AYTON CASTLE, WEST AYTON, NORTH YORKSHIRE: PHASE 1 REPAIRS

ARCHITECTURAL AND ARCHAEOLOGICAL RECORDING

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EXECUTIVE SUMMARY

The ruined tower house at West Ayton represents the last surviving above-ground structural element of an important medieval and post-medieval manorial complex. In 1993, at the instigation of the owners, Scarborough Borough Council, an archaeological and architectural survey was carried out. This included a historical survey, a review of previous investigations, a survey of the surrounding earthworks, a photographic survey and architectural analysis of the ruined structure, and recommendations for the consolidation and preservation of the monument.

This 1993 survey was then used as the basis for a scheme of consolidation and conservation, Phase 1 of which was undertaken in 2006. As part of this work, the external and internal faces of the south and east elevations of the tower house were scaffolded and a pre-intervention archaeological survey, designed to augment and enhance the previous 1993 survey data, was undertaken. A watching brief was also undertaken during the repairs. The north and west walls of the tower house were not included in the Phase 1 works, but the opportunity was taken to review the 1993 survey while on site. The earthworks surrounding the tower house were also re-examined, and an ecological survey of the castle complex was produced. This report uses the 1993 survey data as its base, but updates its descriptive and analytical elements on the basis of the new information recorded during the Phase 1 works and relevant new material published since 1996.

Limited excavations carried out between 1958 and 1961 by the Scarborough and District Archaeological Society identified five phases of occupation on the site. The main phase is represented by at least five buildings dating to the mid 13th to mid 14th century, comprising a hall, service annex, kitchen range and dovecote, all surrounded by a stone wall. The surviving three storey tower house probably dates to the late 14th to early 15th century and was built over part of one of the earlier buildings, almost certainly by Sir Ralph Eure (1349-1422). Although previous suggestions that the medieval master mason, John Lewyn, was involved in the design of the tower house are now in doubt, Ayton Castle shares a number of characteristics with other surviving tower houses in Northumberland, and Eure's Northumbrian background was a likely influence on its design. The review of the 1993 survey has led to a re-assessment of how the internal layout of the tower house may have been organised, while a re-consideration of some of the associated earthworks suggests that they may have formed part of an ornamental designed landscape contemporary with the tower house.

The last recorded occupant of the tower house at Ayton died there in 1679 and it is likely that piecemeal demolition and removal of stone has taken place thereafter. An engraving of 1796 shows the tower house in its present ruined state and some re-used architectural fragments can be seen in the surrounding field walls and around the base of the tower. The basement of the tower was used as a cattle byre during the 18th or 19th centuries and earthwork evidence also suggests that the larger enclosure or precinct in which the tower house sits was used to accommodate stock during the same period. Three phases of 20th century repair can be identified on the structure, the major works occurring in 1912 which involved the consolidation and capping of the upper courses, the placing of iron grilles over the door and window openings, and the insertion of various concrete lintels and roofing slabs. The 2006 conservation works have aimed to limit or undo the damage caused by some of the earlier repairs, as well as to slow down the rate of erosion to the exposed faces, although further phases of work are needed before the structure is fully consolidated.

1 INTRODUCTION

Reasons and Circumstances of the Project

1.1 In June 2005, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by Scarborough Borough Council through their project architects, Purcell Miller Tritton of York, to undertake a programme of architectural and archaeological recording during the Phase 1 repairs to Ayton Castle, West Ayton, North Yorkshire (NGR SE987851). The Phase 1 repairs were undertaken between July and November 2006 by Historic Property Restoration Ltd (HPR), and the work comprised the consolidation and rebuilding of the upper parts of the south and east elevations of the ruined structure. These works were funded by Scarborough Borough Council and English Heritage.

1.2 The architectural and archaeological recording involved an initial photographic survey and a detailed examination of those areas to be repaired and consolidated from scaffolding erected for the project. Existing drawings and records produced in 1993 were enhanced, and a watching brief was undertaken during the programme of works to record items of interest that were revealed. An additional ecological specialist report was also commissioned (Holloway 2005) to augment the archaeological work and to provide an input into the architect's specifications.

Site Location and Description

1.3 Ayton Castle is situated to the north-east of the village of West Ayton, some 7km to the south-west of Scarborough (NGR SE987851) on the north side of the Vale of Pickering and within the North York Moors National Park (see figure 1). The ruined structure, which lies off Castle Rise and to the north of High Mill, commands an elevated position above the River Derwent at the southern end of the Forge Valley (see plate 1). The structure was designated a Grade I Listed Building of Special Architectural or Historic Interest on 18th January 1978 (Department of the Environment 1986, 21; IOE 327062; see Appendix 1) while it and its immediate environs are protected as a Scheduled Monument (number 28295) under the Ancient Monuments and Archaeological Areas Act 1979. The site was purchased by Scarborough Corporation in 1930.

1.4 The ruined stone tower and surrounding earthworks are all that remain above ground of a medieval manorial complex. A combination of previously collated documentary material and architectural evidence suggests that the tower dates from the late 14th to early 15th century, while the surrounding earthworks probably represent buildings associated with this and an earlier mid 13th to 14th century manor. Some of these features were excavated by the Scarborough and District Archaeological Society between 1958 and 1961 (Rimington & Rutter 1967) while the tower was partly repaired in 1912 and again in 1959. In recent years, the tower has suffered from a combination of natural erosion, storm damage, neglect and deliberate vandalism.

1.5 The castle is aligned north-west/south-east but, for the purposes of this report and the following descriptions, it is considered to be aligned north-south.

Report

1.6 A previous archaeological and architectural survey of the castle (Dennison 1996) has been used as a basis of this current report. The earlier descriptive and analytical text has been updated, to take account of both the new information

recorded as part of the 2006 conservation works and relevant new material published since 1996 (e.g. Emery 1996). It should be noted that the repair/consolidation scheme of Ayton Castle is likely to be a long-term project, and so this report should be seen as an interim statement, which can be combined with subsequent reports and ongoing research undertaken during future phases of repair.

Project Archive

1.7 A properly ordered and indexed archive (paper, magnetic and plastic media) was prepared on conclusion of the project (EDAS site code AYC 06). This archive contains field and final ink drawings, written accounts and reports, and photographic negatives, prints, slides and catalogues. This archive will be retained by EDAS in case further work is undertaken at the site, in which case it will be amalgamated with future archives. If not, the 2006 archive will be deposited with the Scarborough Museum.

2 HISTORICAL SURVEY

Introduction

2.1 As noted above, the account of the excavations undertaken at Ayton Castle by the Scarborough and District Archaeological Society (hereafter the Scarborough Society) includes a section on the history of the site (Rimington & Rutter 1967, 9-23). As this information is well researched and detailed, it was not considered necessary to undertake additional documentary research as part of the 1996 survey, apart from some verification and consulting some general material on the village and the surrounding area (Dennison 1996, 2-8). The following chapter is therefore a summary of that produced in 1996, with some minor alterations to include relevant material published since then, to place the 2006 repair works into context.

The Manorial Complex in the Medieval Period

2.2 While there is considerable documentary evidence relating to the medieval manor and the history of land ownership in West Ayton (see Dennison 1996, 2-5), there are few specific references to the manorial complex or later castle. Documents show that the site was occupied by two main families in the medieval period, the de Aytons who originated from Barlby to the south-east of Selby and the Eures from Stokesley, while from the 16th century it was associated with the Dawnays of Sessay and the Mauleverers of Ingleby Arncliffe.

2.3 Gilbert de Barlby (c.1120-c.1180) became the first Gilbert de Ayton, and it seems that he was the first member of the family to actually move to and live at West Ayton; Emery states that a small house was erected in the second half of the 12th century (Emery 1996, 297). Successive generations of the family lived at West Ayton from the 11th to 14th centuries, and it is obvious that they would have used an existing manorial complex or built a new one. The earliest building to be excavated on the site by the Scarborough Society (Building 4) was dated to the early 13th century but some possible evidence for earlier structures was noted (see Chapter 3 below). Without further research, either documentary or archaeological, it is only possible to say that this building is likely to be associated with the early members of the de Ayton family, perhaps being built by William de Ayton (c.1155-c.1200) or his son Gilbert (1180-1235). It should be noted that only one building of this date was actually identified in the excavations, and it is likely that their manorial complex would have consisted of several additional structures, probably grouped around a courtyard and surrounded by a wall.

2.4 By the mid-14th century, the fortunes of the de Ayton family were probably at their height. The most prominent member was another Sir Gilbert de Ayton (c.1275-1349) and it is known that he was living at the site at the turn of the 14th century as he was assessed at nine shillings in the 1301 Lay Subsidy, by far the highest tax paid of all the inhabitants (Rimington & Rutter 1967, 75). He would have commanded a well-built and substantial manorial seat, particularly after he was knighted in 1306 and then created a baron in 1324, and it is tempting to speculate that he was responsible for the first major rebuilding phase seen on the site, when a hall and separate two storey service annex, kitchen range and dovecote were erected, sometime in the mid-13th to mid-14th centuries (see Chapter 3 below). In 1383, his son William 2nd Lord Ayton (c.1300-1389) granted land for a chaplain “in the chapel of St John the Baptist within the manor of Aton”, possibly suggesting that there was also a chapel within the complex.

2.5 Despite the de Aytons being notorious enemies of the Scots, the manor does not seem to have been affected by the Scottish raids which took place in the region in the early part of the 14th century. In 1322 the residents in the Vale of Pickering, including the Vicar of Seamer, negotiated a payment of 300 marks in return for being left unmolested and, although there are no records of any actual attacks on Ayton, some of the additional security measures evident from the excavated buildings, such as the blocking of some external doorways, may date from this period. It is unclear from the 1967 excavation report whether the abandonment of the excavated buildings in the mid-14th century was due to Scottish raids, natural decay or the deliberate levelling of the site by the later owner (see Chapter 3 below).

2.6 The manor was subdivided into three when Sir William de Ayton died in 1389, and that part containing the manor house complex passed to the Eure family. It has been suggested that it was Sir Ralph Eure (1349-1422) who was responsible for building the surviving tower (Rimington & Rutter 1967, 16), although it was built over parts of an earlier hall, but no specific documents relating to its construction have to date been found. However, the structure is generally dated to the late 14th or early 15th century from its architectural detailing (Ryder 1982, 111; RCHME 1987, 24; Emery 1996, 197-8; Hislop 2007, 28) (see Chapter 5 below).

2.7 It seems quite likely that Sir Ralph Eure did build the tower, rather than a member of the de Ayton family, as suggested elsewhere (Russell 1923, 441). Sir Ralph also had houses at Stokesley (south of Middlesborough) and Witton (County Durham) in the north of England, and so would have been familiar with the pele towers and other defended houses that were being built in that area during the 13th and 14th centuries. He would also have known about the Scottish raids in the Vale of Pickering and surrounding areas in the early 14th century and he actually went on several Scottish expeditions, being commissioned by Henry IV to negotiate peace with the Scots on several occasions. He would, therefore, have appreciated the need for a defendable house which could be protected against attack.

2.8 There are a few documentary references which show that members of the extended Eure family were living at Ayton during the succeeding years. John de Ayton was there at the end of the 15th century and another Ralph Eure (1460-1539) was described as being “of Ayton”; in his will he required that “all my household stuff and goodes at Ayton and Malton” be divided between his wife Agnes and his son William. The castle is mentioned by Leland in 1534 (see Chapter 3 below) and a document of 1537 records that derogatory comments were made against the King “in the buttery of Ayton Castle” (Rimington & Rutter 1967, 17). In 1545 Agnes, Dowager Lady Eure, was assessed at Ayton Castle in the Lay Subsidy tax of that year but towards the end of the 14th century it seems that the family decided to move to their more comfortable house at Malton. Nevertheless, the house was still occasionally used, for example William Lord Eure (c.1530-1594) decided to “tarry at my house at Ayton” in 1569 (Russell 1923, 441).

The Post-medieval History

2.9 Other references note that the castle was still being occupied in the first half of the 17th century. In 1600 a William Dawnay was living there and the diary of Lady Hoby of Hackness records that she dined at the castle on 1st May 1600 (Meads 1930, 117). The castle does not appear to have been affected by the Civil War but in February 1641 Royalist troops were accommodated in the structure on their way

down the east coast**,** and it is possible that Parliamentary troops were stationed there during their sieges of Scarborough in 1645 and 1648.

2.10 The last recorded occupier was Edmund Mauleverer who died of consumption at the castle in 1679. Rimington and Rutter suggest that the heirs of Edward Stockdale, who owned the castle in the 1670-80s, probably began dismantling it after Mauleverer's death, and in 1775 some of the castle fabric was used to rebuild the bridge across the River Derwent (Rimington & Rutter 1967, 22). An engraving of 1796 shows the castle in a ruinous state, as do subsequent engravings of the early 19th century (see Chapter 3 below).

2.11 The basement rooms of the castle appear to have been used as a cattle byre at some time from the early 18th century. Rimington and Rutter also note that the area to the south-west of the tower contained a number of crude unmortared walls apparently built after the castle had ceased to be permanently occupied. These walls contained architectural fragments from earlier buildings and it was concluded that they represented a series of cattle or sheep enclosures built in the 18th or 19th century (Rimington & Rutter 1967, 38). However, no evidence of this land use survives on the ground or in the cartographic records.

3 REVIEW OF PREVIOUS WORK

Introduction

3.1 An account of the previous work undertaken on the site up to 1993 was produced in the earlier survey report (Dennison 1996, 9-20). The following text provides a summary of this material, updated as necessary, as well as more recent work carried out as part of the 1996 survey, to provide a context for the 2006 repairs. Further details relating to the archaeological excavations can be found in the published account (Rimington & Rutter 1967, 27-70).

Accounts, Descriptions and Illustrations

3.2 In 1534, Leland briefly mentions the castle: "Cumming over Darwent I saw a Manor Place ... at this Manor Place is a Tower or Pile" (Hearne 1768-70, 1, fol 70) while Hinderwell, writing in 1798, notes that "this building appears to be of great extent, the foundations spreading nearly over an acre of ground" (Hinderwell 1798, 291). These descriptions are fairly typical for, although several authors have recognised the presence of the castle, few actually discuss it in any detail. Hey recognises that Ayton is one of several 15th century fortified towers in Yorkshire (Hey 1986, 99) but it is rather surprising that the castle is not mentioned in the 1986 book describing the landscape heritage of the North York Moors (Spratt & Harrison 1986).

3.3 Four engravings dating to 1796, 1815, 1824 and 1831 have been found depicting the tower (Rimington & Rutter 1967, 81), and these were re-examined as part of the current project. Although they are all views from the south side of the river rather than detailed close-up sketches, all show the tower in a ruinous condition. Walker's engraving of 1796, based on an original drawing by Hornsey, shows the castle from the south (see plate 3) whereas that by Whittock, published by Allen in 1831, is viewed from the east (see plate 4) (Hinderwell 1798, facing p291; Allen 1831, facing p272). The depiction of the castle appears fairly accurate in the earlier illustration whereas Whittock shows the east elevation as being largely intact - it is not known whether this is a true reflection of the remains or artistic license.

3.4 An enclosure map of 1795, which depicts the village and "part of old enclosures of West Ayton, north of Ings Lane", shows the castle as a single isolated structure in the occupation of George Osbaldeston Esq (NYCRO ZDS V3/2 MIC 1476) (see figure 2). A rectangular building is also located in a small rectangular field to the south of the castle and there are two parallel walls suggesting a track running to the west of the fishpond field. The castle is similarly depicted on maps of 1838 (NYCRO ZDS M3/3 MIC 1509) and 1850 (NYCRO ZDS M3/4 MIC 1509) although the building to the south is no longer apparent. The Ordnance Survey maps of 1854 (6" sheet 93) and 1912 (25" sheet 93(3)) show the castle as a roofless two-celled ruin named as "Ayton Castle (in ruins)" on the former and "Ayton Castle (remains of)" on the latter (see figures 3 and 4). These two maps also depict a complex of earthworks around the tower and in the field to the south, of a similar appearance to that recorded by the earthwork survey (see Chapter 4 below). When the land was sold to the Honourable Marmaduke Dawnay in 1840, lot number 1 in the Sale Catalogue refers to the castle field as "Hall Grounds" (Rimington & Rutter 1967, 22).

3.5 The first detailed account of the castle appears in the Victoria County History for North Yorkshire, where it is described in architectural terms with a basement floor

plan (Russell 1923, 441) (see figure 5). However, the work of the Scarborough Society represents the first significant piece of work ever done on the castle and the surrounding land (Rimington & Rutter 1967) (see below). George Pye also produced a drawing of the castle for the cover of the Scarborough Society's publication (see plate 7). More recently, the castle has been noted by Pevsner (1966, 68) and a limited architectural description is contained in the 16th List of Buildings of Special Architectural or Historic Interest (Department of the Environment 1986, 21; see Appendix 1).

3.6 In terms of other regional works, the castle is briefly mentioned by Ryder in his overview of medieval Yorkshire buildings (Ryder 1982, 111), by Harrison and Hutton in their work on vernacular architecture (Harrison & Hutton 1984, 19-20), and it is included in the Royal Commission on the Historical Monuments of England's survey of the houses of the North York Moors (RCHME 1987, 24-5); the latter do not however provide a new survey but reproduce the Scarborough Society's floor plans. The site is also described by Salter, where it is correctly called a tower rather than a castle (Salter 2001, 17), although it receives only a passing mention in Turner's study of Yorkshire castles (Turner 2004, 194 & 198). Emery provides a brief account of the structure in his survey of greater medieval residences in the north of England (Emery 1996, 297-298), while most recently Hislop (2007, 28) discusses previous assertions that Ayton may be associated with the master mason John Lewyn. Finally, details of the site are contained on a number of websites, including *CastleUK.net* and *The Gatehouse*, the latter containing an excellent bibliography.

Twentieth Century Repair and Conservation Works

3.7 The tower has a history of piecemeal restoration and renovation during the 20th century. In 1911 the Yorkshire Archaeological Society managed to persuade the then owner, Colonel Dawnay, to undertake urgent repairs to prevent the collapse of the structure. Extracts from the Society's minute books show that this work was being carried out in July 1912 (Rimington & Rutter 1967, 80); no other records of this or other work have yet been found in the Yorkshire Archaeological Society archives, or in the records of Scarborough Borough Council and English Heritage.

3.8 Unfortunately, there is no detailed account of the repairs that were done in 1912, but it is likely that this work is represented by the areas of hard grey cement mortar and associated repairs which can be seen over several areas of the tower. These works include the insertion or replacement of a concrete lintel over the internal door in the basement, the insertion of a number of dressed stone roofing slabs in the north basement room, the dismantling and re-erection of the top three or four courses and the capping of the wall tops on the south and east elevations, the replacement of the lintel on the external face of the west window to the right of the door, and the replacement of several of the voussoirs around the main doorway. It is also possible that the 1912 work included the placing of iron grilles and gates over most of the window and door openings, some of which remain today.

3.9 In 1957 the question of further repairs was considered and the then Scarborough Corporation (as owners of the site) co-operated with the Ministry of Public Buildings and Works to carry out further urgent works necessary for the structural stability of the building. The Scarborough Society provided the labour, and they cleared considerable amounts of debris and other rubbish from the basement rooms in the summer of 1958. Stonemasons from the Corporation began their work in May 1959 but again, there appear to be no records or details of the actual work that was carried out. It is possible that an area of mortar repair seen on the

external elevation under the south window dates from this period, together with other isolated areas of renovation, for example along the plinth and string courses and in the internal set-backs.

3.10 The 1993 architectural survey (Dennison 1996; see below) also identified a later phase of, as yet undocumented, conservation work. This appears to be limited but is most apparent in the repointing and consolidation of the internal set-back on the east elevation, particularly around the top of the fireplace and the joist holes. This has been done in an appropriate and sympathetic mortar mix, and does much to enhance the fabric and appearance of the monument in this localised area.

3.11 At possibly around the same time, and perhaps as part of the same works, a trench c.2m wide was been dug around the base of the tower, varying in depth from being absent to the north of the west doorway to some 2.5m deep on the east side. This trench, which is still partially open, reveals the lower courses of the external elevations and the original excavation is likely to have destroyed or damaged any archaeological deposits in this area. Some of the excavated material has been piled up on the edge of the trench away from the tower, effectively creating an external bank along the east side.

The 1958-61 Excavations

3.12 A considerable amount of work was carried out on the tower and the surrounding area by the Scarborough Society between 1958 and 1961. In addition to the excavation of buried buildings to the east and south of the tower, they undertook clearance work within the tower and produced an architectural plan and description (Rimington & Rutter 1967).

3.13 The excavations were important in establishing a chronology for the site, showing that the ruined surviving tower was in fact the latest of five phases of medieval activity. Unfortunately, the published account of their excavations is all that remains of their work; the archive was thought to have been passed to either Scarborough Borough Council (the site owners) or English Heritage (who, as the Ministry of Public Buildings and Works, funded the excavations) (J G Rutter, *pers. comm.*), but despite strenuous efforts to locate it, neither organisation admits to having the archive and it seems to have been lost or destroyed. There is also no record of it in the National Monuments Record held by English Heritage. Some of the finds were deposited in Scarborough Museum but these have also been lost, although a few photographs of the excavations in progress and a limited amount of correspondence remains; the best of the photographs are reproduced in the 1967 excavation report.

3.14 In the absence of the excavation archive and finds, it is impossible to properly re-assess the 1958-61 excavations; we have to rely on an interim report and the published account (Wilson & Hurst 1963, 336-338; Rimington & Rutter 1967, 37-70). Unfortunately, neither of these sources clearly indicates the locations of all of the trenches. In addition, the published excavation plan shows the first phase on the site as being 12th century in date whereas the excavation text and the specialist reports suggest that the only dating evidence for this phase is some early 13th century pottery; although a 12th century date might be inferred, the reasons for this attribution are not clearly stated. The lime kiln in the east of the site is also shown as being 12th century whereas the excavated evidence suggests that it should be 14th century.

The outlying structures

3.15 The investigations were concentrated in an area to the east and south of the ruined tower (Rimington and Rutter 1967, plate 2). A number of slit trenches were excavated and the lines of exposed walls followed; it is unclear from the excavation report or accompanying photographs whether any open-area excavation took place. A total of six structures were uncovered, named in the report as Buildings 2, 3, 4 and 5 (Building 1 being the present tower), and a dovecote and lime kiln (see figure 6). The following account draws on the published report with such re-interpretation as is appropriate and possible.

3.16 All the excavated buildings and associated structures were dated on artefactual evidence to the medieval period. The earliest building (Building 4) was ascribed to the early 13th century while the remainder belonged to the mid to late 13th and 14th centuries. The lime kiln was attributed to the same date as the tower and was probably built for the production of lime for mortar used during its construction. Underlying the structures in the north-east part of the site was a 3ft thick layer of black soil which, on analysis, was shown to be made up of charred plant remains, specifically wheat; this was interpreted as farmyard refuse. A large quantity of 16th and 17th century debris containing domestic rubbish, animal bone, clay pipes and pottery etc was found almost everywhere within the area of the excavations, overlying the excavated features to a depth of between “a few inches” and “several feet”, and effectively levelling up the ground. The excavators concluded that some parts of the site had been used as a rubbish tip. The excavated remains are described briefly below in chronological terms.

3.17 Building 4 was located c.6m to the north-east of the tower (see figure 6). The full extent of the structure was not determined, but it was at least 6m wide and possibly at least c.20m long. The west wall contained a well-preserved fireplace and the walls, which averaged 0.91m high and 0.61m wide, retained some of their original plaster on both sides. The interior of the building was not fully examined, but a hoard of iron tools was found under the north part of the chimney breast which was posited at the west end of the structure. The early 13th century date for the building is attributed to some Scarborough and Greyware pottery sherds and the fact that the walls were overlain by later structures; a date earlier than the early 13th century could therefore be possible.

3.18 To the north-east of Building 4 was an undefined structure which had mostly been demolished to make way for a later dovecote and limekiln. There was a simple doorway in its west wall, with a paved area and a step, presumably to the west although this is not clear. To the south, at a right-angled junction of walls, a number of 13th century pottery sherds were found, including an almost complete green-glazed handled ewer, together with fallen masonry and roofing tiles. At the south-west corner of the structure, a wall ran to the west, parallel to the north wall of Building 4, although the precise relationship between two, and the adjacent Building 2, is not clear from the excavation plan and text. A black humus-rich soil layer 0.61m-0.91m thick lay immediately under the structure and the walls connecting it to Building 2. This deposit, interpreted as farmyard refuse earlier in date than any of the stone buildings, had a sharp edge to the east of Building 2, possibly indicating the former presence of a timber building. If so, this would represent the earliest known structural phase on the site.

3.19 Two buildings (Buildings 2 and 3) lay immediately to the east of the tower (see figure 6). Both were rectangular in plan and had the same alignment as the later tower, the west wall of Building 3 actually lying beneath the east wall of the tower.

Internally, Building 2 measured c.12m north-south by c.6m east-west and, given the presence of an internal stair, it must have been at least two storeys high. This was a complex structure with several differently-sized rooms, one of which contained a stone-lined circular cistern. A further well and cistern complex lay at the north end of Building 2. The building was interpreted as a domestic annex placed next to the main 13th to 14th century manor house, and it appears to have been used for storage and the provision of a water supply for the complex. A passage 2.74m wide was also identified between Buildings 2 and 3.

3.20 Internally, Building 3 measured c.13m north-south by c.5m east-west. There were two ground floor entrances, one in the north-east corner and one in the south wall. The majority of the west wall lay under the later tower. The central part of the east wall contained an external buttress-like structure, possibly a chimney breast, which extended into the passage. The south wall of the building was cut through by a later drain which ran from the later latrine pit dug on the east side of the later tower. The footings of another wall were seen running to the west from the south-west corner of the building, and paved yards were uncovered to the north of Building 3, to the north of Building 2 in what might have been part of the earlier Building 4, and to the east of Building 2. The excavators concluded that Building 3 was constructed as the main hall of the medieval complex, and that it pre-dated Building 2.

3.21 Building 5 lay c.8m to the south of Building 3 and the tower (see figure 6) and was interpreted as being a 13th to 14th century kitchen range, consisting of two rooms joined at opposing corners and on the same alignment as the buildings to the north. The north room was c.4m square, and contained a fireplace on its south side. The south room measured c.17m north-south and c.7m east-west internally, and had a later circular oven and fireplace on the east side. This room was built on steeply sloping ground from massive square blocks which had been grouted with lime (a technique not seen elsewhere on the site), and the walls were plastered inside and out. The steep natural slope meant that the southern part of the kitchen was effectively a basement. The existing drystone wall which formed the southern boundary of the field had been built on top of the south wall of Building 5. The west wall of the kitchen range was not traced throughout its length and it is possible that additional buildings, either attached or separate, lay to the west.

3.22 A circular earthwork 35m to the east of the tower proved on excavation to be the remains of 13th to 14th century dovecote. It was 7.62m in diameter and the walls survived to an average height of 1.52m. The stones were squared on the outer surface, set in clay and both faces were plastered. There was also a small narrow doorway in the south-east quadrant. The internal nesting holes had an alternating L-shaped plan with small alighting ledges. No pottery later than the mid-14th century was found in the structure, and so it was suggested that it had gone out of use at this time, possibly when the adjacent lime kiln was built, to be replaced by another structure seen as an earthwork in the north-west part of the site.

3.23 Two pronounced oval earthwork mounds to the south-east of the dovecote proved to be the remains of a lime kiln. The base of the kiln was defined by walls 1.37m high which formed a circular structure 1.83m in diameter. Draught holes capped by large stones were positioned on the east and west sides, and there was a ramp on the north side up which limestone and fuel could be raised. A double mound of stones and rubble overlay the structural remains; these mounds contained quantities of lime, coal and gravel. Only one piece of 14th century glazed pottery was found in association with the kiln, suggesting that it was in use when the tower was being built.

3.24 The wall around the manorial enclosure was investigated in several places on the east side of the complex, but it is not now possible to locate the positions of the excavated trenches, either from the excavation report or the remaining earthwork evidence. Where the wall was examined, it proved to be of no great strength and at one point there were two identical walls less than 0.30m apart, presumed to show a collapse and later rebuilding. The excavation report notes that the wall averaged 1.07m wide with footings extending slightly on either side, although a width of 0.86m was recorded in another location (Rimington & Rutter 1967, 49 & 36).

The tower structure

3.25 As part of the 1958-61 excavations, some work was also undertaken in the tower itself (Building1) (see figure 7). The accumulated rubbish was cleared out of the basement but no evidence of any of the original floors was recovered, as they had been removed and replaced by 19th century rough cobbling which was probably associated with the use of the basement as a cattle byre. However, the entrance lobby was paved with flagstones. No evidence for a well or internal drains was seen. Amongst the finds were a silver farthing of Edward III (1335-1343) and a Hans Krauwinckel brass counter (1580-1610), both found in the north basement room, and a lead bullet found in the rubble of the main stairway, which had been blocked by a 19th century wall to prevent cattle climbing the stairs.

3.26 At first floor level, the grass and other vegetation was cleared to reveal a floor of unpatterned thick clay tiles. A short stretch of paving linked the top of the stairs to the foot of what was probably a second stone stair giving access to the upper floor. A south door led out of this lobby into the main hall while another door, roughly opposite the window lighting the stairs, gave access to a small chamber which occupied the north end of the fist floor. This chamber was heated by a brick hearth positioned in the centre of the north wall (see figure 7). The creation of this smaller chamber or solar appeared to be a later functional alteration to the original first floor hall.

3.27 The distribution of glass found outside the tower suggested that its windows were glazed. The recorded distribution of roofing tiles also suggest that it was originally roofed with green-glazed tiles which were later replaced with coarse unglazed roof tiles. No roofing tiles were found in the debris at first floor level, suggesting that the roof had been deliberately removed rather than having collapsed. Some architectural fragments, including some of the basement roofing ribs, were found to the south of Building 2.

Conclusions from the excavations

3.28 Without being able to examine the relative archives or finds, it is impossible to provide a detailed assessment of the 1958-61 excavations. On the basis of the available information, the interpretation of part of a mid 13th to mid 14th century manorial complex comprising at the minimum a hall (Building 3), service annex (Building 2), kitchen range (Building 5) and dovecote seems to be satisfactory, although it should be noted that these dates were only obtained from artefactual evidence. Indeed, the excavation technique that was used (i.e. the excavation of slit trenches, and following the lines of walls identified in the slit trenches, rather than open area excavation) would not have examined the internal arrangements of any of the buildings or the functional relationships between them. A further examination of the interior of Building 4 might, for instance, have provided a date

earlier than the early 13th century and would have resolved the stratigraphic sequence of the structure near the dovecote.

3.29 The excavators considered that Building 3 was slightly earlier in date than Building 2. However, it is possible that both buildings were contemporary, with the differences in foundation design being a reflection of function rather than date. The idea of a bridge connecting the two buildings at first floor level across a passage, as suggested by the excavators, is also difficult to sustain from the available evidence, and they do not appear to have considered the possibility of there being an external stair on any of the south, east or north elevations of Building 2. The presence of a formal passage-way between Buildings 2 and 3 is also unlikely, particularly as the chimney breast and the thicker wall of Building 3 reduced its width to c.1m. This passage, however, was floored and gated at both ends, and so may have been used as a "short cut" between various parts of the complex.

3.30 The identification of a substantial north-south wall extending to the north of the kitchen range (Building 5), together with a corresponding section blocking the window on the south side of Building 3, as being part of the enclosure wall and a gateway, might be correct; the small square room on the south side of the entrance might therefore have been a guard house. The question about the remaining lengths of the enclosure wall is covered in Chapter 4 below.

3.31 The "black humus soil" identified in the north-east part of the excavations pre-dated any of the stone buildings. This material was interpreted as farmyard refuse, and was associated with some evidence for contemporary timber structures. These features and deposits suggest the presence of an earlier medieval phase of activity which was not investigated.

3.32 It is unclear from the excavation report as to why the complex ceased to be occupied in the mid 14th century. It might have been abandoned as a result of Scottish raids; the blocking of the doors in the south walls of Buildings 2 and 3 suggests an element of additional security, and there is a possibility that the east wall of the kitchen range had been destroyed by an explosion, and it was not subsequently rebuilt. It is clear that the tower house was built over the west wall of Building 3, but it is uncertain whether it and/or the surrounding structures were deliberately levelled in the late 14th century to make way for the tower, or whether they were already abandoned and/or demolished. It is also by no means certain that the enclosure wall remained in use after the end of the 14th century.

1966-67 Resistivity Survey

3.33 In the summers of 1966 and 1967, pupils from the Scarborough High School for Boys undertook some limited geophysical survey on the site using a home-made resistivity meter (Evans 1968). Their work was confined to an area to the south and east of the tower, a short distance away from the site of the 1958-61 excavations. The results, although crude, revealed the presence of a massive east-west wall to the east of the kitchen range as well as other disjointed wall-lines. These were all on the same alignments as the excavated features and so are likely to represent further buildings and associated structures.

1993 Earthwork Survey

3.34 The well-preserved earthworks surrounding the ruined tower were previously surveyed by the Scarborough Society, in advance of their 1958-61 excavations (Rimington & Rutter 1967, 35-36 & figures 5 and 7). A further, more detailed

survey was carried out in 1993 by Anthony Walker and Partners as part of their survey of the tower (Dennison 1996, 21-31). Details of this, and the new interpretation of some of the findings, is set out in Chapter 4 below.

2005 Ecological Survey

3.35 An ecological survey of the castle and its environs was undertaken in 2005 to record items of interest and to inform the specification produced for the 2006 repair and consolidation programme (Holloway 2005). A summary of the findings is presented in Chapter 6 below, and the full unedited report appears as Appendix 2.

2006 Geological Report

3.36 A geological report was commissioned by the project architects, Purcell Miller Tritton, to identify the fabric of the castle and to assist with the sourcing and matching of replacement stone (BGS 2006). Details from this report have been incorporated into the architectural description below, where appropriate, and the full unedited report appears as Appendix 3.

2006 Draft Conservation Management Plan and Related Surveys

3.37 A draft Conservation Management Plan for the site, i.e. the field containing the ruined tower and the field to the south, both owned by Scarborough Borough Council, was produced by Purcell Miller Tritton in December 2006. In order to gather the necessary information, the plan utilised existing reports and new material produced and collated for the 2006 repair works (Dennison 1996; Holloway 2005). A new appraisal of the historic landscape was also commissioned to complete the understanding of the site complex (Green 2006). A final version of the Conservation Management Plan was produced in May 2008 (Purcell Miller Tritton 2008).

4 EARTHWORK SURVEY

Introduction

4.1 As noted above, the well-preserved earthworks surrounding the ruined tower were first surveyed by the Scarborough Society and then again in 1993. The 1993 survey carried out by Anthony Walker and Partners used a total station EDM with data being processed on CivilCad software. This was then enhanced where appropriate by hand measurement. The resulting hachured plan appears as figure 8 and full details of the survey results appear in the earlier report (Dennison 1996, 21-31). No new earthwork survey was undertaken as part of the 2006 Phase 1 recording work on the tower, although the opportunity was taken to inspect the earthworks and some additional observations to those made in 1996 are presented below. In particular, new ideas and perspectives on earthworks and landscapes surrounding castles have come to the fore since 1996, and some of the conclusions made in the 1996 report can be now reassessed and reinterpreted.

4.2 The earthworks fall into two distinct areas, those in the large field around the tower, and others to the south adjacent to the River Derwent. For ease of description, these two areas are referred to as the "Castle Field" and the "Fishpond Field", and they are divided by a partially collapsed drystone wall.

The Castle Field

4.3 The tower lies within the centre of a large, approximately rectangular, field which measures a maximum of 360m east-west and 180m north-south. To the east of the tower, the land is steeply sloping, rising from 35m AOD at a point inside the southern boundary to 65m AOD to the north, although the overall gradient is interrupted in two places by terracing. The area to the north of the tower is less steep and has been slightly levelled with several linear terraces. The earthworks fall into two main types. Those around the castle in the west half of the field are generally shallow linear banks and ditches representing platforms and wall-lines of probable buildings and associated features, many of which are depicted in a simplified form on the early Ordnance Survey maps. Other, rather amorphous earthworks result from the 1958-61 excavations. Outside this area, to the north and east, there is a series of terraces and a hollow-way.

Castle precinct

4.4 The castle and associated buildings appear to be located within an almost square enclosure or precinct, measuring 120m east-west by 110m north-south overall, with the tower in a central southern position. The east side of the enclosure is the best defined, formed by a c.5m wide and 0.75m high bank which runs north-south for a total distance of 115m ("a" on figure 8). Rimington and Rutter record that the east wall of the enclosure was excavated in "several places" but it is not possible to identify the locations of their trenches from the records or the earthworks.

4.5 The north side of the precinct is probably represented by a substantial scarp ("b"), 120m long and 2m high, running east-west and forming the south side of a levelled terrace c.15m wide. To the west of a footpath, the scarp is less pronounced, appearing to form the rear (back) of a number of associated features (see below). The west side of the enclosure is less well defined although there is a general but perhaps stepped north-south alignment. The south side of the precinct is more problematic - the west part is probably marked by the surviving drystone wall while the east part is possibly represented by the top of a steep scarp which lies just

inside (north of) the existing field boundary. The entrance into the precinct is probably represented by the existing access along Castle Rise and then a route into a marked c.5m wide gap between buildings "i" and "j" (see below) positioned in the approximate centre of the west side. A slight break in the boundary wall in the north-west corner of the enclosure might also be a secondary entrance, as previously suggested by Rimington and Rutter (1967, 36).

Buildings and other features within the precinct

4.6 A number of earthwork platforms and depressions can be identified around the edges and within the castle precinct, representing the probable sites of former buildings and other structures (see plate 8). Taken together, there are some nine or ten presumed structures, but it should be noted that they may not all be contemporary.

4.7 One probable building ("d"), evident as a rectangular depression measuring 17m by 5m, lies in the south-east corner and its south end has been disturbed by the main east-west footpath and track which runs through the site. There is an open-ended depression just to the north of this, and a levelled platform ("e") further to the north. Another well-defined north-south aligned rectangular depression ("f"), representing a building measuring 20m by 10m with opposed entrances, lies to the west. To the west again is another smaller sub-rectangular depression, 1.5m deep, containing a central rectangular hole which might be a small structure, pond or watering place. There are further building platforms or depressions positioned around the north-west corner of the precinct, namely "g" "h" and "i", each seemingly butted against the precinct wall. Earthwork "h" is almost circular in plan, measuring c.5m internally, while earthwork "i" is 23m long by 6m wide. A small section of exposed walling, 3m long and 0.45m wide and unaccompanied by any earthworks, lies to the east of the south-east corner of this building.

4.8 The well-defined earthworks representing feature "j" have a rather confusing plan, but one possible building containing several rooms can perhaps be identified. In the north-west corner is a rectangular room c.10m by c.3m, with an entrance towards the north on the west side. Another square room is attached to the south-east, measuring 7m east-west and possibly 14m north-south; the smaller east-west banks may mark further internal sub-divisions or even a passage-way or corridor. In all cases, the earthworks of this structure are sharply defined, suggesting the presence of stonework immediately beneath the surface, and stone and rubble have been exposed where the earthworks are crossed by a footpath. The juxtaposition of these earthworks to the possible entrance into the precinct (see above) might suggest that it is a gatehouse or tower structure.

4.9 The area between structure "j" and the ruined tower also contains a number of vague earthworks. For the most part, these are unidentifiable as specific structures, although one platform ("k") might represent the site of further buildings. A slight terrace ("l") can also be seen to the south, running east towards the tower. Earthworks to the south-west, adjacent to the footpath, appear to be eroded natural features, possibly marking earlier footpath alignments (not shown on figure 8).

4.10 To the south-east of the tower are what appear to be the earthworks of another rectangular building ("n"), measuring 17m by 6m and presumably lying just inside, or forming part of, the line of the south precinct wall. The south-west corner of this structure was possibly identified by the resistivity survey undertaken in 1967-68, with a wall extending to the east, and other wall-lines were observed to the north of

building “n” (Evans 1968). To the west there are a series of vague earthworks, spoil, and disturbed ground, probably resulting from the 1958-61 excavations. However, a prominent 2m square earthwork can be seen just to the south of the east-west footpath and track which corresponds to the position of a buttress, identified during the excavations at the north end of the kitchen range (Building 5, excavation grid 30 on figure 6).

4.11 Further nebulous earthworks to the east of the tower mark the site of the 1958-61 excavations and spoil dumps; a section of walling exposed in a small depression corresponds to the east side of the well to the north of Building 2 (excavation grid 11 on figure 6). Two prominent mounds to the east (“o”), between 1m and 1.5m high, coincide with the position of the excavated dovecote and lime kiln. Rimington and Rutter's earthwork description refers to two oval earthwork mounds 9.14m by 3.05m and 1.22m high in this location (Rimington & Rutter 1967, 47), while a photograph depicting the excavations in progress show two mounds either side of a slit trench (Rimington & Rutter 1967, plate 2). It is unclear whether the two surviving mounds represent excavation spoil or are a reconstruction of the existing earthworks; the former is more likely. Another low mound of loosely compacted material to the north of the tower might also be excavated spoil.

Terraces

4.12 To the north of the tower are the denuded remains of at least three terraces built into the natural hillslope. The southern-most terrace has a levelled area measuring c.120m east-west by c.15m north-south, its southern scarp marking the probable line of the north precinct wall (“b”) (see above). The east end of this terrace is terminated by a rectangular platform (“p”), measuring 17m by 3m, which might represent the site of a building or other structure; it is interesting to note that the east side of this feature is formed by a continuation of the east precinct wall, but on a slightly different alignment. There are two other narrower terraces to the north of this main terrace, with a further levelled area beyond, although this might be the effect of the natural line of the slope. The east ends of these higher terraces are left open while all the west ends are characterised by a southern curve which respects a northern extension of the west precinct wall alignment.

4.13 To the east of the east enclosure wall “a”, there are few earthworks apart from a very prominent 2m high scarp (“q”) which forms the south side of another terrace. This terraced area varies in width from 6m in the east to over 14m in the centre, the north side being defined by the natural slope. The scarp has the same alignment as that seen to the west (“b”), but it is clearly separated from it by structure “p”. The east end of the scarp within the Castle Field is marked by a scatter of rounded stones, but it can be traced for a further c.20m beyond here, gradually merging into the slope of the Forge Valley. A flattened strip at the base of the scarp, c.4m-5m in width, might represent the former line of a trackway. Some 20m into Castle Field, a spread and shallow south-facing scarp appears to diverge from the line of the trackway and runs south-west towards the centre of the east side of the castle enclosure or precinct (not shown on figure 8).

4.14 To the west of building “j”, beyond the footpath on the west side of Castle Field, is another prominent terraced area (“m”). Its east side is formed by a well-defined bank c.30m long and 0.75m high, perhaps representing the line of the west precinct wall or another prominent boundary, and the north end clearly runs over the tail of the large east-west scarp. The earthwork plan produced by Rimington and Rutter and the Ordnance Survey map of 1912 (25" sheet 93(3)) both show the north and south scarps continuing west beyond the present field boundary, but

these features have now been levelled as a result of residential development. Rimington and Rutter (1967, 34) note that this enclosure is the "place where the horses were exercised".

Hollow-way

4.15 A hollow-way, marking the line of a former road or track, runs along the southern boundary of most of the Castle Field. The north side is defined by a prominent scarp and the south by the existing drystone wall. The hollow-way may arguably once have entered Castle Field across the adjacent dam (see below), the dam effectively acting as a crossing point over a marshy damp valley bottom. The point at which the hollow-way enters the field is marked by a north-south section of stone wall ("r"), and the route continues west as a well-defined linear hollow between 1m-4m deep and c.5m wide for some 230m to a point to the south of the tower ("s"). The deepest section of the hollow-way lies beneath the presumed alignment of the south enclosure wall and an erosion scar on the northern scarp reveals a quantity of stone and rubble here. An alternative explanation for this erosion scar might be that it represents a ruined building, perhaps part of an ornamental or designed landscape providing a viewing point across the fishpond complex below (see below).

4.16 It is not possible to be precise about the course of the hollow-way beyond point "s". The excavation plan produced by Rimington and Rutter shows that this area coincides with southern part of the excavated kitchen range (excavation grids 37 and 39 on figure 6), the south wall of which matches the line of the existing drystone wall (see above). It is unlikely that the track would have terminated at the kitchen range, and so the alignment was presumably diverted south and then west, and there is a bank running to the west on the south side of the drystone wall; this alignment is continued to the west by the southern walled boundary of Castle Rise. A short curved section of the drystone wall at the entrance to the Castle Field utilises corbel stones from the tower in its capping, and this butts against a well-built corner of a field boundary which a map of 1795 shows represents the inside of a right-angled extension of Castle Rise (NYCRO ZDS V3/2 MIC 1476) (see figure 2).

The Fishpond Field

4.17 The field between the tower and the River Derwent is also approximately rectangular in shape, measuring 340m east-west by 110m north-south, and it contains the well-preserved earthworks of a set of fishponds (see plates 8 and 9). Not surprisingly, the ground is low lying, below 35m AOD, and is prone to flooding.

4.18 The north-east boundary of the field is formed by a raised bank 60m long, 1.5m high and c.5m wide. This substantial and massive feature is in effect a dam, positioned across this part of the river valley, to prevent water flooding the field and the ponds below. The dam is strengthened by having the majority of both sides revetted by stone walling, although in places the revetting has now collapsed to reveal an earth core. There is a butt joint in the revetment in the approximate centre of the north side, but this appears not to be of significance. Rimington and Rutter (1967, 36) note the existence of a possible weir in the river at the south-east end of the dam but no evidence for this remains today. To the north of the dam, there is a very slight rise in ground level in line with the point on the north face where the stone revetment ends. This rise can be traced north, and may define a sub-triangular pond once retained by the dam; the pond may have been as much as 40m wide by over 50m in length. The east-west footpath and trackway crossing the Castle Field (see above) continues

east beyond the survey area and slopes down towards the north end of the possible pond. It may have been used to bring animals down to the pond to be watered.

4.19 The main earthworks in this field form a set of linear ponds aligned parallel to the river. Water appears to have been channelled to the complex via a leat ("t"), which extends for c.100m north-east from the east end of the main pond; the leat must originally have been constructed to pass either through or around the north side of the dam to the east (i.e. near "r"), but no evidence for this now remains. The leat is on average 5m wide and 0.5m deep, and it appears to bend around a possible platform ("u") measuring 10m by 7m. At the point at which the leat enters the main pond, a channel allows water to be diverted to the south into a by-pass leat. There is a second channel into the main pond towards the western end of the by-pass leat, which then peters out to the west.

4.20 The main and largest pond in the complex ("v") measures c.70m long, and is retained by banks between 1m and 1.5m high. The east part is only c.5m wide and is separated from the west part by a narrower channel. This area is c.15m wide and there is a shallow ledge ("w") on the north side, marking another constricted passage. The by-pass leat allowed water to be drained into the area to the west of this ledge, and it is likely that additional areas of water were once ponded up between this point and a culvert to the west. A bank 0.5m high marks the northern limit of this water and the Ordnance Survey map of 1912 (25" sheet 93(3)), and the earthwork plan produced by Rimington and Rutter (1967, 48), show a southern bank and the by-pass leat continuing as far as the culvert; it appears that these earthworks have been covered by modern spoil and debris, possibly dredged from the River Derwent.

4.21 A further right-angled pond ("x") is located to the north of the main pond, one longer arm parallel to and the other shorter arm at right angles to the main alignment. Water entered this pond via a channel in the north-east corner of the main pond, but there appears to be no outlet drain.

4.22 A 19th century culvert at the west end of the fishpond complex allows water to run from the ponds into a farm complex to the west, while a second drain diverts water south-west to an abandoned 19th century sluice gate. This was formerly positioned on the side of the mill race which served the early 19th century High Mill; the race was probably infilled in 1963 (Rimington & Rutter 1967, 36).

4.23 On the north side of the ponds there is a further earthwork bank ("y") up to 0.5m high, running approximately north-south. Approximately half way along its length, there is a misalignment or kink; at this point, photographs of these earthworks taken from the area of the Castle Field suggest that another bank runs east and then returns to the north (see plate 8), perhaps defining an enclosure some 20m to 25m square. It may be that this enclosure is a later alteration, overlying the southern section of the bank. The bank is depicted on Rimington and Rutter's earthwork plan as being a "ramp" but no explanation is given as to its function.

4.24 Further west, to the south of a scarp possibly defining the course of the former road or track (see above), there is a prominent levelled area ("z"), measuring 55m by 20m. This enclosure is depicted on the map of 1795 (NYCRO ZDS 3/2 MIC 1476) with a rectangular building in the south-east corner; no earthworks of this structure remain. The 1795 map also shows that the north boundary wall had a more northerly alignment in this area. Only the east wall of the enclosure is shown on maps of 1838 and 1850 (NYCRO ZDS M3/3-4 MIC 1509), and the north wall has reverted to its present position. The enclosure is portrayed as an earthwork on

the Ordnance Survey map of 1854. There is another more irregular shelf of land to the south.

Re-interpretation of the earthworks

Pre-castle features

4.25 Quite clearly, the medieval manorial complex, including the tower house, did not exist in isolation, nor was it set down in a virgin landscape. Although a detailed understanding of the development of the local landscape around the complex would require examination over a much wider area, and further documentary research, a few tentative suggestions might be made.

4.26 It is noticeable that within the survey area, there are a series of terraces, most prominently that defined by scarps ("b") and ("q"), and also the scarp above the hollow-way ("r" to "s"), that follow a same broad orientation to the River Derwent. As such, their position may have been determined by underlying geology or the pre-existing natural topography. They may be natural features, but they could also be early agricultural terraces, pre-dating the medieval complex but subsumed into its form and partly shaping its layout and siting. It is also possible that some of them may be pre-medieval features. The terrace formed by the scarp "q" to the east of the medieval complex was previously thought to represent the line of a Roman road (Clark 1935, 144) and, although no evidence has been found to substantiate this, there may be the remains of a trackway running parallel to its base, with a shallow scarp leaving its south side to run towards the medieval complex. Any one of these features might be the remains of an earlier routeway, subsequently blocked by the east side of the castle enclosure or precinct. Perhaps the hollow-way ("r" to "s") to the south of the castle replaced an earlier route, which skirted around the south edge of the castle precinct, although again its relationship with the excavated buildings here is not clear. Rimington and Rutter (1967, 36) considered that terrace "q" was a later, rather than an earlier, road, although given that it clearly pre-dates the east side of the castle enclosure, this is considered unlikely.

The medieval complex

4.27 The excavations undertaken between 1958-61 demonstrate that the medieval manorial complex of which the tower house forms a part had been developing and changing over a period of at least 200 years. It is likely that the overall layout of the complex also developed over time, as may have the enclosure or precinct within which it sat. Nevertheless, the earthwork survey strongly suggests that the medieval manorial complex and tower house lay within a well-defined sub-rectangular walled enclosure or precinct (see figure 9), measuring some 120m east-west by 110m north-south. The 1958-61 excavations revealed that, on the east side at least, the wall was c.1.07m wide which, although not substantial, would have been sufficient to serve as a physical and legal boundary. The earthworks suggest that the wall probably continued around the north and the west sides; the southern alignment was not identified although the eastern part is likely to follow the top of a natural scarp, above a hollow-way or track.

4.28 Without further investigation, the precise alignment of the west precinct wall to the south of building "i" can only be assumed. It might, for example, have turned west to follow a well-defined scarp "c" and then south where there is a well-defined bank. More probably however, it continued south on an alignment matched by a boundary to the south of Castle Rise to form an almost square enclosure with the

5m wide gap between buildings “i” and “j” representing the main entrance; building “j” might therefore be a gatehouse. The line of another bank (“l”) could denote the wall-line of an internal enclosure (see figure 9); its proximity to the tower might suggest a garden area or a more private enclosure for the use of the inhabitants of the former. If properly screened, the existence of an enclosed garden area close to the principal entrance need not contradict its more private nature; at Ravensworth Castle, also in North Yorkshire, part of what appears to be a private pleasure ground was placed adjacent to the principal approach to the site but screened from it by a wall (Dennison, Holloway & Richardson 2006). A similar arrangement also exists at Haddon Hall in Derbyshire, the precinct layout of which shares other similarities with Ayton (Erik Matthews, *pers. comm.*).

4.29 It is quite possible that the main enclosure or precinct was sub-divided into different areas, and there may also have been associated yards or courts to the west flanking the principal entrance route. As mentioned above, Rimington and Rutter noted that local people knew the enclosure to the west of the site (“m”), which has since been divided by a modern field boundary, as "the place where the horses were exercised" (Rimington & Rutter 1967, 38).

4.30 The principal entrance to the castle enclosure or precinct therefore appears to have been located on the west side. However, Rimington and Rutter also suggest that the gap in the north-west corner of the enclosure marks the site of an entrance and gatehouse (Rimington & Rutter 1967, 36). It is unlikely that this was the main entrance, but it might represent a secondary access into fields to the north. Alternatively, it may have been created after the medieval complex had fallen out of use but while the enclosure still formed a useful unit, i.e. to house stock or perhaps even to form a small farm complex; Rimington and Rutter noted that the area to the south-west of the tower contained a number of crude unmortared walls apparently built after the castle had ceased to be permanently occupied, which they interpreted as being a series of cattle or sheep enclosures built in the 18th or 19th century (Rimington & Rutter 1967, 38).

4.31 As with the west side, the exact alignment of that part of the south enclosure wall to the west of the excavated kitchen range (“s”) is also problematic. The excavators considered that the east wall of the kitchen was sufficiently well-built to represent part of the precinct wall (Rimington & Rutter 1967, 44), and so the alignment might have followed this and then turned west along the north side of the former track; it is presumed that some kind of boundary would have been required to separate the castle enclosure from the public road. The possible line of the south enclosure wall might be depicted on the map of 1795, which also shows that the north side of Castle Rise originally extended further east before turning south (see figure 2). The short length of walling in the outside angle of the turn might represent the south end of the west precinct wall. The requirement to accommodate the south precinct wall and the track presumably accounts for the slightly curved southern boundary of Castle Rise. The 1958-61 excavations also revealed a section of substantial walling running south from the south-west corner of Building 3, which was matched by a large buttress on the north-west corner of the kitchen range (see figure 6). Given the possible alignments of the west and south enclosure walls, this might represent an internal gateway located on the east side of an open yard or garden.

4.32 Within the precinct, the earthwork survey has identified at least five possible rectangular buildings (“d”, “f”, “g”, “i” and “j”), a possible circular structure (“h”) and several other platforms (e” and “k”) which might contain further buildings; these are in addition to the six revealed by excavation (see figure 9). It is to be expected that

there would have been a number of buildings surrounding the main medieval residence, for example a bakehouse, barns, granaries and stables; the excavations revealed a kitchen range, service building and dovecote and the documentary survey suggested the possibility of a chapel. Four of the earthwork buildings ("d", "g", "i" and "j") are attached to the inside of the enclosure wall and as noted above, buildings "i" and "j" might have formed a gatehouse and associated structures. Building "f" may have formed a hall, associated with the tower house but not attached to it (Erik Matthews, *pers. comm.*); it is noticeable that both the tower and the earthwork are of a similar size and are on the same orientation.

4.33 All of the structures noted above are on a similar alignment to both the excavated complex and the later tower house, but without further archaeological investigation it is impossible to determine which phase of occupation they might relate to; some may even be associated with the pre 13th century activity represented by the black humus-rich soil identified in the north-east part of the excavations. The excavation report makes it clear that the surviving tower house was constructed over the west wall of Building 3, but it is uncertain as to whether it and the surrounding structures were deliberately levelled in the late 14th century to make way for the tower house, or whether they were already abandoned and/or demolished. It is also by no means certain that the precinct wall remained in use after the end of the 14th century.

4.34 Some of the other buildings revealed by the earthwork survey might have remained in continuous use, or even have been constructed at this time; the description of the site by Leland in 1534 (see Chapter 3 above) implies there were other buildings surrounding the tower at this time. The open-ended depression to the north of building "d" might be a quarry associated with the lime kiln, which was built in the late 14th century, and Rimington and Rutter (1967, 46) suggest that building "h" is a second dovecote which was used when the dovecote excavated to the east of the tower was abandoned in the mid 14th century. However, their earthwork plan shows a much larger structure which was not recognised in the more recent survey.

4.35 The surface earthworks may also reflect post-medieval activity, as well as different phases of medieval activity. Rimington and Rutter recorded that a considerable depth of 16th to 17th century domestic rubbish was spread over the excavated areas to the south and east of the tower (Rimington & Rutter 1967, 38); while those earthworks to the north-west of the tower appear to be "genuine", some of the more amorphous features, for example in the north-east corner of the enclosure ("e"), might result from dumped material. More importantly, it is clear from the short section of walling exposed to the east of the south-east corner of building "i" that there might be further buried features which are not visible as earthworks.

4.36 Finally, the function of the terraces to the north of the precinct remains uncertain. Assuming that the top of the scarp defining the southern terrace ("b") marks the position of the north precinct wall, the levelled area would lie immediately outside the wall. With the site of a building ("p") at the east end, it might be taken to form a garden terrace or ornamental walkway, with additional terraces to the north. Alternatively, this and the other slighter terraces above may relate to former agricultural activity, either pre-dating the castle or possibly contemporary with it.

The fishpond complex

4.37 The original 1993 survey stated that:

"The fishpond complex requires little interpretation. The earthwork features are characteristic of a medieval-type system with the leats being an essential feature of water management, allowing water movement into and out of the ponds to be controlled, usually by wooden sluices; a free flow of water to maintain the oxygen supply is essential to the keeping and rearing of fish in ponds … This particular set of ponds presumably dates to the 13th to the 15th century, when the occupation of the manorial complex was at its height" (Dennison 1996, 30-31).

4.38 This interpretation would appear to remain broadly correct, although developments in castle studies since 1996 would also introduce another possible element for consideration; that the fishpond complex and the earthworks to the north of it are part of an ornamental designed landscape. The study of castles has changed considerably in recent years, resulting in much discussion on the place of castles in medieval society and the validity of former interpretations. Until c.20 years ago, castles were viewed almost entirely in terms of their military role, and so all aspects of them were therefore interpreted from a military perspective, or placed within a military context. However, increasingly detailed fieldwork on the castles themselves and their surrounding environs now suggest that many of the "military" aspects of their structure and design are less convincing, and that the buildings themselves appear to be set within landscapes designed for pleasure, not war (e.g. Everson 1998; Taylor 2000). Probably the best known example of this revisionist work is Bodiam Castle in East Sussex, where it has been argued that all of the supposedly military features, such as gunloops and moats, were essentially created for the purposes of display, and symbolic and social statement (Coulson 1990; Coulson 1992), while the surrounding landscape, which incorporated water features, elaborate drives, planting schemes and viewing areas, were deliberately created to impress visitors, friends and enemies alike (Everson 1996).

4.39 This rejection of an overtly "military" analysis of many castles was accompanied, and to some extent preceded, by more detailed study of their social context, for example, the symbolism involved in the grant of a licence to crenellate (Coulson 1979). However, there are also dangers in over-emphasising the display and status elements of castles (Dixon 2002, 10-11), and so recent works tend to stress the complex nature of their structures, both in terms of their landscape settings and/or their social interaction with wider medieval society (Creighton 2002; Coulson 2003). For example, Johnson argues that it is the differences between castles that need to be considered, rather than trying to construct an evolution of types (Johnson 2002, 10), and so it may be better to discuss an individual site entirely on its own merits. Dixon makes a similar case for great towers and keeps, noting that almost every one is a unique building in itself and that any resemblance between sites is often the result of a convergence of design achieved through later modification (Dixon 2002, 12). The key in trying to interpret a castle site is therefore to recognise that it served a diverse series of needs which would have changed over time, and that contemporary perception, spatial arrangements and even the physical structure of the castle would have evolved to meet these needs (Creighton 2002, 1). Amongst many other things, castles are now considered to have acted as stage settings for the nobility, to represent ideas of late medieval elite identity, to have been gendered, to be a manifestation of lordly power, as well as having the no less important functions of administrative, economic and estate centres (Johnson 2002, 12-13 & 32-33; Coulson 2003, 89 & 187). Most recently, some criticisms of the move away from the defensive discussion of castles has appeared (i.e. Platt 2007), re-emphasising the defensive aspects of the structures in relation to late medieval social and political instability.

4.40 In the light of these developments, one might argue that the fishpond complex forms part of an ornamental landscape, perhaps partly contemporary with the tower house, and partly designed to be viewed from it, or from other "viewing points" in the immediate landscape (see Chapter 8 below). The north-south bank ("y") and the L-shaped pond ("x") may have served to enclose a garden or orchard area and, as previously noted, there is some evidence to suggest that this enclosed area was itself further sub-divided, perhaps in a number of phases; these sub-divisions are quite prominent on the 1968 aerial photograph, as are a number of other potential garden features in this area which were not identified by the earthwork survey (see plates 8 and 9). Perhaps the main pond ("v") did indeed form a medieval fishpond associated with the original manorial complex of the 13th or early 14th century, but it was then subsequently incorporated into a garden or gardens in the late 14th or early 15th century when the tower was constructed, when the right-angled pond ("x") and ramp ("y") were also added.

4.41 The river and ponds at the south end of the enclosed area would have helped to create a sense of a "watery landscape", argued to be an important element of many medieval designed landscapes. In addition to any views that may have been obtained from the tower house, there is also a good view from the hollow-way ("r") and it may be significant that the erosion scar on the north side of the hollow-way is in line with the enclosed area – could it be the remains of a shelter or other structure from which one looked out over the gardens? The provision of gardens at some distance from the main residence, rather than immediately adjacent to it, is paralleled at numerous other late medieval castle and residence sites, such as Barden Tower in North Yorkshire, a lodge thought to have been built by Henry Clifford shortly after 1485 (Moorhouse 2003, 345-348) or at Pendragon Castle, near Mallerstang in Cumbria (Erik Matthews, *pers. comm.*). Of course, were this to be the case at Ayton, then a route would need to be proposed which linked the tower house, the main enclosure and the garden area, either incorporating or by-passing the hollow-way ("r").

5 ARCHITECTURAL RECORDING

Introduction

5.1 The tower known as Ayton Castle was constructed in the late 14th or early 15th century, probably by Sir Ralph Eure who inherited a third part of the de Ayton estate in 1389 (see Chapter 2 above). Rimington and Rutter speculated that the master mason John Lewyn of Durham may have been involved in its design, on the basis that analogues can be found in Northumberland towers, and that Lewyn was known to the Eure family (Rimington & Rutter 1967, 7 & 28). However, Ayton is not amongst the works attributed to Lewyn by Harvey in his early study of English medieval architects (Harvey 1954, 166-169), while Hislop, in his recent detailed study of Lewyn's works, specifically rejects any such attribution. He argues that while the design of Ayton may well have been influenced by similar structures in Northumberland, for example the c.1390 Vicar's Pele at Corbridge, and it could have been built by a Northumberland master mason, stylistically there is nothing to link it to John Lewyn. However, Witton Castle (in County Durham and also built by Ralph de Eure), which Hislop describes as being quite different in character to Ayton, may have been strongly influenced by Lewyn's works elsewhere (Hislop 2007, 28).

5.2 The last recorded occupier of the tower was Edmund Mauleverer. He died at the castle in 1679 and from that date the condition of the castle began to deteriorate; an engraving of 1796 shows the tower in its present ruinous state. The basement was subsequently used as a cattle byre and there is a history of 20th century repair and archaeological investigation (see Chapter 3 above). The tower is presently surrounded by a wooden post and rail fence, located *c.*3m from the surviving walls, within a complex of well-preserved earthworks (see figure 9 and Chapter 4 above).

5.3 Where appropriate, the details gathered from the 1957 clearance work, the 1958-61 excavations (Rimington & Rutter 1967) and the 1993 survey (Dennison 1996), together with information from other secondary sources, have been included and updated in the following account, to provide a context for the new structural information gathered during the 2006 works. The numbering system used for the windows in the 1996 report is also retained here for ease of comparison.

Methodology

Pre-intervention recording

5.4 An initial pre-intervention photographic survey was undertaken on 22nd March 2005, using a medium format camera with perspective control and black and white film, with a 35mm format camera used for colour transparencies and colour prints. Digital photographs were also taken.

5.5 A detailed examination of those areas to be repaired and consolidated was then carried out from the scaffolding erected for the project in August 2006. The drawings and other records produced in 1993 were enhanced, and new plans and stone-by-stone elevation drawings were completed at a scale of 1:50. Photographs were taken as appropriate. Additional records were also made of mouldings and other architectural details not previously examined; this included an isometric drawing of the machicolations in the south-east corner of the tower and details of visible masons' marks.

Watching brief during repair works

5.6 A watching brief was also undertaken at periodic intervals during the programme of works to record items of interest that were revealed. Existing plans and elevation drawings were amended or enhanced as necessary, and a photographic record of the repair work was made using a 35mm colour prints and digital shots.

Definition

5.7 The question of the definition of Ayton Castle has already been raised (Dennison 1996, 32-33), but is repeated and updated here for convenience.

5.8 The castle is variously described in the literature as a pele tower (Rimington & Rutter 1967, 28; Russell 1923, 441; Department of the Environment 1986, 21), a tower house (RCHME 1987, 24; Hislop 2007, 28; Emery 1996, 297) or both (Pevsner 1966, 68). The problems of defining, and confusing, both types of structure have been discussed at a regional level (e.g. Dixon 1979; Ryder 1982, 82-88; Ryder 1990) and more recently within Yorkshire (Degnan 1993). The popular image of a pele tower is that of a free-standing defendable stone tower with an associated barmkin (a wooden palisade or stone wall enclosing a small yard) and possibly a few outbuildings, whereas a tower house is a strong defendable and crenellated hall house, with or without outbuildings, in which the rooms have been arranged vertically rather than horizontally. The pele tower is generally considered to belong to the vernacular whereas the tower house, as a building of a higher status social group, belonged to a more polite style of architecture, although as noted above, nomenclature is often confused, with Hellifield Peel, North Yorkshire, representing a solar tower that was remodelled as a tower house proper in the late medieval period (Ryder & Birch 1983). Both types of structures are usually associated with the border counties of Northumberland, Cumbria and south Scotland; however, as Emery notes, there are also a considerable number of examples in Yorkshire (Emery 1996, 283).

5.9 English Heritage, as part of their Monuments Protection Programme, have produced single monument class descriptions for pele towers and tower houses (Schofield 1989a; 1989b). Pele towers are considered to be usually constructed of drystone walls with an external stair and a barmkin which were used as defendable refuges, whereas tower houses are permanently occupied buildings characterised by thick stone walls, stone vaulted basements and crenellated towers. In more detail, tower houses are defined as being rectangular in plan and three storeys high with a roof walk. They usually have a ground or basement floor entrance, a stone vaulted basement and a spiral intra-mural stair with living accommodation in the upper levels. They generally date from the period 1350 to 1600 and represent a response by the wealthier members of society to the increasingly unsettled nature of the medieval and early post-medieval periods. On the basis of ground floor plan, four types of tower house have been recognised, Type 1 being rectangular without adjoining structures (Schofield 1989b, 3). Emery also notes that tower house rarely stood alone, but were protected by either an outer enclosure, moat or palisade (Emery 1996, 285).

5.10 On the basis of the English Heritage definition discussed above, Ayton Castle should be classified as a Type 1 tower house rather than a pele tower. It is referred to as a tower house throughout the following text, following the recent examples of Emery (1996) and Hislop (2007).

Location and Plan Form

5.11 As stated above, the tower house is located to the south-west of centre of a rectangular enclosure or precinct, once walled, and with surviving earthwork and buried archaeological evidence for a variety of internal structures (see figure 8 and plate 8). At present, it is bounded by grassed areas on all sides, the ground surface sloping gently upwards to the north, and gently downwards to the south until it meets a steep south-facing scarp adjacent to the field boundary which divides the Castle Field from the Fishpond Field.

5.12 The tower house is rectangular in plan, the existing remains measuring, at ground floor level, 16.95m long by 10.80m wide externally, with its long axis aligned approximately north-west/south-east (north-south) (see figure 10); as previously noted, the tower is assumed to be aligned north-south for the purposes of this description. The wall faces are set back on both internal and external faces between each floor (see plate 6) and there is a corresponding reduction in the thickness of the external walls; these vary from 2.50m in width in the north-west corner at ground floor level to 0.95m at parapet level. The only external doorway is located in the west wall at basement level (see plate 2).

Structure and Materials

Structure

5.13 The tower house is of three storeys, comprising basement, first floor and second floor, with a turret or other small projection at the south-east corner above the second floor. The south and east walls survive to the greatest height, almost to parapet level; the height from the ground to the highest surviving course is 13.55m. However, the north wall stands to first floor level only. Internally, the tower consists of a basement, divided into two rooms, each with a vaulted ceiling. This supported a first floor which, according to Rimington and Rutter (1967, 32-33), was initially a single space which was later sub-divided. The second floor may also have comprising a single space, but again there is some surviving structural evidence for possible sub-division (see below).

5.14 Access between the floors was achieved by the use of two intra-mural staircases between the basement and the first floor; no clear evidence for access to the second floor remains (see figure 10). The second floor was covered by the roof, suggested by Rimington and Rutter (1967, 35) to be of double-hipped form and originally covered with glazed tiles, later replaced by other materials. They also considered that the machicolated projection at the south-east corner had supported a turret, but with access to a wall-walk behind the parapet being through a continuation of the newel staircase at the north-west corner.

5.15 A chamfered plinth runs around the base of the tower house. On the south face, this lies above the first masonry course, c.0.20m above ground level. This line is continued along the west face, but to the north of the doorway it is stepped to a height of 1.00m to allow for the sloping ground. On the east face, the step has been obscured by the mortared rubble wall of the north side of a later latrine pit (see below), but a single vertically chamfered stone indicates its position. The first and second floor levels are defined by throated string courses or drip bands which project *c.*0.05m horizontally from the lower face (see plates 2 and 6). The drip band on the first floor is also stepped, on the west face. The upper surface of this band is chamfered, giving a similar appearance to the plinth, and there is a groove running along the underside, designed to carry rainwater away from the wall face.

All the string courses are present on the south face, occurring at the south-west corner 4.50m and 8.66m above ground level, but they survive only partially on the west and east faces. There is no evidence of any earlier or contemporary buildings having been attached to any of the external elevations, suggesting that the tower house has always been a detached structure.

5.16 The south-east corner of the tower house retains a set of machicolations which survives largely intact (see plate 6). They are carried on three corbelled ribs on both the south and east faces, each three courses high, projecting a total of 0.54m from the wall face (see figure 15). Although no structural evidence remains, it might be assumed that there was a similar arrangement at the south-west corner or perhaps all four corners; a fallen curved corbel stone was previously located on the ground under the south-west corner. Although ostensibly defensive, these features would also have contributed to the ornamentation of the building, and the number and arrangement of the windows and other openings demonstrates that defence was not a primary concern, although security most certainly was.

Materials

5.17 The tower house is constructed almost entirely of mortared ashlar blocks of local Lower Calcareous Grit (late Jurassic period), which is a soft yellow to brown sandstone containing distinctive light coloured coarse grained feeding tubes (Richard Myerscough, *pers. comm.*; BGS 2006 - see Appendix 3; see plate 2). Some mid-Jurassic sandstones have been used for the door and window openings, and there is a mortared rubble core of mixed geology. On average, the facing stones are 0.30m high and up to 1.10m long. The height of the coursing is uneven, with no apparent pattern to the distribution of deeper or shallower courses, although a possible alternation of deeper and shallower courses may be present in the upper part of the external south elevation. In several places, a single deep course is replaced by two shallower ones of the same overall depth mid-way across an elevation, while elsewhere there are slight misalignments in the coursing, although neither appear to denote any phasing sequence, the whole tower house apparently being of a single phase of construction. Although a detailed geological assessment of the stone has been undertaken (BGS 2006), it is not possible at present to say exactly where it may have originated or to locate any possible source quarries.

5.18 It was previously noted that the castle appeared to be well constructed (Rimington & Rutter 1967, 31). While some of the architectural details suggest this, for example the high quality work associated with the drip moulds of the string courses, other areas are particularly poor with uneven bedding and inconsistent coursing apparent in many places. The calcareous sandstone is generally a poor quality building stone, being soft, easily weathered and susceptible to spalling, and in some places the erosion makes many surviving details of moulding and other features unclear (see plate 10). In addition, differing mortars and the differential erosion on the exposed stonework attest to the periodic renovation of many areas of the internal and external faces.

Constructional techniques

5.19 Little evidence was uncovered during the Phase 1 works relating to the original construction period, for example building breaks, putlog holes etc. A single possible putlog hole was noted to the east of centre in the south elevation above the level of the second floor chamfered string. In the east elevation, three possible putlog holes were identified by the original 1993 survey, two at first floor level and a

third on the second floor, and the current survey recorded a fourth possible example to the first floor. Another possible example was noted just above the first floor string course to the west elevation.

5.20 During the 1958-61 excavations, the Scarborough Society took the opportunity to record the various masons' marks that were seen on the tower. These included erecting or positioning marks, so named because they were applied to a stone to indicate the correct relationship with adjoining stones, as an aid to construction. Examples of these marks were also found on the soffits of the surviving vault ribs in the basement rooms, where the centre line was inscribed (Rimington & Rutter 1967, 77-79).

Masons' marks

5.21 It appears that the recording of the other masons' marks on the tower house by the Scarborough Society was limited to those areas of the interior then fully accessible i.e. the basement, the remains of the north-west stair and the south-east stair passage to the first floor; it is not clear if the accessible parts of the external elevations were examined.

5.22 Their survey identified a total of 96 masons' marks, forming 26 different types, and this was taken to imply that 26 different masons had been employed at one time or another during the construction period of the castle. An analysis of the marks suggested either a break in construction or the employment of different masons from first floor level upwards, with two of the marks, the "hour-glass" and "W" forms occurring most commonly on more complicated pieces of masonry. These two latter marks were also found on a part of Seamer church believed to have been built before 1450 (Rimington & Rutter 1967, 77-79). However, some of the other masons' marks, such as several of the "X" forms, have been recorded in large numbers at Harewood Castle in West Yorkshire, which was built after 1366 (Richardson & Dennison, in prep.).

5.23 The 2006 survey identified a total of 17 masons' marks, all on the south external, south internal and east internal elevations. It is not possible to ascertain if any of these were included in the total recorded previously. Where possible, the marks have been classed using the same names established by the Scarborough Society, although four examples ("the half triangle", the "inverted-Y", the "V" form and the "single line") were of a type not previously recorded; it is acknowledged that some type attributions may be mistaken as a result of weathering. Included the latter, eight different types were recorded. The locations of some of the masons' marks are shown on figures 11 to 14, and the various different types and their distribution can be summarised as follows:

Type	South external	East internal	South internal
X forms	3	1	
Hour-glass forms	1		
Full Arrows	2	1	
Six-line forms	1	1	1
V forms	2		1
Half-triangle	1		
Inverted-Y		1	
Single-line		1	

5.24 It is not possible to draw any detailed conclusions from the limited number of marks recorded, as not all elevations of the castle were able to examined systematically. However, their broad distribution, particularly the lack of the "W"

and “hour-glass” forms above basement level, may support the previous conclusions that the more skilled masons were employed to cut (and perhaps also oversee the construction of) the rib vaulting.

5.25 The Scarborough Society also identified what they described as “symbolic” marks found on the ceiling slabs of the stairs passage at first floor level towards the head of the intra-mural stair rising from the south basement room. Four examples were identified, forming two sets of six-pointed stars. It has been suggested that these may have been made by the castle's inhabitants as "good luck" symbols (Rimington & Rutter 1967, 77-78).

External elevations

South elevation (see figure 11)

5.26 Prior to the 2006 conservation works, the masonry of the south elevation, although appearing to be well preserved, was in the worst condition of all the external faces with substantial areas of stonework having spalled. In the south-east corner, the wall survives to a height of 13.55m above ground level, possibly equating to one course above the parapet level. The south-west corner only survives to a height of 10.42m, the upper courses having fallen. Near the west end of this elevation, under the larger of the first floor windows, substantial mortaring and further repairs have been carried out, probably in the 20th century.

5.27 The chamfered plinth forms the second masonry course, 0.20m above ground level, while at the south-west corner the first and second floor string courses occur at heights of 4.50m and 8.66m above ground level. The plinth and string courses run horizontally along this face, although they are all in varying states of preservation; the chamfers on the plinth survive best at the east end, while sections of the string courses have been lost. The stones forming the plinth are on average 0.40m long, the stones forming the string courses being generally longer and shallower. A number of the individual stones making up the plinth and string courses appear to have been renewed in the past.

5.28 Above the chamfered plinth, the 1993 survey work identified several areas of 20th cement repointing (Dennison 1996, figure 17), the primary purpose of which appears to have been to infill several large cracks situated directly below the large first floor window (W1). To the west of the head of the uppermost crack, a renewed quoin at the south-west corner appears to retain a small square socket in the face.

5.29 The remains of four windows survive in the south elevation, identified as W1, W2, W3 and W4 on figure 11 (see also plate 15). The largest window (W1) is located at first floor level 2.60m east of the south-west corner and, although it would have been tall enough to either walk into from the interior or indeed to sit in, there is no surviving structural evidence for either a timber or stone external projection in the manner of an oriel. A number of quality dressings survive or have been renewed, particularly on the east side, but the outline form of the window is still recognisable. On the external face, the jambs are double chamfered and have rebates, with a groove clearly designed to take leaded glazing; this may have been fixed, or there may have been opening panes within the glazing, a form sometimes depicted on late medieval illuminations. To the front of the glazing, there was an external grille of closely-spaced iron bars, as evidenced by surviving recesses in the window jambs. Internally, the window jambs have a hollow chamfer and a deep splay. A stone in the upper right-hand (east) corner displays a square return to the external

chamfer and, assuming that the first floor string course formed the sill, the window would have had an approximate maximum height of 2.50m and a width of 1.02m, and may have had a square head, although little now survives. Internally the window is splayed to a maximum width of 2.50m; the lowest course forms a step having a narrower splay, and perhaps forms the remains of a window seat. Externally, several courses of stone including and below the string course have fallen out both above and below the window, perhaps as a result of the external barring being removed.

5.30 There is a second very small window opening (W3) to the east of the larger window, lighting the east end of the first floor intra-mural passage. This window was neither glazed nor barred, being 0.22m wide and 0.40m high externally, and widening to 0.86m in the passage.

5.31 There was once another large window (W2) at second floor level, located directly above that (W1) on the first floor, although it is now only clearly recognisable as such from the internal evidence. At either side, there are five ashlar courses of a splay, 2.40m wide to the interior; no details of any external moulding survive.

5.32 To the east, there is another smaller window (W4), set 1.70m west of the south-east corner and lighting the south-east corner of the second floor. The window is of similar form, although not identical, to a second floor window (W8) in the east elevation. It has a width of between 0.68m and 0.40m and a height of between 1.10m and 0.92m; it is chamfered externally and narrowly splayed internally, with flat lintel and sill, though these are weathered. There are two square sockets 0.03m wide in the left jamb, at 0.34m and 0.64m above the sill, the lowest of which is filled with a lead plug. These once housed an external iron grille; close examination of the lintel and sill during the conservation works established that the grille was divided into six parts of equal size.

5.33 A single putlog hole was identified by the original 1993 survey on the south elevation, measuring 0.19m wide and 0.10m high, and positioned almost centrally between the two second floor windows.

East elevation (see figure 12)

5.34 As noted above, the south-east corner of the tower survives to a height of 13.55m above ground level. This height is maintained for some 5.92m to the north, from where it falls to first floor level. The uneven coursing which characterises the tower is particularly noticeable in this elevation, for instance to the left (south) of the first floor fireplace below the string course, although this may be related to the construction of the intra-mural stairs here. The number of closers used to accommodate the windows is also a sign of poor workmanship, although these might possibly also relate to alterations to the windows. In general, however, the stonework on this face is in a much better condition than that on the south or west external faces, which are more exposed to the prevailing elements. The first and second floor string courses occur at heights of 4.50m and 8.66m above ground level and run horizontally throughout the surviving part of the elevation; the first floor string course is in good condition for much of its length, although a few of the individual stones making up the string courses and plinth had been renewed prior to the 2006 conservation work.

5.35 At the south-east corner, the chamfered plinth forms the second masonry course, 0.20m above ground level. This course extends horizontally for a distance of 11.20m, at which point it is butted by the vertical north side of an external latrine

pit. The plinth is not visible to the north of the latrine pit, but may once have been stepped as the surviving plinth to the west elevation is. The latrine pit measures some 1.80m in length (north-south) by 1.00m (east-west), and is clearly a later addition to the tower house, the vertical north side butting the chamfered plinth of the east elevation. The south side is defined by a small step with a gradual slope to the south, although this area was obscured by modern rubbish, stone and vegetation at the time of the inspection. The floor of the pit is of limestone slabs and at the base in the centre of the east side there is a square entrance to a culvert which, on excavation, was found to run east and south through the foundations of earlier adjacent buildings. The pit was positioned beneath presumed former garderobe projections on the first and second floors (see below).

5.36 Above the chamfered plinth, there are two complete windows at basement level, and the remnant of a third (see plate 10). The larger of the two complete windows (W5) is located 5.50m north of the south-east corner, and lights the southern of the two basement rooms. It has an almost identical moulding profile to the window (W10) in the west elevation, which lights the same chamber, although the embrasure to its rear differs slightly in form, being without a pointed arch and not chamfered, and, because of the intra-mural stairs in the south-east corner, it is not set directly opposite. Overall, the window measures 0.66m wide externally and is 0.30m wide at its narrowest, the splay widening to 1.98m on the internal face. The lintel is badly weathered and the sill is composed of two stones. There are internal and external rebates, and a number of bar holes for an external grille in the jambs. A staggered joint or building break may rise a short distance from the north side of the window head to the large hole at first floor level; the stone used in the construction appears to be slightly different either side of the “joint”, although this is not certain. The fragmentary remains of what may once have been a similar window lighting the north basement room are present at the east end of the surviving facing stone of the elevation.

5.37 To the left (south), and at a slightly higher level, there is a smaller, narrower opening (W6), which serves to light the lower steps of the intra-mural stair passage. It is 0.14m wide and 0.66m high, square-headed and plain chamfered on the outside. The window is slightly splayed internally, while internal rebates show it was designed to be fitted with shutters, probably of board form. A second window (W7), located on the first floor, illuminates the stair passage at a higher level. This measures 0.50m wide at the external face, with a deep plain chamfer to the sides, lintel and sill. It has a maximum height of 1.08m and a minimum height of 0.90m and internally it has a rebate and splays to a width of 0.57m. South of the window, there is an area of collapse, which has left an opening some 3.30m high and 2m wide; the collapse has occurred at the same place where the wall narrows markedly at the back of an internal fireplace. Beyond here, at the northern edge of the surviving part of the east elevation, there are the fragmentary remains of an internal wall face, possibly once part of a garderobe passage here.

5.38 The single surviving window at second floor level (W8) is narrow and square-headed, measuring 0.30m wide and 1.08m high. It is chamfered externally to both the sides, lintel and sill. To the interior it has a narrow splay and there is a suggestion of a rebate, but the stone is so badly eroded that this is impossible to determine with any certainty. To the north of the window, at the extreme north end of the surviving part of the elevation, there is a vertical break in the stonework which is associated with the position of a projecting feature, perhaps a garedrobe; three of the exterior stones project outward at a shallow angle, and would have provided support for this projection which was probably of stone but could have

been timber. Adjacent to the remains of this projection, slightly below the level of the parapet string course, the flue of the first floor fireplace is visible in plan.

5.39 Three possible putlog holes were identified on this elevation by the original 1993 survey; they are on average 0.20m wide and 0.10m high. One is located at first floor level, approximately midway between the window (W7) and the collapsed fireplace back, a second above and south of the latter and the third on the second floor to the south of the window (W8). In addition, the current survey identified a fourth possible example at the south end of the elevation just below the second floor string course.

North elevation (not illustrated)

5.40 This elevation did not form part of the 2006 conservation works, but the survey drawings produced in 1996 (Dennison 1996, figures 9 & 19) were re-examined in the field, and additional items were noted. The following text is therefore included here for completeness.

5.41 Relatively little of the external face of the north elevation survives, the maximum height being 2.34m (below first floor level), although the rubble core is present up to first floor level (see below) (see plate 5). The only course of facing stone to the to survive for the full length of the elevation is that at ground floor level. The chamfered plinth forms the second course of stonework, at c.0.60m above ground level, although it is for the most part poorly preserved. Generally, the visible rubble infill throughout the tower house is of little architectural significance. However, embedded in the material at the eastern end of this elevation are several architectural fragments, including the remains of a trefoil-headed window or window light, broken into four, and previously suggested to represent part of a window that was cut for the castle but subsequently never used (Rimington & Rutter 1967, 30). There are also two corners of chamfered window reveals and two sections of window jamb. Rather than being cut but not actually used, it is more probable that these architectural fragments were introduced into the core at a later date, perhaps during some of the previous conservation works to the tower house.

5.42 There is a single window opening (W9) in this elevation which, in its existing form, is almost certainly a later alteration to the building. Externally it is *c.*1.50m wide, with the chamfered plinth probably forming the sill, but its precise external form remains unclear. There is no ashlar to the splays or jambs through the walls, as occurs in the other windows, which suggests that the opening has been enlarged at a later stage.

West elevation (not illustrated)

5.43 Once again, this elevation did not form part of the 2006 conservation works, but the previous survey drawings and data (Dennison 1996, figures 10 & 20) were re-examined and additional items were noted.

5.44 The west elevation survives to a maximum height of 10.42m at the south end and 6.95m over the doorway. At the points marked by steps in the chamfered plinth and string courses, the ashlar is of poor quality with irregular coursing and small stones being used. The south-west corner also shows evidence of restoration and/or rebuilding. The 1993 survey recorded evidence for 20th century cement repointing across the lower part of the elevation, mostly located at or below the level of the chamfered plinth. At the south end of the elevation, the plinth runs at a

height of c.0.20m above ground level, although for most of its length it is obscured from view. On the north side of the entrance doorway (see below), the plinth continues at this level for 0.80m before rising vertically 1.00m to a new height of 1.08m above ground level and then continuing horizontally; the chamfer is retained on the vertical section. The first floor string course also retains a step, rising through 0.40m, although it is set some 0.70m to the south of that in the plinth. Only a short section of the second floor string course survives, at the south end of the elevation.

5.45 The only original entrance doorway to the tower house is located in this elevation, situated off-centre at basement level, some 8.64m to the north of the south-west corner (see plate 2). The doorway is 1.46m wide and has a maximum height of 2.20m and is formed by a shallow four-centred arch with a broad plain chamfer on the outside of the badly weathered jambs and arch. Five of the voussoirs are modern replacements and are of different lithology. They do not appear in a photograph taken before 1923 (Russell 1923) but were present in the late 1950s (Rimington & Rutter 1967, plate 3), and so can probably be assigned to the repair programme carried out by Colonel Dawnay in 1912; some of the uneven courses around the doorway may also belong to this work. On the inside of the doorway there is a hollow chamfer to the right (south) and a rebate to the left (north). In each side of the lobby, immediately behind the jambs, there are two blocked holes, c.0.15m square, which almost certainly represent holes for draw bars. There are also two iron pintels on the south jamb and a lock mortice on the north, as well as two stout square section posts just inside the doorway, and a number of other fittings. These are all associated with an iron gate which is pictured *in situ* in a photograph taken in the 1950s (Rimington & Rutter 1967, plate 4).

5.46 There are two windows at basement level in the west elevation, one either side of the doorway. To the south, a square-headed rectangular window (W10) has a worn and cracked sill. The head is chamfered, and appears to be a modern replacement as it is of a more gritty sandstone than the other masonry, and much of the stonework above has been heavily repointed with cement mortar, again perhaps during Dawnay's 1912 works. The window has a height of 1.08m and a width of 0.40m. The sides and top are plain chamfered and scars indicate the presence of external rebates. Internally, this window is deeply splayed with a second rebate on the interior and, although much of the masonry has been removed, it is possible to see that there was a flat sill inside the embrasure. To the north of the doorway, the second window (W13) is set higher than that to the south, some *c.*2.20m above ground level and 4.0m south of the tower's north-west corner. This window lit the main intra-mural staircase here and was originally 0.4m wide and at least 1.08m high; it was chamfered and rebated internally, and chamfered on the outside, but is severely weathered with only the sills and parts of the jambs remaining.

5.47 There is some surviving evidence for a single first floor window (W11), set some 4.50m north of the south-west corner. This appears to have been a large feature, perhaps once similar to the first floor window (W1) in the south elevation. The north side is the better preserved, standing to a height of 2.20m; only two courses remain on the south side, to a height of 0.60m. Both sides are splayed 0.80m into the wall, beyond which the ashlar and dressings are lost. The opening has a maximum width of 3.30m internally, narrowing to 2.50m externally. There was once another window (W12) above to the second floor, but all that remains of this are two courses on the south side of the interior elevation forming the beginning of the splay.

5.48 A blocked hole, 0.28m high and 0.10m wide, north of the south-west corner just above the first floor string course, may represent a former putlog hole. The recent mortar suggests that it was blocked in this century, possibly during repairs carried out in 1959.

5.49 During the conservation works, a fallen stone was recovered from the west side of the building beneath a window (W10). The stone was 0.42m long, 0.22m deep and 0.28m wide; it was moulded to one end, with a combination hollow chamfer and cyma recta over a second hollow chamfer. The form of the stone suggests that it came from some kind of drip course of perhaps a hoodmould, although the moulding is unlike any now surviving on the castle. It might possibly have come from a south-west corner turret, although this would suggest that any such structure was different to that to the south-east corner, or another structure to the upper part of the building that is now lost.

Circulation

Basement (see figure 10)

5.50 As noted above, the only original access into the tower house was through the doorway in the west elevation. From the doorstep, the floor level drops into a small lobby measuring 2.10m east-west by 1.75m north-south. The change in floor level is due in part to accumulated external debris; the 1958-61 excavations revealed the lobby to be paved with flagstones (Rimington & Rutter 1967, 31 & figure 2). On the north side of the lobby is the 1.20m wide entrance to the principal stair passage. No steps remain *in situ* and the passage contains accumulated rubble behind a modern iron grille blocking entry at the base. No steps were found during the 1958-61 excavations, although a blocking wall had been built in the 19th century to prevent cattle climbing the ramp (Rimington & Rutter 1967, 30), and any surviving steps may have been removed at this time. The ceiling of the stair passage currently rises at a steep angle, running straight for 1.15m before curving round to the east, from which point it appears to have taken the form of a newel stair. The newel form of the north end of the passage means that the external wall is at its thinnest by the stair window (W13), being reduced to two skins of ashlar some 0.32m thick. There is a recess in the east wall of the passage, perhaps a lamp or candle recess, its sill being cut into a block; the stone forming the back of this recess has been pushed out so that there is now a hole through this wall into the north basement room.

5.51 The basement proper is divided into two rooms by a partition wall 0.80m thick that runs east-west across the full width of the building. This would have been the main supporting wall for the vaulted ceiling and it is interesting to note that, while the upper courses including those containing the springers for the ribs are of relatively large blocks, the lower courses are built of a variety of smaller shaped stones which exhibit numerous interrupted bedding planes and vertical joints; this is particularly marked on the north face of the partition wall. The reasons for this are unclear but it may be connected to the fact that this area was less visible, and so the construction was of a lower quality. Although several areas appear to have been restored, the wall does not seem to have been rebuilt.

5.52 Each room in the basement has a barrel-vaulted ashlar ceiling, with a shallow arc and slight apex, 3.45m high in the north room and 3.30m high in the south (see figure 14). The ceilings of both rooms are supported by ashlar ribs, 0.48m wide and plain chamfered on both sides, which are spaced 0.70m apart in the north room and 0.60m in the south room; the springers are c.1.70m above present floor

level. Originally, the north room contained five ribs and the south room six, but in each case the westernmost rib has been removed apparently to allow the enlargement of a doorway (see below). The soffits of the remaining ribs still have a scratched centre line together with a number of masons' marks. To the sides of several of the springers, there are sockets which possibly supported timber formwork used during the construction of the vault above.

5.53 The floors of both rooms are presently covered with an uneven spread of compacted soil, rubble and other rubbish, the northern room containing a substantial mound of earth, presumably resulting from the 1958-61 excavations. It is almost certain that the floors would have originally had a flagstone surface, higher than at present, partly to assist drainage. The 1958-61 excavations showed that the floor levels were set "several inches" lower than that of the lobby but that the original floors had been removed. No evidence for a well or internal drains was found (Rimington & Rutter 1967, 31).

i) North basement room

5.54 The north basement room is accessed through a doorway at the east end of the entrance lobby, measuring 1.33m in width and 2.38m in height. To the lobby side, the jambs are square, but to the north basement the stonework is badly worn, perhaps a consequence of its use as a cattle shelter. However, a chamfer remains visible to both jambs, that on the north jamb surviving only partially, while a stone threshold indicates the former floor level. The pointed-arched head of the doorway has been damaged by the insertion of adjacent corbelled slabs to the ceiling, probably in 1912 (see below), although the stone forming the north side of the head still survives, as does part of that on the south side.

5.55 The north room measures 6.20m east-west by 5.90m north-south and was identified as a kitchen by Rimington and Rutter, presumably because of the large fireplace in the north part of the east wall. There are no surviving intact windows in this room but the centre of the east wall contains the south splay of a window similar to those in the south room (W5 and W10). Apart from two voussoirs of a chamfered arch, no details survive but a pre-1914 basement or ground floor plan published in 1923 shows this window *in situ* (Russell 1923, 441; see figure 5), although to what extent this depiction is diagrammatic or interpretive is unclear. A window in the north wall of the room (W9) is almost certainly a later insertion, or an enlargement of an original opening. The north wall also contains two other openings, one either side of a support for a vault rib, with sills set at different levels, the east being 0.20m higher than the west. The base of the embrasure slopes upwards towards the exterior in the eastern portion, but it is stepped in the west; this might indicate that these were originally simply two recesses. However, the right hand stone forming the sill of the eastern opening slopes upwards into the embrasure, and has an upwards return, suggesting that this sill is at the original height. The excavations of 1958-61 revealed the presence of coal deposits outside the opening together with the stumps of two wooden posts, suggesting a door. This, together with the proximity of a fireplace, led the excavators to conclude that the two recesses were originally cupboards or aumbries and that the back of the western recess was hacked through to provide a coal chute, probably in the 17th century (Rimington & Rutter 1967, 32). Hislop (2007, 28) mentions only a "single mural cupboard in the north wall", while Emery (1996, 297) states that "two aumbries in the north wall have been hacked into windows".

5.56 The fireplace is located in the north part of the east wall. Although much of the masonry has been robbed out, there are four stones within the core which form a

face at right-angles to the main elevations, and which may represent the north side of a flue. Rather than rising vertically, the flue is angled to the north, possibly to avoid an upstairs window or to link up with another fireplace higher in the building. Originally, the fireplace would have been narrower, having had to fit into the space to the north of the window, but at a later date it was evidently widened, as the fireback consists only of roughly mortared rubble. The remains of the left jamb of the fireplace are therefore probably original, but the right jamb, which retains a stop chamfer, clearly belongs to the later phase because it lies beneath the former window embrasure. The later, and surviving, hearth is c.1.30m deep (the wall being 2.85m thick), but the back has been extensively robbed out with the resulting hole reaching from the floor to the top of the vaulting.

5.57 At the west end of the south wall (i.e. the basement partition wall), there is a doorway, 1.93m high and 0.97m wide, which links the two basement rooms. The door jambs are roughly chamfered to the north, and there are rebates and chamfers to the south. The rebates are only present for the lowest 0.82m of the doorway, suggesting that it was either once lower than its present height or that the upper part has been rebuilt; this is also the opinion of Emery, who states that some form of opening between the two rooms was likely (Emery 1996, 298), in contrast to Rimington and Rutter who suggest that it was a wholly later insertion (Rimington & Rutter 1967, 31). Further evidence for raising/rebuilding is provided by the removal of the adjacent westernmost vault ribs and associated corbels and springers in both the north and south rooms; two of the rib pieces have been re-used to cap a section of stone wall at the entrance to the Castle Field. In the south room, the springer which partly obscured the door was cut, while in the north room the southern part of the rib was replaced by seven corbelled slabs, measuring up to 1.31m in length, 0.09m high and of varying width; the tooling on their surfaces and of the lintel suggests that they are probably the result of Dawnay's 1912 repairs.

ii) South basement room

5.58 The south basement room, because of its lack of any heating provision, was referred to as a buttery by Rimington and Rutter, a word originally meaning a bottle store but later used for a general food storage room; as noted above, the “buttery of Ayton Castle” appears in a document of 1537. The room measures 6.90m east-west by 6.20m north-south, the greater width as compared to the north room being due to a thinner west wall with no stair passage. A number of small circular recesses are located at periodic intervals along the walls, at various heights. These are likely to be of little architectural significance and, given that the basement was used a cattle byre during the 19th century (Rimington & Rutter 1967, 28), they may be associated with the provision of stalls.

5.59 The south room is lit by two windows, one in the west wall (W10) and one (W5) in the east. As has already been noted above, the internal details of the west window differ from that of the east, although both had flat or sloping bases. It is not clear why the rear arch of the east window should differ from that of the west, and why it should also lack a chamfer, but these differences may be attributable to constraints caused by the adjacent stair passage, rather than to differing phases of construction or the work of different masons.

5.60 The east wall of the south room also contains the doorway leading to an intra-mural stair passage at the south-east corner of the tower house. The doorway is 2.20m high and 0.80m wide, the lowest 0.90m of the opening some 0.20m narrower. The stair passage is narrower and steeper than the principal stairs at

the north-west corner of the tower house. The average height of the risers is 0.20m, as is the average width of the treads. The first step stands some 0.50m above present floor level of the south room, probably indicating that the room's floor level was originally higher although there could have been a temporary step. The stair passage turns through 90 degrees above the fifth step, then continues south up through the thickness of the wall. The passage has a stepped slab roof and is lit by two windows (W6 and W7) in the east wall, described above. The stairs terminate at the point where the passage turns west into the south wall, where it continues with a roughly flagged floor for 4.40m, splaying out slightly for the final 0.75m to accommodate an internal door (see below). This section is lit by a narrow squint (W3) in the south wall, also described above.

First floor (see figures 10, 13 and 14)

5.61 The principal stair at the north-west corner of the tower house enters the first floor to the north of a short spur wall, 0.65m thick and 0.90m long, which projects from the west wall. Any evidence for the floor surface is now obscured by a grass covered mound, but the excavation work done in 1958-61 revealed evidence for a number of features (see figure 7). The excavators were of the opinion that the first floor had once been formed by a single space but "at some early period" a small room was created at the north end through the erection of a "comparatively poorly-built wall" (Rimington & Rutter 1967, 32-33); unfortunately, no details are given as to the materials used in the wall, but it was presumably of stone. The room was entered via a doorway in the west wall, presumably opening off a small lobby at the head of the principal stair, and it was heated by a brick hearth in the north wall. The south wall of the room was in line with the surviving spur wall projecting from the west wall, and the excavator's plan shows a second doorway between the two (Rimington & Rutter 1967, 25 & 32-33). This area is now grassed, and none of the excavated features remained visible in either 1993 or 2006.

5.62 The internal walls at first floor level survive to various heights. The south wall and the southern 9m of the east wall stand to the full height of the first floor (c.4.80m). The west wall has an average height of 2.60m, although the south-west corner rises to 6.40m. The northern part of the east wall and the whole of the north wall do not survive above floor level. Generally, the interior faces of these walls appear to be well constructed, although there is some evidence of irregular bedding in the east wall. As stated above, the first floor appears to have originally have been formed by a single space, 7.55m wide (east-west) and originally c.13m long (north-south), but was then shortened to 9.40m with the insertion of another room at the north end. The main room was lit by at least two windows (W1 and W11) in the south and west walls respectively and heated by a fireplace in the east wall, and with an intra-mural stair passage in the south wall leading down to the south basement room.

5.63 As noted above, a large fireplace in the east wall provided heating for the main room (see figure 14). Like that in the basement, it has been substantially robbed out, although the jambs are largely intact; three holes in the lower courses of the left (north) jamb face across the hearth and these were presumably meant to take part of an iron grate (see plate 13). Both fireplace jambs retain chamfer stops on their very lowest courses. Above this, the fireplace (with a maximum width of 2.70m) rises with a curving taper, the flue at 3.50m above floor level being only 1.20 wide. The height of the lintel is not discernible, but a facing stone to the right, 1.50m above the floor, projects out from the jamb and therefore probably sat above a lintel. Some of the ashlar at the fireback survives and there is a thin core between this and the stonework of the east elevation. Above the fireplace

opening, recent repairs have been carried out, possibly in 1959, to consolidate the wall while the flue has been blocked with a reinforced concrete slab at a height of 4.46m above present first floor level; some resetting of the rubble core has taken place, probably at the same time as this action.

5.64 To the north of the fireplace, a reveal or return, now only a single course high, runs through the wall at 90 degrees to the internal east elevation. There are also three stones in the floor here that appear to represent the remains of a structure. The 1958-61 excavators speculated that there had been one or more garderobes in the wall at this point, accommodated in a projecting structure, and this seems likely given the presence of the latrine pit directly below (Rimington & Rutter 1967, 33). They postulated more than one garderobe, as they thought the small later room at the north end of the first floor would have had needed access to its own garderobe, although this is not certain. To the south of the fireplace, a staggered building break appears to rise from floor level and run upwards from north to south to a height of c.2.30m.

5.65 The internal west wall was not scaffolded as part of the 2006 works and so only limited observations can be made beyond those already made in 1993. There was formerly a large window (W11) positioned in the southern part of the wall, and a wall spur projecting from the face directly to the south of where the principal stair rose from the basement. In 1993, it was noted that a large stone incorporated in the west wall at this point had a chamfer sloping to the north. This is of uncertain function but it may indicate the presence of an intermediate floor at this northern end, perhaps a gallery above one end of a larger room.

5.66 The south wall of the first floor contains a single window (W1) adjacent to the doorway giving access to the south basement room via an intra-mural stair passage (see figure 10). Small rectangular recesses cut into the east jamb of the window probably once supported internal board shutters, while in the base of the feature, slightly projecting stones at either side almost certainly form the remains of window seats. The doorway to the stair passage is 0.75m wide and 1.84m high and there are two holes inside the passage in the west wall, at 0.35m and 1.53m above floor level. These are probably from the original door pintels, and the presence of a door opening into the passage would explain the slight splay in the south side of the passage at this point. There are also three iron bolts here, clearly associated with a later grille formerly positioned across this opening. On the room side of the doorway, there are three more holes, two on the east jamb and one on the west, each about 0.08m in diameter, probably representing the remains of door fittings from a different phase.

5.67 The north wall of the stair passage is formed by a single skin of ashlar, 0.20m thick; there is a small square hole to the east of the door which runs the full width of the wall, and may once have been used to house a lamp. The roof of the stair passage is constructed of flat slabs lain across its width and it is lit by a very narrow window (W3) at the south-west corner and a larger window (W7) at its northward return. It is not clear as to why the stair passage extends so far along the south wall of the first floor, when it could have opened into the south-east corner; presumably there was a desire to place the doorway towards the centre of the south wall, perhaps to accommodate whatever functions the first floor was put to.

Second floor (see figures 10, 13 and 14)

5.68 The only access to the second floor appears to have been via a continuation of the principal stair at the north-west corner. The 1958-61 excavations uncovered a single step at the north end of the small first floor north-west corner lobby or landing, apparently the foot of a stair rising upwards to the north, and presumably either curving around tightly in an anticlockwise direction or being angled through the wall thickness here (Rimington & Rutter 1967, 33).

5.69 Only sections of the south and east walls survive to their full height (c.4.70m) on the second floor, with a very small part of the west wall in the south-west corner. The second floor was supported on a timber floor, a remnant of which survives above the internal set-back on the east wall. Above this set-back, at least four 0.20m square joist recesses are visible within the rubble core; at their south end, there is a larger recess 0.40m wide and 0.48m high, located almost directly over the first floor fireplace and presumably representing the position of a much larger timber. All these recesses have now been blocked with mortared rubble, probably during the 1959 or later repairs. There is no clear evidence for a north-south aligned spine beam in the south wall, although it is noticeable that there is a change in level at the end of the surviving uppermost first floor masonry course. This level change is located in the approximate centre of the wall, and so might be related to a large north-south timber formerly housed here. Were this to be the case, then the timber floor-frame of the second floor may have been divided into four or perhaps even six areas of roughly equal size by the larger timbers, with each area crossed by east-west joists set between these timbers and the stone room walls.

5.70 It is not clear from the surviving structural evidence if the second floor was formed by a single space, or sub-divided. The southern part was lit by narrow square-headed windows (W4 and W8) in the south-east corner, with larger windows (W2 and W12) in the south-west corner. In the south wall, what appear to be approximately vertically aligned sockets are placed mid-way between the narrower and larger windows, with a second shallow recess visible to the west of the upper socket. A similar recess at about the same height is visible in the east wall, between the narrower window and the probable garderobe, and there may be a blocked socket at the same level c.1.40m to the north. One interpretation of these features might be that they represent the remains of a small area in the south-east corner of the second floor that was partitioned off, perhaps using wooden screens, and this might be supported by the smaller size of the windows here. Alternatively, their position midway between windows and other features could suggest that they are the result of wall-mounted sconces having been removed at a later date.

5.71 Towards the centre of the east wall, there are the remains of a projecting feature, interpreted by the 1993 survey as a garderobe, although at that date no detailed inspection was possible. The feature comprises the fragmentary remains of a narrow passage or space contained within the thickness of the east wall. As noted above, three exterior stones on the east side of the feature project outwards at a shallow angle, while the remains of a flagstone floor here also angle outwards in the same manner. Taken together, the evidence suggests a projecting stone structure; given that this projection is situated above the ground floor external latrine pit, its interpretation as a garderobe, rather than the remains of another structure such as an oriel, seems likely.

5.72 Although the flue from the first floor fireplace passes through the east wall close to the south of the garderobe, no fireplace is apparent at second floor level in the

portion of the east wall which survives. There must surely have been some heating provision to the second floor, and perhaps a fireplace was located either at the north end of the east wall or perhaps in the north wall. There is similarly little evidence for the form of any roof structure over the second floor, and whether it was ceiled or the roof trusses left on view. A slightly projecting stone at the southern end of the uppermost course of the east wall might be interpreted as a corbel to support one end of a truss; similar slightly projecting stones can be seen in the same position towards the east end of the south wall. The 1958-61 excavators suggested that common rafters may have rested on the ledge running around the top of the east and south walls, and that the roof may therefore have been double-hipped, forming a flat pyramid (Rimington & Rutter 1967, 35). Such a roof type has been noted on other tower houses of similar design (Dixon 1979).

5.73 The distribution of roofing tiles found during the 1958-61 excavations suggest that the tower house may originally have been roofed with relatively heavy and coarse olive-green glazed clay tiles in the late 14th/early 15th century; by the 17th century, these may have been wholly or partly replaced by a heavier and coarser unglazed tile (Rimington & Rutter 1967, 67). No tiles were found in the debris at first floor level, suggesting that the roof covering had been deliberately removed rather than being allowed to collapse. However, at basement level, numerous fragments of red roof tile and perforated limestone slates were recovered (Rimington & Rutter 1967, 35), although it is not certain that these came from the tower house, and they may simply have been dumped here at a later date.

Parapet level (see figure 10)

5.74 In the absence of any other evidence, it is assumed that access to parapet level was via a continuation of the principal stair in the north-west corner of the tower house. This would presumably have lead to a walkway positioned behind an embattled parapet, although no evidence for such was exposed during either the 1993 or the 2006 surveys; prior to the 2006 works, the tops of many of the walls were covered in a hard cement mortar, probably applied during the restoration works carried out in 1912 and/or the 1950s.

5.75 The walkway may have given access to a small turret at the south-east corner of the tower house, carried on the set of machicolations that survived largely intact here, although at the time of the 2006 works in poor structural condition. The machicolations were taken down and rebuilt, with some stones being replaced as part of the 2006 works, and so it was possible to see how they were constructed (see figure 15). There were three projecting corbelled ribs on both the south and east elevations, with a further rib set at the corner; each rib was three courses high (a total of 1.03m) and 0.30m wide (see plate 11). The ribs supported further corbelled stones, forming a capping course, within which there were once at least four square holes (see plate 12); in theory these allowed the dropping of missiles onto assailants in the event of an attack. The central corbelled stone to the capping course on the south side had been lost, but to the east, the capping remains intact.

5.76 Each corbelled rib was made up of three courses, each course comprising a single stone, c.0.95m in total length. The underside of the outer end of each stone was rounded, and each course projects *c.*0.18m out from the face of the stone below. The capping course to the east face comprises a rectangular stone to the north end, a central T-shaped stone, and large sub-rectangular corner stone, containing two triangular openings and possibly made up of two separate sub-triangular pieces of stone. It is assumed that the capping course to the south face was once

similarly constructed, but the T-shaped central stone has since fallen or been removed. All the capping stones had a flat upper surface with a plain chamfer on the upper, outer, edge and with both a shallow plain chamfer and a deeper hollow chamfer on the underside. The shallow plain chamfer running around the upper edge of these machicolations continued along the wall faces to the north and west, cut into a drip band along both the south and east faces, that on the south face being badly eroded.

5.77 It might be assumed that there were originally matching machicolations and corner turrets at the other three corners of the tower house, although this is not certain, and they may have been present only on one side or perhaps even only at one corner. However, the collapse of the upper levels of the tower house is such that few other features survive at parapet level. A small elliptical spout hole lies approximately half way along the south elevation, cut between the top two courses, leading rainwater out over the drip band. Some 8m to the north of the south-east corner of the tower, in the centre of the thickness of the east wall, is the top of a square chimney, 0.40m wide. This represents the top of the flue from the first floor and slates had been mortared around the edge of the hole, probably to block it, as part of the 20th century repairs.

6 SUMMARY OF ECOLOGICAL SURVEY WORK

Introduction

6.1 As noted in Chapter 3 above, a programme of ecological survey work was undertaken in advance of the 2006 repairs. This work covered the ruined castle and the surrounding fields, and comprised a Phase 2 Habitat Survey and a summer Bat Survey, and was designed to inform the architect's specification for the repairs (Holloway 2005). A copy of the full report appears as Appendix 2, but a summary is provided here for completeness. The survey confirmed the presence of bats at the castle, and so further bat survey work was undertaken prior to and during the repairs to comply with the appropriate regulations and legislation.

Survey Methodology

6.2 Existing available ecological data from a 1km radius around the site was collected and assessed, and the location and nature of any designated sites in the vicinity were recorded. A Phase 2 Habitat survey was then undertaken on 29th July 2005 by Dr Madeline Holloway of EINC, using the standard methodology devised by English Nature. The vegetation surrounding the castle was mapped and a series of seven target notes were produced to provide supplementary information relating to species composition and structure, evidence of management regimes, habitats too small to map, and transitional or mosaic habitats. Sufficiently detailed vegetative descriptions were recorded so that basic National Vegetation Classification (NVC) categories could be assigned. All the hedgerows surrounding and within the site were also assessed.

6.3 In order to gather information on the bats which were thought to populate the castle, a daytime external and internal inspection of the accessible stonework was also undertaken on 29th July 2005. Each part of the castle was systematically searched for bats, bat droppings and any other signs beneath potential bat roost sites.

Survey Results

Improved grazed pasture

6.4 The remains of the castle stand in a small area surrounded by tall nettles within a wider cattle-grazed pasture which extends over the majority of both the Castle Field and the Fishpond Field. Despite the presence of earthworks, this pasture has undergone some agricultural improvement in the past which has resulted in a species-poor sward and patches of tall weeds. This equates to NVC MG6 *Lolium perenne - Cynosurus cristatus* grassland.

6.5 Such species-poor, cattle-grazed, grassland is a ubiquitous habitat in Britain and often forms the bulk of dairying and fattening pasture in many parts of the country. It is likely that both the Castle Field and the adjoining horse-grazed pastures to the south have been subject to an extension of grazing into late spring/summer and to agricultural improvement by the application of artificial fertilisers. These measures tend to reduce species diversity and favour the dominance by grasses, both of which were apparent in all the fields that were surveyed. The nature conservation value of these pastures is therefore considered to be generally relatively low.

Semi-improved cattle-grazed pasture

6.6 The steeper thinner-soiled slopes in the north-east corner of the Castle Field had largely escaped the above improvements and distinct zonations to more calcareous, unimproved species-rich grassland (MG5) were evident. Several meadow species (*Cynosurus cristatus* - *Centaurea nigra* grassland) persisted on the steep slopes. The latter represents one of the rarest and most endangered grassland types in the UK and North Yorkshire, and this part of the pasture almost meets one of the criteria thresholds for the selection of Sites of Importance for Nature Conservation (SINC). Additional ecological interest is also given to this part of the field simply by its proximity to the Raincliffe and Forge Valley Woods SSSI. As a consequence, the eastern third of the cattle-grazed pasture is considered to be of at least of District ecological value.

Hedgerows

6.7 Most of the hedgerows bordering the survey area were species-poor and of only local ecological interest. However, the exception was the hedgerow that separates the Castle Field from the Fishpond Field, which was overgrown and species-rich. This hedgerow fulfils the criteria to qualify it as “Important” under the Hedgerow Regulations of 1997, and is therefore considered to be of District ecological value.

The ruined castle

6.8 Parts of the external stonework of the castle were obscured by vegetation at the time of the survey. A young sycamore (*Acer pseudoplatanus*) had grown up beside the main basement entrance, obscuring the window (W11) here, and ivy (*Hedera helix*) had grown over some of the stonework to the north around another window (W13). Other shrubs here included elder (*Sambucus nigra*). A thin soil had accumulated on the top stones of the castle, where a grass dominated flora was recorded. A row of four mature lime (*Tilia vulgaris*) were located parallel to the north side of the castle at a distance of c.10m. A mature sycamore (*Acer pseudoplatanus*) stood c.25m to the south-west of the castle.

Bats

6.9 No signs of any bats were recorded in the assessable external stonework of the castle. However, three pipistrelle bats (*Pipistrellus* sp.) were recorded roosting in the north basement room; two were located between the vaulting of the room and another was in the stonework forming the south elevation. It is possible that these bats may also use the basement for hibernation purposes. The presence of bats within the castle is therefore considered to be of at east District ecological importance. It was further concluded that all the hedgerows and isolated trees within the survey area, as well as the adjacent River Derwent and the Raincliffe and Forge Valley woodland, are good foraging areas for bats.

6.10 All species of bats are protected under Regulation 38 of The Conservation (Natural Habitats etc) Regulation 1994 and under Section 9 of the Wildlife and Countryside Act 1981. A bat roost is defined as “any structure, or place, which is used for shelter or protection”, irrespective of whether or not bats are resident. The Regulation and Act make it illegal to deliberately kill, damage, take or disturb bats, or to destroy, damage or obstruct access to a bat roost.

Recommendations for additional survey work

6.11 It was recommended that further survey work was undertaken to confirm whether the identified bats were using the basement of the castle for hibernation purposes. Additional bat survey work would also be required to support the application for a bat licence which would be needed to allow the 2006 repair work to proceed, as this work would have short term disturbance and possibly long term impacts to the resident population. The results of this additional bat survey work are summarised below.

6.12 It was also recommended that a great crested newt survey should be undertaken in the Fishpond Field to the south of the castle, should any other conservation works be required in this area.

Bat Licence Application

6.13 In order to obtain the necessary Bat Licence from DEFRA, additional bat survey work was undertaken by Dr Madeline Holloway of EINC on 28th March 2006 (Holloway 2006). In addition to the three bats (subsequently identified as brown long-eared bats *Plecotus auritus* spp. rather than pipistrelle bats) noted above, a further four brown long-eared bats were roosting within the castle basement; two in the south elevation of the north basement, one in the north elevation of the south basement, and one between the roof stones of the main entrance. The maximum number of bats on the site were therefore estimated to be c.10, mainly using the castle as a temporary summer roost although some individuals were also using it as a winter roost.

6.14 A mitigation strategy was then prepared to reduce the impacts of the proposed 2006 repair work. This strategy included the following measures:

- the scaffold was recommended to be erected in May-June 2006, when disturbance to the bats would be minimal;
- the scaffolding was not be sheeted or netted to allow bats to continue to use any external roosts;
- further inspections would be carried out from the scaffolding during the two-three week period of archaeological survey prior to any repair work starting, as well as during repair work, to allow any further bat roosts to be identified and recorded;
- any crevices showing signs of bat activity would be left unmortared and undisturbed, to allow habitation to continue;
- bat boxes would be erected in the adjacent mature sycamore tree and on the castle fabric, to provide alternative shelters should the bats be disturbed by the works;
- a monitoring plan would be put in place to assess whether the bat population had responded well to the mitigation, and to inform ongoing roost management.

6.15 On the basis of the documentation supplied, a Bat Licence (WLF 023227) was issued by DEFRA, for the period June 2006-June 2007 to Dr Holloway, on behalf of Scarborough Council.

Results of Additional Inspections

6.16 Several more site inspections were carried out from the scaffolded structure before, during and after the repair works, in accordance with the Bat Licence, as follows.

Visit 1: 4th August 2006

6.17 The first visit meant that a closer inspection of the vegetation covering the uneven surface above the vaulted basement could be made. A range of grasses and herbs had colonised this area, including false-oat grass *Arrhenatherum elatius*, red fescue *Festuca rubra*, hogweed *Heracleum sphondylium*, nettle *Urtica dioica*, yarrow *Achillea millefolium*, cow parsley *Anthriscus sylvestris*, cleavers *Galium aparine*, ragwort *Senecio jacobea*, ribwort plantain *Plantago lanceolata*, nipplewort *Lapsana communis*, black medick *Medicago lupulina*, black knapweed *Centaurea nigra*, and bird's-foot-trefoil *Lotus corniculatus*. Seedling and sapling woody species were also scattered in this area including rose *Rosa* spp., elder *Sambucus nigra*, and sycamore *Acer pseudoplatanus*. Other plants recorded in small corners where soil had accumulated included cock's-foot *Dactylis glomerata*, common mouse-ear *Cerastium fontanum*, rye-grass *Lolium perenne*, common mallow *Malva sylvestris*, and dandelion *Taraxacum* spp. None of these plants were particularly uncommon in this locality.

6.18 No bats were recorded anywhere on the castle at this time, but nine crevices in the stonework of the south external elevation were considered to have some bat potential and some had bat droppings within them. Another crevice on the east external elevation was also noted. These crevices were marked, and were to remain open and undisturbed by the repair work.

Visit 2: 11th October 2006

6.19 The presence of ferns such as male fern *Dryopteris felix*-mas and maidenhair spleenwort *Asplenium trichomanes* attested to the damper conditions in the chimney of the east elevation. These ferns are not particularly uncommon and their local populations would not unduly suffer if the plants had to be removed as part of the repair works.

6.20 Two brown long-eared bats *Plecotus auritus* were recorded in crevices in the stonework of the south elevations of both the north and south basements. Unfortunately, most of the bat potential crevices on the south external elevation had been infilled, and so these were dug out and reinstated by the Contractor.

Visit 3: 23rd November 2006

6.21 The bats previously noted in the south elevations of the north and south basements were still present on site, and a further brown long-eared bat *Plecotus auritus* was recorded in the vault of the north basement. A bat box was erected in the corner of the south elevation in the vicinity of window W4, and two other bat boxes were erected in the mature sycamore tree adjacent to the castle.

Visit 4: 13th June 2007

6.22 A pre-emergence examination of the north and south basements was undertaken. One brown long-eared bat *Plecotus auritus* was recorded hanging from a crevice in the vault roof, in the same position as that seen on 29th July 2005 and 23rd

November 2006. No bats were recorded in the crevices in the south and east external elevations, and none of the bat boxes showed evidence of use.

7 SUMMARY OF REPAIR PROGRAMME

Introduction

7.1 The following text provides a summarised account of the 2006 repair programme undertaken on the castle structure. It is largely drawn from records kept by the project architect and has been supplemented by observations made by EDAS and photographs supplied by the Contractors, Historic Property Restoration Ltd (HPR).

7.2 The previous 1996 report contained proposals for the consolidation and limited restoration of the castle (Dennison 1996, 49-60). These recommendations were taken on board, and updated and prioritised by the project architect, and a specification for the Phase 1 repairs was produced in June 2006 (Purcell Miller Tritton 2006). Budgetary and time constraints meant that the works were limited to the upper levels of the castle, and the work was carried out by HPR between July and November 2006.

Conservation Philosophy

7.3 The principles of repair and management for the castle as a whole were outlined in the previous report (Dennison 1996, 51-53), while the subsequent specification set out the approach and procedures that were to be adopted (Purcell Miller Tritton 2006, 33-44).

7.4 The conservation philosophy for the site as a whole, and in particular for the 2006 repairs, can be summarised as follows:

- the principal of “consolidate as found” would be followed, in accordance with best practice, with any rebuilding or replacement kept to an absolute minimum to preserve the historic integrity of the remains;
- any interventions, e.g. new mortar or stonework, would match the existing as closely as possible, with fallen stone etc being utilised as appropriate;
- previous interventions would be respected where they are not harmful to the long-term well-being of the remains;
- new pointing would be undertaken only where necessary, i.e. no repointing where the original mortar is in a good and stable condition;
- there would be minimal intervention to the plant, lichen and other vegetation growth, i.e. only those items causing damage to the fabric (e.g. saplings and ivy) will be removed;
- architectural and archaeological recording would be carried out prior to, during and in some cases after the conservation work.

Summary of Repairs

7.5 The 2006 fabric repairs undertaken to the upper levels and wall tops of the south and east elevations (i.e. above the upper string course), both internal and external, comprised three main conservation activities, namely repointing, limited rebuilding and rebedding, and selective stone replacement. Full details of the methodology used are contained in the architect’s specification (Purcell Miller Tritton 2006, Section 4). For the most part, the methodology detailed in the architect’s

specification was followed, although some minor alterations arose once the fabric was able to be viewed close up from the scaffolding, for example in determining the amount of repointing and stone replacement required.

7.6 Details of the completed repair works are shown on the "as-fixed" drawings produced by the project architect (ref 230537-200-203 dated June 2005), copies of which are reproduced as Appendix 4.

Repointing

7.7 To facilitate the repointing, a natural hydraulic lime powder was mixed with grit sand and water (1 part lime to 3 parts sand for general pointing) and a test area applied to the east face adjacent to the machicolations in order to compare its appearance to the original. NHL 3.5 was used for wall tops and exposed masonry with NHL 2 used for general pointing. When this had been approved by the project architect, repointing commenced according to the specification. As a general rule, areas of original pointing which had failed or decayed away were cut back at least by 40mm to a solid face. The new mortar was applied flush to the face and then allowed to dry for a period of c.2-4 hours before being roughened with a stiff bristle brush using a stippling motion to create an uneven weathered appearance capable of shedding water; the new mortar will take several years to fully harden but it was initially protected from wind, rain and frost for some two weeks by damp hessian or canvas sheeting. Very fine joints were repointed with the same mortar, but with some of the larger grit having first been sieved out.

7.8 The repointing work was confined to the upper levels of the south and east external and internal elevations, which were in the worst condition; 100% repointing over the whole of these areas was carried out. A total of ten vertical joints on the south external elevation and one on the east external elevation were left open to provide a roosting habitat for bats.

Rebuilding and rebedding

7.9 A certain amount of rebuilding was required on the highest parts of the structure, to maintain structural stability. The uppermost, walltop course of the south and east elevations, as well as some of the next course on the south external elevation, were dismantled, replaced and rebedded, and re-mortared (see plate 15). The existing 20th century cement pointing and capping to the wall tops was removed and re-consolidated with 1:3 NHL 3.5 sand mortar, using reclaimed stone as necessary; the core work was slightly inclined to allow water to be shed, and soft capping was not carried out (see plate 14). The wall top masonry, particularly the core was riddled with plant roots, perhaps from before previous work. The rebedding of the wall top has allowed the proper removal of these roots.

7.10 Six 12mm stainless steel threaded bars were inserted into the lower two ashlar courses and stringcourse on the south external elevation, to secure vulnerable stones. Some of the upper levels of corework were also rebuilt on the south elevation, in the reveal of the window (W2) here.

7.11 A part of the pillar on the north side of the first floor fireplace on the east internal elevation were rebuilt using fallen stones reclaimed from base of the castle (see plate 13). On two stones, a chamfer was applied, to match the stopped chamfer evident on the in situ stone below. The work was carried out to improve the very limited support to the ashlar face above. The machicolations in the south-east corner were also rebuilt (see below).

Stone replacement

7.12 Some areas of stonework were so severely eroded that they needed to be replaced with new stone. The new stone was Bluebank sandstone, obtained from Lowther's Cragg Quarry near Whitby, North Yorkshire. Having sought advice from the British Geological Survey, this was recommended as a satisfactory match for the original stone (BGS 2006 - see Appendix 3).

7.13 The "as fixed" drawings (see Appendix 4) show the areas in which stone replacement took place. On the east external elevation, one or two stones were replaced, including the cracked lintel over the upper window (W8) and one of the corner quoins. On the south external elevation, stone replacement was more extensive, due to the severe weathering on this side of the castle - the large stones forming the uppermost courses below the wall tops were almost all replaced, as well as two stones at the bottom of the window (W2). No stones were renewed on the internal faces.

7.14 The main area of stone replacement took place on the machicolations in the south-east corner of the castle. Here, the majority of the corbelled ribs, which were in a very poor condition, were replaced with new stone (see plate 16), and this provided interesting information on how they were constructed (see Chapter 5 above and figure 15).

8 DISCUSSION AND CONCLUSIONS

8.1 As might be expected with only Phase 1 of the repair works to the tower house complete, there are still a number of points meriting further discussion, as outlined below.

Pre-castle Structures

8.2 It is almost certain that there were pre-existing features on and around the castle site prior to the development of any kind of manorial complex here. Although no evidence was recovered by the 1993 survey or the current conservation works to substantiate Clark's suggestion that a Roman road ran to the immediate north of the site (Clark 1935, 144), several of the earthwork features in the vicinity could represent either routeways or agricultural terraces which pre-date the medieval complex of which the tower house forms part.

8.3 Despite Emery's suggestion that the de Ayton family erected a small house on the site during the second half of the 12th century (Emery 1996, 297), no evidence for such was recovered during the admittedly limited excavations carried out between 1958 and 1961 by the Scarborough Society, who identified five phases of occupation on the site (Rimington & Rutter 1967). Pre-13th century activity is suggested by a layer of black humus soil, interpreted as farmyard refuse and possibly associated with timber structures. An early 13th century (or earlier) structural phase is identified by Building 4, interpreted as a possible manorial hall with associated outbuildings. The main occupation phase is represented by at least four buildings dating to the mid 13th to mid 14th century, comprising a hall (Building 3), a service annex (Building 2), a kitchen range (Building 5) and dovecote, all set within a stone walled enclosure. The surviving tower house, which dates to the late 14th to early 15th century, was built over part of one of the earlier buildings. The adjacent lime kiln also dates to this period, although it is wrongly ascribed on the excavation plan. The final phase of activity is represented by 16th to 17th century material dumped over various parts of the site.

The Tower House

8.4 The documentary survey suggests that the mid 13th to 14th century complex was built by Sir Gilbert de Ayton (c.1275-1349). The later surviving tower house was almost certainly constructed by Sir Ralph Eure (1349-1422) in the late 14th or early 15th centuries, who inherited parts of the former de Ayton estates in 1389. Although Hislop dismisses the suggestion made by Rimington and Rutter that the medieval master mason John Lewyn was involved in the design of the tower house (Hislop 2007, 28), both he and Emery (1996, 298) note the similarity of Ayton to other tower houses further north, and cite Eure's Northumbrian background as a likely influence in this. There were two major phases of tower house building in Northumberland, one between 1340 and 1415 resulting in c.80 structures, with a further 80 added between 1415 and 1541. Although these obviously varied in size and status, they share a number of broad characteristics: they are usually of three storeys, the lowest storey is covered by a broad barrel vault; there is a ground floor entry leading to a lobby, with access to an adjacent newel stair; the hall or principal chamber lies on the first floor, with a retiring chamber on the upper floor; and even the most modest towers could retain a degree of internal comfort (Emery 1996, 25). However, although a number of parallels can be drawn (see below), one should not perhaps focus solely on sites in Northumberland, as Matthews also suggests there are similarities between Ayton Castle and medieval residences in the East Midlands such as Ashby-de-la-Zouche and Haddon (Erik Matthews, *pers.*

comm.), and the following text also offers comparisons with other sites in Yorkshire. Comparisons with the Midlands sites may also extend to the landscape setting of Ayton (see below).

8.5 It can be seen from the architectural description above that the surviving parts of Ayton Castle share many of these broad characteristics. The only entrance lay in the west elevation at ground or basement floor level, and it retains evidence for a draw bar. The entrance leads into a small lobby, which in turn gave access to a newel stair at the north-west corner almost certainly rising through all three storeys of the building and also to the northern of two vaulted basement rooms. The north basement room may have been the kitchen, although a detached kitchen could have been located elsewhere within the precinct, while the south basement room also served a service or storage function. The two may have been linked originally by a doorway in the partition wall; indeed, if the south basement room did perform a service function, this seems highly likely, as otherwise the circulation route between it and the kitchen would have been rather awkward. Nevertheless, at other near contemporary castles in North Yorkshire, there is evidence that lower level rooms were accessible only from rooms on the floor above and not by direct connections between each another, for example as at the probable early 15th century Harlsey Castle near Mount Grace Priory (Matthews & Richardson 2007). The mural staircase linking the south basement room to the first floor chamber at Ayton may also indicate that there was a need for separate access. Unfortunately, the Yorkshire tower house which might have provided one of the closest parallels to Ayton, at Whorlton in North Yorkshire, now survives to basement level only.

8.6 The newel staircase in the north-west corner led to the first floor. Although the 1958-61 excavations suggested that a single original space was later sub-divided by the insertion of a smaller room at the north end, it is possible that there were in fact originally two chambers, a larger inner chamber to the south occupying about two-thirds of the floor and a smaller outer chamber to the north; an original cross-wall in the position of the surviving stub on the west side would place the fireplace on the east side of the inner chamber in the approximate centre of its east wall. It may therefore be that the structures uncovered here by the 1958-61 excavations are a later rebuilding of an original arrangement. As well as being heated, the larger southern inner chamber was lit by large windows in the south and west walls, and apparently provided with a garderobe adjacent to the fireplace; the garderobe was probably housed within a projection placed above a pit adjacent to the east wall.

8.7 The newel staircase rose again to the second floor. This may have had a similar arrangement to the first floor, with an outer and inner chamber, although as on the first floor, the outer room was so narrow that a lobby might be a better description. The inner chamber was again provided with large windows in the south and west walls and a garderobe projection in the east wall, but any large fireplace must have been located in the west rather than the east wall. There is some structural evidence that the south-east corner of the inner chamber was partitioned off by wooden screens to form a separate space, but the use of this space is uncertain; Emery notes that a rather small mural angle chamber in a similar position on one of the upper floors of Chipchase Castle in Northumberland, functioned as an oratory (Emery 1996, 68-69).

8.8 The newel staircase almost certainly gave access to the roof area of the tower house, which may have been provided with a wall walk, an embattled parapet and angle turrets. It seems unlikely that there were only corbelled machicolations at the south-east corner; the upper parts of some of the larger Northumberland tower

houses, such as Belsay or Chipchase, are highly articulated, and even more modest structures such the Vicar's Pele at Corbridge have corbelled machicolations at all four angles (Emery 1996, 49 & 68-72). Interestingly, the form of the corbelled machicolations at the latter appear very similar in some respects to those at Ayton. The moulded stone recovered from the west side of the tower house at Ayton during the conservation works provides further support for the argument that there were once other structures at the uppermost level which have since disappeared.

8.9 The last recorded occupant of the tower house at Ayton died there in 1679 and it is likely that piecemeal demolition and removal of stone has taken place thereafter; some re-used architectural fragments can be seen in the surrounding field walls and around the base of the tower. An engraving of 1796 shows the tower house to be in its present ruined state (see plate 3), and the basement was used as a cattle byre during the 18th or 19th centuries. A number of iron grilles were placed over the door and window openings in the 19th century and earthwork evidence might also suggest that the larger enclosure in which the tower house sits was used to accommodate stock during the same period. Three phases of 20th century repair to the tower house can be identified, the major works occurring in 1912 and involving the consolidation and capping of the upper courses and the insertion of various concrete lintels and roofing slabs.

The Castle Precinct and Designed Landscape

8.10 The 1958-61 excavations established that the tower house overlay the west wall of an earlier hall but it is unclear whether it and the surrounding structures were deliberately levelled by Sir Ralph Eure to make way for the tower, or whether they were already abandoned and/or demolished. The earthwork survey undertaken in 1993 revealed the possible alignment of the enclosure or precinct wall, and the remains of at least six rectangular buildings within it, including a probable gatehouse on the west side, as well as attached or associated enclosures to the west and internal sub-divisions. To the south, further earthworks, including the medieval fishponds, may have been modified to form part of a designed ornamental landscape, perhaps associated with the tower house (see plate 9). Parts of this landscape may well have been visible from the first and second floors of the tower house, although this is not certain. Although large, the windows to the south wall are not aligned exactly on the ponds and, where evidence survives, the openings appear to have been filled with fixed glazing and to have had external bars.

8.11 Examination of a number of other late medieval castles in Yorkshire, in particular Harewood Castle near Leeds, suggests that the relationship between an apparent viewing point such as a window and a view are not as straightforward as they may initially appear (Richardson & Dennison 2007; Richardson, in prep.). Nevertheless, if the ponds and other earthworks were to form part of an ornamental landscape, they would represent an interesting contrast with other near contemporary sites in Yorkshire, such as the aforementioned Harlsey Castle, where the fishponds and gardens are contained within a moated enclosure or precinct, rather than lying beyond it (Matthews & Richardson 2007).

8.12 One should also not forget the role of the castle as a site to be viewed, rather than to look out from. A recent paper by Barnwell (2007) discusses the landscape setting of Peak Castle in Derbyshire, and how its dramatic setting of cliffs and heights may have been understood by contemporaries. Such ideas apply to designed and ornamental landscapes as well as natural ones. For example, the

double canals to the south of Sheriff Hutton Castle, North Yorkshire, not only provided a clear view into the north-west of the adjacent park from the castle grounds, but also allowed the castle to act as a backdrop to whatever activities were taking place in this part of the park (Roberts & Richardson 2005,133-134); the extensive earthworks at Whorlton Castle, North Yorkshire, may have functioned in a similar manner, creating a "tableau" in which the castle was placed (Erik Matthews, *pers. comm.*). It is possible that a similar arrangement existed at Ayton, so that when the tower was viewed from the village and road to the south (see plate 1), it was positioned between gardens in the foreground and the evidence of agriculture to the north (Erik Matthews, *pers. comm.*). Related to this idea is the continued fashion throughout the late medieval period and into the 17th century of the use of a tower within a courtyard arrangement as a symbol of royal or baronial power. Dixon and Lott note several examples of tower houses in the Midlands and north of England where the importance of the tower is the "signalling out of the lord's apartments above the roofs of an adjacent range of buildings" (Dixon & Lott 1993, 95). Such an argument would also seem to be eminently applicable to Ayton.

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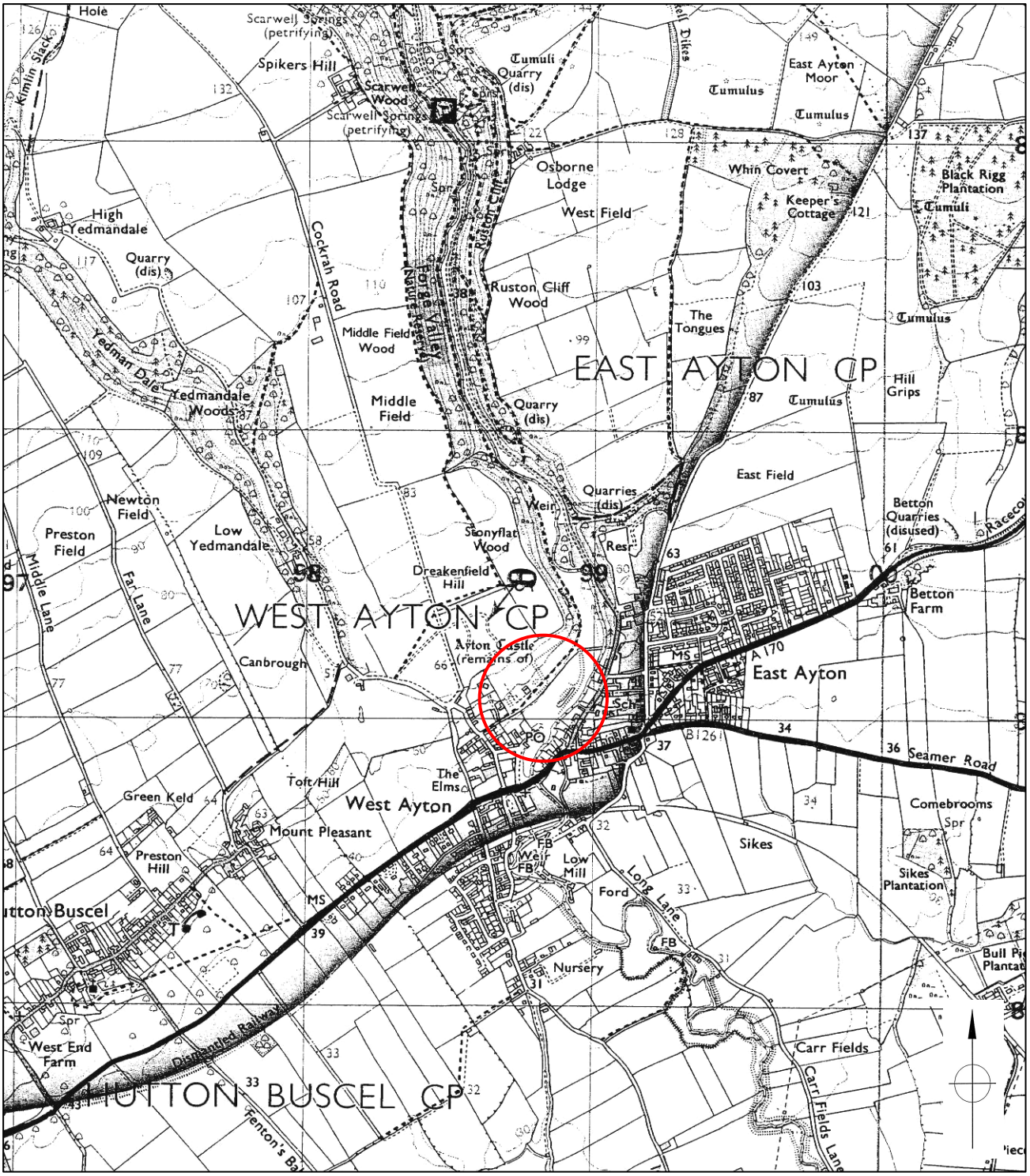
10 ACKNOWLEDGEMENTS

10.1 The programme of architectural and archaeological recording during the Phase 1 repairs was funded by Scarborough Borough Council and English Heritage. The work was primarily undertaken by EDAS (Shaun Richardson and Ed Dennison), with help and support from the following individuals and organisations.

10.2 The pre-intervention medium format photography was undertaken by Stephen Haigh. The architectural and archaeological fieldwork was undertaken by Shaun Richardson and Ed Dennison, with assistance from Richard Lamb. The ecological survey work was undertaken by Dr Madeline Holloway of Ecological Information Network Consultants (EINC). Additional documentary and background research was undertaken by Ed Dennison and Shaun Richardson.

10.3 Especial thanks are due to the project architect, David Sherriff of Purcell Miller Tritton, and the Contractors, Historic Property Restoration (HPR), specifically Peter and Charlie Hixson. Other members of the project team included Chris Walden (Scarborough Borough Council) and Keith Emerick and Giles Proctor (English Heritage).

10.4 This report was produced by Ed Dennison and Shaun Richardson, with David Sherriff providing comments on a draft text. Erik Matthews also provided interesting insights, based on his considerable knowledge of castles in northern and central England. Any errors or inconsistencies in the report remain the responsibility of Ed Dennison. The archive relating to the project will remain with EDAS for the present, until such time that it has been determined whether additional phases of repair will be undertaken on the castle; otherwise the archive will be deposited with Scarborough Museum. The copyright of this report has now passed to the owners of the site, Scarborough Borough Council, although Ed Dennison and Shaun Richardson retain the right to be named as authors.



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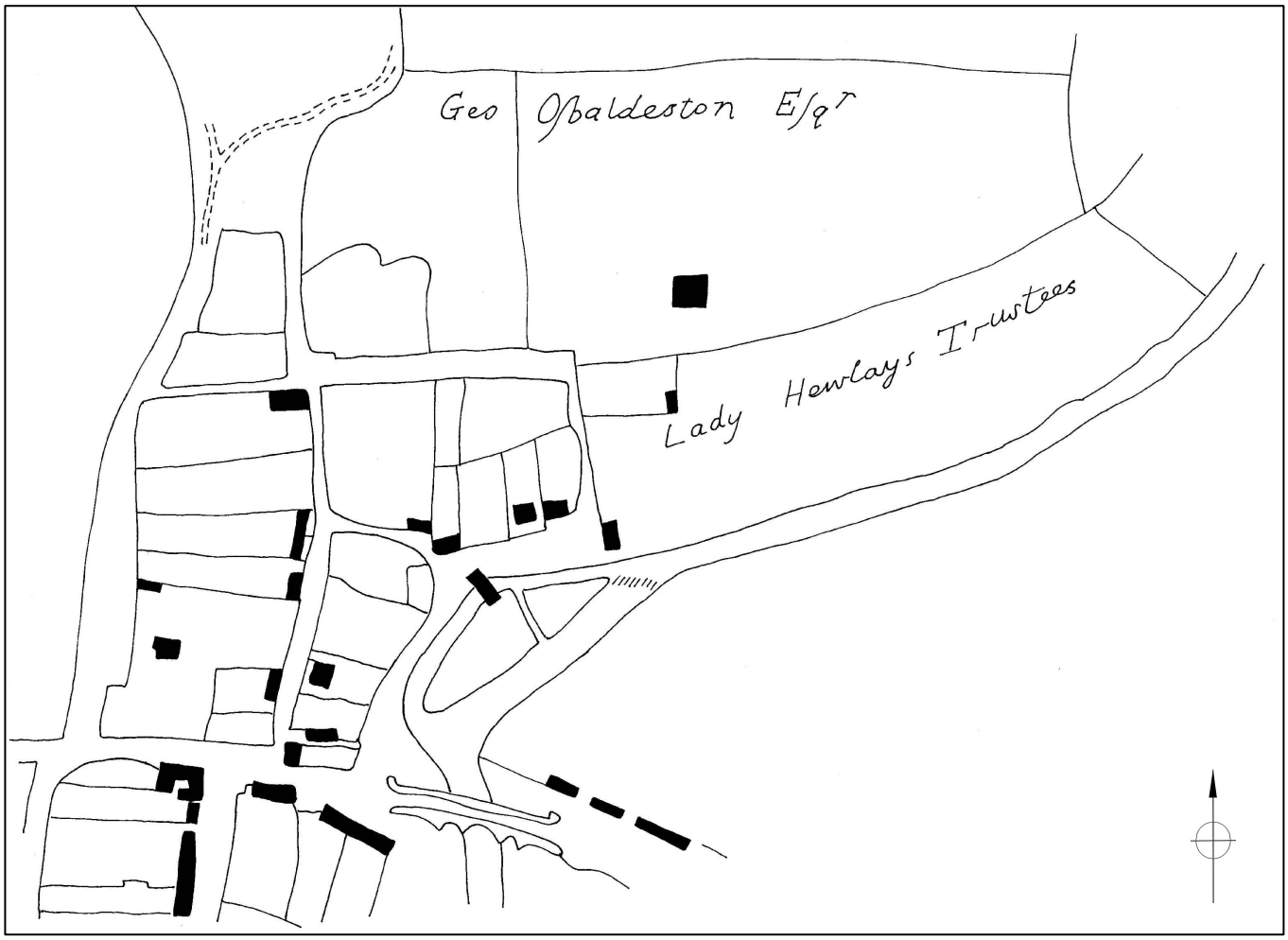

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PROJECT	
AYTON CASTLE PHASE 1 REPAIRS	
TITLE	
SECTION OF 1795 MAP	
SCALE	DATE
NTS	OCT 2008
EDAS	FIGURE 2

Ordnance Survey 1854 6” map
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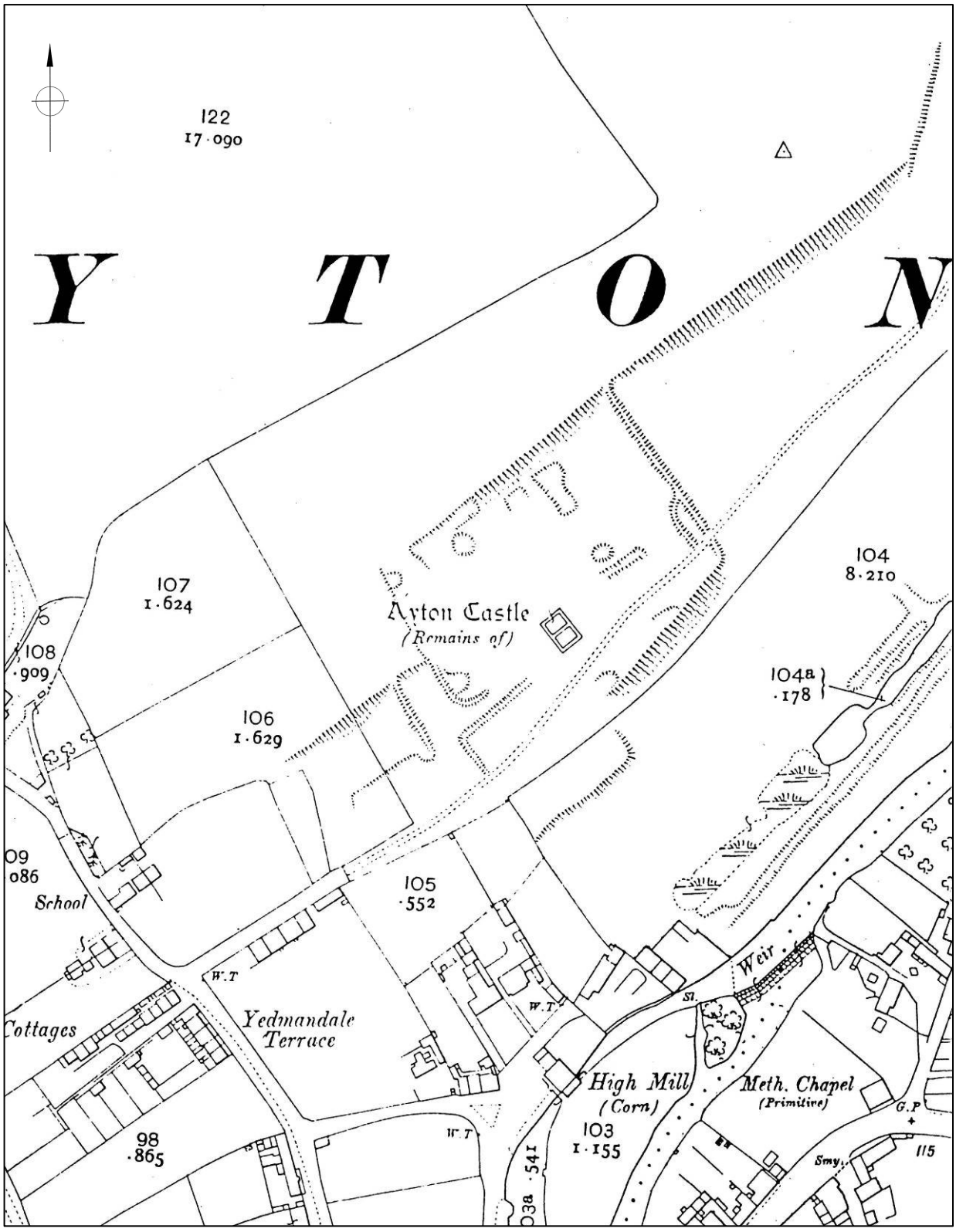

Ordnance Survey 1912 25"" map
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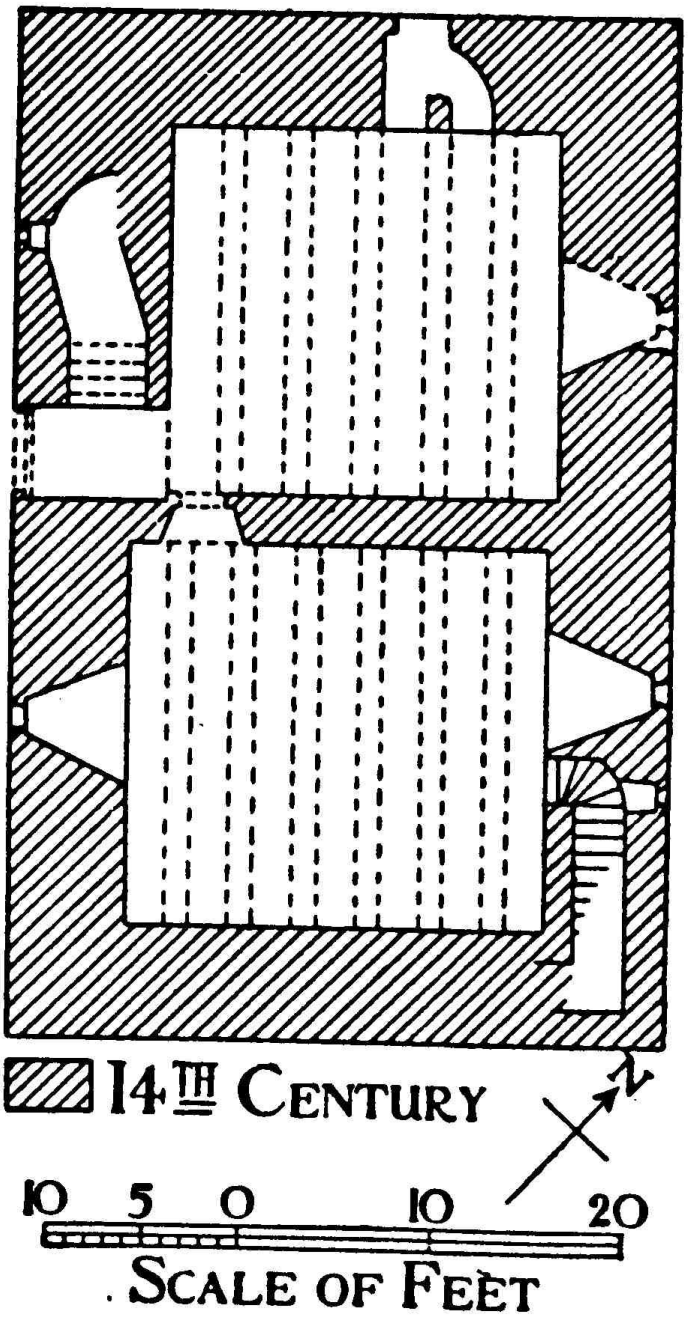

Russell 1923, 441.

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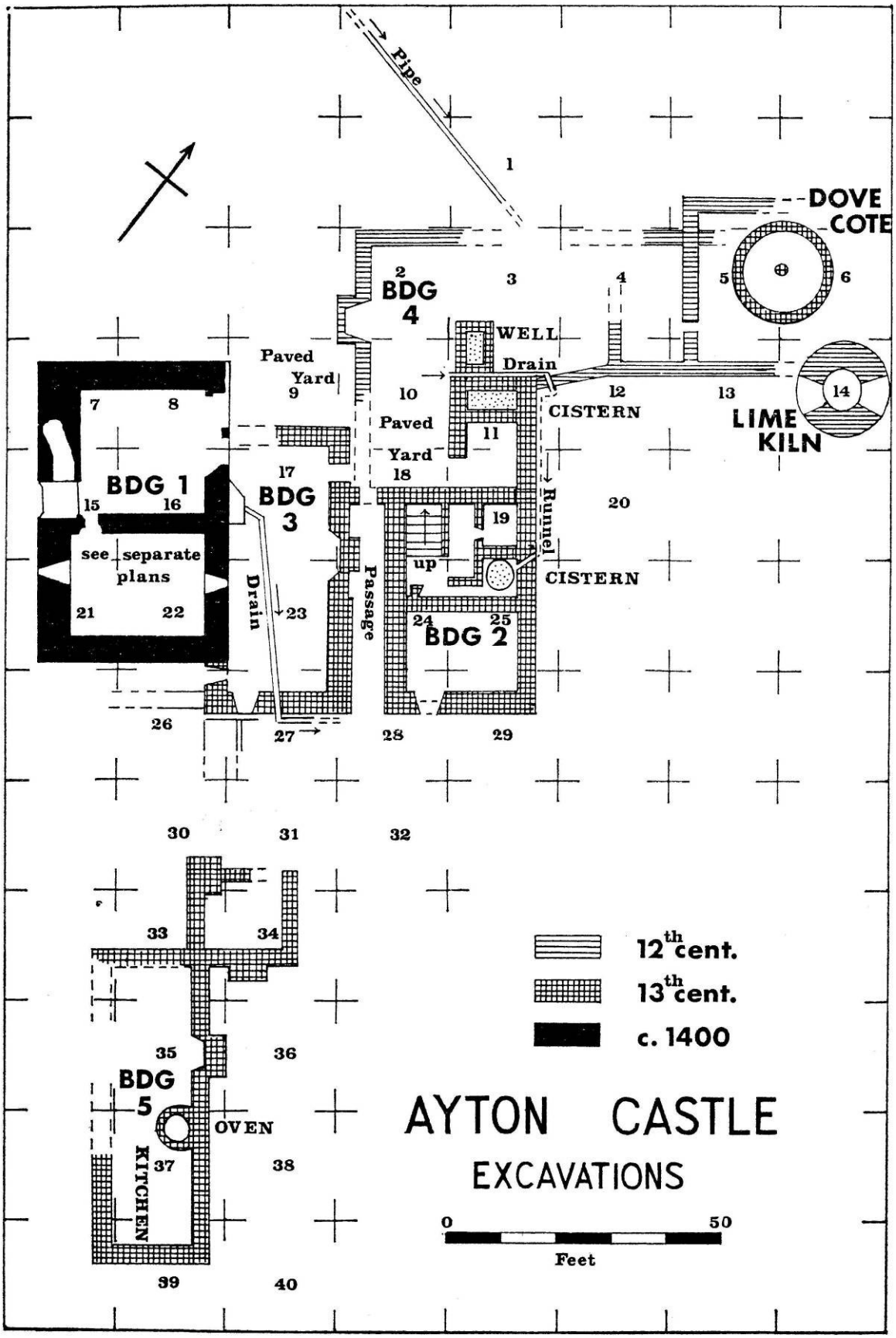
EDAS	FIGURE: 5



Rimington & Rutter 1967, figure 6 (p39).

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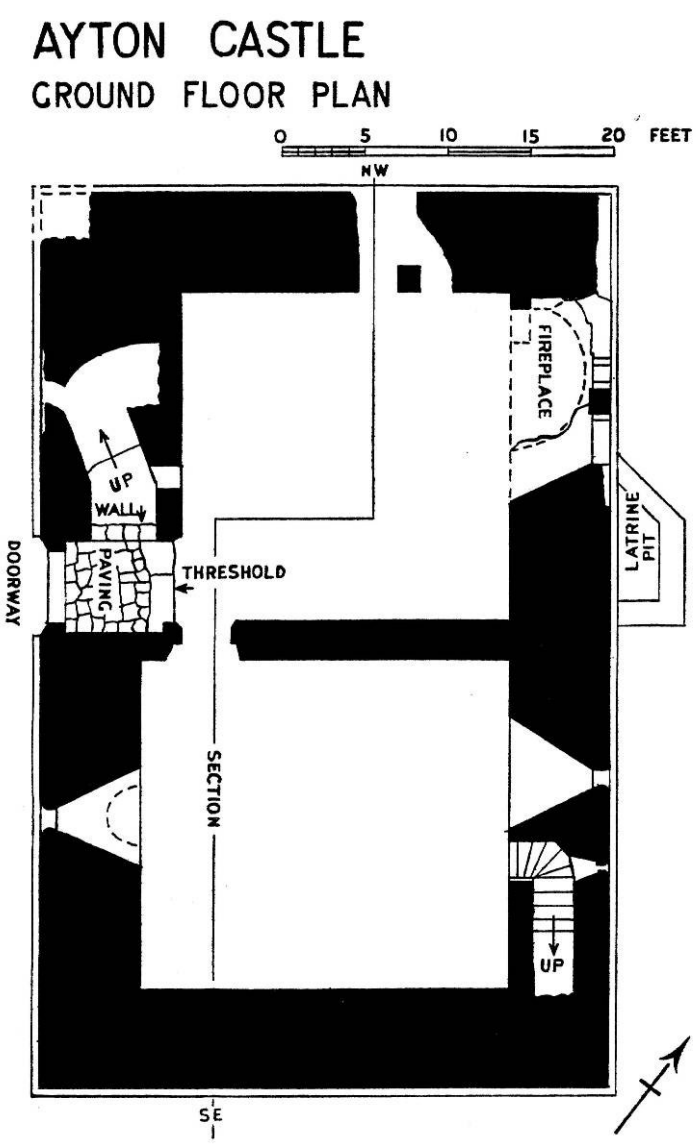

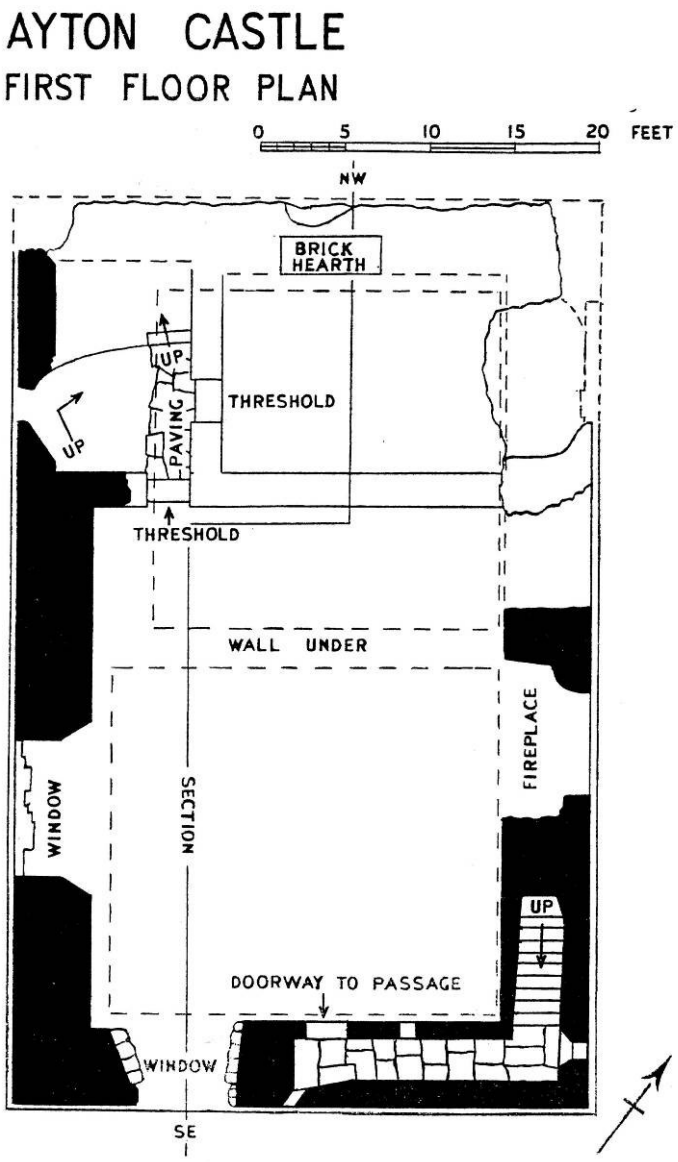

Rimington & Rutter 1967, figures 2 and 3 (p24 & 25).

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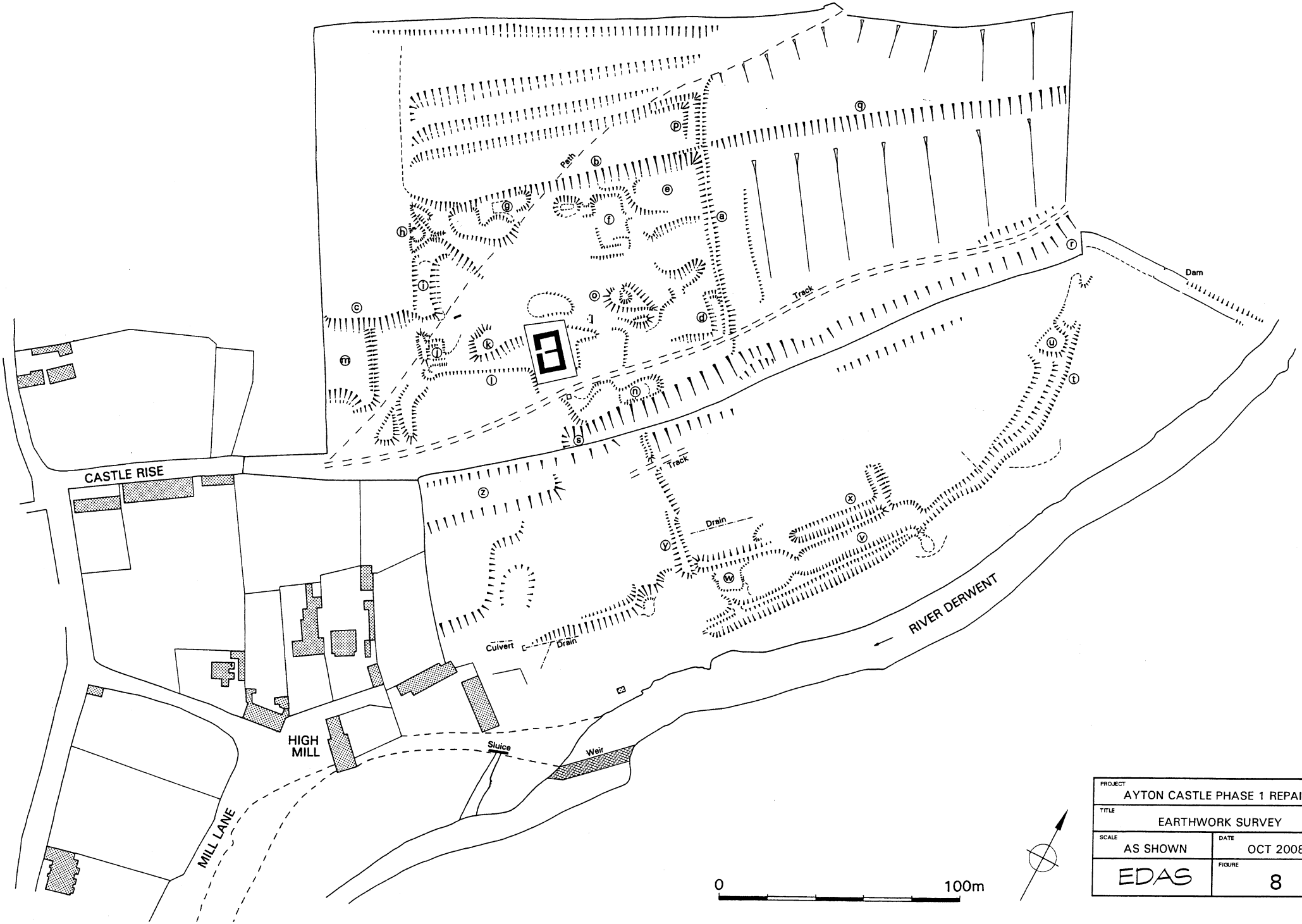

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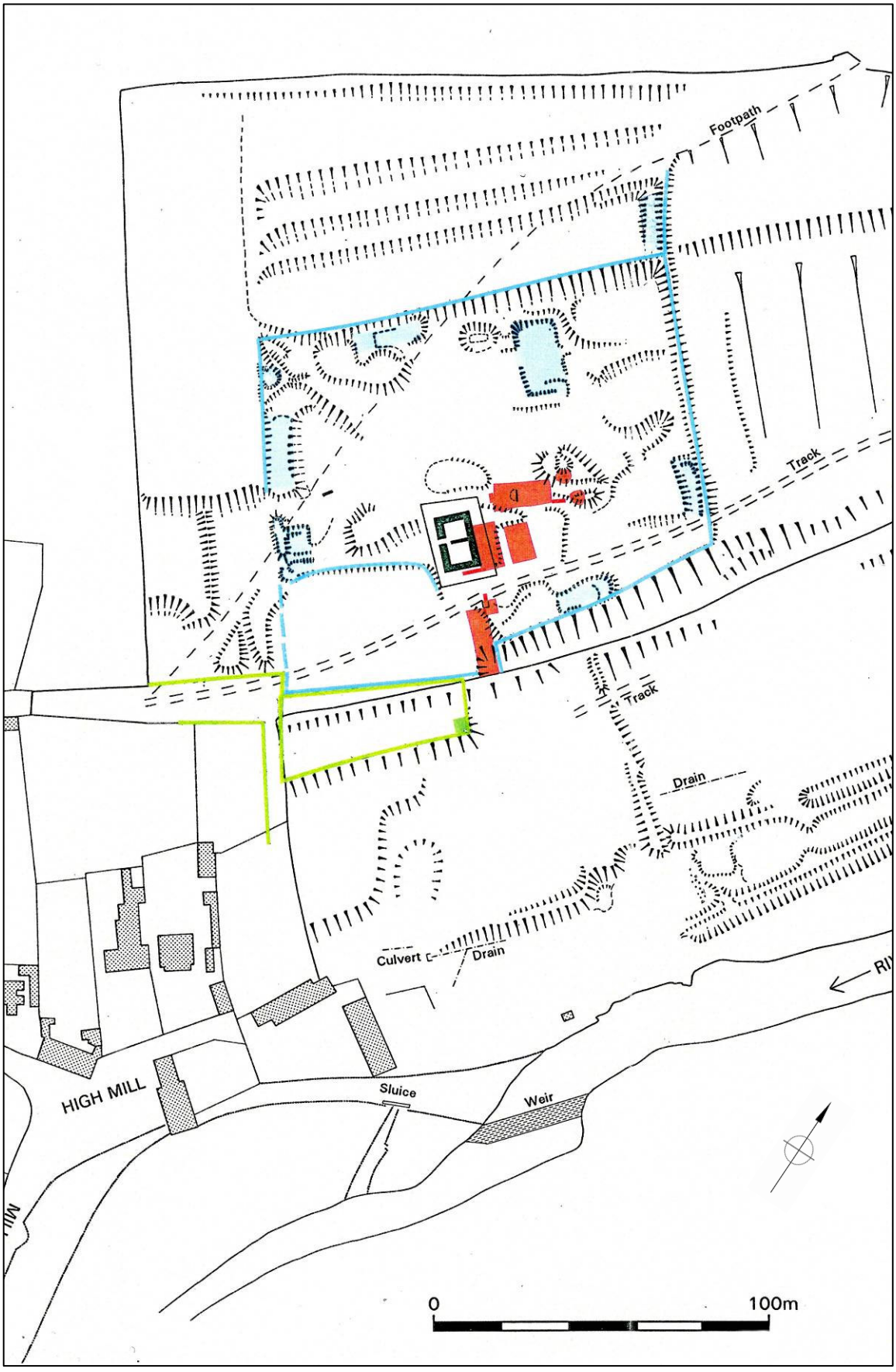

STRUCTURES REVEALED BY EARTHWORK SURVEY

STRUCTURES REVEALED BY EXCAVATION

FEATURES DEPICTED ON 1795 MAP

Dennison 1996, figure 5

PROJECT: AYTON CASTLE PHASE 1 REPAIRS	
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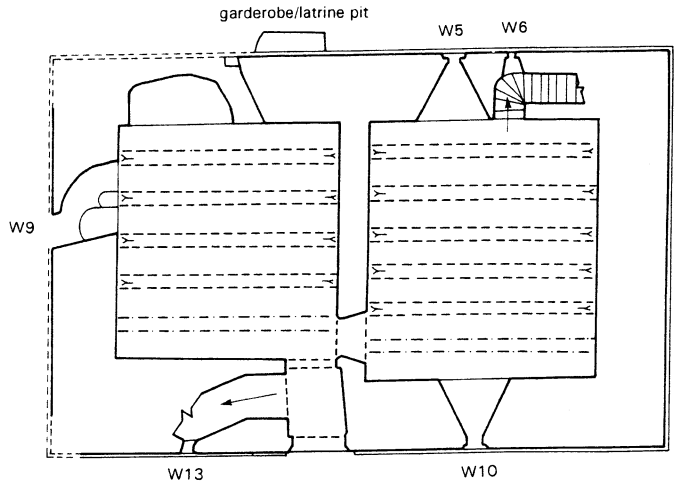
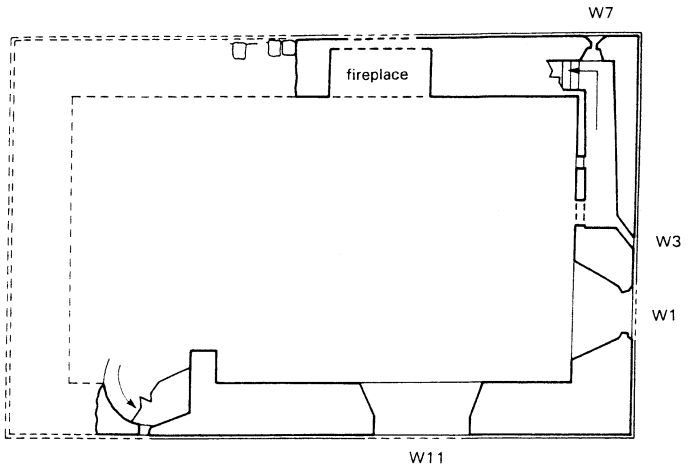
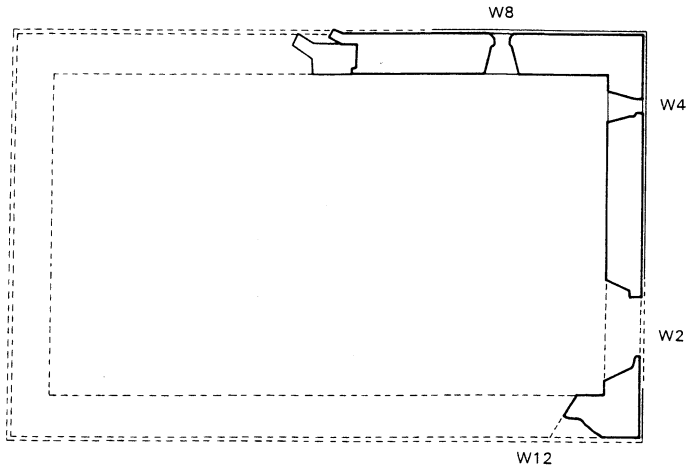


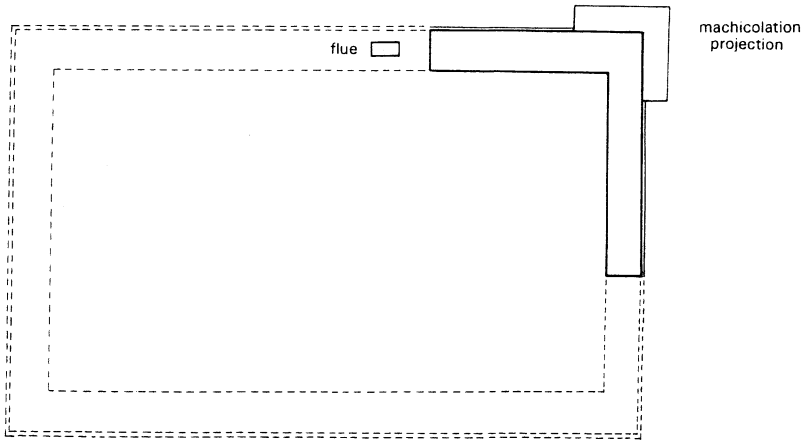
Basement/Ground floor



First floor



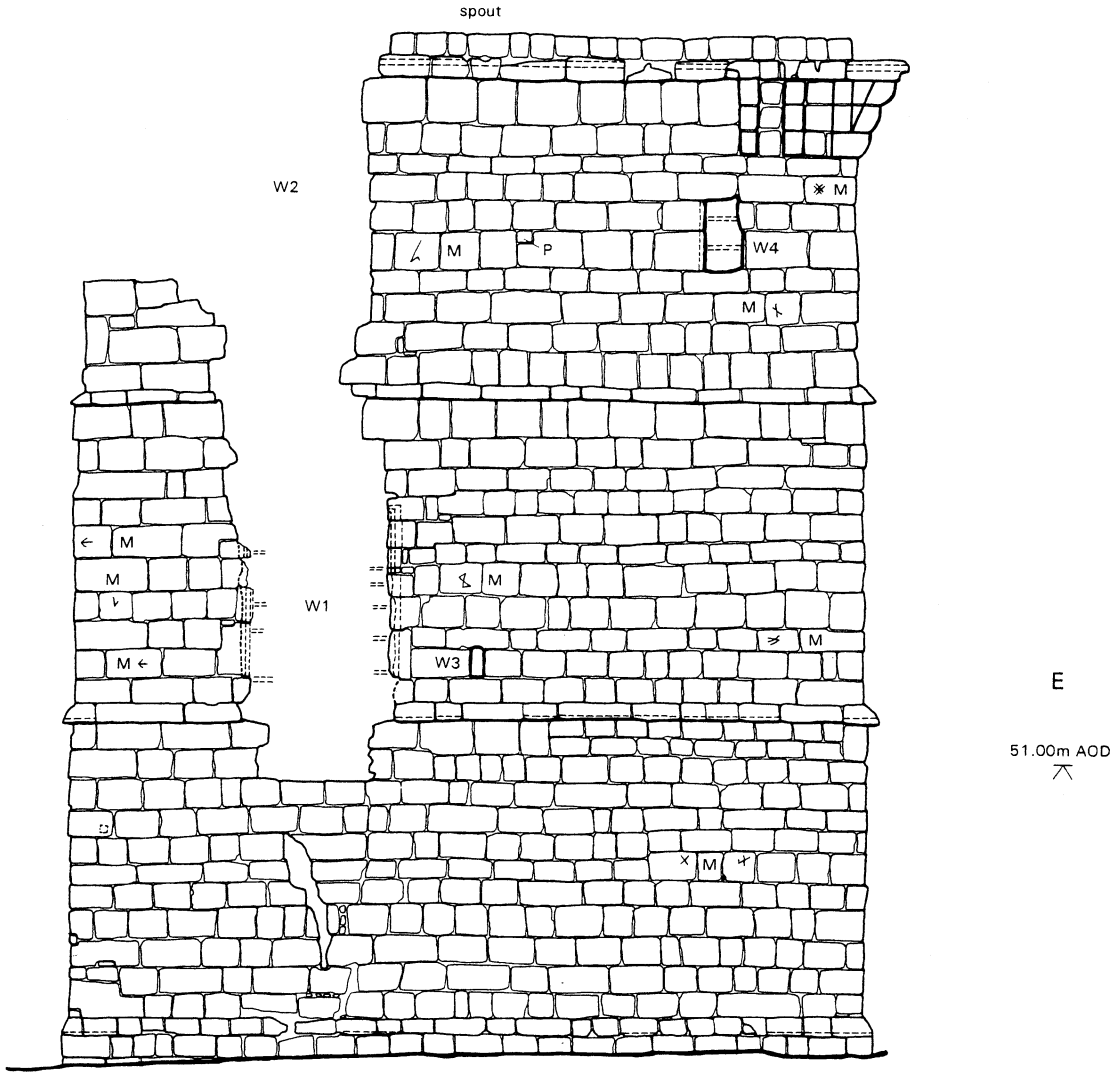
Second floor



Parapet level

0 10m

PROJECT: AYTON CASTLE PHASE 1 REPAIRS	
TITLE: FLOOR PLANS	
SCALE: AS SHOWN	DATE: OCT 2008
EDAS	FIGURE: 10



Corework

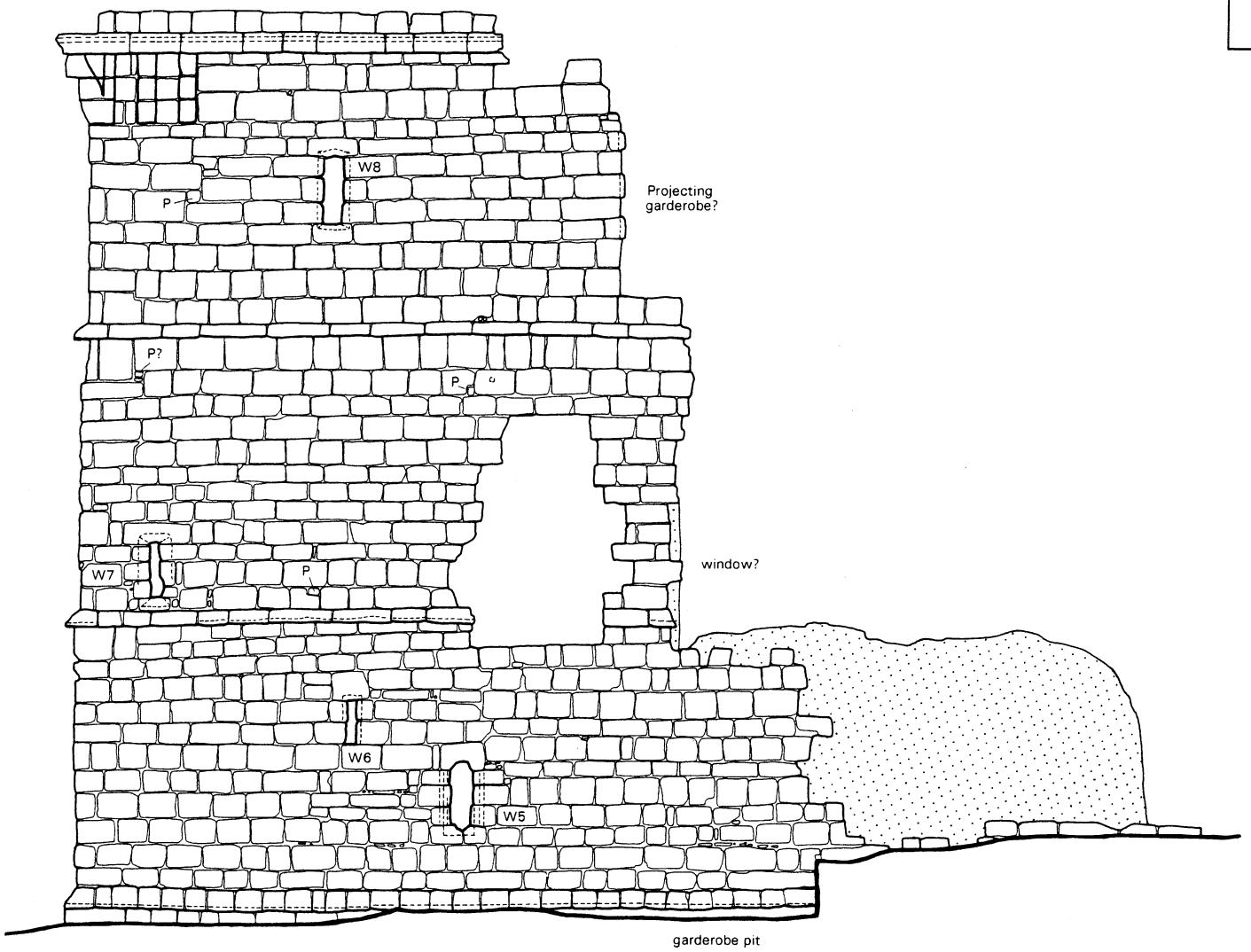
P Putlog holes

M Masons' marks (not to scale)

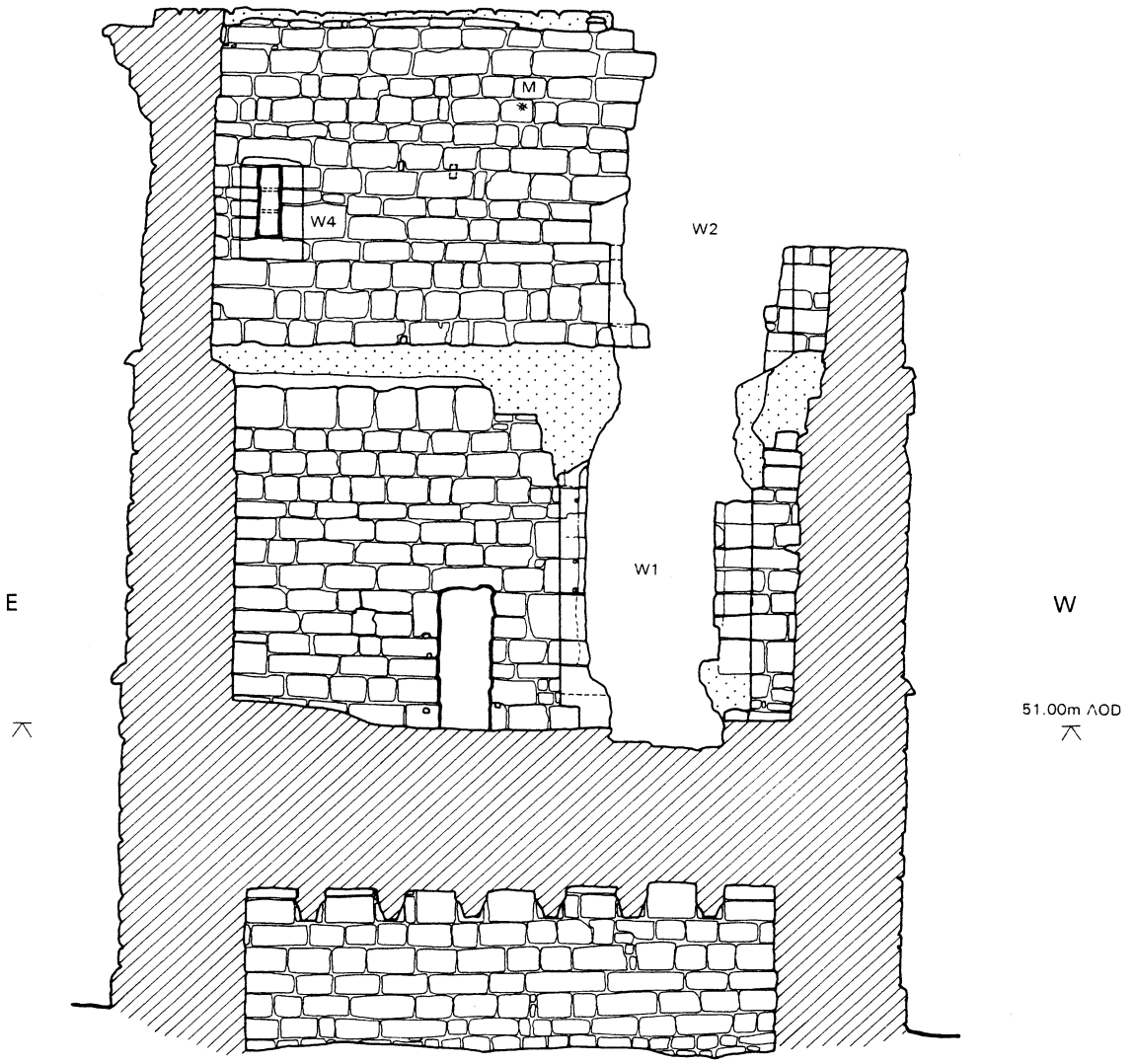
0 5m

PROJECT: AYTON CASTLE PHASE 1 REPAIRS	
TITLE: SOUTH EXTERNAL ELEVATION	
SCALE: AS SHOWN	DATE: OCT 2008
EDAS	FIGURE: 11

PROJECT	
AYTON CASTLE PHASE 1 REPAIRS	
TITLE	
EAST EXTERNAL ELEVATION	
SCALE	DATE
AS SHOWN	OCT 2008
EDAS	FIGURE 12



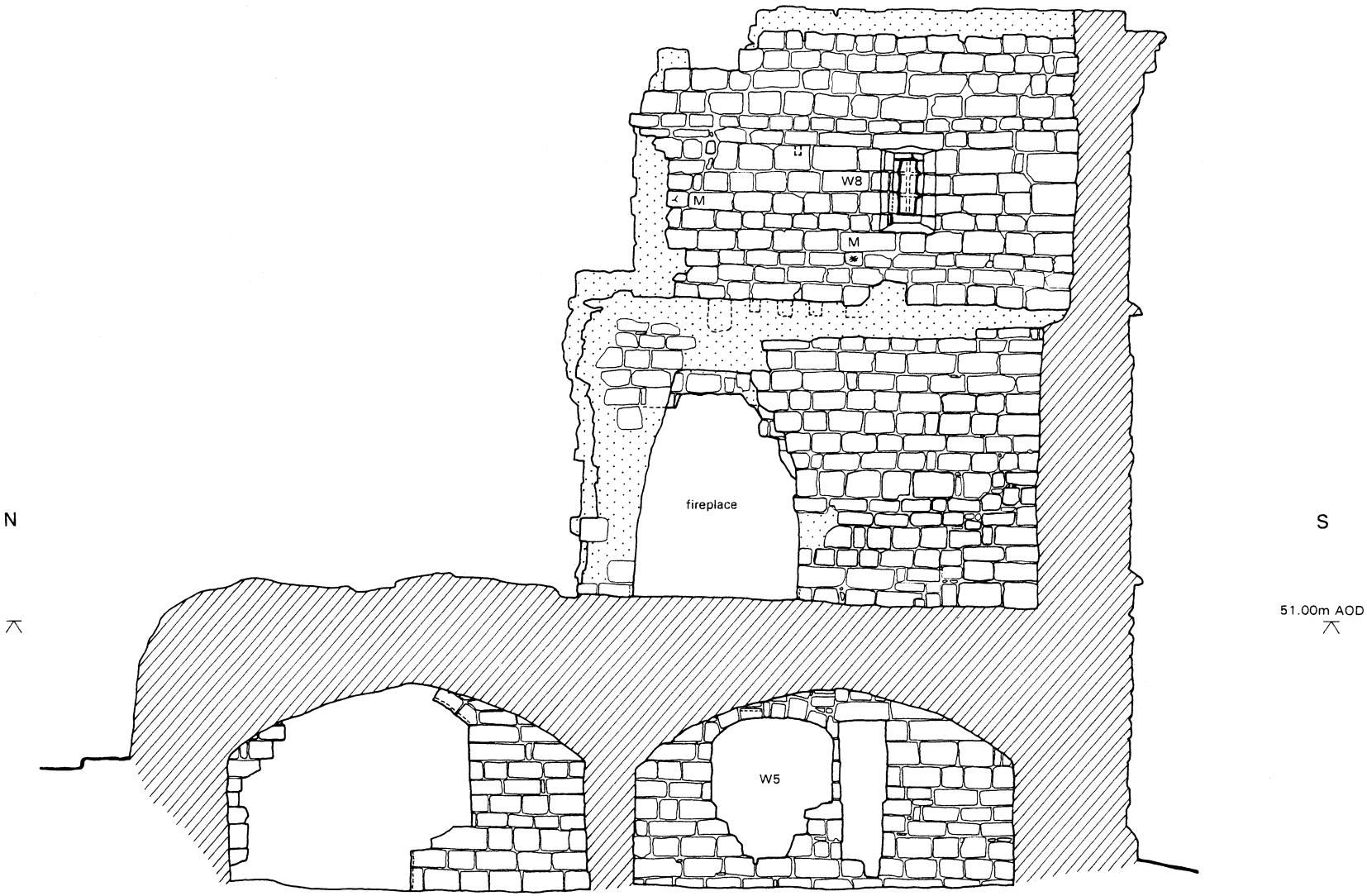
PROJECT	
AYTON CASTLE PHASE 1 REPAIRS	
TITLE	
SOUTH INTERNAL ELEVATION	
SCALE	DATE
AS SHOWN	OCT 2008
EDAS	FIGURE 13



Corework

P Putlog holes

M Masons' marks (not to scale)



Corework

P Putlog holes

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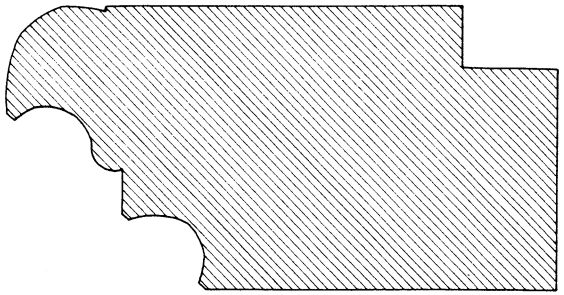
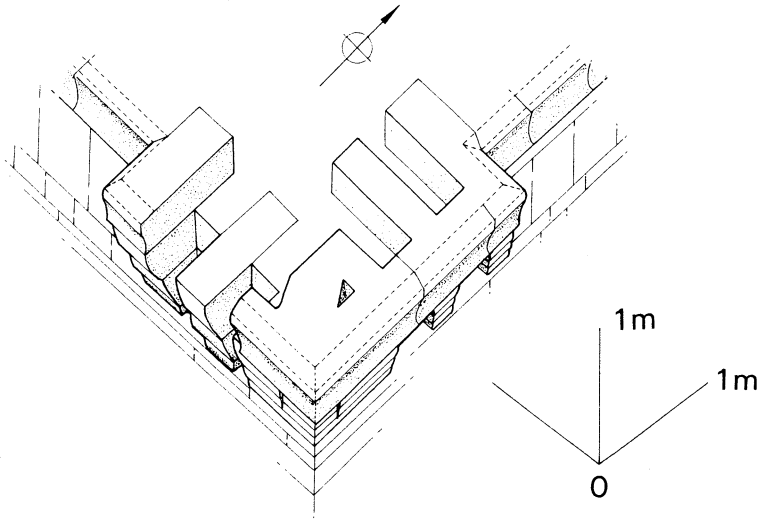
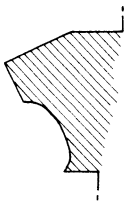


Profile of fallen stone
on west side
beneath window

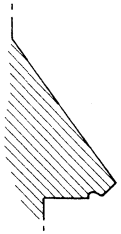
0 100mm



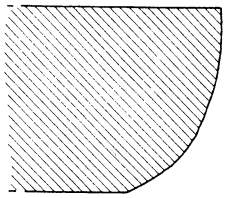
Isometric view of machicolations
based on surviving parts



Parapet moulding



Drip course



Typical machicolation corbel

0 500mm

PROJECT: AYTON CASTLE PHASE 1 REPAIRS	
TITLE: MACHICOLATIONS AND MOULDINGS	
SCALE: AS SHOWN	DATE: OCT 2008
EDAS	FIGURE: 15

Plate 1: View to Ayton Castle, looking west across the river Derwent.

Plate 2: Ayton Castle, west elevation, looking north-east.

Plate 3: 1796 engraving of Ayton Castle by Walker, after an original drawing by Hornsey (Hinderwell 1798, facing p291).

Plate 4: 1831 engraving of Ayton Castle (Allen 1831, facing p272).

Plate 5: Ayton Castle looking east, prior to 2006 repairs.

Plate 6: Ayton Castle looking south, prior to 2006 repairs.

Plate 7: 1965 drawing of Ayton Castle by George Pye.

Plate 8: 1968 aerial photograph of Ayton Castle (CUCAP AUH 65).

Plate 9: View of earthworks in Fishpond Field, looking east.

Plate 10: Lower part of east elevation, looking south.

Plate 11: Detail of corbels and machicolations, prior to repair.

Plate 12: Detail of machicolations, prior to repair (photo courtesy of HPR).

Plate 13: Repairs to north side of first floor fireplace.

Plate 14: Repairs to wall tops.

Plate 15: Completed Phase 1 repairs, south elevation, looking north.

Plate 16: Restored and renewed machicolations.

APPENDIX 1

APPENDIX 1: LISTED BUILDING DESCRIPTION

IoE number : 327062
Location : AYTON CASTLE, CASTLE RISE (north off), WEST AYTON, SCARBOROUGH, NORTH YORKSHIRE
Date listed : 18 January 1967
Date of last amendment : 18 January 1967
Grade : I

SE9885

CASTLE RISE
(north side, off)

7/37

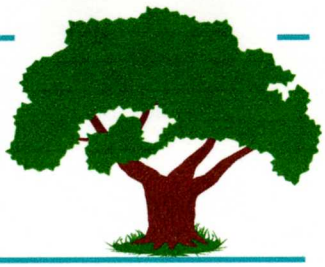
Ayton Castle

Pele tower, ruinated. Late C14. Sandstone ashlar. Rectangular, 2-cell plan 21 metres by 13.5 metres. Originally 3 storeys, on a chamfered plinth, each storey off-set with a chamfered string course. Pointed doorway flanked by square-headed window openings with chamfered quoined surrounds. Upper machicolation survives to east corner only. Interior: both ground floor rooms have depressed pointed tunnel vaults supported on chamfered transverse ribs. The surviving windows are deeply splayed. Staircases rise within the walls, to the left of the entrance, and from the inner room. Very rare building type in this part of Northern England. Scheduled Ancient Monument, No 144. The Victoria County History of the Counties of England: Yorkshire, North Riding, Vol II, p441. F Rimington and J Rutter “Ayton Castle, its History and Excavation”, Scarborough Archaeological Society Research Report Number 6, 1967.

Source: Images of England website (*www.imagesofengland.org.uk*)

APPENDIX 2

EINC
Ecological Information
Network Consultants



AYTON CASTLE

Ecology Report

October 2005

66 Norwood Terrace, Shipley, Bradford, Yorkshire, BD18 2BB. Phone 01274 598839. E-mail m.holloway@einc.freeserve.co.uk
Director: Dr. Madeline Holloway Fax 0870 1680591

AYTON CASTLE ECOLOGY REPORT

CONTENTS

FIGURES

APPENDICES

1 INTRODUCTION

1.1 EINC was commissioned by Ed Dennison Archaeological Services Ltd (EDAS), in June 2005 to undertake an ecological assessment of Ayton Castle, West Ayton, Scarborough, North Yorkshire. This report describes the findings of the desk top study and fieldwork from the Phase 2 Habitat Survey and the Summer Bat Survey.

1.2 Criteria used to evaluate the flora and fauna at Ayton Castle according to their national, regional, district, parish or local ecological value are presented together with recommendations for further specialist surveys.

2 METHODOLOGY

2.1 Desktop study

2.1.1 Existing information regarding ecological data within the grounds of Ayton Castle and within a radius of 1 kilometres was collected and assessed. Consultees approached included:

- The North-East Yorkshire Ecological Data Centre (NEYEDC)
- The North Yorkshire Bat Group

2.1.3 The location and nature of any designated sites in the vicinity of Ayton Castle was recorded. This included both statutory and non-statutory sites. Information on species protected by the Wildlife and Countryside Act 1981 (as amended) in Ayton Castle and within the general vicinity was also collected. UK and Local Biodiversity Action Plans were additionally consulted for information on priority habitats and species within a national and local context respectively. To this end guidelines for the selection of Sites of Importance for Nature Conservation in North Yorkshire were consulted (North Yorkshire SINC Panel 2002). Members of the North Yorkshire SINC Panel include English Nature, the Environment Agency, North Yorkshire County Council, Borough of Scarborough and Yorkshire Wildlife Trust.

2.2 Field Survey

Phase 2 Habitat Survey

2.2.1 A Phase I Habitat Survey was undertaken using the standard methodology devised by English Nature (English Nature 1993) on 29th July 2005. The vegetation within the grounds at Ayton Castle was mapped onto a c.1:1400 scale map using standard alphanumeric codes, which were used to produce a coded habitat map (Figure 2). Further information was described in the form of target notes which provide supplementary information on species composition and structure, evidence of management, habitats too small to map and transitional or mosaic habitats.

2.2.2 Target Note information on habitats included the vegetative descriptions that are required by a Phase 2 Habitat Survey. This defines the vegetation of selected areas more precisely in terms of its plant communities. In this case the vegetative details recorded were sufficiently comprehensive to ascribe a basic National Vegetation Classification (NVC) category for the described plant community. Where habitats did not readily match NVC categories, or where they were considered to be of limited nature conservation value, a description, and a list of dominant species found, is provided within the target notes and is deemed sufficient. Plant nomenclature follows that used by Stace (1997).

2.2.3 It must be noted that plants identified from a single survey in the year are unlikely to record every species which may occur on a site. Nonetheless, sufficient detail on the composition of the vegetation has been obtained to enable it to be characterised and assessed. Notes were made on other species seen on site, including any tracks or signs of mammals, birds and invertebrates.

Bat survey - daytime inspection

2.2.4 A daytime external and internal inspection of the accessible stonework of Ayton Castle was undertaken on 29th July 2005. At this time of year bats are likely to be in their summer roosts, and evidence of their presence includes:

- Presence of bats – bats may be recorded roosting in small cracks within the external or internal stone walls of the castle and between the window and/or door lintels and adjacent stonework.

- Staining – where sites are used heavily by bats the stone around the roost entrance may become stained with oil from the bats fur. Scratches on the stone worn smooth by the passage of bodies would also be used as evidence where this was attributable to bats rather than roosting or nesting birds

- Droppings – bat droppings in crevices, stuck to walls below suitable crevices, and on the ground below suitable crevices.

2.2.5 Each part of the castle was systematically searched for bats, bat droppings and any other signs beneath potential bat roost sites. Accessible cracks for bats were examined with the use of a Clulite Lamp (1,000,000 candle power). The bat roost potential of mature trees within the site was not determined in this report.

3 BASELINE ENVIRONMENT

This section describes the current ecological conditions gathered by a combination of desktop study and field surveys

3.1 Nature conservation interest of the study area

3.1.3 Ayton Castle is located within the North York Moors National Park and within the latter are several statutory sites of national conservation importance. One such site, Raincliffe & Forge Valley Woods, borders the eastern edge of the

field in which Ayton Castle is located (Figure 1). This site has been designated both a statutory Site of Special Scientific Interest (SSSI) and a National Nature Reserve (NNR). It consists of a sequence of woodland types which flank the steep east and west facing slopes of the Derwent valley and comprises one of the best examples known of mixed deciduous woodland in north-east England. Also of note within the SSSI are some small areas of calcareous grassland that are associated with limestone outcrops at the southeast end of the valley. For further nature conservation details of this site refer to Appendix 1. Another SSSI, Spiker's Hill Quarry, occurs just over half a kilometre north of Ayton Castle. However, the interest of this site lies in its geological, rather than nature conservation, interest, and no further details of the site are relevant to this report.

3.1.4 Whilst there are no non-statutory Sites of Importance for Nature Conservation (SINCs) within a 1km radius of the study area the NEYEDC database had several records for various protected species within the vicinity. This included both otter and water vole records adjacent to the River Derwent, which runs alongside the south, south-western border of the study area. NEYEDC also note that a lack of survey information for any particular area or taxanomic group does not necessarily mean that there is no nature conservation interest present.

3.2 Site Description

3.2.1 The remains of Ayton Castle stand in a small area surrounded by tall nettles *Urtica dioica* within cattle-grazed pasture. The pasture is riddled with evidence of old earthworks but has, nevertheless, undergone agricultural improvements resulting in a species-poor sward and patches of tall weeds. This was identified by the National Vegetation Classification as MG6 *Lolium perenne – Cynosurus cristatus* grassland. Even so, the steeper, thinner-soiled, slopes to the north-east had largely escaped such improvements and distinct zonations to more calcareous species-rich grassland (identified as MG5) were evident. An overgrown hedgerow, identified as "Important" by the Hedgerow Regulations (1997) separated this field from the improved pastures to the south west. These horse-grazed, seasonally flooded, pastures were adjacent to the River Derwent.

3.3 Flora

3.3.1 This section is concerned with individual target notes, which offer greater detail for specific areas than is described in the above section (3.1). The locations of all the different habitats at Ayton Castle, together with the target notes, are shown on Figure 2.

Target Note 1 (re-seeded grassland - MG7)

3.3.2 The grassy track adjacent to Castle Rise, leading towards the castle was generally species-poor and dominated by rye-grass *Lolium perenne*. This part of the field was classified as MG7 *Lolium perenne* ley. Other frequent grasses and herbs included cock's-foot *Dactylis glomerata*, nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris*, creeping thistle *Ranunculus repens*, white clover *Trifolium repens*, spear thistle *Cirsium vulgare*, creeping thistle *C. arvense*, broad-leaved dock *Rumex obtusifolius*. Diversity was slightly increased beside the trampled path with the occurrence of a few ephemerals such as annual

poa *Poa annua,* pineappleweed *Matricaria discoidea* and greater plantain *Plantago major*. Less frequent herbs included hoary willowherb *Epilobium parviflorum* and hogweed *Heracleum sphondylium*,

Target Note 2 (improved, cattle-grazed pasture - MG6)

3.3.3 Permanent, cattle-grazed, pasture covered most of the gentle, south south-west facing slopes of the field within which Ayton Castle is located. Using the National Vegetation Classification (NVC) the pasture was classified as MG6 *Lolium perenne – Cynosurus cristatus* grassland. The relatively long sward of this pasture is likely to have been subject to an extension of grazing into late spring and to agricultural improvement by the application of artificial fertilizers. These measures tend to reduce the species diversity of such pastures and favour the dominance by grasses, both of which were apparent in this field. Such species-poor grassland was relatively uniform throughout most of the field (although refer to Target Note 3), and equally covered all the old earthwork mounds that are shown in Figure 2.

3.3.4 Rye-grass *Lolium perenne* tended to be the most abundant grass with frequent crested dog's-tail *Cynosurus cristatus*. Yorkshire fog *Holcus lanatus* was also locally abundant, especially around areas of cattle dung, together with occasional coarse tussocks of cock's-foot *Dactylis glomerata.* Other occasional grasses included false oat-grass *Arrhenatherum elatius* and timothy grass *Phleum pratense*. As is typical of an MG6 sward grasses dominated the pasture and the herbaceous component of the sward was relatively unvaried in its composition. Such herbs included white clover *Trifolium repens*, ribwort plantain *Plantago lanceolata* and dandelion *Taraxacum agg.*. Occasional herbs recorded included red clover *Trifolium pratense*.

3.3.5 Patches of tall herbs were frequent throughout the field and along its margins, and were likely to be associated where local eutrophication of the soil had occurred and/or it had been relatively recently disturbed. The frequent small areas of exposed bare soil were evidence of the latter, perhaps caused by over-grazing. Such herbs included broad-leaved dock *Rumex obtusifolius*, nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris* and spear thistle *Cirsium vulgare*. Of particular note, however, was the scattered occurrence of musk thistle *Cardus nutans*, a tall, spiny thistle more characteristic of bare places on calcareous soils, recorded along the upper slopes of the field.

3.3.6 Of great importance for management of the pasture was the occurrence of creeping thistle *Cirsium arvense* and common ragwort *Senecio jacobea* as locally frequent weeds within the field. Rodwell (1992) notes that common ragwort is a biennial which seeds prolifically and which can rapidly colonise over-grazed pastures and areas of bare soil, especially in times of drought or where there is infestation by rabbits. It is not unpalatable to all stock (sheep can eat it) but in quantity it is lethal. Creeping thistle is a perennial which spreads readily by the production of nodal shoots from extensive adventitious roots.

Target Note 3 (species-rich lowland pasture - MG6c, with patches of calcareous grassland similar to MG5 meadow vegetation)

3.3.7 The species-richness of the pasture increased markedly towards the steeper slopes at the north-eastern edge of the field. The herb-rich vegetation here was relatively short, with extensive evidence of rabbit grazing, and was not interspersed by large patches of tall weeds. It was mostly classified by the NVC as MG6c grassland (*Lolium perenne – Cynosurus cristatus* grassland, *Tricetum flavescens* sub-community). However, on the thinner soils of some of the steeper slopes there were distinct zonations to more calcareous grassland, where meadow species of an MG5 meadow community (*Cynosurus cristatus – Centaurea nigra* grassland), persisted.

3.3.8 Crested dog's-tail *Cynosurus cristatus* was still the most abundant grass in this location. However, occasional, or locally frequent, other grasses included rye-grass *Lolium perenne*, yellow oat-grass *Trisetum flavescens*, common bent *Agrostis capillaries*, Yorkshire fog *Holcus lanatus* and quaking-grass *Briza media*. Herbs typical of more calcareous grassland included occasional, to locally frequent, lady's bedstraw *Galium verum,* salad burnet *Sanguisorba minor*, thyme *Thymus sp.,* small scabious *Scabiosus columbaria*, hoary plantain *Plantago media*, common restharrow *Ononis repens*, and musk thistle *Cardus nutans*.

3.3.9 Other herbs recorded included mouse-ear hawkweed *Pilosella officinarum*, bird's-foot-trefoil *Lotus corniculatus*, autumn hawkbit *Leontodon autumnalis*, self-heal *Prunella vulgaris*, germander speedwell *Veronica chamaedrys*, yarrow *Achillea millefolium,* common mouse-ear *Cerastium fontanum*, red clover *Trifolium pratense*, white clover *Trifolium repens*, common sorrel *Rumex acetosa*, prickly sow-thistle *Sonchus asper,* ribwort plantain *Plantago lanceolata*, and dandelion *Taraxacum agg.*. Tall weed species such as creeping thistle *Cirsium arvense*, hogweed *Heracleum sphondylium*, spear thistle *Cirsium vulgare* and common ragwort *Senecio jacobea* were only occasionally scattered throughout.

Target Note 4 (Ungrazed, tussocky grassland - MG1)

3.3.10 Below the gappy hedge along the north western boundary of the site (separated from the grazed pasture by a fence) was the patchy occurrence of coarse, tussocky swards classified by the NVC as MG1e *Arrhenatherum elatius – Centaurea nigra* grassland. Such grassland is characteristic of mesotrophic soils with a relatively high pH and can be maintained, in the absence of grazing, by regular but infrequent cutting. However, in this case the community was being invaded by shrubs and is therefore a temporary stage in the succession to scrub and woodland.

3.3.11 Frequent grasses and herbs included false oat-grass *Arrhenatherum elatius*, smooth meadow-grass *Poa pratensis,* yellow oat-grass *Trisetum flavescens*, common bent *Agrostis capillaris*, yarrow *Achillea millefolium*, Yorkshire fog *Holcus lanatus*, lady's bedstraw *Galium verum*, harebell *Campanula rotundifolia*, black knapweed *Centaurea nigra,* common sorrel *Rumex acetosa,* musk thistle *Cardus nutans* and ground-ivy *Glechoma hederacea*. Tall weeds that were scattered throughout included spear thistle *Cirsium vulgare*, hogweed *Heracleum sphondylium* and nettle *Urtica dioica*. Also common throughout was the presence of rabbit warrens.

Target Note 5 (improved, heavily horse-grazed pasture - MG6)

3.3.12 Heavy grazing by horses in the locally flooded fields adjacent to the River Derwent has produced short, tight swards which are grass- dominated. Similar to the field described in Target Note 2, however, the swards were classified as MG6 *Lolium perenne – Cynosurus cristatus* grasslands. Once again rye-grass *Lolium perenne* was the most abundant grass with locally abundant crested dog's-tail *Cynosurus cristatus* and a patchy distribution of Yorkshire fog *Holcus lanatus*. Other more occasional grasses included meadow foxtail *Alopecurus pratensis*, yellow oat-grass *Trisetum flavescens*, red fescue *Festuca rubra*, timothy grass *Phleum pratense* and common bent *Agrostis capillaries*.

3.3.13 Unlike the adjacent field described in Target Note 2, however, patches of tall weeds were not particularly frequent, although they were, nevertheless, present on an occasional basis. Thus, herbs recorded within the fields here included spear thistle *Cirsium vulgare*, common ragwort *Senecio jacobea*, creeping thistle *Cirsium arvense*, white clover *Trifolium repens*, yarrow *Achillea millefolium*, common mouse-ear *Cerastium fontanum*, creeping buttercup *Ranunculus repens* and autumn hawkbit *Leontodon autumnalis*. Occasional daisy *Bellis perennis* was also recorded on some of the old earthwork mounds, which were otherwise covered in a similar grassland vegetation to the rest of the fields.

Target Note 6 (Ayton Castle)

3.3.14 Tall weeds dominated by nettle *Urtica dioica* surrounded the immediate vicinity of Ayton Castle. Parts of the external stonework were obscured by woody vegetation. For example, a young sycamore *Acer pseudoplatanus* had grown up beside the main basement entrance, obscuring part of window No. 11, and ivy *Hedera helix* had grown over some of the stonework to the north of window No. 13 (BHWB Figure 6). Other shrubs here included elder *Sambucus nigra*. A thin soil had accumulated on the top stones of the castle remains, where a grass dominated flora was recorded. This area was inaccessible for further survey.

3.3.15 A row of four mature lime *Tilia vulgaris* were located parallel to the northern elevation of the castle at a distance of approximately 10m. A mature sycamore *Acer pseudoplatanus* occurred approximately 25m to the south-west of the castle.

Target Note 7

3.3.16 A small pond occurred between the old earth mounds at this location and the water had a green 'soupy' appearance interspersed by occasional water crowfoot *Ranunculus spp.*. The muddy edges of the pond had little marginal vegetation, with only occasional floating sweet grass *Glyceria fluitans.* Other plants recorded in the nearby vicinity included and water forget-me-not *Myosotis scorpioides,* bird's-foot-trefoil *Lotus corniculatus*, silverweed *Potentilla anserine*, self-heal *Prunella vulgaris* and field horsetail *Equisetum arvense*.

Hedgerow No. 1 (H1)

3.3.17 A trimmed hedge c. 2m high by 2m wide and co-dominated by hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, elder *Sambucus nigra* and beech *Fagus sylvatica*.

Hedgerow No. 2 (H2)

3.3.18 A recently planted hedgerow with a mix of young hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, hazel *Corylus avellana*, guelder-rose V*iburnum opulus* and rose *Rosa spp.*

Hedgerow No. 3 (H3)

3.3.19 A trimmed beech *Fagus sylvatica* hedge borders the field adjacent to the garden with occasional semi-mature silver birch *Betula pendula*.

Hedgerow No. 4 (H4)

3.3.20 A trimmed hedge c. 2m high by 2m wide dominated by hawthorn *Crataegus monogyna.* Other species included rose *Rosa spp.*

Hedgerow No. 5 (H5)

3.3.21 An overgrown, gappy hedge co-dominated by hawthorn *Crataegus monogyna* and elder occurs along the northern border of the site. The shrubs were 3-4m tall and 2-3m wide. Refer to Target Note 4 for a description of the ground flora in some of the larger gaps between the shrubs.

Hedgerow No. 6 (H6)

3.3.22 An overgrown, unmanaged hedgerow with several mature ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus,* located along the top of a large hedgebank. Shrubs included hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, elder *Sambucus nigra*, hazel *Corylus avellana* and rose *Rosa spp.*. The ground was heavily cattle poached but woodland ground flora plants recorded included dog's mercury *Mercurialis perennis*, herb-robert *Geranium robertianum* and ivy *Hedera helix*. This hedgerow qualified as "Important" under the Hedgerow Regulations of 1997.

3.4 Fauna

Fauna recorded during the Phase 2 Habitat Survey included mole hills amidst the soft earth beside the River Derwent.

Bats

3.4.1 No signs of bats were recorded in any of the accessible external stonework of the castle. However, three pipistrelle bats *Pipistrellus sp* .were recorded roosting within the northern half of the basement (BHWB Figures 6 and 11). Two pipistrelles were located between the vault stones of the basement roof (BHWB Figure 6), whilst a third one was located between the vertical stones of the south elevation (BHWB Figure 11).

3.5 Consultations

3.5.1 Refer to section 3.1.

4 NATURE CONSERVATION VALUE OF AYTON CASTLE

4.1 Criteria for evaluation

4.1.1 It has become standard practice for bodies designating sites of nature conservation interest to evaluate sites according to criteria identified in the Nature Conservation Review (Ratcliffe, 1977) and in Guidelines for the selection of biological SSSIs (NCC 1989). Briefly these criteria are:

- size (extent);
- diversity;
- rarity;
- fragility;
- typicalness;
- recorded history;
- position within an ecological/geographical unit;
- potential value;
- intrinsic value.

4.1.2 These criteria can be used to help assess the International, National, Regional, High Local (County), Moderate Local (District), Low Local (Parish) or Negligible overall value of the fauna and flora within a site. Examples of the levels of ecological value that have been assigned to the fauna and/or flora of specific areas are summarised in Table 1. The examples further refine government guidance on the nature conservation aspects of planning (PPG 9: Nature Conservation) published by the Department of Environment in 1994.

4.1.3 PPG9 notes that "….statutory and non-statutory sites, together with countryside features which provide wildlife corridors, links or stepping stones from one habitat to another, all help to form a network necessary to ensure the maintenance of the current range and diversity of our flora, fauna, geological and landform features and the survival of important species" (DOE 1994, paragraph 15). Not uncommonly, however, otherwise unpromising (and undesignated) sites may support species highlighted as being of conservation interest or concern in one of a number of published lists. In such cases, it becomes necessary to consider the value of the site on the basis of its more noteworthy species. Thus, the overall site assessment involves variable weighting of the criteria used for the selection of SSSIs. Some areas may be important for a combination of attributes, whilst others are rated highly for only a single important feature. This report therefore follows the more detailed and up-to-date advice given by Regini & Tofts (2000) on the three categories of Local Ecological Value shown in Table 1: High Local Value (County), Moderate Local Value (District) and Low Local Value (Parish)

4.1.4 Nevertheless, in practice the lack of a comprehensive county floral and faunal database make the detailed application of many of these criteria problematic. An additional guideline, the re-creatability of the habitat, is therefore assessed according to the professional judgement of an experienced ecologist. The

more difficult a habitat is to re-create if it should be destroyed, the greater the value which should be placed upon it. It is normally the case that habitats that are more 'natural' are more valuable and thus the emphasis in nature conservation tends to be upon the protection of natural or semi-natural ecosystems.

Table 1: Ecological value of habitats (Regini and Tofts - 2000)

Level of Value	Examples
International	Internationally designated or proposed sites, or otherwise meeting criteria for international designation. Sites supporting populations of internationally important species.
National	Nationally designated sites such as SSSIs, or non-designated sites meeting SSSI designation. Those containing viable areas of any key habitat identified in the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book species (excluding scarce species), or supplying critical elements of their habitat requirements.
Regional	Sites containing viable areas of threatened habitats listed in a Regional Biodiversity Action Plan (or some Natural Areas), comfortably exceeding Sites of Importance for Nature Conservation (SINC) criteria, but not meeting SSSIs selection criteria. Sites supporting viable breeding populations of Nationally Scarce species or those included in the Regional Biodiversity Action Plan (or some Natural Areas) on account of their rarity, or supplying critical elements of their habitat requirements.
High Local (County)	Sites meeting the criteria for a county or metropolitan area designation (such as a Site of Importance for Nature Conservation SINC), which may include amenity and educational criteria in urban areas. Ancient semi-natural woodland. Designated Local Nature Reserves. Sites containing viable areas of any key habitat type identified in the County Biodiversity Action Plan (or some Natural Areas). Sites supporting viable breeding populations of species known to be county/metropolitan rarities, or supplying critical elements of their habitat requirements (e.g. featuring in a county 'red data book' or included in the county/metropolitan Biodiversity Action Plan or some Natural Areas), or supplying critical elements of their habitat requirements.
Moderate Local (District)	Undesignated sites, or features considered appreciably to enrich the habitat resource within the context of the Borough or District, or included in the Borough or district Biodiversity Action Plan or some Natural Areas. Amenity and educational functions will be recognised in urban areas. Sites supporting viable breeding populations of species listed as rare in the District or Borough Biodiversity Action Plan or some Natural Areas, or supplying critical elements of their habitat requirements.
Low Local (Parish)	Undesignated sites, or features considered appreciably to enrich the habitat resource within the context of the Parish or neighbourhood (e.g. a species-rich hedgerow).
Negligible	Low grade and widespread habitats.

4.1.5 The evaluation of fauna and flora at Ayton Castle is based on survey work undertaken on 29th July 2005. Information gained from the desk-based study is referred to wherever appropriate in each evaluation.

4.2 Habitats

Improved, grazed pastures

4.2.1 Approximately two thirds of the species-poor, cattle-grazed, grassland surrounding Ayton Castle is a ubiquitous habitat in Britain and often forms the bulk of dairying and fatting pasture in many parts of the country. It is likely that both this field and the adjoining horse- grazed pastures further south have been subject to an extension of grazing into late spring/summer and to agricultural improvement by the application of artificial fertilizers. These measures tend to reduce their species diversity and favour the dominance by grasses, both of which were apparent in all the fields that were surveyed. The nature conservation value of these pastures is therefore considered to be generally relatively low (however, refer to paragraphs 4.2.3 and 4.2.4 for the exception).

Semi-improved, cattle-grazed pasture

4.2.2 The species-richness of the cattle-grazed pasture surrounding Ayton Castle increased markedly on the thinner soils of the steeper slopes towards the north-eastern half of this particular field (Target Note 3). Within this section of the field there was a distinct zonation from the species-poor MG6 grassland community to more calcareous, unimproved, species-rich grassland. For example, several meadow species characteristic of an MG5 meadow community (*Cynosurus cristatus – Centaurea nigra* grassland), persisted on the steep slopes. The latter represents one of the rarest and most endangered grassland types in the UK and North Yorkshire.

4.2.3 Indeed, this part of the pasture nearly meets one of the criteria thresholds for the selection of Sites of Importance for Nature Conservation (SINC) based on the grassland selection guidelines of the North Yorkshire SINC Panel (2002). For example, a score of 11 was totalled from the calcareous grassland species listed in Table 7 of these guidelines (North Yorkshire SINC Panel 2002 pp. 31). The threshold criterion is a score of 12. Additional ecological interest is also given to this part of the field simply by its proximity to Raincliffe & Forge Valley Woods (SSSI). Overall, then, the eastern third of the cattle-grazed pasture is considered to be of at least district ecological value.

Hedgerows

4.2.4 Most of the hedgerows bordering the Ayton Castle study area were species-poor and of only local ecological interest. However, the exception to this was the hedgerow that separates the cattle- and horse-grazed pastures, which was overgrown and species-rich (H6). This hedgerow fulfilled the criteria to qualify it as “Important” under the Hedgerow Regulations (1997) and is therefore considered to be of district ecological value.

4.3 Fauna

Bats

4.3.1 Three pipistrelle bats *Pipistrellus sp.* were located in the north basement of Ayton Castle and were using this area as a summer roost. It is possible that these bats may also use the basement for hibernation purposes and further survey work is recommended to confirm this supposition. All species of bats are protected under Regulation 38 of The Conservation (Natural Habitats, etc.) Regulation 1994 (Schedule 2) (the legislative instrument for implementation of the EU Habitats and Species Directive) and under Section 9 of the Wildlife and Countryside Act 1981 (as amended by Schedule 5). A bat roost is defined as 'any structure, or place, which is used for shelter or protection', irrespective of whether or not bats are resident. The Regulation and Act of Parliament makes it illegal to deliberately kill, damage, take or disturb bats, or to destroy, damage or obstruct access to a bat roost. The presence of bats within Ayton Castle is therefore considered to be of at least district ecological importance.

4.3.2 The UK is also a signatory to the Agreement on the Conservation of Bats in Europe (under the Bonn Convention). This Agreement places obligations on the Government to protect important bat roosts or foraging areas. Good foraging areas for bats can be found in sheltered areas with a plentiful supply of insects for feeding, and research indicates that such areas can be found within, and adjacent to, broadleaved woodland, isolated mature trees, hedges and water (Walsh & Harris 1996). The conclusion here is that all the hedgerows and isolated trees within the Ayton Castle study area, as well as the adjacent River Derwent and Raincliffe and Forge Valley Woodland, are good foraging areas for bats.

5 RECOMMENDATIONS

5.1 Bats

5.1.1 A bat licence from Defra (Department of Environment, Food and Rural Affairs) will be required to cover the proposed restoration works at Ayton Castle. This is because of the predicted short-term and long-term impacts to the local bat population from the proposed restoration works. For example, short-term disturbance to the roosting bats within the basement will occur from the erection of scaffolding. Additional impacts will include extra noise and vibrations from the presence of site operatives and machinery, as well as changes in the site layout and local environment. Long-term impacts to bats can occur from roost modifications and roost loss and, in this case, may occur via the infilling of crevices between the stonework that are otherwise suitable areas for bat roosts.

5.1.2 The Defra bat licence will require the work to take into account the clear seasonal changes in behaviour and roost selection shown by bats, and be undertaken when they are at their least vulnerable. In this case it is recommended that scaffolding be erected in April 2006, provided the weather is sufficiently warm and the bats have woken up from hibernation. This time is ideal because bats have woken up from hibernation but have not yet begun breeding. Additional measures to ensure the least disturbance to bats include

the erection of bat boxes on nearby trees. These boxes will help to provide alternative, safe, places (voids) in which bats can cluster if temporarily disturbed from the castle.

5.1.3 Further measures required within the Defra Licence will also include keeping open particular crevices between the stonework that are suitable for bat roosts. This work will be supervised by a licenced bat worker and will require further survey work when the scaffold is up. Finally, a monitoring plan will be required by the licence to assess whether the bats have responded well to the mitigation measures, and to inform ongoing roost management. This will involve a pre-emergence examination of the accessible roosts and counting the number of bats leaving any other identified roosts in June/July 2006 and/or June/July 2007, depending on when the work is finished.

5.1.4 After submission to Defra of the bat licence application form (which includes a comprehensive Method Statement and a Reasoned Statement of Application) a formal decision by the Department will take a minimum of six weeks to complete. The contents of the Method Statement include a survey and site assessment (which will be on-going), an impact assessment, full description of the mitigation strategy and a timetable of works. It is essential that specifications of the proposed works are included in the Method Statement, including site plans and maps to illustrate the various details. If relevant it may also include habitat creation, restoration and/or enhancement of terrestrial habitats within the vicinity of Ayton Castle.

5.1.5 To ensure that sufficient survey work is undertaken for approval of the Bat Licence application it is recommended that further survey work be undertaken to establish whether the bats are also using the castle as a hibernation roost. The latter should consist of three visits between November 2005 and March 2006 to monitor the presence/absence and possible movement of bats during the winter months within the basement of Ayton Castle. All existing survey work, and plans for further survey and monitoring work, will be included within the Bat Licence application.

5.2 Other recommendations

5.2.1 Records of other protected species along the nearby River Derwent include otter and water vole. It is also possible that great crested newts (another protected species) breed in the pond within the horse-grazed pasture to the south of the castle. In order to enhance the overall nature conservation value of the landscape, or should any other works be required in this field, then a great crested newt survey is recommended. The latter should be undertaken between March and mid-June with at least two visits undertaken between mid-April and mid-May.

6 REFERENCES

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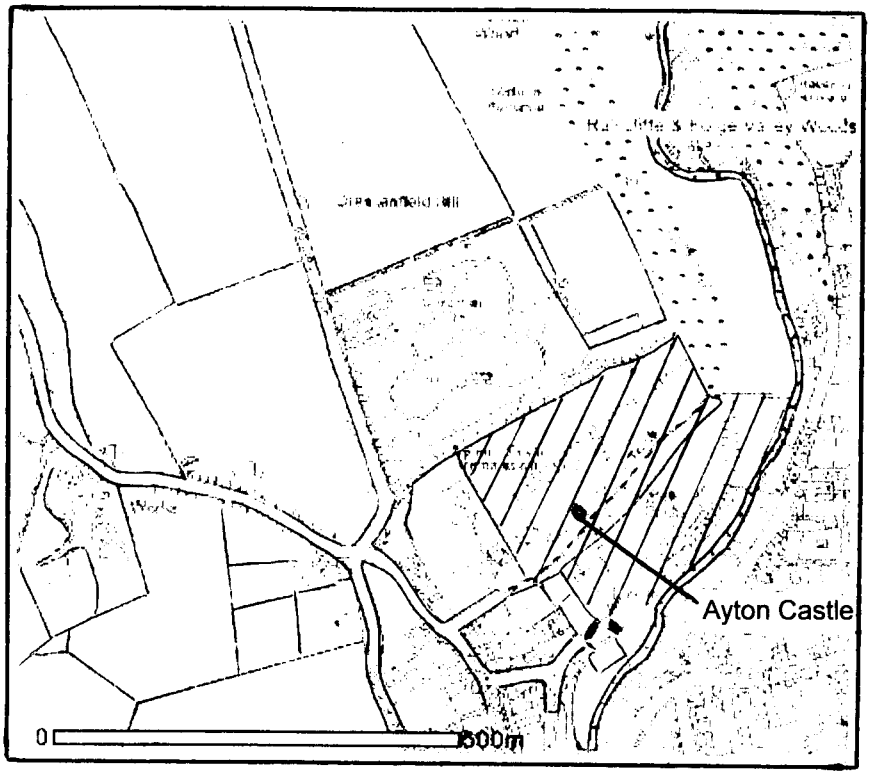
PROJECT	Ayton Castle, North Yorkshire
TITLE	LOCATION OF THE STUDY AREA
SCALE	c. as shown
DATE	30/9/05
EINC	FIGURE 1



KEY

Ayton Castle study area

Raincliffe & Forge Valley Woods (SSSI)

Key to the Phase 2 Habitat Survey (Figure 2) – Ayton Castle


Species-rich hedgerow with trees


Species-poor hedgerow


Gappy, species-poor, hedgerow


Mature tree


Dense scrub


Scattered scrub


Improved grassland


Semi-improved pasture


Calcareous grassland


Tall ruderals (e.g. nettle *Urtica dioica*)


Standing water


Running water

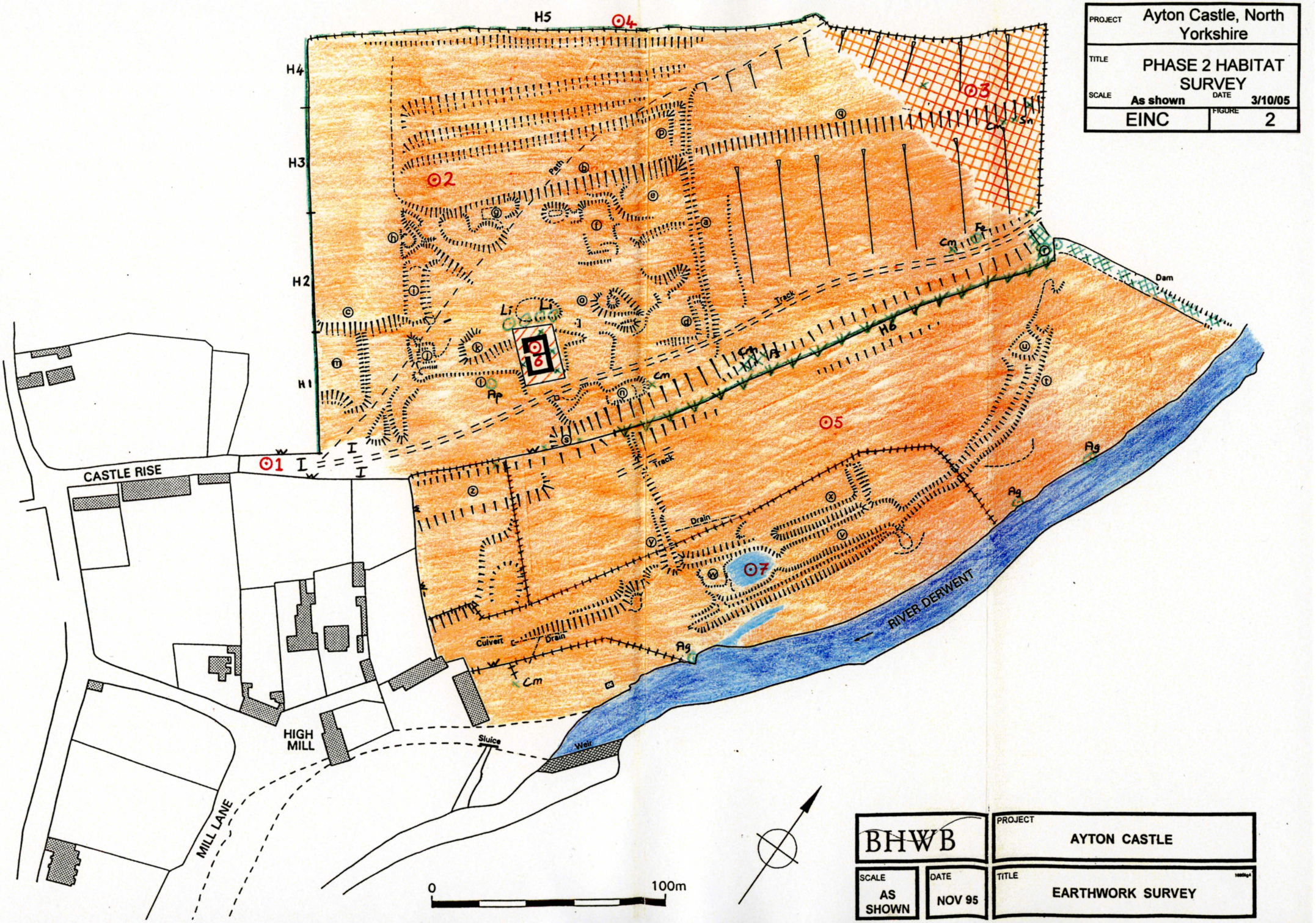

Target Note

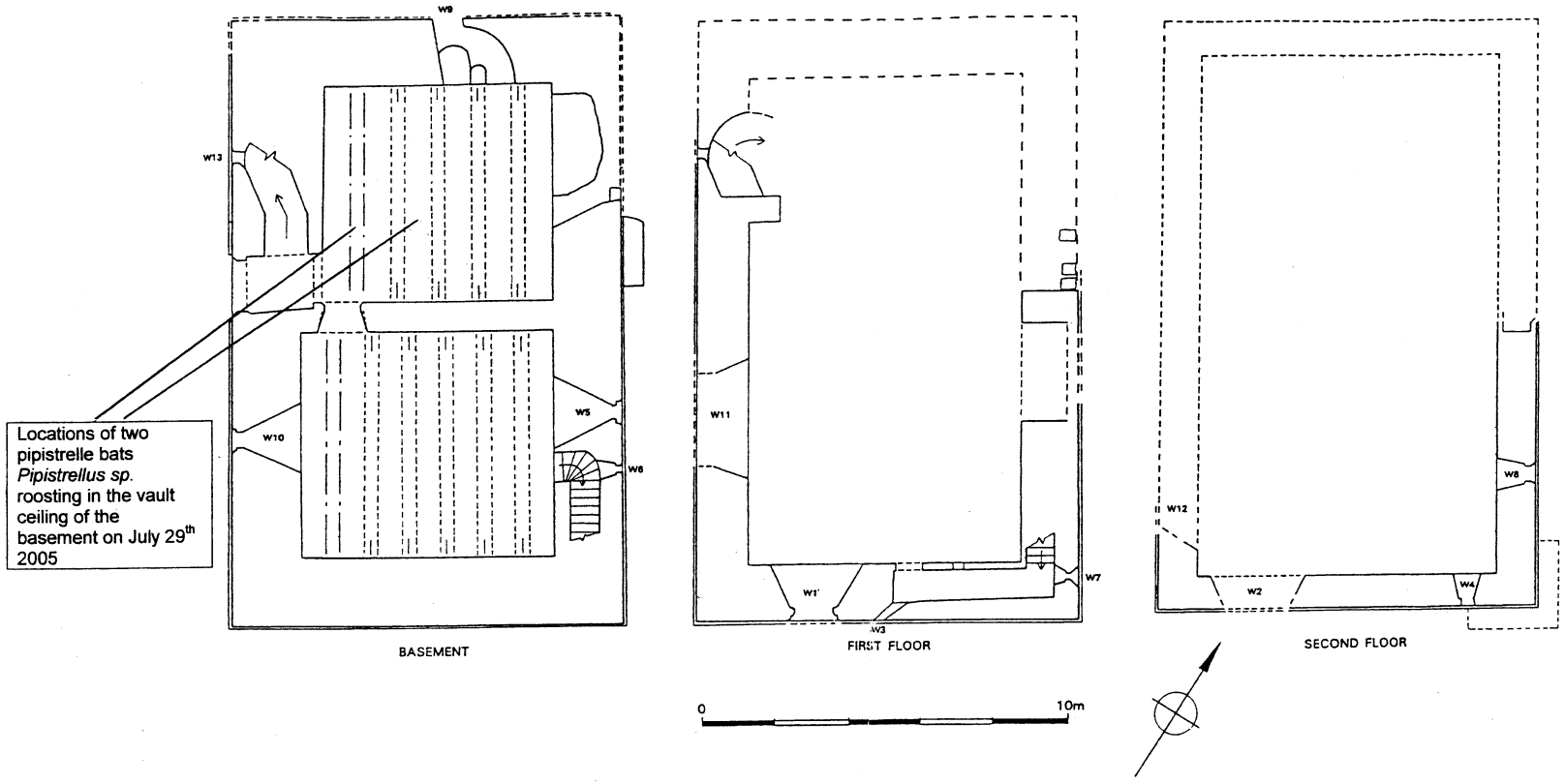

Fence


Wall

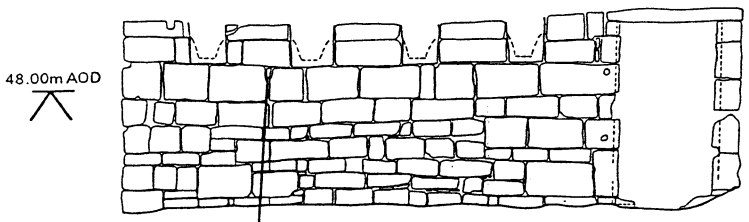
Codes

Ag	alder *Alnus glutinosa*
Ap	sycamore *Acer pseudoplatanus*
Cm	hawthorn *Crataegus monogyna*
Fe	ash *Fraxinus excelsior*
H	hedgerow
Li	common lime *Tilia vulgaris*
Ps	blackthorn *Prunus spinosa*
Sn	elder *Sambucus nigra*


PROJECT Ayton Castle, North Yorkshire
TITLE PHASE 2 HABITAT SURVEY
SCALE As shown
DATE 3/10/05
EINC
FIGURE 2
H5
H4
H3
H2
H1
H6
CASTLE RISE
HIGH MILL
MILL LANE
RIVER DERWENT
Track
Path
Drain
Culvert
Sluice
Weir
Dam
Cm
Ag
Ap
Fe
Sn
Li
0
100m
BHWB
PROJECT AYTON CASTLE
SCALE AS SHOWN
DATE NOV 95
TITLE EARTHWORK SURVEY

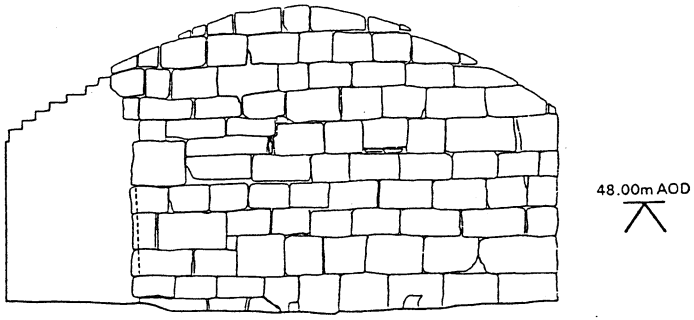


BHWB	PROJECT: AYTON CASTLE	FIGURE: 6
SCALE: AS SHOWN	DATE: NOV 95	TITLE: FLOOR PLANS

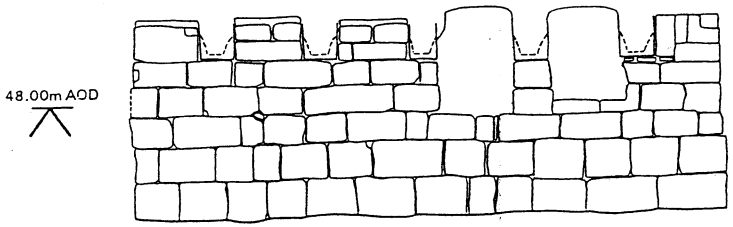


SOUTH ELEVATION

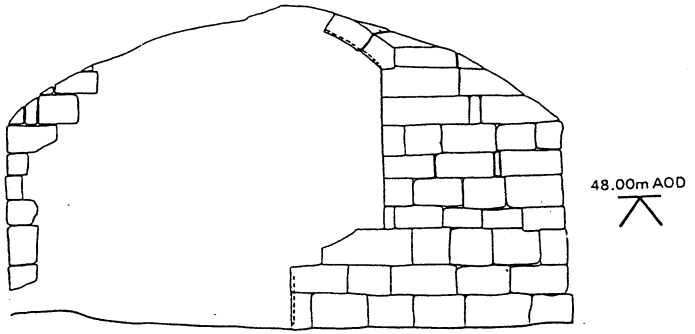
Location of a pipistrelle bat *Pipistrellus sp.* roosting in the wall of the south elevation on July 29th 2005



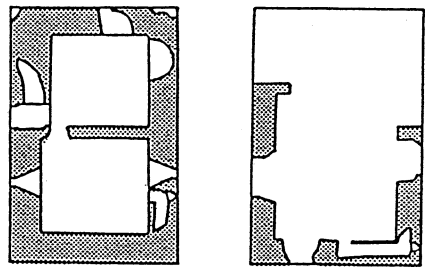
WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION



BHWB
BARTON HOWE WARREN BLACKLEDGE

PROJECT
AYTON CASTLE

TITLE
NORTH BASEMENT: ELEVATIONS

FIGURE
11

SCALE
AS SHOWN

DRAWN BY
ED

DATE
DEC 95

APPENDIX 1 Information on Raincliffe & Forge Valley Site of Special Scientific Interest (SSSI) and Forge Valley National Nature Reserve (NNR)

County: North Yorkshire **Site Name: Raincliffe and Forge Valley Woods**

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981. Part of this site is a National Nature Reserve (NNR).

Local Planning Authority: North York Moors National Park, (Scarborough Borough Council)

National Grid Reference: SE 986870

Ordnance Survey Sheet 1:50,000: 101 **1:10,000:** SE 98 NE

Area: 95.6 (ha) 236.2 (ac)

First Notified: 1954 * **Date of Revision:** 1984

Description:
Forge Valley Woods flank the steep east and west facing slopes of the Derwent valley and extend along a northwest facing spur into Raincliffe Woods. They comprise one of the best examples known of mixed deciduous woodland in north-east England.

There is a sequence of woodland types occupying different levels of the valley sides. In the wet valley bottom alder *Alnus glutinosa* and willow *Salix* sp., predominate with a ground flora of opposite-leaved and alternate-leaved golden saxifrage *Chrysosplenium oppositifolium* and *C. alternifolium*, yellow flag *Iris pseudacorus* and pendulous sedge *Carex pendula.*

The middle slopes support a mixed canopy in which ash *Fraxinus excelsior* and wych elm *Ulmus glabra* are largely dominant with sycamore *Acer pseudoplatanus* locally prevalent, and an understorey of hazel *Corylus avellana*, field maple *Acer campestre*, holly *Ilex aquifolium*, bird cherry *Prunus padus* and spurge laurel *Daphne laureola.* The base-rich soils here support a diverse field layer dominated by dog's mercury *Mercurialis perennis*, ramsons *Allium ursinum* and bramble *Rubus fruticosus* with other herbs such as sanicle *Sanicula europaea*, wood anemone *Anemone nemorosa*, toothwort *Lathraea squamaria*, and ferns including soft shield fern *Polystichum setiferum* and hart's tongue *Phyllitis scolopendrium.* Several species of orchid occur, including early purple-orchid *Orchis mascula*, broad-leaved helleborine *Epipactis helleborine* and bird's-nest orchid *Neottia nidus-avis.*

At the top of the slope more acidic soils support pedunculate oak *Quercus robur* with rowan *Sorbus aucuparia* and holly. The field layer contains bilberry *Vaccinium myrtillus*, great woodrush *Luzula sylvatica*, heather *Calluna vulgaris* and wavy hair-grass *Deschampsia flexuosa.* In the Raincliffe sector chickweed wintergreen *Trientalis europaea* is recorded. Small areas of calcareous grassland are associated with limestone outcrops at the southeast end of the valley and here rock-rose *Helianthemum nummularium*, carline thistle *Carlina vulgaris* and thyme *Thymus praecox* occur. There are also several well-developed tufa springs.

The woodland supports a rich population of breeding birds including nuthatch, treecreeper, garden warbler, wood warbler, redstart and black-cap.

Other Information:
1. This site is listed in 'A Nature Conservation Review', edited by D A Ratcliffe (1977). Cambridge University Press.

2. Most of the site was notified as "Raincliffe Wood" in 1954. Forge Valley Woods were declared as a National Nature Reserve in 1977, the remaining woodland comprising a revised Raincliffe Wood SSSI. During the 1984 revision the boundary of the SSSI has been amended to form, with Forge Valley Woods, one SSSI.
3. During the 1984 revision the site has been reduced.

* Under Section 23 of the National Parks and Access to the Countryside Act, 1949.

ENGLISH NATURE

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MAPS NEWS HELP

Nature Reserves

Sites of Special Scientific Interest (SSSI)

International Sites

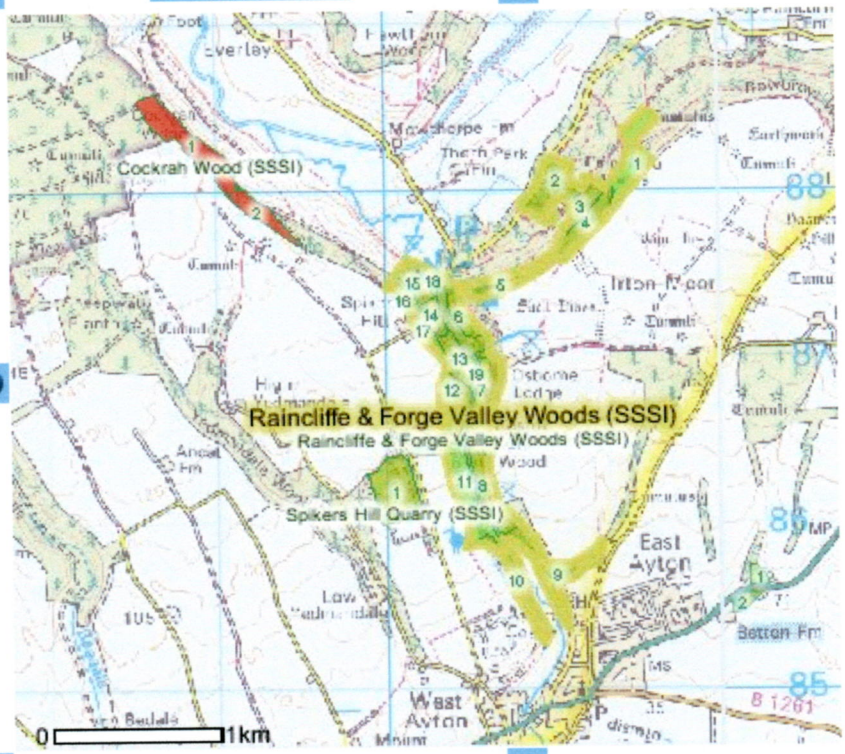
Biodiversity Action Plan Priority Habitats

Geological Sites Map

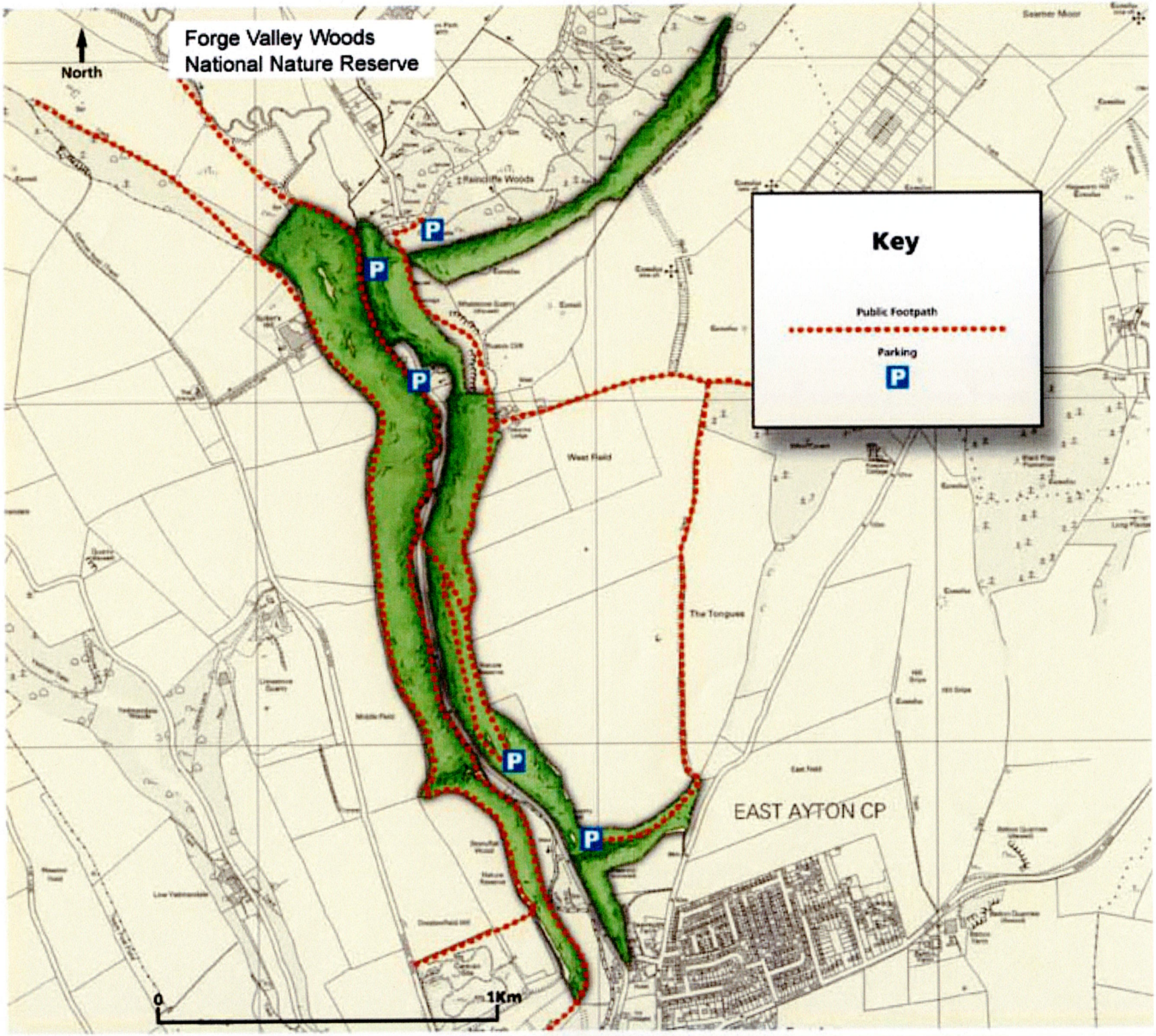
Targeting and Planning Map

Search maps for English postcodes, places, sites and more... GO Tips

Make page smaller



Click on the map with the mouse to get information about map f


Forge Valley Woods
National Nature Reserve
North
Key
Public Footpath
Parking
P
EAST AYTON CP
0
1Km

APPENDIX 3

GeoReports

Building Stone Assessment

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Report prepared for:

David Sherriff
Purcell Miller Tritton
29 Marygate
York
YO30 7WH

The identification, sourcing and matching of a stone sample from Ayton Castle, West Ayton, North Yorkshire.

Building Stone Assessment

This report provides a detailed petrographic description of the sample or samples taken from the buildings or structures in accordance with British Standard BS EN 12407:2000 (Natural Stone Test Methods – Petrographic Examination). Stone type is defined in accordance with European Standard prEN 12670:1997. Where possible the source or sources of the original stone are identified.

The report also provides, where appropriate, recommendations for the most suitable replacement stone types from currently available commercial sources.

Site Address:
Ayton Castle
West Ayton
North Yorkshire

Area centred at: 498732,485357
Radius of site area: 50 metres

Report reference: GR_101440_1
Client reference: DS.SC.230537
Site reference:
Date sampled / received: **17 March 2006**
Date analysed: **28 March 2006**
Date of report: 7 April 2006

Section 1: Executive Summary:

Site name: **Ayton Castle**

The sample of building stone supplied comprises:
Buff to yellow brown coloured, friable calcareous sandstone.

The most appropriate replacement stone is:

Sandstone from the local Lower Calcareous Grit Formation (Upper Jurassic)
- no currently active quarries

Other possible replacement stones are:

Middle Jurassic (Saltwick Formation)

Aislaby Quarry
Eskdale Stone Ltd,
Guisborough Road,
WHITBY
North Yorkshire,
YO21 1SF,
Tel: 01947 820821

Lowther's Crag Quarry,
N Ward,
Ugglebarnby,
WHITBY
North Yorkshire

Sussex Sandstone

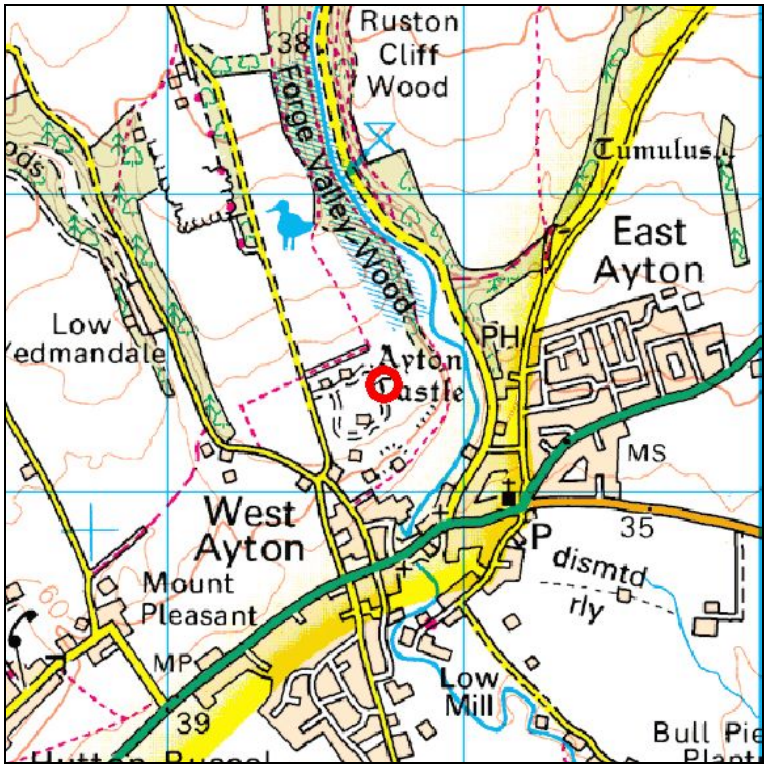
Philpots Stone Quarry
W T Lamb & Son Ltd
Philpots Lane,
West Hoathly,
EAST GRINSTEAD,
West Sussex,
RH19 4PS
Tel: 01342 810428

Paddockhurst Quarry
C/0 R H & R W Clutton,
92 High Street,
East Grinstead,
West Sussex,
RH19 3DF,
Tel: 01342 712791

Other remarks:

Please see the further information in section 8 of this report.

Section 2: Location of site



Scale: 1:25000 (1cm = 250m)

SITE LOCATION

Section 3: Introduction

A single sample of stone from the fabric of Ayton Castle (14th Century) at West Ayton in North Yorkshire was provided for analysis and matching.

Sample preparation

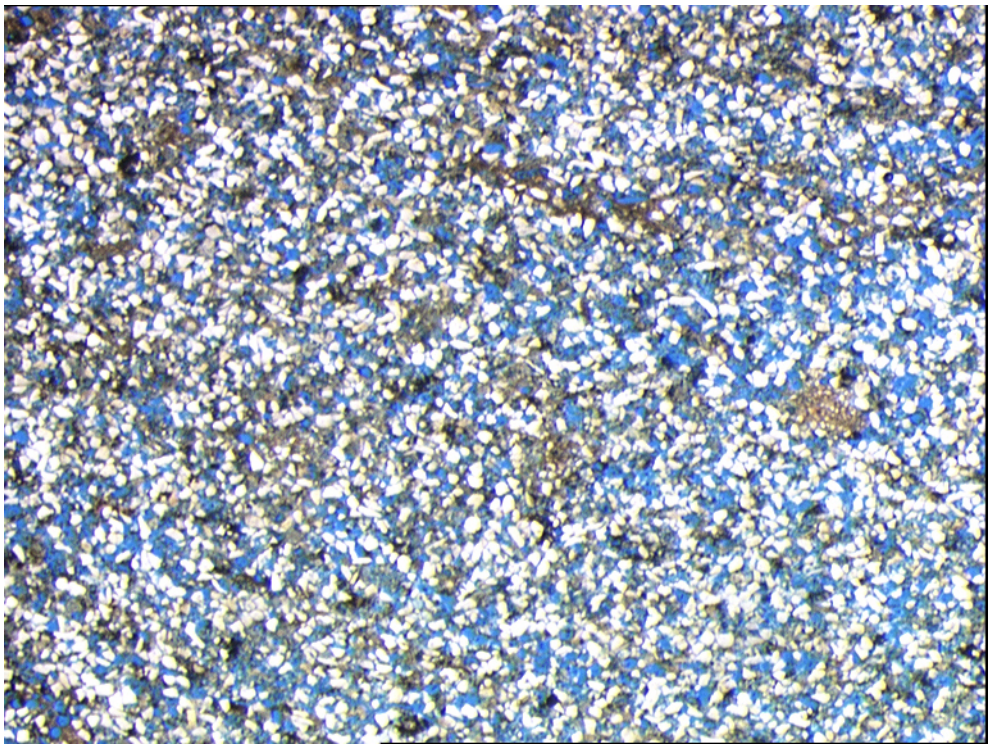
The thin section described in this report was prepared to a standard thickness of 30 microns by the thin section laboratories at the *British Geological Survey, Keyworth, Nottingham*.

- The sample was impregnated with blue-dye resin before preparation in order to facilitate identification and description of its pore space characteristics.
- As an aid to mineral identification during analysis, the section was stained using a standard dual carbonate *alizarin red-S* and *potassium ferricyanide* chemical stain to help determine the composition of any carbonate cement phases and grains present. The staining differentiates non-ferroan calcite (pale pink) from ferroan calcite (mauve→ purple → dark blue with increasing Fe-content); from dolomite (no colour); from ferroan dolomite (pale to deep turquoise with increasing Fe-content).
- The presence of potassic feldspar was determined using a sodium cobaltinitrite stain which produces a yellow coloration of the feldspar grains.

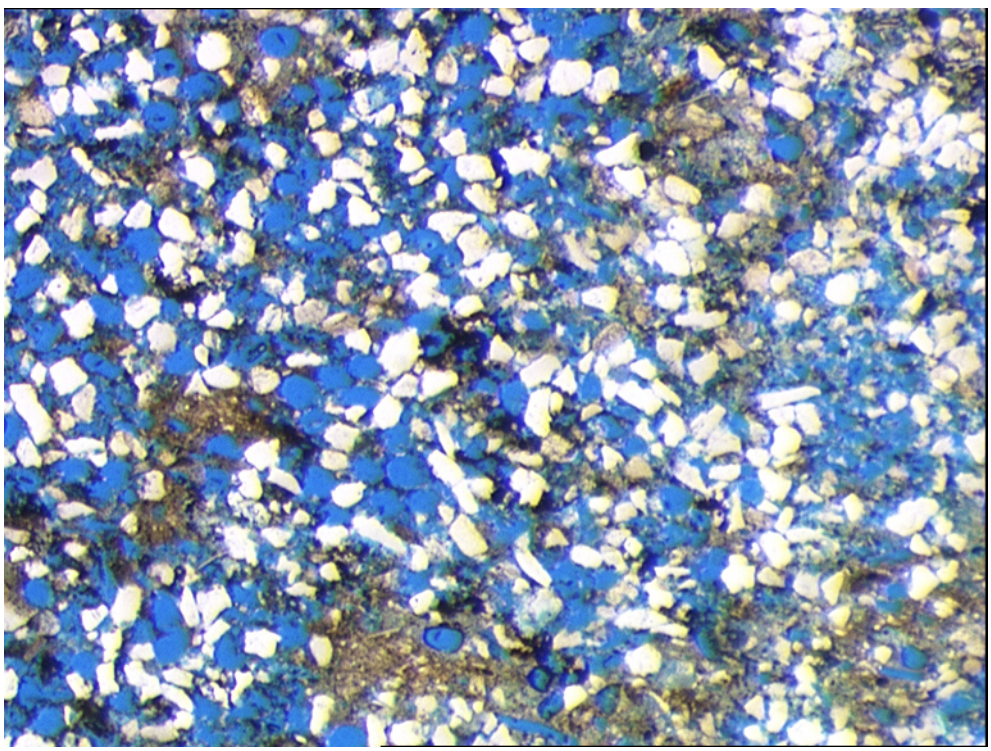
Section 4: Macroscopic description of samples

Buff to yellow-brown coloured, porous, friable, calcareous sandstone.

Section 5: Microscopic description of sample



Photomicrograph Sample 1 (Field of view 8mm left to right)



Photomicrograph Sample 1 enlarged (Field of view 3mm left to right)

Hand Specimen

Buff to yellow brown coloured, friable, porous, calcareous sandstone.

Thin section

Framework grains

Dominated by very fine sub-angular to sub-rounded detrital siliciclastic grains, with abundant evidence of bioclastic grains in a porous, muddy calcareous matrix. The siliciclastic grains (white in photomicrographs) dominantly comprise monocrystalline quartz, potassic and leached sodic / calcic feldspars and sparse muscovite mica grains. The bioclastic framework grains originally comprised siliceous spheres (spicules) derived from the decay of marine sponges. The weathering of the sandstone has, however, largely leached away these siliceous spicules leaving only open spheroidal pore spaces (*now infilled with blue resin*). The biogenic silica that formed the original skeletal material in these spicules is markedly more soluble than detrital silica and therefore more easily removed by weathering or during burial diagenesis.

Dark reddish-brown ferruginous aggregates commonly occur throughout the fabric.

Matrix

Pervasive muddy, micritic calcareous matrix.

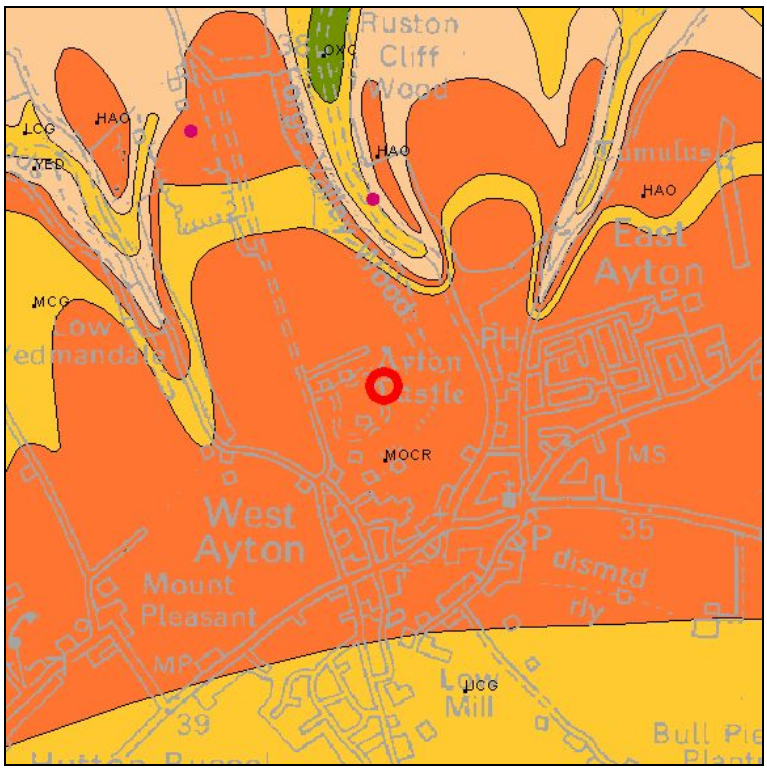
Macroporosity (blue-resin impregnated)

Highly porous. The extensive open porosity is a consequence of the secondary leaching out biogenic silica sponge spicules.

Comments

The high porosity formed by the dissolution of the silica spicules together with the weak micritic matrix, has produced a highly porous, easily weathered, friable sandstone.

Section 6: Geology of the site



Scale: 1:25000 (1cm = 250m)

SITE LOCATION

Key to Bedrock geology:

Map colour	Computer Code	Rock name	Rock type
	HAO	HAMBLETON OOLITE MEMBER	LIMESTONE, OOIDAL
	LCG	LOWER CALCAREOUS GRIT FORMATION	SANDSTONE
	MCG	MIDDLE CALCAREOUS GRIT	SANDSTONE
	MOCR	MALTON OOLITE MEMBER AND CORAL RAG MEMBER (UNDIFFERENTIATED)	LIMESTONE, OOIDAL
	UCG	UPPER CALCAREOUS GRIT FORMATION	SANDSTONE
	YED	YEDMANDALE MEMBER	LIMESTONE AND CALCAREOUS SANDSTONE
	OXC	OXFORD CLAY FORMATION	MUDSTONE

Section 7: Conclusions (see also Section 1)

The 14th C castle at West Ayton is sited on limestones of the Malton Oolite and Coral Rag members of the Corallian Group (Upper Jurassic). However, the stone sample from the castle is not an ooidal limestone from these beds but a very fine grained, bioclastic, calcareous sandstone probably sourced locally from the Lower (or possibly Upper Calcareous Grit) Formation of the Corallian Group, cropping out to the north and south, respectively of the castle site. These sandstone intervals form part of an alternating sequence of oolitic and bioclastic limestone intervals within the Corallian Group. Both the limestones and the sandstones have been extensively quarried in the local area in the past.

Jurassic sandstones were extensively used in Yorkshire as a vernacular building material in the past but are in general a comparative rarity in the rest of the UK. Many of these Yorkshire Jurassic building sandstones came from the non-marine sandstone successions of the Middle Jurassic Ravenscar Group in the North Riding. In general these sandstones are coarser grained, non-bioclastic and better cemented than the Castle sandstone. A number of quarries still work these mMiddle Jurassic sandstones for building stone.

Although an extensive local quarrying industry is also known in the local Upper Jurassic sandstone beds, lasting well into the 19th century, no quarries are currently working the sequence for building stone.

Three options are available, therefore, for obtaining stone for the repair of the decayed stonework in the castle

1. depending on the amount of stone needed it may be worthwhile to consider temporary re-opening of one of the local sandstone quarries in the Lower Calcareous Grit Formation (e.g. SE 9789, 8668; SE 9643, 8588; SE 9925, 8631) to obtain sufficient material for the repair.
2. consider using the sandstone from the two quarries in the Middle Jurassic which are currently active in North Yorkshire, at **Aislaby** and **Lowther's Crag**. Both are working sandstones in the Saltwick Formation (*see Section 1 for contact details*).
3. consider using stone from outside the Yorkshire area. The only sandstones which are almost as fine in grain-size as the Ayton Castle Stone are the Sussex sandstones from the Lower Cretaceous of the Weald area in south east England. Although paler in colour they do offer a possible alternative to the Ayton sandstone – **Philpots Quarry, Paddockhurst** *(see Section one for contact details*

Please note that the Blue Bank Quarry at Whitby mentioned in your covering letter is not present in our list of currently active UK quarries.

Graham Lott
British Geological Survey
Keyworth, UK.
7 April 2006

Section 8: Information about this Report

Introduction:

This report provides a petrographic examination of a sample or samples of building stone. It is designed for use by professionals involved in building repair and/or conservation but it might also be useful for private individuals to help them judge whether or not further professional advice should be sought. We recommend that members of the public consult a qualified professional about the results in this report before making any major decisions based on it.

Limitations of the report:

- This report is based on analysis of the sample or samples provided and cannot be assumed to be representative of all materials in a building or structure unless an on-site assessment has been carried out by a qualified professional.
- Please note that a recommendation of a replacement stone does not constitute a repair specification. All aspects of the building (location, detailing, other materials) must be considered in competent repair work.
- The report provides a petrographic examination of stone type. This does not guarantee that a replacement stone is suitable for a particular purpose (e.g. carved detail), nor does it guarantee specific properties of a stone such as strength.
- Please note that the characteristics of stone from a quarry source can vary over time, and that the recommendations in this report are based on comparison with samples held in our collections. It is recommended that prior to specification, current samples should be obtained from a particular quarry, and we would be happy to comment on these if required. Whilst the analysis undertaken in this report complies with BS EN 12407:2000, the mention of specific stone types should not be taken as an endorsement, or otherwise, of the quality of a particular product.
- Recommendations for replacement stone are based on and limited to an interpretation of the records in the possession of The British Geological Survey (BGS) at the time the examination is carried out.
- This report is supplied in accordance with the GeoReports Terms & Conditions available separately, and the copyright restrictions described in Section 9 of this report.

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British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham NG12 5GG
Tel: 0115 936 3143; Fax: 0115 936 3276

Email: enquiries@bgs.ac.uk

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Important notes about this report

- The data, information and related records supplied in this report by BGS can only be indicative and should not be taken as a substitute for specialist interpretations, professional advice and/or detailed site investigations. You must seek professional advice before making technical interpretations on the basis of the materials provided.
- Geological observations and interpretations are made according to the prevailing understanding of the subject at the time. The quality of such observations and interpretations may be affected by the availability of new data, by subsequent advances in knowledge, improved methods of interpretation, and better access to sampling locations.
- Raw data may have been transcribed from analogue to digital format, or may have been acquired by means of automated measuring techniques. Although such processes are subjected to quality control to ensure reliability where possible, some raw data may have been processed without human intervention and may in consequence contain undetected errors.
- Detail which is clearly defined and accurately depicted on large-scale maps may be lost when small-scale maps are derived from them.
- Although samples and records are maintained with all reasonable care, there may be some deterioration in the long term.
- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
- Data may be compiled from the disparate sources of information at BGS's disposal, including material donated to BGS by third parties, and may not originally have been subject to any verification or other quality control process.
- Data, information and related records which have been donated to BGS have been produced for a specific purpose, and that may affect the type and completeness of the data recorded and any interpretation. The nature and purpose of data collection, and the age of the resultant material may render it unsuitable for certain applications/uses. You must verify the suitability of the material for your intended usage.
- If a report or other output is produced for you on the basis of data you have provided to BGS, or your own data input into a BGS system, please do not rely on it as a source of information about other areas or geological features, as the report may omit important details.
- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.

Report issued by:

BGS Enquiry Service

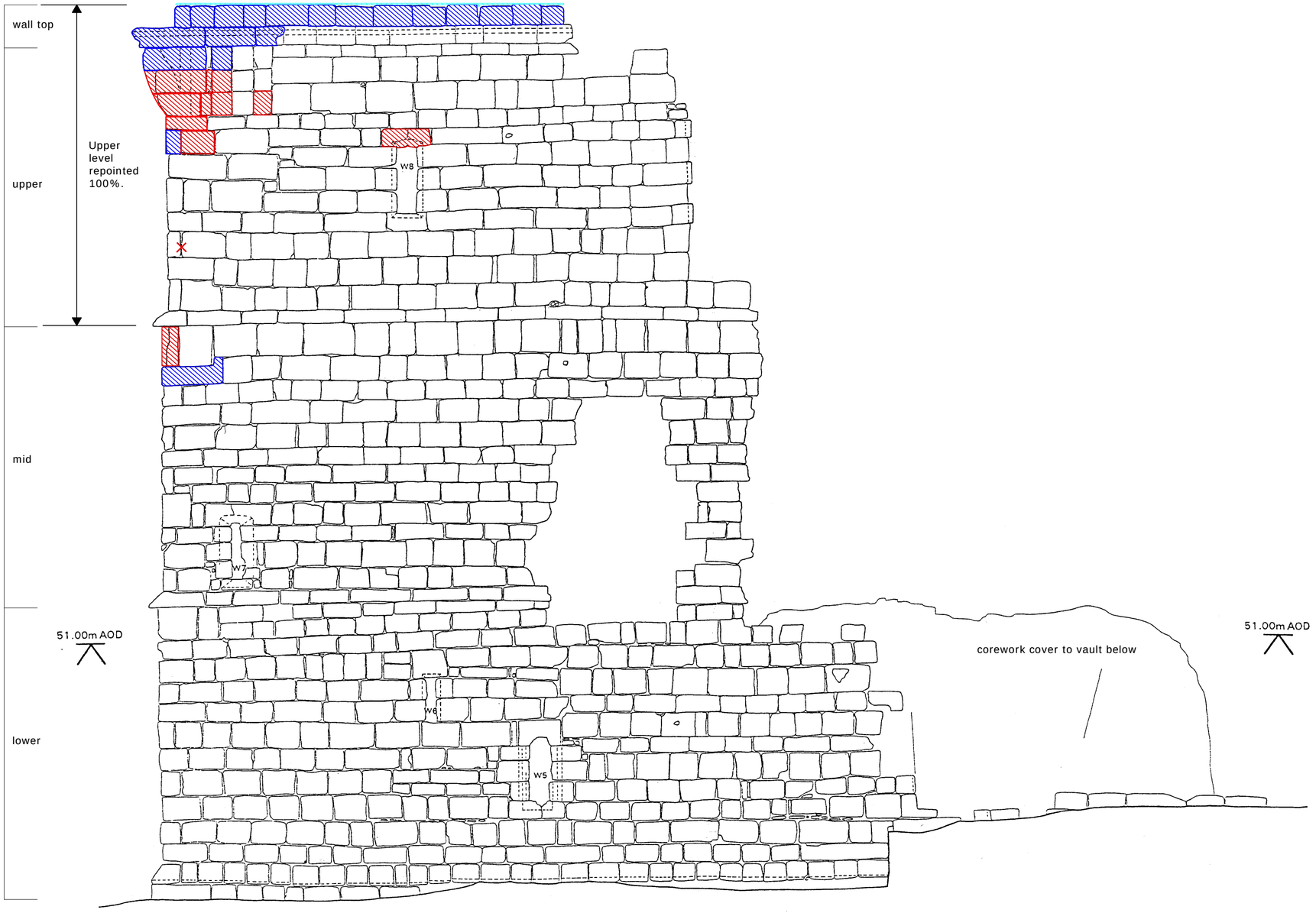
Section 10: Contact details for building stone enquiries

Murchison House (MH or MW) Office:
For Scotland:
Ewan Hyslop
Murchison House
West Mains Road
Edinburgh
EH9 3LA
Tel: 0131 650 0282
Fax: 0131 667 2785
Email: ekh@bgs.ac.uk

Keyworth (KW) Office
For England & Wales:
Graham Lott
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Tel: 0115 9363109
Fax: 01159 363276
Email : gkl@bgs.ac.uk

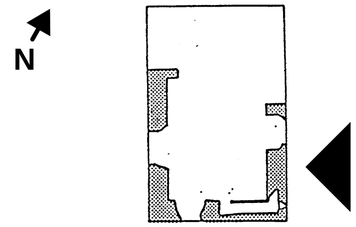
Exeter (EX) Office
For Devon & Cornwall:
Alick Leslie
Records & Data Enquiries
BGS Exeter Business Centre
Forde House
Park Five Business Centre
Harrier Way
Sowton
Exeter
Devon
EX2 7HU
Tel: 01392 445271
Fax: 01392 445371

APPENDIX 4



Do not scale from this drawing

The contractor is to check all dimensions on site



× Open joints retained for bats

M Mason's mark

Area of corework rebuilt

Stone carefully cut out and renewed using stone from Lowther's Cragg Quarry, nr Whitby

Stone re-bedded to consolidate

Wall top consolidated using reclaimed stone and 1:3 NHL3.5 sand mortar

Re-built masonry - stones reclaimed from site

original base drawing prepared by Barton Howe Warren Blackledge, 1995

EAST EXTERNAL ELEVATION

In general, the masonry of this elevation appeared to be in slightly better condition than the south and west sides.

0 5m

AS FIXED

REVISION	DATE	DRAWN	CHECKED	DESCRIPTION
C	17.05.08	CE	DS	As Fixed
B	30.06.06	CS	DS	Items omitted for revised tender
A	Mar '06	DS		Revised for tender

CLIENT
SCARBOROUGH BOROUGH COUNCIL

SCALE
1:50 @ A2

DATE
June 2005

PROJECT
AYTON CASTLE, West Ayton, North Yorkshire

DRAWN
BS

CHECKED
DS

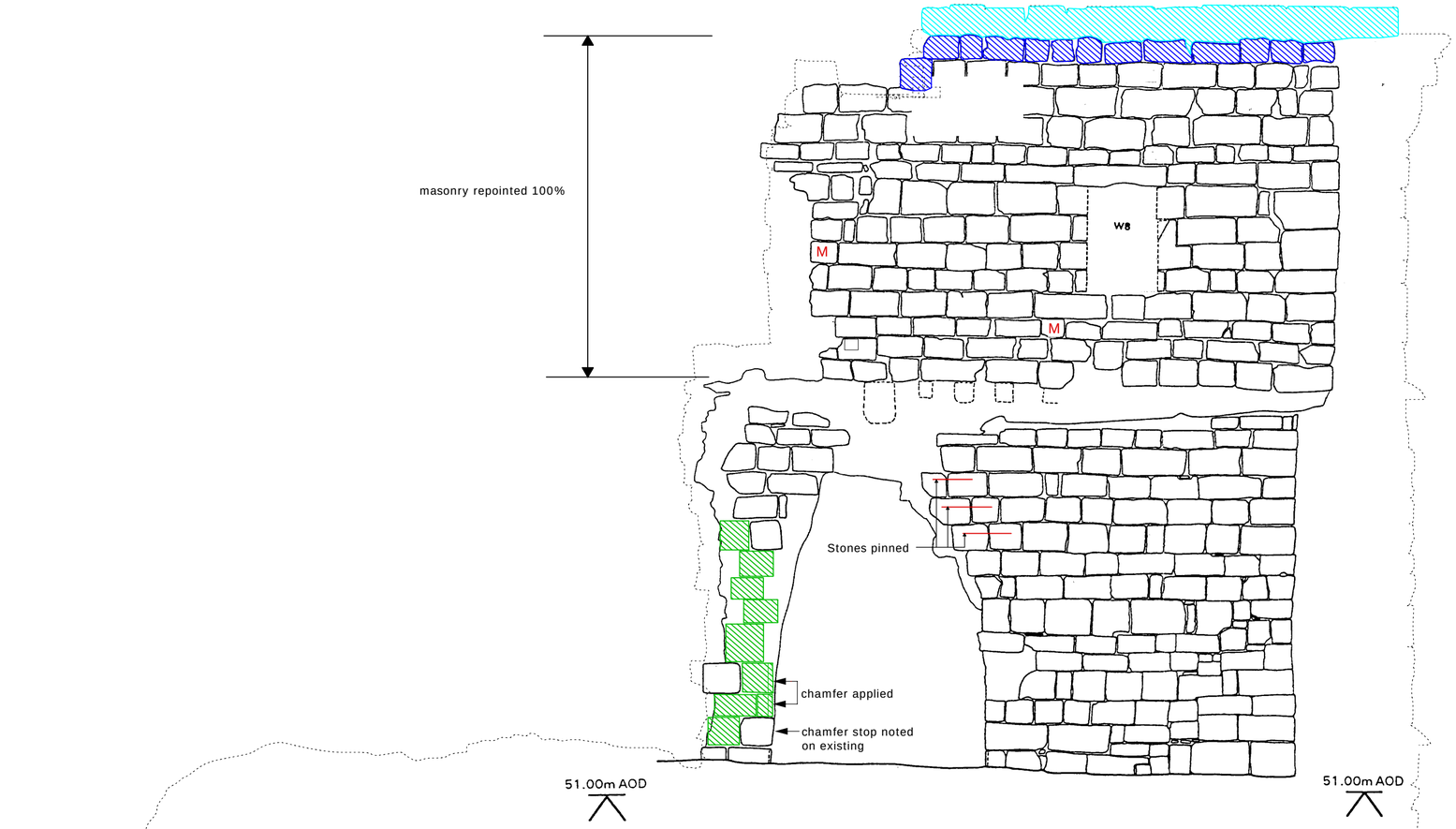
DRAWING TITLE
EAST EXTERNAL ELEVATION
Phase 1 masony repairs

JOB NUMBER
230537

DRAWING NO.
200

REVISION
C

29 MARYGATE, YORK, Y030 7WH, TEL 01904 644001, FAX 01904 623462

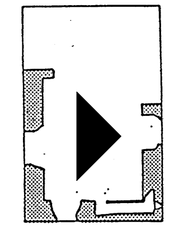


EAST INTERNAL ELEVATION

0 5m

Do not scale from this drawing

The contractor is to check all dimensions on site



N

× Open joints retained for bats

M Mason's mark

Area of corework rebuilt

Stone carefully cut out and renewed using stone from Lowther's Cragg Quarry (nr Whitby)

Stone re-bedded to consolidate

Wall top consolidated with reclaimed stone and 1:3 NHL3.5 sand mortar

Re-built masonry - stones reclaimed from site

original base drawing prepared by Barton Howe Warren Blackledge, 1995

AS FIXED

REVISION	DATE	DRAWN	CHECKED	DESCRIPTION
C	17.05.08	CE	DS	As fixed
B	30.06.06	CS	DS	Items omitted for revised tender
A	Mar '06	DS		Revised for tender

CLIENT
SCARBOROUGH BOROUGH COUNCIL

SCALE
1:50 @ A2

DATE
June 2005

PROJECT
AYTON CASTLE, West Ayton, North Yorkshire

DRAWN
BS

CHECKED
DS

DRAWING TITLE
EAST INTERNAL ELEVATION
Phase 1 masonry repairs

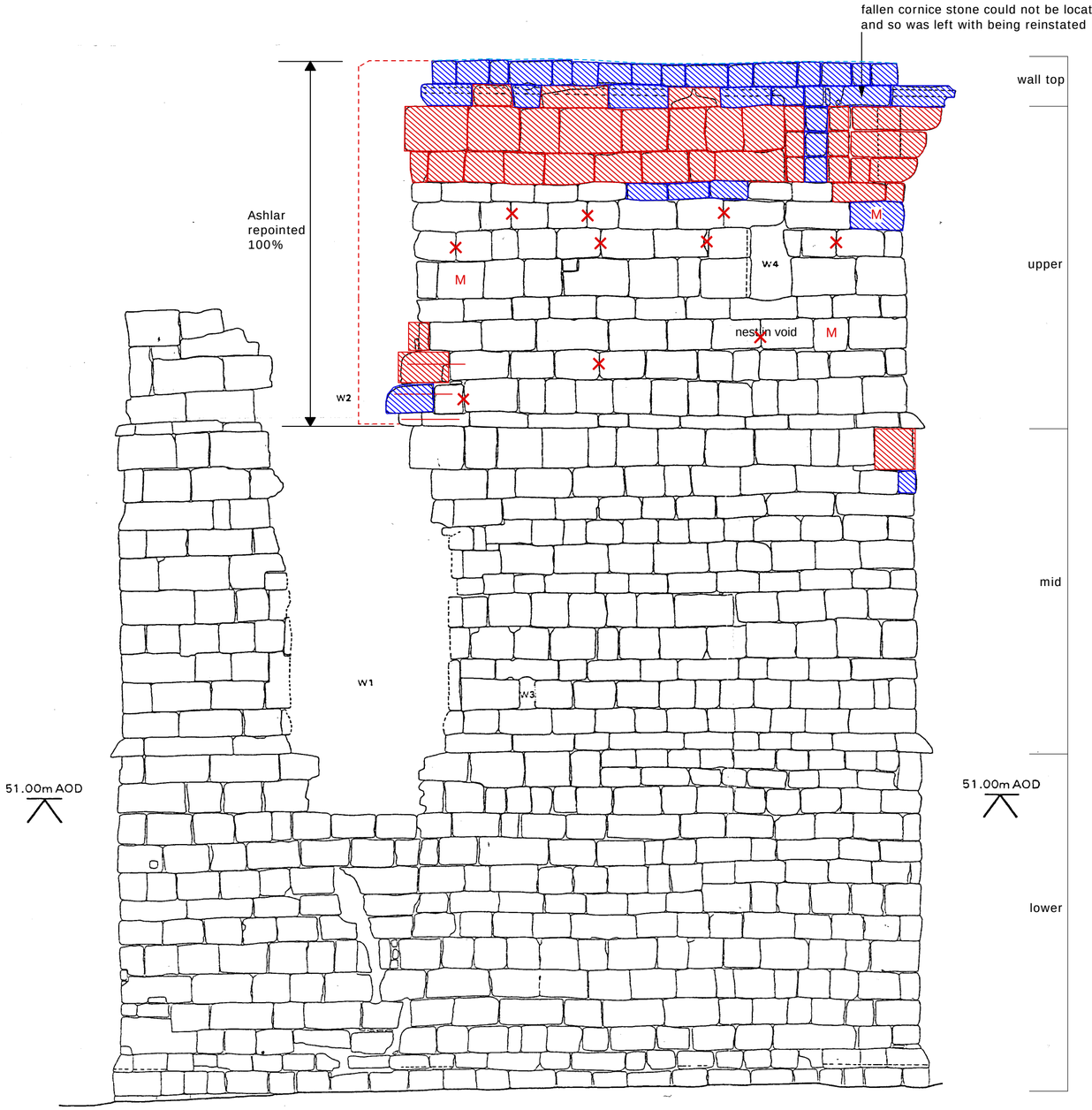
JOB NUMBER
230537

DRAWING NO.
201

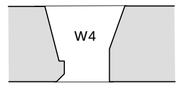
REVISION
C

29 MARYGATE, YORK, Y030 7WH, TEL 01904 644001, FAX 01904 623462

PURCELL MILLER TRITTON



SOUTH EXTERNAL ELEVATION



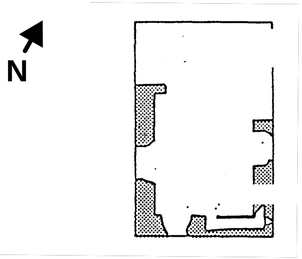
DETAIL OF WINDOW 4 1:5

DETAIL OF WINDOW 1 1:5

Do not scale from this drawing

The contractor is to check all dimensions on site

This drawing is subject to copyright



×	Open joints retained for bats
M	Mason's mark
- - - -	Area of corework rebuilt
	Stone carefully cut out and renewed using stone from Lowther's Cragg Quarry, nr Whitby
	Stone re-bedded to consolidate
	Wall top consolidated with reclaimed stone and 1:3 NHL3.5 sand mortar
	Re-built masonry - stones reclaimed from site

original base drawing prepared by Barton Howe Warren Blackledge, 1995

AS FIXED

REVISION	DATE	DRAWN	CHECKED	DESCRIPTION
C	17.05.08	CE	DS	As Fixed
B	30.06.06	CS	DS	Items omitted for revised tender
A	Mar '06	DS		Revised for tender

CLIENT: SCARBOROUGH BOROUGH COUNCIL

SCALE: 1:50 @ A2

DATE: June 2005

PROJECT: AYTON CASTLE, West Ayton, North Yorkshire

DRAWN: BS

CHECKED: DS

DRAWING TITLE: SOUTH EXTERNAL ELEVATION
Phase 1 masonry repairs

JOB NUMBER: 230537

DRAWING NO.: 202

REVISION: C

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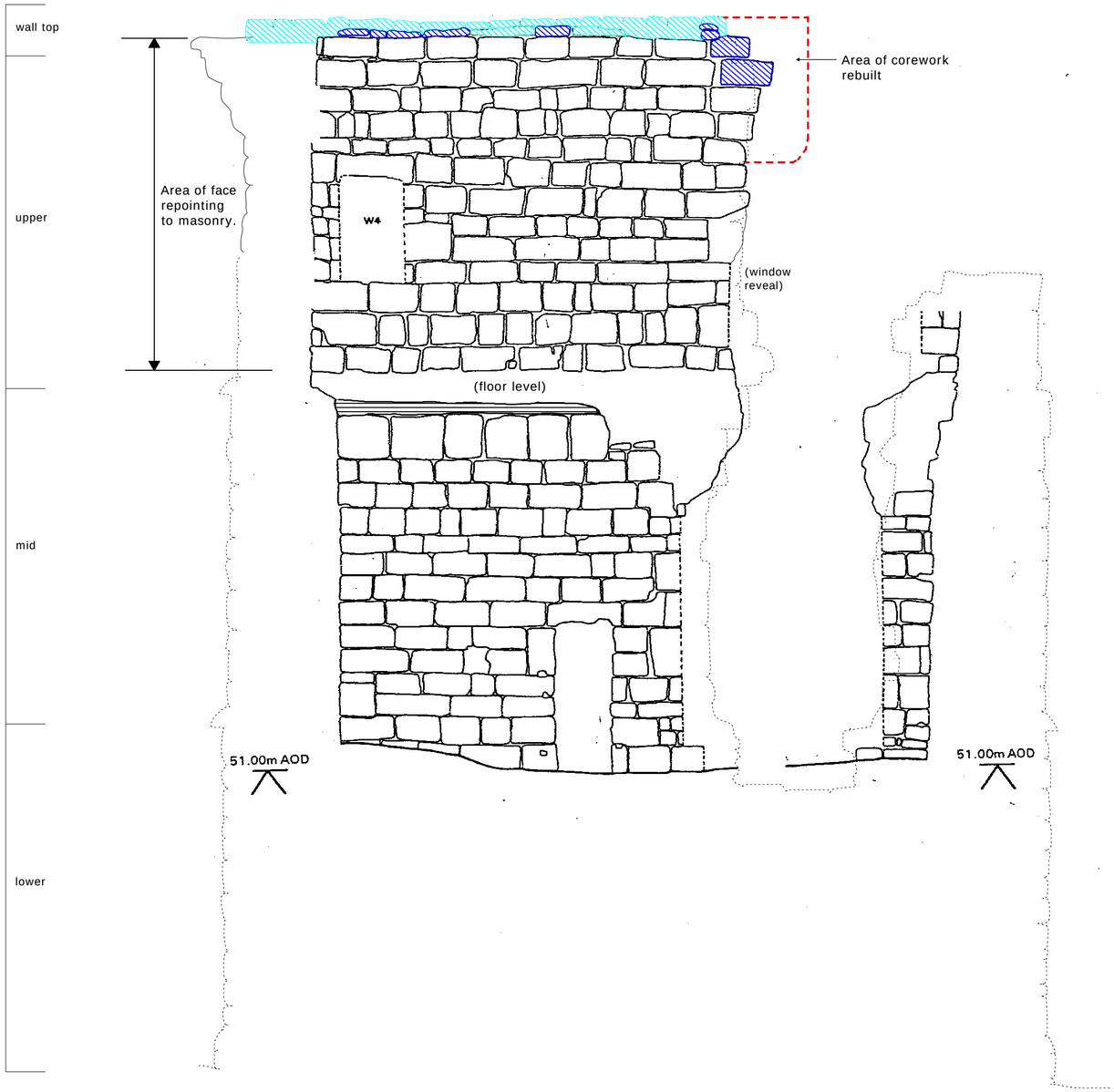
PURCELL MILLER TRITTON

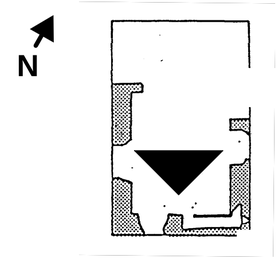


SOUTH INTERNAL ELEVATION

0 5m

Do not scale from this drawing

The contractor is to check all dimensions on site



- Open joints retained for bats
- M — Mason's Mark
- Area of corework rebuilt
- Stone carefully cut out and renewed using stone from Lowther's Cragg Quarry, nr Whitby
- Stone re-bedded to consolidate
- Wall top consolidated with reclaimed stone and 1:3 NHL3.5 sand mortar
- Re-built masonry - stones reclaimed from site

original drawing prepared by Barton Howe Warren Blackledge, 1995

AS FIXED

REVISION	DATE	DRAWN	CHECKED	DESCRIPTION
C	17.05.08	CE	DS	As Fixed
B	30.06.06	CS	DS	Items omitted for revised tender
A	Mar '06	DS		Revised for tender

CLIENT
SCARBOROUGH BOROUGH COUNCIL

PROJECT
AYTON CASTLE, West Ayton, North Yorkshire

DRAWING TITLE
SOUTH INTERNAL ELEVATION
Phase 1 masonry repairs

SCALE 1:50 @ A2 | DATE June 2005
DRAWN BS | CHECKED DS
JOB NUMBER 230537 | DRAWING NO. 203 | REVISION C

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