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Summary

Thirty-seven tree-ring samples were taken from thirty timbers from various phases at Hergest Court, Kington, Herefordshire (SO 281 554). Four replicated site chronologies were produced, spanning the years AD 1078-1266, AD 1167-1306, AD 1438-1598, and AD 1451-1665. Tree-ring dating has identified re-used timbers dating from AD 1267 most likely from the primary roof structure of Building G, an uncercroft of AD 1307, a felling date range of AD 1485-1515 for a pentice extension to the undercroft, an AD 1666 block above the undercroft extension with a staircase extension of the same date. A timber-framed core between the two main ranges was found to date from AD 1619-22. A two-storey detached solar block survives to the west, dating stylistically to *c* AD 1300 although the roof is not original and contained a single dated timber of AD 1452.

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THE TREE-RING DATING OF HERGEST COURT, KINGTON, HEREFORDSHIRE

1. INTRODUCTION

Hergest Court, approximately two miles south-west of Kington, Herefordshire (SO 281 554; Fig 1), is one of the most important medieval sites on the Welsh Marches, not least for its associations with the Vaughans and Welsh poetry. Built on a naturally defensive site, it is first mentioned in an *Inquisition Post-Mortem* of AD 1251. The building was analysed by Richard Morriss and comprehensively covered in his buildings survey report (Morriss 1995). This report is somewhat difficult to simplify here because the individual phases of construction have been labelled 'Building' A, B, etc, and lettered in an order not necessarily related to chronological phasing (Fig 2). This not withstanding, Morriss suggests the following phasing on architectural or typological grounds:

Late Thirteenth Century The earliest surviving phase of Hergest Court was thought to be the stonework to the eastern wing now incorporated in Building G. This includes the north wall which is one metre thick and rise two storeys. There survives in this wall a large blocked window opening with arched head and splayed reveals. Other features noted on this wall was a corbel and possibly another, smaller opening further to the east. Little else is thought to have survived from this phase of construction.

Adjacent to Building G is a short section of wall with a medieval doorway, referred to as Building H. This is a westward extension of the north wall of Building G, but a straight joint shows that it was a separate phase of construction. The doorway has a pointed arched head and is opening inward, serving a room replaced by the present Building C. The section of surviving wall aligns with the obvious construction break in the east gable wall of the detached solar block of Building A to the west.

Building A is a detached solar block to the west of the main building, is a two-storey stone-built building. The roof has been reconstructed at least twice, the last time after it had burned in the nineteenth century when the eaves were lowered. However, features still surviving include the original ground-floor and first-floor external doorways, an original rear ground-floor loop opening, and several original first-floor windows, one with a pair of window seats. The upstairs room also retains an original stone fireplace and coved stone-built mantle shelf. Some re-used timbers were noted to be used in the construction of the present roof, and some *in situ* wall plates were noted on the north side, partly-charred in the nineteenth-century fire.

Fourteenth Century Building C was thought to have been extended northwards in the fourteenth century, into part of the area presently occupied by Building B. All that remains of this structure is an undercroft which is now under the southern half of the eastern bay of Building B. This is a single room with a stone spine-wall with a later door and an original surviving splayed window loop (blocked) which might be a fragment of the perimeter defensive wall. This area of cellar is roofed over with baulks of oak measuring 6" x 30", laid close together forming a solid timber ceiling some 6" thick.

Fifteenth Century The east wing, Building G, was thought to date from this period. This is a two-storey stone-built structure with one metre-thick walls similar to the north wall which dates from the thirteenth century. Surviving features thought to date from this period includes a medieval fireplace and a reset mantelshelf with carved angel surviving on the east wall at ground-floor level.

Late Fifteenth/Early Sixteenth Century Between Buildings C and D is a single isolated truss which, together with some wall framing of the bays either side, was thought to be the sole survivor of a building which was built on the north side of Building G and originally across the medieval doorway of Building H. This is thought to include a section of re-set wall framing between the kitchen and the staircase hall with a timber depressed four-centred head with sunk spandrels and cavetto chamfers. The *in situ* truss above has a single collar with evidence for a single strut. The purlins are large-sectioned and are trenched in the back of the principal rafters. Most of the west bay has been removed to accommodate the later staircase tower in Building D.

A section of wall framing in the cellar to the north of the undercroft under Building B was also thought to date from this period. This takes the form not unlike a pentice, and comprises three posts supported on a large sole plate and carrying a plate which presumably still supports joists which are obscured by the ceiling plaster. This clearly extended the line of building above, but still not as far as the present northern wall of Building B.

Early Seventeenth Century Building B above cellar level was thought to have been constructed at this time. It is a large close-studded three-bay range of two stories with attics. Both floors are carried on three sets of longitudinal beams, and the roof on three sets of purlins on each side. This building has enclosed the fourteenth- and fifteenth-century remains at cellar level, and has been intruded into the western bay of Building C. Features include very fine inlaid panelling in the first-floor room at the west end of this range.

Early-to-mid Seventeenth Century Following the construction of Building B, a new stair tower was constructed (Building D). This gives access to the upper floors of Buildings B and C, and the attics of Building B. This is also timber-framed although it is almost all obscured externally by shingle-hanging and internally by plasterwork. It uses the southern wall of Building B and the central cross-frame of Building C for the north and east walls respectively. The staircase itself is a dog-legged arrangement rising three stories and is of high quality, with raking splat balusters and newels with ovolo stop-chamfered corners and recessed panels in each face.

Eighteenth Century Building E was thought to have been constructed at this time in the internal angle formed by Buildings B and C. It is few datable features, and appears to have been built of little new timber. The roof was constructed with many re-used timbers stylistically dating from the sixteenth century.

2. OBJECTIVES

The tree-ring analysis was requested by John Yates, English Heritage Inspector of Historic Buildings, as part of a major programme of grant-aided repairs to the building. The original brief was to sample and date the primary construction of Buildings B, C, D, and E. However, as the phasing of the surviving timberwork proved to be considerably more complex than expected during sampling, this brief was expanded by agreement with the Ancient Monuments Laboratory to include the re-used roof timbers above Building G, and to unravel the complex building sequence of Building B.

3. SAMPLING

A number of areas were identified as having some potential or desirability for dating. However, this potential varied considerably from area to area, depending primarily on survival and accessibility.

Building A survives relatively intact up to the wall tops. This building was inspected for primary timbers, but careful study concluded that the lintels above the ground-floor openings (some of which may not be primary) may have been re-used and did not retain any sapwood or heartwood/sapwood boundary. Similarly, the two timbers forming the seats to the rear window reveals (themselves a later alteration) had no sapwood and were badly charred from the nineteenth-century fire which destroyed the roof. However, there were sections of wall plates surviving from an earlier roof and these were inspected. Those at the front of the building had mortices for close-studding, suggesting a rather late date before being re-used, whereas one at the rear had complete sapwood and no close studding mortices. In the end, only one sample from this rear wall plate was taken on the hope that it might prove to be from the primary phase of construction.

In Building B, the earliest phase was clearly the undercroft. This remarkable ceiling consisted of solid baulks of oak between 18in and 30in wide (450 - 750mm) by 6in thick (150mm), laid flat and abutting to form a solid ceiling of timber. Only one other (undated) example of such a solid timber floor was known to the author, that at The Chestnuts, Water Orton, Warwickshire (Alcock *et al* 1991). Here this was a first-floor structure to a cross-wing with baulks averaging 12in (300mm) by 4in (100mm) thick, and four were sampled, with one retaining complete sapwood (***hc1***, ***hc2***, ***hc12***, and ***hc14***). Also in this area, the door posts to the west door were noted to be constructed from re-used roof timbers. As one retained complete sapwood it too was sampled (***hc13***). To the north of the undercroft the timber structure forming a pentice was assessed. All three studs and sole plate were unsuitable for sampling as they were of re-used timbers, but the jetty plate looked the most promising and was therefore sampled (***hc3***). This at least retained a heartwood/sapwood boundary.

Above the cellars, the superstructure of Building B gave the widest selection of samples. Although the close-studded north wall was problematical due to external decay and proximity to hard render, seven samples were taken from the ground-floor and first-floor timbers, mainly internally (***hc4*** - ***hc8***, ***hc27***, and ***hc28***). Most of these exhibited exceptionally long ring sequences, and all retained complete sapwood. The purlins in the roof might have also provided suitable samples but were too high above the attic floor to allow for safe access. Nevertheless, the articulation between the floor frames and cross frames is sufficiently clear to determine the roof structure is coeval with the lower two floors.

Building C had less timbers to choose from, although some more were identified than were noted in the buildings report (Morris 1995). Most of the available timbers were either too fast grown or had no sapwood, therefore only five timbers were sampled. These included the principal posts and a purlin at the central truss (***hc16***, ***hc17***, and ***hc22***), as well as two studs at first-floor level adjacent to Building G (***hc9*** and ***hc10***).

The staircase tower comprising Building D had very few suitable timbers accessible. Only four timbers were sampled, which included a purlin which oversailed onto Building B (***hc20***), and a corner post where the top of the staircase tower extended above the central truss of Building C (***hc29***). A string from the staircase was also sampled, as was a stud infilling a doorway at first floor level (***hc11*** and ***hc18***), both requiring second cores to obtain complete sapwood. The stair string was sampled twice, as the first core (***hc11a1*** and ***hc11a2***) broke, losing about six rings at the heartwood/sapwood transition. A second core (***hc11b***) was taken a little further along the timber, but the surface appeared slightly abraded, leaving some question as to whether it was complete to the bark edge. By visually comparing the three individual segments, it was found that both cores were complete and all were combined to form the mean, ***hc11***.

Building E was inspected thoroughly, but appeared to be constructed almost entirely of re-used timbers. One first-floor beam however was sampled as it appeared to be of first-use timber and with complete sapwood (***hc15***). However, it did not have very many rings, and no other timbers relating to this standing building were considered suitable. There was a wide selection of

timbers comprising the roof structure from an earlier, possibly sixteenth-century, building, although these were not sampled as this was not part of the sampling brief. These re-used timbers could have come from any number of buildings on the site, so would not have contributed specifically to the better understanding of one specific phase.

Although largely reconstructed, Building G still retained some historic fabric. Investigation of the roof space revealed a rafter still *in situ*, encased in a later chimney stack on the dividing wall between Buildings C and G. This was found to run almost from the northern eaves line of Building G, to the south face of the chimney stack where it had been chopped back to the face of the stack when the roof was subsequently reconstructed. It was not possible to core the timber as it was encased on three sides by stonework, but enough of the upper severed end protruded to allow about ½" (13mm) to be sawn off for a sample (***hc21***). Other timbers including smoke-blackened rafters and braces of similar section and exhibiting notch-lap joints were found re-used in the present existing roof structure to Building G. A number of these had good ring counts and one still retained complete sapwood. Five of these were cored: ***hc19*** from a timber re-used as a purlin, and four rafters re-used as braces: ***hc23***, ***hc24***, ***hc25***, and ***hc26***. Sample ***hc24*** was cored twice to obtain complete sapwood. Further sampling of the timberwork was not possible due to the weak ceiling joists, and it was not possible to ascertain whether there were any other timbers below due to later finishes.

4. METHODOLOGY

All samples were of oak (*Quercus* spp.) from what appeared to be primary first-use timbers, or which appeared to have been re-used from an early phase. Those timbers which looked most suitable for dendrochronological purposes with complete sapwood or reasonably long ring sequences were selected. *In situ* timbers were sampled by coring, using a 16mm hollow auger. Redundant timbers encased within the later structure were sectioned where coring was not possible. Where the retention of sapwood proved difficult, or a defect was evident in a core, a timber might be sampled twice. The two radii are then labelled ***a*** and ***b***. The location of the samples are shown on the cellar, ground-floor, first-floor, and attic plans (Appendix A).

The dry samples were sanded on a linisher, or bench-mounted belt sander, using 60 to 1200 grit abrasive paper, and were cleaned with compressed air, to allow the ring boundaries to be clearly distinguished. They were then measured under a x10/x30 microscope using a travelling stage electronically displaying displacement to a precision of 0.01mm. After measurement, the ring-width series for each sample was plotted as a graph of width against year on log-linear graph paper. The graphs of each of the samples in the phase under study are then compared visually at the positions indicated by the computer matching and, if found satisfactory and consistent, are averaged to form a mean curve for the site or phase. Duplicate radii from the same timber would be combined first before proceeding with any further stage analysis. This mean curve and any unmatched individual sequences are compared against dated reference chronologies to obtain an absolute calendar date for each sequence.

Here this was accomplished by using a combination of both visual matching and a process of qualified statistical comparison by computer. The samples were first matched visually, and then independently matched by computer. The ring-width series were compared on an IBM compatible 486SX computer for statistical cross-matching using a variant of the Belfast CROS program (Baillie and Pilcher 1973). A version of this and other programmes were written in BASIC by D Haddon-Reece, and latterly re-written in Microsoft Visual Basic by M R Allwright and P A Parker. The bar diagram graphics software was written by M R Coome.

Once a tree-ring sequence has been firmly dated in time, a felling date, or date range, is ascribed where possible. With samples which have sapwood complete to the underside of, or including

bark, this process is relatively straight forward. Depending on the completeness of the final ring, I e if it has only the earlywood vessels formed, or the latewood, a *precise felling date and season* can be given. However, as it is not known how wide the complete summer growth band should be for that particular tree, it cannot be stated conclusively whether the tree was felled in early or late summer, or if indeed it was felled at some point in the early winter. If the sapwood is partially missing, or if only a heartwood/sapwood transition boundary survives, then an *estimated felling date range* can be given for each sample. The number of sapwood rings can be estimated by using an empirically derived sapwood estimate with a given confidence limit. An accepted sapwood estimate for British and Irish oaks is given as between 10 and 55 rings with a 95% confidence range (Hillam *et al* 1987). A recent review of the geographical distribution of dated sapwood data from historic building timbers has shown that a 95% range of 11-41 rings is more appropriate for Wales and the Border Counties (Miles 1997a), which will be used throughout this report. If no sapwood or heartwood/sapwood boundary survives, then the minimum number of sapwood rings from the appropriate sapwood estimate is added to the last measured ring to give a *terminus post quem* or *felled after* date.

Some caution must be used in interpreting solitary precise felling dates. Many instances have been noted where timbers used in the same structural phase have been felled one, two, or more years apart. Where ever possible, a *group* of precise felling dates should be used as a more reliable indication of the *construction period.* It must be emphasised that dendrochronology can only date when a tree has been felled, not when the timber was used to construct the structure under study. However, it is common practice to build timber-framed structures with green or unseasoned timber and that construction usually took place within twelve months of felling (Miles 1997a).

5. ANALYSIS

All samples were numbered in order of sampling, and are designated ***hc1***, ***hc2***, etc. Duplicate samples from the same timber are given the suffix ***a***, ***b***, etc. Sample locations are shown on the drawings in Appendix A. Details of each sample, including date, no of rings, sapwood complement, location, and other characteristics are summarised in Table 1, and scale section drawings of each timber are shown in Figure 3. All dated samples are shown arranged in chronological position in Figure 4.

Phase 1: Re-used Roof Timbers - AD 1267

Six samples were taken from the roof of Building G, ***hc19***, ***hc21***, ***hc23***, ***hc24***, ***hc25***, and ***hc26***, together with another sample, ***hc13*** from the door post in the undercroft of Building B. These seven samples were compared with each other and, with the exception of ***hc19***, were found to match and were combined to form the site master ***HERGEST1*** (Table 2; Appendix B). This was compared against the reference chronologies and was found to span the years AD 1078-1266 (Table 3).

Two of these dated samples had complete sapwood, ***hc24*** giving a precise felling date of winter AD 1266/7, and ***hc13*** giving a precise date of summer/autumn AD 1267. Two radii from sample ***hc21*** (the *in situ* rafter embedded in the chimney stack) gave a last measured ring of AD 1209, which, without any sapwood or heartwood/sapwood boundary, can only give a *terminus post quem*, or felled after AD 1220. This is not inconsistent with the other felling dates of the group, but one other sample, ***hc26***, may indicate a later phase. This had a last measured ring of AD 1263, which included 2 rings of sapwood. By applying the sapwood estimate of 11-41 rings, a felling date range of AD 1272-1302 is given for this timber. Either this represents a timber from a later phase of building demolished and re-used at the same time, or it may mean that this particular sample had only 5 rings of sapwood, not impossible given that 1 in 20

samples will fall outside the estimated felling date range, and several examples of sapwood ring counts as low as 4 or 5 have been noted (Miles 1997a). The remaining two dated samples, ***hc25*** and ***hc23***, had no heartwood/sapwood boundaries and thus gave *termini post quos* of after AD 1192 and after AD 1234 respectively.

Most of the first phase samples were from slow-growing trees upwards of between 150 and 200 years old when felled, as illustrated in Figure 5.

Phase 2: Undercroft Ceiling to Building B - AD 1307

Four samples were taken from the solid timber ceiling of the undercroft below Building B (***hc1***, ***hc2***, ***hc12***, and ***hc14***). Of the four samples taken, only samples ***hc1*** and ***hc2*** matched each other with a *t*-value of 9.84, and were combined to form the site master ***HERGEST2***.

This was compared with the reference chronologies and was found to span the years AD 1167-1306 (Table 4). Timber sample ***hc1*** had complete sapwood and bark, the first core (***hc1a***) losing the sapwood in drilling, requiring a second core (***hc1b***) which preserved the sapwood to the underside of bark. This gave a precise felling date of spring AD 1307. No other timber had any complete sapwood sound enough to survive drilling, and the other dated sample, ***hc2***, had only a heartwood/sapwood boundary giving a felling date range of AD 1278-1308, consistent with the AD 1307 felling date from sample ***hc1***.

Phase 3: Pentice Extension under Building B - AD 1485-1515

One core (***hc3***) was taken from the horizontal jetty plate supported by posts to the pentice extension outside the original stone walls to the Phase 2 undercroft, and since encapsulated within an extended cellar to Building B. This had 69 rings and was compared with the reference chronologies, and dated to span the years AD 1406-74 (Table 5). As the sapwood was in poor condition, only a heartwood/sapwood boundary survived on the core, giving a felling date range of AD 1485-1515.

Phase 4: Building C - AD 1619-22

Five timbers were sampled from the east-west aligned timber-framed core to the building. Two studs (***hc9*** and ***hc10***) and two principal posts (***hc16*** and ***hc17***) were cored, and a protruding severed end of a purlin (***hc22***) was cut back ½in (12mm). Sample ***hc10*** appeared to have either waney edge or complete sapwood, but on coring this was found to be only a ring-shake, and with only 24 rings this sample was not worth comparing with the other samples. The remaining four samples matched together to form the site master ***HERGEST3*** (Table 6). This was compared with the reference chronologies, and dated to span the years AD 1434-1598 (Table 7). Because of the relatively short overlap between samples ***hc22*** and ***hc16***, sample ***hc22*** was removed from the master and both it, and the depleted ***HERGEST3*** less ***hc22***, were compared against the master chronologies and were found to still have the correct relative dating. Sample ***hc9*** was the only timber in the range to have complete (or any) sapwood, but this unfortunately was so beetle-ridden that it broke in half during coring, with the possible loss of up to three rings. Only a small area of complete sapwood was visible, and there was insufficient room to core a second time without causing unacceptable damage to the historic fabric, or the wholesale removal of plaster around the timber, again not an option. As the main part of the core finished at AD 1598, adding to this the complete sapwood section of 21 rings, plus at most 3 rings lost at the junction, gives a much reduced felling date range of AD 1619-22. The other dated samples, ***hc16***, ***hc17***, and ***hc22***, produced estimated felling date ranges of AD 1596-1626, AD 1600-30, and a

terminus post quem of after AD 1549 respectively, which are not inconsistent with the felling date range of AD 1619-22 given by ***hc9***.

Phase 5: Close-studded Wing Building B and Staircase Tower Building D - AD 1666

Eleven samples were taken from various timbers, both from the north-west close-studded range and the adjacent staircase tower, all but one retaining complete sapwood. Conversely, despite the exceptional length of the samples, the inter-site matching within the group was less than one would normally expect. Two samples of 89 rings (***hc4***) and 143 rings (***hc20***) failed to match in whole or part, and another (***hc6***) matched only moderately despite having 230 rings. This effect was primarily due to extreme distress and distortion as illustrated in the proportional ring representations (Fig 5). Nevertheless, six samples matched together and were combined to form the site master ***HERGEST4*** (Table 8). This was compared with the reference chronologies, and dated to span the years AD 1451-1665 (Table 9). Samples ***hc5*** and ***hc8*** both gave a precise felling dates of summer/autumn AD 1665, while samples ***hc6***, ***hc27***, and ***hc28*** all produced precise felling dates of spring AD 1666. Relating to the construction of the staircase tower, a stud blocking a doorway cut across by the upper flight of the staircase (***hc18***) produced a precise felling date of winter AD 1665/6.

Samples ***hc4***, ***hc7***, ***hc11***, ***hc20***, and ***hc29*** failed to match the other samples or any of the other site masters. However, sample ***hc11***, from the stair stringer, did match the reference chronologies independently, spanning the dates AD 1564-1665 (Table 10). However, because of the obvious disturbed ring sequence for this sample, it was not included in any of the site masters.

Almost all of the timbers from this phase are notable for their long ring sequences and slow growth patterns, some on the point of being undateable. Many of the studs, rails, and other minor members were cut from large, but short, old trees, many possibly having originated from hedgerows due to the visible effect of pollarding (Fig 5). Some of these trees could have been in excess of 250-300 years old when felled. Some of the primary beams and posts appeared to be either quartered or halved from larger trees, some of less age than the shorter members. Therefore, many of the timbers were rejected for sampling due to inadequate numbers of rings, or distressed and distorted ring sequences which may be the result of pollarding.

Building E: North-east corner infill block

Only the ceiling beams to the ground floor appeared to be first-use timbers, and only one of these appeared to have sufficient number of rings for analysis. This has 59 rings with complete sapwood, but failed to date. The roof structure was built entirely of re-used timber and would not helped in dating the present Building E.

Building A: Detached Solar Block - repair timber - AD 1452

Only one timber which might have originated from the primary phase of construction was located with any potential for tree-ring dating. Therefore this was cored and a 66-ring sequence obtained (***hc30***). This was compared to the reference chronologies and was found to date, spanning the years AD 1386-1451. Because it did not match any other of the Hergest site masters, it was dated individually (Table 11). As this sample retained complete sapwood, a precise felling date of spring AD 1452 can be given.

The analysis has here produced four replicated site chronologies, spanning the years AD 1078-1266 (***HERGEST1***), AD 1167-1306 (***HERGEST2***), AD 1438-1598 (***HERGEST3***), and AD

1451-1665 (***HERGEST4***). These were not combined into two larger, composite, chronologies because the *t*-values between the various sites suggested that the material, apart from coming from slightly different time periods, also originated from different woodland sources. For instance, ***HERGEST1*** matched with ***HERGEST2*** with a *t*-value of 6.4, whilst ***HERGEST3*** matched with ***HERGEST4*** with a *t*-value of only 4.06. It was considered that keeping the individual site chronologies separate would be more useful for future dendrochronological research rather than to form yet another large replicated multi-phase site composite, even if only for a relatively small local area.

6. DISCUSSION

The earliest phase identified through the dating is the eastern wing (Building G); although the roof had been entirely rebuilt, a rafter was found *in situ* encased in a later chimney stack and was dated to sometime after AD 1220. This rafter is important because it suggests the previously conjectured north-south alignment of the original roof (Morriss 1995) may instead have been aligned east-west. Although it is possible that this may only prove that the roof was hipped rather than gabled at the north end, this *in situ* rafter is still set at a higher level than would normally be expected for an aisled hall. Therefore, what had been previously considered to be a window in a north gable end now may be a side window to a chamber or solar. Further investigation should be undertaken to identify the original eaves level on this side as well determining the extent of the thirteenth-century fabric remaining in the other walls of the building. Other roof timbers found re-used in the present building and in the undercroft of the block adjacent (Building B) produced felling dates of AD 1267. One timber had a significantly later heartwood/sapwood boundary date, raising the possibility of material from a slightly later phase being included, but it is also possible for it to have been felled in AD 1267, although it would lay outside the 95% confidence limit.

The question is whether the AD 1267 felling date can be ascribed to Building G. Certainly, sample ***hc21*** dates the masonry to which it relates to no earlier than AD 1220, and the same masonry has features which have been dated stylistically to no later than 1300 (Morriss 1995). Furthermore, the ring patterns of ***hc21*** match sufficiently consistently well with the other re-used timbers which have produced the AD 1267 felling date that it is not possible to differentiate this sample on dendrochronological grounds alone. Therefore, it is quite likely that an AD 1267 date could be ascribed to the remaining stonework in the north wall of this range. However, should other early timbers be exposed in the course of restoration works, it would be desirable to submit these for dendrochronological analysis as these might help to further refine any phasing variations. A number of mortices and notch-lap joints were noted on the timbers, and further study and careful recording of these would be invaluable in helping to reconstruct the original roof design.

Massive ceiling timbers from an earlier undercroft below Building B were investigated and four sampled. Two dated, with one producing a felling date of spring AD 1307. Dating has also shown that the structure above the undercroft was further extended to the north by an external pentice between AD 1485 and 1515.

Between Building G (originally constructed *c* AD 1267) and the undercroft below Building B (constructed AD 1307) is the timber-framed structure of two bays (Building C), dated to the fifteenth century on stylistic grounds (Morriss 1995). Four out of five samples from this structure dated, with one producing a felling date range of AD 1619-22. One feature at ground-floor level is a doorway between the two bays with a moulded four-centred head. Because it is not physically framed into the surviving timber frame here dated, caution should be used before dating this feature through association, and this might be a re-set fifteenth-century fragment.

Five precise felling dates ranging from summer AD 1665 and summer AD 1666 clearly date the re-building of the superstructure above the undercroft and pentice extension of Building B. This three-bayed close-studded structure appeared to have no provision for a staircase, although there was a doorway framed in the south wall giving access into the western bay of Building C.

Paradoxically, two samples from the staircase tower (Building D) which was built on the site of the western bay of Building C, and up against the existing Building B (AD 1666), have both given precise felling dates of winter AD 1665/6. One is from an infill stud which blocked a doorway in the south wall of Building B which was fouled by the staircase. The other is from the second-leg stringer of the first flight of the staircase. Whilst arguments could be given that the stud infilling the doorway could be re-used from another part of Building B, the stair string cannot be explained away so easily. Certainly the staircase was built as a single conception, rising to the attic storey above Building B, and so would have cut across the doorway in the south wall of Building B in any event. A possible explanation is that the two blocks were pre-framed independently off site, and on erecting on site it was found that the relationship with the existing structure of Building C and the undercroft of the pre-existing Building B did not coincide as planned, necessitating some re-alignment or 'bodging'. This scenario is not as unusual as it seems, for other dated examples of buildings being altered almost before completion are known.

One such example is at 4-5 St John's Alley, Devizes, Wiltshire, which is a two-bayed three-storey townhouse with full attics and cellars. Tree-ring dating identified the primary structure as being constructed from trees felled in AD 1646/7. No original staircase was noted, but primary joists from each floor frame from cellar to attic had been cut out for the insertion of what appeared to be a secondary staircase. However, dendrochronology of some of the scratch-moulded stair framing showed that they too were from trees felled in AD 1646/7. Clearly there was no other place from which the moulded timbers for the staircase could have come from within the primary structure, and the only plausible explanation is that the position of the staircase was left for a last minute decision once the frame had been erected, at which point the floor joists were cut out to suit (Miles in prep).

Other examples where the dendrochronology apparently conflicts with the structural evidence can be found at Charlton Court Barn, Steyning, West Sussex (Miles 1994a), where the building evidence suggested two phases but the same precise dates were had from both. And at 73-77 Winchester Street, Overton, Hampshire (Miles 1997a; Roberts and Miles 1997), an inserted floor frame which seemed to cut across a hall window was found to be of the same date as the rest of the structure. When considered in the light of these and the numerous other examples of adjoining coeval ranges being independently framed, the staircase tower at Hergest Court might appear less problematic.

A beam from the reconstructed NE corner (Building E) appeared to be primary, unlike most of the other components, and was sampled. Despite having complete sapwood and bark, it had only 59 rings and failed to date.

A single sample from the wall-plate of the two-storey detached solar block (Building A) dated to spring AD 1452. However, as the roof had been reconstructed at least twice since the presumed thirteenth-century primary building phase, this is of limited use in dating the surviving fabric. It had been hoped at the time of sampling that this might have been a primary survival, but the dating has shown that at best it may represent one of these later phases. However, without collaborative dating it might just as likely have originated from some other building within the complex.

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Table 1: Summary of tree-ring dating

HERGEST COURT, KINGTON, HEREFORDSHIRE

Sample number,	type	Timber and position	Dates AD spanning	H/S bdry	Sapwood	No of rings	Mean width mm	Std devn mm	Mean sens mm	Felling seasons and dates/date ranges (AD)
Thirteenth-century re-used roof timbers										
* *hc13*	c	SW cellar doorpost (re-used rafter) T 3	1174-1266	1249	17½C	93	1.63	0.35	0.207	summer/autumn 1267
hc19	c	Timber re-used as purlin, bay 11	-		2	150	0.74	0.28	0.171	
hc21a	s	Section of *in situ* rafter in chimney, bay 7	1104-1191			88	1.71	0.62	0.227	
b	s	ditto	1160-1209			50	1.42	0.61	0.270	
* *hc21*		Mean of ***hc21a*** + ***hc21b***	*1104-1209*			*106*	*1.58*	*0.64*	*0.230*	*after 1220*
* *hc23*	c	Timber re-used as brace, truss 8	1153-1223			71	1.71	0.39	0.217	after 1234
hc24a	c	Timber re-used as brace, truss 9	1123-1237	1237	h/s	115	1.46	0.38	0.178	
b	c	ditto	1205-1266	1238	28C	62	1.19	0.24	0.166	
* *hc24*		Mean of ***hc24a*** + ***hc24b***	*1123-1266*	*1238*	*28C*	*144*	*1.42*	*0.36*	*0.174*	*winter 1266/7*
* *hc25*	c	Timber re-used as brace, truss 10	1078-1181			104	1.52	0.54	0.182	after 1192
* *hc26*	c	Timber re-used as brace, truss 11	1120-1263	1261	2	144	0.87	0.35	0.212	1272-1302
* = *HERGEST1*		**Site master**	**1078-1266**			**189**	**1.39**	**0.40**	**0.161**	
Solid Timber Planks over Undercroft, Building B										
hc1a	c	Cellar ceiling plank 6, bay 3	1173-1278	1278	h/s	106	2.68	0.87	0.218	
b	c	ditto	1196-1306	1282	24¼C	111	1.94	0.78	0.224	
* *hc1*		Mean of ***hc1a*** + ***hc1b***	*1173-1306*	*1280*	*26¾C*	*134*	*2.29*	*0.97*	*0.211*	*spring 1307*
* *hc2*	c	Cellar ceiling plank 4, bay 3	1167-1267	1267	h/s	Ω101	2.56	1.17	0.257	1278-1308
hc12	c	Cellar ceiling plank 3 bay 3	-			107	1.15	0.41	0.188	
hc14	c	Cellar ceiling plank 2 bay 3	-		h/s	59	1.65	0.43	0.214	
* = *HERGEST2*		**Site master**	**1167-1306**			**140**	**2.27**	**0.90**	**0.216**	
Pentice Extension to Undercroft, Building B										
hc3	c	Jetty plate to pentice in cellar, bay 3	1406-1474	1474	h/s	Φ69	2.22	0.61	0.195	1485-1515
Building C: E-W Core										
* *hc9i*	c	S stud first floor bay 4	1533-1598	1592	6	66	2.52	1.60	0.221	
ii	c	disjointed sapwood end (0-3 rings lost max.)	-		21C	21	0.91	0.38	0.369	*c* 1619-1622
hc10	c	S stud first floor bay 4	-			Φ24	4.69	0.57	0.134	
* *hc16*	c	S principal post, truss 6	1515-1585	1585	h/s	71	1.88	1.11	0.215	1596-1626
* *hc17*	c	N principal post, truss 6	1522-1589	1589	h/s	Ω68	2.93	1.69	0.328	1600-1630
* *hc22*	s	S purlin at truss 6	1434-1538			105	1.83	0.47	0.156	after 1549
* = *HERGEST3*		**Site master**	**1434-1598**			**165**	**2.09**	**0.79**	**0.197**	
Building B: Close Studded NW Range										
hc4	c	First floor ceiling long. beam S, bay 3	-		24½C	89	2.44	1.32	0.216	
hc5a	c	Rail, Truss 4 first floor	1451-1664	1615	49½C	214	0.65	0.19	0.185	summer 1665
b	c	ditto	1478-1664	1619	45½C	187	0.72	0.19	0.175	summer 1665
† *hc5*		Mean of ***hc5a*** + ***hc5b***	*1451-1664*	*1617*	*47½C*	*214*	*0.68*	*0.17*	*0.166*	*summer 1665*
† *hc6*	c	First floor ceiling long. beam - centre bay 2	1436-1665	1643	22¼C	230	1.05	0.54	0.174	spring 1666
hc7	c	N stud, bay 2 first floor	-		34C	79	1.44	0.63	0.208	
hc8a	c	N window cill, bay 2, first floor	1590-1647			58	1.53	0.39	0.160	
b	c	ditto	1637-1664	1655	9½C	28	1.69	0.36	0.144	
† *hc8*		Mean of ***hc8a*** + ***hc8b***	*1590-1664*	*1655*	*9½C*	*75*	*1.52*	*0.36*	*0.152*	*summer 1665*
† *hc27*	c	N long. beam, ground floor bay 1	1520-1665	1640	25¼C	146	1.06	0.20	0.146	spring 1666
† *hc28*	c	N long. beam, ground floor bay 2	1470-1665	1642	23¼C	196	1.34	0.48	0.172	spring 1666
Building D: Staircase Tower										
hc11a1	c	S string second flight staircase bay 4	1564-1648	1648	h/s	85	1.39	0.39	0.214	
a2	c	ditto	1655-1665		11C	11	1.98	0.33	0.206	
b	c	ditto	1569-1665	1648	17C	97	1.44	0.43	0.204	
hc11		Mean of ***hc11a1*** + ***hc11a2*** + ***hc11b***	*1564-1665*	*1648*	*17C*	*102*	*1.46*	*0.43*	*0.204*	*winter 1665/6*
hc18a	c	Stud in blocked doorway to stairs bay 3	1534-1631	1624	7	98	1.10	0.42	0.231	
b	c	ditto	1615-1665	1622	43C	51	0.82	0.17	0.209	
† *hc18*		Mean of ***hc18a*** + ***hc18b***	*1534-1665*	*1623*	*42C*	*132*	*1.03*	*0.39*	*0.225*	*winter 1665/6*
hc20	c	E purlin bay 3 from staircase tower	-		47C	143	1.09	0.63	0.258	
hc29	c	SE corner post to building D, truss 6	-		1	89	1.35	0.78	0.242	
† = *HERGEST4*		**Site master**	**1451-1665**			**230**	**1.00**	**0.26**	**0.138**	
Building E: Reconstructed NE Range										
hc15	c	S transverse beam ground floor building E	-		28½C	Φ59	2.99	1.07	0.244	
Building A: Detached Solar Block										
hc30	c	N wallplate, west end, solar building A	1386-1451	1429	22¼C	66	1.77	0.77	0.230	spring 1452

Key: *,† = sample included in site-master; c, s = core, slice; Φ = within 5 rings of centre; Ω = within 10 rings of centre; ¼C, ½C, C = bark edge present, partial or complete ring: ¼C = spring (ring not measured), ½C = summer/autumn (ring not measured), or C = winter felling (ring measured); H/S bdry = heartwood/sapwood boundary - last heartwood ring date; std devn = standard deviation; mean sens = mean sensitivity. Sample numbers with ***a***, ***b***, etc suffixes indicate duplicate cores from same timber. Samples with ***1***, ***2***, etc suffixes indicate the two sections of an interrupted sequence. The composites produced by taking the mean of the respective duplicates have the averaged details and felling dates shown in italics.

Table 2: *t*-values and overlaps for components of ***HERGEST1***

Sample:	***hc21***	***hc23***	***hc24***	***hc25***	***hc26***
dated at:	1209	1223	1266	1181	1263
hc13	4.32	6.14	6.78	3.70	4.04
	36	50	93	8	90
hc21		7.17	5.77	5.19	6.93
		57	87	78	90
hc23			7.47	4.87	6.56
			71	29	71
hc24				5.76	5.95
				59	141
hc25					5.20
					62

Table 3: Dating of ***HERGEST1*** against reference chronologies at AD 1266

Reference chronology	**Spanning**	**Overlap**	***t*-value**
PETERC *(Tyers 1999a)*	887-1225	149	7.28
*† GTOXNBLD *(Miles and Haddon-Reece 1993)*	1081-1246	166	8.51
WSTNSTOW *(Miles 1998)*	1069-1199	122	9.27
SALOP95 *(Miles 1995)*	881-1745	189	9.27
* ENGLAND *(Baillie and Pilcher 1982)*	404-1981	189	9.31
PBT_A *(Tyers 1999b)*	994-1196	119	9.38
BRISTOL *(Hillam 1994)*	770-1320	189	9.58
MASTERAL *(Haddon-Reece and Miles 1993)*	404-1987	189	9.68
SOUTH *(Hillam and Groves 1994a)*	406-1594	189	9.71
STOKE2 *(Miles and Worthington 1997)*	1046-1289	189	11.38

* = Component of MASTERAL
† = Component of SALOP95

Table 4: Dating of ***HERGEST2*** against reference chronologies at AD 1306

Reference chronology	**Spanning**	**Overlap**	***t*-value**
SARUMBP1 *(Miles and Worthington forthcoming)*	1160-1301	135	6.49
HERE20C *(Tyers 1996)*	1174-1317	133	7.02
*† GTOXNBLD *(Miles and Haddon-Reece 1993)*	1081-1246	80	7.20
*† PLOWDEN1 *(Miles and Haddon-Reece 1993)*	977-1301	135	7.21
† LUDLOW2 *(Miles and Haddon-Reece 1993)*	1139-1274	108	7.21
SOUTH *(Hillam and Groves 1994a)*	406-1594	140	7.71
MASTERAL *(Haddon-Reece and Miles 1993)*	404-1987	140	8.05
NORTH *(Hillam and Groves 1994b)*	440-1742	140	8.15
STOKE2 *(Miles and Worthington 1997)*	1046-1289	123	9.41
SALOP95 *(Miles 1995)*	881-1745	140	9.48

* = Component of MASTERAL
† = Component of SALOP95

Table 5: Dating of ***hc3*** against reference chronologies at AD 1474

Reference chronology	Spanning	Overlap	*t*-value
MC16 *(Fletcher1977)*	1314-1636	69	5.53
STOKE3 *(Miles and Worthington 1997)*	1390-1530	69	5.55
PLASMAWR *(Miles 1997b)*	1360-1578	69	5.77
TYMAWR1 *(Miles and Haddon-Reece 1996)*	1346-1459	54	5.84
† BROOKGT *(Miles and Haddon-Reece 1993)*	1362-1611	69	5.95
GWYDWN *(Miles and Worthington forthcoming)*	1411-1571	64	6.09
PENIARTH *(Miles and Haddon-Reece 1996)*	1385-1550	69	6.19
† GIERTZ *(Siebenlist-Kerner 1978)*	1341-1636	69	6.37
SALOP95 *(Miles 1995)*	881-1745	69	6.51
IGHTFELD *(Groves 1998)*	1341-1566	69	6.81

† = Component of SALOP95

Table 6: *t*-values and overlaps for components of ***HERGEST3***

Sample:	***hc9***	***hc16***	***hc17***
dated at:	1598	1585	1589
hc22	0.00	3.61	1.43
	6	24	17
hc9		4.53	5.73
		53	57
hc16			6.96
			64

Table 7: Dating of ***HERGEST3*** against reference chronologies at AD 1598

Reference chronology	Spanning	Overlap	*t*-value
HEREFC *(Tyers 1996)*	1313-1640	166	6.19
ALCASTON *(Miles and Worthington 1998)*	1389-1556	123	6.36
† BEDSTONE *(Miles and Haddon-Reece 1995)*	1341-1560	127	6.57
DORE2 *(Tyers and Boswijk 1998)*	1363-1612	165	6.59
† ASHWOOD *(Miles and Haddon-Reece 1994)*	1419-1619	165	6.61
*† GIERTZ *(Siebenlist-Kerner 1978)*	1341-1636	165	6.81
CALLGHTN *(Miles and Worthington 1997)*	1335-1569	136	6.87
NORTH *(Hillam and Groves 1994b)*	440-1742	165	7.53
MASTERAL *(Haddon-Reece and Miles 1993)*	404-1987	165	7.82
SALOP95 *(Miles 1995)*	881-1745	165	8.37

* = Component of MASTERAL
† = Component of SALOP95

Table 8: *t*-values and overlaps for components of ***HERGEST4***

Sample:	***hc6***	***hc8***	***hc18***	***hc27***	***hc28***
dated at:	1665	1664	1665	1665	1665
hc5	2.71	2.77	3.20	4.56	7.68
	214	75	131	145	195
hc6		3.04	3.43	4.33	5.36
		57	132	146	196
hc8			4.13	4.41	4.60
			75	75	75
hc18				6.10	4.35
				132	132
hc27					4.15
					146

Table 9: Dating of ***HERGEST4*** against reference chronologies at AD 1665

Reference chronology	**Spanning**	**Overlap**	***t*-value**
SENG98 *(Bridge 1998a)*	944-1790	230	5.86
STOKE5 *(Miles and Worthington 1997)*	1463-1662	200	6.03
DORE2 *(Tyers and Boswijk 1998)*	1363-1612	177	6.17
PENIARTH *(Miles and Haddon-Reece 1996)*	1385-1550	115	6.30
† GOLDING *(Miles and Haddon-Reece 1994)*	1491-1666	175	7.45
* EASTMID *(Laxton and Litton 1988)*	882-1981	230	8.04
*† UPWICH3 *(Groves and Hillam 1997)*	1454-1651	198	8.16
NORTH *(Hillam and Groves 1994b)*	440-1742	230	8.42
SALOP95 *(Miles 1995)*	881-1745	230	8.55
MASTERAL *(Haddon-Reece and Miles 1993)*	404-1987	230	8.60

* = Component of MASTERAL
† = Component of SALOP95

Table 10: Dating of ***hc11*** against reference chronologies at AD 1665

Reference chronology	**Spanning**	**Overlap**	***t*-value**
† GOLDING *(Miles and Haddon-Reece 1994)*	1491-1666	102	4.79
* SCOTLAND *(Baillie 1977)*	946-1975	102	5.08
† FULWAY *(Miles and Haddon-Reece 1994)*	1397-1639	76	5.10
alc7 *(Miles and Worthington 1998)*	1604-1703	62	5.21
NORTH *(Hillam and Groves 1994b)*	440-1742	102	5.84
SALOP95 *(Miles 1995)*	881-1745	102	6.15
* EASTMID *(Laxton and Litton 1988)*	882-1981	102	6.61
STOKE5 *(Miles and Worthington 1997)*	1463-1662	99	6.78
PBT_C *(Tyers 1999b)*	1559-1668	102	6.94

* = Component of MASTERAL
† = Component of SALOP95

Table 11: Dating of ***hc30*** against reference chronologies at AD 1451

	Reference chronology	Spanning	Overlap	t-value
	CORD1 *(Miles 1994b)*	1395-1448	54	4.73
	BRUTON3 *(Miles and Worthington 1997)*	1363-1453	66	5.05
	MASTERAL *(Haddon-Reece and Miles 1993)*	404-1987	66	5.07
	HANTS97 *(Miles 1997c)*	1041-1972	66	5.11
	FIELDPB *(Bridge 1993)*	1309-1465	66	5.31
*	MC16 *(Fletcher1977)*	1314-1636	66	5.38
‡	GOLEIGH1 *(Miles and Worthington 1997)*	1372-1465	66	5.39
	SENG98 *(Bridge 1998a)*	944-1790	66	5.54
*	EASTMID *(Laxton and Litton 1988)*	882-1981	66	5.66
	NEWDIG1 *(Bridge 1998b)*	1261-1483	66	6.16

‡ = Component of HANTS97
* = Component of MASTERAL

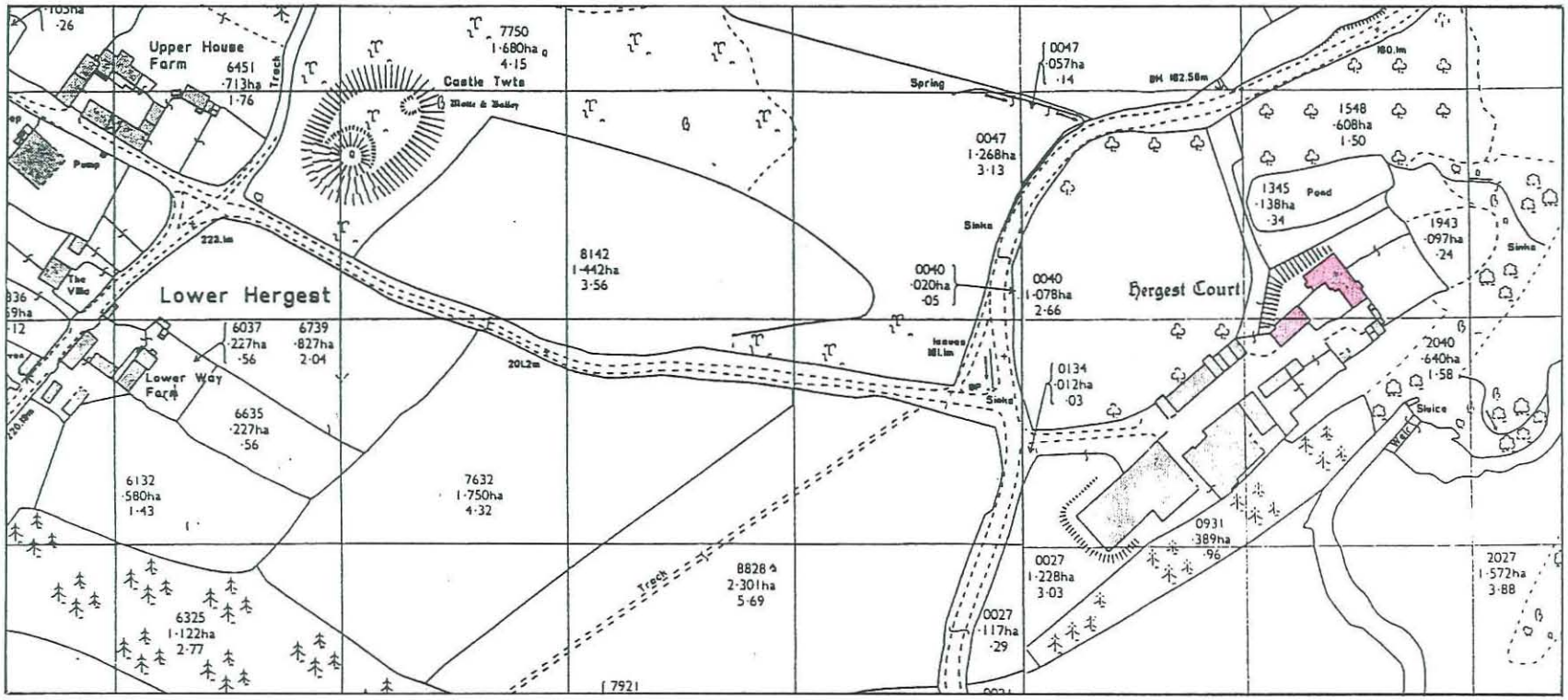


Figure 2: Site plan showing building identification *After Morriss 1995*

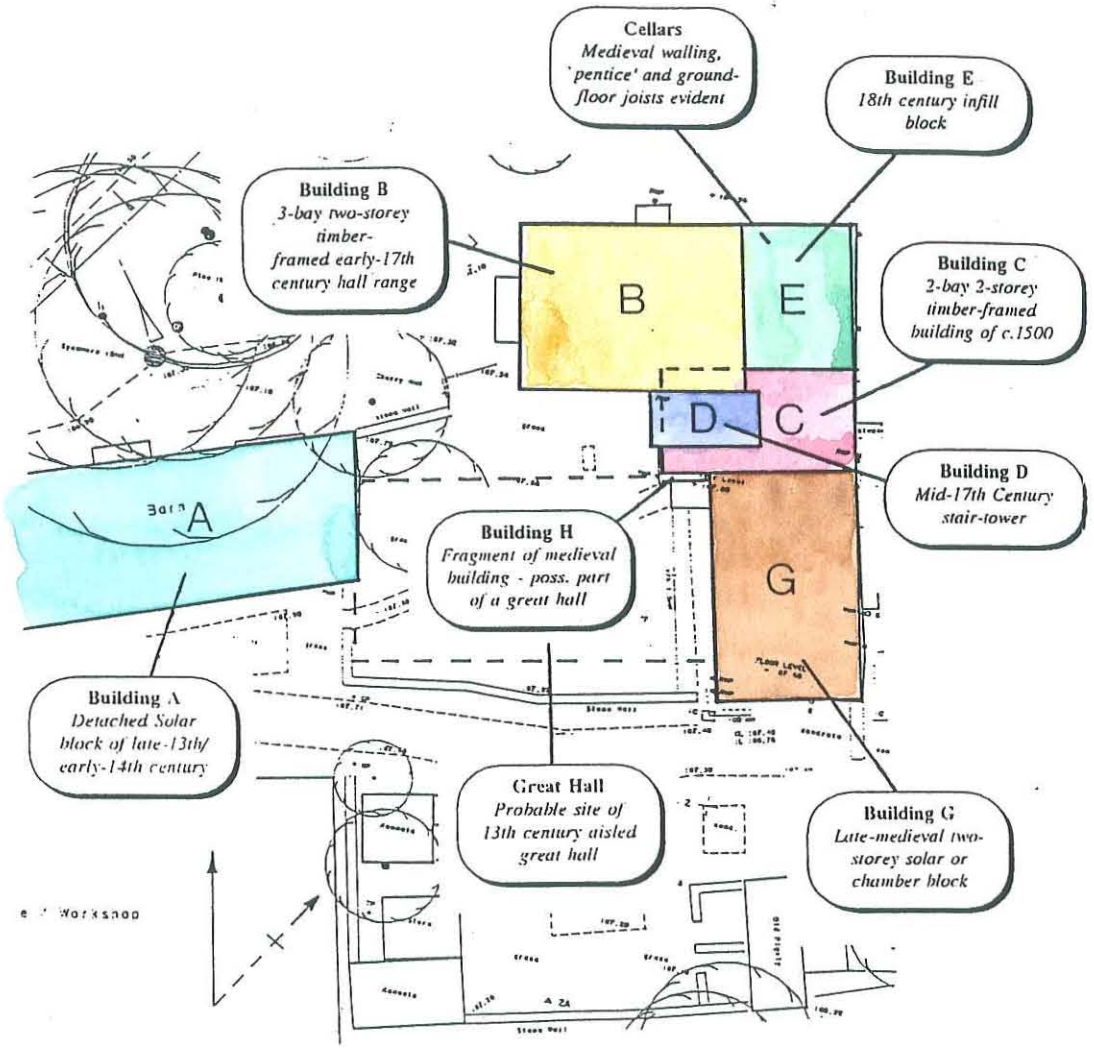
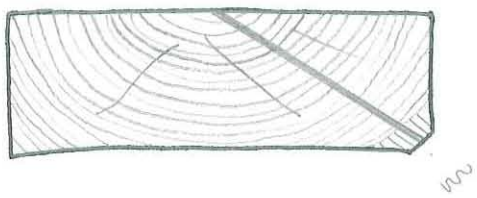
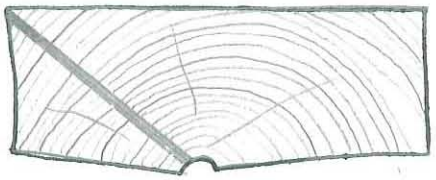


Figure 3: Scale section drawings *(scale 1:8)*

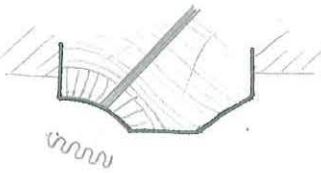


hc1

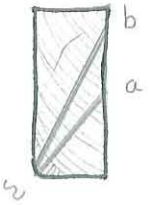


hc2

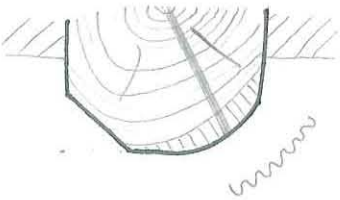
hc3



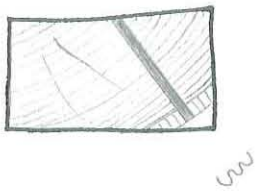
hc4



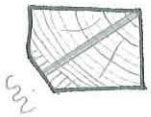
hc5



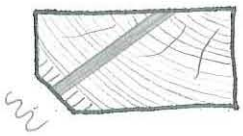
hc6



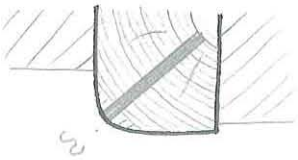
hc7



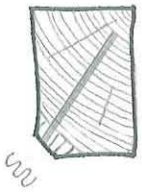
hc8



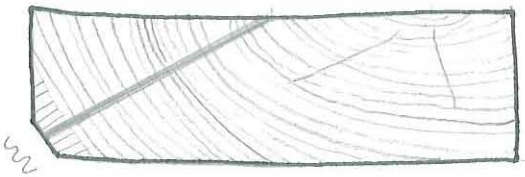
hc9



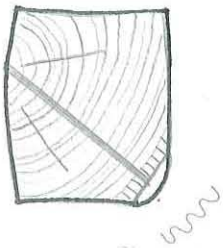
hc10



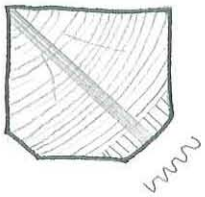
hc11



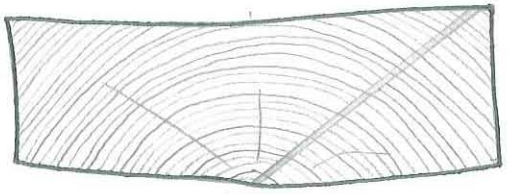
hc14



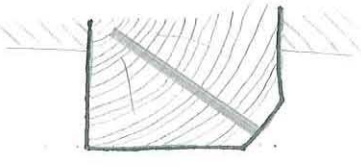
hc15



hc13



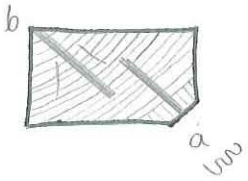
hc12



hc16

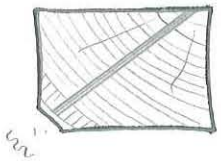
Key: *Sapwood* *Bark edge*

hc17

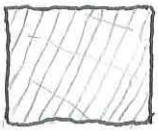


hc18

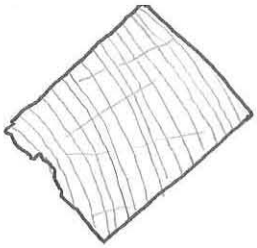
hc19



hc20



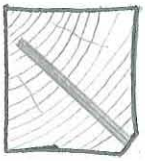
hc21



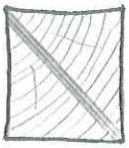
hc22

hc23

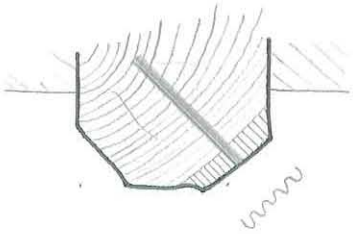
hc24



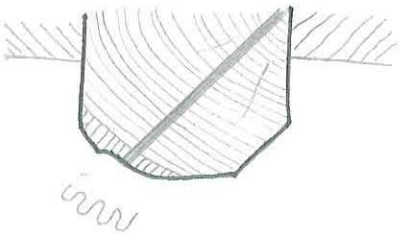
hc25



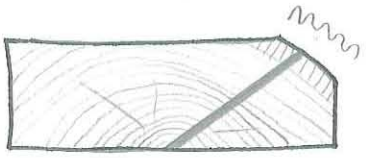
hc26



hc27



hc28



hc29

hc30

Figure 4: Dated samples in chronological position

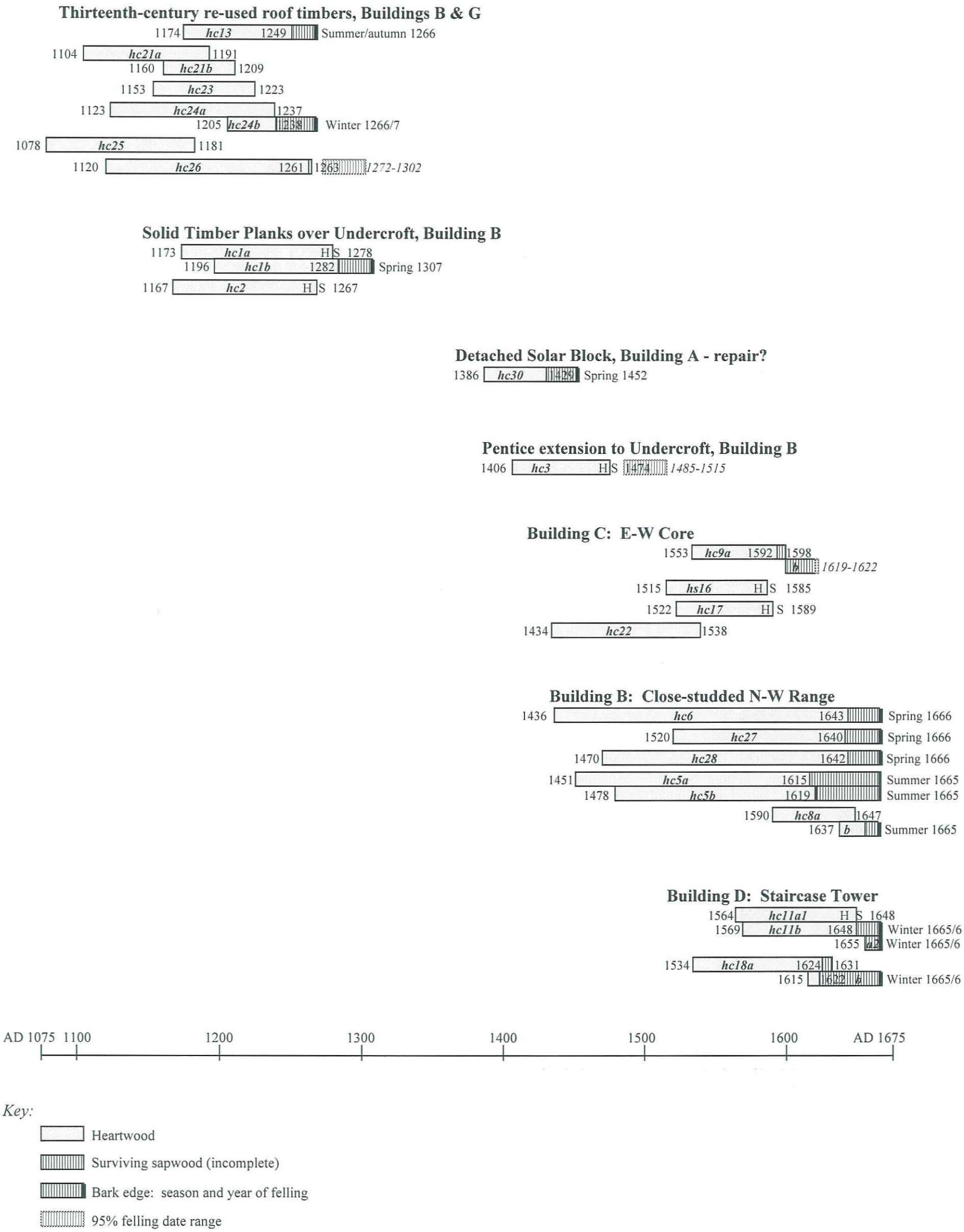
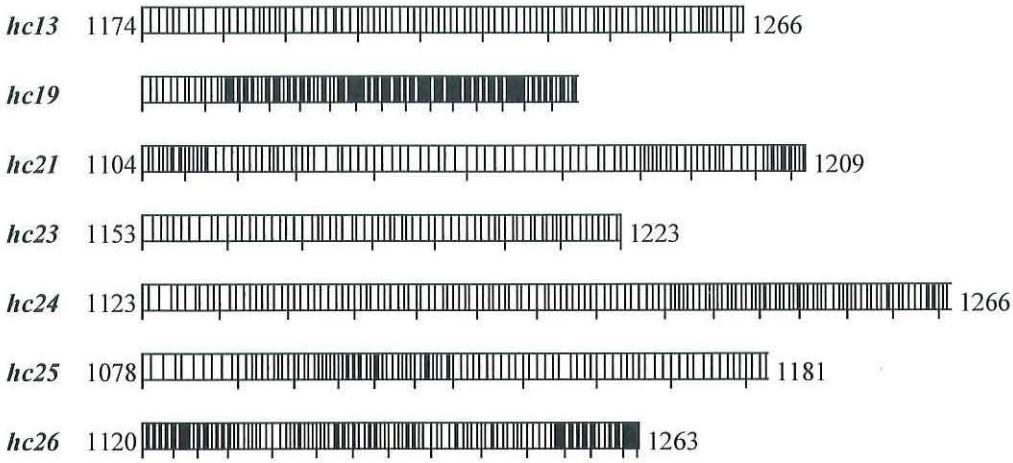
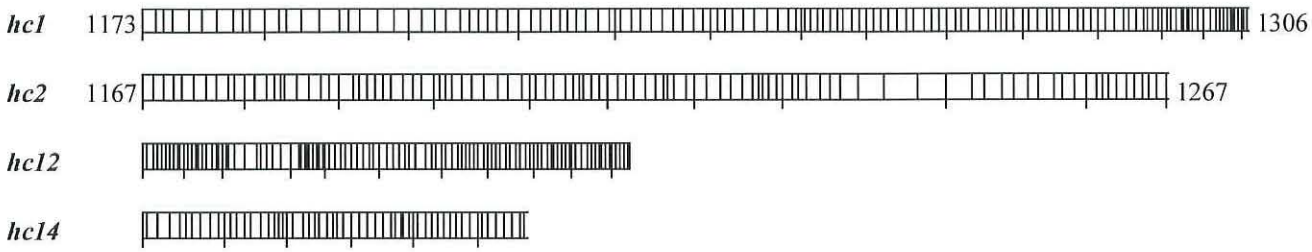


Figure 5: Scale representations of individual ring sequences

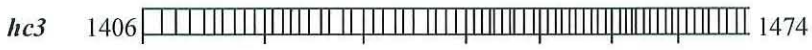
Thirteenth-century re-used roof timbers



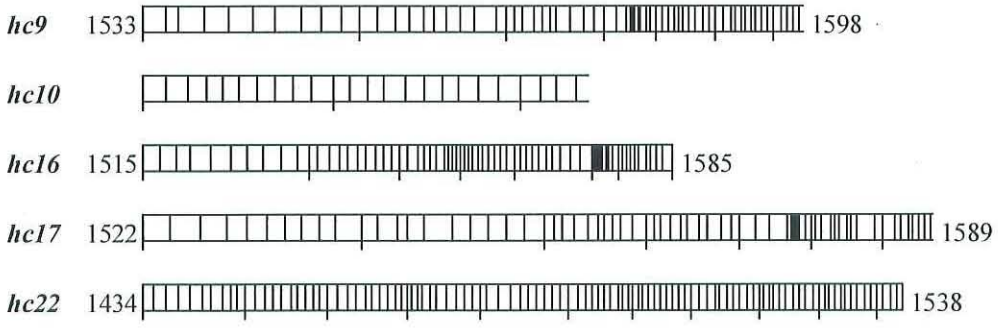
Solid Timber Planks over Undercroft, Building B



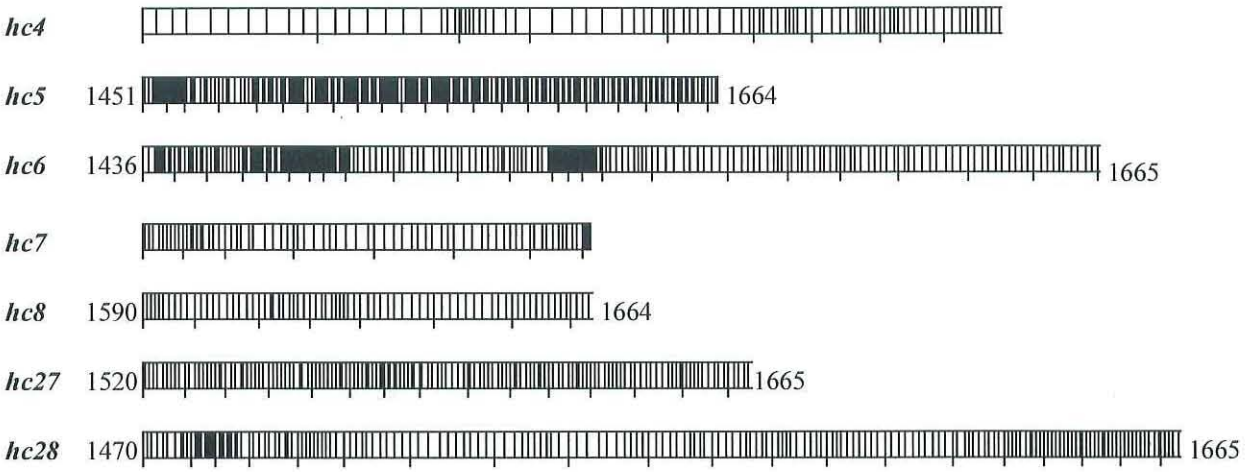
Pentice Extension to Undercroft, Building B



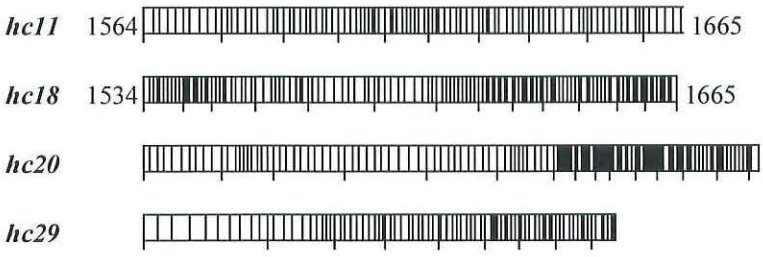
Building C: East-West Core



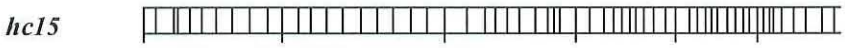
Building B: Close Studded North-West Range



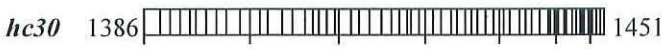
Building D: Staircase Tower



Building E: Reconstructed NE Range

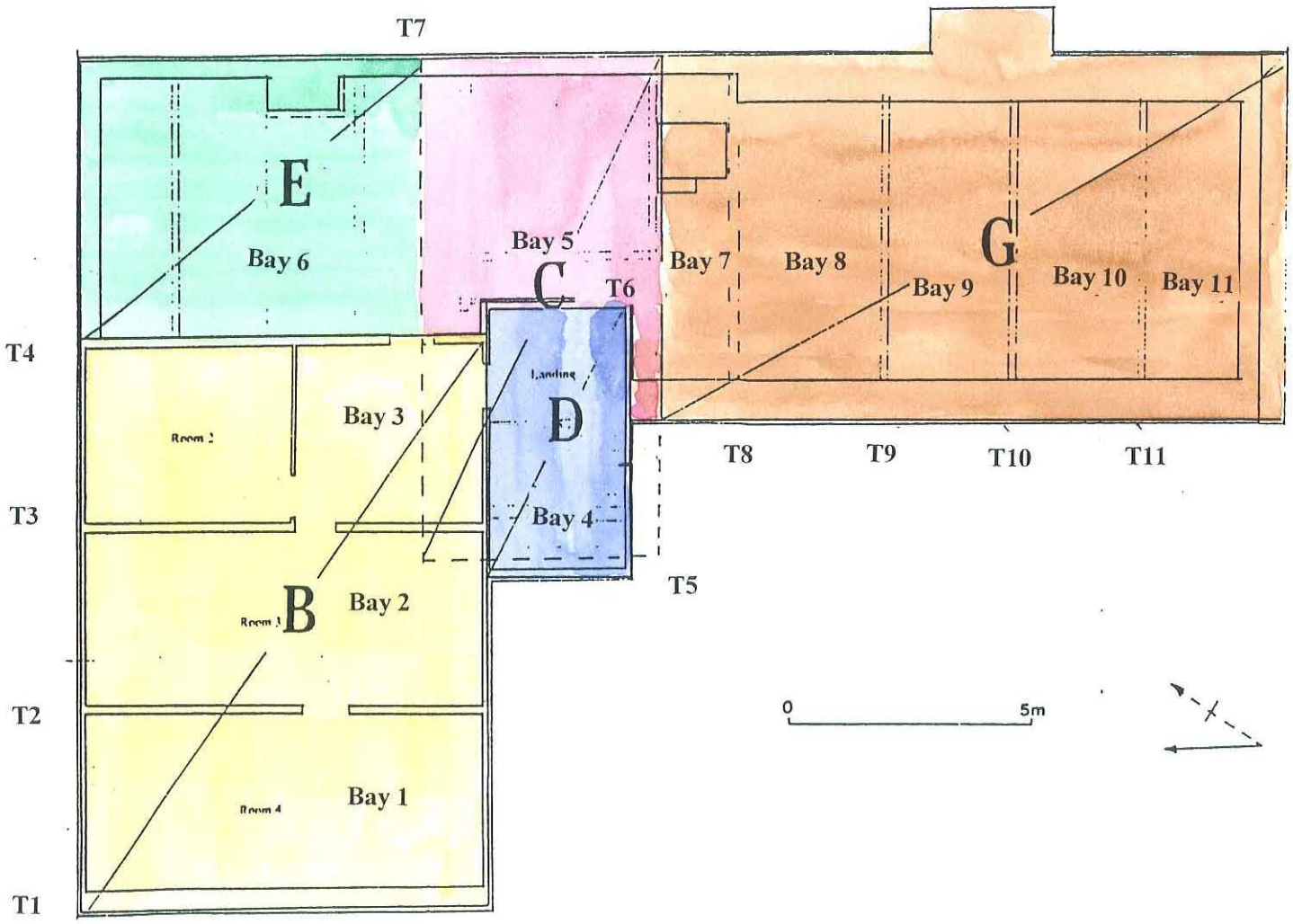


Building A: Detached Solar Block

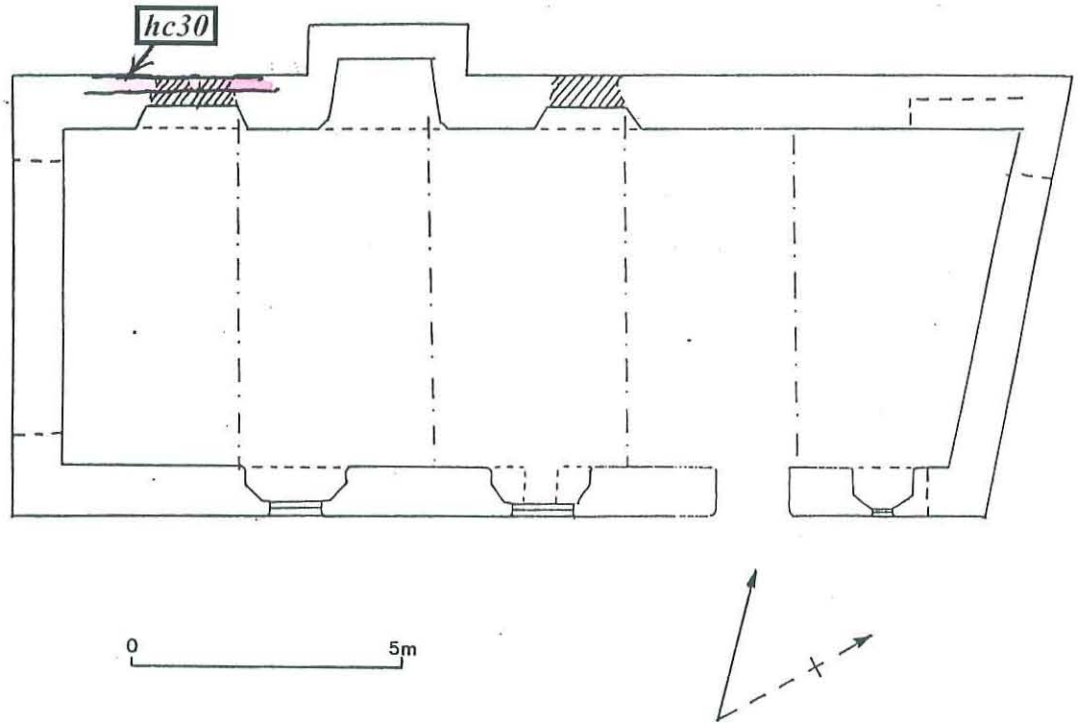


APPENDIX A: Plans showing locations of timbers sampled (after Morriss 1995)

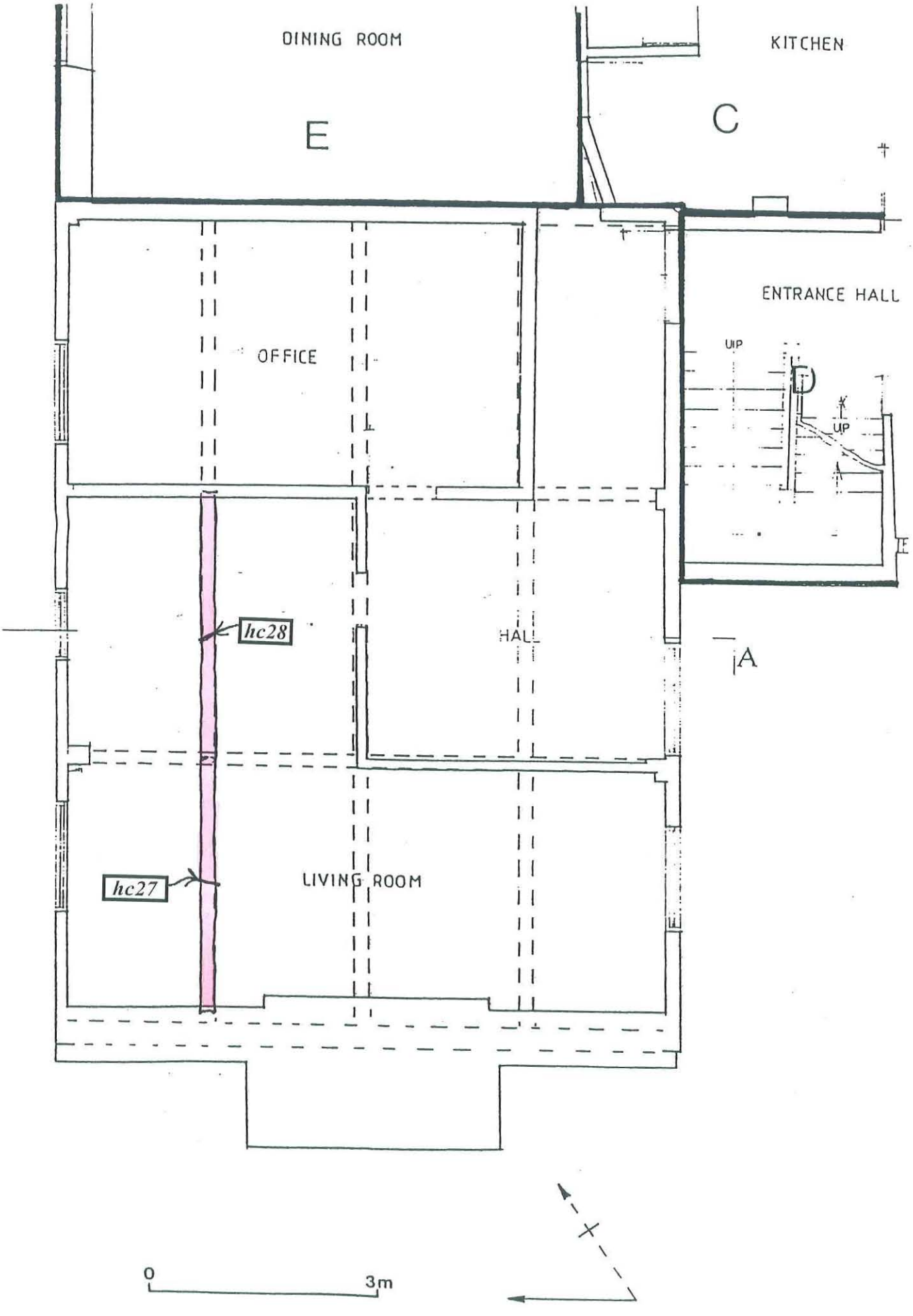
Attic plan of Hergest Court showing the various building phases and truss numbering scheme



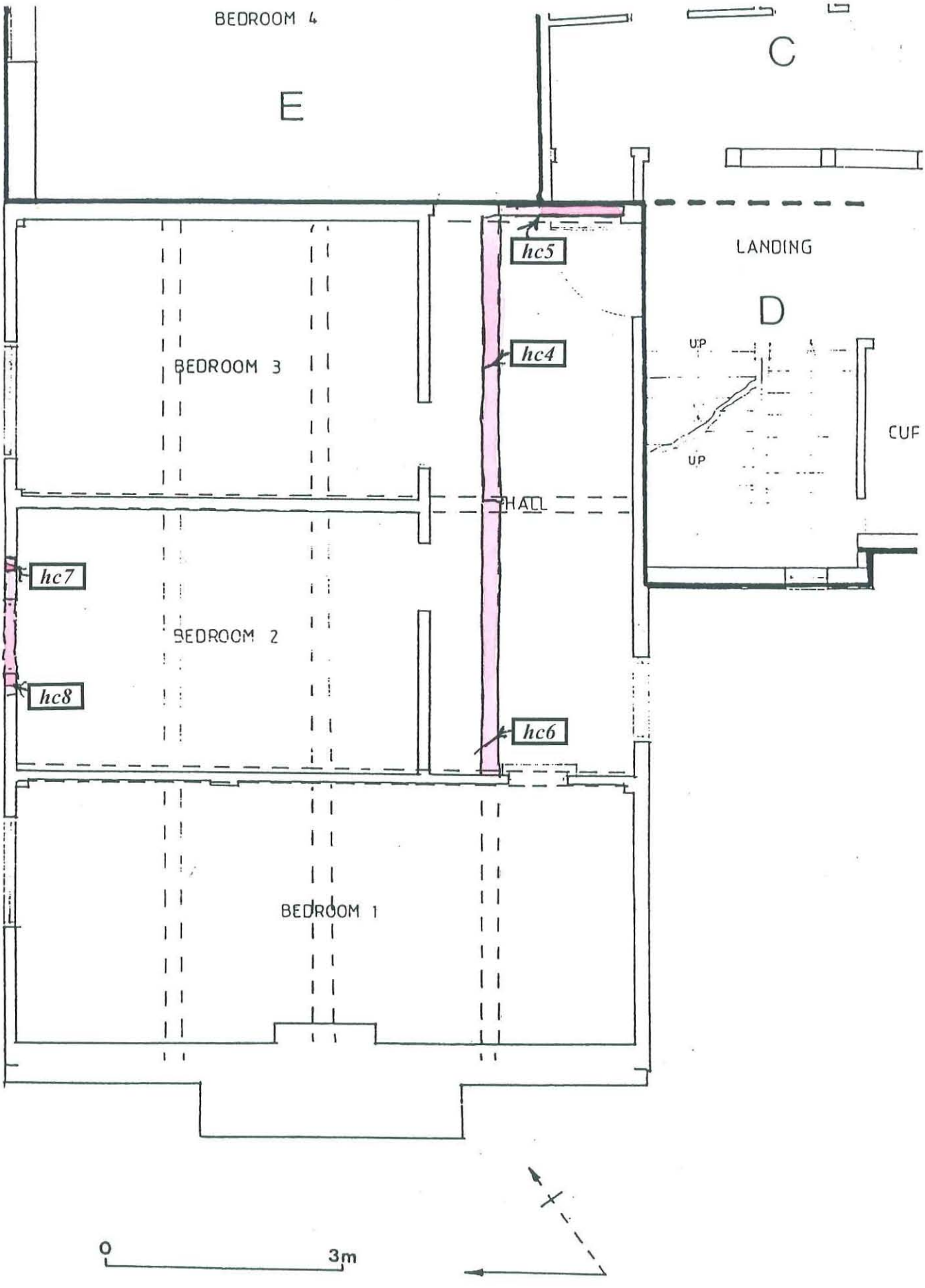
First-floor plan of Solar Block (Building A) showing location of sample



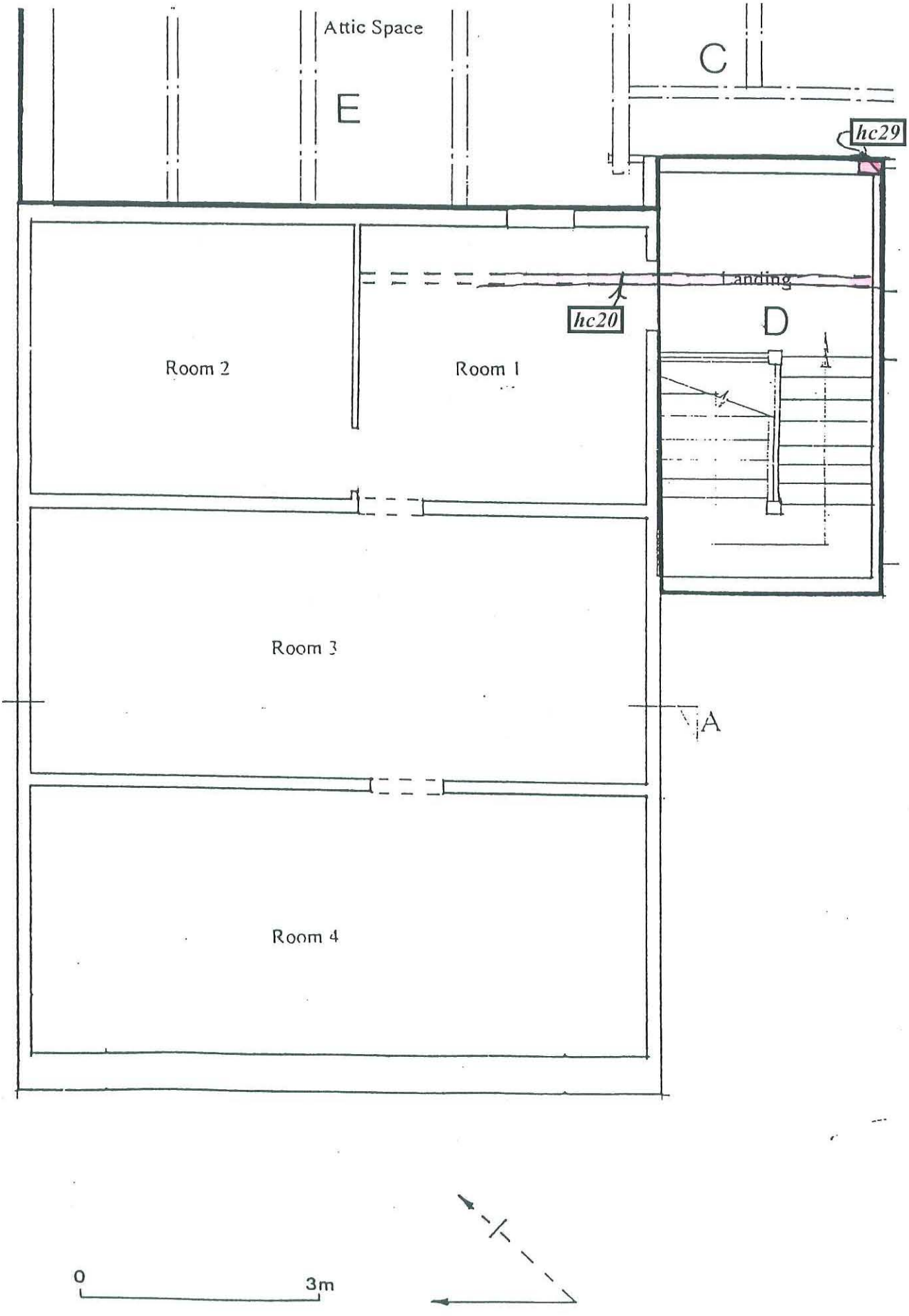
Ground-floor plan of north wing (Building B) showing location of samples



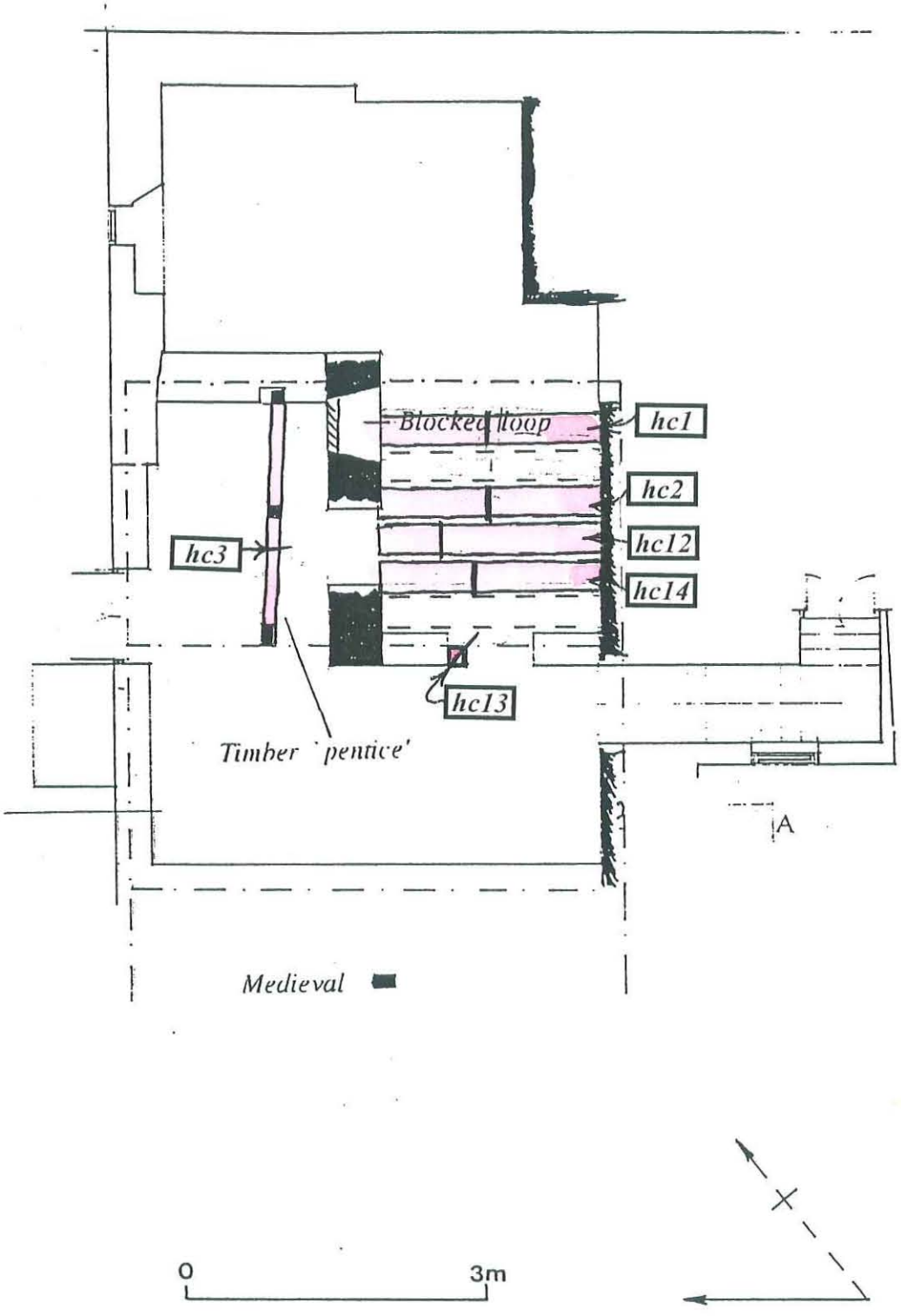
First-floor plan of the north wing (Building B) showing location of samples



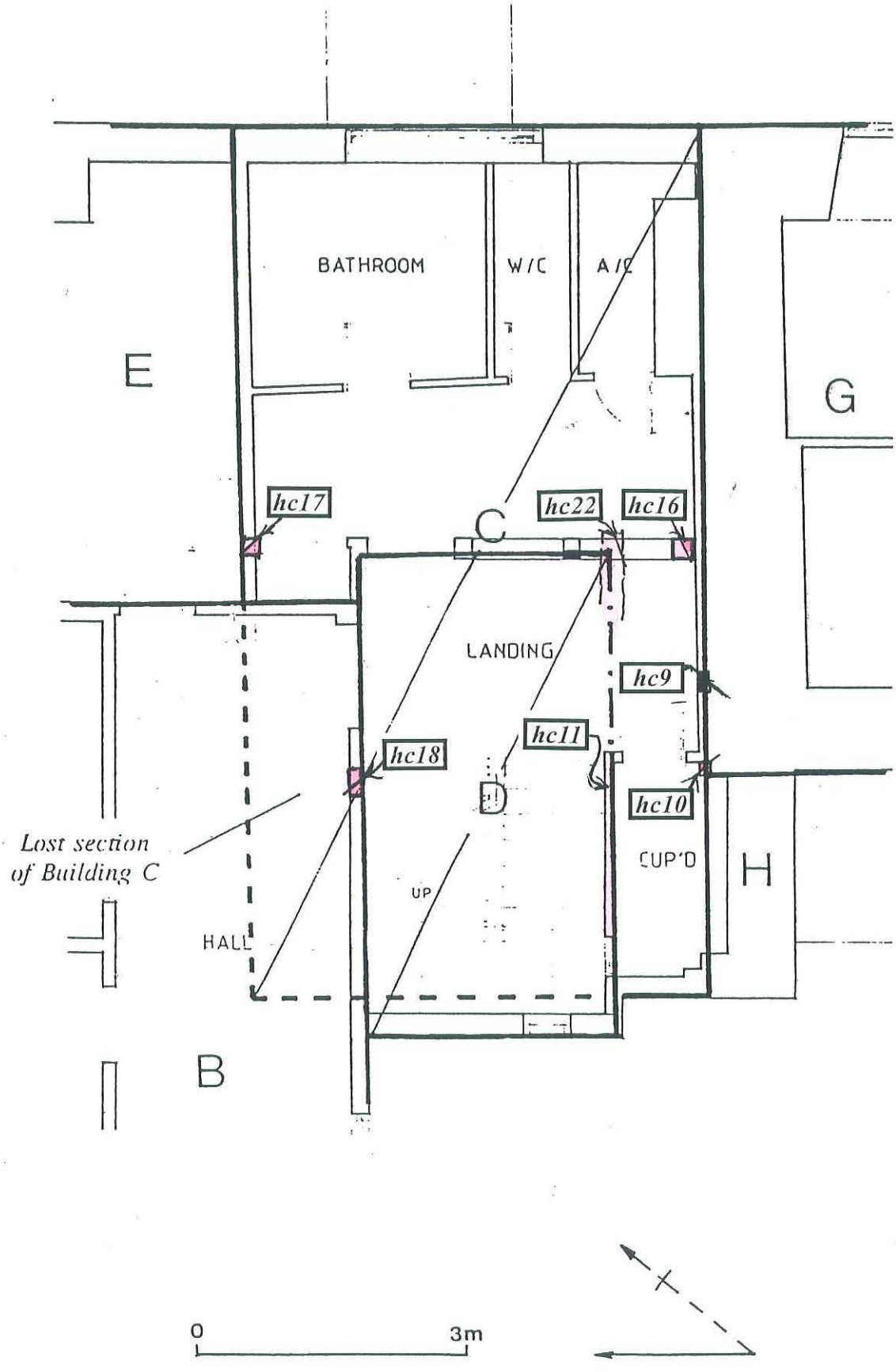
Attic plan of the north wing (Buildings B & D) showing location of samples



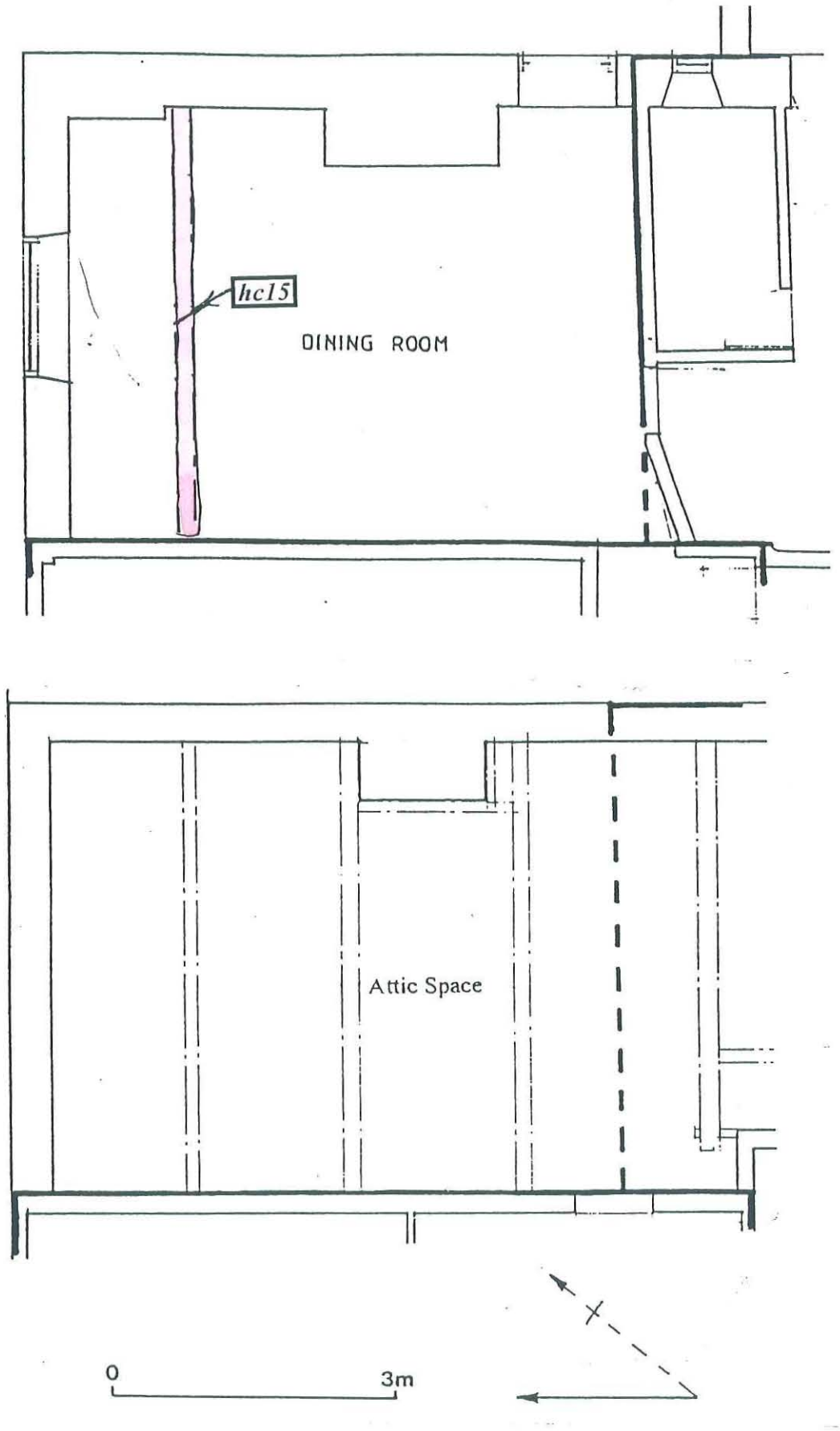
Cellar plan (Buildings B & E) showing location of samples



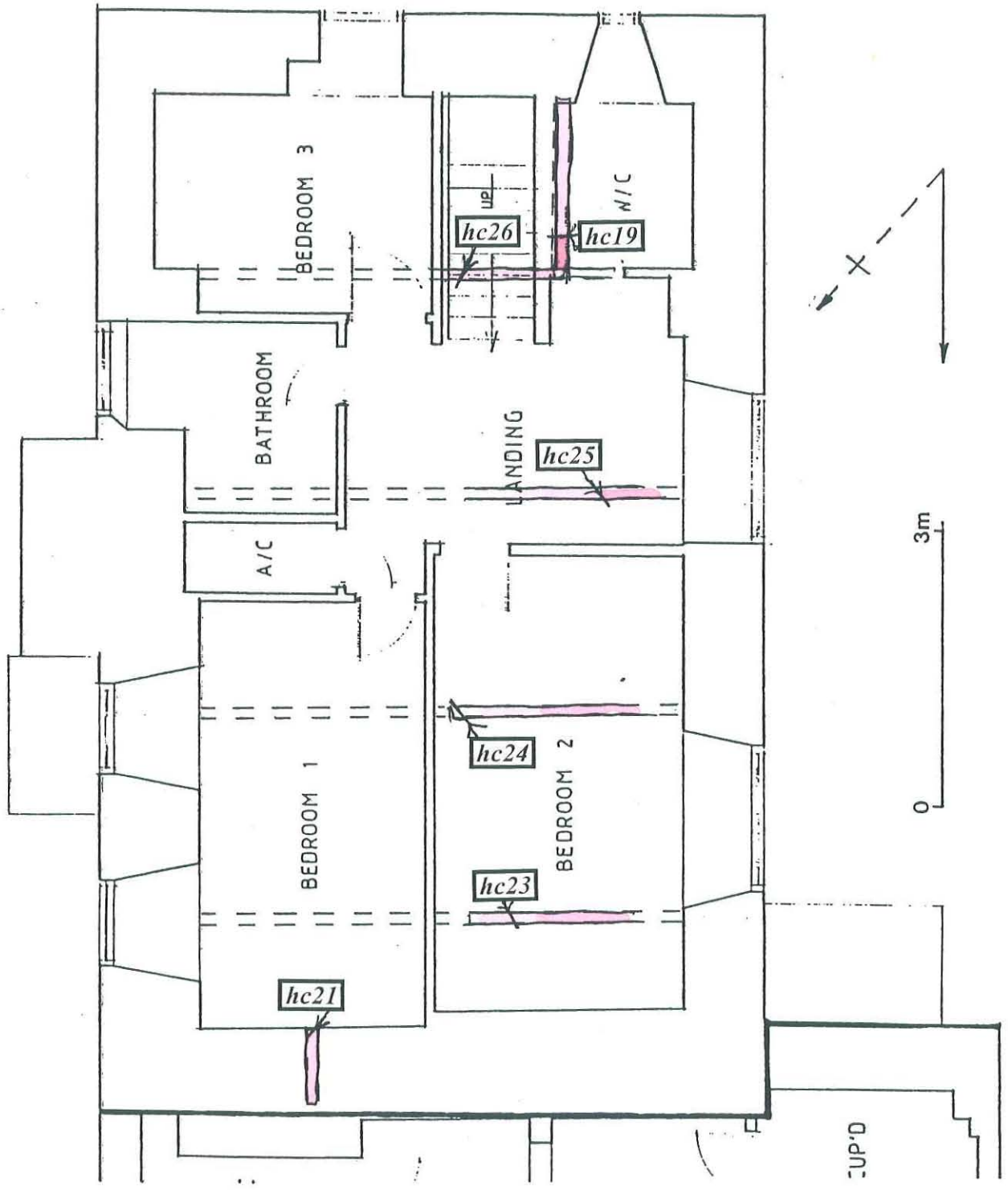
First-floor plan of Buildings C & D showing location of samples



Ground-floor and attic plans of Building E showing location of sample



First-floor plan of the east wing (Building G) showing location of samples and trusses



APPENDIX B: Ring-width data for site master curves

HERGEST1 AD 1078-1266 Hergest Court Kington - ***hc13+21+23+24+25+26***

ring widths (0.01mm)	**number of samples in master**
189 rings, starting date AD 1078	
214 279 305 171 285 246 201 260 249 169	1 1 1 1 1 1 1 1 1 1
175 164 105 133 175 148 111 101 116 144	1 1 1 1 1 1 1 1 1 1
114 149 135 125 93 110 125 120 118 92	1 1 1 1 1 1 2 2 2 2
102 90 73 94 80 84 87 118 116 102	2 2 2 2 2 2 2 2 2 2
77 58 117 129 132 141 148 141 131 145	2 2 3 3 3 4 4 4 4 4
147 90 99 94 134 136 117 136 104 148	4 4 4 4 4 4 4 4 4 4
183 122 155 158 145 142 158 183 161 153	4 4 4 4 4 4 4 4 4 4
177 183 165 142 167 225 168 156 179 174	4 4 4 4 4 5 5 5 5 5
168 226 231 147 191 151 161 171 171 188	5 5 5 5 5 5 5 5 5 5
166 178 137 167 178 179 132 122 157 120	5 5 5 5 5 5 6 6 6 6
132 188 125 162 211 172 112 149 135 161	6 6 6 6 5 5 5 5 5 5
110 137 179 163 140 159 156 162 151 140	5 5 5 5 5 5 5 5 5 5
149 175 106 127 146 147 95 139 134 104	5 5 5 5 5 5 5 5 5 5
139 125 137 137 113 121 144 139 133 144	5 5 4 4 4 4 4 4 4 4
130 141 143 147 135 135 102 112 116 113	4 4 4 4 4 4 3 3 3 3
128 122 113 107 104 100 119 114 75 121	3 3 3 3 3 3 3 3 3 3
112 133 139 104 102 119 125 117 134 131	3 3 3 3 3 3 3 3 3 3
119 118 105 83 90 113 95 139 112 112	3 3 3 3 3 3 3 3 3 3
92 67 81 82 86 138 128 128 130	3 3 3 3 3 3 2 2 2

HERGEST2 AD 1167-1306 Hergest Court Kington - ***hc1+2***

ring widths (0.01mm)	**number of samples in master**
140 rings, starting date AD 1167	
257 269 233 202 287 298 318 245 201 353	1 1 1 1 1 1 2 2 2 2
292 372 320 174 190 326 359 262 295 397	2 2 2 2 2 2 2 2 2 2
430 217 238 345 346 298 324 285 275 327	2 2 2 2 2 2 2 2 2 2
218 193 222 243 284 308 332 267 312 242	2 2 2 2 2 2 2 2 2 2
171 247 255 313 246 154 140 229 237 271	2 2 2 2 2 2 2 2 2 2
266 245 226 301 258 204 141 165 262 262	2 2 2 2 2 2 2 2 2 2
293 352 280 277 237 161 114 145 200 146	2 2 2 2 2 2 2 2 2 2
239 169 179 298 231 215 321 428 537 498	2 2 2 2 2 2 2 2 2 2
433 246 368 258 290 224 316 183 279 273	2 2 2 2 2 2 2 2 2 2
250 180 159 191 214 232 171 215 213 199	2 2 2 2 2 2 2 2 2 2
196 270 217 170 219 182 215 248 220 191	2 1 1 1 1 1 1 1 1 1
204 199 107 108 154 140 122 130 130 144	1 1 1 1 1 1 1 1 1 1
66 83 54 113 143 160 205 125 114 106	1 1 1 1 1 1 1 1 1 1
106 67 61 72 95 73 71 83 101 120	1 1 1 1 1 1 1 1 1 1

HERGEST3 AD 1434-1598 Hergest Court Kington - ***hc9+16+17+22***

ring widths (0.01mm)	**number of samples in master**
165 rings, starting date AD 1434	
265 305 268 306 293 238 276 206 156 186	1 1 1 1 1 1 1 1 1 1
257 246 220 208 239 173 181 203 176 174	1 1 1 1 1 1 1 1 1 1
254 234 234 221 188 169 221 188 161 148	1 1 1 1 1 1 1 1 1 1
104 133 119 180 180 239 240 226 187 180	1 1 1 1 1 1 1 1 1 1
198 293 295 256 192 205 203 216 171 206	1 1 1 1 1 1 1 1 1 1
237 193 168 173 146 156 170 132 113 111	1 1 1 1 1 1 1 1 1 1
141 103 157 166 143 169 160 151 156 148	1 1 1 1 1 1 1 1 1 1
186 211 186 118 187 168 144 170 160 158	1 1 1 1 1 1 1 1 1 1
124 255 263 258 313 360 263 300 442 440	1 2 2 2 2 2 2 2 3 3
342 291 302 277 263 265 259 364 258 356	3 3 3 3 3 3 3 3 3 4
220 360 433 341 345 407 367 384 266 241	4 4 4 4 4 3 3 3 3 3
307 263 227 170 214 231 265 354 195 190	3 3 3 3 3 3 3 3 3 3
189 245 173 216 162 302 248 218 311 286	3 3 3 3 3 3 3 3 3 3
338 99 47 42 59 70 94 122 110 145	3 3 3 3 3 3 3 3 3 3
163 128 97 128 122 139 256 165 198 171	3 3 3 3 3 3 3 3 3 3
226 121 121 151 138 161 132 151 141 191	3 3 2 2 2 2 1 1 1 1
189 144 123 188 81	1 1 1 1 1

HERGEST4 AD 1436-1665 Hergest Court Kington - ***hc5+hc6+8+18+27+28***

ring widths (0.01mm)	**number of samples in master**
230 rings, starting date AD 1436	
168 117 61 48 59 55 61 71 81 91	1 1 1 1 1 1 1 1 1 1
80 86 66 90 82 66 80 80 79 74	1 1 1 1 1 2 2 2 2 2
67 72 61 51 80 78 78 70 71 56	2 2 2 2 2 2 2 2 2 2
56 50 62 58 62 70 88 92 86 120	2 2 2 2 3 3 3 3 3 3
107 55 88 99 85 79 49 68 90 71	3 3 3 3 3 3 3 3 3 3
75 74 61 54 59 50 71 69 73 50	3 3 3 3 3 3 3 3 3 3
71 51 42 96 82 86 80 69 82 74	3 3 3 3 3 3 3 3 3 3
69 51 68 83 90 85 88 76 73 67	3 3 3 3 3 3 3 3 3 3
76 61 93 131 101 117 125 113 127 111	3 3 3 3 4 4 4 4 4 4
113 122 143 135 135 169 155 134 134 109	4 4 4 4 4 4 4 4 5 5
103 119 118 133 122 155 94 97 99 92	5 5 5 5 5 5 5 5 5 5
96 88 104 121 121 132 127 114 113 104	5 5 5 5 5 5 5 5 5 5
93 83 99 106 95 102 107 94 130 98	5 5 5 5 5 5 5 5 5 5
68 72 85 112 95 101 89 98 99 92	5 5 5 5 5 5 5 5 5 5
96 117 91 97 102 104 87 89 97 122	5 5 5 5 5 5 5 5 5 5
115 124 113 156 124 119 98 106 116 129	5 5 5 5 6 6 6 6 6 6
142 136 135 144 112 140 137 133 149 120	6 6 6 6 6 6 6 6 6 6
128 127 124 125 110 125 90 113 100 116	6 6 6 6 6 6 6 6 6 6
98 94 106 104 118 110 112 105 104 93	6 6 6 6 6 6 6 6 6 6
86 89 118 139 108 113 125 121 100 131	6 6 6 6 6 6 6 6 6 6
106 119 145 112 120 151 131 130 135 132	6 6 6 6 6 6 6 6 6 6
141 109 113 109 113 111 99 106 110 130	6 6 6 6 6 6 6 6 6 6
113 118 110 98 118 120 119 130 112 127	6 6 6 6 6 6 6 6 6 4

hc3 AD 1406-1474 Hergest Court Kington
ring widths (0.01mm)
69 rings, starting date AD 1406
452 353 341 342 253 245 285 243 271 240
208 220 225 179 291 283 214 319 220 292
272 238 292 230 238 345 210 229 255 266
205 200 185 138 166 201 137 237 228 166
195 194 168 192 144 200 216 153 192 160
176 171 144 132 173 164 216 196 133 163
198 195 182 184 251 196 269 162 283

hc11 AD 1564-1665 Hergest Court Kington
ring widths (0.01mm)
102 rings, starting date AD 1564
232 191 171 206 214 162 236 216 176 163
156 104 155 181 158 164 243 154 104 132
139 126 152 151 99 166 122 117 142 137
144 165 143 119 90 95 88 99 85 144
134 85 89 122 116 100 120 111 140 103
80 109 70 109 163 149 130 123 169 135
107 88 87 110 129 212 130 127 148 127
118 136 99 144 179 192 190 199 107 99
92 141 180 161 142 146 134 200 112 98
144 158 218 191 203 197 219 169 234 197
245 228

hc30 AD 1386-1451 Hergest Court Kington
ring widths (0.01mm)
66 rings, starting date AD 1386
381 291 217 257 171 243 274 245 312 278
234 241 316 260 283 222 156 196 190 135
264 223 257 291 255 177 200 142 180 173
174 215 222 188 189 171 111 230 198 128
119 174 205 187 151 176 211 076 056 068
064 124 088 109 101 098 073 072 066 059
053 121 102 082 067 097

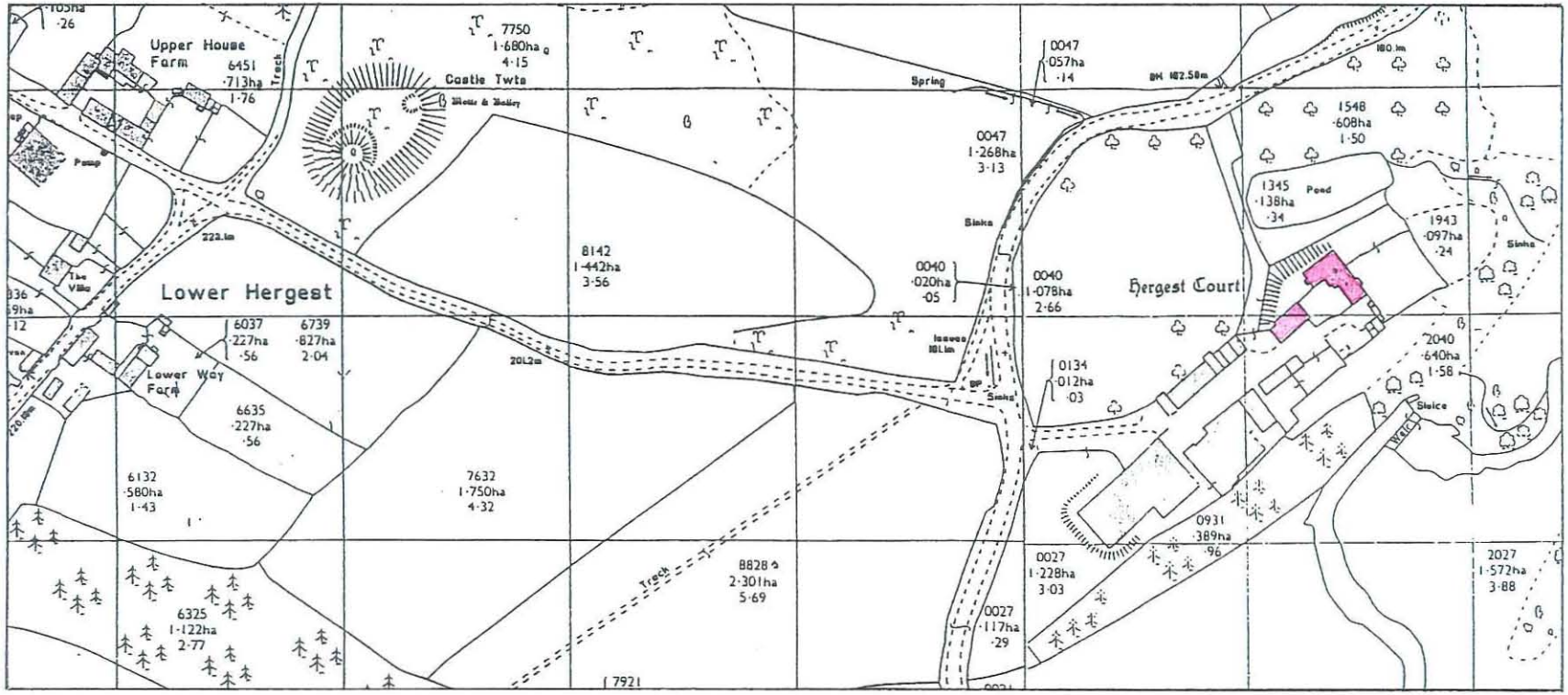
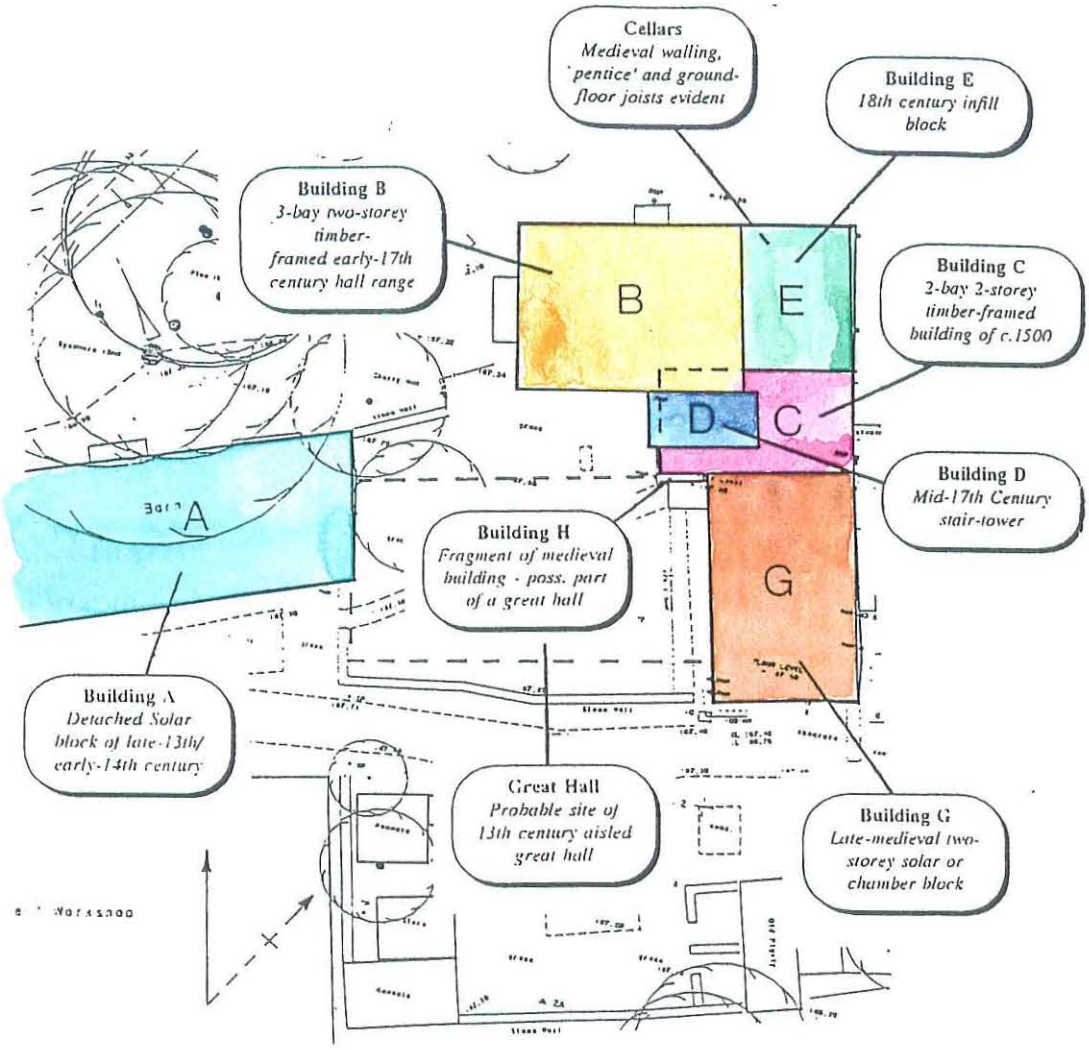
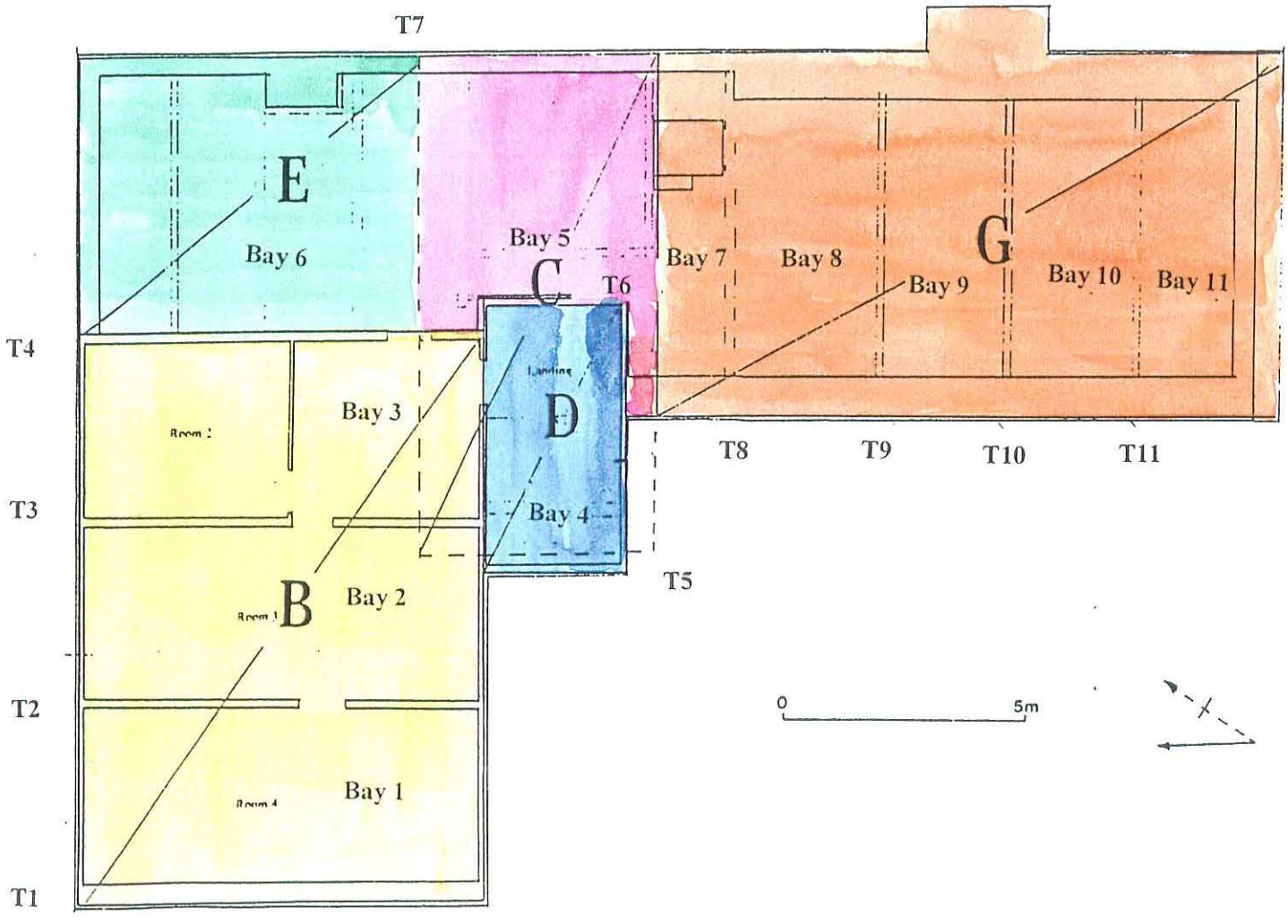


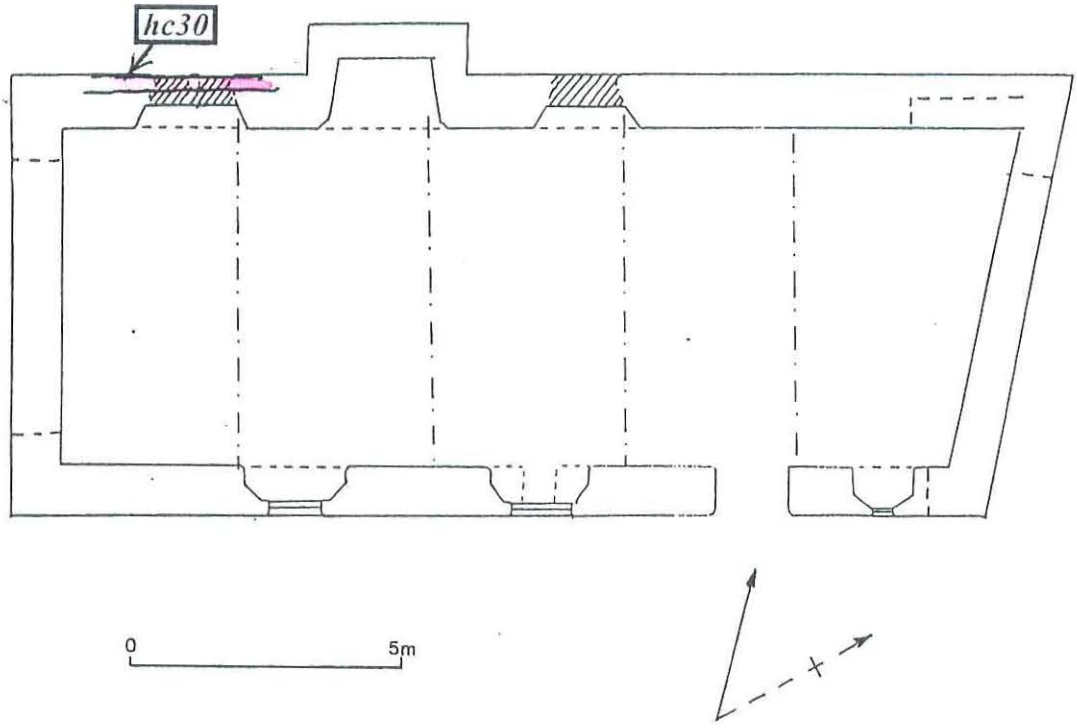
Figure 2: Site plan showing building identification *After Morriss 1995*



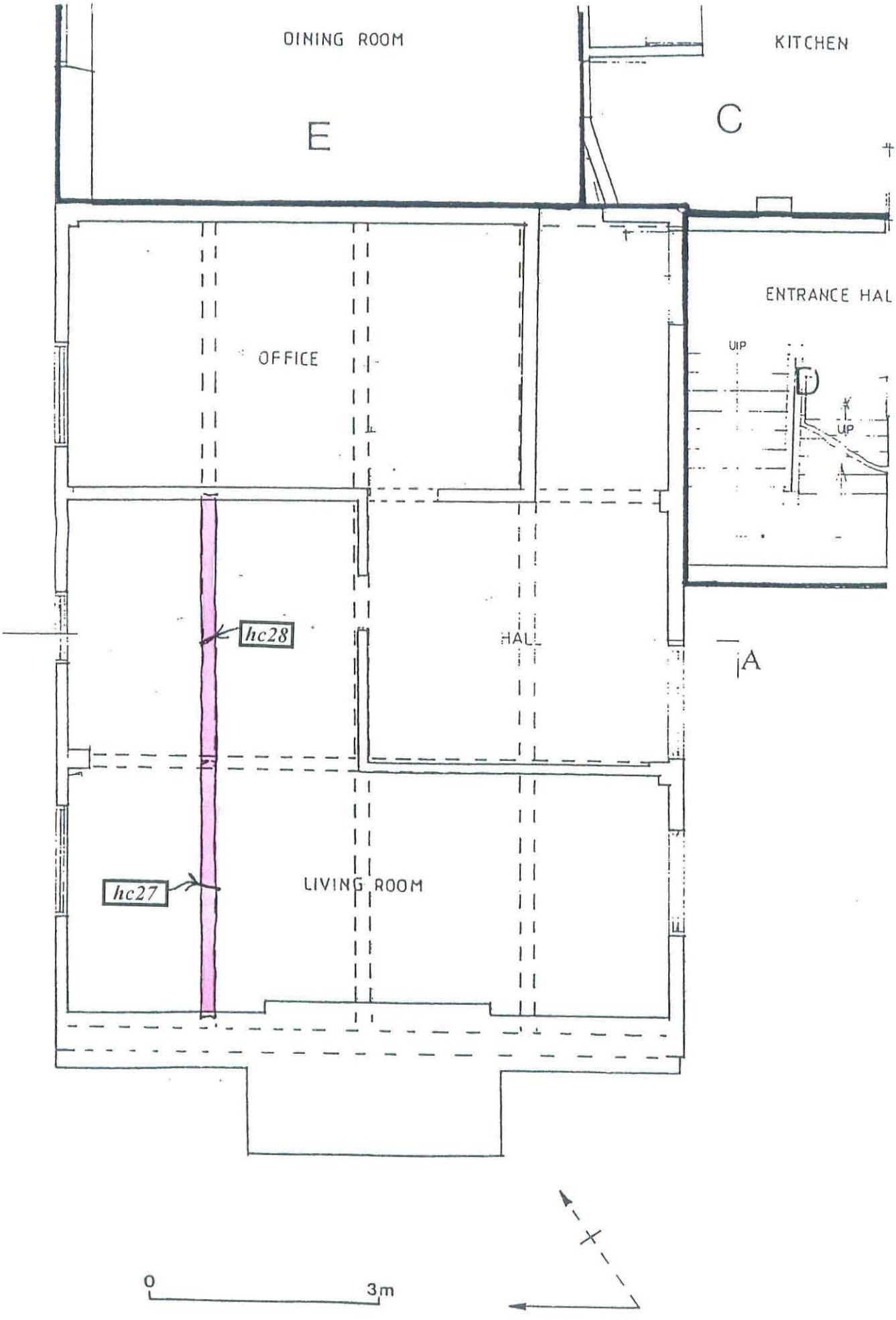
Attic plan of Hergest Court showing the various building phases and truss numbering scheme



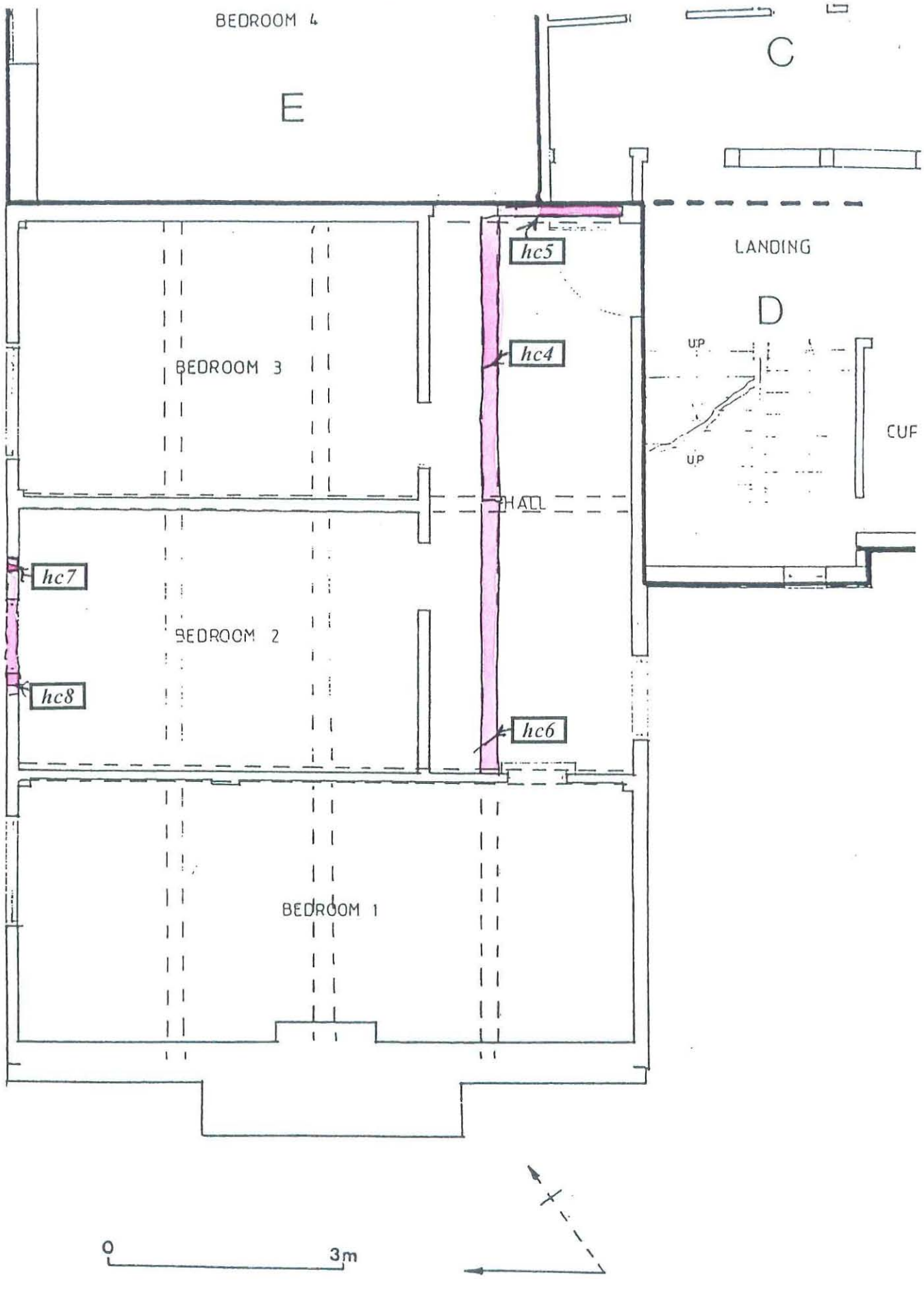
First-floor plan of Solar Block (Building A) showing location of sample



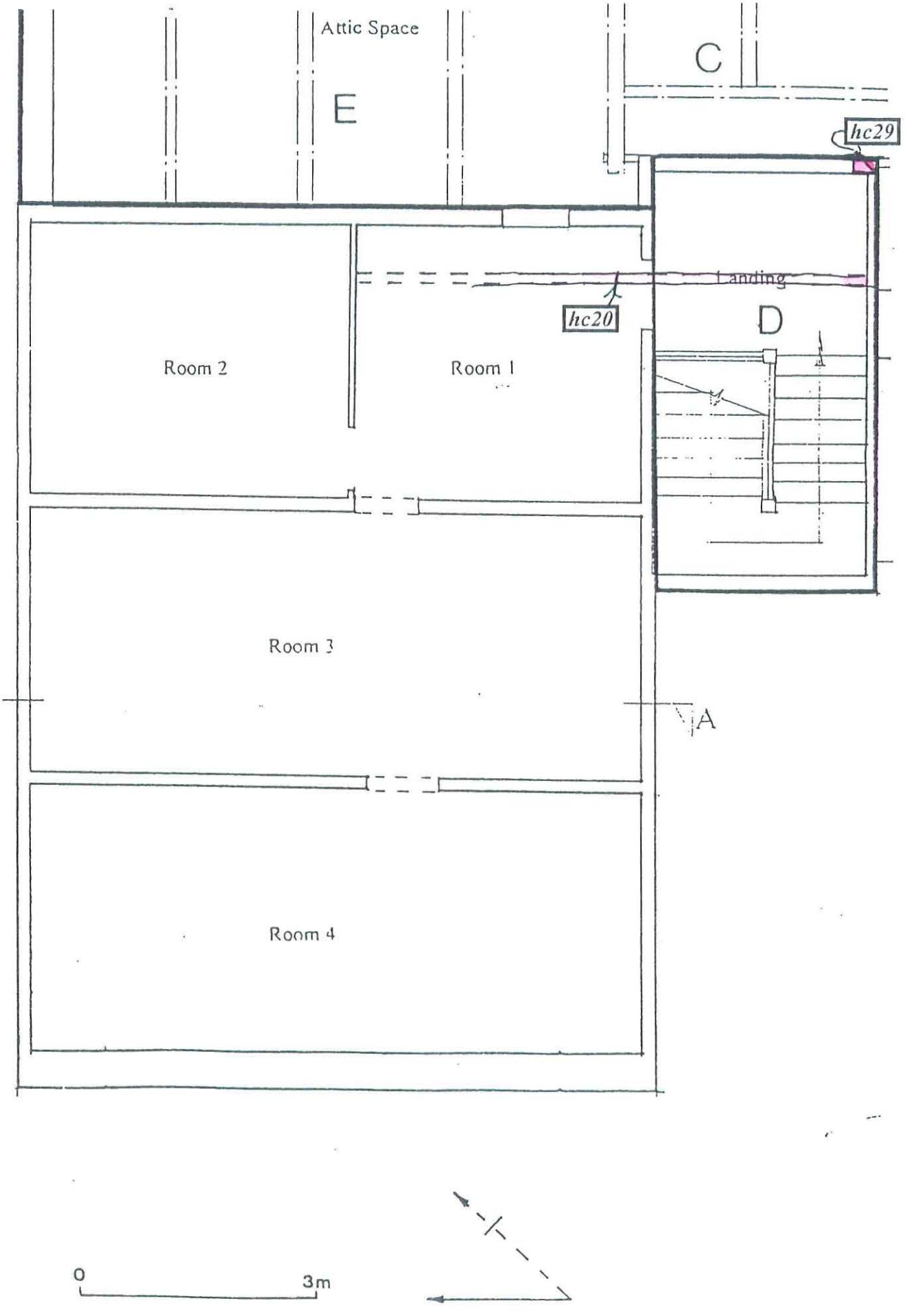
Ground-floor plan of north wing (Building B) showing location of samples



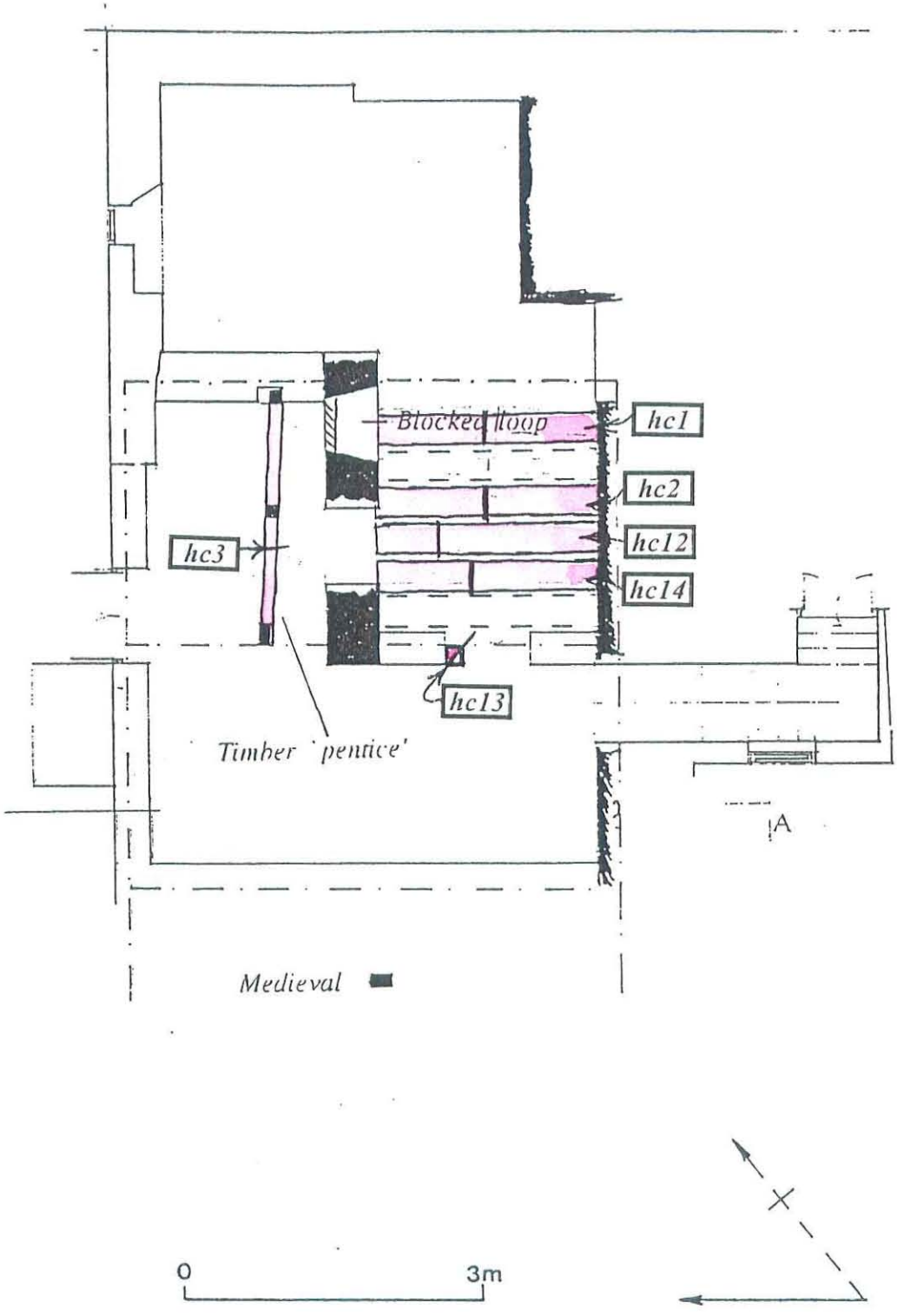
First-floor plan of the north wing (Building B) showing location of samples



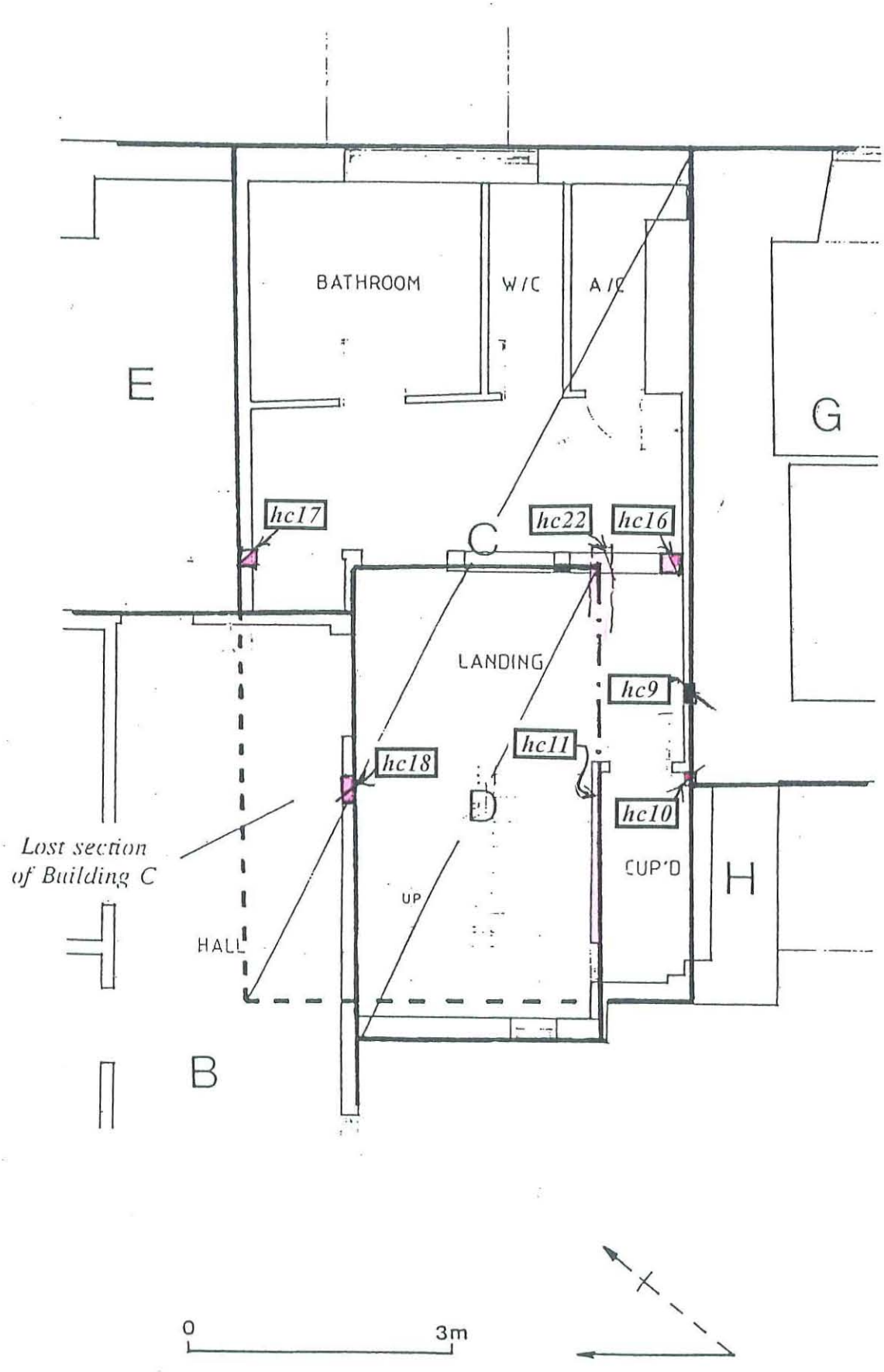
Attic plan of the north wing (Buildings B & D) showing location of samples



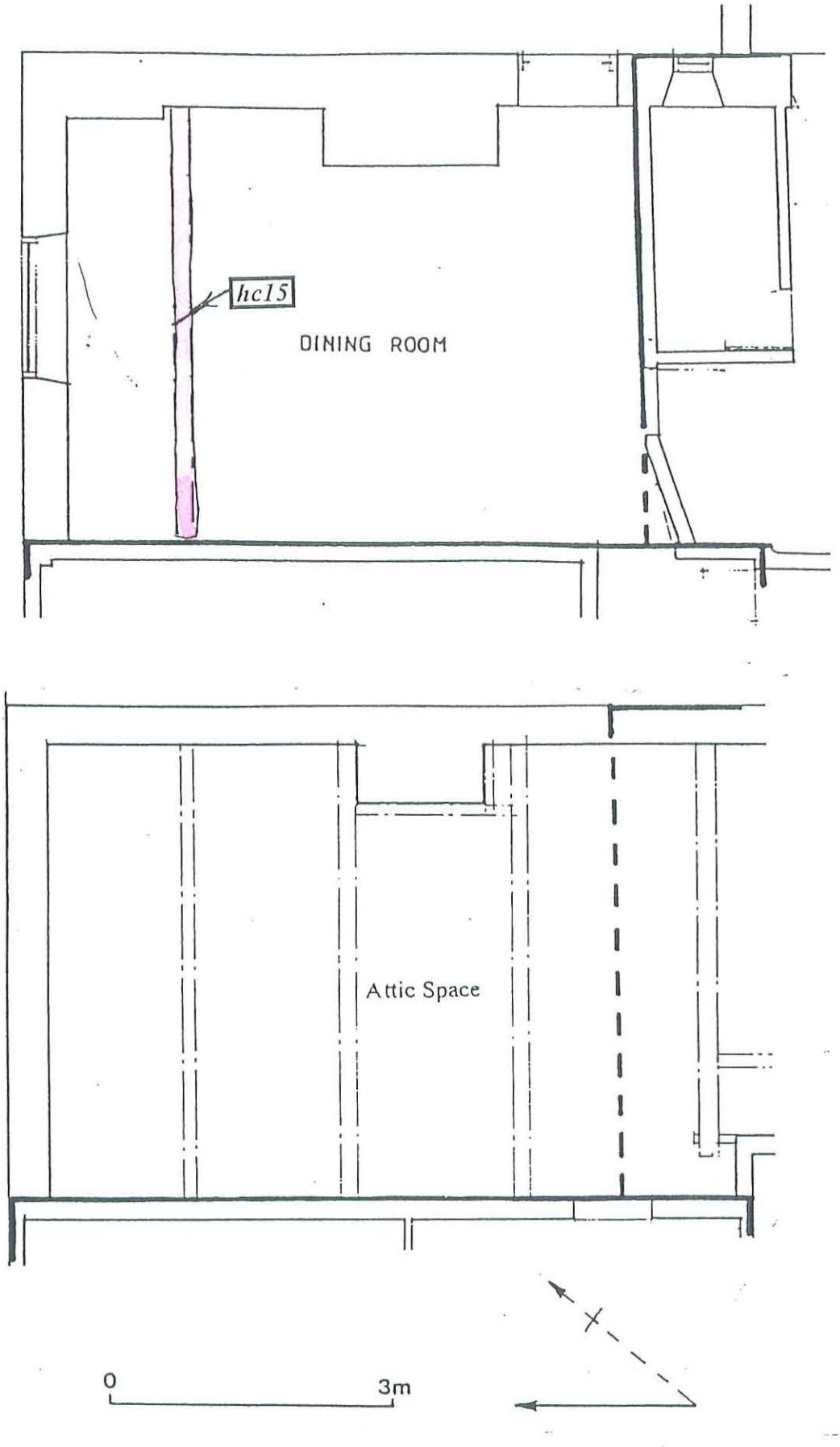
Cellar plan (Buildings B & E) showing location of samples



First-floor plan of Buildings C & D showing location of samples



Ground-floor and attic plans of Building E showing location of sample



First-floor plan of the east wing (Building G) showing location of samples and trusses