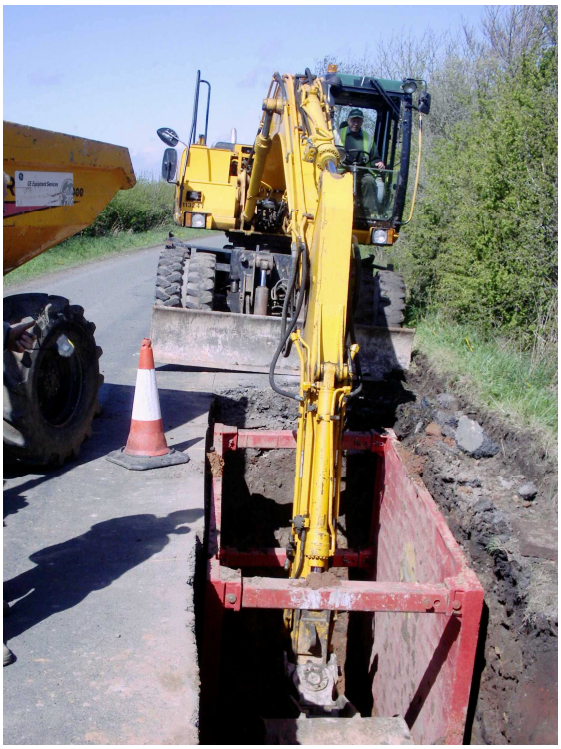

SOLWAY COAST CLUSTER, CUMBRIA

Archaeological Evaluation

Oxford Archaeology North

June 2007

United Utilities

Issue No: 2006-7/553
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SUMMARY

United Utilities have put forward proposals to improve the wastewater treatment system along the Solway coast in Cumbria, from Bowness-on-Solway (NY 2257 6281) to Drumburgh (NY 2672 5980). Since the proposed works traverse the line of Hadrian's Wall, which forms part of the trans-national 'Frontiers of the Roman Empire' World Heritage Site, a series of meetings was held between United Utilities and the Hadrian's Wall Archaeologist, at which an archaeological mitigation strategy was agreed. The strategy, which was designed to limit the impact of the works on this internationally important monument, included the archaeological evaluation of four key points where it was envisaged that the new pipeline would either cross the line of the Wall itself, or would be likely to impact upon archaeological features associated with it.

The four proposed crossing points, all located within or adjacent to the highway of the Bowness to Drumburgh road, were situated at Fishers Cross (Site D; NGR NY 2399 6227), Kirkland House (Site E; NGR NY 2431 6176), Westfield Marsh (Site G; NGR NY 2475 6126), and Glasson Farm (Site I; NGR NY 2575 6034). Three other sites identified as requiring evaluation were located at Shore Gate House, Bowness Village (Site A; NGR NY 2250 6282), Glasson Wastewater Treatment Works (Site J; NGR NY 2589 6023), and Drumburgh (between manholes 3 and 4) (Site L; NGR NY 2674 5985). In the event, and with the agreement of the Hadrian's Wall Archaeologist, evaluation of Site L did not proceed due to the presence of a sewer pipe that would have rendered the work ineffective. The archaeological works were carried out intermittently by Oxford Archaeology North (OA North) between February 2006 and April 2007.

Archaeological features were observed at all but one of the evaluated sites (Site J), although here a series of gullies of probable natural origin were recorded. Possible evidence for Hadrian's Wall was observed at Site E, in the form of what may have been the sandstone rubble foundation for the Stone Wall, and possible remains of this foundation were also encountered at Sites G and D, though here the interpretation was rather more tentative. What may have been the spread remains of the Turf Wall were recorded towards the south-eastern end of Site D. The poor condition of the remains at all the evaluated sites indicated that in this area the Stone Wall had been extensively robbed for re-use by local communities. In the nineteenth century, the construction of the canal between Carlisle and Port Carlisle, and subsequently of the Silloth to Carlisle railway, also caused disturbance to the sub-surface remains of the Wall. Evaluation of Sites E, G and I exposed construction layers for the canal and the railway embankment, whilst a post-medieval culvert and a possible mill-race were recorded at Site A.

Recommendations for a watching brief, to be maintained during the insertion of the new pipeline, have been put forward for all the evaluated sites, since it is thought likely that the pipeline will impact on archaeological features recorded during the course of the evaluation at Sites A, D and E, and has the potential to disturb archaeological deposits situated within the boundaries of the World Heritage Site at Sites G, I and J.

ACKNOWLEDGEMENTS

OA North would like to thank United Utilities for commissioning the project, and in particular Lee Dymond for facilitating the work. Mike Collins, the Hadrian's Wall Archaeologist, is thanked for providing much advice and assistance. Thanks are also extended to D Calvert and B Kirkaldy of Hewden, for their skill with the mechanical excavators, and to Steve Caunce and Ian Jackson of KMI, for assistance with the groundworks. The local knowledge of the villagers also proved invaluable. Particular thanks are expressed to Professor David Shotter for his identification of the Roman coin from Site A.

For OA North, the evaluation was undertaken by Jeremy Bradley, Vix Hughes, Andy Lane, Kathryn Levey and Tom Mace; Jeremy and Andy also prepared the evaluation report. Assessment of the finds was carried out by Sean McPhillips and the report illustrations were produced by Mark Tidmarsh. The project was managed by Alison Plummer, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 United Utilities are proposing improvements to wastewater treatment along the Solway coast in Cumbria, from Bowness-on-Solway (NY 2257 6281) to Drumburgh (NY 2672 5980) (Fig 1). The route runs through an area of high archaeological potential and affects a number of known sites including the Hadrian's Wall World Heritage Site (HWWHS), which is part of the 'Frontiers of the Roman Empire' trans-national World Heritage Site. Following discussions between United Utilities, Cumbria County Council's Archaeology Service (CCCAS) and the Hadrian's Wall Archaeologist, it was proposed that the development area be subjected to a desk-based assessment and walkover survey as a first stage of archaeological investigation. Following the completion of this work (OA North 2004), discussions were held with both CCCAS and English Heritage, and it was decided that a programme of archaeological evaluation would be necessary.

1.1.2 The evaluation was designed to examine four key points where the pipeline would, it was believed, cross the line of Hadrian's Wall. In addition, it was agreed that three other sites would also be evaluated, since it was thought that archaeological features associated with the Wall might be present in these areas (*Section 1.2.1*, below).

1.1.3 The main phase of archaeological work was undertaken intermittently between February and June 2006. Unfortunately, discrepancies in the map data relating to the exact location of Hadrian's Wall at the four crossing points resulted in a situation where it was felt that the archaeological works conducted in these areas did not fully evaluate the putative line of the Wall. Following further discussions between United Utilities and the Hadrian's Wall Archaeologist, it was agreed that the trenches at these sites should be extended in order to address this issue, the work being undertaken during March and April 2007.

1.2 SITE LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 The four proposed crossing points were located at Fishers Cross (Site D; NGR NY 2399 6227), Kirkland House (Site E; NGR NY 2431 6176), Westfield Marsh, 200m west of Westfield House (Site G; NGR NY 2475 6126), and 350m east of Glasson Farm (Site I; NGR NY 2575 6034) (Fig 2). The three other proposed evaluation sites were located at Shore Gate House in Bowness-on-Solway (Site A; NGR NY 2250 6282), the proposed Glasson Wastewater Treatment Works (Site J; NGR NY 2589 6023), and a site located between manholes 3 and 4 at Drumburgh (Site L; NGR NY 2674 5985).

1.2.2 The landscape of this section of the Solway coast is typically flat and exposed to the prevailing south-westerly winds (Countryside Commission 1998, 19). It is commonly used for dairy farming with large areas of pasture predominating in many areas as a result of extensive land improvement (*op cit*). Much of the improvement has been concerned with the drainage of former mosses and

wetlands, although elements of these remain in places (*op cit*, 20), and have provided a wealth of palaeoenvironmental data pertinent to understanding the morphology of the local post-glacial environment (Hodgkinson *et al* 2000).

1.2.3 The underlying geology of the area comprises Triassic Mudstones and siltstones of the Mercia Mudstones Group, or Keuper Marls (British Geological Survey 1982). The drift geology is boulder clay, commonly found across the region, which was deposited in the immediate post-glacial period. In the last 10,000 years, subsequent to the formation of the boulder clays, soils of the Newport I Association, well-drained brown soils, have accumulated in the area around Bowness-on-Solway (Ordnance Survey 1983). By contrast, the rest of the area is largely covered by alluvial gley soils of the Rockcliffe Association (*op cit*).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.3.1 ***Prehistory***: although evidence for immediate post-glacial activity in the area is lacking, sites and findspots dating to the late Mesolithic are known from almost the entire length of the Cumbrian coast (Cherry and Cherry 2002; Young 2002). Few remains dating to the Mesolithic are known in North Cumbria, although occasional finds have been made (OA North 2002, 6). Such sites are not well known along the south side of the Solway, but they have been identified on the northern side (Morrison 1981; Hodgkinson *et al* 2000, 110). Extensive remains thought to represent all-year settlement, have been investigated on the coast at Eskmeals to the south-west (Bonsall *et al* 1994), and other sites of this type undoubtedly remain to be found. There is evidence for human impact on the vegetation of the North Cumbrian coast from as early as *c* 6000 BC (Hodgkinson *et al* 2000, 107). A sequence of acute sea-level changes is also known to have affected the area from *c* 5000 BC. This at first resulted in a dramatic rise in relative sea level, before a gradual retreat to current levels (Lloyd *et al* 1999). This resulted in the development of extensive wetlands, which grew out of areas of shallow water held in a number of smaller basins (Hodgkinson *et al* 2000, 99). This sequence of events was also probably responsible for the creation of a submerged forest discovered during the nineteenth century between Glasson and Kirkland (*op cit,* 87).

1.3.2 Sites of Neolithic date are elusive within the area, although discoveries of artefacts such as axes are not uncommon, and their relationship with wetland environments may be significant (*ibid*, 111). Excavation at Plasketlands, near Mawbray (Bewley 1993), identified a timber structure dated to the mid-fourth millennium BC. This remains a rare discovery, although the large number of stone axes of Neolithic date discovered across the Solway Plain would suggest that further settlements existed (Hodgkinson *et al* 2000).

1.3.3 Sites dating to the later prehistoric period are difficult to recognise, although a number of sub-circular enclosures have been identified by aerial photography (Bewley 1994), many of which may be of Bronze Age or Iron Age date. Settlements of this type are unlikely to have surviving above-ground remains in an area of intense agriculture such as the Solway coast (McCarthy 2002, 45). Environmental evidence from Oulton Moss included cereal pollen dating from

c 2000 cal BC (Hodgkinson *et al* 2000, 113), demonstrating the presence of agriculture by at least the early Bronze Age. The remains of timber palisades in the moss at Bowness Common, perhaps dating to the late prehistoric period, have also been discovered (Hodgson 1904), but little can be said with any certainty about them. A small collection of flint artefacts was discovered during excavations at Bowness Roman fort (Potter 1979, 326), one of which is thought to be Bronze Age in date. Canoes, presumably, but not necessarily, prehistoric in date, have also apparently been discovered in the mosses at Drumburgh and Bowness (Neilson 1974).

1.3.4 ***Roman***: the few excavated late prehistoric date in the region have in some cases been shown to have been occupied over a prolonged period, sometimes lasting well into the Roman period (Bewley 1992). Roman activity on the south side of the Solway is, of course, graphically demonstrated by the presence of Hadrian's Wall, which was created between *c* AD 122 and 130 as part of an attempt to construct a permanent northern frontier for the province of *Britannia* (Daniels 1978, 5). Beyond Bowness-on-Solway, which marked the western end of the Wall, the Hadrianic frontier system was extended down the Cumbrian coast at least as far as Moresby, the works comprising a system of regularly-spaced turrets and milefortlets, supplemented by full-sized auxiliary forts at Beckfoot, Maryport, Burrow Walls (possibly a late Roman addition) and Moresby itself (Breeze 2006, 373-413). In the northern part of the system there is also some evidence for a timber palisade associated with the towers and milefortlets, although this feature remains controversial (*op cit*, 379-80).

1.3.5 Hadrian's Wall represented the culmination of several attempts to bring stability to the region (Daniels 1978, 4-5), although whether the Wall was preceded by an earlier frontier system has been, and continues to be, a matter for debate. It is generally acknowledged that, following the Roman army's withdrawal from southern Scotland around the beginning of the second century AD, the Tyne-Solway corridor was held by a slightly greater concentration of military units than elsewhere in the North (although some archaeologists question even this; Bidwell 1999, 14). Until recently, this disposition was seen by most scholars as marking the establishment of a frontier system (the so-called Stanegate frontier) extending from Corbridge in the east to Carlisle in the west. It was also suggested that the system may have extended east of Corbridge, perhaps to the Tyne estuary, and west of Carlisle as far as the known fort at Kirkbride, incorporating a possible early fort at Burgh-by-Sands (Burgh I) (Shotter 2004, 58). In some quarters, however, the existence of these putative extensions has been questioned, and indeed the very concept of the Stanegate 'frontier' itself has been challenged (Bidwell 1999, 14).

1.3.6 Probably little more than a decade after it was completed Hadrian's Wall was abandoned following the Roman re-occupation of southern Scotland, and a new frontier line, the Antonine Wall, was constructed across the Forth-Clyde isthmus (Breeze 2006, 28). This proved to be short-lived, however, and by the AD 150s the Antonine Wall was permanently abandoned and Hadrian's Wall was recommissioned (*op cit*).

1.3.7 As first built, the western sector of the Wall, west of the river Irthing, was constructed of turf and timber, as were its milecastles and forts (the latter being

added as a change of plan as the Wall was actually being built), although the turrets were of stone from the beginning. The Turf Wall, milecastles, and forts were later replaced in stone, and in some places the alignment of the Stone Wall differed from that of the Turf Wall (*op cit*, 60-2). Precise details of the sequence of construction and modification, and the dating of these changes, are difficult to determine, although there is some evidence to suggest the reconstruction in stone occurred in two phases, with the westernmost sector not being rebuilt until after the Antonine Wall was abandoned (*op cit*, 60).

1.3.8 Excavations at Drumburgh (*Congavata* or *Congabata*; *ibid*, 359) initially identified the Stone Wall fort (Haverfield 1900a), although later work revealed an earlier earth-and-timber fort of 0.8 ha (the smallest on the Wall) associated with the Turf Wall (Simpson and Richmond 1952). Between Drumburgh and Bowness-on-Solway, the Wall has been examined in piecemeal fashion over the years (Breeze 2006, 362-6). The Turf Wall has not been investigated west of Drumburgh, although the turf-and-timber phase of Milecastle 79 has been excavated, whilst Turret 79b appears to have been of typical Turf Wall type (*op cit*, 365-6). At Port Carlisle, the Stone Wall was disturbed during the construction of the canal (*op cit*, 363; Lancaster University Archaeological Unit 1995), and was found to have been constructed on timber piles. Further west, excavations in 1930 demonstrated that the Stone Wall had been built on a substantial sea bank (Breeze 2006, 364). Stone Wall Milecastles 78 and 79 have been excavated, whilst Milecastle 77 was sought in 1973 but not found. Turret 76a, immediately west of Drumburgh, was found in 1948, and the locations of the turrets between Milecastles 78 and 79 (Turrets 78a and 78b), and between Milecastle 79 and the fort at Bowness (Turrets 79a and 79b) are also known. Those between Milecastles 77 and 78 (Turrets 77a and 77b) have not, however, been located, nor has Turret 76b. The Vallum is visible as a surviving earthwork at various points along this line (*op cit*), and what remains of the Stone Wall has been identified in several places, together with traces of the Military Way, the road than ran to the south of the Wall. The existence of the Wall Ditch in this sector has not been proven, and indeed there are indications that this feature may have been deliberately omitted, at least in places (*op cit*, 362-4). Large sections of the Wall itself have been lost on the approach to Bowness, and there are records of deliberate, and quite large-scale, destruction in the post-medieval period (Daniels 1978, 253). In places the presumed line of the Wall has been projected between those points where it has been located by excavation. Such projections provide a 'best fit' based on the available evidence, but must be regarded as conjectural (R Newman *pers comm*).

1.3.9 The Stone Wall fort at Bowness-on-Solway (*Maia*; Breeze 2006, 367) was, at 2.31 ha, the second largest on the Wall. Here, a number of generally small-scale excavations have identified various elements of the fort, including the west gate (Birley 1931), the west rampart (Mohamed 1971), and the east wall (Breeze 2006, 368). More extensive excavations during the early 1970s revealed evidence for internal buildings and for activity extending into the fourth century AD (Potter 1975; 1979). Evidence for a civilian settlement (*vicus*) to the south of the fort has also been found (Birley 1931; Duff 1939; Carlisle Archaeology Ltd 2000; 2001; OA North 2002), but this area has yet to be examined in detail.

Remains outside the fort's eastern defences have also been tentatively interpreted as forming part of the *vicus* (Caruana and James 1987).

1.3.10 ***Early Medieval***: there is a marked gap in the archaeological and historical record of the region following the collapse of Roman administration in the early fifth century AD. Place-name evidence suggests that there was a degree of continuity within the indigenous population, with 'Celtic' name elements surviving in a number of places (Haverfield 1900b; Armstrong *et al* 1950). A sequence of small regional kingdoms was established following the end of Roman rule, although the influence of each fluctuated over time (Rollinson 1996, 33). The most pertinent to this region is that of Rheged, probably established some time in the later sixth century AD (McCarthy 2002, 141-2). Higham has suggested that the borders of Rheged approximated to those of the Romano-British administrative unit of the *civitas Carvetiorum* (Higham 1986, 253), the centre of which was Carlisle. By the late seventh century the neighbouring Anglian kingdom of Northumbria had annexed Rheged, either by military force or by a diplomatic marriage between king Oswy and a Rhegedian princess (*ibid*, 270). From the eighth century onwards the British kingdom of Strathclyde to the north began to exert an influence on the area, itself later coming under pressure from the Dalriadan Scots and the Hiberno-Norse. The process and chronology by which the later kings of the emergent Scotland were able to lay claim to the Princedom of Cumberland is not currently understood (R Newman *pers comm*), and power fluctuations, not least due to the appearance of Viking settlers in Cumbria, and further north, during the centuries immediately prior to the Norman invasion, contribute to a very obscure picture. Place-name evidence tends to be dominated by Norse words (Armstrong *et al* 1950), although the survival of place-names of British origin may be attributable to the Strathclyde influence of the tenth century or, perhaps, the endurance of the native British population (R Newman *pers comm*). While physical evidence for continuity of settlement and activity in the early medieval period is not obvious within the study area, it has, however, been identified in Carlisle and at the Hadrian's Wall fort of Birdoswald, (McCarthy 2002, 134). Within Glasson Moss there is evidence for hemp retting, thought to date to the seventh century AD (Cox *et al* 2000), demonstrating that at least one settlement and its related infrastructure must have existed there at this time.

1.3.11 ***Medieval***: at the time of the Norman Conquest northern Cumbria was controlled by the Scottish kings, but in 1092 William II (Rufus) took Carlisle and the surrounding area from a local lord who appears to have paid allegiance to Scotland (Rollinson 1996, 43; Summerson 1993, 47). During the period of the Anarchy in England, which followed the death of Henry I in 1135, the region once more came under Scottish control, but reverted peacefully to English rule in 1157. Having passed from the de Moulton family and the Barony of Gilsland, Bowness-on-Solway and the neighbouring area formed part of the Barony of Burgh, which was given to Gamel le Brun, who resided at Drumburgh (Nicolson and Burn 1777; Whellan 1860, 149). Permission was granted to fortify the manor house at Drumburgh in 1307, but the manor was dispersed to various families by the end of the fourteenth century (*op cit*, 149). It was, however, reunited with the Barony of Burgh at a later date (*op cit*). The area was very volatile throughout the medieval period, at first due to continuous

cross-border conflict with Scotland (Rollinson 1967, 87-9), and later as a result of general lawlessness associated with the border reivers, although the focus of this conflict tended to be further east (Fraser 1995). This led to the construction of a number of fortified houses in the area, including that at Drumburgh. The picture of medieval Cumbria, especially on the borders, is one of almost tidal activity, the greatest influence and power pressing on the region fluctuating between the kingdom of the Scots to the north and that of the English to the south (R Newman *pers comm*). Although Henry II created strong baronies in the north-west against the Scots, the Anglo-Scottish border was not politically settled until the 1240s.

1.3.12 Medieval remains have been found at Bowness (Potter 1979), and one of the ditches of the Wall fort there seems to have been re-cut during the thirteenth century (Daniels 1978, 255). There may also have been a grange at Drumburgh, later attached to the castle (Simpson and Richmond 1952, 12), of which an L-shaped ditch remains. There is also evidence for a chapel existing at Drumburgh (D Perriam *pers comm*). However, the area seems to have seen little development during the medieval period, and most settlements appear to have remained small until the nineteenth century (Whellan 1860).

1.3.13 ***Post-medieval***: the rural situation of the study area left it largely unaffected by the changes of the Industrial Revolution. An experimental alum works is thought to have been set up by Peter Spencer, who had taken out a patent for a process using coal waste in 1845, initially near Burgh-by-Sands and later possibly to the south of Drumburgh (Pickles 2002, 17). However, it was alterations to the transport network brought about because of the growth of industry in Cumbria that lead to major changes in the landscape during the early nineteenth century. Plans to improve Carlisle's connections with the coast had been made as early as the late eighteenth century (Hadfield and Biddle 1970, 336-7). In 1807 moves were made to encourage the construction of a canal from Carlisle to the sea in order to facilitate coal supplies to the city (Ramshaw 1997, 9). At first, despite gaining support, the scheme came to nothing, and it was not until 1817 that the plan was finally put into action (*op cit*, 10). Following meetings between the relevant parties and the passing of an Act of Parliament work began in 1820 (*op cit*, 12). The Carlisle Navigation Canal was finally opened in 1823 (*op cit*, 25), reaching the sea at Port Carlisle. The canal was successful, and in 1836 plans were made to expand the capacity of the docks at Port Carlisle, although these were never carried out. It was, however, intended that the canal should ultimately connect with similar schemes that would provide a link all the way to Newcastle-upon-Tyne (*op cit*, 6).

1.3.14 The expansion of many of the villages in the area can be attributed to the arrival of the canal. Port Carlisle, formerly known as Fisher's Cross, is recorded as containing only two houses in 1830 (Whellan 1860), but had expanded to its current, albeit relatively small, size only 30 years later. In time though, the canal was not considered profitable enough, and railways were being favoured over them. It never formed part of a connection to Newcastle, and the new railways soon came to dominate the national transport network (Ramshaw 1997, 135). In 1848 a proposal was put forward to convert the canal into a railway but this was turned down (*op cit*, 123). Nevertheless, the scheme was

not forgotten. There were some improvements in the operation of the canal in its final years, largely as a result of the removal of the Ravenbank Jetty, which had caused the canal dock to silt up rather than improve its navigation as intended, but this was not enough to save it. The construction of the Carlisle to Silloth railway began in 1853, following the draining of the canal and dismantling of the locks, and the last boats to use it were sold off or went elsewhere (*op cit*, 135-7).

2. METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 The Hadrian's Wall Archaeologist issued a specification for the archaeological works (*Appendix 1*). In response to this, and at the request of United Utilities, OA North submitted a project design (*Appendix 2*) for the archaeological evaluation of a number of sites along the line of the proposed wastewater treatment improvement scheme (*Section 1.2.1*, above). OA North was subsequently commissioned by United Utilities to carry out the work. The project design was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (IFA), and generally accepted best practice.

2.2 EVALUATION

2.2.1 The evaluation trenches at Sites A, D and E were excavated within the highway of the Bowness to Drumburgh road, as was Trench 2 at Site I. Site G was located on the roadside verge, whilst Sites J and L, together with Trench 1 at Site I, were situated in adjacent fields. A mechanical excavator fitted with a toothless ditching bucket removed the topsoil and modern overburden under archaeological supervision to the surface of the first significant archaeological deposits, which were cleaned by hand. All features of archaeological interest were investigated and recorded. By agreement with the Hadrian's Wall Archaeologist, Site L was not subjected to investigative archaeological work, since the presence of an existing sewer pipe would have rendered this ineffective.

2.2.2 All the evaluated trenches were excavated stratigraphically, whether by machine or by hand. Investigation of intact archaeological deposits was exclusively manual. A minimum sample of 50% of archaeological features was excavated. Selected pits and postholes were half-sectioned, linear features were subjected to no less than a 25% sample, and extensive layers were sampled by partial rather than complete excavation. In terms of the stratigraphic sequence, maximum information retrieval was achieved through the examination of the strata visible in the edges of later cut features. All excavation, whether by machine or by hand, was undertaken with a view to avoiding damage to any archaeological features that appeared worthy of preservation *in situ*. On completion of the archaeological works, the evaluation trenches were backfilled with no further reinstatement of the farmland, although the highway was reinstated to the appropriate standard by the pipeline contractor.

2.3 PALAEOENVIRONMENTAL ASSESSMENT

2.3.1 Two bulk samples were taken and processed for the assessment of charred and waterlogged plant remains. The samples were hand-floated and the flots collected on a 250 micron mesh and air dried. The flots were scanned with a Leica MZ6 stereo microscope and plant materials were recorded and provisionally identified. Botanical nomenclature follows Stace (1991). Plant

remains were scored on a scale of abundance of 1-5, where 1 is rare (less than 5 items) and 5 is abundant (more than 100 items). The components of the matrix were also noted.

2.4 FINDS

2.4.1 All finds recovered were bagged and recorded by context number; all significant finds were retained and have been processed and temporarily stored according to standard practice and following IFA guidelines.

2.5 ARCHIVE

2.5.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with current IFA and English Heritage guidelines (English Heritage 1991). The paper and digital archive will be deposited with Carlisle Record Office on completion of the project.

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

3. RESULTS OF THE EVALUATION

3.1 SITE A (SHORE GATE HOUSE)

3.1.1 Site A was located towards the eastern end of Bowness-on-Solway village, in the roadway immediately opposite Shore Gate House (Fig 3). Originally, the trench was to be 27m in length, but the frequency of modern services in this area meant that the trench had to be reduced in size. An engineering statement submitted by United Utilities (Dooley 2006) indicates that because of the density of services, the pipe trench will require hand excavation. It has therefore been agreed, in consultation with the Hadrian's Wall Archaeologist, that an archaeological watching brief will be maintained during the construction process in order to examine those areas not covered by the works described below.

3.1.2 Two trial holes (A and B; not illustrated) were first excavated within the footprint of the evaluation in order to locate modern services. Subsequently, an area 10.48m long and 1.3-1.5m wide was opened, although this was excavated in two sections (Trench 1 to the east and Trench 2 to the west) to maintain vehicular access along the highway (Fig 3). The trenches were excavated to a maximum depth of 1.36m (5.96m OD).

3.1.3 ***Trench 1***: this trench measured 5.25m by 1.3m, and was excavated to a depth of 0.7m (6.22m OD) (Fig 4; Plate 1). The modern tarmac road surface, ***707***, was laid upon deposit ***706***, a make-up layer of crushed stone and bitumen. Layer ***706*** sealed further make-up deposits, ***717*** and ***721***, and an electricity cable trench, ***708***; the latter in turn cut an infilled sewer trench, ***710***. Make-up layer ***721*** overlay ***716***, a 0.38m thick deposit of mid-dark reddish-brown silty-sand. This was seen to overlie a stone wall, ***713***, situated on the western edge of the trench, and also sealed a spread of large cobbles, ***712***, which appeared to abut the wall (Fig 4; Plate 2). Layer ***712*** sealed ***715***, a deposit of compacted sandstone fragments and cobbles that also abutted wall ***713***. Three sherds of eighteenth or nineteenth century pottery were recovered from this material, which may have been deliberately dumped to level the area adjacent to the wall, possibly as an early road make-up layer.

3.1.4 Wall ***713*** was badly damaged and extended beyond the trench edges to the north and south, but was 0.5m wide and survived to a maximum height of 0.3m (Fig 4; Plates 3 and 4). It was constructed of roughly dressed sandstone blocks and undressed rubble bonded with a yellow-brown sandy mortar containing white lime flecks. It was placed within a construction trench 0.1m deep, ***719***, which was observed on the eastern side of the wall, cutting into the natural sandy subsoil, ***718*** (Plate 4). The cut was filled with pale brown silty-sand, ***720***, which produced a possible Mottled ware sherd dating to the eighteenth century. The small pottery assemblage from Trench 1 suggests an eighteenth-nineteenth century date for the earliest features and deposits recorded in this area.

3.1.5 ***Trench 2:*** this essentially formed a western extension to Trench 1 but was offset 0.3m to the north in order to avoid a live sewer and electricity cable

trenches. It measured 5.23m by 1.5m, was aligned north-east/south-west, and was excavated to a maximum depth of 1.36m (5.96m OD) (Fig 5).

3.1.6 At the eastern end of Trench 2, the modern road surface, ***707***, had been laid on make-up layers ***706*** and ***721***, which in turn sealed a large cut feature of indeterminate form and function up to 0.6m deep, ***732***. The base of the cut was filled with mid grey-brown silty sand (***734/735***), but the bulk of the feature contained a deposit of mixed, dark brown clay and yellow sand, ***733***. The western lip of this feature cut a 0.55m-thick deposit of mid-orange clay-sand, ***731***, possibly the fill of a service trench or a pit-like feature. To the west, this material was cut by a sewer trench, ***728***, which had also been dug through the eastern edge of a well-laid cobble surface 0.11m thick, ***722***. This comprised regularly-sized cobbles (*c* 90mm x 90mm x 45mm) set on end within a sandy matrix, and survived only in the western 1.3m of the trench, where it was directly overlain by the modern road surface. Where ***722*** had been removed by the sewer, a repair seems to have been effected with a deposit of cobbles in grey sand, ***730***, that sealed the infilled sewer trench and also partly overlay deposit ***731***. All the above deposits are undated, although they are unlikely to pre-date the nineteenth century.

3.1.7 At the western end of the trench (Plate 5), surface ***722*** sealed a layer of dark brown sandy-silt up to 0.35m thick, ***723***. This in turn overlay an earlier cobbled surface, ***724*** (Plate 6), comprising a layer of medium-large cobbles 0.14m thick, bedded on 0.1m of orange sand, ***725***. This surface extended into the trench for just over 1m, and extended north and south of the excavated area. Its eastern edge had been provided with a kerb of larger cobbles and undressed sandstone blocks. Beneath layer ***725*** a deposit of brownish-grey silty-sand, ***727***, was observed, which contained approximately 30% medium-sized, sub-rounded stones. This overlay ***726***, the natural sandy subsoil.

3.1.8 East of sewer ***728***, the top of the natural subsoil had been removed by human activity. There, deposit ***731*** (*Section 3.1.6*, above) overlay 0.65m of dark reddish-brown sandy-clay, ***736***, which in turn sealed 0.1m of dark greyish-brown sand, ***737*** (Fig 5). These deposits produced 47 sherds of eighteenth or nineteenth century pottery, including trailed slipware of mid-eighteenth century or later date. Sealed beneath these levels were the remains of a north/south aligned stone culvert 0.8m wide internally (Plate 7). The eastern side of the culvert lining, ***739***, was butted by the west face of wall ***713*** in Trench 1 (*Section 3.1.4*, above) but was not bonded to it. In fact, the wall appeared to be a later addition, and may have been intended to strengthen this side of the culvert. ***739*** was 0.25m wide and survived to two courses (0.38m) in height, and was constructed from dressed, red sandstone blocks (up to 0.66m x 0.23m x 0.22m) bonded with a pale yellow sand and lime mortar. The masonry appeared to have been set directly onto the natural subsoil. The lining of the western side of the culvert, ***738***, was similarly constructed, 0.3m wide and 0.34m in height. Silting of the culvert channel was marked by a sequence of three fills; ***740***, a primary fill of mid-brown sandy-clay, 0.1m thick, ***741***, 0.2m of pale brown sand, and ***742***, an upper fill of grey silt 0.2m thick. Amongst the small assemblage of pottery recovered from these fills was a sherd of trailed slipware, indicating that the culvert was in use during or after the mid-

eighteenth century. Cartographic evidence suggests that this feature may have been associated with an 'old mill-race', which is shown on the First Edition Ordnance Survey map of 1868. An intact section of this feature can still be seen between The Restings and Shore Gate House, at the eastern end of the village (Plate 8).

3.1.9 Although no features or deposits of Romano-British date were recorded at Site A, an unstratified and heavily worn coin of the emperor Claudius II (AD 268-70) was recovered from a post-medieval context. This is likely to have been minted in the AD 270s/280s, although in view of its worn condition it was probably deposited no earlier than the turn of the third and fourth centuries (*Section 4.1.6*, below).

3.2 SITE D (FISHERS CROSS)

3.2.1 Site D was located within the highway and verge opposite Hesket House, Port Carlisle (Fig 6). The trench was aligned north-west/south-east, measuring 18m by 1.4m, and was excavated to a maximum depth of 3m. The trench was moved 0.3m further into the highway than originally intended in order to avoid a water main. Despite its relocation, the trench was crossed by a live mains-water service aligned north-east/south-west, the presence of which necessitated a bipartite approach to the excavation (Trench 1 to the north-west and Trench 2 to the south-east). Following completion of the original evaluation, the trench was extended 8m beyond its original south-eastern end, at the request of English Heritage (*Section 1.1.3*, above).

3.2.2 ***Trench 1 (north-west end)***: the tarmac road surface, ***609***, overlay a series of make-up layers (***605, 606, 607*** and ***608***) (Fig 7; Plate 9). The earliest of these, ***605***, overlay a series of sandy layers (***602***, ***603*** and ***604***), directly beneath which was a deep accumulation of mid orange-brown sand, ***601***, that appeared to fill a large feature, ***847***, cut into the natural orange-brown clay-sand (***600***; (seen at 7.98m OD). Cut ***847*** was visible in section and appeared to represent the northern lip of a large ditch at least 10m wide and in excess of 2m deep, the southern part of which lay beyond the limits of excavation. It is possible that this feature was part of the ditch fronting the stone phase of Hadrian's Wall, the possible foundation for which was recorded to the south-east, in Trench 2 (***620***; *Section 3.2.4*, below). If this was the case, however, it would mean that the berm between the Wall and the Ditch would have been little more than 2.5m wide, considerably narrower than the usual width of *c* 6m (Breeze 2006, 63), although it is conceivable that this discrepancy resulted from a gradual widening of the ditch caused by erosion or weathering of its upper edges in the years after it was dug.

3.2.3 ***Trench 2 (south-east end):*** at this end of the trench, road surface ***609*** overlay only a single make-up deposit (***608***, the uppermost layer seen to the north-west) (Fig 7). At the south-east end of the trench, ***608*** sealed a layer of brown sandy clay, ***631***, up to 0.25m thick. This in turn overlay a mid-brown silty-sand, ***610/630***, containing 75% pebble inclusions, which covered the whole of the excavated area. Towards the north-western end of the trench this sealed a ditch, ***621***, 1.68m wide with steep, slightly concave sides, and a flat-bottomed, U-

shaped profile (Fig 7; Plate 10). The ditch had three fills;: the uppermost, ***611***, comprised a 0.22m thick layer of mid-brown silty-sand; beneath which was 0.22m of greyish-black silty-sand, ***615***, and a basal fill of light grey sand, ***616***, 0.24m thick.

3.2.4 Ditch ***621*** cut two deposits, ***612*** and ***623/632***. To the south-east, deposit ***623/632*** comprised a 0.2m thick layer of mid brown silty-sand. This overlay ***622/629***, 0.22m of greyish-black clay, which in turn overlay ***624/628***, a 0.14m thick deposit of brownish-yellow sand. North-west of the ditch, deposit ***612*** comprised 0.54m of black-brown sand, which may have filled an earlier cut feature. This putative feature cut a 0.60m thick deposit of yellowish-brown sand, ***613***, which in turn sealed, ***614***, a greyish-black silty-sand 0.18m in depth. Beneath deposit ***614*** a light yellow-brown silty-sand 0.16m deep, ***618***, was observed at the extreme north-western end of the trench. ***618*** overlay ***619/627***, a far more extensive deposit of pale orange-red sand 0.18m in depth, which covered the whole of the excavated area; to the south-east it was directly overlain by layer ***624/628***. Towards the northern end of the trench, layer ***619/627*** sealed ***620***, a very compact reddish-orange sand, up to 0.44m thick with 95% sandstone inclusions, comprising small/medium-sized fragments and crushed stone (Plate 10). To the south-east, a similar, although less compact, deposit, ***626***, was recorded in section along the full length of the trench (Plate 11). Deposit ***620*** lay a few metres north-west of the projected line of Hadrian's Wall, and is tentatively interpreted as the possible remains of the Stone Wall foundation; no artefactual material was, however, recovered from it. Layer ***626*** may represent a spread of material from the foundation, perhaps the result of disturbance caused by ploughing or levelling. Beneath ***620*** the natural red-brown pebbly sand, ***617/625***, was observed at 7.88m OD. It should, however, be noted that the subsoil at this location formed a low bank, the top of which was 3m wide and rose 0.25m above the surrounding natural surface. It was not clear whether this bank was natural and formed by tidal action or had perhaps been reshaped to form a bank on which the Stone Wall had been built. A smaller bank was observed some 9m to the south-east; this feature was also formed from the natural clay and was also sealed by deposit ***626*** (Fig 7).

3.2.5 ***Trench Extension:*** the uppermost road make-up layers seen at Site D continued to the south-east, here numbered in descending order ***633-35***. Immediately below these deposits were two silty-clay layers***, 636*** and ***637*** (Fig 7a), which in turn sealed a dark organic band 0.05-0.10m thick, ***638***, probably a turf line. This overlay further interleaving layers of clay and gravelly clay up to 0.35m thick, ***639, 640***, which sealed another thin band of probable turf, ***641*** (Plate 12). Beneath ***641*** was a layer of sandy clay 0.35-0.4m thick, ***642***, that directly overlay the natural drift geology (an orange-pink clay, ***643***, overlying a more stony clay, ***644***).

3.2.6 The sequence of interleaving clays and probable turf bands recorded in the trench extension were initially interpreted by the excavators as representing at least two relict ground surfaces (represented by the putative turf lines) that had each been sealed in turn by alluvial deposits resulting from episodes of tidal inundation. None of the deposits recorded in this area were considered to be related to Hadrian's Wall. Given the character of the deposits, however, and

their location, precisely on the projected line of Hadrian's Wall as shown on modern mapping, it is possible that they were in fact the remains of the Turf Wall, although it must be stressed that this interpretation is tentative. As built, the Turf Wall was 6m wide at the base (Breeze 2006, 58), whilst the deposits recorded at Site D were in excess of 8m, north-west to south-east. This discrepancy could, however, be due to subsequent spreading of the Wall material, either deliberately in antiquity or by the plough in more recent times, and to the fact that the trench cut obliquely across the line of the Wall. If the two probable turf lines (***638*** and ***641***) are taken as the top and bottom of the putative Turf Wall material, the Wall at this point survives no more than 0.25m in height.

3.3 SITE E (KIRKLAND HOUSE)

3.3.1 A single trench (Trench 1) was excavated at Site E, which was located within the highway *c* 14m north of Kirkland House, on a north-west/south-east alignment (Fig 8). It measured 41m by 1.4m, and was excavated to a depth of 3m (5.67m OD; Fig 8). Due to mapping discrepancies (*Section 1.1.3*, above) an extension just under 10m in length was excavated at the north-western end of the original evaluation trench (Fig 9), in order to ensure that the trench fully crossed the putative line of Hadrian's Wall.

3.3.2 Tarmac road surface ***508*** was bedded on a compacted grey crushed stone layer ***507*** (Plate 13). Beneath this a levelling layer of yellow-orange sand up to 0.20m thick, ***506***, was observed (Fig 9). Sealed by ***506*** was 0.6m of mid-brown silty-clay, ***505***, which in turn overlaid ***504***, a light grey sandy-clay 0.52m deep. It is thought that deposits ***504*** and ***505*** may have been upcast deposited during the construction of the Carlisle to Port Carlisle canal, the remains of which lie immediately north-east of the site. Context ***504*** sealed ***502***, a 0.16m thick layer of black-grey clay-sand, which itself overlay ***501***, a deposit of crushed sandstone in an orange-grey clay-sand matrix (Plate 14). This measured 7.75m, north-west to south-east, and 0.24m in depth, and directly overlay the natural orange sand, ***500*** (encountered at 7.79m OD to the south-east and 7.31m OD to the north-west). Layer ***501*** may have been the remains of the foundation for Hadrian's Wall, the Wall stone itself having been comprehensively robbed (dressed stone from the Wall is clearly visible in the walls of the barns at nearby Kirkland House). Immediately north-west of putative foundation ***501***, overlying deposits ***502*** and ***504*** appeared to infill what was either a man-made cut or, more probably, the edge of a low natural terrace on which ***501*** itself had been set (Fig 9).

3.3.3 ***Trench Extension:*** the upper stratigraphic levels within the extension were identical to those found within the original trench. These included road make-up layers, ***506-08***, and the possible canal upcast layers directly below***,*** ***505*** and ***509*** (***509*** can be equated with ***504*** in the main trench) (Fig 9a). A possible relict ground surface, ***513***, marked by a thin layer of black sandy silt, was seen below ***504/509*** at the south-east end of the trench. This was cut by a shallow north-east/south-west aligned ditch, ***512*** (Fig 9a; Plate 15). The ditch was 1.50m wide and 0.30m deep with a flat base, and contained two fills, ***510*** overlying ***511***. It yielded no dating evidence, but was probably a field boundary or drainage ditch

that had been sealed beneath the upcast from the canal. To the north-west a thin band of pebbles appeared to mark the original ground level associated with the ditch (Fig 9a), below which was a band of mid-brown clay-silt, ***521/522***.

3.3.4 On either side of the ditch, deposits ***513*** and ***521/522*** overlay a layer of brownish yellow clay, ***515***, probably water-lain material, which in turn sealed a probable relict ground surface represented by a thin band of dark-brown silty-clay, ***516***. Underlying ***516*** was ***517***, a layer of brownish yellow silt, that was also probably water-lain. This sealed the natural red clay, ***518/520***. No remains relating to Hadrian's Wall were observed within the trench extension.

3.4 SITE G (WEST FIELD MARSH)

3.4.1 A single trench (Trench 1) was excavated at Site G, situated south-east of the access road to Glendale Caravan Park, on top of the disused railway embankment where it bisects the supposed line of Hadrian's Wall (Fig 10).. It was aligned north-west/south-east, measuring 21m by 2m, and was excavated to a maximum depth of 1.05m. As with Sites D and E an extension to the trench was required, to cover the whole putative width of Hadrian's Wall in this location (*Section 1.1.3*, above). The extension measured 12m and was excavated to a depth of 1.70m and adjoined the south-east end of the original trench.

3.4.2 The trench ran parallel to the existing disused railway embankment with the canal basin falling away sharply to the south-west. A mid-reddish-brown sandy-silt topsoil, ***305***, sealed the embankment make-up, ***303***, which comprised a mid brown silty-sand that was excavated to a depth of 0.45m along the entire length of the trench (Fig 12). At the north-west end of the trench, deposit ***303*** overlay a mid grey brown silty-clay layer, ***301***, which contained a linear spread of small- to medium-sized sandstone boulders, ***302***, approximately 3m wide and aligned roughly east/west (Fig 11; Plate 16). It is tempting to interpret this feature, which, with layer ***301***, directly overlay the natural orange clay (***300***; observed at 7.47m OD), as part of the foundation for Hadrian's Wall; however, its irregularity and the lack of associated artefactual materials render the interpretation tentative.

3.4.3 On the south-western edge of the trench, layer ***301*** was cut by ***306***, a north-west/south-east linear feature measuring 14m by 1.35m and in excess of 0.45m deep (Figs 11, 12). This feature, which was filled with mid-brown silt-clay, ***304***, containing lenses of greyish-white orange sand (Plate 17), appeared to correspond to the north-eastern edge of the cutting for the adjacent canal.

3.4.4 ***Trench Extension:*** below topsoil ***305*** was a 0.55m thick layer of grey-brown, silty-clay, ***307*** (Fig 12), which was the equivalent of the embankment make-up layer, ***303***, within the original trench. Below this was a reddish-brown silt, ***308***, which contained 5-10% small-medium sandstone fragments (Plate 18). Towards the south-eastern end of the trench, sealed below deposit ***308***, was a lens of black clay 0.1m thick, ***309***. This deposit overlay a layer of water-lain grey clay, ***310***, that in turn sealed a build-up of greyish-yellow clay in excess of

0.4m thick, ***312/313***. No finds were recovered from any of the deposits in this area.

3.5 SITE I (GLASSON FARM)

3.5.1 ***Trench 1:*** this trench, which measured 15m by 2m, was located on top of the disused railway embankment between Glasson and Drumburgh, and was aligned north-west/south-east (Fig 13). It was excavated to a maximum depth of 1.2m (7.90m OD). The excavation revealed a topsoil, ***408***, sealing a series of seven dumps of earth within the construction of the railway embankment (***401-407***) (Fig 14; Plate 19). Layer ***407*** comprised a dark brown clayey-sand and overlay ***406***, a mixed orange-brown and dark grey sandy silt with intermittent light grey patches. Deposit ***405***, a light orange-brown sand, was sealed by ***406*** and overlay ***404***, a dark grey-brown clay-sand. Beneath this was ***403***, a mid-grey brown clay-sand, which in turn overlay a compact grey sandy-clay layer ***401***. Beneath layer ***401*** was a light orange sand, ***402*** (not illustrated), which appeared to be redeposited natural. The subsoil, a mottled orange-grey sand, ***400***, was encountered at 8.04m OD.

3.5.2 ***Trench 2 (not illustrated in detail):*** this trench was located within the highway, 2m south-east of Trench 1 and *c* 48m north-west of Bombadil Cottage, and crossed the projected line of Hadrian's Wall (Fig 13). It was aligned north-west/south-east, measured 6.6m by 1.3-1.4m, and was excavated to a depth of 1.5m. The top of the trench was covered by 0.06m of tarmac, ***838/843***, which overlay a 0.29m thick make-up deposit, ***839/844***, comprising stone rubble and grey stone chippings. This sealed a 0.27m thick layer of dark grey-black compacted clinker/industrial waste, ***840/845***, beneath which was 0.72m of grey clay with occasional sandstone inclusions, ***841***. At the base of the trench, below ***841***, a thick band of orange clay, ***842/846***, probably represented the natural subsoil (Plate 20).

3.5.3 ***Trench Extension:*** the trench extension, undertaken due to mapping discrepancies over the position of Hadrian's Wall (*Section 1.1.3*, above), was placed immediately south of the north-western end of Trench 1 (Fig 15a). The extension measured 11.45m by 1.5m and was excavated to a depth of 1.20m. The base of the excavation lay between 8.08m OD at the south-eastern end of the trench and 9.08m OD to the north-west.

3.5.4 Below the topsoil, ***411***, was a 0.30m thick layer of silty-clay, ***412***. This deposit overlay a mid brown silty clay, ***417***, which was confined to the north-west end of the trench (Fig 14a). Over the rest of the excavated area, ***412*** sealed a mottled brownish-yellow silty-clay, ***413***, which interleaved in one part of the trench section with ***414***, a deposit of mid grey silty-clay.

3.5.5 Sealed below deposit ***413***, was a layer of pale yellowish-grey, mottled - possible gleying - clay, ***415***. This deposit sloped downwards to the south-east and, together with layers ***413*** and ***414***, might possibly have filled the edge of a pond (Plate 21). Natural drift geology, in the form of a pale yellowish grey clay, ***416***, was glimpsed at the north-western end of the trench. No evidence for Hadrian's Wall was observed within the trench.

3.6 SITE J (GLASSON WASTEWATER TREATMENT WORKS)

3.6.1 The evaluation at Site J consisted of five 25m by 1.8m trenches (Trenches 1-5), designed to evaluate the field east of Bombadil Cottage, Drumburgh. In agreement with the Hadrian's Wall Archaeologist, the precise location of the trenches was altered from that shown in the specification to a position where maximum below ground disturbance would be created by the proposed Glasson Wastewater Treatment Works development (Fig 15).

3.6.2 ***Trench 1 (not illustrated in detail):*** this was positioned along the line of a proposed access road, and was aligned north-east/south-west. It measured 25m by 1.8m and was excavated to a depth of 0.4m (5.38m OD). The excavation revealed a 0.32m thick layer of mid-orange speckled grey sand, ***801***, sealed by modern topsoil (Plate 22). A sondage, 0.97m in depth, was excavated towards the south-west end of the trench to test for natural deposits. There ***801*** overlay a mid-grey, mottled orange sand, ***802***. Both ***801*** and ***802*** are thought to have been marine alluvium; no archaeologically significant features or deposits were observed.

3.6.3 ***Trench 2:*** this trench was positioned within the footprint of the proposed treatment works, and was aligned approximately north/south (Fig 15). It measured 25m by 1.8m and was excavated to a maximum depth of 0.55m (5.38m OD). On removal of a 0.30m thick layer of grey-brown silty-sand topsoil, ***807***, a gully or ditch, 2.25m wide and 0.57m deep, ***803***, was revealed. This feature, which traversed the trench on a roughly north-east/south-west alignment (Fig 16), had gently sloping sides and a flat base (Fig 17; Plate 23). The lower fill, ***805***, was a pale grey/orange silty-sand, overlain by an upper fill of mid-grey/orange silty-sand, ***804***. Both fills appeared to have been gradually deposited, probably through natural silting, and indeed it seems likely that feature ***803*** was itself of natural origin. It cut a layer of mid-orange speckled grey clay-sand, ***806***, which can probably be interpreted as a marine alluvium.

3.6.4 ***Trench 3:*** this was located to the west of, and parallel with, Trench 2, on a roughly north/south alignment (Fig 15). Trench 3 measured 25m by 1.8m and was excavated to a maximum depth of 0.7m (5.23m OD). Removal of 0.28m of mid-grey-brown silty-sand topsoil, ***808***, revealed two shallow gullies, ***810*** and ***813***, both on a north-east to south-west alignment, and both of probable natural origin (Fig 16; Plates 24 and 25). Gully ***810***, situated in the northern end of the trench, was 2.6m wide and 0.4m deep, and was cut by a modern land drain. A lower fill of light grey sand, 0.21m deep, ***811***, was sealed by an upper fill of mid-dark grey-brown clay-sand, ***812***; both deposits appear to have been formed during the gradual silting-up of the gully. Feature ***813***, situated towards the southern end of the trench, was 1.8m wide and 0.16m deep, and contained a lower fill of light greyish-orange clay-sand, ***815***, overlain by an upper fill of mid-dark grey/orange clay-sand, ***814***. Gullies ***810*** and ***813*** cut the natural geological subsoil, a pale yellow-orange clay-sand, ***809***.

3.6.5 ***Trench 4:*** this trench was positioned to the west of Trench 3, and aligned approximately east/west (Fig 15), within the footprint of the septic tanks for the proposed treatment works. It measured 25m by 1.8m and was excavated to a maximum depth of 0.38m (5.34m OD). Beneath the mid grey-brown silty-sand

topsoil, ***816***, were two shallow gullies, ***818*** and ***820***, crossing the trench on a north-east/south-west alignment (Fig 16; Plate 26). As with feature ***803*** in Trench 2, and also features ***810*** and ***813*** in Trench 3, it seems likely that ***818*** and ***820*** were of natural origin. Gully ***818***, situated towards the eastern end of the trench, was 5.7m wide and 0.32m deep, and was filled with ***819***, a light grey/brown mottled orange sand. Gully ***820*** was situated approximately 5.5m west of ***818*** and aligned roughly parallel with it. This feature was 5.5m wide and 0.3m deep, and contained a lower fill of dark blue/grey clay, 0.1m thick, ***821***, sealed by an upper fill of grey silty-clay with degraded sandstone inclusions, ***822*** (Fig 17). Both features cut a layer of mid-orange mottled grey clay-sand, ***817***, probably a water-lain alluvial deposit.

3.6.6 ***Trench 5:*** this was located to the south of, and parallel to, Trench 4, within the footprint of the proposed submerged aerated filter feed pumping station, and was aligned approximately east/west (Fig 15). It measured 25m by 1.8m and was excavated to a maximum depth of 0.54m (5.26m aOD). A 0.15m thick layer of grey-brown silty-sand topsoil, ***823***, overlay a deposit of dark grey-brown silty-sand 0.05m thick, ***824*** (Figs 17 and 18). This sealed a deposit of probable tidal alluvium, ***829***, which had been cut by three gullies, ***825***, ***827*** and ***830***, all aligned roughly north-east to south-west (Fig 16; Plate 27). Gully ***825***, observed at the extreme western end of the trench, was 0.94m wide and 0.08m deep, and was filled with, ***826***, a mid-grey/brown clay-sand. This feature appeared to be a the same as gully ***820*** in Trench 4 to the north (*Section 3.6.5*, above). Gully ***827***, located centrally within the trench, was 6.3m wide and 0.32m deep (Fig 17), and was filled with mid-grey sand containing orange clay inclusions, ***828***; this deposit produced a sherd of eighteenth century slipware. Feature ***827*** appears to have been a continuation of gully ***818***, recorded in Trench 4 to the north (*Section 3.6.5*, above). Gully ***830*** was 3.24m wide and 0.3m in depth and was situated at the eastern end of the trench. It appeared to be the same feature as gully ***810*** in Trench 3 to the east (*Section 3.6.4*, above). It contained a lower fill of blue/grey clay 0.2m deep, ***831***, and an upper fill of dark brown clay-sand ***832*** (Fig 18; Plate 28). The latter contained a sherd of mid-eighteenth century trailed slipware. The upper fill was truncated to the east by a trench containing a ceramic field drain and cut by a U-profiled, north-east/south-west aligned ditch or gully, ***833***, 1.2m wide and 0.25m deep. This was probably a drainage ditch pre-dating the ceramic drain; it contained a lower fill of dark grey/brown silty-sand 0.05m thick, ***835***, and an upper fill of re-deposited subsoil, a yellow-orange sand, ***834*** (Fig 18; Plate 28).

4. THE FINDS AND PALAEOENVIRONMENTAL ASSESSMENT

4.1 THE FINDS

4.1.1 ***The Assemblage:*** a small artefactual assemblage was recovered durign the course of the evaluation, mostly from stratified contexts within Sites A and J. In total, 67 items were collected, of which the majority (57) were pottery sherds. Other material included clay pipe (3 fragments), glass (2 fragments), a copper-alloy Roman coin, and fragments of slate, shell and animal bone. With the exception of the coin, the assemblage can be largely dated to the eighteenth and nineteenth centuries, with small amounts of seventeenth century material also present. The assemblage was, on the whole, in reasonable condition, and was assessed following guidelines produced by the IFA. The quantities of different types of finds are presented in Table 1, below, and a full catalogue is set out in *Appendix 3*.

Category	**Quantity**
Pottery	57
Clay tobacco pipe	3
Glass	2
Animal bone	2
Copper alloy	1
Marine shell	1
Slate	1
Total	***67***

Table 1: Artefact quantification by material category

4.1.2 ***Pottery:*** in total, 57 fragments of post-medieval pottery were recovered, from the following contexts:

- fill ***720*** of construction cut ***719***, for wall ***713***, in Site A, Trench 1;
- layers ***736***, ***737***, and fills ***740***, ***741*** of culvert ***738/739***, in Site A, Trench 2.
- fill ***828*** of gully ***818***, in Site J, Trench 4;
- upper fill ***832*** of gully ***830***, in Site J, Trench 5;

Approximately half of the assemblage was composed of finewares, mainly tableware vessels, whilst the remainder comprised coarseware vessels for use in the kitchen. The latter are more useful for dating purposes, since they were more subject to changing fashion and technology, thereby remaining in circulation for shorter periods than the finewares.

4.1.3 A range of seventeenth to eighteenth century finewares was represented, including slip-coated and slip-decorated wares, self-glazed earthenwares, brown and black-glazed red earthenware, and Mottled ware. Of these, black-glazed red earthenwares and slip-coated wares were the most common types. A reasonably large amount of coarsewares with a similar date range was also recovered. The material comprised earlier black-glazed red earthenwares and brown-glazed red

earthenwares, which could not always be distinguished from each other, and self-glazed buff-coloured and orange earthenwares, which can be broadly dated to the period from the late seventeenth century to the mid-nineteenth century.

4.1.4 Small quantities of bone china and other white earthenwares, representing approximately half of the fineware assemblage and dating mainly from the late eighteenth century to the early nineteenth century, were also recovered. Decoration, where present, took the form of relief-moulded beading and factory-made slipware designs with cut-away decoration. Decoration was more frequently found on china than on white earthenware, and included painted patterns in blue or earth colours, factory-made slipware or floral transfer-printed patterns. The forms represented in the white earthenwares included bowls, plates, and mugs. Sources are difficult to ascribe, although the nine sherds of hand-trailed slipware were most probably a Staffordshire-type product.

4.1.5 The amount of pottery (47 fragments) recovered from sandy clay layers ***736*** and ***737*** at Site A, Trench 2, suggests that these were dumped materials that accumulated over a relatively short period. The presence of trailed slipware is significant in that it may indicate that these deposits did not pre-date the mid-eighteenth century. Similarly, trailed slipware found within secondary fill ***741*** of culvert ***738/739*** in the same trench would suggest a date no earlier than the second half of the eighteenth century for the accumulation of this deposit.

4.1.6 ***Copper-Alloy***: a single heavily worn and patinated copper-alloy coin was recovered during the course of the evaluation, from the area adjacent to culvert ***738/739*** in Trench 2 at Site A. The coin has been identified as a radiate copy of Claudius II (AD 268-70), probably minted in the AD 270s/280s, although its worn condition suggests that it remained in circulation for some time. Coins of Claudius II seem to have had a relatively enduring circulation, probably because the great fourth century emperor Constantine I (d. AD 337) claimed Claudius (falsely) as an ancestor (D Shotter *pers comm*).

4.1.7 ***Miscellaneous Finds:*** fragments of clay tobacco pipe from layer ***741*** in Trench 4 were not closely datable, although their presence is consistent with the approximate date range suggested by the pottery from the same deposit. Fragments of an unstratified glass wine bottle from Site A, Trench 2 have an eighteenth-nineteenth century date range, consistent with the dating of the other stratified artefactual materials collected from the trench. There was little of interest amongst the rest of the assemblage and, as such, it was of little significance to the further interpretation of the site.

4.1.8 ***Conclusion***: although the assemblage is small, the finds have enabled the remains in Site A to be dated to the eighteenth-nineteenth century. The gullies recorded at Site J appear to date to the eighteenth century on account of the pottery contained therein (*Appendix 4*).

4.2 PALAEOENVIRONMENTAL ASSESSMENT

4.2.1 ***Plant Remains:*** two environmental bulk samples were taken from two deposits in Site J, Trench 3, namely contexts ***811*** (the lower fill of gully ***810***) and ***814***

(the upper fill of gully ***813***). It was hoped that assessment of charred and waterlogged plant remains contained within the samples would provide information relating to the environment and economy of the site and provide material suitable for dating.

4.2.2 The results of the assessment are shown in Table 2 below. Both samples contained small quantities of charcoal. The only charred plant material recorded was a fragment of *Bromus* (Bromes) from context ***811*** and an unidentified woody seed from context ***814***. Modern waterlogged roots and seeds were recorded, with *Juncus* (Rushes) in both samples. Other modern seeds included *Chenopodium album* (Fat hen), *Rumex acetosa* (Common sorrel), *Euphorbia helioscopia* (Sun spurge) and *Poaceae.*

Sample	Context	Feature	Sample size (litres)	Flot description	Plant remains	Potential
1	814	Gully	10	250 ml. Modern roots and seeds (5), Charcoal >2mm (3) <2mm (5), Insect fragments (1), Clinker (1)	Modern WPR (1) *Juncus,* (Rushes) *Poaceae* (Grasses) >4mm, *Rumex acetosa* (Common sorrel), *Euphorbia helioscopia* (Sun spurge) CPR (1) Unidentified woody seed	None
2	811	Gully	20	250 ml. Modern roots and seeds (5), Charcoal >2mm (3) <2mm (5), Coal (1)	CPR (1) *Bromus* (Bromes) WPR (1) *Chenopodium album* (Fat hen), *Juncus* (Rushes)	None

Table 2. Assessment of charred and waterlogged plant remains (CPR and WPR). The remains were scored on a scale of 1-5, where 1 is rare (1-5 items) and 5 is abundant (more than 100 items)

4.2.3 ***Discussion and Potential:*** there is no potential for analysis of the plant remains from the assessed samples. Because of the high level of modern contamination and the resulting uncertainty concerning the taphonomy of the charcoal there is no potential for radiocarbon dating.

5. DISCUSSION

5.1 INTRODUCTION

5.1.1 Three of the six sites evaluated in advance of the proposed improvements to wastewater treatment along the Solway coast (Sites D, E and G) yielded limited, but potentially significant information concerning the course and location of Hadrian's Wall in this part of Cumbria. Site A produced useful data of post-medieval date, in addition to a residual Roman coin. At Sites I and J, little in the way of archaeological features were recorded, other than a series of deposits associated with the construction of the railway embankment and road at Site G, and a number of gullies of probable natural origin at Site J. A proposed seventh site (Site L) was not evaluated, by agreement with the Hadrian's Wall Archaeologist, due to the presence of a live sewer. Site A was located close to the east wall and east gate of the Hadrian's Wall fort at Bowness-on-Solway. It was also situated in close proximity to known Roman deposits, possibly located within a *vicus*, on the eastern approaches to the fort (Carlisle Archaeology Ltd, 2001). In spite of this, it contained no archaeology of Roman date. At Sites D, E and G the evaluation trenches may have traversed the line of Hadrian's Wall, but for the most part the identified archaeological remains could only be tentatively associated with the Wall.

5.1.2 ***Site A:*** all the features and deposits recorded within Trenches 1 and 2 at Site A were post-medieval in date. They included a stone-lined culvert, a wall and various deposits dumped as road make-up layers. Pottery recovered from these remains indicated activity during the eighteenth and nineteenth centuries. The presence of wall ***713*** suggested that buildings once extended further south than presently, beneath the modern road surface. Culvert ***738/739*** can probably be equated with the 'old mill-race' shown on the first edition Ordnance Survey map of 1868; it is conceivable that this feature could have eighteenth century (or possibly even earlier) origins (OA North 2004).

5.1.3 Work carried out by Carlisle Archaeology Ltd in 2000 revealed Roman remains, believed to form part of a building, located approximately 8-10m from Site A (Carlisle Archaeology Ltd 2001, 14). On the whole, however, few Roman levels were found in this area, and it was suggested that the modern roads had removed most of the Roman archaeology, including the remains of Hadrian's Wall itself (*op cit*, 40). This hypothesis is supported by the results of the Site A evaluation, for whilst the presence of a late third century coin, albeit in a post-medieval context, was suggestive of Roman activity in the vicinity of the site, no remains of this period were encountered.

5.1.4 ***Site D:*** the most significant results of the evaluation at Site D were the discovery of the possible remains of the turf phase of Hadrian's Wall, the possible foundation for the Stone Wall, and what may have been the Stone Wall Ditch. The identification of the Turf Wall in the south-eastern extension to Trench 2 must be regarded as tentative, since the deposits in question were initially thought to represent at least two phases of buried ground surfaces (represented by probable turf-lines ***638*** and ***641***) sealed beneath alluvial clays (***636, 637, 639, 640***) deposited as a result of tidal inundation. In view of the

character of these deposits, however (Plate 12), and their location, precisely on the projected line of Hadrian's Wall as shown on modern mapping, it is possible that they represented the remains of the Turf Wall, surviving to a height of *c* 0.25m. As built, the Turf Wall was *c* 6m wide at the base (Breeze 2006, 58), but the remains at Site D extended north-west to south-east for at least 8m. This discrepancy may have been due to subsequent levelling and spreading of the Wall material, either in antiquity (perhaps when the Turf Wall was replaced in stone), or as a result of more recent agricultural activity, and to the fact that the trench cut obliquely across the projected line of the Wall.

5.1.5 West of the fort at Burgh-by-Sands, excavations in 1989 demonstrated that the Turf Wall in this area had been built on a cobble foundation 5.65-5.8m wide (Austen 1994, 38), and traces of a similar feature are also known from the vicinity of Milecastle 72 and at Beaumont (*op cit*, 50). The provision of a foundation of this kind was by no means universal, however (Breeze 2006, 60), so its apparent absence at Site D need not be considered anomalous.

5.1.6 The possible Stone Wall foundation was represented by a layer of compacted, crushed sandstone and sandstone fragments (***620***) situated at the north-western end of Trench 2, approximately 12m north of the putative Turf Wall deposits. This deposit was situated largely on top of a low bank, but also extended south-east (as ***626***) for at least 9m, suggesting that the remains of the foundation had been spread out, though whether this was the result of deliberate levelling or ploughing was not ascertained. In 1930, excavations on the line of the Wall between Drumburgh and Bowness suggested that the Stone Wall had been built, at least in some places, upon a substantial sea-bank (Breeze 2006, 364). In so far as it was possible to tell, the bank recorded at Site D was of natural origin.

5.1.7 Some 2.5m north of the possible Stone Wall foundation, within Trench 1, was the southern edge of a large ditch or ditch-like feature (***847***) that had been dug through the natural clay. If the interpretation of ***620*** is correct, it seems likely that ***847***, which was in excess of 10m wide and at least 2m deep, was the Stone Wall Ditch. On a cautionary note, however, it should be noted that the Wall Ditch has never been certainly observed on this sector of the Wall and seems to have been absent at some excavated sites (*ibid*). Further investigation would be required to confirm or refute the tentative interpretation offered for feature ***847***, particularly since, at only 2.5m, the berm between this feature and the putative Wall foundation was considerably narrower than the normal width of *c* 6m (*ibid*, 63); it is, however, possible this resulted from weathering or erosion of the southern lip of the ditch after it was dug.

5.1.8 The findings at Site D, if correctly interpreted, would suggest that the course of the stone phase of Hadrian's Wall lies approximately 10m north-west of its position as shown on the modern mapping, although the cartographic data appear to provide an accurate location for the Turf Wall, if the deposits recorded in the trench extension are indeed the remains of that feature.

5.1.9 ***Site E:*** a layer of crushed sandstone, ***501***, was found at the base of the trench at this site, directly overlying the natural subsoil. It appeared to form a low bank just under 8m wide and 0.24m thick, and has been interpreted as the probable

remains of the foundation for the stone phase of Hadrian's Wall, the projected line of which passed directly through the site. The width of the putative foundation may be explained by the fact that the trench cut across the projected line of the Wall at a shallow, oblique angle. Wall stone can still be seen in the walls of the barns at Kirkland House, which lies close to the site (OA North 2004). The course of the Wall was examined near to this point in 1934 when Milecastle 78 was excavated (Breeze 2006, 363). Here the Wall foundation was found to be 2.86m in width. Other deposits recorded at Site E included probable upcast from the construction of the adjacent canal basin, which sealed a probable old ground surface and a possible field boundary or drainage ditch. The date of these remains is not known (they did not have any recorded stratigraphic relationship with the probable Wall foundation), but they post-dated a series of probable water-lain deposits that in turn sealed an earlier, and also undated, relict ground surface.

5.1.10 ***Site G:*** a roughly linear spread of sandstone boulders, ***302***, was observed at Site G. This deposit was aligned roughly east to west and lay only a few metres north of the projected line of Hadrian's Wall as shown on modern mapping. It is therefore tentatively interpreted as the remains of the Stone Wall foundation. However, Site G also incorporated the edge of the embankment of the disused railway, represented by context ***303***, which directly overlay ***302***, so it is conceivable that the boulders also formed part of the embankment make-up, which is known to date from the early 1850s. A linear feature, ***316***, running along the western edge of Site G is thought to have been associated with the construction of the canal, which was opened in 1823.

5.1.11 ***Site I:*** Site I was located partly on top of the disused railway embankment between Glasson and Drumburgh and partly within the highway. Trench 1 revealed dumped deposits associated with the construction of the embankment, but few other deposits of note were recorded. Although the site traversed the projected line of Hadrian's Wall, no trace of the Wall was found.

5.1.12 ***Site J:*** a series of five shallow gullies (***803***, ***810/830***, ***813***, ***818/827***, ***820/825***) were recorded within Trenches 2-5 at Site J. These are believed to have formed naturally, perhaps as a result of tidal action or water draining from the adjacent fields. Two sherds of eighteenth century pottery from the fills of these features may indicate that some or all were post-medieval in date.

5.2 CONCLUSIONS

5.2.1 Three of the four sites where the proposed pipeline crossed the projected line of Hadrian's Wall (Sites D, E and G) produced some evidence for the presence of the Wall, although interpretations were, for the most part, tentative. At Site D, there was evidence to suggest that the evaluation trench cut across not only the line of the stone phase of Hadrian's Wall, but also the earlier Turf Wall, situated some 12m to the south, and possibly also part of the ditch fronting the Stone Wall. The possible remains of the heavily disturbed Stone Wall foundation were also recorded at Sites E and G, but no trace of the Turf Wall or the Wall Ditch was found. Sites A, I and J produced no evidence for the Wall, nor were any other deposits of possible Roman date recorded, although a

residual Roman coin was recovered from Site A, which lay close to the fort at Bowness-on-Solway. The absence of Roman deposits in these areas is likely to be due, at least in part, to post-medieval truncation and other fairly recent disturbances. Overall, the evaluation, together with earlier archaeological investigations in the area, have demonstrated that preservation of Hadrian's Wall and its associated features along this part of the Solway coast is extremely variable, and that conditions encountered at any given locale do not provide an indication of the likely level of preservation elsewhere, even in the case of sites situated only a few metres apart. Recent work at Drumburgh, for example (Collins, 2006 20), has shown that quite substantial remains of the Stone Wall foundation do survive in this area.

6. IMPACT AND RECOMMENDATIONS

6.1 IMPACT AND RECOMMENDATIONS

6.1.1 ***Impact:*** it is clear that the pipeline will impact upon the archaeological remains found at Sites A, D, E and G, and further archaeological work is therefore recommended at these points. At Sites I and J, where the findings were less certain, the potential archaeological impact of the proposed works is less clear. However, in view of the archaeological sensitivity of the whole area, which lies within the boundaries of the Hadrian's Wall World Heritage Site, it is felt that an archaeological presence should be maintained at both sites during the course of the construction works.

6.1.2 ***Site A:*** the fairly limited evaluation conducted at Site A revealed archaeological deposits principally of post-medieval date. Roman levels may have suffered truncation, but their absence cannot be taken as proof that the Roman strata have been completely removed over the whole of this area. Earlier work has demonstrated that traces of Roman structures do survive in close proximity to the site, perhaps associated with a civilian settlement on the eastern approaches to the Hadrian's Wall fort at Bowness-on-Solway. Consequently, the pipeline could potentially disturb or destroy surviving Roman deposits situated outside the evaluation trenches, in addition to impacting upon the post-medieval features recorded during the evaluation. At the very least, therefore, a watching brief should be maintained on any groundworks undertaken within this area. The Engineering Statement for Site A suggests that the pipe trench will probably have to be hand-dug due to the presence of many live services (Dooley 2006), so it would make sense for the trench to be excavated by an archaeological team. However, very recent changes to the design mean that the pipe will no longer pass through Site A (Paul Hastings *pers comm*).

6.1.3 ***Site D:*** at Site D, the possible remains of both the turf and stone phases of Hadrian's Wall, and perhaps also the Stone Wall ditch, were recorded on the line of the proposed pipeline. In view of the fact that the evaluation trench has already caused some disturbance to these features, it would make sense to lay the pipe on the line of the trench to avoid causing additional damage. It is recommended that a watching-brief be maintained at this site during the course of the works, and that sampling of the putative Turf Wall deposits recorded in the trench extension should be undertaken for palaeoenvironmental analysis.

6.1.4 ***Site E:*** the construction of the canal and railway adjacent to Site E probably resulted in severe disturbance to the remains of Hadrian's Wall in this area. However, the evaluation of Site E has demonstrated that traces of the putative Stone Wall foundation (deposit ***501***) do survive. It is therefore suggested that an archaeological watching brief is maintained on all groundworks conducted within this area. Unfortunately, at this location there would appear to be no alternative route for the pipeline that would not necessitate crossing the projected line of Hadrian's Wall at some other point, particularly in view of the location of the canal to the north-east and the presence of buried cables on the opposite side of the road.

6.1.5 ***Site G:*** the proposed pipeline follows the line of the railway embankment and canal at this point and will impact upon the archaeological remains of these features. Although the impact on Hadrian's Wall itself is likely to be minimal, the evaluation demonstrated the existence of a feature (deposit ***302***) that may represent the Stone Wall foundation. It is therefore suggested that a watching brief should be maintained on any groundwork undertaken within this area, in order to record any potentially significant archaeological deposits. It will be particularly important to attempt to determine whether the putative Wall foundation is indeed of Roman date, or represents up-cast from the construction of the railway embankment.

6.1.6 ***Site I:*** construction of the railway embankment and the modern road appeared to have removed all trace of earlier archaeological deposits within the evaluation trenches. In view of the archaeological sensitivity of the area, however, and the demonstrable variation in the preservation of Hadrian's Wall on this part of the Solway coast, it is recommended that a watching brief be maintained during the course of any groundworks.

6.1.6 ***Site J:*** on the evidence of the evaluation conducted at Site J, construction of the proposed Wastewater Treatment Works will not impact upon archaeologically sensitive deposits. However, in view of the archaeological sensitivity of the area, it is desirable that an archaeological watching brief is maintained on the groundworks at this site.

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8. ILLUSTRATIONS

8.1 FIGURES

8.2 PLATES

Plate 3: Site A, Trench 1, eastern elevation of wall ***713***

Plate 4: Site A, Trench 1, showing construction cut ***719*** for wall ***713***

Plate 5: South-facing section of Site A, Trench 2 (west)

Plate 6: Site A, Trench 2, cobbled surface ***724***, looking west

Plate 7: South-facing section of Site A, Trench 2 (east)

Plate 8: Intact section of culvert ***738/739*** adjacent to Site A, looking north-east

Plate 9: North-east-facing section of Site D, Trench 1, north-western end

Plate 10: North-east-facing section of Site D, Trench 2, south-eastern end, showing sondage through compacted layer ***620/626***.

Plate 11: North-east-facing section of Site D, Trench 2, south-eastern end, showing ditch ***621***, and compacted layer ***620/626***.

Plate 12: North-east-facing section within trench extension, Site D, showing alluvial deposits and relict ground surfaces above natural clay.

Plate 13: North-east-facing section of Site E, Trench 1, northern end

Plate 14: Site E, Trench 1, crushed sandstone layer ***501***, looking north-west

Plate 15: North-east facing section within the trench extension at Site E, showing ditch ***512***

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Plate 20: North-east-facing section of Site I, Trench 2

Plate 21: North-east-facing section within the trench extension at Site I, showing possible pond deposits ***413***, ***414*** and ***415*** beneath later levels ***411*** and ***412***

Plate 22: Trench 1, Site J, looking north-east

Plate 23: Trench 2, Site J, north-east-facing section of gully ***803***

Plate 24: Trench 3, Site J, north-east-facing section of gully ***810***, truncated by a land drain

Plate 25: Trench 3, Site J, north-east-facing section of gully ***813***

Plate 26: Trench 4, Site J, showing gullies ***818*** (furthest away) and ***820*** (nearest), looking east

Plate 27: Trench 5, Site J, showing gullies ***825*** and ***827***, looking east

Plate 28: Trench 5, Site J, north-facing section of gully ***830*** and ditch ***833***

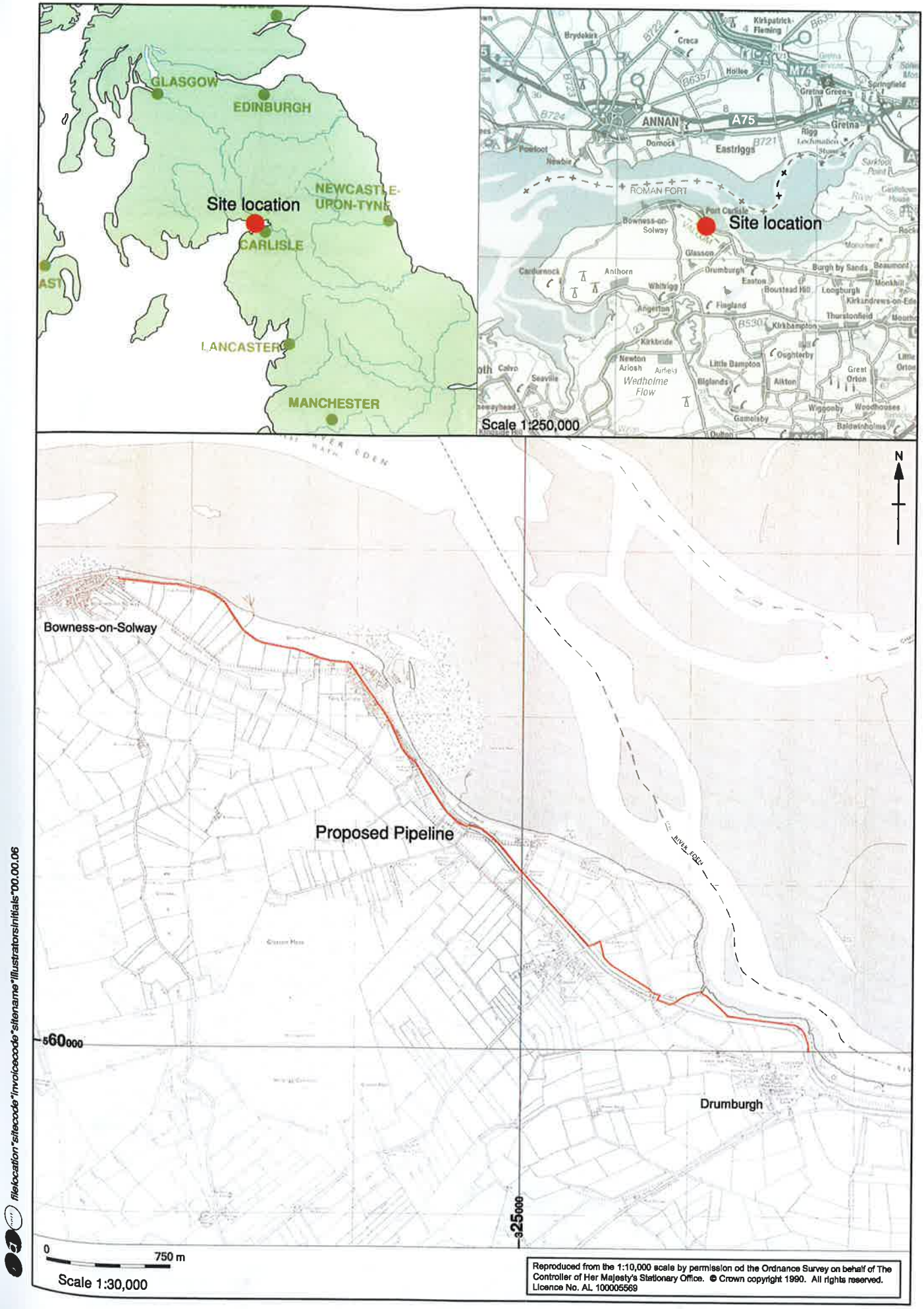


Figure 1: Site Location

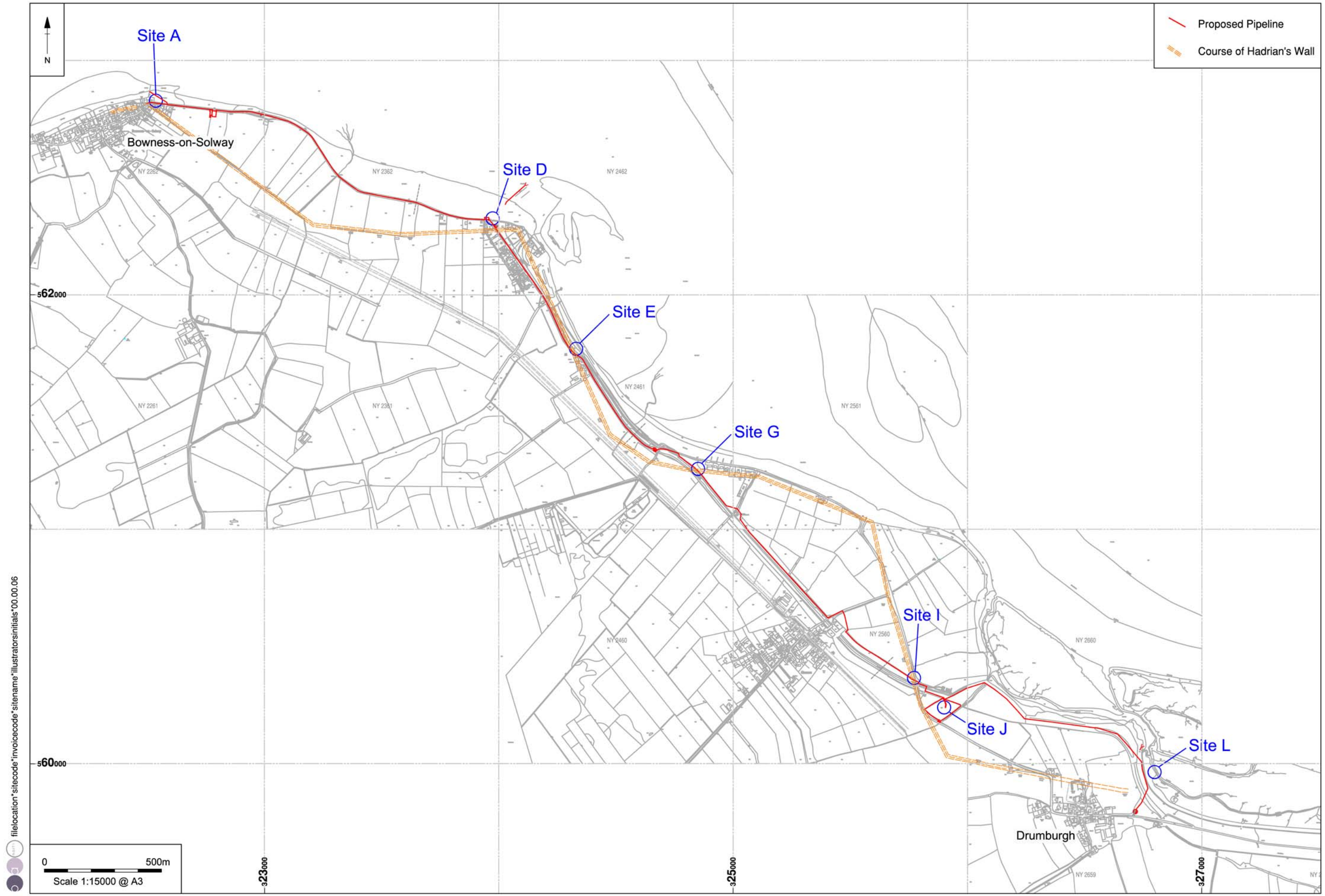


Figure 2: Plan showing location of evaluation sites

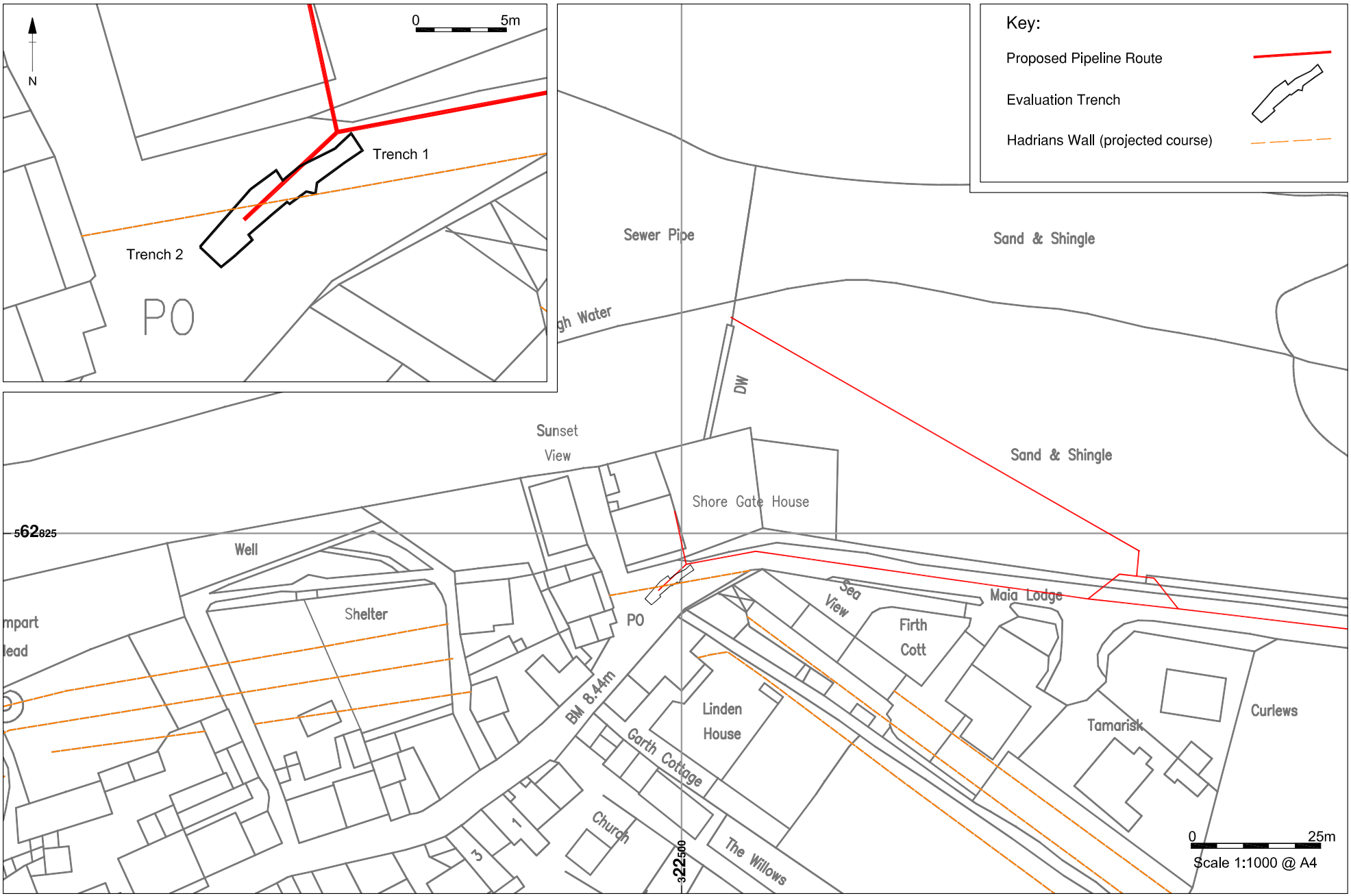


Figure 3: Site **A** trench location plan

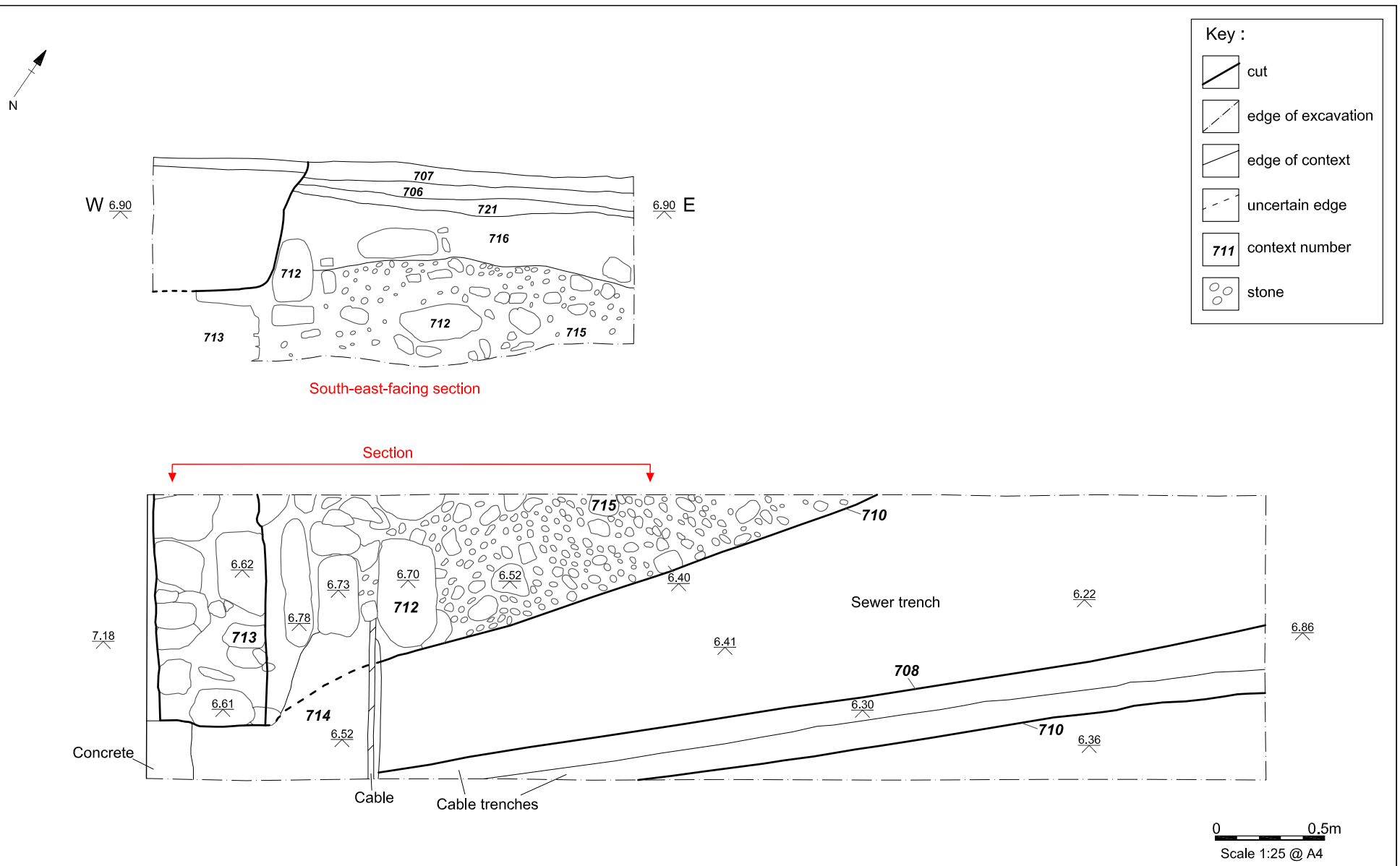


Figure 4: Plan and section of Trench 1, Site **A**

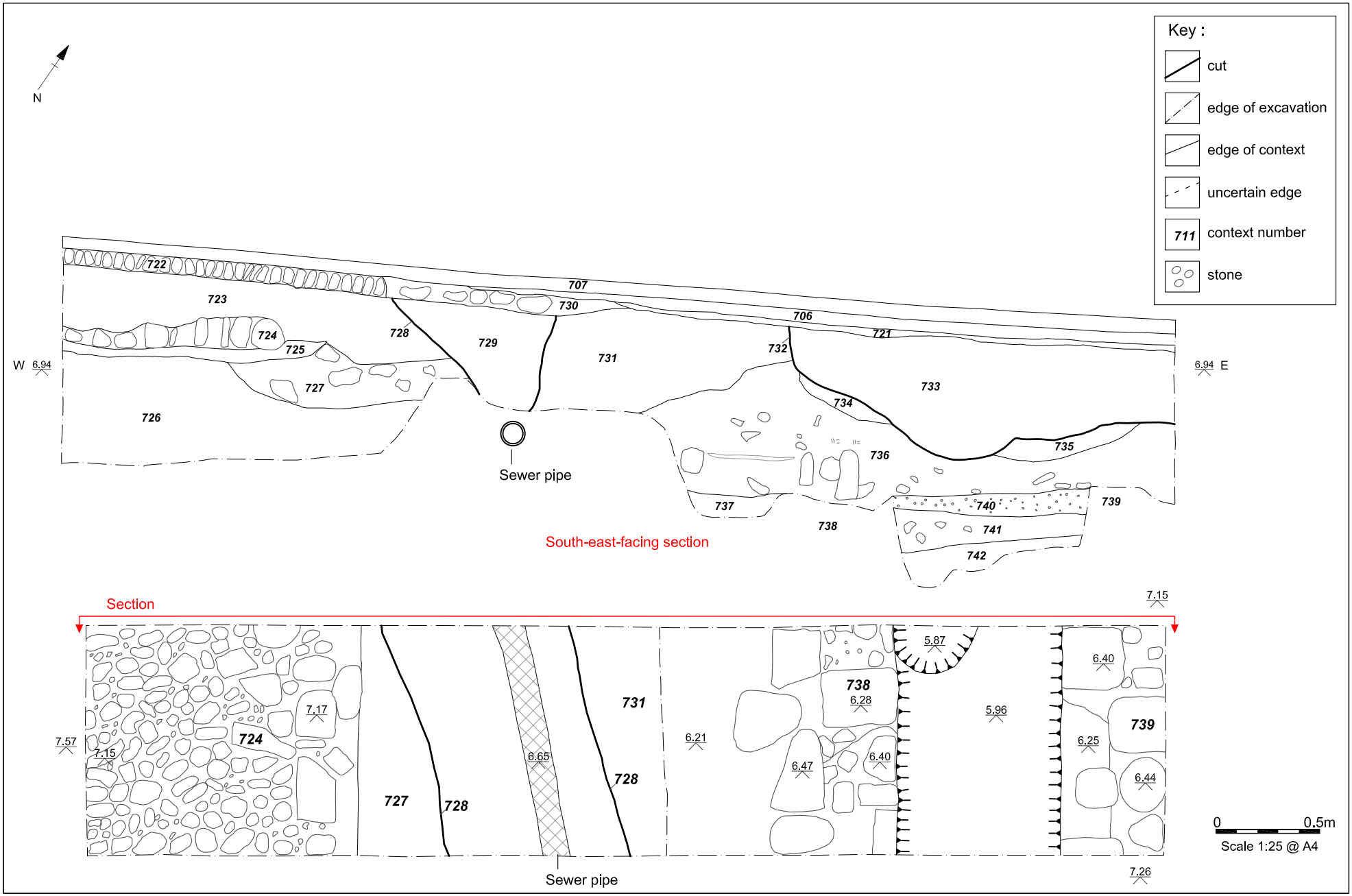


Figure 5: Plan and section of Trench 2, Site **A**

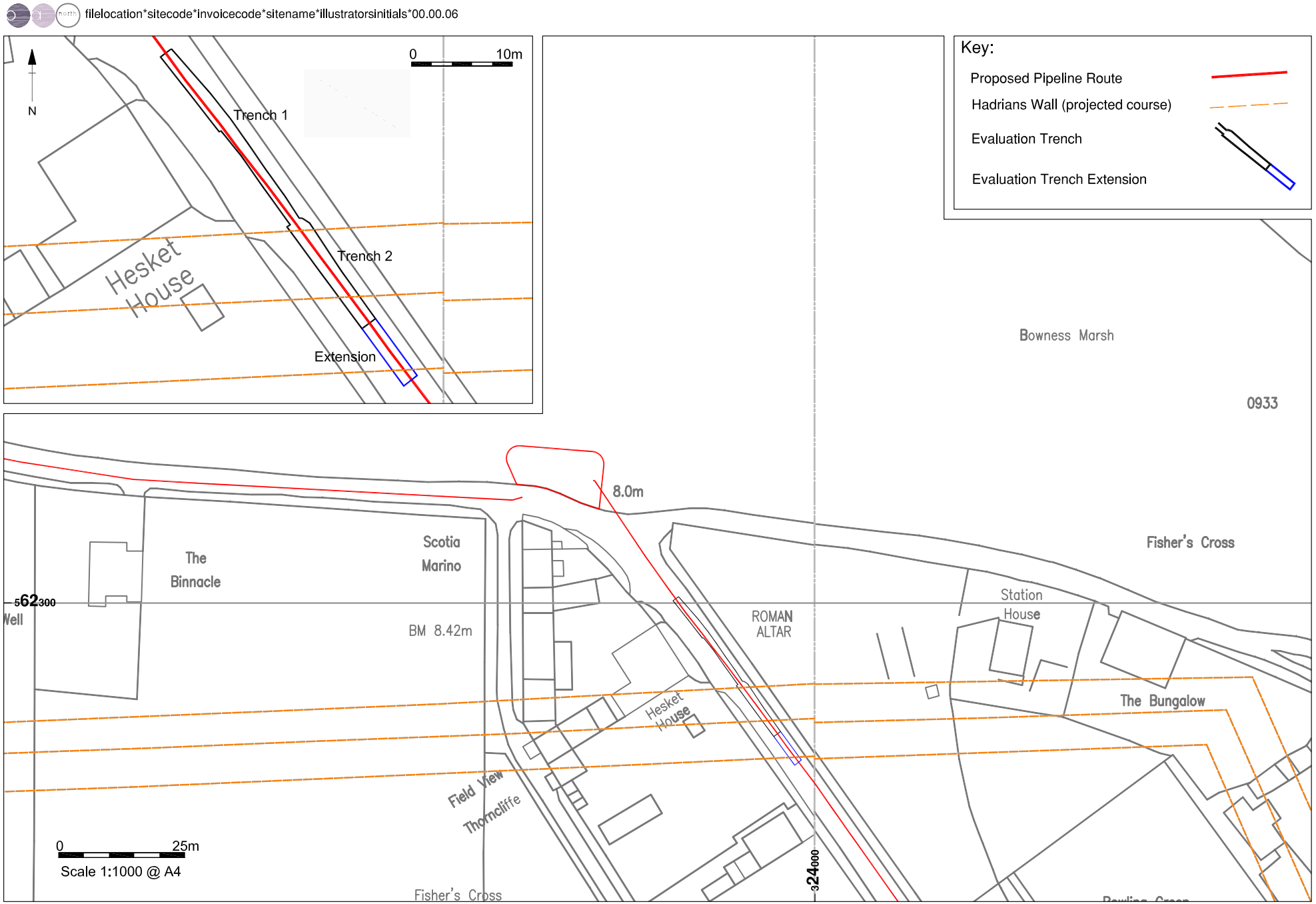


Figure 6: Site **D** trench location plan

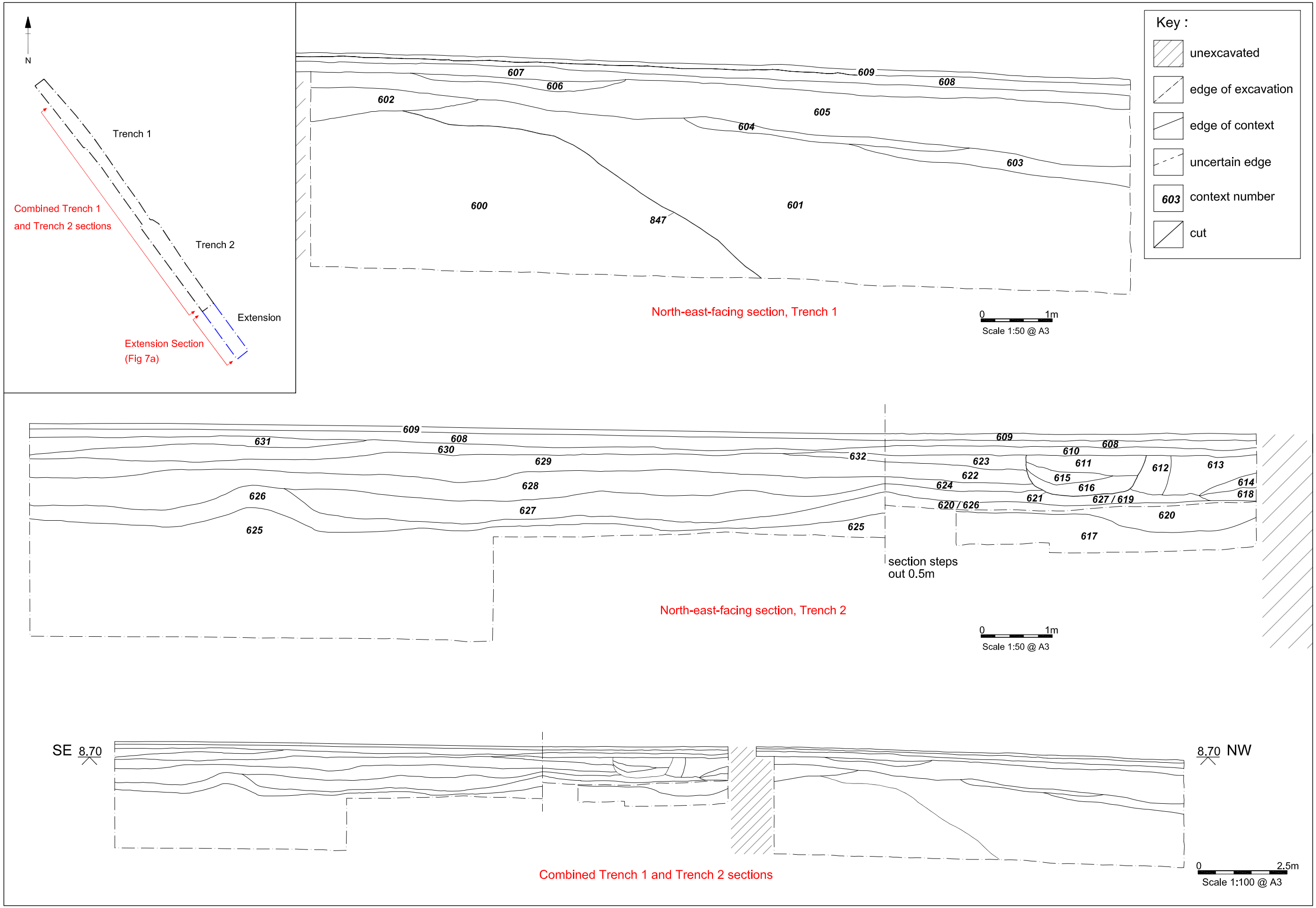


Figure 7: North-east-facing sections through Trenches 1 and 2, Site **D**

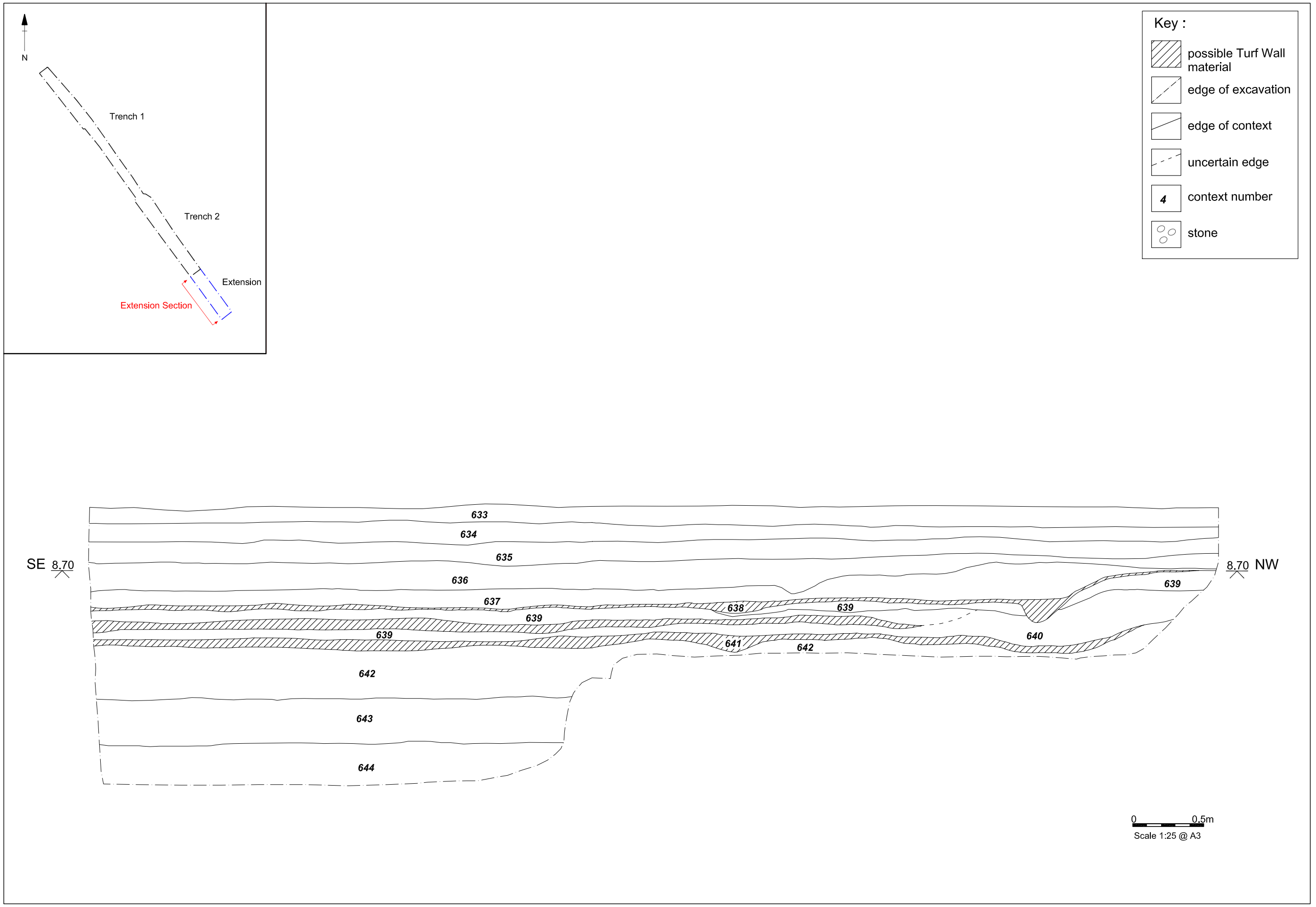


Figure 7a: North-east-facing section through the extension to Trench 2, Site **D**

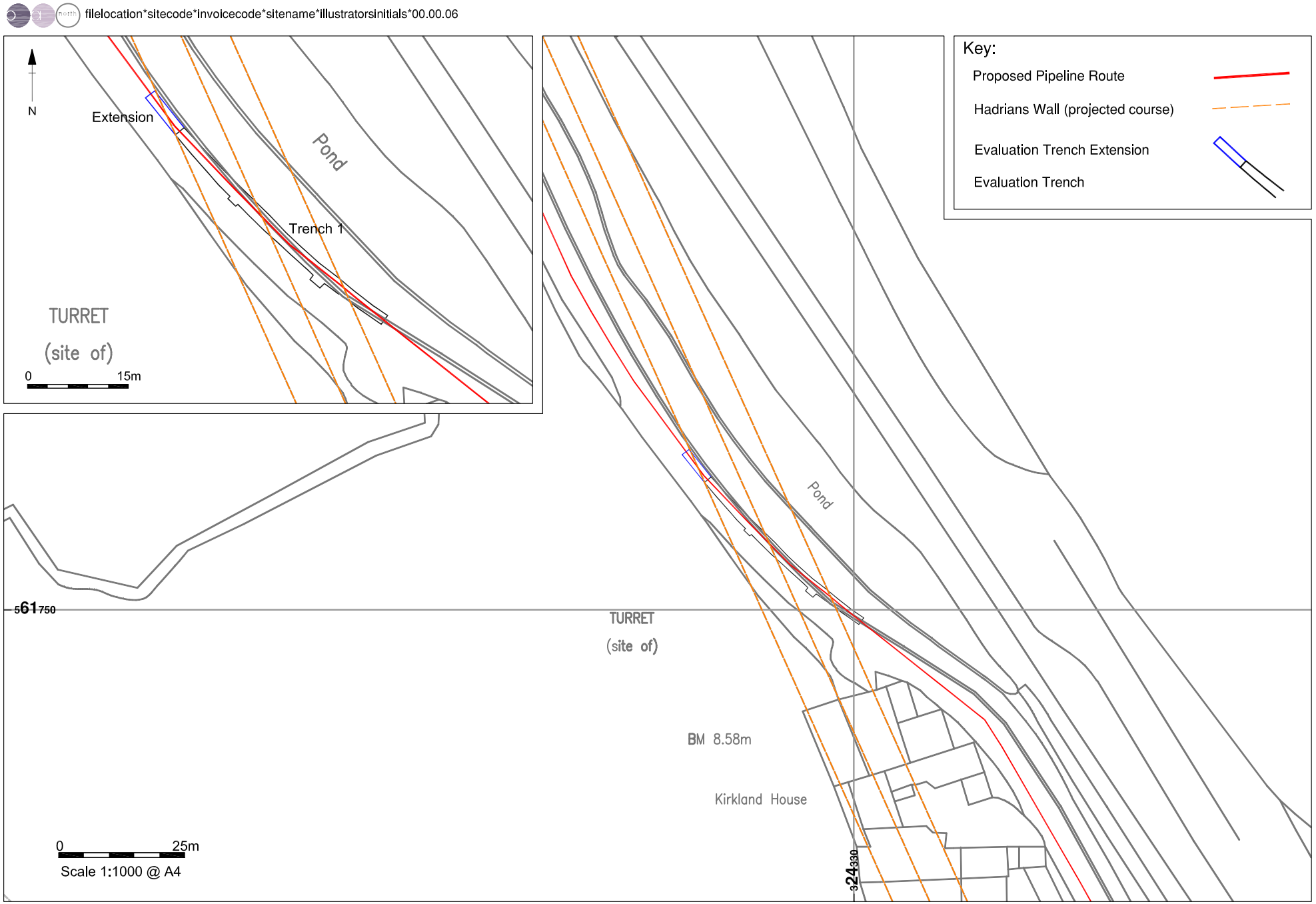


Figure 8: Site E trench location plan

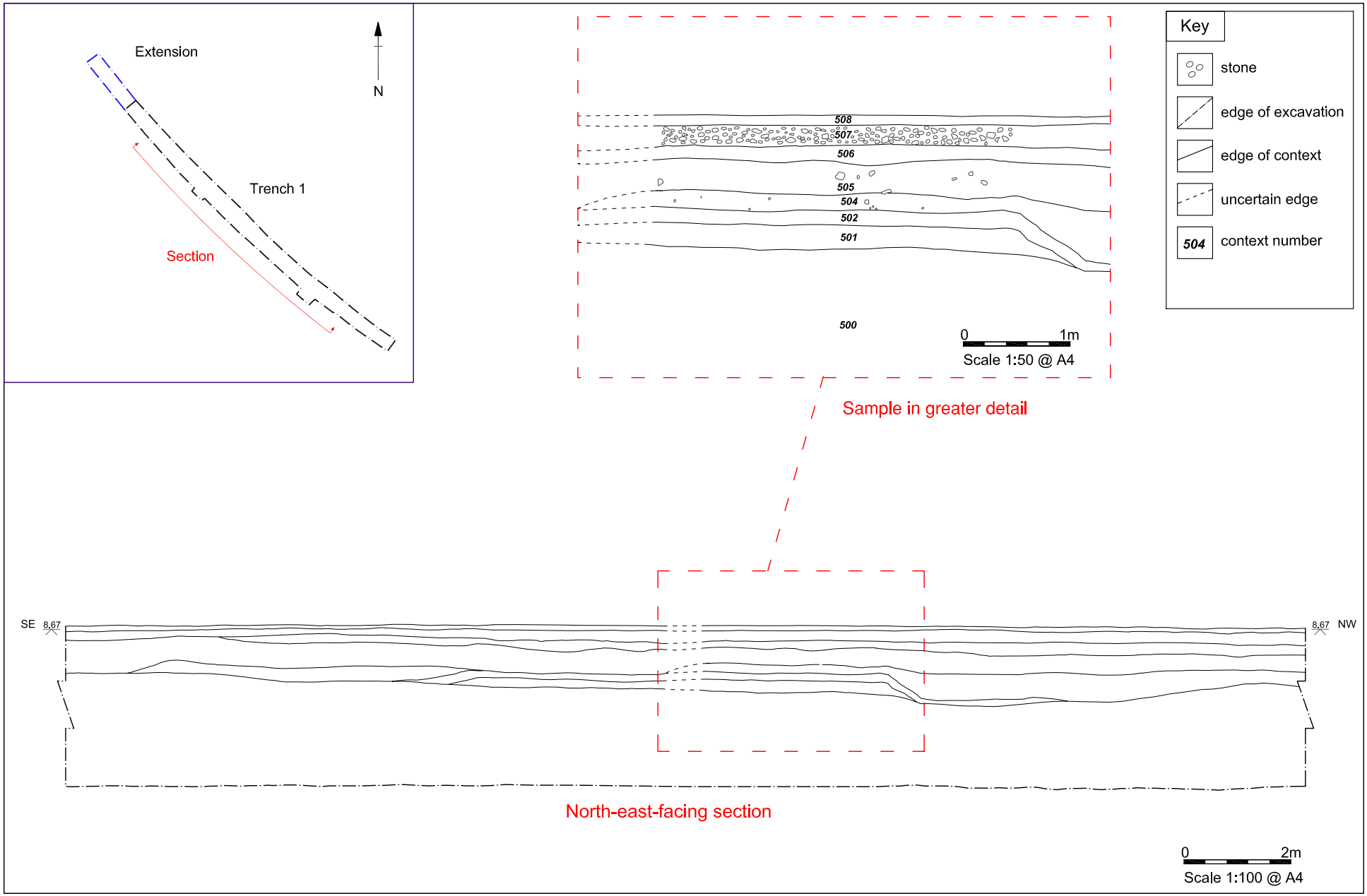


Figure 9: North-east-facing section through Trench 1, Site **E**

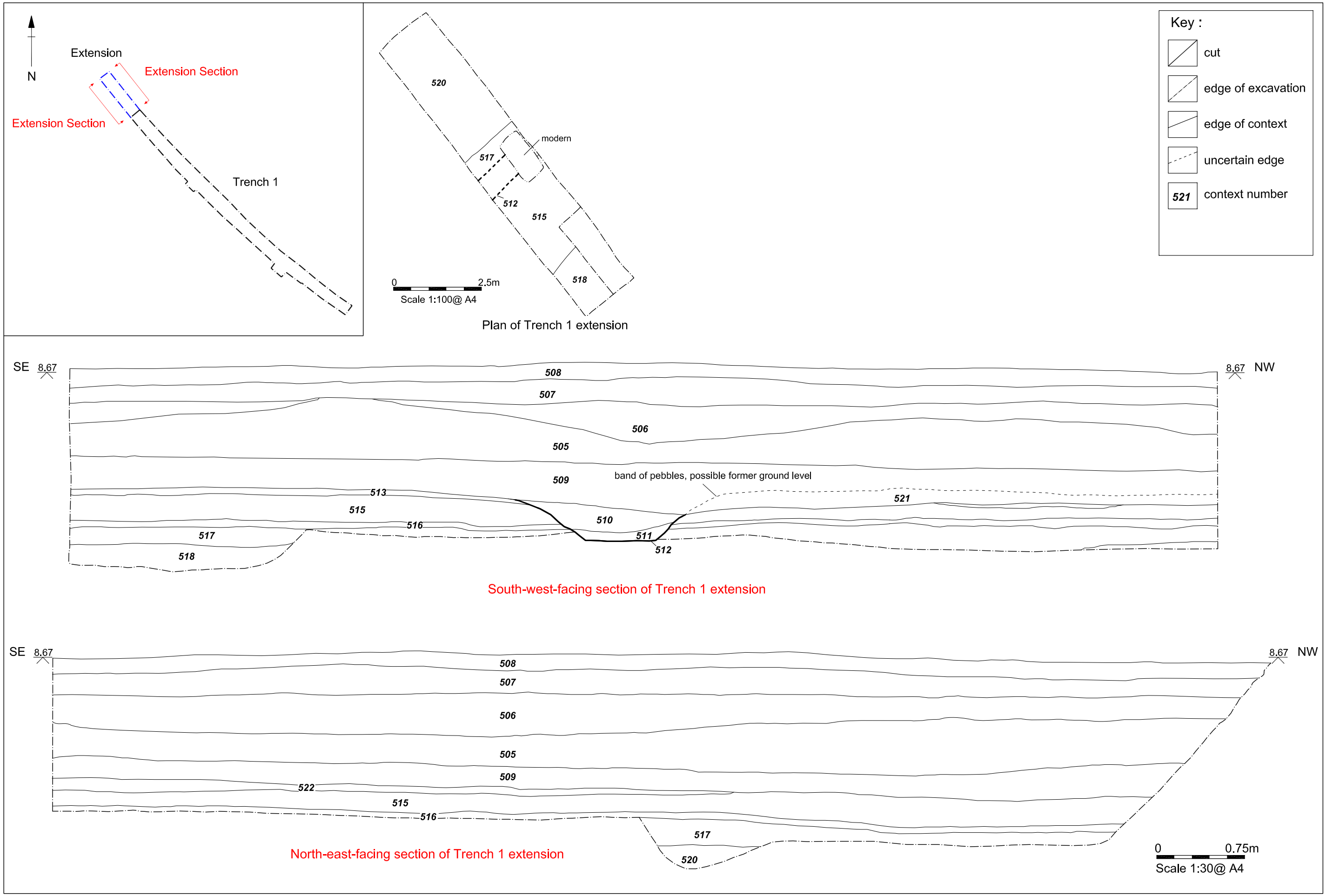


Figure 9a: Plan and sections of the extension to Trench 1, Site **E**

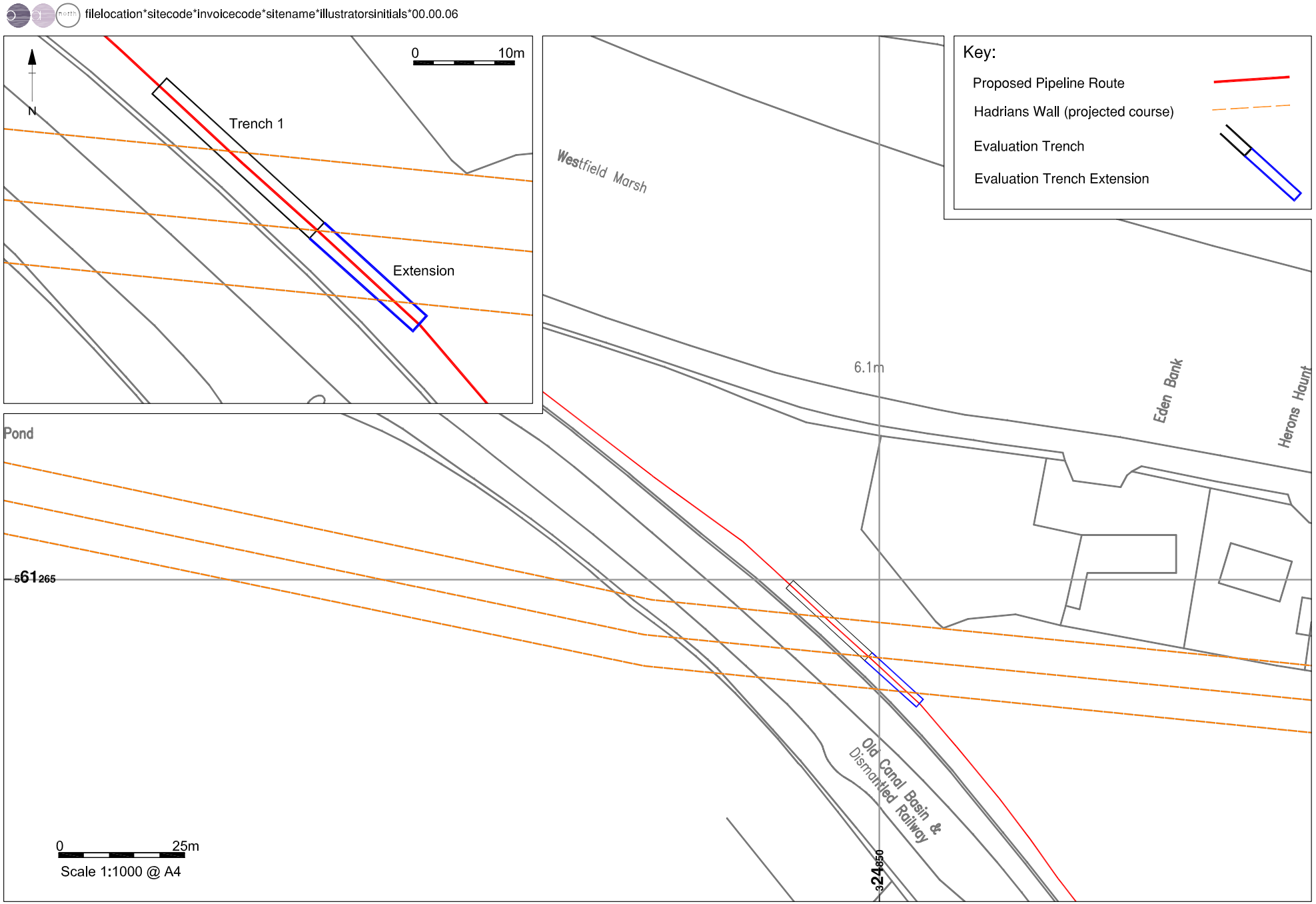


Figure 10: Site **G** trench location plan

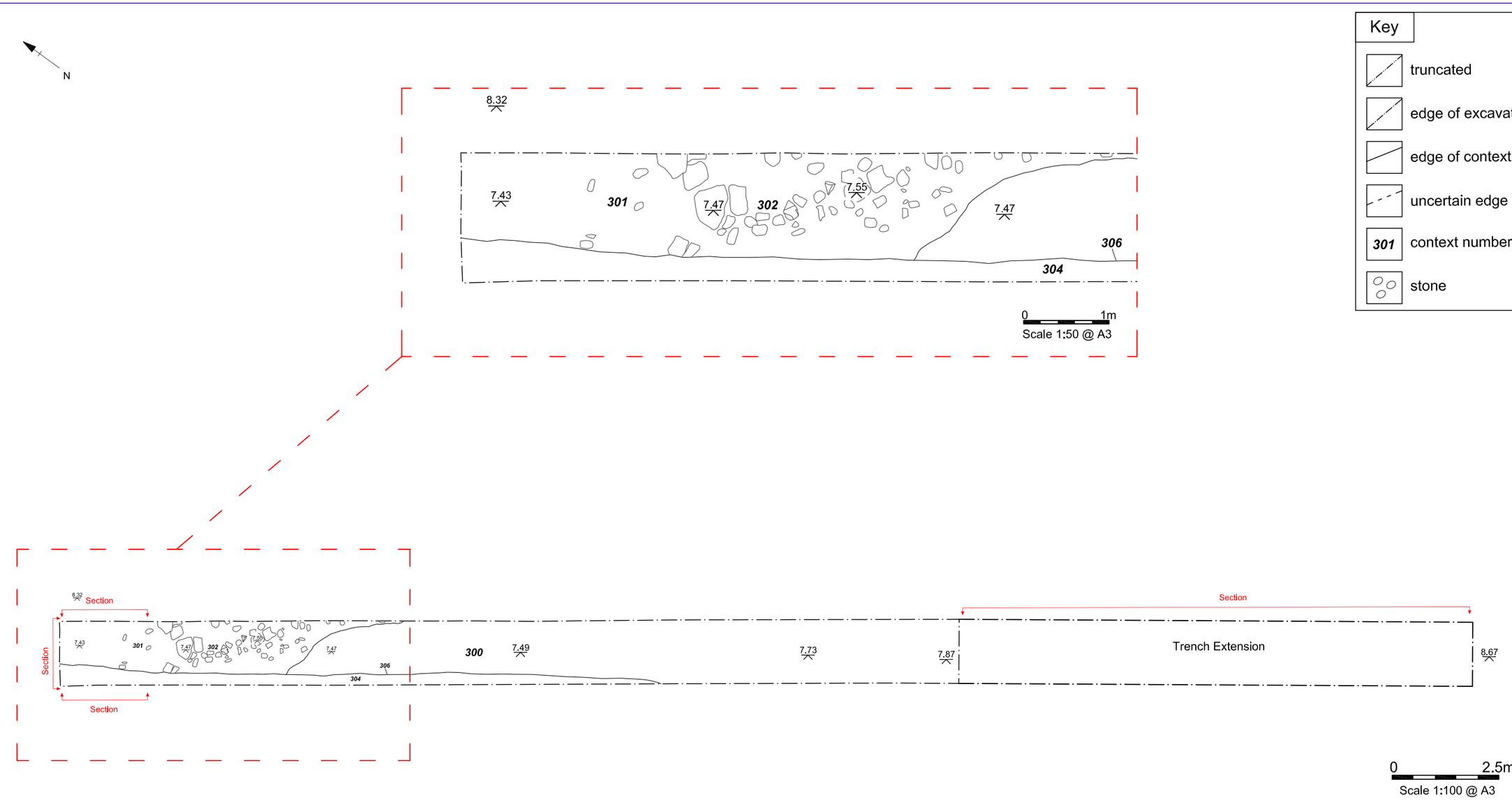
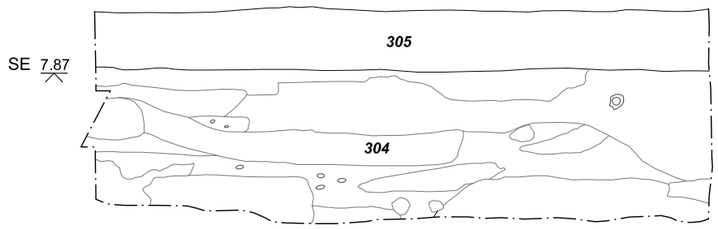
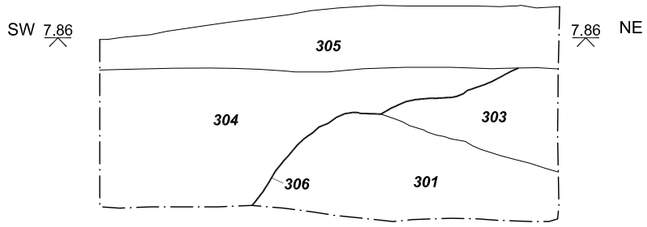


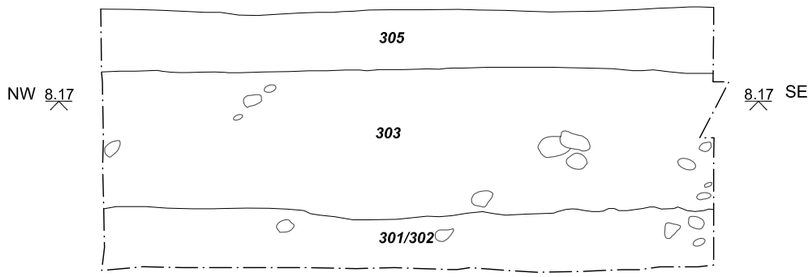
Figure 11: Plan of Trench 1, Site **G**



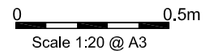
Partial north-east-facing section of Trench 1 (see Fig 11)

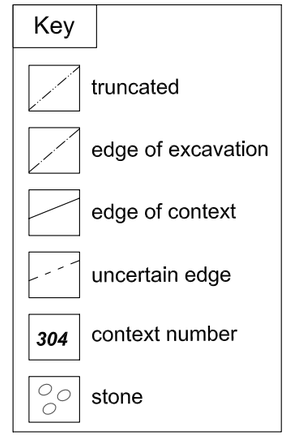


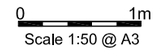
South-east-facing section of Trench 1 (see Fig 11)

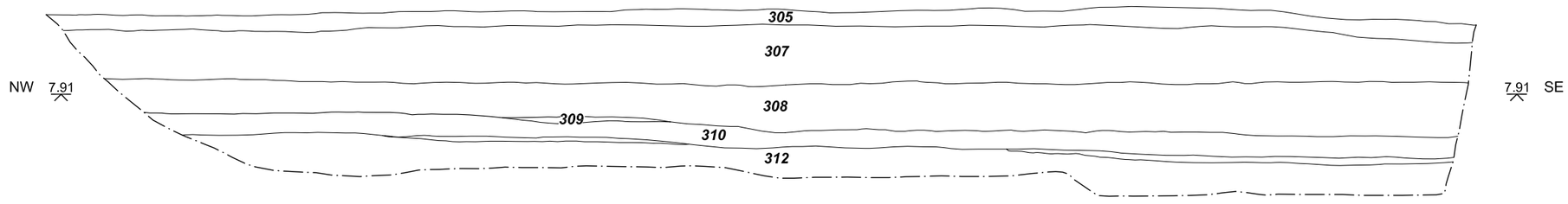


Partial south-west-facing section of Trench 1 (see Fig 11)









South-west-facing section of Trench 1 extension (see fig 11)

Figure 12: Sections through Trench 1, and the extension, Site **G**

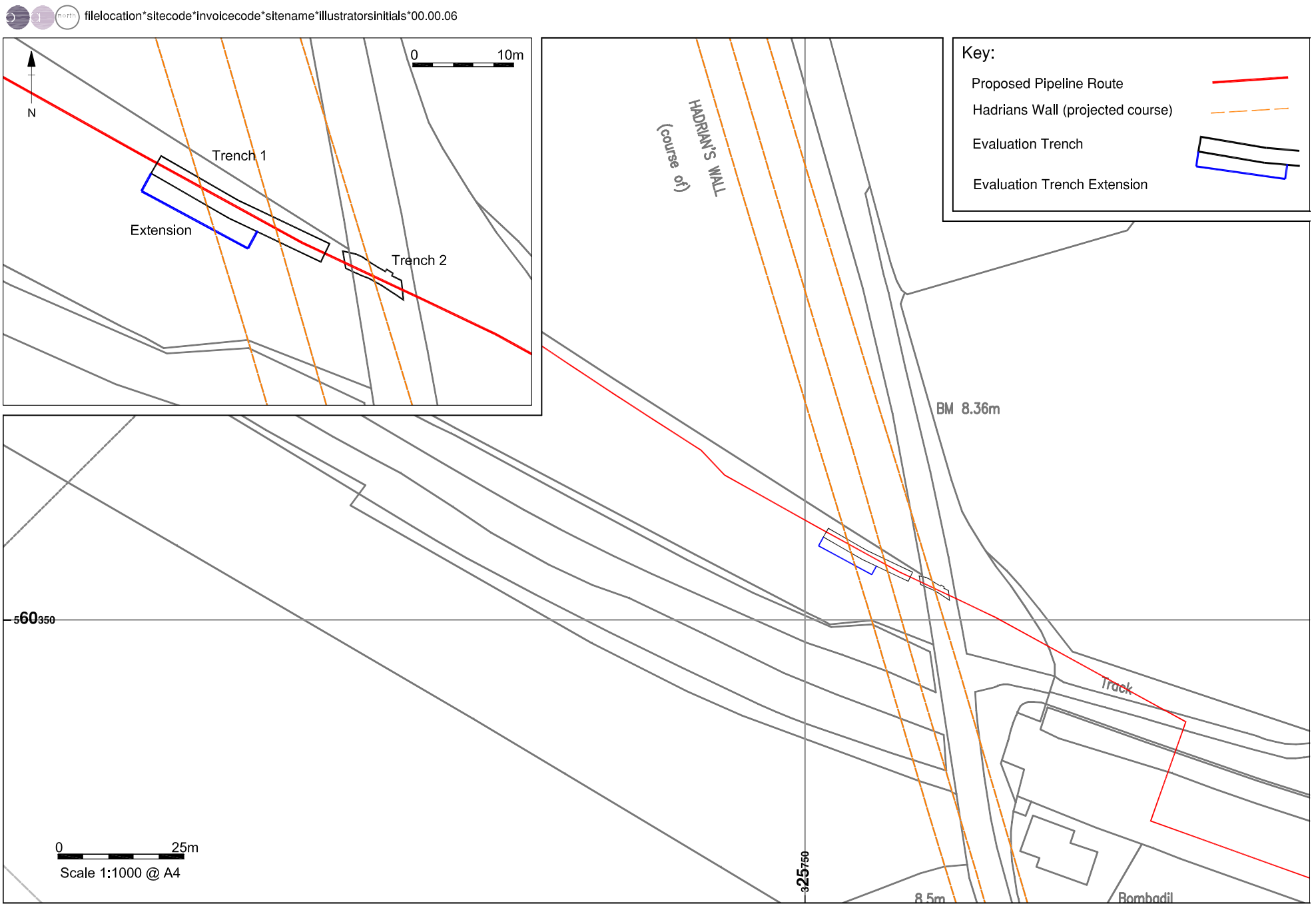


Figure 13: Site I trench location plan

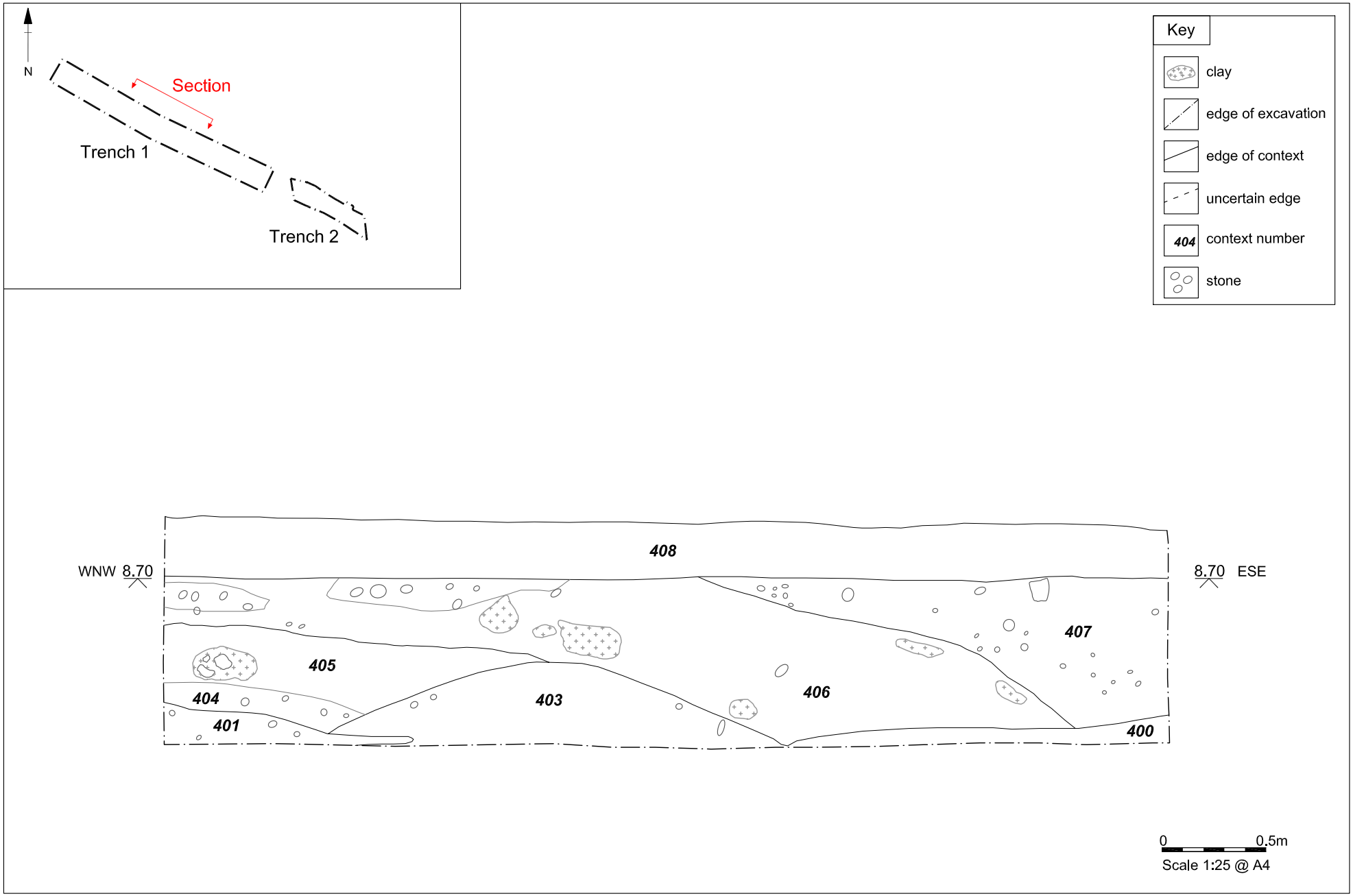


Figure 14: South-west-facing section through Trench 1, Site I

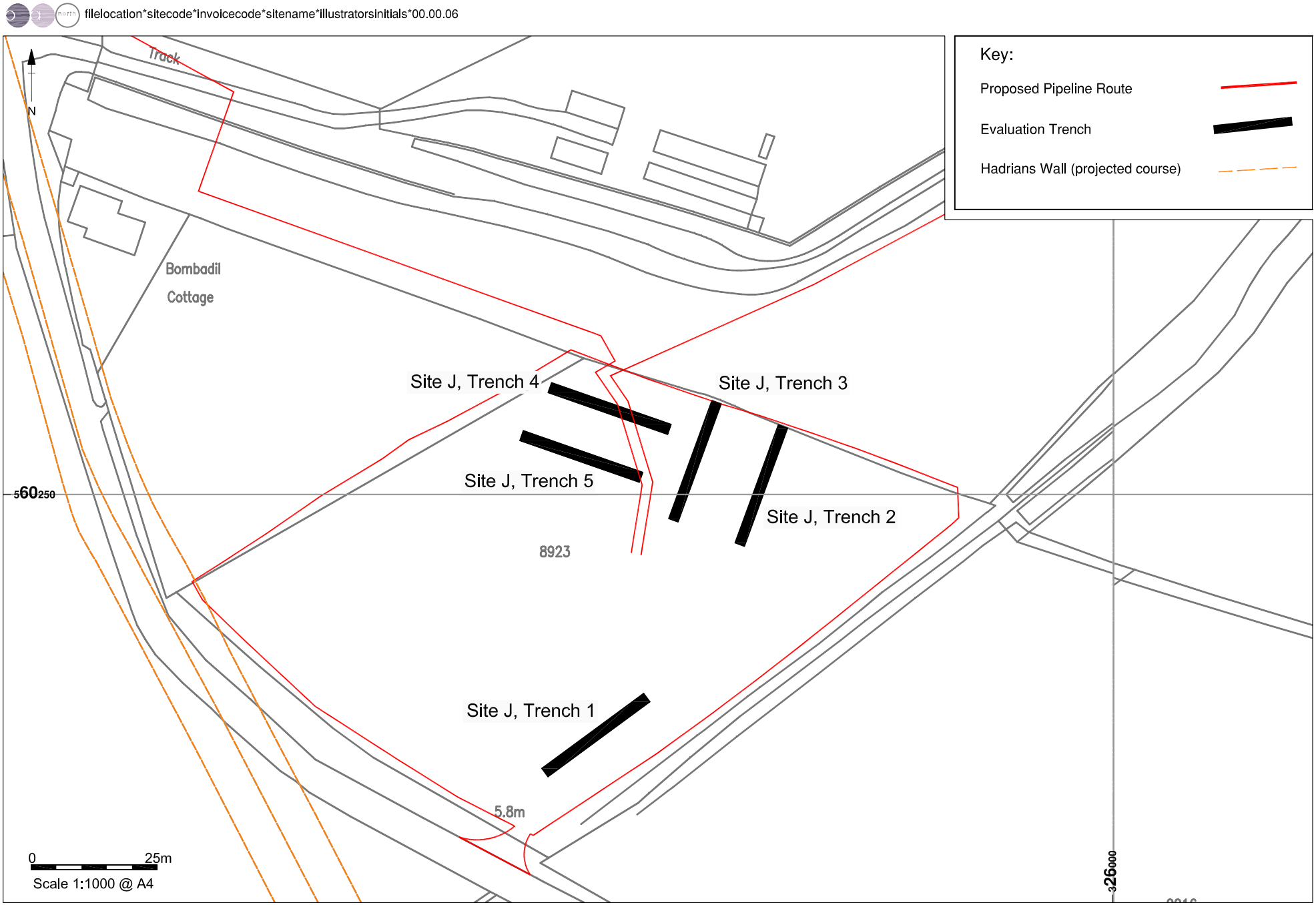


Figure 15: Site **J** trench location plan

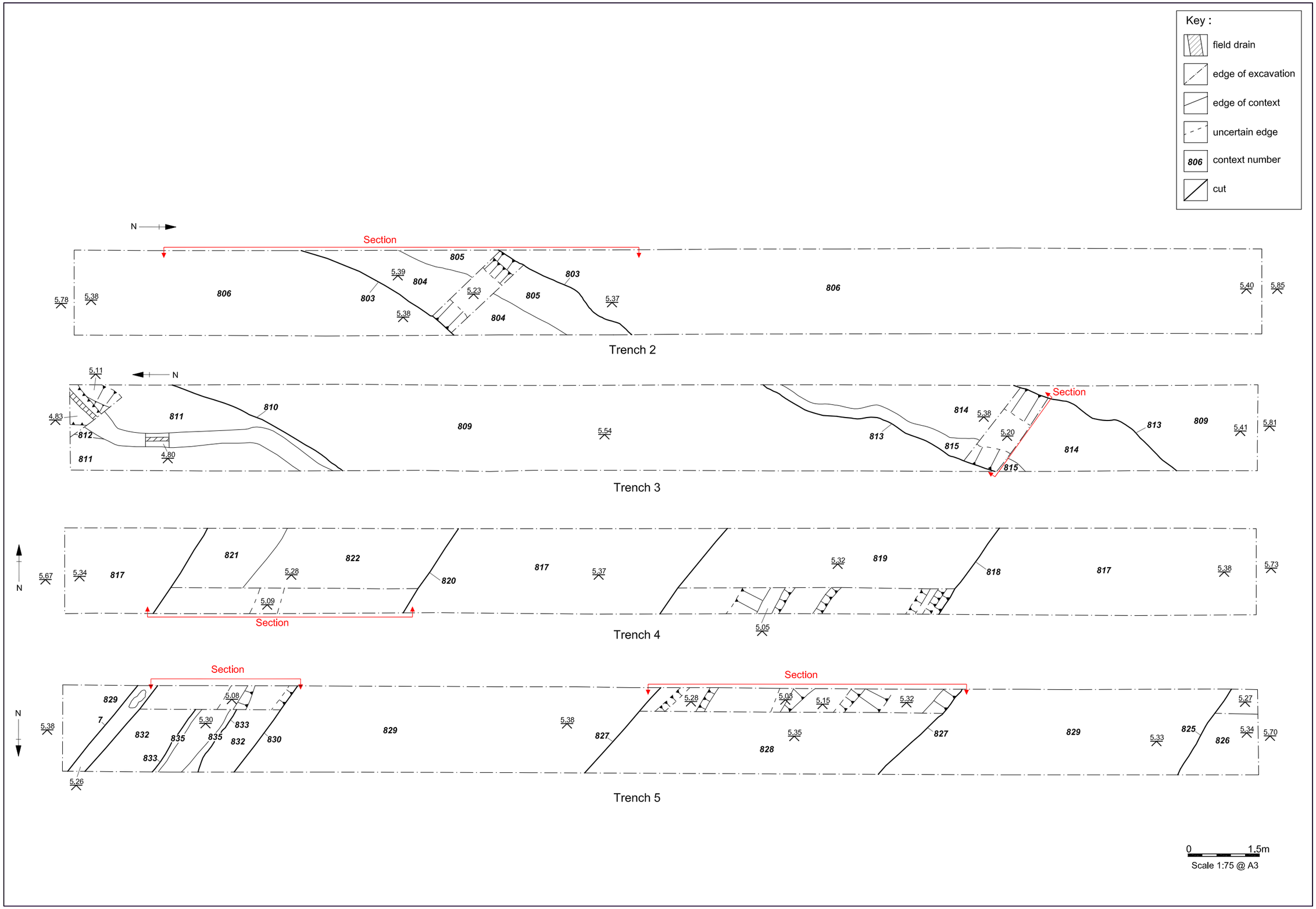
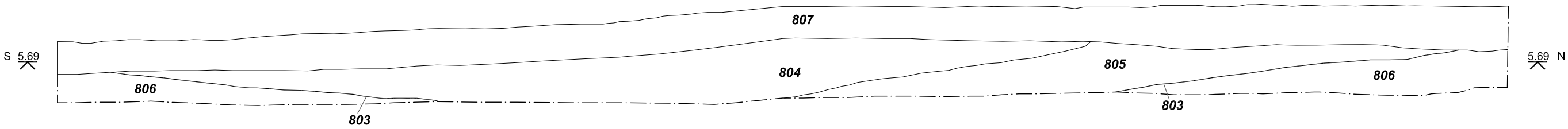
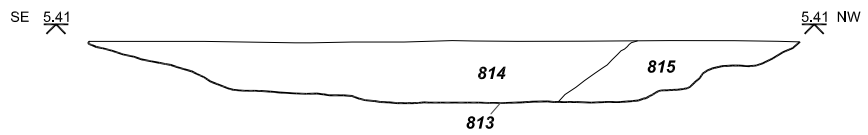


Figure 16: Plans of Trenches 2-5, Site **J**



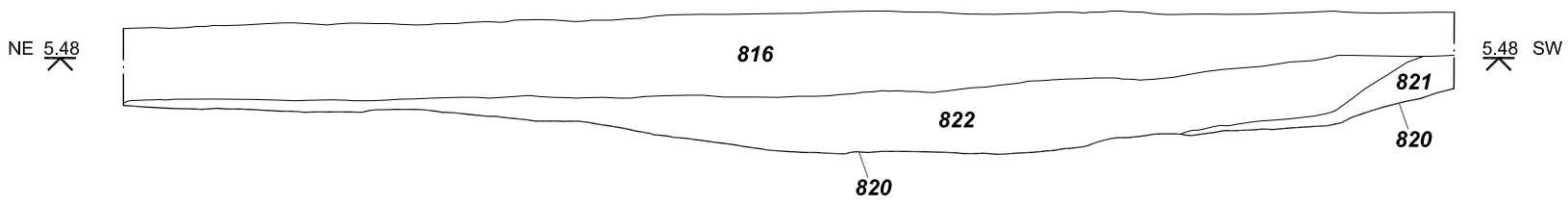
East-facing section, Trench 2 (see Fig 16)

0 0.75m
Scale 1:30@ A3



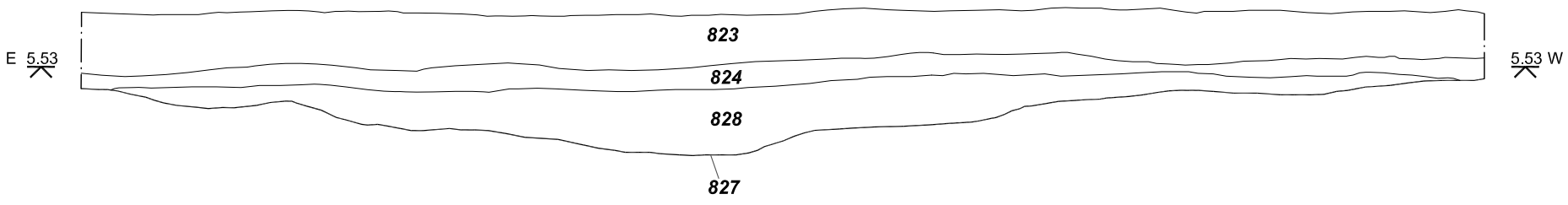
North-east-facing section, Trench 3 (see Fig 16)

0 0.5m
Scale 1:20@ A3



North-facing section, Trench 4 (see Fig 16)

0 0.75m
Scale 1:30@ A3



North-facing section, Trench 5 (see Fig 16)

0 0.75m
Scale 1:30@ A3

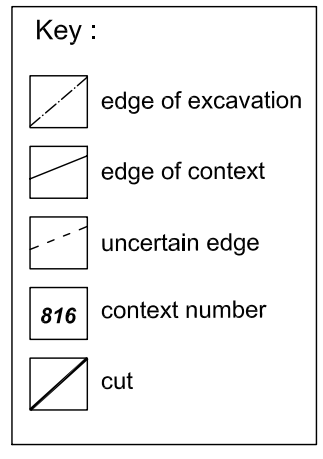


Figure 17: Sections through Trenches 2-5, Site **J**

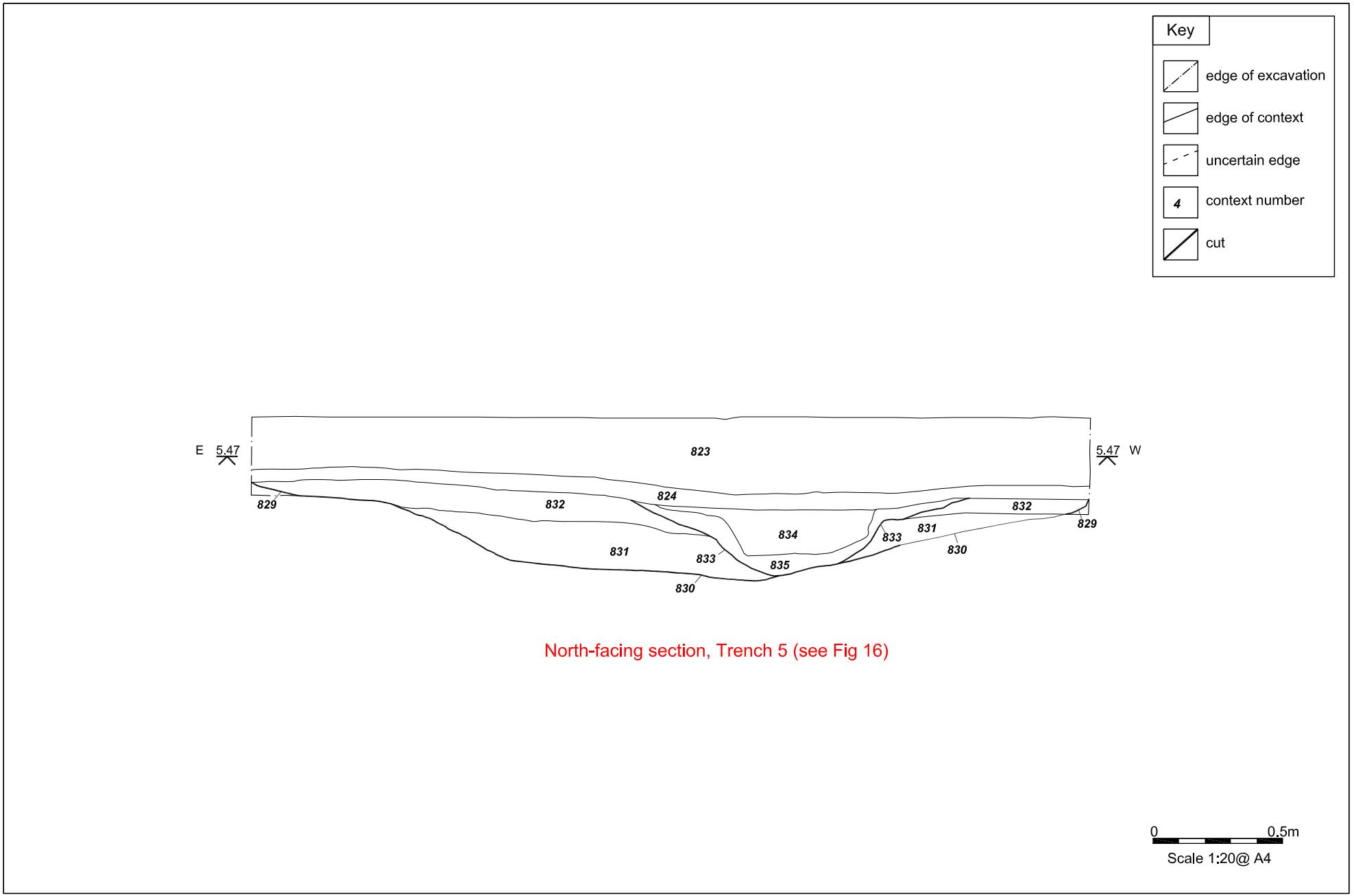


Figure 18: North-facing section through Trench 5, Site **J**

Plate 1: Site A, Trench 1, showing stone layer ***712*** and service trenches ***708*** and ***710***

Plate 2: Site A, Trench 1, showing spread ***712*** and wall ***713***

Plate 3: Site A, Trench 1, eastern elevation of wall ***713***,

Plate 4: Site A, Trench 1, construction cut ***719*** for wall ***713***, looking west

Plate 5: South-facing section of Site A, Trench 2 (west)

Plate 6: Cobbled surface ***724***, looking west

Plate 7: South-facing section of Site A, Trench 2 (east), showing remains of stone-lined culvert ***738/739***

Plate 8: Intact section of culvert ***738/739***, adjacent to Site A, looking north-east

Plate 9: North-east-facing section of Site D, Trench 1, north-western end

Plate 10: North-east-facing section of Site D, Trench 2, showing sondage through compacted layer ***620/626***

Plate 11: North-east-facing section of Site D, Trench 2, showing Ditch ***621***, and compacted layer ***620***/***626***

Plate 12: North-east-facing section within trench extension, Site D, showing possible spread material derived from the Turf Wall

Plate 13: North-east-facing section of Site E, Trench 1, northern end

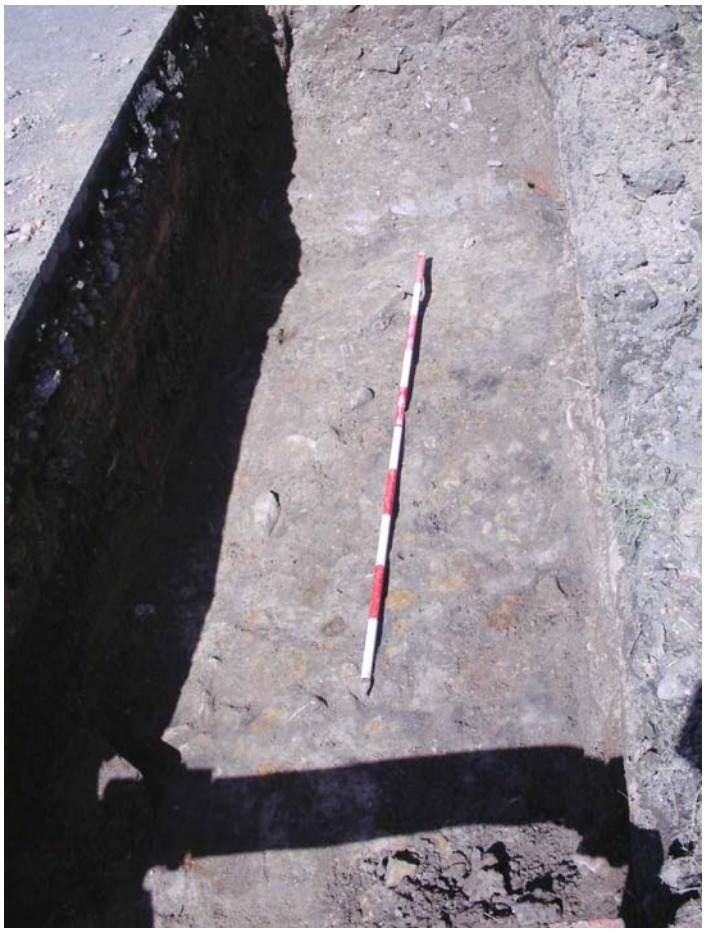


Plate 14: Site E, Trench 1, showing crushed sandstone layer ***501***, looking north-west

Plate 15: North-east-facing section within the trench extension at Site E, showing ditch ***512***

Plate 16: Site G, Trench 1 showing stone feature ***302***

Plate 17: North-east-facing section of Site G, Trench 1, showing fill ***304*** of feature ***306***

Plate 18: South-east-facing section of Site G, trench extension , showing possible water-lain deposits sealed by layer ***308***

Plate 19: South-west-facing section of Site I, Trench 1 showing embankment make-up layers ***401-407***

Plate 20: North-east-facing section of Site I, Trench 2

Plate 21: North-east-facing section within trench extension (Site I), showing possible road deposits ***413***, ***414*** and ***415*** beneath later levels ***411*** and ***412***

Plate 22: Trench 1, Site J, looking north-east

Plate 23: Trench 2, Site J, north-east-facing section of ditch ***803***

Plate 24: Trench 3, Site J, north-east-facing section of Gully ***810***, truncated by a land drain

Plate 25: Trench 3, Site J, north-east-facing section of Gully ***813***

Plate 26: Trench 4, Site J, showing gullies ***818*** (furthest away) and ***820*** (nearest), looking east

Plate 27: Trench 5, Site J, showing gullies ***825*** and ***827***, looking east

Plate 28: Trench 5, Site J, north-facing section of gully ***830*** and ditch ***833***

APPENDIX 1: PROJECT BRIEF

Proposed Works for Water Treatment: Solway Estuary
Bowness on Solway and Glasson
Brief for Supplementary Archaeological Evaluation Archaeological Evaluation

Background

United Utilities have made an application for planning permission for a variety of works between Bowness on Solway and Drumburgh, to provide water treatment for a number of settlements adjacent to the Solway Firth. The archaeological issues associated with the scheme have been the subject of extensive discussions between United Utilities, the County Archaeologist and English Heritage, which has meant that most such issues have either been resolved or clear processes to try to resolve them have been identified. However, in two areas, the proposed works will involve ground disturbance on archaeologically sensitive sites, which had not previously been identified as forming part of the scheme. The first of these areas lies across the line of Hadrian's Wall within the village of Bowness on Solway, while the second lies a short distance to the north of the line of the Wall close to the village of Glasson.

Given the archaeological sensitivity of these sites and the national importance of the remains of Hadrian's Wall, it is necessary to check to see whether the proposed works can be accommodated without unacceptable disturbance of archaeological remains. As such, an archaeological evaluation is necessary in order to inform United Utilities application for planning permission.

Reason for Evaluation

The proposed works take place in two areas:

- The village of Bowness on Solway, on a site that crosses the line of Hadrian's Wall. Because of this location there is a clear potential on this site for the proposed works to impact on archaeological remains of national importance

- An area to the south-east of the village of Glasson. This site is located a short distance to the north of Hadrian's Wall, and as the site of a proposed water treatment works will involve very considerable ground disturbance. The proximity of the Wall and potential for previously unrecorded archaeological remains in this area mean that this site has a potential for the disturbance of archaeological remains

Guidance on archaeology and planning is clear that archaeology of national importance, such as the remains of Hadrian's Wall, should be preserved in-situ, and not disturbed by development. Equally, where sites (like the one at Glasson) have a strong archaeological potential, there can be a need to clarify this potential in advance of any determination of a planning application.

It is therefore necessary to ascertain what archaeological remains, if any are likely to be impacted on by the proposed cables in advance of the County Archaeologist and English Heritage being able to advise the LPA as to whether planning permission should be granted.

United Utilities have therefore agreed to undertake this evaluation in order to inform the decision on their planning application. In neither area will the works involve a scheduled ancient monument

Evaluation Requirements

To provide information about the extent, depth, and nature of the archaeological deposits present within the development, it is suggested that the following evaluation work takes place:

- At Bowness, a single evaluation trench should be excavated in the position indicated on the attached plan

It is suggested that four trenches be excavated; three to evaluate the archaeology across the minor road, and three for that along the road. Trench

1 should measure 1m by 6.5m. Trenches 2, 3 and 4 should measure 1m square. The archaeologist must avoid over-excavation of any archaeological deposits, and should leave all nationally important remains in-situ, including intact remains of Hadrian's Wall. Excavation should continue only down to the level of the proposed cable (archaeologist must confirm this with the commissioning agent), except where nationally important archaeology has been encountered.

All trenches will take place within roads that are in daily use, and arrangements for this crossing must be confirmed with the commissioning agent prior to works commencing.

Archaeological contractors are invited to submit specifications for the evaluation in accordance with the above requirements. They should allow for the undertaking of the fieldwork, for liaison as necessary with English Heritage and for the completion of a report on the work suitable for submission to English Heritage, and the County and National Park SMR's, to allow advice on the scheduled monument consent application to be given to the DCMS. The specification of the commissioned archaeologist must be approved in writing by English Heritage before the works commence.

In the event of any queries about this brief, please contact Mike Collins, Hadrian's Wall Archaeologist, English Heritage, Bessie Surtees House 41-44 Sandhill, Newcastle upon Tyne, NE1 3JF; tel: 0191 2691212, email: mike.collins@english-heritage.org.uk

APPENDIX 2: PROJECT DESIGN

Oxford
Archaeology
North

Revised January 2005

SOLWAY COAST WASTEWATER TREATMENT IMPROVEMENTS (Hadrian's Wall Crossings 1 to 4)

ARCHAEOLOGICAL EVALUATION
PROJECT DESIGN

Proposals
The following project design is offered in response to a request by United Utilities for an archaeological evaluation, topographic survey and watching brief in advance of wastewater treatment improvements from Bowness-on-Solway to Drumburg, Cumbria.

1. INTRODUCTION

1.1 United Utilities (hereafter the client) are proposing improvements to wastewater treatment along the Solway Coast from Bowness-on-Solway to Drumburgh, Cumbria. The route runs through an area of high archaeological potential and affects a number of known sites including the Hadrian's Wall World Heritage Site (HWWHS). Following discussions between the client, the Cumbria County Archaeology Service (CCAS) and the Hadrian's Wall Archaeologist, it was proposed that the development area be subjected to a desk-based assessment as a first stage of archaeological investigations. This and the subsequent walkover survey were undertaken in April 2004. Following the completion of the first phase, discussions were held with both CCAS and English Heritage, when it decided that a further programme of archaeological work would be necessary. This document details the second phase of archaeological work four proposed crossings of Hadrian's Wall.

1.2 The route of the proposed improvement runs in close proximity to the line of Hadrian's Wall, and crosses it in several locations. It also passes to the north of Knockcross Roman Camp. Other sites of significance are the dis-used railway, the route of the Carlisle canal and the potential for locating Peter Spencers experimental Alum works near Drumburgh.

1.3 OA North has considerable experience of the assessment, evaluation and excavation of sites of all periods, having undertaken a great number of small and large-scale projects during the past 20 years. Watching briefs, evaluations and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.

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

2 OBJECTIVES

2.1 The following programme has been designed to provide an accurate archaeological assessment of the designated area within its broader context. The required stages to achieve these ends are as follows:

2.2 ***Evaluation:*** to implement a programme of trial trenching examining the points at which the pipeline will cross Hadrian's Wall.

2.3 ***Report and Archive:*** an interim report may be issued should there be any further mitigation work necessary. The final report will be produced for the client within eight weeks of completion. A site archive will be produced to English Heritage guidelines (MAP 2) and in accordance with the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990).

3 METHOD STATEMENT

3.1 EVALUATION

3.1.1 The programme of evaluation will require trial trenching to establish the presence or absence of any previously unsuspected archaeological deposits and, if established, will then test their date, nature, depth and quality of preservation. In this way, it will adequately sample the threatened available area.

3.1.2 The evaluation is required to investigate the following sites:

Hadrian's Wall crossings

Crossing 1 - Fishers Cross, Port Carlisle (highway);

Crossing 2 - Kirkland House -turret 78a (highway);

Crossing 3 - Westfield Marsh;

Crossing 4 - East of Glasson Farm (highway).

3.1.3 The trial trenching is required to investigate no less than 5% of the area of the pumping stations/wastewater and OA North sites. For the Hadrian's Wall crossings the area to be evaluated is to be no less than the length/width of Wall to be disturbed. The following table presents an indication of the dimensions of the trial trenches within each site.

Site	Total trial trench dimensions	No. of days on site
Crossing 1 - Fishers Cross (highway)	17m x 1m within verge	2
Crossing 2 - Kirkland House -turret 78a (highway)	57m x 1m along highway	3
Crossing 3- Westfield Marsh	21m x 2m within field	2
Crossing 4 - East of Glasson Farm (highway)	15m x 2m within field, 7m x 1m across highway	3

Table 1: Dimensions of trenches including an indication of days required in the field

3.1.4 ***Highway Sites:*** the evaluations across and along the public highway (Fishers Cross, Kirkland House and Glasson Farm - *Sections 3.1.5 to 3.1.7* below) will be undertaken at a time when the construction contractor is present on site. The construction contractor will be responsible for removal and reinstatement of the

various sections of road surface. The contractor will also be responsible for all traffic control and health and safety. An archaeologist will be present at all times during the opening up of the trenches, and following removal of the road surface will proceed to treat the trench as an evaluation. The contractor will be asked to make his mechanical excavator available to the archaeologist at the expense of the client.

3.1.5 *Crossing 1- **Fishers Cross***: the investigation of this crossing will take place within the verge to the north of the road. The trench, to be opened by machine as below (*Section 3.1.8*) will run along the verge of the highway for the width of Hadrian's Wall (approximately 17m). The width of the trench will be based on the area required for the installation of new services, which is approximately 800mm out from the edge of the existing services.

3.1.6 *Crossing 2 - **Kirkland House - turret 78a***: this evaluation will run for approximately 57m along the public highway, necessitating the closure of the highway (MWH comment).

3.1.7 *Crossing 4 - **East of Glasson Farm***: the evaluation of this highway crossing will take place in two halves in order to allow vehicular access along the highway. Both sections will measure approximately 3.5 m x 1m.

3.1.8 ***Evaluation Methodology:*** the evaluation for the off-road trenches (Crossing 3 and 4) will be manual. The topsoil for the highway and roadside verge trenches (Crossings 1, 2 and 4) will be removed by machine (fitted with a toothless ditching bucket) under archaeological supervision to the surface of the first significant archaeological deposit. This deposit will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and inspected for archaeological features. All features of archaeological interest must be investigated and recorded unless otherwise agreed by the County Archaeology Service. The trenches will not be excavated deeper than 1.20m to accommodate health and safety constraints; any requirements to excavate below this depth will involve recosting.

3.1.9 All trenches will be excavated in a stratigraphical manner, whether by machine or by hand. Any investigation of intact archaeological deposits will be exclusively manual. A minimum sample of 50% of archaeological features must be examined by excavation. Selected pits and postholes will normally only be half-sectioned, linear features will be subject to no less than a 25% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal. It is hoped that in terms of the vertical stratigraphy, maximum information retrieval will be achieved through the examination of sections of cut features. All excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features, which appear worthy of preservation *in situ*.

3.1.10 The evaluation trenches will be backfilled (with the exception of the highways crossings) No further reinstatement will take place. The Hadrian's Wall Archaeologist will be notified as to the presence of any significant archaeology on all sites with the exception of the OA North identified sites. No reinstatement will take place until this process has been completed and English Heritage consent obtained.

3.1.11 ***Environmental Sampling:*** environmental samples (bulk samples of 30 litres volume, to be sub-sampled at a later stage) will be collected from stratified undisturbed deposits and will particularly target negative features (gullies, pits and ditches). Subject to the results of the evaluation an assessment of any environmental samples will be undertaken by the in-house palaeoecological specialist, who will examine the potential for further analysis. The assessment would examine the potential for macrofossil, arthropod, palynological and general biological analysis. The costs for the palaeoecological assessment are included as a core part of this work, but will only be called into effect in agreement with the County Archaeologist, English Heritage, and the Client. However, as an integral part of the evaluation work, the decision of the County Archaeologist and English Heritage shall be considered to be binding

3.1.12 Samples will also be collected for technological, pedological and chronological analysis as appropriate. If necessary, access to conservation advice and facilities can be made available. OA North maintains close relationships with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs artefact and palaeozoological specialists with considerable expertise in the investigation, excavation and finds management of sites of all periods and types, who are readily available for consultation.

3.1.13 ***Recording:*** all information identified in the course of the site works will be recorded stratigraphically, with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.

3.1.14 Results of the field investigation will be recorded using a paper system, adapted from that used by Centre for Archaeology of English Heritage. The archive will include both a photographic record and accurate large-scale plans and sections at an appropriate scale (1:50, 1:20, and 1:10). Levels will be tied into the Ordnance Datum. All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration.

3.1.15 ***Treatment of finds:*** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.1.16 ***Treasure:*** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.1.17 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.

3.1.18 ***Contingency plan:*** in the event of significant archaeological features being encountered during the evaluations, discussions will take place with the Archaeological Officer/English Heritage, as to the extent of further works to be carried out, and in agreement with the Client. All further works would be subject

to a variation to this project design. In addition, a contingency costing may also be employed for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This has been included in the costing and would be in agreement with the client.

3.1.19 ***Human Remains****:* any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. English Heritage and the local Coroner will be informed immediately. If removal is essential the exhumation of any funerary remains will require the provision of a Home Office license, under section 25 of the Burial Act of 1857. An application will be made by OA North for the study area on discovery of any such remains and the removal will be carried out with due care and sensitivity under the environmental health regulations, and if appropriate, in compliance with the 'Disused Burial Grounds (Amendment) Act, 1981.

3.2 REPORT/ARCHIVE

3.2.1 ***Report:*** interim reports will be produced for the pumping station/wastewater treatment sites and the Hadrian's Wall crossings. These will be compiled immediately following the completion of the fieldwork and will be presented to the Hadrian's Wall Archaeologist.

3.2.2 ***Final report***: one bound and one unbound copy of a written synthetic report will be submitted to the client, and a further three copies will be submitted to the Cumbria SMR within eight weeks of completion of fieldwork. The Hadrian's Wall Archaeologist will also receive a copy of the report. The report will include a copy of this project design, and indications of any agreed departure from that design. It will present, summarise, and interpret the results of the programme detailed above and will include a full index of archaeological features identified in the course of the project, with an assessment of the overall stratigraphy, together with appropriate illustrations, including detailed plans and sections indicating the locations of archaeological features. Any finds recovered will be assessed with reference to other local material and any particular or unusual features of the assemblage will be highlighted and the potential of the site for palaeoenvironmental analysis will be considered. The report will also include a complete bibliography of sources from which data has been derived.

3.2.3 This report will identify areas of defined archaeology. An assessment and statement of the actual and potential archaeological significance of the identified archaeology within the broader context of regional and national archaeological priorities will be made. Illustrative material will include a location map, section drawings, and plans. This report will be in the same basic format as this project design; a digital copy of the report can be provided, if required.

3.2.4 Provision will be made for a summary report to be submitted to a suitable regional or national archaeological journal within one year of completion of fieldwork, if relevant results are obtained.

3.2.5 ***Confidentiality:*** *all* internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

3.2.6 ***Archive:*** *the* results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct. OA North conforms to best practice in the preparation of project archives for long-term storage. This archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the CSMR (the index to the archive and a copy of the report). OA North practice is to deposit the original record archive of projects (paper, magnetic and plastic media) with the appropriate County Record Office, and a full copy of the record archive (microform or microfiche) together with the material archive (artefacts, ecofacts, and samples) with an appropriate museum. Wherever possible, OA North recommends the deposition of such material in a local museum approved by the Museums and Galleries Commission, and would make appropriate arrangements with the designated museum at the outset of the project for the proper labelling, packaging, and accessioning of all material recovered.

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

4 PROJECT MONITORING

4.1 Monitoring of this project will be undertaken through the auspices of the CCAS Archaeologist and the Hadrian's Wall Archaeologist, both of whom will be informed of the start and end dates of the work.

5 WORK TIMETABLE

5.1 A breakdown by site is presented in Table 1.

5.2 The client report will be completed within twelve weeks following completion of the fieldwork.

6 STAFFING

6.1 The project will be under the direct management of **Alison Plummer BSc (Hons)** (OA North Senior Project Manager) to whom all correspondence should be addressed.

6.2 The evaluations will be directed by an OA North supervisor. All OA North's project officers and supervisors are experienced field archaeologists who regularly undertaken supervision of numerous small- and large-scale evaluation and excavation projects.

6.3 An archaeological assistant will assist the supervisor.

6.4 The processing and analysis of any palaeoenvironmental samples will be carried out under the auspices of **Elizabeth Huckerby BA, MSc** (OA North project officer), who has extensive experience of the palaeoecology of the North West, having been one of the principal palaeoenvironmentalists in the English Heritage-funded North West Wetlands Survey.

6.5 Assessment of any finds from the excavation will be undertaken by **Sean McPhillips BA**. Sean has worked as a finds supervisor for English Heritage and MOLAS on a number of occasions and has extensive knowledge concerning finds.

7 INSURANCE

7.1 OA North has a professional indemnity cover to a value of £2,000,000; proof of which can be supplied as required.

APPENDIX 3: CONTEXT LIST

Context Number	Trench	Description
300	Site G, Trench 1	Orange clay - natural
301	Site G, Trench 1	Mid-grey-brown silty-clay - layer
302	Site G, Trench 1	Linear sandstone spread. Foundation for stone phase of Hadrian's Wall?
303	Site G, Trench 1	Mid-brown clay (railway embankment). Same as ***307***
304	Site G, Trench 1	Mid-brown/grey silts with lenses of grey/white/orange sands and silty-clay. Fill of ***306***
305	Site G, Trench 1	Mid-grey-brown sandy-silt - topsoil
306	Site G, Trench 1	Possible cut for canal basin. Filled by ***304***
307	Site G, Trench extension	Grey-brown silty-clay (railway embankment). Same as ***303***
308	Site G, Trench extension	Reddish-brown silt - layer
309	Site G, Trench extension	Charcoal-rich clay - layer
310	Site G, Trench extension	Water-lain grey clay - layer
312	Site G, Trench extension	Pale yellow-grey clay - layer. Same as ***313***
313	Site G, Trench extension	Fine yellow-grey clay - layer. Same as ***312***
400	Site I, Trench 1	Mottled orange-grey sand - natural
401	Site I, Trench 1	Compact grey sandy-clay (railway embankment)
402	Site I, Trench 1	Mid-orange-grey sand (railway embankment)
403	Site I, Trench 1	Mid-grey-brown clay-sand (railway embankment)
404	Site I, Trench 1	Dark grey-brown clay-sand (railway embankment)
405	Site I, Trench 1	Light orange-brown sand (railway embankment)
406	Site I, Trench 1	Mixed orange-brown, brown and dark grey sand and silt, intermittent light grey clay patches (railway embankment)
407	Site I, Trench 1	Dark brown clay-sand (railway embankment)

408	Site I, Trench 1	Dark brown clay-sand - topsoil
411	Site I, Trench extension	Topsoil
412	Site I, Trench extension	Silty-clay - layer
413	Site I, Trench extension	Mottled brown-yellow silty-clay - layer
414	Site I, Trench extension	Mid-grey silty clay - layer
416	Site I, Trench extension	Mottled, possible gleying clay - natural
417	Site I, Trench extension	Mid brown silty-clay - layer
500	Site E	Orange sand - natural
501	Site E	Crushed sandstone with orange-grey sand. Foundation for stone phase of Hadrian's Wall?
502	Site E	Black clay - layer
503	Site E	Grey clay-sand - layer
504	Site E	Light grey clay-sand - layer
505	Site E	Mid-brown silty-sand - layer
506	Site E	Yellow-orange sand with occasional clay inclusions - bedding/levelling layer
507	Site E	Crushed stone - road make-up
508	Site E	Tarmac - road surface
600	Site D, Trench 1	Orange-brown clayey-sand - natural
601	Site D, Trench 1	Mid-orange brown sand. Fill of ***847***, possible ditch associated with the stone phase of Hadrian's Wall
602	Site D, Trench 1	Light orange sand - layer
603	Site D, Trench 1	Mid-brown-grey sand with 95% pea gravel - layer
604	Site D, Trench 1	Light grey sand with 30% pebbles - layer
605	Site D, Trench 1	Dark orange/grey-brown sand with 80% pebbles- layer
606	Site D, Trench 1	Grey sand - road make-up
607	Site D, Trench 1	Mid-orange sand with frequent 75% pebbles - road make-up

608	Site D, Trench 1	Crushed stone and bitumen - road make-up
609	Site D, Trench 1	Tarmac - road surface
610	Site D, Trench 1	Mid-light brown sand with 75% pebbles. Same as ***630***
611	Site D, Trench 1	Mid-brown silty-sand - fill of ***621***
612	Site D, Trench 1	Grey-black clay - layer
613	Site D, Trench 1	Light yellow-brown sand - layer
614	Site D, Trench 1	Grey-black silty-sand - layer
615	Site D, Trench 1	Grey-black silty-sand with 75% pea gravel - fill of ***621***
616	Site D, Trench 1	Light grey sand - fill of ***621***
617	Site D, Trench 1	Reddish-brown sand with 15% pebbles - natural
618	Site D, Trench 1	Light brown-yellow silty-sand - layer
619	Site D, Trench 1	Light orange-red sand - layer. Same as ***627***
620	Site D, Trench 1	Reddish-orange sand with 95% sandstone. Foundation for stone phase of Hadrian's Wall?
621	Site D, Trench 1	Cut of possible ditch. Filled by ***611***, ***615*** and ***616***
622	Site D, Trench 1	Grey-black clay - layer. Same as ***629***
623	Site D, Trench 1	Mid-brown silty-sand - layer. Same as ***632***
624	Site D, Trench 1	Brown-yellow sand - layer. Same as ***628***
625	Site D, Trench 2	Reddish-brown sand and stone - natural. Same as ***617***
626	Site D, Trench 2	Compacted reddish-orange sand with frequent sub-rounded stones - layer
627	Site D, Trench 2	Mid-light orange-brown sand - layer. Same as ***619***
628	Site D, Trench 2	Orange sand - layer. Same as ***624***
629	Site D, Trench 2	Grey-orange clay and sand mix - layer. Same as ***622***
630	Site D, Trench 2	Mid-to dark grey sandy-gravel - layer. Same as ***610***
631	Site D, Trench 2	Black-grey sandy-silt - layer
632	Site D, Trench 2	Mid-brown sandy-silt - layer. Same as ***623***
633	Site D, Trench extension	Road make-up
634	Site D, Trench extension	Road make-up

635	Site D, Trench extension	Road make-up
636	Site D, Trench extension	Silty-clay - layer
637	Site D, Trench extension	Silty-clay - layer
638	Site D, Trench extension	Black organic layer (probable turf). Part of the turf phase of Hadrian's Wall?
639	Site D, Trench extension	Gravelly clay layer. Part of the turf phase of Hadrian's Wall?
640	Site D, Trench extension	Gravelly clay layer. Part of the turf phase of Hadrian's Wall?
641	Site D, Trench extension	Black organic layer (probable turf). Part of the turf phase of Hadrian's Wall?
642	Site D, Trench extension	Alluvial clay and gravel - layer
643	Site D, Trench extension	Mid-orange-pink clay, natural
644	Site D, Trench extension	Stony clay, natural
700	Site A, Trial Hole (a)	Mid-reddish-grey sandy-silt - layer
701	Site A, Trial Hole (a)	Mid-grey-brown silty-clay - layer
702	Site A, Trial Hole (a)	Mid-orange-brown silty-sand - layer
703	Site A, Trial Hole (a)	Stone culvert. Same as ***738/739***
704	Site A, Trial Hole (a)	Cut of service trench. Filled by ***705***
705	Site A, Trial Hole (a)	Reddish-brown sand. Fill of ***704***
706	Site A, Trench 1	Stone and bitumen - road make-up
707	Site A, Trench 1	Tarmac - road surface
708	Site A, Trench 1	Cut for electric cable trench. Filled by ***709***
709	Site A, Trench 1	Fill of ***708***
710	Site A, Trench 1	Cut for sewer trench. Filled by ***711***
711	Site A, Trench 1	Fill of ***710***
712	Site A, Trench 1	Spread of medium to large boulders - layer
713	Site A, Trench 1	Red sandstone wall. Fill of ***719***

714	Site A, Trench 1	Light orange sand - layer
715	Site A, Trench 1	Dark grey brown silty-sand - layer
716	Site A, Trench 1	Mid-dark reddish-brown silty-sand - layer
717	Site A, Trench 1	Compact dark grey-brown silty-sand - road make-up
718	Site A, Trench 1	Yellow sand - natural
719	Site A, Trench 1	Cut for sandstone wall. Filled by ***713***, ***720***
720	Site A, Trench 1	Fill of ***719***
721	Site A, Trench 1	Grey stone - road make-up
722	Site A, Trench 2	Cobbled surface
723	Site A, Trench 2	Dark grey-brown sandy-silt - road make-up
724	Site A, Trench 2	Cobbled surface
725	Site A, Trench 2	Mid-orange sand - bedding layer
726	Site A, Trench 2	Yellow-brown sand - natural
727	Site A, Trench 2	Dark brown-grey silty-sand - layer
728	Site A, Trench 2	Cut for sewer pipe. Filled by ***729***
729	Site A, Trench 2	Fill of ***728***
730	Site A, Trench 2	Disturbed cobble layer
731	Site A, Trench 2	Mid-orange clay-sand - layer
732	Site A, Trench 2	Cut of pit. Filled by ***732, 734, 735***
733	Site A, Trench 2	Fill of ***732***
734	Site A, Trench 2	Fill of ***732***
735	Site A, Trench 2	Fill of ***732***
736	Site A, Trench 2	Dark reddish-brown sandy-clay - layer
737	Site A, Trench 2	Dark grey-brown sand - layer
738	Site A, Trench 2	Sandstone wall - culvert. Associated with ***739***. Same as ***703***. Filled by ***740, 741, 742***
739	Site A, Trench 2	Sandstone wall - culvert. Associated with ***738***. Same as ***703***. Filled by ***740, 741, 742***
740	Site A, Trench 2	Mid-brown sandy-clay. Fill of ***738/739***
741	Site A, Trench 2	Light brown sand . Fill of ***738/739***

742	Site A, Trench 2	Mid-grey silt. Fill of ***738/739***
800	Site J, Trench 1	Mid-greyish-brown sandy-silt - topsoil
801	Site J, Trench 1	Mid-orange speckled grey sand - marine alluvium?
802	Site J, Trench 1	Mid-grey speckled orange sand - marine alluvium?
803	Site J, Trench 2	Cut of gully. Filled by ***804, 805***
804	Site J, Trench 2	Upper fill of ***803***
805	Site J, Trench 2	Lower fill of ***803***
806	Site J, Trench 2	Mid-orange speckled grey clayey-sand - marine alluvium?
807	Site J, Trench 2	Mid-grey brown sandy-silt - topsoil
808	Site J, Trench 3	Mid grey-brown sandy-silt - topsoil
809	Site J, Trench 3	Mid-yellow-orange clay-sand - natural
810	Site J, Trench 3	Cut of gully. Filled by ***811, 812***. Same as ***830***
811	Site J, Trench 3	Lower fill of ***810***
812	Site J, Trench 3	Upper fill of ***810***
813	Site J, Trench 3	Cut of gully. Filled by ***814, 815***
814	Site J, Trench 3	Upper fill of ***813***
815	Site J, Trench 3	Lower fill of ***813***
816	Site J, Trench 4	Mid-grey-brown silty-sand - topsoil
817	Site J, Trench 4	Mid-orange mottled grey clay-sand - marine alluvium?
818	Site J, Trench 4	Cut of gully. Filled by ***819***. Same as ***827***
819	Site J, Trench 4	Fill of ***818***
820	Site J, Trench 4	Cut of gully. Filled by ***821, 822***. Same as ***825***
821	Site J, Trench 4	Lower fill of ***820***
822	Site J, Trench 4	Upper fill of ***820***
823	Site J, Trench 5	Mid-grey-brown silty-sand - topsoil
824	Site J, Trench 5	Dark grey-brown silty-sand - layer
825	Site J, Trench 5	Cut of gully. Filled by ***826***. Same as ***820***
826	Site J, Trench 5	Fill of ***825***
827	Site J, Trench 5	Cut of gully. Filled by ***828***. Same as ***818***

828	Site J, Trench 5	Fill of ***827***
829	Site J, Trench 5	Mid-orange mottled grey clay-sand - marine alluvium?
830	Site J, Trench 5	Cut of gully. Filled by ***831, 832***. Same as ***810***
831	Site J, Trench 5	Lower fill of ***830***
832	Site J, Trench 5	Upper fill of ***830***
833	Site J, Trench 5	Cut of gully/ditch. Filled by ***834, 835***
834	Site J, Trench 5	Upper fill of ***833***
835	Site J, Trench 5	Lower fill of ***833***
836	Site A, Trial Hole B	Compacted stony layer
837	Site A, Trial Hole B	Orange-brown sand - layer
838	Site I, Trench 2	Tarmac road surface. Same as ***843***
839	Site I, Trench 2	Grey stone layer - road make-up. Same as ***844***
840	Site I, Trench 2	Industrial waste and clinker -road make-up. Same as ***845***
841	Site I, Trench 2	Grey clay with sandstone inclusions - layer
842	Site I, Trench 2	Natural clay. Same as ***846***
843	Site I, Trench 2	Tarmac road surface. Same as ***838***
844	Site I, Trench 2	Grey stone layer - road make-up. Same as ***839***
845	Site I, Trench 2	Industrial waste and clinker - road make-up. Same as ***840***
846	Site I, Trench 2	Natural clay. Same as ***842***
847	Site D, Trench 1	Cut of ditch? Possible ditch associated with the stone phase of Hadrian's Wall

APPENDIX 4: FINDS CATALOGUE

Object No.	Site	Trench	Context	Category	Quantity	Description	Date Range
1010	A	1	***715***	Pottery	1	Factory made slipware cup with brown and cream square panel decoration	19th century
1010	A	1	***715***	Pottery	1	Brown glazed red earthenware (fine) cup	18th/19th century
1010	A	1	***715***	Pottery	1	Dark brown glazed red earthenware (coarse)	18th/19th century
1004	A	1	***720***	Pottery	1	Small fragment of brown glazed buff earthenware with frequent manganese specks; possible Mottled ware	18th century?
1002	A	2	***736***	Pottery	1	Brown glazed red earthenware (coarse)	18th/19th century
1002	A	2	***736***	Pottery	4	Black glazed red earthenware (coarse with frequent limestone inclusion)	18th/19th century
1002	A	2	***736***	Pottery	1	Yellow ware (later tradition derivative)	19th century
1005	A	2	***736***	Pottery	6	Black glazed red earthenware (coarse with fine grit inclusion)	17th to 19th century
1005	A	2	***736***	Pottery	1	Bone china plate	19th/20th century
1005	A	2	***736***	Pottery	1	Trail slipware; brown glaze with hand applied yellow strip decoration; probable Staffordshire product	Mid 18th century
1005	A	2	***736***	Pottery	1	Self coloured glazed red earthenware (coarse)	18th/19th century?
1011	A	2	***736***	Animal Bone	2	Cow?	-
1003	A	2	***737***	Pottery	1	Trail slipware plate; dark brown with yellow applied spots; probable Staffordshire	Mid 18th century

						product	
1003	A	2	***737***	Pottery	3	Black glazed red earthenware (coarse with frequent limestone inclusion).	18th/19th century
1007	A	2	***Unstrat***	Copper Alloy	1	Radiate copy, Claudius II (AD 268-70)..	*c* AD 270-280
1001	A	2	***740***	Stone	1	Roof slate	Not closely datable
1008	A	2	***741***	Shell	1	Water snail	-
1009	A	2	***741***	Clay Tobacco Pipe	3	Plain stems: two narrow and one medium bored	18th/19th century
1012	A	2	***741***	Pottery	3	Trail slipware; reddish-brown glaze with yellow applied loosely diagonal strips	18th century
1012	A	2	***741***	Pottery	1	Trail slipware dish; olive green glaze on buff coloured fabric with comb style, irregularly applied brown strips around the edge	17th/18th century?
1012	A	2	***741***	Pottery	5	Glazed white earthenware plates; plain, cobalt blue transfer, and gold star motif decoration	19th/20th century
1012	A	2	***741***	Pottery	2	Orange glazed red earthenware	19th century
1012	A	2	***741***	Pottery	1	Mottled ware	18th century
1012	A	2	***741***	Pottery	2	Brown glazed red earthenware (coarse)	18th/19th century
1012	A	2	***741***	Pottery	14	Black glazed red earthenware (coarse); pancheon, storage jars and jugs	17th-19th century
1006	A	2	***Unstrat***	Glass	2	Greenish-blue iridescent neck and base possibly deriving from a single wine bottle	18th/19th century

1013	J	5	***828***	Pottery	2	Trail slipware; light brown glaze with yellow applied stripes	18th century
1014	J	5	***832***	Pottery	1	Trail slipware; red glaze on pale red/buff fabric with cream coloured applied concentric ring decoration	Mid 18th century