent Valley, which slopes gradually down, from west to east, towards the Derwent basin. The estate, which is currently accessed from the A694, is located within both the statutory Green Belt and the Axwell Park Conservation Area, and is also partially within the Derwent Valley wildlife corridor.

1.1.2 Following programmes of building investigation at the Hall (OA North 2004), and archaeological landscape survey of the walled gardens (OA North 2007), a roof survey was undertaken and watching brief was maintained during structural works.

2. METHODOLOGY

2.1 PROJECT BACKGROUND

2.1.1 A recommendation for this tertiary phase of the project was made by the Tyne and Wear Archaeology Officer. The roof survey and watching brief were undertaken over a series of visits between October 2006 and April 2007.

2.2 ROOF SURVEY

2.2.1 The roof survey comprised a Level II-type survey (English Heritage 2006) of the timbers, comprising a descriptive record and section drawings (of typical features) and a detailed photographic record. Access was only provided to the northern part of the roof structure.

2.2.2 ***Descriptive Record****:* written records using OA North *pro forma* record sheets were made of the roof structure. Particular attention was paid to timber marks, both assembly marks and shipping marks, corbels, and truss construction.

2.2.3 ***Timber drawings:*** section drawings were produced by data capture of detailed survey data using a reflectorless total station. Observations will be made from a network of control stations positioned on the scaffold within the roofspace of the hall. Elements of the surveyed data were enhanced by hand measurement using tapes, again undertaken from the scaffold within the hall. These were produced in order to show the form and location of structural features and/or features of historic interest. The final drawings were produced using an industry standard CAD package.

2.2.4 ***Photographs:*** a detailed photographic record of the roof structure within the areas highlighted above was compiled from the scaffold within the hall. This was carried out using black and white and colour slide 35mm SLR cameras and a variety of lenses.

2.3 WATCHING BRIEF

2.3.1 Close liaison was maintained between OA North staff and the site contractors during the watching brief. The programme comprised observation during the stripping of the interior of the building prior to extensive renovation and remodelling.

2.3.2 The recording comprised a full description and preliminary classification of features or structures revealed on OA North *pro-forma* sheets and their accurate location in plan. In addition, a photographic record in colour slide and monochrome formats was compiled.

2.4 ARCHIVE

2.4.1 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*, 2nd edition, 1991). The original record archive of project will be submitted to the Archaeology Officer for Tyne and Wear.

2.4.2 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3. HISTORICAL BACKGROUND

3.1 HISTORY OF AXWELL PARK AND THE ESTATE

3.1.1 The following is a synthesis of the documentary research regarding the Hall and estate, which was originally gathered during the original survey of the Hall (OA North 2004).

3.1.2 The earliest reference to Axwell is in 1223 (Watts 2002, 2), although this probably refers to the original Axwell (also known as Old Axwell or Axwell Houses), which was positioned some distance to the east (D/X/35/6 nd). It is considered likely that an original village of Axwell was present in the area (SMR No 627), although this was likely to have been south of the River Derwent (Jennifer Morrison pers comm).

3.1.3 In Bishop Hatfield's Survey of 1345-81 (Greenwell 1857, 93) Axwell is owned by Hugh de Redhugh. It is recorded in 1362 as a see of Durham held by William de Birtley, and by 1411 it had passed to Roger Thornton (MacKenzie and Ross 1834, 199). There is little information regarding the original manor although it may have only consisted of lands to the east in the vicinity of Axwell Houses (D/CG 7/1 1568; D/CG 7/4 1604-5). It is known to have passed to Roger Ogle in 1574 and then Roger Lumley in 1604 (*ibid*). The manor at Axwell Houses was apparently occupied in the early seventeenth century by the Selbys, who then moved to a mansion called Whitehouse, which stood on the site of the present Axwell Hall (*op cit*, 200). It is not recorded when they moved to this site, although they are recorded as being at Whitehouse by at least 1661 (D/CG 7/66 1661). The property at Old Axwell was described as still standing in 1834 (MacKenzie and Ross 1834, 200).

3.1.4 The Clavering family, who were responsible for building the present Axwell Hall and park, bought the Axwell Estate in 1629, presumably from the Selbys (*op cit*, 199), and initially lived at Old Axwell (D/CG 7/15 1629). Shortly after this date they appear to have rapidly expanded their land holdings; they are named beneficiaries in the division of the Winlaton Estate in 1632 (D/CG 19/303-306 *c*1632; D/CG 19/18 *c*1632) and by the end of the seventeenth century they had evidently purchased Whitehouse and the land around it (D/CG 7/90 1668-9). The earliest direct reference to the Clavering family at Whitehouse is in 1710 (Dickinson (ed) 1968, 79) and there are several more references following this (D/CG 7/236 1712; D/CG 7/127 1714).

3.1.5 It is not recorded whether the building of Axwell Hall (begun in 1758) incorporated any parts of the Whitehouse, which originally stood on the site. Plans produced by William Shield in the early eighteenth century, and taken from 'an old survey', show the Whitehouse as having a T-shaped plan (D/X/35/2 *c*1832) and on two plans schematic elevations are also shown. One of these shows a single storey building of symmetrical design with a hipped gable roof, central doorway and single chimney (D/X/35/6 nd). The other shows a similarly symmetrical window of two storeys with a plain string course or sill band, a hipped roof with coping, two chimneys and a doorway

with a square surround (D/St/P7 nd). Which of these two drawings, if either, is the most accurate representation is impossible to say. The other buildings shown on the former plan are all very schematic but each one is different, perhaps suggesting that there is some attention to detail. Bourn is quite adamant that Whitehouse was demolished prior to the construction of Axwell Hall stating that '*The father of Mr Ralph Norton, the late agent to the Axwell estate, was present at the demolition of the old hall, after which the site was planted with trees*' (Bourn 1896, 171).

3.1.6 Construction of the current hall is thought to have begun in 1758 (McCombie 2002, 1), although accounts of borings for coal carried out in 1752-4 are already referring to Axwell Hall (3410/Bud/26/31 1752-3; 3410/Bud/26/36 1754; 3410/Bud/103/33 1754; 3410/Wat/2/27/104 1753-4), perhaps suggesting that construction had already begun or that the former Whitehouse had changed name. 'Axwell Hall' is in itself something of a misnomer as the earliest accounts refer to it as 'Axwell Park' (Paine 1767; ND/Du 9/2 1786; ND/Du 9/3 nd, ND/Du 9/4 nd). Axwell is fortunate in having an account of its construction compiled by the architect James Paine (1767, 14-16), which includes drawings showing elevations, plans and a cross-section. The complete, and rather lengthy, text regarding Axwell is presented in *Appendix 4* of the OA North 2004 report. The important point made by Paine is that his original plans were altered as a result of interference by Sir Thomas Clavering, which '*striped* (*sic*) *the building entirely of its proportions and ornaments, till no traces of the original design were left*' (Paine 1767, 16). Paine's criticism of his client's decision is remarkably blunt; he describes the situation as '*mortifying*' and complains that '*his character as an artist lies at stake*' (*ibid*).

3.1.7 The alterations made by Thomas Clavering appear to have been largely cosmetic, comprising the removal of much of the ornamentation from the centre of the front elevation and columns from the staircase (*ibid*). It is further stated that the '*out-offices belonging to this house were not designed by the author, nor had he any concern in the greatest part of the finishings of the house*' (*ibid*). Although he does not say who was responsible for these elements it has been suggested that they were built by John Bell of Durham, the clerk of works for the whole construction (Vivat Trust Management Services Ltd 1994a, 14). The new hall was probably completed within three years; Bishop Pococke describes the shell as having been complete in 1760 and the Claverings may have been in residence by 1761 (Bourn 1896, 172).

3.1.8 It is further recorded that the renowned architect John Dobson made additional alterations to the hall in 1817 (Dobson 1885, 77; Faulkner and Greg 2001, 21). Exactly what these alterations consisted of is not recorded, however. Dobson (1885, 25-7) is highly critical of the buildings designed by Paine and his contemporaries, which typically '*made the entrance from the South…in the centre of the building, and opening directly into the hall, through which the air rushed unchecked*' (*op cit*, 27). The mansions designed by John Dobson took this in to account, and made every effort to trap air and prevent draughts by the use of double doors and thick inner walls (*op cit*, 28). He even invented means for stopping dry rot, which was particularly common in buildings designed by Paine (*op cit*, 30). It is likely that Dobsons alterations were concerned

principally with the main entrances, although the suggestion that he moved the principal entrance to the north side (Faulkner and Greg 2001, 21) would seem to be erroneous.

3.1.9 Further alterations were carried out during the rest of the nineteenth century, although the exact details are not known. It is stated, for example, that in 1880 the estate was '*meticulously restored*' (Barford 1999, 38), and that the interiors were '*much altered in the nineteenth century*' (Whittaker and Clark 1971, 48). It is similarly claimed that '*As with other grand houses in the nineteenth and early twentieth centuries, the Hall was continually upgraded and enhanced with the latest in services and domestic conveniences*' (Vivat Trust Management Services Ltd 1994a, 17). Additions to the exterior considered to date to the late nineteenth century include the carved armorial bearings and balustraded terrace (CC/PL 1177 n.d.), which are not shown on the Ordnance Survey plans until 1897 (Ordnance Survey 1856; 1897).

3.1.10 Although much of this evidence is somewhat anecdotal it is largely confirmed by the sales particulars from the sale of the estate in 1920, although it is still shown as retaining many of its original Georgian features (D/CG 7/3190 1920). The sale of the estate due to the collapsing fortunes of the Clavering family (by that time the Napier-Claverings (Vivat Trust Management Services Ltd 1994a, 17)) lead to the eventual decline of the Hall and park. The estate was purchased by a syndicate of Newcastle businessmen and its various parts sold off for a variety of uses (*ibid*).

3.1.11 The hall became the new home for the Newcastle Ragged School, which had been founded in 1847 for poor boys and had out grown out of its original premises (*ibid*). It moved to Axwell in 1922 following alterations to the building and the construction of playing fields (*ibid*) These alterations included the addition of a kitchen block (Eltringham 1921d), a schoolmaster's house (Eltringham 1921e), workshops (Eltringham 1921f), sanitary block (Eltringham 1921g), boiler house and laundry (Eltringham 1921a), staff dining area (Eltringham 1922a) and other alterations (Eltringham 1921b; 1921c; 1922a). Alterations to the interior of the hall itself were also carried out (Eltringham 1922b) and there is a reference to '*exempted buildings*' constructed for '*His Majesty's use*' or the use of a Secretary of state, although this is not explained (Symons 1922). Whether the work was fully completed is also not clear as Eltringham describes old drains that were not connected because he had '*been unable to discover their outlet*' (1922c).

3.1.12 Some details of the internal alterations are known: the internal arrangement was reorganised to accommodate approximately 150 pupils, the main staircase was removed and replaced with two adjacent staircases and the main kitchen was converted for use by the staff including cloakrooms (Vivat Trust Management Service Ltd 1994a, 28). Apart from this '*No major structural changes were made to the interiors*' (*ibid*). In 1933 the school became an approved school, although there was little expenditure on the buildings due to the economic climate (*ibid*).

3.1.13 Between 1956-8 an area to the east of the Hall was levelled and a new headmaster's house was built, by the pupils, on the site (*ibid*). Shortly

afterwards additional housing for staff was constructed, some along the main drive (*ibid*). The stable block was demolished in the late 1960s and replaced in 1970 with new classrooms and workshops (*ibid*). The entire building, particularly the south front, had suffered greatly from damage caused by smoke emitted by the coke works to the south and in 1972 some remedial work was carried out; three years before this an attempt had been made to remove the dry rot from the building (*ibid*). During the 1970s the City of Newcastle was appointed '*The Responsible Authority*' for Axwell Hall, at which time it began to fall into a poor state of repair (Vivat Trust Management Services Ltd 1994a, 29).

3.1.14 The number of pupils was beginning to decline by this time and a new facility, Clavering House, built close to the Hall in 1976-8, took over all of the school's roles after the Hall was closed in 1981 (*ibid*). The Hall and surplus land was sold in 1986 to a private company, and plans were put in place to convert it to residential use in 1992, although the scheme was eventually withdrawn (Vivat Trust Management Services Ltd 1994a, 30). A second scheme for conversion involving the gutting of the Hall was proposed following this but this was turned down (*ibid*). The Hall was subjected to repeated vandalism and theft of architectural features during the 1990s and a fire broke out in 1990 (*ibid*). The condition of the Hall was so bad that in 1993 a conservation strategy was drawn up in order to find a sympathetic way to preserve the building (Gateshead Metropolitan Borough Council 1994; Vivat Trust Management Services Ltd 1994c). As a result of this a detailed investigation into the condition of the hall was carried out which identified extensive dry rot (Vivat Trust Management Services Ltd 1994d; 1994e), severe collapse of the ceilings in several places (Vivat Trust Management Services 1994b) and a number of recommendations were made for remedial and long-term repairs (Vivat Trust Management Services Ltd 1994e).

4. RESULTS

4.1 INTRODUCTION

4.1.1 The survey of the roof structure was not practicable until the latter stages of the renovation of the Hall, as access was required from a large internal scaffold, following the removal of unstable internal floors. Given the quantity of scaffold required, it was not economically feasible to scaffold the entire Hall at one time, and thus it was split into nine equal squares, designated the letters A through J (excluding I), with A being in the north-west corner, C in the north-east, and J in the south-east (Fig 2). Each truss has been ascribed a number, corresponding to that given by the initial roof structure survey (Edmondson Surveys Ltd 2006).

4.1.2 The initial inspection of the roof allowed for the detailed recording of areas A, B and C, which formed the north range of the quadrangle roof. A second visit afforded access onto the top of the roof, enabling examination of the timbers of Areas A, B, C, and D, the latter also being scaffolded internally. Removal of the felt roof covering of the north range revealed that the lantern, located in the centre of the quadrangle (Area E) was in a particularly poor, and apparently dangerous, state of repair, leading to its immediate removal, prior to any archaeological recording. No access to the internal roof space of the eastern and southern ranges of the roof was provided for archaeological recording.

4.1.3 One of the major features of the roof structure is the large quantity of carpenter's assembly marks incised into the majority of timbers. These are presented in a tabular form as an appendix to this report (*Appendix 1*), and provide evidence for both the original construction of the roof, and subsequent repair.

4.2 THE ROOF STRUCTURE - AREA A

4.2.1 This short, approximately 21' (6.40m) square area of the roof structure, forms the hip of the north-western quadrant. It comprises just over two bays in each direction, supported on two complete and two partial trusses. The area is separated from Areas B and D by brick partition walls. The bricks in the dividing walls are thin, typically 2¼", between 9¼" and 9¾" long and 4¾" wide (57mm x 235-248mm x 121mm), suggesting an eighteenth century date, almost certainly contemporary with the erection of the present Hall in the mid-eighteenth century. These are laid in English Garden Wall bond (with five rows of stretchers between those of headers) with rough, slobbered, lime mortar, pale grey/brown in colour, suggesting that the walls were unplastered and not visible from within the house. These walls function as dividing walls below ceiling level, and served only to house the chimney stacks, and were therefore not constructed to the full width of the roof space (Plate 1). The purlins (two on each pitch) are tusk-tenoned (Plate 2) and continue above the dividing walls, linking the trusses to those in Areas B and D.

4.2.2 Within the quarter-bays of the northern pitch, adjoining the dividing wall is a channel-section timber drain, constructed on a slope to remove water from the inner quadrangle (Plate 1). A plank-built walkway on the internal face of the parapet wall is canted above the trusses on brick piers, as in Area B to the east.

4.2.3 ***Truss 6:*** comprises two principal rafters, with a tie-beam extending only as far as, and jointed (presumably tenoned) into the face of the western truss of the north range of the roof (Truss 8). The eastern principal rafter is steeper than those within the standard trusses, as it is propped to the upper purlin, which continues over and through the chimney stack to the south. At its base it has a birdsmouth joint onto a pad on the tie-beam of Truss 9. The assembly marks are inscribed on the upper, southern face of the truss, which is unusual in that all other trusses within the west range have their upper face on the northern side. The eastern principal rafter retains a notch, cut for a removed post, positioned at collar height. This inconsistency of assembly marks and redundant carpentry suggests that the truss has been rebuilt.

4.2.4 Immediately outside the queen strut, attached to the angled brace from the tie beam, is a large wrought-iron U-shaped hook. Similar items are present in corresponding positions on all the trusses along the western range of the roof (Plate 3), and probably carried a pipe, almost certainly a water pipe, possibly part of a sprinkler system, which was installed in the early or mid-twentieth century.

4.2.5 Within the central section of the north pitch of the roof, between Trusses 8 and 9, is a shallow dormer, 3' (0.91m) wide, with a timber sarked roof attached to the underside of the upper purlin.

4.2.6 ***Truss 7:*** to the north is a further half-truss, Truss 7, which although similar to Truss 6, has only one principal rafter. It butts the western end of the ridge purlin of the north range of the roof, above Truss 8. Assembly marks 'I', were observed on the upper, north face of the truss, although on the west pitch, the principal rafter is marked as 'II' at the assembly positions for two of the purlins to Truss 6. Both purlins to the hip rafter are also marked 'II', suggesting some repair or rebuilding of the roof structure.

4.2.7 The hip of the roof is supported on a hip rafter of similar scantling to the principal rafters. At its foot, this is marked 'NW' on its top face (Plate 4), and it is mortised into a short dragon beam, which has a dovetailed lap joint into an angle tie, bracing the wall plates of the west and north elevations. Above this is a further angle tie, which appears to rest on the wall plates, and has a mortice through the face for a further dragon beam (Plate 5). This redundant tie suggests a remodelling of the roof.

4.2.8 ***Truss 8:*** this is the first complete truss at the west end of the north range of the roof, comprising queen struts, a collar, braced principal rafters, and additional straight raking struts from the tie-beam (Plate 6). The braces below the principal rafters are tenoned into the ogee-jowled heads of the queen struts, and are jointed to the principal rafters with stirrup bolts, having packing wedges between (Fig 2). All joints are single-pegged, with later strengthening beams bolted to both faces of the tie-beams, which are supported on convex

stone corbels, projecting from the wall face (Plate 7). The truss has assembly marks 'I' on its western, upper face, with the collar also inscribed 'N WEST' (Plate 8). The ridge purlins are tenoned into the face of the apex of each truss, the two principal rafters having a halved joint with undersquinted abuttments. Each pitch of the roof has two purlins, tusk-tenoned and single-pegged through the principal rafters, and overlain by 4" x 2" (0.10m x 0.05m) band or pit-sawn rafters on approximately 18" (0.45m) centres, supporting timber sarking below a Welsh slate roof.

4.2.9 ***Truss 9:*** this truss is positioned adjacent to the dividing wall between Areas A and B, at such close proximity that examination of its upper, eastern face was not possible in any detail. It is of similar construction to Truss 8, with an additional timber, with a Baltic Timber mark (Plate 9), clasping the half-truss to the west (Truss 6). Assembly marks 'II' were observed on the upper face of the truss.

4.3 THE ROOF STRUCTURE - AREA B

4.3.1 This represents the main part of the north pitch of the roof, on the rear of the Hall, comprising five complete and two partial bays, measuring 46' (14.02m) in length, and 23'9" (7.24m) wide, 2'9" (0.84m) wider than Areas A and C, due to the facade having a central projection.

4.3.2 ***Truss 10:*** the truss is of similar style and construction to those within the other areas recorded, and is of similar size, despite the greater width of the external wall of Area B, which remains consistent on the internal wall face. Assembly marks 'III' were observed on the upper, eastern face, with Baltic Timber marks also present on the soffit of the northern principal rafter, and in three places on the eastern strengthening member to the tie-beam. One of the lower purlins on the north pitch has an assembly mark 'XII', suggesting repositioning or re-use of this timber.

4.3.3 ***Truss 11:*** this is the same as Truss 10, with assembly marks 'IIII' on the upper face (Plate 10). It also has Baltic Timber marks on one of the blocking wedges between brace and principal rafter, and also on the eastern strengthening member to the tie-beam. At its joints with the purlins, the south principal rafter is marked 'XII', whilst the northern principal rafter is marked 'IIII', as the upper face of the truss. The lower north purlin is again marked 'XI'. A Baltic Timber mark was also observed on the southern purlin of the lower pitch between Trusses 11 and 12.

4.3.4 ***Truss 12:*** this truss had assembly marks 'V', and Baltic Timber marks on both of the blocking wedges positioned between the braces and principal rafters, and on both strengthening members to the tie-beam. At its joints with the purlins, the south principal rafter is marked 'XIII', whilst the northern principal rafter is marked 'V', as the upper face of the truss.

4.3.5 ***Truss 13:*** this truss has had its collar removed, and has no strengthening member on the eastern side of the tie-beam. That on the western side has a semi-circular rebate cut into the top of it, 7" wide and 2" deep (0.18m x

0.05m), positioned between, and also slightly cutting the northern queen strut and the angled brace to the northern principal rafter (Plate 11). This feature appears to almost certainly relate to the large wrought-iron U-shaped hooks observed on trusses elsewhere, presumably for housing a water pipe. At its joints with the purlins, the south principal rafter is marked 'XIIII', whilst the northern principal rafter is marked 'IV', except for the upper purlin on the north pitch to Truss 14, which is marked 'VI', as the upper face of the truss.

4.3.6 ***Truss 14:*** this truss retains its collar, but like Truss 13, has only one strengthening member to the tie-beam, this time positioned on the eastern side. The truss has 'VII' assembly marks, but also has additional 'XX' assembly marks scratched into the lower face of the collar, although these are assumed not to relate to the assembly of the truss. At its joints with the purlins, the south principal rafter is marked 'XV', whilst the northern principal rafter is marked 'VII', demonstrating a continuous if somewhat bizarre numbering of the purlins within the roof of Area B.

4.3.7 Between Trusses 14 and 15, the south wall has a slender, 5" x 3" (0.13m x 0.08m) I-section steel beam across the wall face. This was of unclear function, but may have acted as a brace for a fixture above the quadrangle roof, which was unfortunately removed prior to archaeological recording.

4.3.8 ***Truss 15:*** this standard truss has assembly marks VIIII (Plate 12), rather than the more conventional, IX, and also out of sequence, as Truss 14 is marked VII. Both strengthening members to the tie-beam have Baltic Timber marks, with the western one also having 'A112' painted upside-down near its northern end, whilst the eastern one has the lower half of 'A132' painted onto it (Plate 13). These would appear to predate the use of the timber in its current location. The southern principal rafter has no assembly marks for the purlins, although the lower purlin from Truss 16 is marked 'XVII', whilst the upper purlin above has been removed. The north pitch is as elsewhere within Area B, and is marked 'VIIII'.

4.4 THE ROOF STRUCTURE - AREA C

4.4.1 ***Truss 16:*** this truss is of the same size as those elsewhere, and has assembly marks 'VIII', suggesting that it has been swapped with Truss 15 during repairs. All but one of the assembly marks were on the minor truss members (collar, struts and braces), with only one on the northern principal rafter, this being at its joint with the queen strut. This would possibly suggest that these timbers were re-used from a truss originally within Area B, although it is possibly more likely that the original Truss VIII and Truss VIIII were swapped in position prior to the original construction of the roof.

4.4.2 ***Truss 17:*** this is the final truss of the north range, and bears assembly marks 'X'. The lower face of the collar is also marked 'NE'.

4.4.3 The hip of the roof is supported on a hip rafter of similar scantling to the principal rafters in Area A. The hip rafter is also similarly mortised into a short dragon beam, which has a dovetailed lap joint into an angle tie, bracing the

wall plates of the west and north elevations, positioned below a redundant dragon beam, without an angle tie.

4.4.4 ***Truss 18:*** this half-truss is similar to Truss 7, at the western end of the north range, having only a single principal rafter. The upper face of the truss is positioned on the northern side, and has several 'X' assembly marks, similar to the adjacent Truss 17. However, the upper purlin on the east pitch, from Truss 18 is marked 'IX'.

4.4.5 ***Truss 19:*** this represents the first full truss of the eastern range, and was the only example recorded due to the lack of access to the south. It was of similar style to those elsewhere, but had assembly marks 'XI' on its southern face, in contradiction to the half-truss (18) to the immediate north. A similar mark was also observed on the top face of the eastern principal rafter below its upper purlin from Truss 18. It is probable that the remainder of the trusses in the eastern range were erected with their upper faces on the southern side.

4.5 THE ROOF STRUCTURE - AREA D

4.5.1 This formed the central section of the western range of the Hall roof, projecting slightly beyond the western facade, presumably originally having a pediment atop the parapet wall. It comprised four complete bays, with part bays beyond to the north and south. That to the south was 32" (0.84m) wide, and had corbelled flues projecting into it, carried on sandstone bases, and similar to those observed in the north range. The dividing walls are similar to those elsewhere. On the western side of the southern wall (to Area G), the wall plate and purlins, including the ridge, continue past the stack, which is offset to the east of the ridge. On the eastern side of the wall, the upper purlin is short, and is keyed into the stack. The lower purlin originally passed on the eastern side, but has been cut away and is propped by the wall. The wall plate is continuous into Area G, butted by the dividing wall. The tie-beams of the two end trusses in Area G, are set perpendicular to those in Area D, and project *c* 2" (51mm) through the face of the dividing wall, which is plastered to ceiling height of the floor below.

4.5.2 ***Truss 1:*** the southern truss in Area D is identified as '1' on the structural roof plan (Edmondson Surveys 2006). It is physically marked 'V', this being chiselled into the upper, southern, face of the truss, as elsewhere within Area D. It is similar to those described in Area A, comprising queen posts with angled braces, wedges, and additional 8½" x 3" (216mm x 76mm) pitched pine ties bolted to either face of the tie. Further similar ties have been bolted to the surface of these in the western half of Truss 1, presumably as this end of the original tie has completely rotted. The truss retains an original collar, as do all those throughout Area D. All also have (?)wrought-iron hangers to the west of the western queen post, presumably carrying a water pipe of *c* 4" (102mm) diameter, and there are straps to all braces. The truss also has additional, scored, assembly setting-out/alignment marks on lower face for collar and upper east purlin. On the western pitch of the roof the purlins from Area G to the south are marked 'VI' at their north end, as is the principal rafter. There is also a 'SW' incised, just above the wall plate, possibly suggesting it should

have been, or originally was the south-west hip rafter (Plate 14). Baltic Timber marks were observed on the east face of the angled brace, and on the west side and inner face of the northern strengthening member to the tie-beam (Plate 15). The lower purlin on the east pitch to Truss 2 to the north has been cut for a dormer, with an additional wall plate added in the angle between the tie-beams and principal rafters of Trusses 1 and 2, in order to support the base of the dormer, which was subsequently removed. The ridge purlin is tenoned into the principal rafters, at an angle perpendicular to the rafter. The wall plates are lapped onto the principal rafters, nailed and butt jointed. They appear repositioned, as the lower end of the principal rafters generally have a stepped lap joint, presumably denoting an earlier wall plate position. The rafters throughout Area D are as elsewhere, typically cut, or gouged, to accommodate the irregular purlins. All are simply angled onto, and nailed to the wall plates at their lower ends.

4.5.3 ***Truss 2:*** this is of similar style to Truss 1 with assembly marks '4' (Plate 16), as opposed to the conventional Roman numerals 'IV' or 'IIII' more typically observed in roof construction. The numbering of trusses within Area D demonstrates that, during the original design and construction of the roof, the truss numbering commenced at the northern end of Area D, within the west range of the building. Baltic Timber marks were observed on the outer face of the southern additional tie brace, on the lower face of the collar, and on the northern two rafters of the west pitch, between the purlins.

4.5.4 In the western wall, immediately north of the truss, is an intramural flue, 1' x 10.5" (0.30m x 0.27m) wide, which presumably serves a fireplace below. The flue dog-legs to the south, 5' (1.52m) below tie-beam level, and is blocked with debris below this point. On the eastern wall, a chimney stack, 5'7" x 2'3½" (1.7m x 0.7m), butts the southern side of Truss 3, and extends above the roof as an ashlar block stack. The three chimney pots are repaired / replaced, comprising a simple plain roll example, with modern ceramic flue ventilator capping, and two more ornamental 'Ramsay' three-lift crown pots (Plate 17).

4.5.5 ***Truss 3:*** this is the same in design as Truss 2. It has an additional gusset plate on the west side, which post-dates the additional strengthening members to the tie-beam, which are cut for the plate, and on the southern side, replaced. The top face of the northern strengthening member has a Baltic Timber mark. Several scratched assembly marks were observed, as with other trusses, but a notable pair below the lower purlin the on west pitch appear to be misplaced marks for a further purlin. The truss is marked 'III' on its upper face and on the principal rafter on the east pitch. The upper marks correspond with the purlin to the north, which is not marked. The principal rafter on the west pitch is partially obscured by a common rafter. On the west pitch an inverted 'VII' is marked on the upper purlin from Truss 2, and 'V' with 'I' on the western face of the upper purlin to Truss 4, suggesting a non-standard construction, or repair. The western end of the principal rafters of Trusses 3 to 5 are heavily cut away, presumably for parapet guttering (Plate 18). It is highly unlikely that this is an original feature of the roof structure, as it significantly compromises the structural integrity of the trusses.

4.5.6 In the western wall, centrally within Bay 3, is a further intramural flue, 11” x 10.5" (0.28m x 0.27m) wide, and similar to that observed in Bay 2, to the south.

4.5.7 ***Truss 4:*** this is of similar style to Truss 3. A metal gusset plate strengthens the eastern end of the truss. There are also replaced timber sections at this end of the additional strengthening members to the tie-beam. The truss is marked 'II', but with an extra wide, shallow chisel mark beyond, almost forming a wide shallow 'III'. The principal rafter has a more regular 'II' on the eastern pitch, which has a similar arrangement of marks to Truss 3. It is also marked 'VIIII' in the position of the upper purlin to Truss 5 on west pitch, with both purlins to Truss 5 obscured by a thick batten for the common rafters. The wall plates on the west pitch are jointed over the truss, the southern having a chiselled 'X' at its northern end, further suggesting a repositioning of the wall plates. Baltic Timber marks were observed on the top face of both additional strengthening beams, the north one spanning 1.6m, and also on the lower face of the eastern queen post, and on the central rafter on the west pitch within Bay 4, positioned above the upper purlin.

4.5.8 ***Truss 5:*** this is the same in design as Trusses 3 and 4, with a gusset plate at the eastern end of the truss. The truss is marked 'I', with a standard arrangement of purlin and rafter marks on the eastern pitch, rather than as Trusses 2 and 3. The principal rafter on the western pitch has markings to each purlin; the upper to Truss 4 is marked 'XI' with an additional ‘I' slightly lower down, with the purlin marked 'X', with a corresponding 'I' on the west face. The upper purlin to Truss 6 is marked 'X' on the principal rafter, 'XI' on the purlin with an 'I' on its west face. the lower purlin to Truss 6 is marked 'XI', as is the truss. The lower purlin to Truss 4 is marked 'X', with a corresponding mark on the truss partially obscured by a common rafter. There also appear to be extra numerals at the ridge on the upper face of the truss, but these are obscured by the ridge purlin. Baltic Timber marks were observed on the top face of the southern additional strengthening beam, and on the inner face of the northern additional strengthening beam.

4.6 THE WATCHING BRIEF

4.6.1 The watching brief was conducted during several visits to the Hall between October 2006 and April 2007, during which, the interior of the building was extensively stripped, prior to renovation and remodelling. The following is an account of the observations made during these visits. All room numbers are those that were used in the original survey conducted by Oxford Archaeology North (2004).

4.6.2 ***Basement, Room 1:*** the room lies at the west side of the house, and straddles both the basement and ground floor levels (Figs 4 and 5). During the stripping, a blocked doorway was revealed on the east elevation, approximately 59" (1.5m) from the south wall, and underneath the staircase from the ground floor (Plate 19). The door had a segmental head and was blocked with grey brick (9" by 2½" by 4"; 0.23m by 0.06m by 0.1m) in a similar manner to the fireplace directly to the north. In the original survey (OA North 2004), an

alcove was noted in a similar position on the west wall of room ***9***. In retrospect, this would now appear to be a partially-blocked doorway, which in conjunction with the blocked doorways of the sump room (***11***), would confirm that there was originally a cross-passage leading from room ***1*** to room ***9*** (Fig 4). Indeed, a similar cross-passage from room ***3*** to room ***9***, may be discerned to the north, and this pair of passages would be consistent with the apparent symmetrical design of the hall.

4.6.3 In addition, the base of a pilaster on the north wall of room ***1*** was revealed, and was found to be resting upon a plinth (13" by 23"; 0.33m by 0.58m) atop a sandstone flag (29" wide by 9" thick; 0.74m by 0.23m) and a layer of clay. This appears to be the common arrangement for all of the columns within the basement. Certainly, the central column within room ***8*** was also observed to rest upon a substantial sandstone flagstone measuring 32" (0.81m) long and 10" (0.25m) wide, with a plinth, 30" (0.76m) long and 19" (0.48m) wide, and a clay deposit below this (Plate 20).

4.6.4 ***Basement, Room 15:*** in the adjacent room, which lies in the south-west corner of the basement, a brick plinth was observed beneath the stone build of the south elevation. This comprised at least three courses of red brick (9" by 3"; 0.23m by 0.76m), whilst extensive brick rubble was also uncovered beneath the concrete floor.

4.6.5 ***Ground Floor, Rooms 18, 36, 44 and 59:*** like most of the rear of the Hall, the north-west corner has suffered from water ingress, and subsequently all of the collapsed floors had been removed by the time of the watching brief, thus creating an open space from ground floor (room ***18***) to second floor (room **54**) (Plate 21) (Figs 4-8). However, sufficient evidence was still visible to discern the original construction of each floor. In the north and south walls of each floor, there were pairs of substantial beam slots with segmental brick heads, underlain by timber wall pieces embedded within the brickwork (Plate 22). These beams originally supported five or six joists, judging by the slots on the east and west walls, and this arrangement appeared to be consistent across all floors, except the ground floor, which was laid with flagstones measuring approximately 30¾" (0.78m) by 19¼" (0.49m).

4.6.6 The stripping of all plaster from the aperture of each window allowed an unhindered view of the relationship between the ashlar sandstone on the exterior and the four courses of handmade brick lining the interior. This is called composite walling where the external facing is dissimilar to the interior. This method of construction is more cost-effective than a solid stone wall. It was also evident that the lintels of each window appeared to be a combination of brick and stone. In some instances, the window panelling was retained, thus demonstrating that the apertures themselves were square, whilst the panelling was splayed to create the embrasures observed throughout the building during the original survey (OA North 2004).

4.6.7 ***Room 22:*** the room lies in the north-east corner of the Hall (Fig 5) and like many of the rooms to the rear of the building, had suffered greatly from water ingress through the roof. Although the floor was rotten, the original pine timbers had survived sufficiently to observe that there were three main beams

aligned east/west and measuring 6½" (0.16m) by 3"(0.076m), which supported 13 north/south joists of comparable dimensions, and floorboards measuring 6½" (0.16m) by 1"(0.025m) (Plate 23). All of these joists had half-lap joints, chamfered undersides and visible adze marks. In addition, the floor of the window was laid with bricks, whilst a tiled hearth, laid with unmarked tiles measuring 6" (0.15m) by 2" (0.05m), survived on the south wall.

4.6.8 ***Rooms 24 and 26:*** these rooms flank the original imperial staircase (room ***25***) and contain the servants' staircases (Fig 5). The staircases comprised well-worn steps measuring 37" (0.93m) wide by 13½" (0.34m) long by 6" (0.15m) high, which were formed from single blocks of sandstone that had been skimmed with concrete to even out the treads during later renovations (Plate 24). Traces of the original cast-iron balustrade were also visible in the form of a pair of lead-filled sockets on each tread.

4.6.9 ***Room 25:*** the room lies to the centre of the building and originally contained the imperial staircase. During the original survey (OA North 2004), the height of the room reached the mezzanine floor only, but by the time of the watching brief, it was exposed right up to the lantern roof of room ***53***, which reflects the probable arrangement of the original design (Figs 5-8, Plate 25). No scarring from this imperial staircase was observed on either the west or east elevations, but a pair of rolled-steel joists (RSJs) were present at first floor height, presumably from the 1920s when the staircase was removed and a floor was inserted to create room ***53*** above (OA North 2004).

4.6.10 Moreover, the hardboard floor surface in Room ***25*** recorded during the original survey (OA North 2004) was confirmed as a later addition. A small sample of timber joists running north/south, measuring 4½" (0.11m) by 3¼" (0.08m), and incised with 'Deer Brand – Made in Canada' on their underside, was observed beneath the later hardboard flooring (Plate 26). In addition, three timber ducts (of unknown use) were exposed on both sides of the room (Plate 27). These measured 14" (0.35m) by 5½" (0.14m) and they continued down into the sump room of the basement (room ***11***). The underlying floor was found to be concrete, which was probably laid as support for the joists and hardboard flooring. The whole assemblage was probably inserted later, the original floor surface does not survive. A test hole was excavated within this concrete to check the depth to the vaulted ceiling of the basement. The vaulted ceiling of room **14** was observed from above as in room ***30*** (*Section 4.6.11)*, and a similar thick layer of rubble infill had been laid over the top of vaulting.

4.6.11 ***Room 30:*** the top of the vaulted ceiling of room ***15*** was observed following the removal of the floor in this room. The groin vaults below are constructed from handmade brick (9" by 2½"; 0.23m by 0.065m) with occasional traces of later concrete. The top of the vaults are laid out in squares measuring 27½" (0.69m) wide and were overlain by a layer of broken brick and infrequent sandstone flags.

4.6.12 In addition, the most easterly of the windows on the south elevation had been stripped of its plaster and architrave, and was subsequently found to have a segmental arched head, whilst a series of timber baulks, which were used to support this surround, were recessed within the brickwork. The baulks were

spaced 12¾" (0.32m) apart and the brickwork comprised handmade brick and lime mortar.

4.6.13 ***Mezzanine Floor, Rooms 33 and 34:*** these rooms are located on the west side of the Hall (Fig 6), and are located above room ***1*** of the ground floor and basement. The inserted partition that divided the rooms at the time of the original survey (OA North 2004) had been removed, and this revealed a pair of steel trusses of I–beam construction that were made by 'Leeds Steel Workers'. These supported a substantial steel rod bolted to the apex of the trusses that appears to continue down to the deep boss and vaulted ceiling of room **1** (Plates 28 and 29). The trusses either replaced an earlier arrangement, which failed or they were inserted in order to provide additional support for the vaulted ceiling below. The latter seems more likely, and it is probable that a column once supported the vault, which was removed as there is also a pilaster in room **1** supporting the other side of the vault (OA North 2007, 27). An additional floor may have been present, dividing the room between the basement and ground floors. Indeed, James Paine's original plan (*op cit*, Plate 5) shows this room as having different access arrangements, and, furthermore no staircase leading to the basement is illustrated.

4.6.14 The principal rafters measured 10" (0.25m) by 6" (0.15m), whilst the tie-beams measured 12" (0.3m) by 6" (0.15m) and the braces were 6" (0.15m) by 4½" (0.11m). These individual members were joined with gusset plates and square-headed bolts, and from the additional bolt-holes and ground bolt-heads, the trusses appeared to be reused. A series of alpha-numerical construction marks (3-3, G-G, E-G and 5-5) on the north face showed that the truss was assembled on site. Patching on the ceiling above demonstrated that some damage was caused when the rod was inserted.

4.6.15 The floor joists of both rooms rested on the inside of the steel tie-beams. Those in room ***33*** ran north/south and measured 4½" (0.11m) by 4" (0.1m), whilst those in room ***34*** appeared to be chamfered, were aligned east/west and measured 3½" (0.09m) by 2½" (0.06m). In addition, they were 16" (0.41m) and 9½" (0.24m) apart, respectively, whilst the floorboards were tongue and groove measuring 6¾" (0.17m) in room ***33***, and square edged and measuring 6¾" (0.17m), in room ***34***. These square-edged floorboards were possibly original, and those in the adjacent room ***35*** were very similar, if slightly offset.

4.6.16 ***First Floor, Rooms 42, 43 and Second Floor Room 58:*** the pair of rooms directly above the mezzanine floor, rooms ***42*** and ***43*** (Figs 7 and 8) were opened to the roof by the time of the watching brief, following the removal of the floor above (room ***58***). The scar of this removed floor was visible in the north wall, and measured 21" (0.53m) thick, and 23" (0.58m) to the bottom of the former coving in room ***43*** (Plate 30). In addition, a wall plate was observed on the east wall, whilst stone 'sills' were visible below the joist slots on the north wall. In addition, three east/west beams supporting north/south joists were observed, of which the most northerly and southerly beams appeared to be set at an angle. It was impossible to measure their dimensions, but they appeared to be comparable to those examined throughout the rest of the building.

4.6.17 On the north-east corner of the room, there were two types of wallpaper visible. One was embossed with a square motif, whilst the other was printed with small flowers, trees and a gilt border (Plates 31 and 32). It is quite possible that these are of early twentieth century provenance, as dado rails became outmoded and paper borders were introduced during the Edwardian era. Furthermore, a pair of flues were visible on the north and south walls of room ***58*** and the roof space above, and these were supported by sets of sandstone corbels, recessed within the brick build of the cross walls.

4.6.18 ***Room 57:*** the only feature of interest within the room was a tin ventilation shaft that underlay the floorboards (Plate 33) (Fig 7). This measured 6" (0.15m) by 2½" (0.06m) and was of indeterminate length, but appeared to be constructed from a single sheet. Externally, the ventilation shaft was visible as a rectangular aperture measuring 6¼" (0.16m) by 2½" (0.06m), which was originally covered by an ogee-shaped cover (Plate 34).

4.6.19 ***Room 60:*** as with the rest of the rooms to the rear of the building, the floor was in bad condition during the original survey (OA North 2004) (Fig 8). At the time of the watching brief, little remained, although a small section was visible within the north wall. It appeared to consist of one main north/south aligned beam, with lesser beams assisting in the support of the east/west joists. As such, it was comparable with the construction of other floors observed during the watching brief. In addition, a brick chimney-breast supported by five sandstone corbels, in a similar manner to the one observed in room ***58***, was also exposed on the west wall (Plate 35).

5. DISCUSSION

5.1 INTRODUCTION

5.1.1 Although limited to certain areas of the restoration programme of the Hall, the watching brief and roof survey have added significant detail to the understanding of its construction and development.

5.2 THE ROOF STRUCTURE

5.2.1 The archaeological survey of the roof has revealed that the present structure is unlikely to represent the eighteenth century roof in its original form. Many of the roof timbers exhibit significant evidence (such as redundant joist slots and tennon holes) for their re-use or repositioning, which cumulatively suggests that the roof has undergone some rebuilding or repair. However, the style of carpentry, the use of timber pegs, and the apparent method of preparation of the timber, strongly suggests that the major timbers of the present roof, are original eighteenth century timbers.

5.2.2 Many of the timbers display Baltic Shipping marks, which became common during the eighteenth century, when local supplies of timber began to dwindle throughout England. Similar marks were also observed on strengthening beams, added to support the tie beams, suggesting that these were also added during the eighteenth or nineteenth century, or were formed from re-used timbers. The previous desk-based assessment (Tyne and Wear Museum Services 2005) identified that 'alterations were undertaken immediately prior to 1922, when the hall became home to the Newcastle Ragged School. The Baltic Timber marks observed on the strengthening beams, suggests an earlier date, but the painting on Truss 15, almost certainly demonstrates their re-use. The style of bolts (square) and stirrups (wrought iron) associated with this programme of repair to the trusses, is commensurate with late nineteenth or early twentieth century work meaning that their insertion during the 'meticulous restoration' of 1880 (Barford 1999, 38) cannot be discounted.

5.3 THE WATCHING BRIEF

5.3.1 A substantial part of the detail observed during the original survey (OA North 2004) related to the alterations undertaken prior to 1922, the year the Hall became the Newcastle Ragged School (Tyne and Wear Museum Service 2005). In light of this, the watching brief was invaluable in allowing further detail to be added to that already collated. The stripping of floors and walls in conjunction with the exploratory holes excavated by the contractors provided a clearer appreciation of how the Hall was originally designed and constructed.

5.3.2 Four cross-passages, which were only partially visible during the original survey (OA North 2004), have become obvious following the removal of wall plaster and the exposure of the blocked door within room ***1*** (Fig 4). The nature of the construction of the groin-vaulted ceiling throughout the cellar is now

also visible, following the following the partial removal of floorboards and sections of the concrete on the ground floor above.

5.3.3 The removal of the inserted first floor above room ***25***, thus creating an open space from the ground floor to the lantern roof, gives some impression of the grandeur and spectacle of the original imperial staircase that once graced the Hall. In addition, the servants' stone staircases that flanked this formal staircase (rooms ***24*** and ***26***) were confirmed during the watching brief, as fixtures dating to the original construction of the house in the 1760s, as opposed to the concrete insertions that it was suggested they could feasibly be.

5.3.4 The floors throughout the building, with the exception of the basement, all appear to have been supported by pine members. These timbers comprise at least three beams fitting into segmental-arched beam-slots and resting upon timber wall compression plates. In addition, the joists all appear to be similar to those in room ***22*** and, as such, are chamfered on their soffits, and fixed with halved lap joints.

5.3.5 The paired RSJ truss in rooms ***33*** and ***34*** was apparently inserted in order to support the vaulted ceiling in room ***1***. Paine's 1767 illustration of the ground floor (OA North 2004) shows the same ceiling pattern in room ***1*** as the present appearance, suggesting the room was originally constructed with a vaulted ceiling. What is less clear however, is how the vaulting was supported. Paine's illustration shows a blacked-out square set in the centre of the dashed ribs suggesting it was a solid column which reached the floor. It appears that the floor of room ***1*** was removed at some stage, creating the current large open space. This would have necessitated supporting the vault from above requiring the insertion of the paired steel truss. Each of the members appears to have been re-used as evidenced by ground-off bolt heads and bolt holes, which makes dating difficult but other evidence, such as a probable late nineteenth century staircase allowing access to the basement, suggests that the steel trusses were inserted around this time.

6. BIBLIOGRAPHY

6.1 PRIMARY SOURCES

3410/Bud/26/31, 1752-3 *Colliery Memoranda: Axwell Hall, Boring*

3410/Bud/26/36, 1754 *Colliery Memoranda: Axwell Hall, Boring*

3410/Bud/103/33, 1753-4 *Boring Accounts: Axwell Hall, Boring*

3410/Wat/2/27/104, 1753-4 *Sinkings and Borings: Axwell Hall Ground, Boring*

CC/PL 1177, n.d. *Axwell Park, Blaydon, Grade II: Notes and Photographs*

D/CG 7/1, 1568 *Bargain and Sale by Rt Hon Sir John Lumley, Knight and Lord Lumley to Matthew Ogle, Gentleman, Servant to Lord Lumley*

D/CG 7/4, 1604-5 *Bargain and Sale by John Ogle of Cousey Parke, Northumberland, Esquire to Roger Lumley of Axwell House Alias Axeheels, Gentleman*

D/CG 7/15, 1629 *Bargain and Sale by William Smyth, Thomas Smyth and Percival Kennelsid of Axwellhowses to James Clavering*

D/CG 7/66, 1661 *Deed of Covenant by George Selby with James Clavering*

D/CG 7/90, 1668-9 *Letters Patent Granting Sir James Clavering Bart and his Heirs Rights of Free Warren etc Over 300a of Land at Whitehouse*

D/CG 7/127, 1714 *Surrender by John Jackson and Francis Johnson to Dame Jane Clavering of Whitehouse*

D/CG 7/236, 1712 *Lease by Sir John Clavering to William Proctor*

D/CG 7/3190, 1920 *Particulars, Plan, Views and Conditions of Sale of the Freehold Residential and Agricultural Estate of Axwell Park, in the County of Durham*

D/CG 19/18, *c*1632 *Abstract of the Deed of Partition of 25 February 1632 of the Lordship of Winlaton with Notes Thereupon Relating to the Seisin and Execution of Same*

D/CG 19/303-6, *c*1632 *Schedules of Lands Allocated to Sir James Clavering, Lord Widdington, Sir William Selby, Robert Anderson, Sir Edward Beckett, Sir Wiliam Beckett and Sir Robert Hodgson on the Division of Winlaton, September 1632*

D/St/P7, n.d. *Plan of Winlaton Lordship Copied from a Plan Surveyed in 1632 and now in the Possession of Charles Townley Esq*

D/X/35/2, *c*1832 *Plan of Axwell Park, High and Low Struddars Farm, Low Shibdon Farm, Mallabar's Closes, and Other Lands, in the Township of Winlaton Belonging to Sir Thomas Clavering Baronet, Copied from an Old Survey (Without Date) by William Shield*

D/X/35/6, n.d. *Plan or Draught of the River Darwent from the Great Dam Adjoining to Good Childs Hough, to its Enterance Into the River Tyne*

Edmondson Surveys Ltd, 2006, *Axwell Hall Roof Survey*

Eltringham, JJ, 1921a *Boiler House & Laundry, Axwell Park*

Eltringham, JJ, 1921b *Proposed Alterations & Additions at Axwell Park,* **1**

Eltringham, JJ, 1921c *Proposed Alterations & Additions at Axwell Park,* **2**

Eltringham, JJ, 1921d *Proposed Alterations etc to Kitchen Block at Axwell Park*

Eltringham, JJ, 1921e *Proposed Alterations etc to Schoolmasters House*

Eltringham, JJ, 1921f *Proposed Alterations etc to Workshops Block at Axwell Park*

Eltringham, JJ, 1921g *Proposed New Sanitary Block at Axwell Park*

Eltringham, JJ, 1922a *Block Plan, Axwell Park School*

Eltringham, JJ, 1922b *Letter to Mr Symon, 5th August*

Eltringham, JJ, 1922c *Letter to Mr Symon, 19th October*

ND/Du 9/2, 1786, *View of Axwell Park by Wm Beilby, Published by W Watts*

ND/Du 9/3, n.d, *View of Axwell Park County Durham, Date and Artist Unknown*

ND/Du 9/4, n.d, *View of Axwell Park, County Durham by T Allom and TP Prior*

Ordnance Survey, 1856 *25": 1 Mile*, Durham

Ordnance Survey, 1897 *25": 1 Mile*, Durham

Symons, G, 1922 *Letter to Mr Eltringham, 8th August*

6.2 SECONDARY SOURCES

Barford, JC, 1999, *Borough Plan for Gateshead, Supplementary Planning Guidance: 1 Conservation Area Planning Policy Guidelines, Strategies and Character Statements,* unpubl rep

Bourn, W, 1896, *History of the Parish of Ryton*, Carlisle

Dickinson, HT (ed), 1968, The Correspondence of Sir James Clavering, *Surtees Soc*, **178**

Dobson, MJ, 1885, *Memoir of John Dobson of Newcastle-on-Tyne*, London

English Heritage, 1991, *Management of Archaeological Projects*, 2nd edn, London

English Heritage, 2006, *Understanding Historic Buildings: A guide to good recording practice*, London

Faulkner, T, and Greg, A, 2001, *John Dobson, Architect of the North East*, Newcastle

Gateshead Metropolitan Borough Council, 1994 *A Strategy for Axwell Park*, unpubl rep

Greenwell, W (ed), 1857, Bishop Hatfield's Survey, *Surtees Soc*, **32**

MacKenzie, E, and Ross, M, 1834, *An Historical, Topographical and Descriptive View of the County Palatine of Durham*, **1**, Newcastle

McCombie, G, 2002, *Axwell Hall, the Status of the Rear Wing: A Report for English Heritage*, unpubl rep

OA North, 2004, *Axwell Hall, Blaydon, Gateshead: Archaeological Building Investigation*, unpubl rep

OA North, 2007, *Axwell Hall, Blaydon, Gateshead: Archaeological Landscape Survey and Watching Brief*, unpubl rep

Paine, J, 1767, *Plans, Elevations and Sections of Noblemen and Gentlemen's Houses*, **1**, London

Tyne and Wear Museum Services, 2005, *Axwell Hall, Blaydon, Tyne and Wear, Archaeological Assessment*, unpubl rep

Vivat Trust Management Services Ltd, 1994a, *Axwell Park Hall, Condition Survey, Section 1, Parts 1-5*, unpubl rep

Vivat Trust Management Services Ltd, 1994b, *Axwell Park Hall, Condition Survey: Section 2, Part 6: Photographs*, unpubl rep

Vivat Trust Management Services Ltd, 1994c, *Axwell Park Hall, Condition Survey: Appendix 1: A Strategy for Axwell Park*, unpubl rep

Vivat Trust Management Services Ltd, 1994d, *Axwell Park Hall, Condition Survey: Appendix 3: Structural Report*, unpubl rep

Vivat Trust Management Services Ltd, 1994e, *Axwell Park Hall Condition Survey: Appendix 4: Schedule of Condition and Recommendations*, unpubl rep

Watts, V, 2002, *A Dictionary of County Durham Place-Names*, English Place-Name Soc Popular Ser, **3**, Nottingham

Whittaker, N and Clark, U, 1971, *Historic Architecture of County Durham*, Newcastle-upon-Tyne

7. ILLUSTRATIONS

7.1 LIST OF FIGURES

Figure 1: Site Location Plan

Figure 2: Roof plan of Areas A, B, and C

Figure 3: Elevation of a typical truss in Area B

Figure 4: Basement plan, showing additional detail observed during the watching brief

Figure 5: Ground floor plan, showing additional detail observed during the watching brief

Figure 6: Ground floor mezzanine plan, showing additional detail observed during the watching brief

Figure 7: First floor plan, showing additional detail observed during the watching brief

Figure 8: Second floor plan, showing additional detail observed during the watching brief

Figure 9: East-facing cross-section

Figure 10: North-facing cross-section

7.2 LIST OF PLATES

Plate 1: Dividing wall within roof space, with angled drainage channel

Plate 2: Tusk-tenoned purlins with assembly marks

Plate 3: Iron strap, presumably for sprinkler system supply pipe

Plate 4: 'NW' locational assembly mark on hip rafter, Area A

Plate 5: Dragon beam with additional redundant wall tie above, Area A

Plate 6: Typical truss, Area B

Plate 7: Corbel supporting tie beam, with additional supporting member bolted to face

Plate 8: 'N West' locational assembly mark on collar, Truss 8

Plate 9: Example of Baltic Timber mark

Plate 10: Assembly marks 'IIII' and queen strut assembly, Truss 11

Plate 11: Cut-out in Truss 13, presumably for sprinkler system supply pipe

Plate 12: Assembly marks 'VIIII', Truss 12

Plate 13: Cut paint mark on strengthening member, Truss 15

Plate 14: 'SW' locational assembly mark on hip rafter, Area D

Plate 15: Baltic Timber mark on secondary timber, Truss 15

Plate 16: Assembly marks '4', Truss 2

Plate 17: Chimney pot, probably of nineteenth century date

Plate 18: Cut principal rafter, presumably for remodelled parapet drain, Area D

Plate 19: The original cross-passage door within room ***1***, with the scar of the later staircase above

Plate 20: Detail of the foundations of a column within the cellar

Plate 21: The removed floors at the north-west corner of the building (rooms ***18***, ***36***, ***44*** and ***54***)

Plate 22: Detail of the beam-slots and wall plates in the north elevation

Plate 23: The floor of room ***22***

Plate 24: Detail of the servants' sandstone staircases in rooms ***24*** and ***26***, which have been repaired with concrete during renovations

Plate 25: The site of the former imperial staircase within room ***25***. Note the rolled steel joist and timber joists of the inserted first floor

Plate 26: Detail of the joists beneath the later hardboard flooring of room ***25***

Plate 27: The timber-lined shafts within room ***25***

Plate 28: The south face of the steel trusses within rooms ***33*** and ***34***

Plate 29: Detail of the iron rod supporting the ceiling of the floor below

Plate 30: The scar of the former floor between rooms ***42*** and ***43***, and ***58*** above, including the wall plate

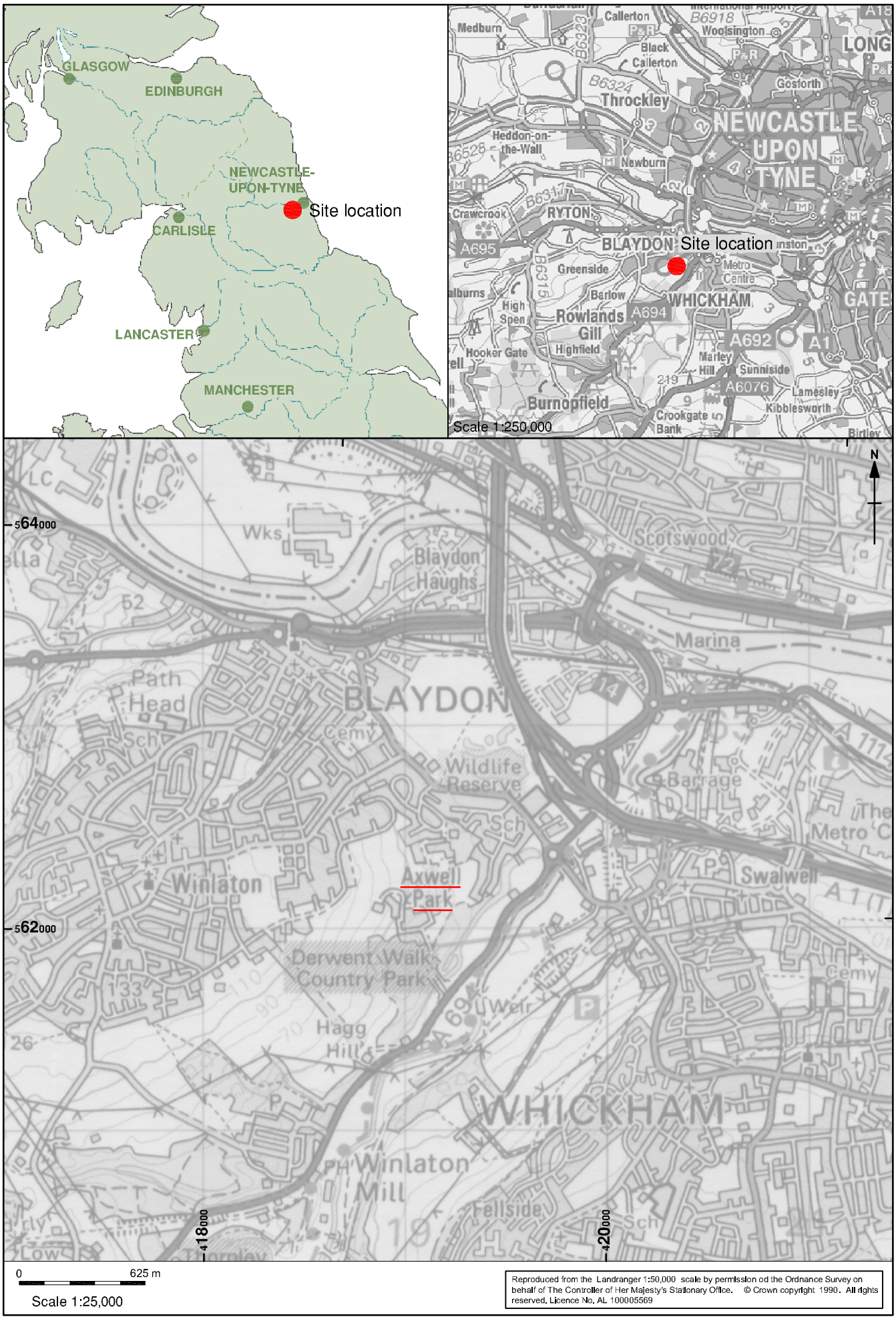
Plate 31: Detail of (probable) early twentieth century wallpaper within ***42*** and ***43***

Plate 32: Detail of (probable) early twentieth century wallpaper within ***42*** and ***43***

Plate 33: Detail of the tin ventilation shaft beneath the floor of room ***57***

Plate 34: Detail of the former ventilation cover, on the exterior of the building

Plate 35: Detail of one of the corbelled chimney breasts, as observed in rooms ***58*** and ***60***



X:\alison\PROJECTS\L9660axwell\cad*L9660*Axwell Hall*MER*29.03.06

Figure 1: Site Location

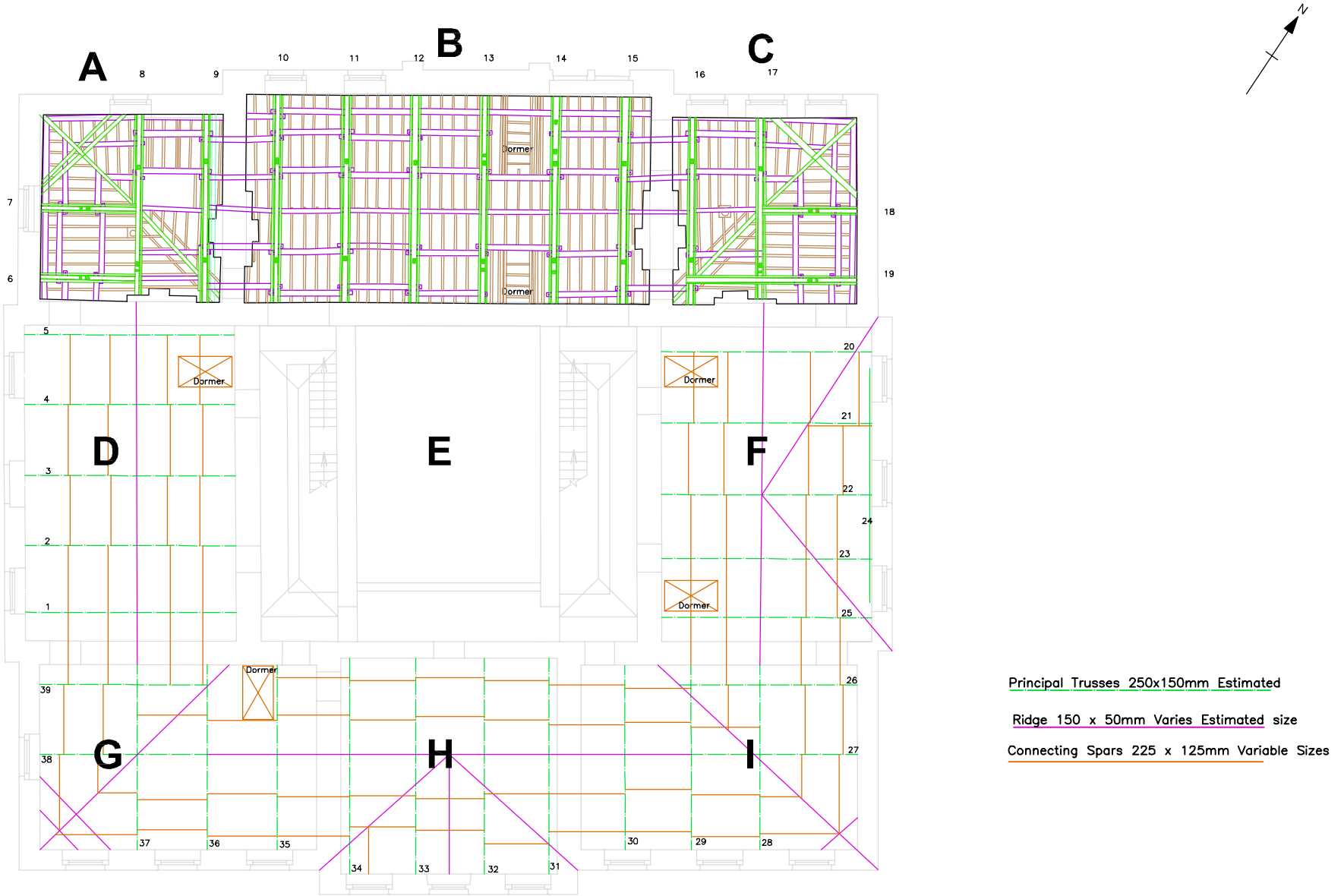


Figure 2: Roof plan of Areas A, B,and C

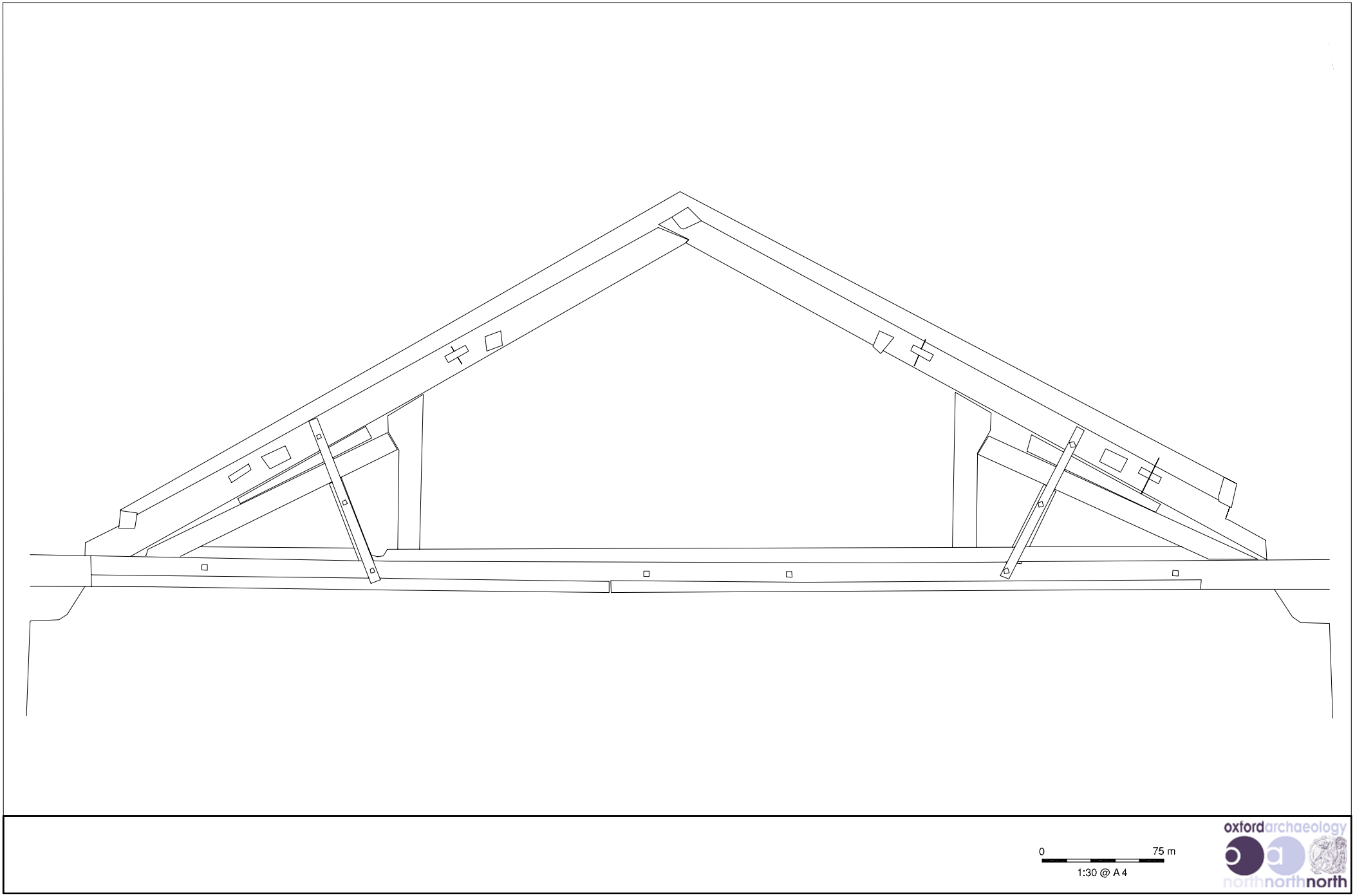


Figure 3: Elevation of typical truss in Area B

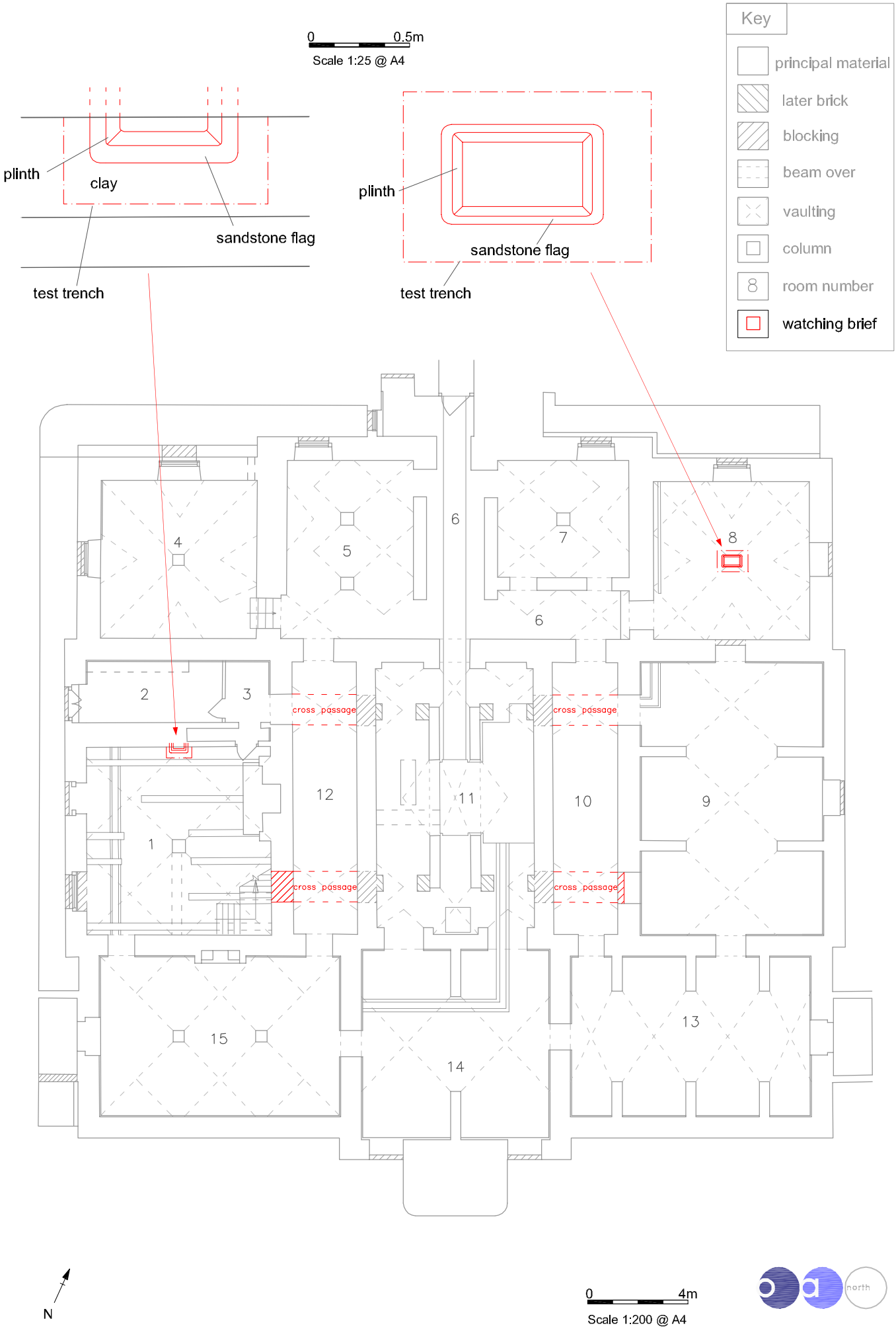


Figure 4: Basement plan, showing additional detail observed during watching brief

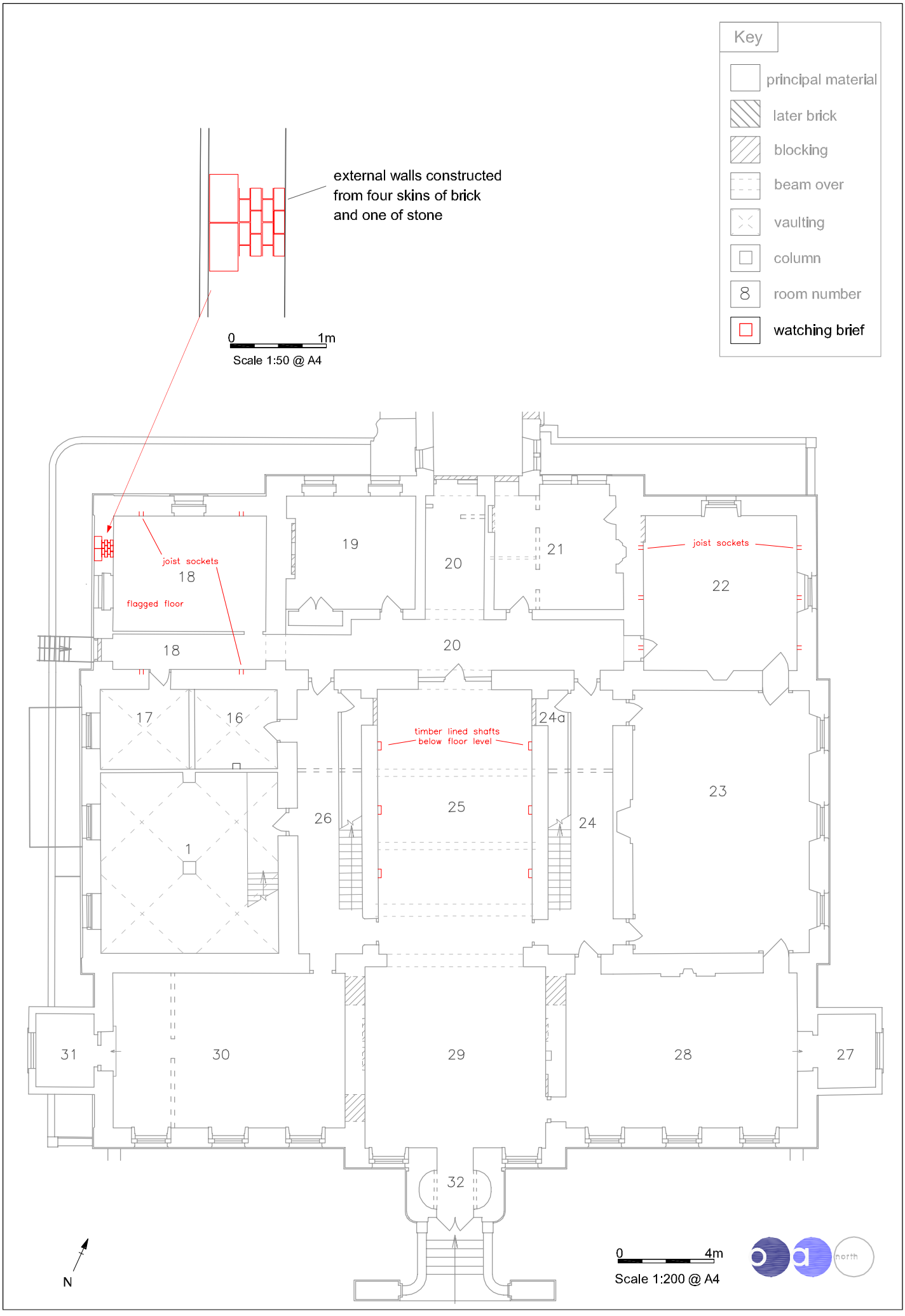


Figure 5: Ground floor plan, showing additional detail observed during watching brief

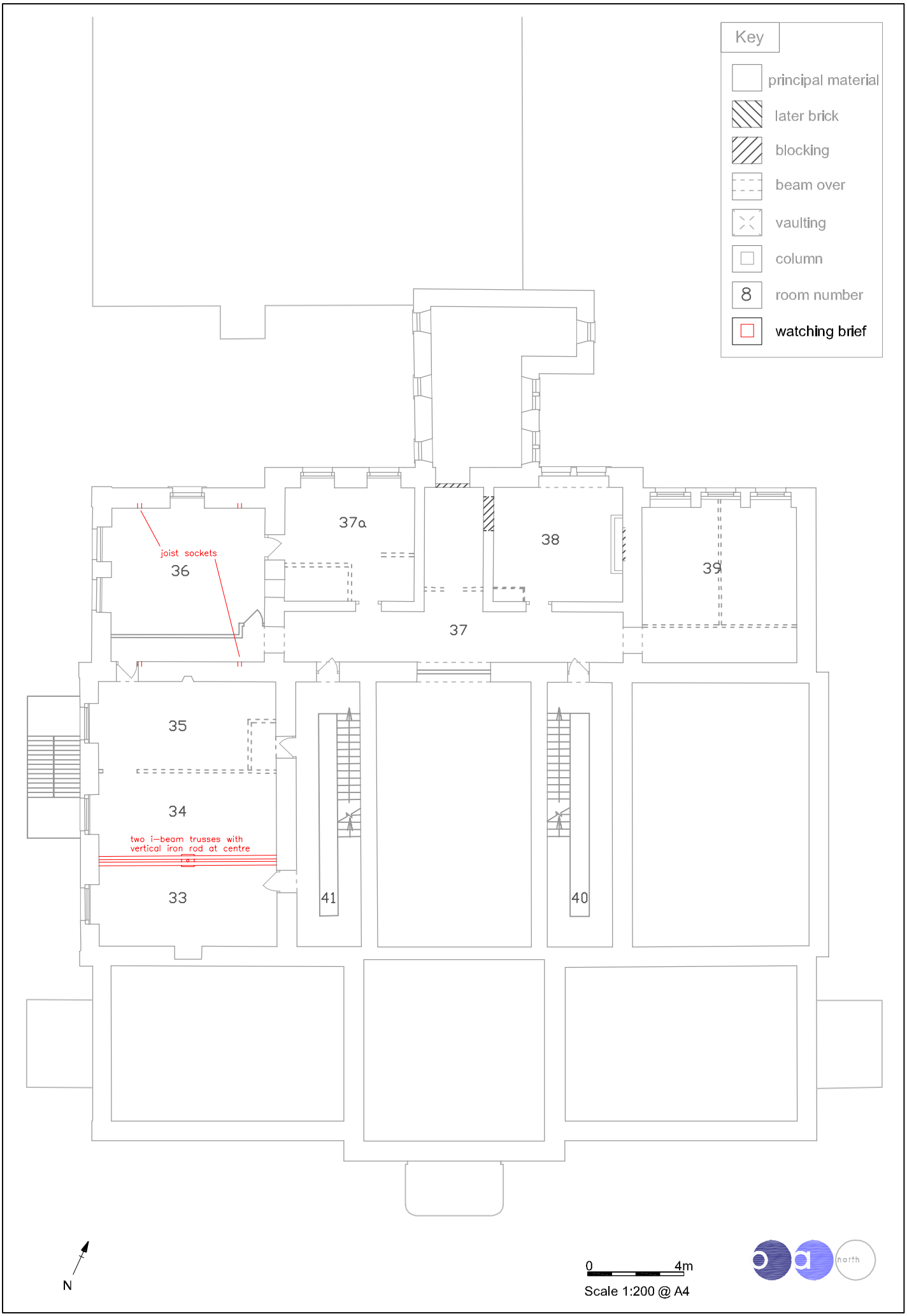


Figure 6: Ground floor mezzanine plan, showing additional detail observed during watching brief

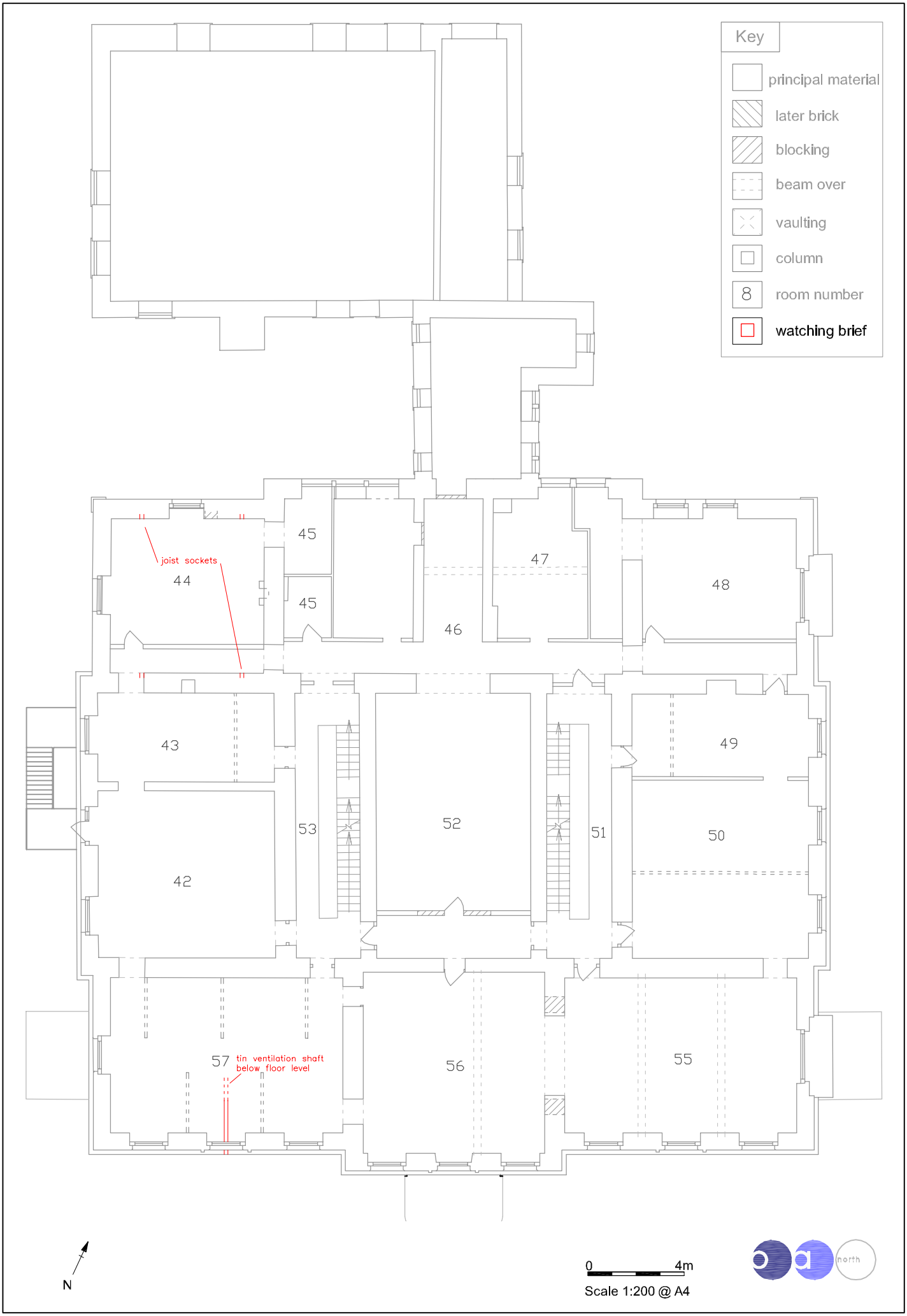


Figure 7: First floor plan, showing additional detail observed during watching brief

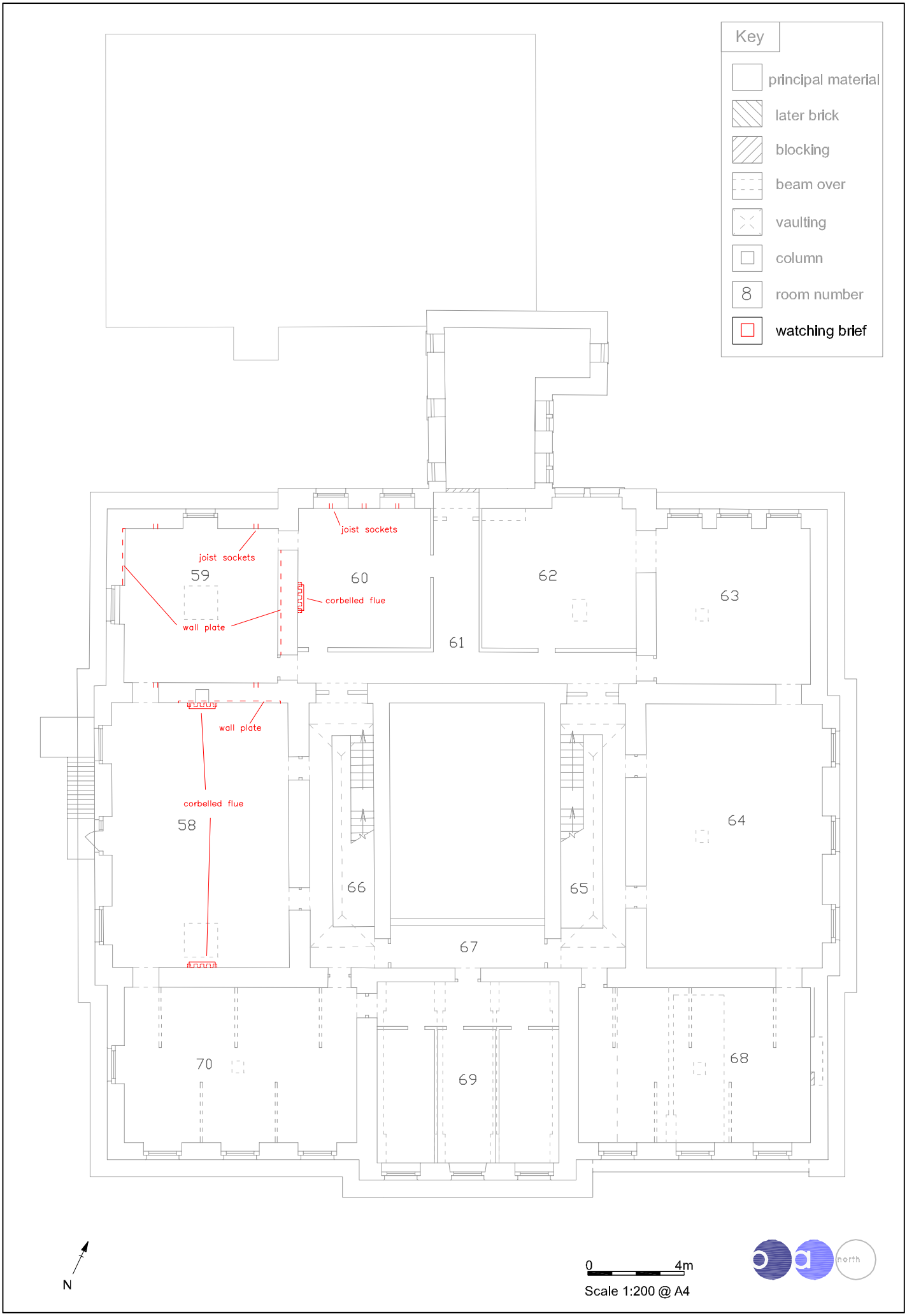


Figure 8: Second floor plan, showing additional detail observed during watching brief

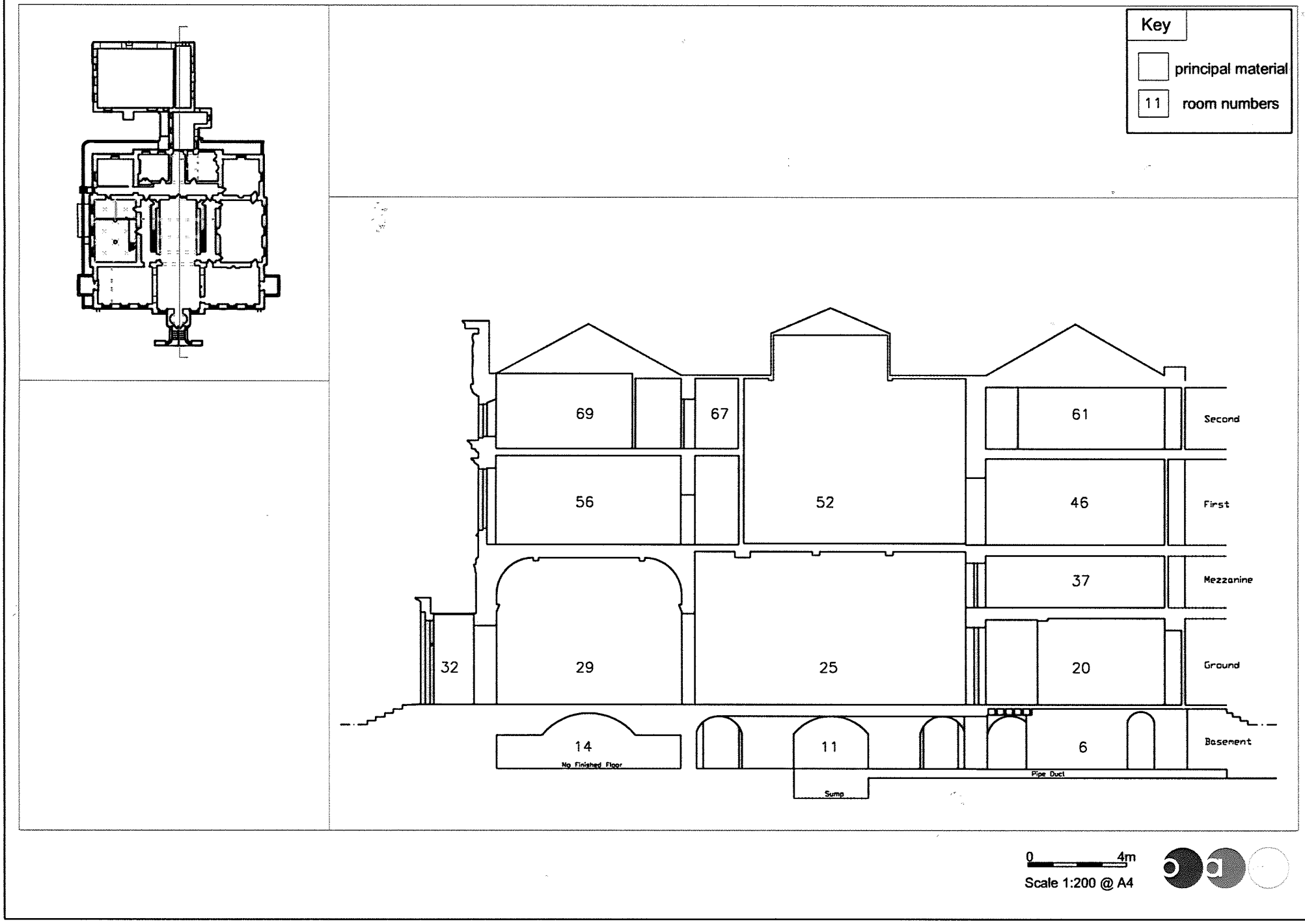
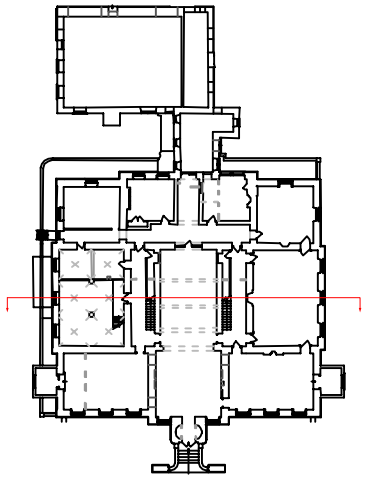


Figure 9: East-facing cross-section



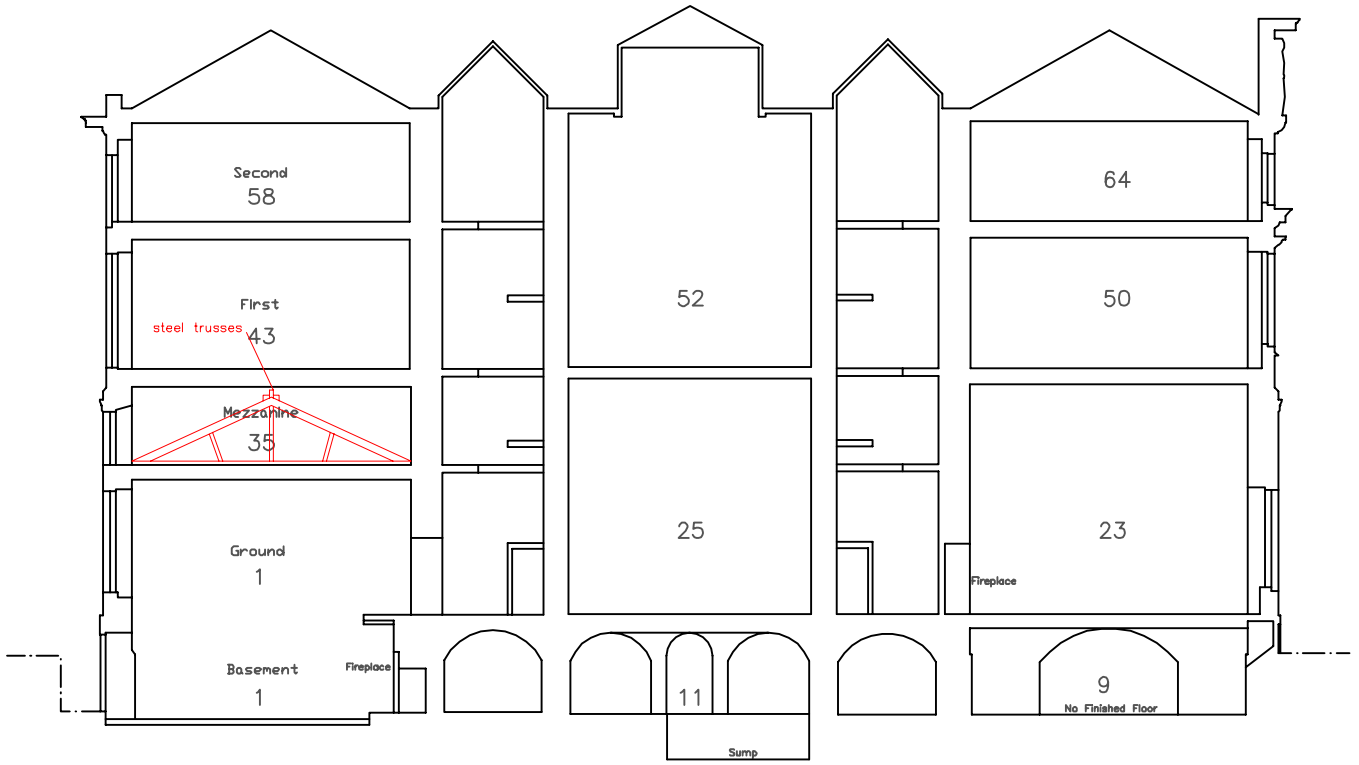


Figure 10: North-facing cross-section

Plate 1: Dividing wall within roof space, with angled drainage channel

Plate 2: Tusk-tenoned purlins with assembly marks

Plate 3: Iron strap, presumably for sprinkler system supply pipe

Plate 4: ‘NW’ locational assembly mark on hip rafter, Area A

Plate 5: Dragon beam with additional redundant wall tie above, Area A

Plate 6: Typical truss, Area B

Plate 7: Corbel supporting tie beam, with additional supporting member bolted to face

Plate 8: ‘N West’ locational assembly mark on collar, Truss 8

Plate 9: Example of Baltic Timber mark

Plate 10: Assembly marks ‘IIII’ and queen strut assembly, Truss 11

Plate 11: Cut-out in Truss 13, presumably for sprinkler system supply pipe

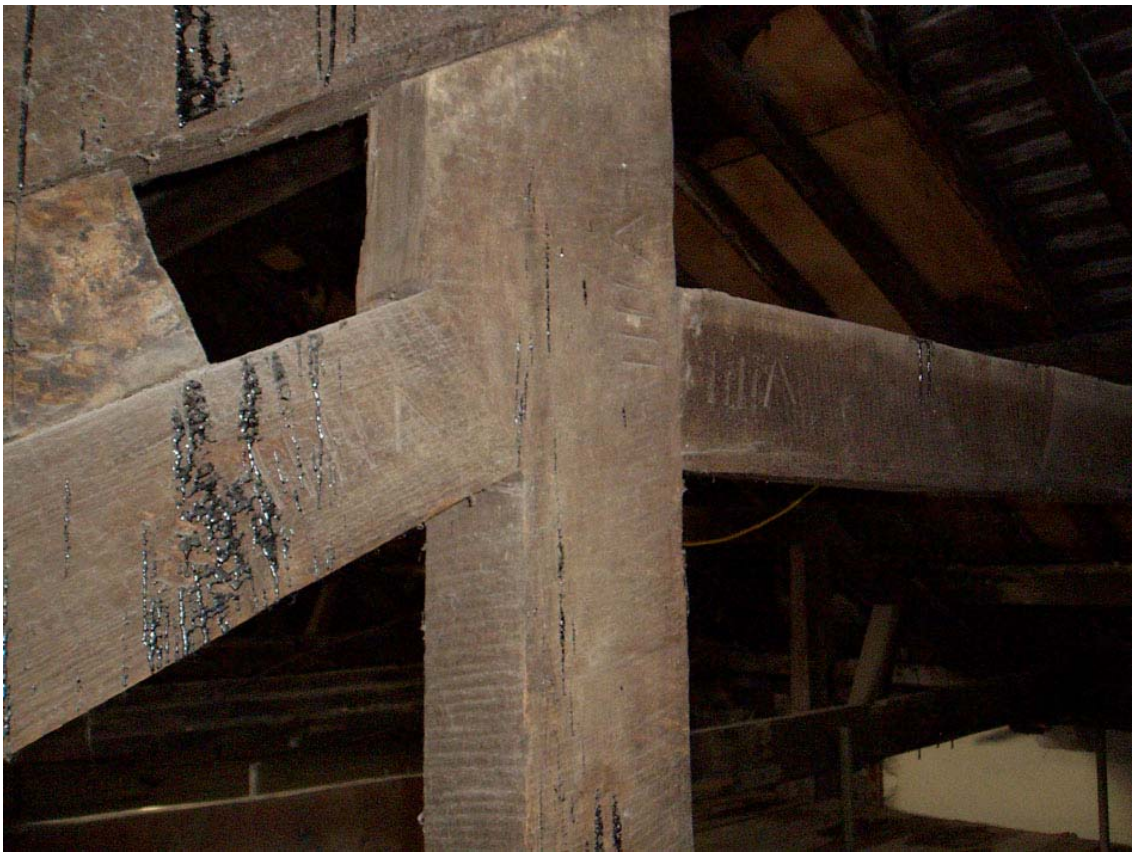


Plate 12: Assembly marks ‘VIIII’, Truss 12

Plate 13: Cut paint mark on strengthening member, Truss 15

Plate 14: ‘SW’ locational assembly mark on hip rafter, Area D

Plate 15: Baltic Timber mark on secondary timber, Truss 15

Plate 16: Assembly marks ‘4’, Truss 2

Plate 17: Chimney pot, probably of nineteenth century date

Plate 18: Cut principal rafter, presumably for remodelled parapet drain, Area D

Plate 19: The original cross-passage door within room ***1***, with the scar of the later staircase above

Plate 20: Detail of the foundations of a column within the cellar

Plate 21: The removed floors at the north-west corner of the building (rooms ***18***, ***36***, ***44*** and ***54***)

Plate 22: Detail of the beam-slots and wall plates in the north elevation

Plate 23: The floor of room ***22***

Plate 24: Detail of the servants' sandstone staircases in rooms ***24*** and ***26***, which have been repaired with concrete during renovations

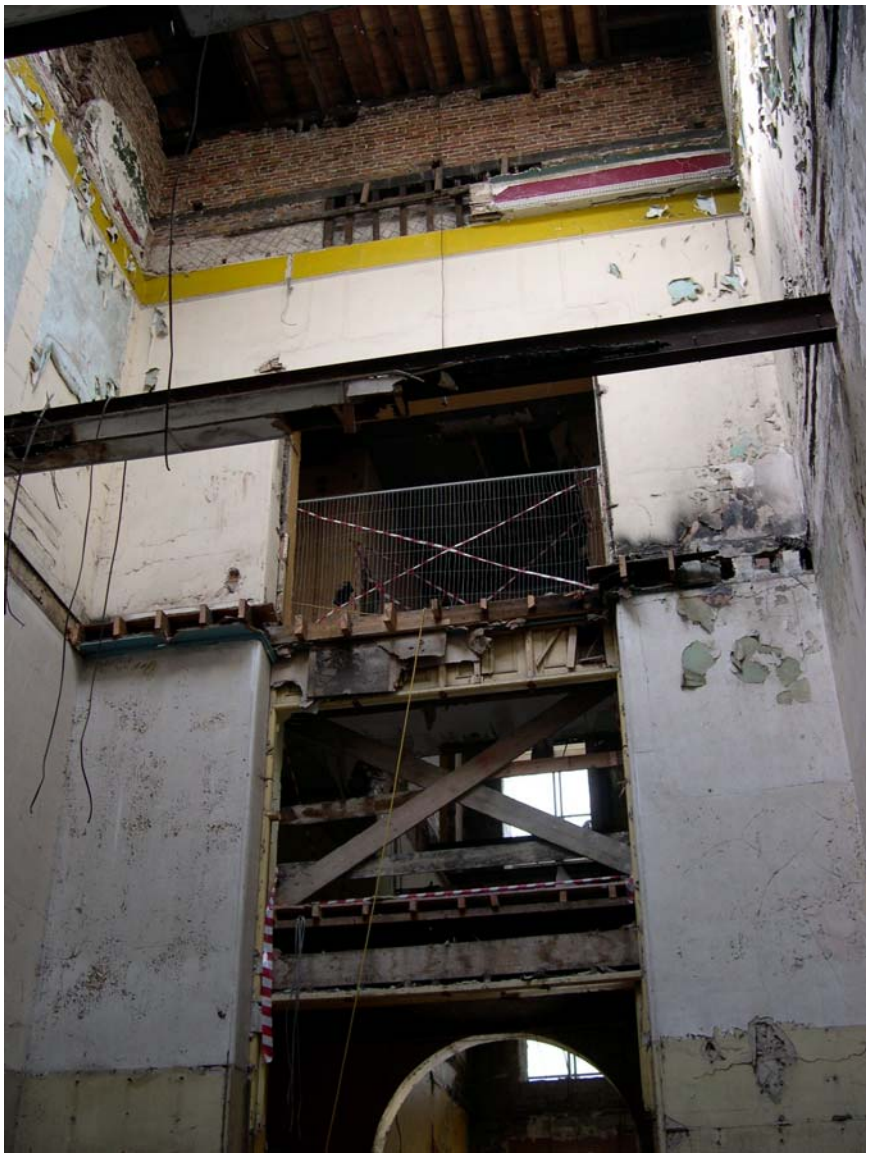


Plate 25: The site of the former imperial staircase within room ***25***. Note the rolled steel joist and timber joists of the inserted first floor

Plate 26: Detail of the joists beneath the later hardboard flooring of room ***25***

Plate 27: The timber-lined shafts within room ***25***

Plate 28: The south face of the steel trusses within rooms ***33*** and ***34***

Plate 29: Detail of the iron rod supporting the ceiling of the floor below

Plate 30: The scar of the former floor between rooms ***42*** and ***43***, and ***58*** above, including the wall plate

Plate 31: Detail of (probable) early twentieth century wallpaper within ***42*** and ***43***

Plate 32: Detail of (probable) early twentieth century wallpaper within ***42*** and ***43***

Plate 33: Detail of the tin ventilation shaft beneath the floor of room ***57***

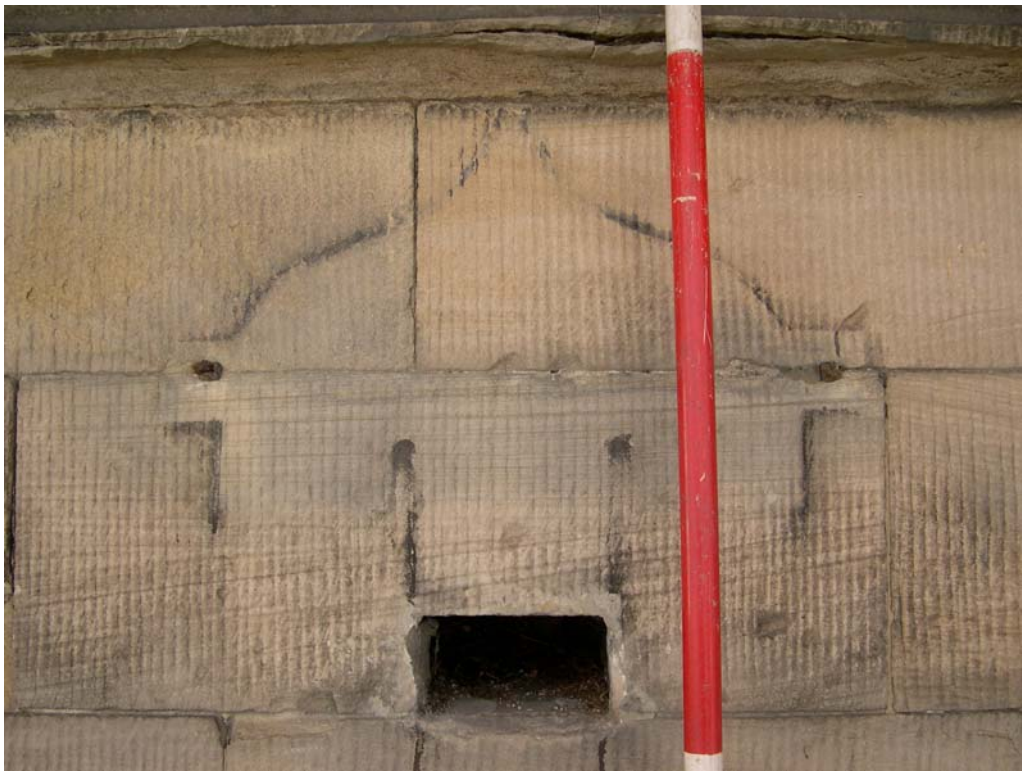


Plate 34: Detail of the former ventilation cover, on the exterior of the building

Plate 35: Detail of one of the corbelled chimney breasts, as observed in rooms ***58*** and ***60***

APPENDIX 1: GAZETTEER OF ROOF TIMBER ASSEMBLY MARKS

Truss	Member(s) and position	Face	Mark
1	Principal rafters, collars and struts	upper	V
1	Western principal rafter, below purlins	outer	VI
1	Western principal rafter, below upper purlin	outer	I
1	Western principal rafter, above wall plate	outer	SW
1	Eastern principal rafter, below purlins	outer	V
1	Eastern principal rafter, below upper purlin	outer	I
1	Purlins of west pitch, from Truss 39, at joint with Truss 1	outer	VI
2	Principal rafters, collars and struts	upper	4
2	Western principal rafter, below purlins	outer	VII
2	Eastern principal rafter, below purlins	outer	4
2	Eastern principal rafter, below upper purlin	outer	I
2	Purlins of east pitch, from Truss 1, at joint with Truss 2	outer	4
2	Upper purlin of east pitch, from Truss 1, at joint with Truss 2	outer	I
3	Principal rafters, collars and struts	upper	III
3	Upper purlin of west pitch, from Truss 2, at joint with Truss 3	outer	VII (inverted)
3	Upper purlin of west pitch, from Truss 4, at joint with Truss 3	outer	V I
3	Purlins of east pitch, from Truss 2, at joint with Truss 3	outer	III
4	Principal rafters, collars and struts	upper	II
4	Western principal rafter, below upper purlin	outer	VIIII
4	Wall plate from Truss 3, at joint over Truss 4	top	X
4	Eastern principal rafter, below purlins	outer	II
4	Purlins of east pitch, from Truss 3, at joint with Truss 4	outer	II
5	Principal rafters, collars and struts	upper	I

5	Western principal rafter, below upper purlin from Truss 4	outer	XI I
5	Western principal rafter, below upper purlin from Truss 6	outer	X
5	Western principal rafter, below lower purlin from Truss 4	outer	X
5	Western principal rafter, below lower purlin from Truss 6	outer	XI
5	Purlins of west pitch, from Truss 4, at joint with Truss 5	outer	XI
5	Upper purlin of west pitch, from Truss 6, at joint with Truss 5	outer	X
5	Lower purlin of west pitch, from Truss 6, at joint with Truss 5	outer	XI
5	Eastern principal rafter, below purlins	outer	II
5	Purlins of east pitch, from Truss 4, at joint with Truss 5	outer	II
6	Principal rafters, collars and queen struts	upper	III
6	Purlins of west pitch, from Truss 7, at joint with Truss 6	outer	XI
7	Collar and strut	upper	II
7	Western principal rafter, below purlins	outer	II
Area A	Hip rafter	top	NW
8	Principal rafters, struts and collar	upper	I
8	Collar	upper	N WEST
8	Purlins of north pitch	outer	I
8	Upper purlin of north pitch, from Truss 9, at joint with Truss 8	outer	X I
9	Struts and collar	upper	II
9	Southern principal rafter, below upper purlins	outer	X
9	Southern principal rafter, below upper purlin from Truss 10	outer	I
9	Northern principal rafter, below upper purlin from Truss 10	outer	X
9	Northern principal rafter, below lower purlin from	outer	II

	Truss 10		
9	Upper purlin of south pitch, from Truss 10, at joint with Truss 9	outer	X I
9	Purlins of north pitch	outer	II
10	Principal rafters, struts and braces	upper	III
10	Southern principal rafter, below upper purlins	outer	XI
10	Southern principal rafter, above upper purlin from Truss 11	outer	I
10	Upper purlin of south pitch, from Truss 11, at joint with Truss 10	outer	XI I
10	Purlins of north pitch, from Truss 11, at joint with Truss 10	outer	III
10	Lower purlin of north pitch, from Truss 9, at joint with Truss 9	outer	XII
11	Principal rafters, struts and collar	upper	IIII
11	Southern principal rafter, below upper purlins	outer	XII
11	Southern principal rafter, above upper purlin from Truss 12	outer	I
11	Upper purlin of south pitch, from Truss 12, at joint with Truss 11	outer	XII I
11	Lower purlin of south pitch, from Truss 12, at joint with Truss 11	outer	XI
11	Upper purlin of north pitch, from Truss 12, at joint with Truss 11	outer	X
11	Upper east purlin from Truss 12, and both lower purlins	outer	IIII
12	Tie beam, principal rafters, and struts	upper	V
12	Southern principal rafter, below upper purlins	outer	XIII
12	Southern principal rafter, above upper purlin from Truss 12	outer	I
12	Northern principal rafter, below upper purlins	outer	V
12	Upper purlin of south pitch, from Truss 12, at joint with Truss 11	outer	XIII I
12	Upper and lower purlins of north pitch, from Truss 13, at joint with Truss 12	outer	V

13	Tie beam, principal rafters, struts and braces	upper	VI
13	Southern principal rafter, below upper purlins	outer	XIIII
13	Southern principal rafter, above upper purlin from Truss 12	outer	I
13	Northern principal rafter, below purlins	outer	IV
13	Northern principal rafter, below upper purlin from Truss 14	outer	X
13	Upper purlin of south pitch, from Truss 14, at joint with Truss 13	outer	XIIII I
13	Upper purlin of south pitch, from Truss 14, at joint with Truss 13	outer	VI
14	Principal rafters, struts and collar	upper	VII
14	Collar	Lower	XX
14	Southern principal rafter, below upper purlins	outer	XV
14	Southern principal rafter, below upper purlin from Truss 10	outer	I
14	Upper and lower purlins of south pitch, from Truss 15, at joint with Truss 14	outer	XV
14	Upper and lower purlins of north pitch, from Truss 15, at joint with Truss 14	outer	VII
15	Principal rafters, struts and braces	upper	VIIII
15	Northern principal rafter, below purlins	outer	IV
15	Northern principal rafter, below upper purlin from Truss 16	outer	X
15	Lower purlin of south pitch, from Truss 16, at joint with Truss 15	outer	XVII
15	Upper and lower purlins of north pitch, from Truss 16, at joint with Truss 15	outer	VIIII
16	Principal rafters, struts and collar	upper	VIII
16	Northern principal rafter, below upper purlins	outer	VIII
16	Northern upper purlin from Truss 17	outer	X
17	Tie beam, principal rafters and struts	upper	X
17	Southern upper purlin from Truss 18	outer	X
18	Principal rafters, struts, collar and braces	upper	X

18	Southern upper purlin from Truss 19	outer	IX
19	Principal rafters, struts, collar and braces	upper	XI
19	Principal rafter	lower	I
19	Eastern principal rafter, below upper purlin from Truss 18	outer	XI