

Leicester's Building, Kenilworth Castle, Kenilworth

ARCHAEOLOGICAL RECORDING



understanding heritage matters

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SUMMARY

A programme of archaeological recording was carried out in advance of the creation of new access walkways, staircases and viewing platforms. The areas of masonry that were to be physically affected by the seating and fixings for the new platforms etc. were subject to detailed photographic and drawn survey. This allowed a few observations to be made regarding the construction of the building. An absence of re-used masonry in the facing of the building, suggests that the facing stone was heavily re-worked or, perhaps more likely, was freshly quarried for the job. Observations within the stair turret, a late addition to the building, suggest that it acted as a buttress for the south-west corner of the building, rather than being the cause of the cracks visible on the exterior face of the south side of the building.

Dendrochronological analysis was carried out on wooden lintels within the building. Of the 46 samples taken, 26 yielded felling dates commensurate with the 1570s construction and none were from later repairs. A single timber was anomalous, being felled in the late 15th century, perhaps suggesting it was re-used from elsewhere in the castle: it has a date similar to timbers in the gatehouse and stables.

A watching brief was conducted during the groundworks for a lightning conductor within the building although no significant archaeological deposits were exposed.

1 INTRODUCTION

1.1 English Heritage have completed a major development project in Leicester's Building in Kenilworth Castle, which includes the installation of new access walkways and staircases to allow visitors to reach the upper levels of the building. Before this work was carried out English Heritage commissioned a programme of archaeological work to be undertaken ahead of the development. Kenilworth Castle is Scheduled Ancient Monument (No. 21576).

1.2 A programme of recording, consisting of a detailed photographic record and drawings of the areas to be affected, along with a watching brief of groundworks during the installation of two lightning conductor rods, in accordance with a brief prepared by Jeremy Ashbee on behalf of English Heritage, was commissioned from Archaeology Warwickshire in February and carried out between March and June 2013. Dendrochronological analysis of the timbers present in the building was also carried out and notes on the building were made by Richard

Morris. This report presents the results of these separate pieces of work. The project archive will be stored with Archaeology Warwickshire until deposition with English Heritage.

2 SITE LOCATION

2.1 Leicester's Building lies in the southern part of the Outer Court of the castle. Work took place in the interiors of the three southernmost rooms and the stair turret of Leicester's Building, Kenilworth Castle, centred at National Grid Reference SP 2785 7223 (Fig 1).

2.2 The underlying geology of the area is Kenilworth Sandstone Formation (British Geological 1984).

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 The earliest castle on the site was probably a motte and bailey construction erected in the early 12th century. This was replaced in stone the late 12th century after the castle became a royal possession in 1173/74. The outer court was added in stone in the 13th century when the water defences may also have been expanded (Thomson 1969, 218-219). Since this time the surface area covered by the castle and its defences has barely altered. Further significant alterations were made under John of Gaunt, Duke of Lancaster, during the late 14th century and Robert Dudley, Earl of Leicester, during the late 16th century. The castle was slighted and fell largely out of use in the aftermath of the Civil War following the execution of Charles I in 1649 (Thomson 1969, 218; Jones 1991a, 2). Following the Civil War Leicester's Gatehouse was converted into a private residence for Colonel Hawkesworth, the parliamentarian officer in charge of the demolition work who had subsequently bought the castle. The Gatehouse and surrounding area then became the farmhouse for Castle Farm and was leased out to tenants.

3.2 Leicester's Building was built by Robert Dudley, Earl of Leicester, between 1570 and 1572 to accommodate Queen Elizabeth in anticipation of her 1572 visit. Richard Morris's analysis suggests that subsequently it underwent considerable modification in readiness for her 1575 19-day progress visit (Morris 2009, 241). It was a four-storey building, consisting of basement, ground floor, principal floor and upper floor. The basement rooms were designed for storage. The ground floor was residential, believed to be for Elizabeth's ladies. The principal floor contained the Privy chamber and Elizabeth's withdrawing chamber, bedroom and inner chamber. The top floor is believed to have housed the ante-chamber and dancing

chamber. All floors were removed after 1650, leaving the interior of the building to be viewed from the basement level.

4 AIMS AND METHODS

4.1 The main aim of the work was to record the areas of walls that would be physically affected by the new staircases etc, and to carry out a watching brief on associated groundworks, to collate the records in an archaeological archive and present the significant aspects of the archive in a report for dissemination.

4.2 The secondary aim was to form an understanding of the remains recorded in terms of their character and date, and to place the evidence in its local and regional context.

4.3 A team of experienced archaeologists recorded areas of the walls marked out on photographs made during a laser survey of the building. Drawings were made at a scale of 1:10 and photographs taken using a Nikon D40 DSLR camera and standard monochrome prints using a SLR camera. An archaeologist was also made available for each day of ground disturbance for the insertion of the lightning conductor rods when notified by the client in accordance with WSI/Brief.

5 RESULTS

5.1 The recording work took place in the main standing body of Leicester's Building in which new staircases and viewing platforms were to be constructed. This was within the main surviving block of the building consisting of the south room of each floor (Storage/Lodgings/Bedroom and inner chamber/Dancing chamber) and the north-east (Storage/Lodgings/Withdrawing chamber/Ante-chamber) and north-west rooms (Services and Stairs), but not the three-storey northern part as this was not included in the viewing platform scheme. When originally completed the main body of the building consisted of a basement level with three floors above. The northern part of the building was always one storey lower than the main block to its south and is too ruinous for any viewing platforms to be inserted. In addition to the main block of the building some parts of the stair turret in the south-west corner were also drawn.

5.2 Leicester's Building is divided into three main areas referred to as the north-east, north-west and south rooms. The areas referred to as 'rooms' for the purpose of this report are actually the space in which a number of rooms would once have existed. Thus each of

these spaces would have had a basement with three floors above. These upper floors are referred to as the ground floor, principal floor and top floor.

5.3 In addition to the main rooms there is also a large stair turret that was added to the south-west corner of the south room and provided access from ground floor level upwards. This was an addition to the original design after a large amount of the building had already been constructed. It is believed that it was constructed between 1572 and 1575 to provide Elizabeth with a private stair between the upper floors (Morris 2010, 20).

5.4 The building was studied by the late Dr Richard K Morris as part of his wider investigation of the works carried out at the castle by Robert Dudley, Earl of Leicester, during his ownership. This was published in *The Antiquaries Journal* (Morris 2009) and has been consulted as part of this report. Morris had noted several interesting features which shed some light on the construction and division of the building, the sum of which has been included as an appendix to this report. He noted that on the top floor several offsets in the masonry might mark the point that work on the construction of the main body of the building was halted in 1571. It was at this point that the stair turret was added to the original design.

Stair turret

5.5 Only the ground floor level of this structure was subject to recording. Within the stair turret the moulded string course, that can be seen just above the level of the ground floor windows in the exterior of the west side of the main original work, can clearly be seen running into the interior of the stair turret, proving that it was added after the building had been constructed to above this level. Also, part of the nearest window on the top floor, in the west wall, was blocked during its construction. The row of windows visible on the exterior of the south-west face of the turret can be seen to always have been blind windows, as no trace of them is visible on the interior of the stair turret. Presumably they were once plastered and painted to look like real windows, as happened later on some of the post-civil war infilling of windows on Leicester's Gatehouse. The stair only appears to have been accessible from the ground floor level upwards. However, below this entrance it is clearly hollow, this lower level being filled with sandy soil and rubble. Whether this area was ever utilised as some kind of storage space is unknown and no blocked door is visible on either its exterior or interior that would have given access to the base of the turret. It should be possible to reconstruct the form of the staircase as the scars of the steps, presumably timber, can be seen in parts of

the walls and it clearly rose in a series of straight sections. Similar scars can be seen in the south-west turret of the keep, Caesar's Tower, where a Tudor staircase was also inserted.

5.6 It has been suggested that the addition of the turret, along with the removal of the south-west corner of the original main block, almost caused the collapse of part of the already completed section of Leicester's Building as a large crack runs up the western side of the exterior of the south face (Morris 2009, 283). An alternative view is that the stair turret was added to form a massive buttress to this corner after the crack appeared. The turret clasps the original corner of the building, which was not sliced away for its construction but, as mentioned above, can still be seen in its interior (something no doubt not obvious in 2009 when examination of the interior was almost impossible). The north-east corner of the interior of the stair turret also contains a large solid block of masonry which rises from the lowest visible stage all the way to the highest. It implies that the stair turret is built around an existing corner buttress. The rather rough interior finishing implies it was never intended to be seen but the coursing of the masonry does suggest it was contemporary with the whole stair turret. Thus the new stair turret might have acted as both buttress and convenient location for new access points. The cutting of doors to give access to the new turret ought not to have substantially weakened this corner. However, *if* the foundations of the stair turret were not deep enough then it might have acted as a weight pulling on the corner rather than as a support. That the crack does not appear to have worsened substantially in the past 440 years might argue against this. Thus the turret may have been designed as the cure for, rather than the cause of, subsidence issues in this part of the new building, associated with the construction of Leicester's Building across the backfilled medieval moat of the inner ward. The building of the stair turret also required blocking up three lights of every window in the west wall of the south room as the turret had to join the outer face of its west wall. It is possible that the large expanse of window in the original design, so close to the corner of the building, might have contributed to its initial weakness and that the partial blocking of the windows was again a necessary measure to strengthen the wall and avert its collapse.

5.7 The only traces of decoration noted within the building were the set of small square holes below the level of the former suspended ceiling on the principal floor level within the south room. These were presumably for wooden pegs to support a plaster frieze, probably with a plaster ceiling. It is believed that rooms were designed as the main accommodation for Elizabeth I, being the largest with the best view out over the former mere (Morris 2009). The principal floor is taller than the first and top floors, again showing its importance.

Richard Morris also noted traces of a partition in this room consisting of faint black lines on the interior of the north and south walls. The lines were caused by pitch, used to seal the partition to the walls.

5.8 Whilst work was being carried out it was also noted that in the short corridors through the thickness of the wall between the northern and southern rooms the remaining fragments of lath and plaster ceilings sometimes retained traces of pale blue paint. This was the only trace of surviving colour seen during the work and was noted whilst executing the elevation drawings.

Watching brief

5.9 A watching brief was carried out during the excavation of two small pits to house lightning conductor rods within the building, in the south-west corner of the south room and south-west corner of the north-west room. These measured 0.28m square, and were 0.20m deep. The two pits only encountered topsoil overlain by a thin layer of gravel that forms the surfacing within the building and no finds were recovered.

6 CONCLUSIONS

6.1 Leicester's Building can be seen to have been constructed in a minimum of three phases. The first phase was the basement, ground floor and principal floor, reaching the latter by the early summer of 1571, according to a letter from John Butler (chief household officer) to Leicester (Morris 2009, 266). Morris has shown that, before work was completed, a decision was then made to add an extra storey to the building to bring it up to a height similar to Caesar's Tower. It was subsequently decided to add a stair turret, possibly before work was finished on the main block. Observations made during work to produce the elevation drawings of parts of the internal faces of the building suggests that one reason for the addition of the turret was to act as a buttress to reinforce the south wall of the building. The cracks may have been caused by the addition of the weight of the unplanned top floor.

6.2 It is unclear how much stone used in the new building was re-used from the nearby abbey site. Only very occasional stones have been recorded that were clearly from the Abbey site, such as the lower half of a grave slab, showing the base of a cross, and no examples of reused mouldings were seen elsewhere in the building. The coursing of the walls was generally even with little hint of difficulties in fitting random re-used stonework together. The conclusions might be that if re-use occurred only the best stone from the

abbey walls, excluding any moulded stonework, was used for the outer faces. If mouldings were re-used then they must only have been for the core of the wall although no evidence of this was seen. It might be that re-used stone was heavily re-worked before being put into Leicester's Building, removing evidence of 'old-fashioned' medieval architecture, or that a large amount of the stone used in the construction was actually quarried new for the project. A number of mason's marks were recorded during the drawing of elevations and this has some potential for comparison with other parts of the castle.

6.3 Dendrochronological analysis of the timber lintels within the building suggests that the timbers almost all date to the original 1570s construction of the building and none are from later repairs or replacements (Appendix C). One timber dated to the same period as the stables and gatehouse suggesting it was re-used from a medieval part of the castle.

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REFERENCES

Arnold, A., Howard, R., and Litton, C. 2007 *Leicester's Gatehouse, Kenilworth Castle, Kenilworth, Warwickshire - Tree-ring analysis of timbers*, English Heritage Research Department Report Series, **8/2007**.

Arnold, A., Howard, R. and Tyers, C. forthcoming *Leicester's Building, Kenilworth Castle, Castle Green, Kenilworth, Warwickshire - Tree-ring analysis of timbers*, Historic England Research Report Series.

British Geological Survey 1984 *Geological Survey of Great Britain (England and Wales), Solid and Drift Geology, Warwick 184*.

Bronk Ramsey, C. 2009 Bayesian analysis of radiocarbon dates, *Radiocarbon*, **51**, 337–360.

Howard, R. E., Litton, C. D., and Arnold, A. J. 2006 *Tree-Ring Analysis of Timbers from Lord Leicester's Stables, Kenilworth Castle, Warwickshire*, English Heritage Research Department Report Series, **21/2006**.

Miles, D. W. H. 2005a *New Developments in the Interpretation of Dendrochronology as Applied to Oak Building Timbers*, unpublished DPhil thesis, Hertford College, Oxford University.

Miles, D. W. H. 2005b *The Tree-Ring Dating of Lord Leicester's Stables, Kenilworth Castle, Warwickshire*, Centre for Archaeology Report, **17/2005**.

Miles, D. 2006 Refinements in the interpretation of tree-ring dates for oak building timbers in England and Wales, *Vernacular Architecture*, **37**, 84–96.

Morris, R. K. 2009 'I was never more in love with an olde howse nor never newe worke coulde be better bestowed': The Earl of Leicester's remodelling of Kenilworth castle for Queen Elizabeth I, *The Antiquaries Journal* **89**, 241-305, Cambridge.

Morris, R. K. 2010 *Kenilworth Castle*. English Heritage Guidebook. London.

APPENDICES

A Observations from the preparatory scaffolding by Richard K Morris 5/5/13

South space (C)

Ground floor:

Some original paviers survive in the hearth of the fireplace.

Principal floor:

Lost partition between rooms C1 and C2, its position is marked by two parallel vertical black lines on the wall between the two south windows. Some reciprocal black marks on the north wall, about 0.23m left of the left jamb (a void) of the fireplace in C1. The black is evidently pitch for sealing, as surplus has run down the north wall into the ground floor room. The width of the timber frame for the partition was approximately 240mm (9½-10"), as measured on the north wall. On the west window, above the top transom, chamfer mouldings have been used instead of ovolos for the interior profiles of the mullions; they would have been hidden by the ceiling at transom level. Chamfers are quicker to carve than ovolos.

The former overmantel area of the bedroom (C1) fireplace (right-hand/E fireplace) is differentiated from that of the fireplace in the west room (C1) by having larger holes in the masonry.

The right jamb of the passage to the SW turret - its metal reinforcement uses a square nut (not hexagonal), thus perhaps early 19thC?

The right jamb of the passage to the turret also has HL (?) boldly incised into the plaster

Top floor:

An offset runs horizontally across the north wall, low down, on each side of the fireplace; this appears to be a joint between where work stopped in July 1571 (to Consult Leicester about the height of the building, Morris 2009, 266-267), to be later restarted later in 1571 or 1572.

North-west space (D)

Principal floor:

The west windows, above the top transom, have chamfer mouldings instead of ovolos for the

interior profiles of the mullions; they would be hidden by the ceiling.

Top floor:

On the east wall, in its southern part, is a slight off-set or ledge at door threshold level – possibly evidence of where work stopped in 1571?

On the east wall the north door to space B (NE rooms), there are different carvers for the left jamb (shallow and narrower) and right jamb. The left jamb carver also worked on the right jamb of the south door to the southern room (C). The same carver probably also did the narrow jamb on the ground floor door from the NW area to the NE.

The north door to the flat roof over the northern space has later Victorian punch-dressed masonry repairs.

North-east space (B)

Principal floor:

The east bay window has unfinished masonry above the upper transoms; this would be hidden by the ceiling at transom level.

A block apparently used for sharpening tools was noted on the north wall near the NW door.

Top floor:

On the south wall between the principal and top floors is a narrow course of stones directly below beam holes, also on the north wall. These appear to coincide with a horizontal timber across the west wall. Is this evidence for the level of cessation of works in July 1571?

New masonry for the inserted chimney flue in the north wall, towards the north-west corner, has a mason's mark; as this should be secondary work, Jenny Alexander should check it against her collection for primary and secondary work elsewhere in Leicester's Building.

Original paviers survive in the hearth of the fireplace.

Mason's Marks

Mason's marks were recorded from the scaffolding in the following locations.

North-east (B)

Principal floor: east wall, SE corner, large maker's mark.

South (C)

Ground floor: door to SW turret, left reveal, several

Principal floor: door to SW turret, right reveal, by metal plate (large)

Top floor: door to SW turret, right reveal, top stone

North-west (D)

Ground floor: door to south space, on left head-stone (large N), also on left and right jambs (both ↑). West wall, south window, left jamb, 4th stone, and above transom – 3rd stone.

West wall, central 2-light window, left jamb, lowest stone, 3rd stone and 3rd stone above transom (all different). West wall, north window, right jamb, large.

B LEICESTER'S BUILDING, KENILWORTH CASTEL,: INTERIM STATEMENT OF THE DENDROCHRONOLOGICAL ANALYSIS

SAMPLING AND ANALYSIS

A total of 46 samples was obtained from a timbers, mostly lintels, within Leicester's Building at Kenilworth Castle (Table 1; Fig 1a–d and Fig 2a–d). One of the lintels was represented by two samples, KNW-D05 and KNW-D24. Analysis of 37 of these samples (nine samples having too few rings for successful analysis) resulted in the production of two site chronologies. The first site chronology, comprising nine samples and being 128 rings long, was dated as spanning the years AD 1423–1550 (Fig 3). The second site chronology, comprising 17 samples and being 192 rings long, was dated as spanning the years AD 1362–1553 (Fig 3). A further sample, KNW-D34, was dated individually, its 77 rings spanning the years AD 1392–1468 (Fig 3). Of the 37 measured samples, ten remain ungrouped and undated.

Interpretation

The 26 dated timbers in site sequences KNWDSQ01 and KNWDSQ02 all appear likely to be coeval (Figs 3 and 4) with the cross-matching between some of the individual timbers within each group indicating that they may have been derived from the same-tree. The cross-matching between the two groups does, however, indicate that the timbers represent disparate woodland sources, one relatively local and one perhaps slightly further afield, even though they appear likely to represent a single period of felling. In the absence of extant bark edge though, it is not possible to ascertain whether these timbers were all felled precisely at the same time or whether they could have been felled over a small number of years and hence whether some of them represent the 1570-72 construction and others the almost alterations made between 1572-75 identified by documentary evidence. However, what is apparent is that these 26 timbers are all associated with the 1570s works and none are later modifications or repairs.

Interpretation, using the standard 15-40 sapwood ring estimate (95% confidence range), indicates a likely felling date in the range AD 1564–89. However, the use of the Sapwood and Combine functions in OxCal (version 4.2.4; Miles 2005a; Miles 2006; Bronk Ramsey 2009) are considered appropriate for this group of timbers and produce a narrower felling date range that neatly encompasses the documentary evidence. The *combined felling date estimate obtained is AD 1568–73 (95.4% probability)* (Arnold *et al* forthcoming), although it is important to note that this latter approach assumes that the timbers were felled at the same

time and also that the number of timbers combined is above the optimum number (see Arnold *et al* forthcoming for further discussion). Optimising the number of timbers combined and using a variety of approaches does, however, produce combined felling date estimates that all range from the mid-AD 1560s to the mid-AD 1570s.

The other dated sample, KNW-D34, appears anomalous. It was dated individually and the cross-matching with the other material from this building is poor. However, it cross-matches very well with other dated samples from the stables and gatehouse at Kenilworth Castle (Miles 2005b; Howard *et al* 2006; Arnold *et al* 2007). The standard 15-40 sapwood ring estimate produces a felling date range of AD 1483–1508, whereas the use of the Sapwood function in OxCal, as per above, produces a felling date range of AD 1476-99 (95.4% probability).

Table 1: Details of tree-ring samples from Leicester's Building, Kenilworth Castle, Warwickshire

Sample number	Sample location	Total rings	Sapwood rings*	First measured ring date AD	Last heartwood ring date AD	Last measured ring date AD
	<u>North-west room, 3rd floor</u>					
KNW-D01	Garderobe lintel	nm	---	-----	-----	-----
KNW-D02	West wall, lintel to north window	53	6	-----	-----	-----
KNW-D03	West wall, lintel to south window	nm	---	-----	-----	-----
KNW-D04	West wall, lintel to middle window	53	h/s	1493	1545	1545
	<u>North-west room, 2nd floor</u>					
KNW-D05	North-east/north-west room, south door, west lintel	141	h/s	1410	1550	1550
KNW-D06	Door to north wall, south lintel	174	h/s	1374	1547	1547
	<u>North-west room, 1st floor</u>					
KNW-D07	West wall, lintel to south window	nm	---	-----	-----	-----
KNW-D08	West wall, lintel to north window	nm	---	-----	-----	-----
KNW-D09	West wall, lintel to middle window	nm	---	-----	-----	-----
KNW-D10	Doorway to east room, lintel	88	h/s	1457	1544	1544
	<u>South room, 1st floor</u>					
KNW-D11	Horizontal plate to north wall	77	4	-----	-----	-----
	<u>Additional timbers</u>					
KNW-D12	Timber A (slice)	60	no h/s	1442	-----	1501
KNW-D13	Timber B (slice)	83	no h/s	1454	-----	1536
KNW-D14	Timber C (slice)	nm	---	-----	-----	-----
KNW-D15	Timber D (slice)	54	h/s	1498	1551	1551
KNW-D16	Timber 8	96	h/s	1449	1544	1544
KNW-D17	Timber 21	162	no h/s	1362	-----	1523
KNW-D18	Timber unknown (slice)	91	h/s	1460	1550	1550
	<u>2nd floor</u>					
KNW-D19	North-east room, door to north wall, outer lintel	nm	---	-----	-----	-----
KNW-D20	North-east room, door to north wall, middle lintel	nm	---	-----	-----	-----
KNW-D21	North-west room, door to north wall, middle lintel	111	no h/s	1431	-----	1541

KNW-D22	North-west room, door to north wall outer lintel	55	no h/s	1457	-----	1511
	<u>2nd floor</u>					
KNW-D23	North-east room, door to north wall, inner lintel	82	no h/s	1393	-----	1474
KNW-D24	North-east/north-west room, south door, west lintel	160	h/s	1387	1546	1546
KNW-D25	North-east/north-west room, south door, east lintel	68	h/s	-----	-----	-----
	<u>1st floor</u>					
KNW-D26	North-east/north-west room, north door, west lintel	107	no h/s	1430	-----	1536
KNW-D27	North-east/north-west room, north door, east lintel	90	no h/s	1453	-----	1542
KNW-D28	North-west room, north (front) door, inner lintel	87	no h/s	1454	-----	1540
	<u>3rd floor</u>					
KNW-D29	North-east-nort-hwest room door, west lintel	76	no h/s	1463	-----	1538
KNW-D30	North-east-north-west room door, east lintel	120	no h/s	1423	-----	1542
KNW-D31	North-west room, doorway to north wall, inner lintel	59	no h/s	-----	-----	-----
	<u>1st floor</u>					
KNW-D32	North-west room, south window, middle lintel	91	no h/s	1450	-----	1540
KNW-D33	North-west/south room door, south middle lintel	57	h/s	-----	-----	-----
KNW-D34	North-west/south room door, south lintel	77	h/s	1392	1468	1468
KNW-D35	North-west/south room door, north middle lintel	77	h/s	1474	1550	1550
	<u>2nd floor</u>					
KNW-D36	North-west/south room door, south lintel (sliced)	133	no h/s	-----	-----	-----
	<u>Stair turret</u>					
KNW-D37	Level 4, lintel 2 (in from walkway)	49	h/s	1504	1552	1552
KNW-D38	Level 4, lintel 4	53	h/s	1501	1553	1553
KNW-D39	Level 3, lintel 8	130	no h/s	-----	-----	-----
KNW-D40	Level 3, lintel 9,	nm	---	-----	-----	-----
KNW-D41	Level 2, lintel 1	59	h/s	-----	-----	-----
KNW-D42	Level 2, lintel 2	86	h/s	1463	1548	1548
KNW-D43	Level 2, lintel 3	70	h/s	1484	1553	1553
KNW-D44	Level 1, lintel 1	73	no h/s	-----	-----	-----
KNW-D45	Level 1, lintel 2	65	no h/s	-----	-----	-----
KNW-D46	Level 1, lintel 5	52	h/s	1502	1553	1553

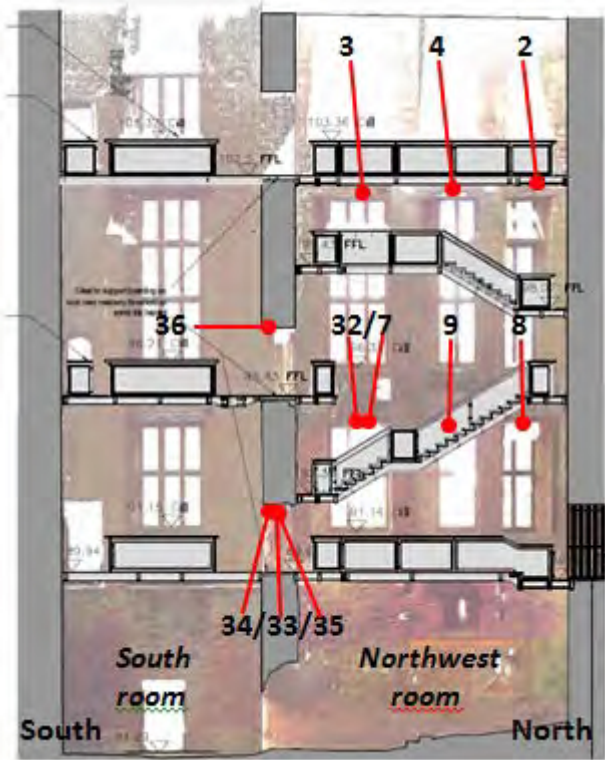


Fig 1A West wall

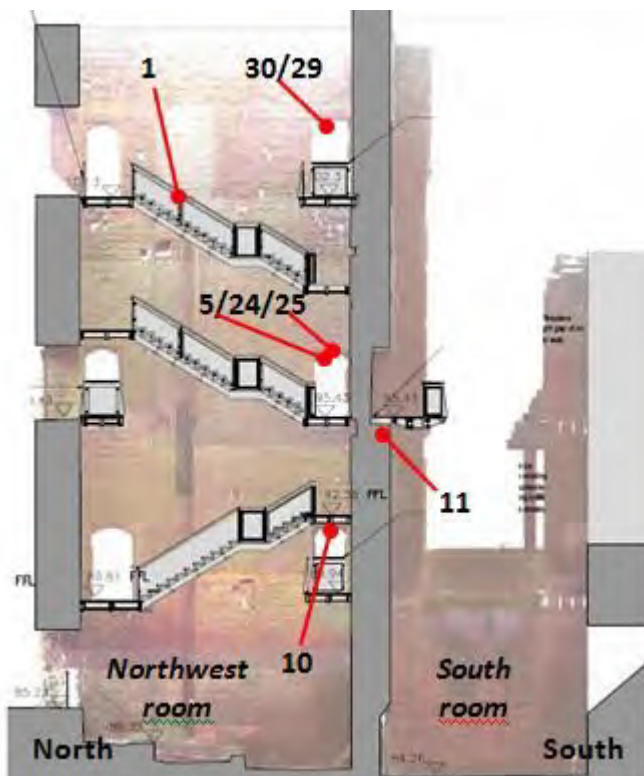


Fig 1B East wall

Figure 1A/B: Elevations through the walls to help locate sampled timbers

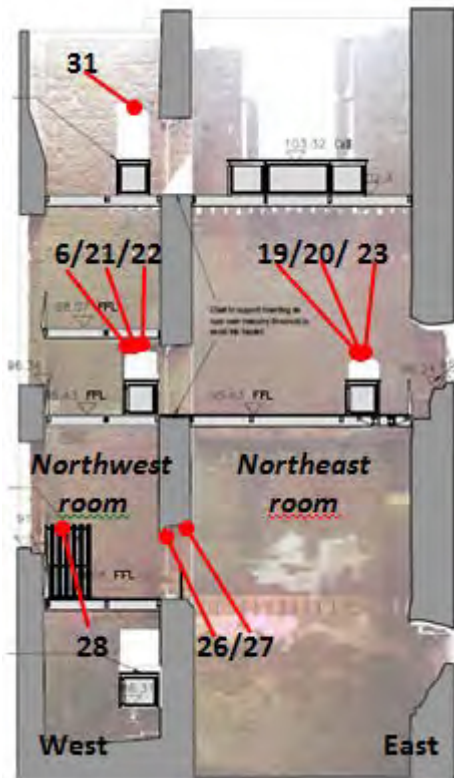


Fig 1C North wall

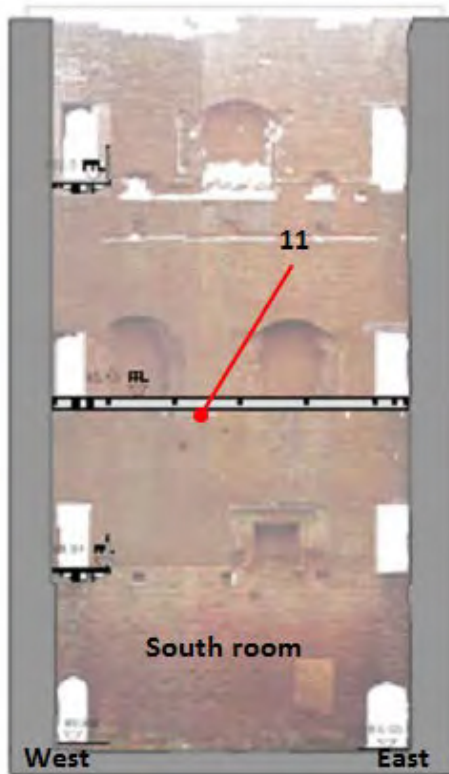


Fig 1D North wall of South room

Figure 1C/D Elevations through the walls to help locate sampled timbers

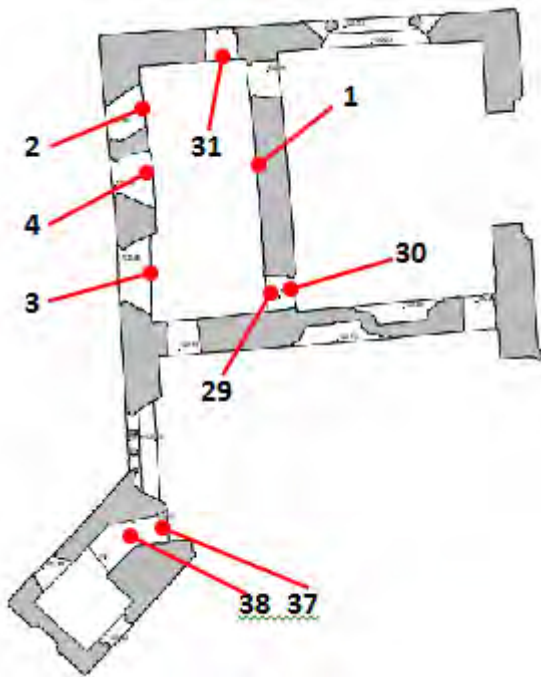


Fig 2A Top floor plan

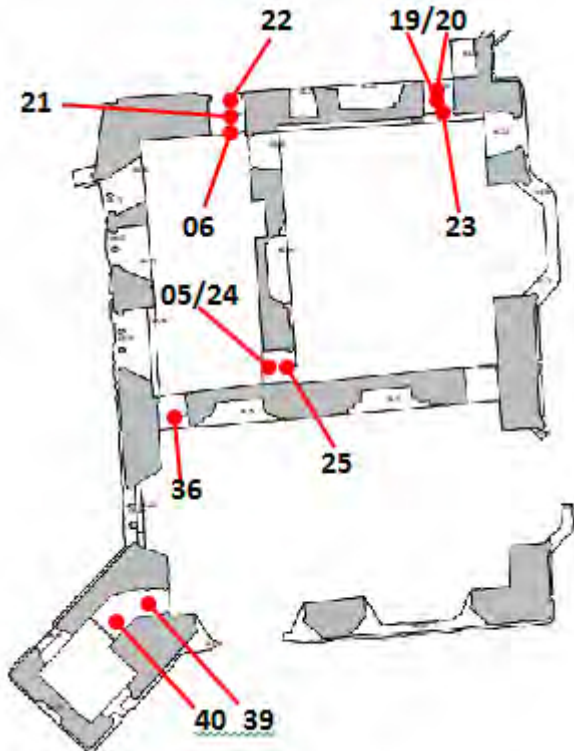


Fig 2B Principal floor plan

Figure 2A/B: Plans of the building to help locate sampled timbers

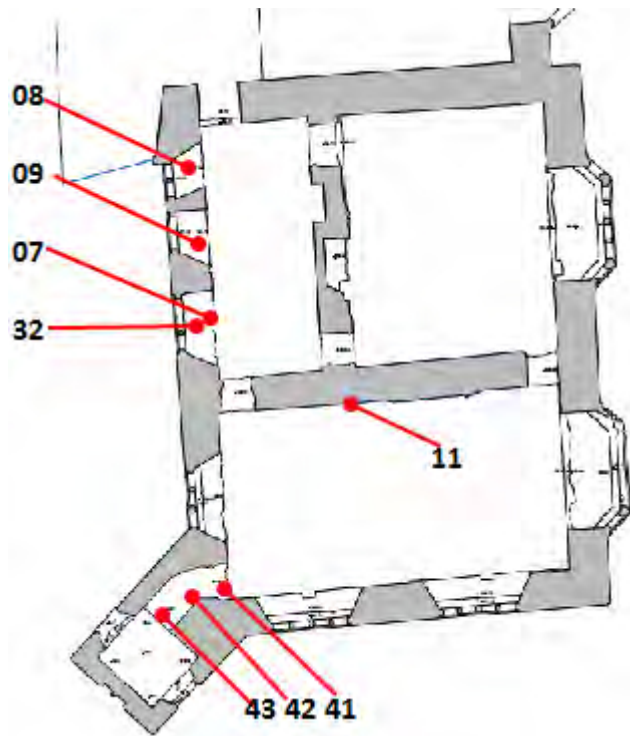


Fig 2C Higher level timbers, ground floor

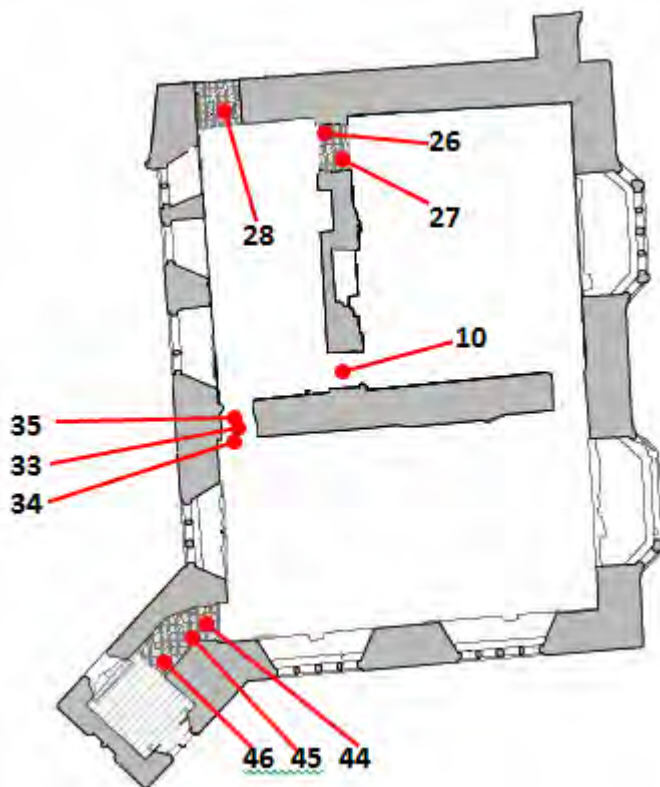
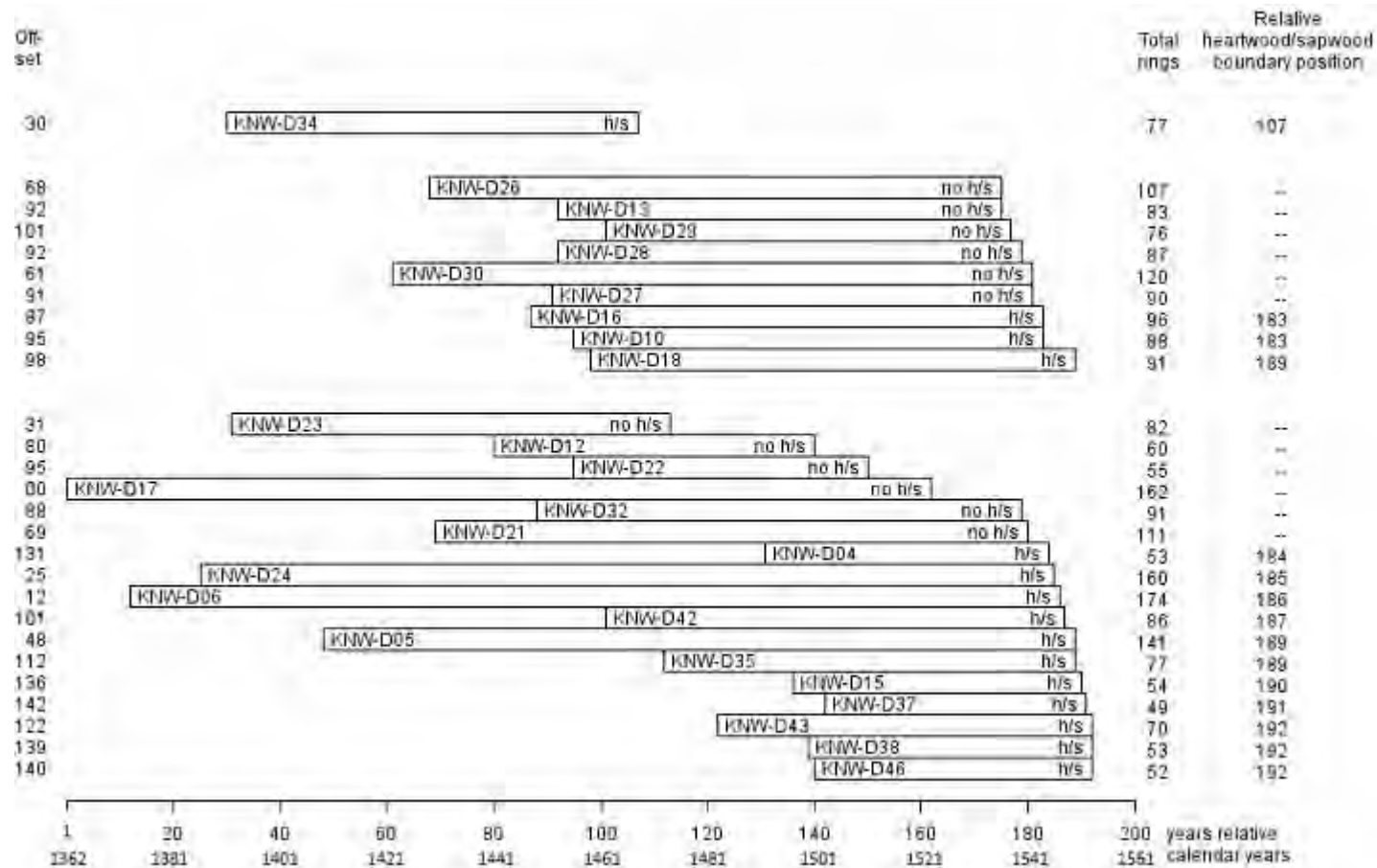


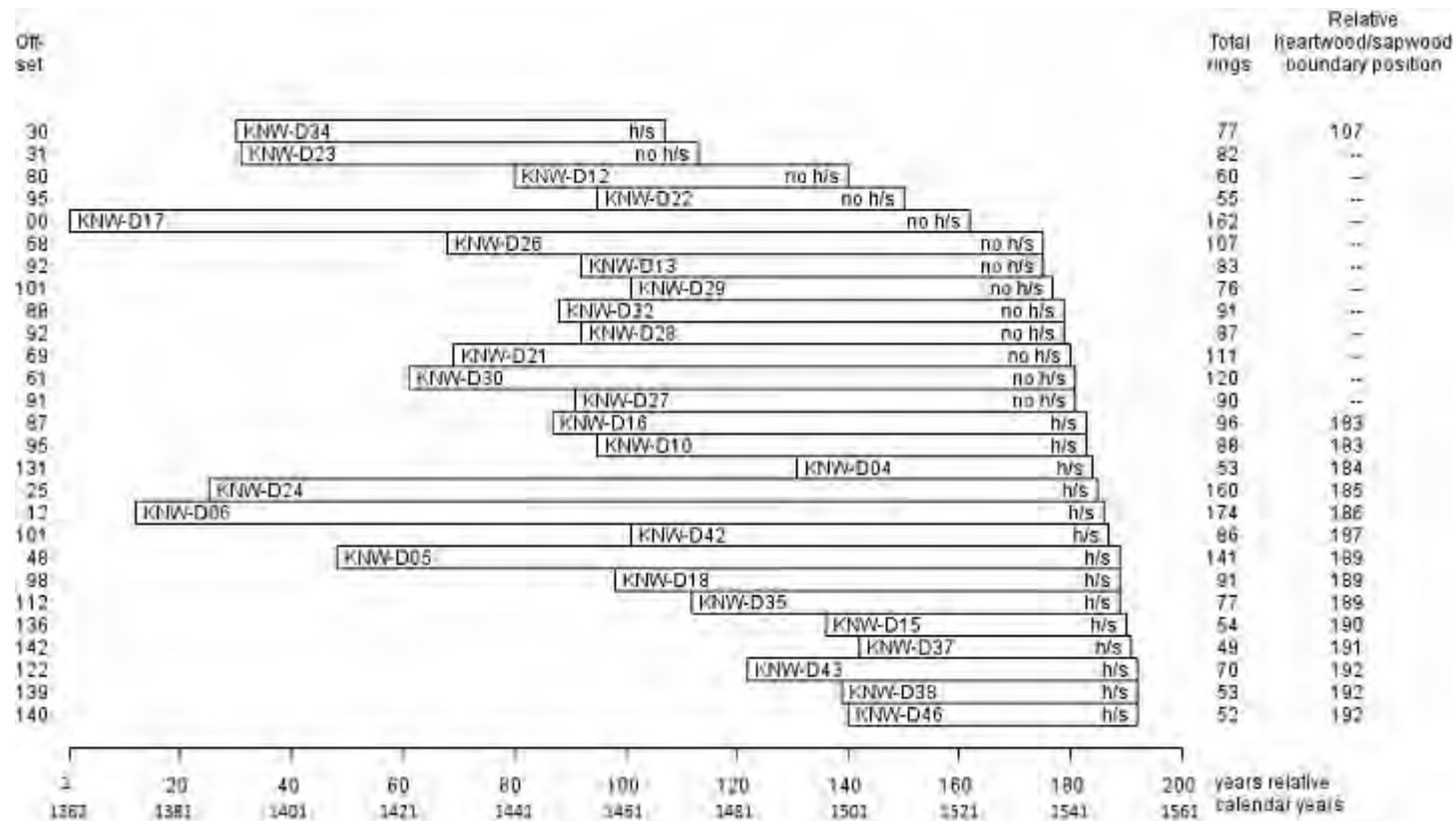
Fig 2D Lower level timbers, ground floor

Figure 2c/d: Plans of the building to help locate sampled timbers



White bars = heartwood rings, h/s = the heartwood/sapwood ring is the last ring on the sample

Bar diagram of the samples in site chronologies KNWDSQ01 and KNWDSQ02 plus individually dated sample KNW-D34. Note that KNW-D05 and KNW-D24 represent duplicate samples from a single timber



White bars = heartwood rings, h/s = the heartwood/sapwood ring is the last ring on the sample

Bar diagram of all dated samples in last measured ring date order. Note that KNW-D05 and KNW-D24 represent duplicate samples from a single timber

C Catalogue of drawings made

No.	Drawing sheet	EH dwg no	Room	Floor	Wall	Plate	Comments
1	1/1	301-3	NE	Principal	South	15	Lower side of door
2	1/2	301-2	NE		West	14	South door
3	1/3	301-2	NE	Principal	West	18	Lower part of doorway
4	1/4	301-2	NE	Principal	West	19	Lower part of doorway
5	1/5	301-2	NE	Top	West	30	Below doorway
6	1/6	301-4	NE	Top	East	31	Masonry area
7	1/7	300-2	NW	Ground	West	5	Below N window
8	1/8	300-2	NW	Ground	West	3	See 12/2
9	2/1	300-3	NW	Ground	East	6	Lower part of doorway
10	2/2	300-3	NW	Ground	East	4	Lower part of doorway
11	2/3	302-1	S	Ground	South	1	Beneath west window
12	3/1	302-2	S	Ground	North	2	Below doorway
13	3/2	302-1	S	Ground	West	32	Below window, N of S door
14	4/1	302-1	S	Principal	South	9	Side of doorway
15	4/2	302-2	S	Principal	East	11	Between GF and PF windows
16	5/1		S	Top	South	24	Adjacent to door
17	5/2		S	Top	West	24	Below door
18	5/3		S	Top	North	25	Below door
19	6/1	302-1	S	Principal	West	10	Between door and window
20	6/2	303-2	S	Principal	North	33	West side
21	6/3	302-2	S	Principal	North	34	East end below fireplace
22	6/4	302-1	S	Principal	West	35	Lead flashing
23	7/1	300-3(A)	NW	Principal	East	17	Lower part of north doorway
24	7/2	300-3(B)	NW	Principal	East	13	Lower part of doorway
25	7/3	300-2(A)	NW	Principal	West	12	Over south window
26	7/4	300-2(B)	NW	Principal	W	16	Over NW window
27	8/1	300-1	NW	Ground	South	7	Top of door
28	8/2	300-1	NW	Principal	North	20	Level with east door lintel
29	8/3	300-1	NW	Principal	North	21	Top of door
30	8/4	300-10	NW	Principal	East	21	Over N door
31	9/1	300-3	NW	Top	East	27	Below N door
32	9/2	300-1	NW	Principal	North	28	Joist holes
33	9/3	300-1	NW	Top	North	29	Joist holes below E door
34	10/1	300-3	NW	Ground	East	8	Top of south door
35	10/2	300-3	NW	Top and P	East	23	Over south door
36	10/3	300-1	NW	Top and P	South	22	Between doors on 2 floors
37	10/4	300-2	NW	Above P	West	26	Above P floor S window
38	11/1		NW	Principal	East		South door lintel
39	11/2		S	Top	West	36	Concrete lintel
40	12/1		NW	Top	East		Top of garderobe shaft
41	12/2		NW	Ground	West	3	Below S window

42	13/1		NW	Top	West		Middle lintel
43	13/2		NW	Top	West		North lintel
44	14/1	300-2	NW	Principal	West		Middle lintel
45	15/1		S	Principal	North		Lintel
46	15/2		S	Principal	West		Top of G floor lintel
47	16/1		NW	Top			Wooden lintel
48	17/1		Turret	Ground	NW	20	Lintel area
49	17/2		Turret	Ground	SE	21	Lintel and below
50	18/1		Turret	Ground	NE + SE	23	Doorway/joist level
51	18/2		Turret	Ground	SW + NW	22 + 20	Doorway/joist level
52	18/3		Turret	Ground	SE	21	Door passage



1 Carrying out recording in the NW room



2 View of scaffolding within Leicester's Building



3 NE room, top floor, masonry below doorway (Drawing 1, Sheet 1/1)



4 NE room, principal floor, masonry below doorway (Drawing 2, Sheet 1/2)



5 NE room, principal floor, masonry below doorway (Drawing 3, Sheet 1/3)



6 NE room, principal floor, masonry below doorway (Drawing 4, Sheet 1/4)



7 NE room, top floor, masonry below doorway (Drawing 5, Sheet 1/5)



8 NE room, top floor, masonry (Drawing 6, Sheet 1/6)



9 NW room, ground floor, masonry (Drawing 7, Sheet 1/7)



10 NW room, ground floor (Drawing 8, Sheet 1/8 superceded by 12/2)



11 NW room, ground floor, masonry below doorway (Drawing 9, Sheet 2/1)



12 NW room, ground floor, masonry below doorway (Drawing 10, Sheet 2/2)



13 S room, ground floor, masonry (Drawing 11, Sheet 2/3)



14 S room, ground floor, masonry below doorway (Drawing 12, Sheet 3/1)



15 S room, ground floor, masonry (Drawing 13, Sheet 3/2)



16 S room, principal floor, masonry (Drawing 14, Sheet 4/1)



17 S room, principal floor, masonry (Drawing 15, Sheet 4/2)



18 S room, top floor, masonry (Drawings 16 (L) and 17(R). Sheets 5/1 and 5/2)



19 S room, top floor, masonry below doorway (Drawing 18, Sheet 5/3)



20 S room, principal floor, masonry by window (Drawing 19, Sheet 6/1)



21 S room, principal floor, masonry and joist hole (Drawing 20, Sheet 6/2)



22 S room, principal floor, masonry by fireplace (Drawing 21, Sheet 6/3)



23 S room, principal floor, masonry above lintel (Drawing 22, Sheet 6/4)



24 NW room, principal floor, doorway base (Drawing 23, Sheet 7/1)



25 NW room, principal floor, doorway (Drawing 24, Sheet 7/2)



26 NW room, ground floor, lintel and masonry (Drawing 25, Sheet 7/3)

HE samples 7 and 32



27 NW room, ground floor, lintel (Drawing 26, Sheet 7/4) HE sample 8



28 NW room, ground floor, masonry above doorway (Drawing 27, Sheet 8/1)

Drawing 28 is 4 courses of masonry P floor W side level with east door lintel – no photo



29 NW room, principal floor, lintel (Drawing 29, Sheet 8/3), HE samples 6, 21, 22



30 NW room, relieving arch over doorway (Drawings 29 and 30, Sheets 8/3 and 8/4)



31 NW room, top floor, masonry below doorway (Drawing 31, Sheet 9/1)



32 NW room, top floor, jost holes (Drawing 32, Sheet 9/2)



33 NW room, top floor, joist holes (Drawing 33, Sheet 9/3)



34 NW room, ground floor, lintel,(Drawing 34, Sheet 10/1), HE sample no 10



35 NW room, principal floor, masonry (Drawing 35, Sheet 10/2)



36 NW room, principal floor, masonry (Drawing 36, Sheet 10/3)



37 NW room, top floor, lintel (Drawing 37, Sheet 10/4) HE sample 3



38 NW room, principal floor, lintel (Drawing 38, Sheet 11/1) HE samples 5, 24, 25,
S room, top floor, Drawing 39 (Sheet 11/2) is of a concrete lintel and was not photographed



39 NW room, top floor, lintel (Drawing 40, Sheet 12/1) HE sample 1



40 NW room, ground floor, masonry (Drawing 41, Sheet 12/2)