



**Bolton TCTS,
Proposed
Transport
Interchange,
Railway Triangle,
Bolton,
Greater Manchester**

**Updated Archaeological
Evaluation Report**



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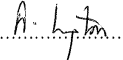
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SUMMARY

Transport for Greater Manchester (TfGM) has devised proposals to construct a major new transport interchange in Bolton, involving the relocation of the existing bus station on Moor Lane to a completely new site, situated some 600m to the south-east, on the fringe of the historic core of the town (centred on NGR SD 7181 0888). The implementation of these development proposals will inevitably necessitate considerable earth-moving works which, potentially, could have a negative impact on any sub-surface archaeological resource.

In order to establish the suitability of the proposed site for development in terms of archaeology and cultural heritage, TfGM commissioned AECOM to carry out a desk-based assessment of the site. This concluded that there were 14 sites of known heritage value within the boundary of the proposed development area, and that these merited further investigation (AECOM 2010). These sites were principally former industrial buildings and associated workers' housing, depicted on late eighteenth- and nineteenth-century mapping. Following consultation with the Greater Manchester Archaeological Advisory Service, it was recommended that a series of targeted trial trenches was excavated across the proposed development area to establish the presence or absence of any buried remains of archaeological interest.

In June 2011, Oxford Archaeology North (OA North) was commissioned to carry out the specified programme of archaeological evaluation, which allowed for the excavation of 13 trial trenches that were targeted on the sites identified in the desk-based assessment. The work was carried out in two stages, the initial element being undertaken during June and July 2011, and the remaining trenches excavated in November 2013 once access agreements have been secured from the land owners.

The results obtained from the evaluation indicate that buried remains of considerable local and potentially regional interest survive *in-situ* across the northern part of the study area, occupying the higher ground to the south of Bollings Yard and Back Johnson Street. In particular, structural remains and buried soil horizons dating provisionally to the seventeenth and eighteenth centuries were exposed at depths less than 1m below the modern ground surface, together with the remains of stone-built workers' housing dating to the late eighteenth or early nineteenth century.

The evaluation has demonstrated that the northern part of the proposed development site contains buried remains of archaeological interest, which offer some potential to address selective objectives drawn from the initiatives for archaeological research of the industrial and modern periods stated in the current Archaeological Research Framework for North West England. Conversely, the trial trenches placed across the southern part of the site, occupying the lower ground adjacent to the railway, revealed that development and landscaping works carried out after the mid-nineteenth century have destroyed most archaeological remains in this area.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) is grateful to Transport for Greater Manchester (TfGM) for commissioning the project. Thanks are also expressed to Matt Parker and Helen Maclean of AECOM for their support, and to Norman Redhead, the Heritage Management Director with the Greater Manchester Archaeological Advisory Service, for his advice and guidance.

The evaluation was directed by Graham Mottershead, assisted by Phil Cooke and Lewis Stitt. The report was written by Graham Mottershead and Ian Miller. The palaeo-environmental samples were processed by Sandra Bonsall, and assessed by Elizabeth Huckerby, and the finds were examined by Chris Howard-Davis. The illustrations were prepared by Graham Mottershead and Mark Tidmarsh, and the report was edited by Ian Miller, who was also responsible for project management.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 Transport for Greater Manchester (TfGM) has devised proposals to construct a major new transport interchange in Bolton, which will improve interchange between bus and rail services. Development proposals allow for the relocation of the existing bus station on Moor Lane to a completely new site, situated some 600m to the south-east, on the fringe of the historic core of the town. The implementation of these development proposals will inevitably necessitate considerable earth-moving works which, potentially, could have a negative impact on any sub-surface archaeological resource. In order to establish the suitability of the proposed site for development in terms of archaeology and cultural heritage, TfGM commissioned AECOM to carry out a desk-based assessment of the site. This concluded that there were 14 sites of known heritage value within the boundary of the proposed development area, and that these merited further investigation (AECOM 2010). Following consultation with the Greater Manchester Archaeological Advisory Service (GMAAS), which provides advice on planning matters to Bolton Metropolitan Borough Council, it was recommended that a series of targeted trial trenches was excavated across the proposed development area to establish the presence or absence of any buried remains of archaeological interest, and thereby inform the planning process. In June 2011, Oxford Archaeology North (OA North) was commissioned to carry out the first stage of the specified programme of evaluation, with the second and final stage being undertaken in November 2013.

1.2 SITE LOCATION AND GEOLOGY

1.2.1 The study area is situated a short distance to the south of Bolton town centre, Greater Manchester (Fig 1). The site lies to the south of Great Moor Street, bounded by Newport Street, Bollings Yard, and the railway lines converging on Bolton station (centred on NGR SD 7181 0888). At the time of the evaluation trenching, the area was in use for car-parking purposes (Plate 1).

1.2.2 Topographically, Bolton Metropolitan Borough straddles the southern edge of the West Pennine Moors, where several deeply cut river valleys open out into the broad basin of the Greater Manchester urban area. The region as a whole comprises the Mersey River Valley (Countryside Commission 1998, 125), although the topography of the Bolton area reflects the valley of the River Croal, a tributary of the River Irwell.

1.2.3 The underlying solid geology of the area consists mainly of Bunter sandstones of Permo-Triassic age, which were deposited under the marine conditions of the period, between 280 and 195 million years ago (Countryside Commission 1998, 125). The overlying drift geology is composed of essentially Pleistocene boulder clays of glacial origin, and sands, gravels, and clays of fluvial/lacustrine origin (Hall *et al* 1995, 8).



Plate 1: Recent aerial view of the study area

2. METHODOLOGY

2.1 INTRODUCTION

- 2.1.1 The approved Written Scheme of Investigation (*Appendix 1*) allowed for the excavation of 13 targeted evaluation trenches, 280m of trenching in total (Figs 2 and 3), with a contingency for an additional 10m of trenching. However, access was not available to all parts of the study area at the time of the initial phase of evaluation, and thus only trenches 2, 5, 6, 7, 8 and 11 were excavated in their entirety in 2011, together with the partial excavation of trenches 9 and 10. The required programme of evaluation trenching was completed during a second-stage of fieldwork, although two trenches were not excavated: Trench 1 was not excavated as it lay beneath the footprint of an extant building, and Trench 4 was abandoned due to a high density of live electric cables connected to an electricity sub-station.
- 2.1.2 The first stage of the fieldwork programme was undertaken between June and July 2011, with the second stage of evaluation carried out in November 2013. All archaeological work undertaken was consistent with the relevant standards and procedures provided by the Institute for Archaeologists.

2.2 EVALUATION TRENCHING

- 2.2.1 The uppermost levels of each trench comprised tarmac surfacing, which was broken out using a toothed bucket. The majority of the overburden deposits comprised modern levelling, lightly compacted backfill or demolition rubble, and was easily removed with a toothless ditching bucket. The machining carefully defined the extent of any surviving walls, foundations and other remains, after which all excavation was undertaken manually. The floor and sides of each trench were cleaned and recorded in an appropriate manner.
- 2.2.2 All information was recorded stratigraphically with accompanying documentation (plans, sections and both colour slide and black-and-white print photographs, both of individual contexts and overall site shots from standard view points). Photography was undertaken with 35mm cameras on archivable black-and-white print film as in digital format, all frames included a visible, graduated metric scale.
- 2.2.3 The precise location of the trenches, and the position of all archaeological structures encountered, was surveyed by GPS. This process generated scaled plans and sections within AutoCAD, which were then subject to manual survey enhancement. The drawings were generated at an accuracy appropriate for 1:20 scale, and all information was tied in to Ordnance Datum.

2.3 FINDS

- 2.3.1 **Artefacts:** all finds recovered were bagged and recorded by context number, processed and stored according to current standard practice based on guidelines set by the Institute for Archaeologists. The finds have been analysed by OA North in-house specialists.
- 2.3.2 **Environmental Samples:** bulk palaeo-environmental samples were taken from buried soil horizons exposed in two of the excavated trenches (trenches 2 and 9), and have been processed accordingly. No other deposits recorded were deemed appropriate for sampling.

2.4 ARCHIVE

- 2.4.1 A full professional archive has been compiled in accordance with the project design, and in accordance with the current IfA and English Heritage guidelines (English Heritage 2008). The paper and digital archive will be deposited with Bolton Museum and Archives Service on completion of the project; the Collections management team with the Museum has been consulted.

3. BACKGROUND

3.1 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 3.1.1 The following section presents a summary historical background of the general area. This overview is presented by historical period, and has been compiled in order to place the study area into a wider archaeological context.
- 3.1.2 **Prehistoric Period:** there are relatively few sites known from this period in the vicinity. The upland areas of the surrounding moors may have been exploited for hunting, but the poor drainage of the Pennines and spread of blanket peat at higher altitudes would have discouraged any settlement (Hall *et al* 1995, 117).
- 3.1.3 **Roman Period:** there are few known remains of Roman date in the Bolton area. Indeed, the only recognised evidence of Roman occupation locally is the line of the road that connected the forts of Manchester and Ribchester (Saxelby 1953, 38). It was reported in *The Gentlemen's Magazine* in 1807 that several Roman burial urns had been discovered on Breightmet Hill, although this awaits corroboration: there are no adequate descriptions of their discovery, and the urns have since been lost.
- 3.1.4 **Early Medieval Period:** the physical remains of this period are rare in the North West as a region (Newman 1996), and this is certainly the case in Bolton. Fragments of two pre-Norman stone crosses, thought to date from no later than AD 950, were discovered when the Bolton Parish church of St Peter was rebuilt in 1866, providing some evidence for activity during this period (Saxelby 1953, 39). Additional evidence, however, is lacking, although the name 'Bolton' may be translated as 'a manor house enclosure' in Old English.
- 3.1.5 **Medieval Period:** following the Norman Conquest, William I assigned most of the land between the Ribble and Mersey rivers to Roger of Poitou, although by the time of the Domesday survey (1080-6) the king had taken over his lands again, and they remained in Crown possession until they were given to Ranulf de Bricasard, the third Earl of Chester (Saxelby 1953, 40).
- 3.1.6 In 1251, King Henry III awarded Bolton a charter to hold a market on Churchgate. Some two years later, Bolton was designated as a market town and borough by a charter from the Earl of Derby, William de Ferrers (Farrer and Brownbill 1911).
- 3.1.7 **Post-medieval Period:** by the end of the fifteenth century, Bolton was a small market town, with two annual fairs for horses, cattle and farm produce (Saxelby 1953, 44). In 1540, at a time when the textile industries in south Lancashire were beginning to flourish, John Leland wrote of the trading of 'cottons and coarse yarns in the market' (Chandler 1993, 263), reflecting the origins of an industry that was to become of paramount significance to the town's economy. The regional importance of Bolton during this period is implied by the level of annotation on Saxton's map of 1577.

- 3.1.8 **The Industrial Period:** during the eighteenth century, Bolton became the seat of a high-quality fustian industry, and the source of the largest contingent of ‘country manufacturers attending the powerful Manchester market’ (Williams with Farnie 1992, 29). In 1773, an enumeration of the inhabitants of the Bolton calculated that the town contained 946 houses with a population of 4,568 (Aikin 1795, 261). At this date, much of the area enclosed by Deansgate and Bradshawgate, occupied by the present Civic Core, comprised open ground, orchards and pasture (Bolton Council 2006, 60).
- 3.1.9 William Yates’ *Map of the County Palatine of Lancaster* of 1786 provides the earliest survey to show the general layout of Bolton. This shows that settlement was focused along the southern bank of the river Croal at the junction of Deansgate and Churchgate with Bradshawgate. This is likely to reflect the layout of the medieval settlement, with some ribbon development along Bradshawgate. The present study area, however, seems to have been entirely undeveloped. The layout of the town depicted on Yates’ map is replicated, but in much greater detail, on an enclosure map of Bolton that was produced in 1793. This map similarly shows the focus of settlement to have been along Deansgate, Churchgate, and the northern part of Bradshawgate. The study area, however, appears to have been dominated by open fields with probable workers’ housing in the north-eastern part.
- 3.1.10 The next available map of Bolton is that surveyed by G Pigot, and published by Baines in 1824 (Plate 2). This shows that the town had experienced rapid growth during the early nineteenth century. The layout of the streets and the configuration of the buildings surveyed by Pigot imply that development may in part have been *ad hoc*, and lacking urban planning. Conversely, the map also shows several streets on the urban fringe to have been laid out in a more regular pattern, but awaiting development, suggesting an element of planning. Development appears to have been focused to the south of the historic core along Deansgate, with some development shown within the present study area.



Plate 2: Extract from Pigot's map of 1824, with arrow marking the present study area

3.1.11 By 1851, the total population of Bolton had reached 60,000. In consequence, land on the fringe of the town was subsumed by urban expansion. An important factor in this expansion was the growth of the factory-based textile industry, particularly during the 1850s when a mill-building boom transformed the town into a leading centre for cotton spinning (Williams with Farnie 1992, 29). The extent to which Bolton had expanded by the mid-nineteenth century is depicted on Ordnance Survey mapping published in 1848, which clearly shows the Scheme Area to have been encompassed by development (Plate 3).

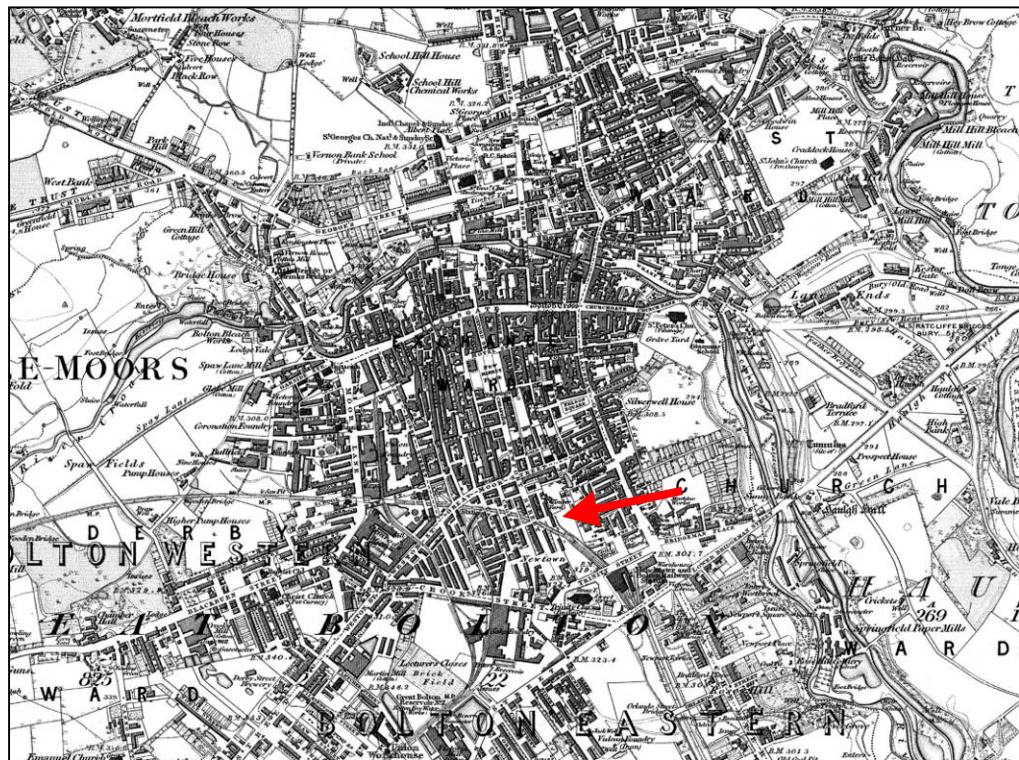


Plate 3: Extract from the Ordnance Survey map of 1848 (surveyed 1844-7), with arrow marking the location of the present study area

3.1.12 By the end of the nineteenth century, the town was a complete industrial townscape, which occupied all open spaces. Much of the initial unplanned expansion had been replaced with more regulated development. A dense periphery of mills, foundries and railway sidings, the so-called 'ring of fire', developed around the town centre, whilst residential populations were displaced from the town centre to the suburbs (Bolton Council 2006).

4. EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 This section summarises the results obtained from each of the excavated trenches. The trenches were placed as close as practicably possible to the locations marked in the Written Scheme of Investigation (*Appendix 1*), and this was for the most part achieved; the precise location of the evaluation trenches superimposed on historical mapping is shown on Figures 2 and 3, and Plate 4. Exceptions included Trench 1, the proposed northern part of which was not excavated as it lay beneath the footprint of an extant building, and Trench 4, which was abandoned due to a high density of live electric cables connected to an electricity sub-station.



Plate 4: Location of the evaluation trenches, superimposed on the Ordnance Survey map of 1848 (surveyed 1844-7)

4.2 TRENCH 1

- 4.2.1 Trench measured 7 x 1.65m, and was excavated to a maximum depth of 1.5m (Plate 5). It was aligned north-west/south-east across the private parking area to the rear of the three modern buildings on the corner of Great Moor Street and Johnson Street, and was targeted on the footprint of single-depth workers' housing fronting onto Back Johnson Street, depicted on the Ordnance Survey map of 1848 (Fig 2).
- 4.2.2 A layer of light yellow silty sand (**106**) was exposed at the base of the excavated trench, at a depth of 1.5m below the modern ground level (Fig 4). This layer clearly represented the natural geology. It was overlain stratigraphically by a layer of mid-brown sandy silt (**104**), which was exposed at a depth of 0.9m below the modern ground surface. Limited excavation of this layer yielded fragments of pottery and glass, with a date range spanning the late nineteenth and twentieth centuries.
- 4.2.3 Layer **104** was cut in the north-western part of the trench by a 0.25m wide wall footing (**103**). The fabric of the foundations comprised machine-made bricks bonded in a hard black mortar, indicative of a late nineteenth- or twentieth-century construction date. Layer **104** was also cut by a concrete capped drain **105**, which was connected to a modern manhole and other drains; the drain was not disturbed during the archaeological works.
- 4.2.4 The trench was overlain with 0.05m of tarmac (**100**), with 0.1m of hardcore levelling material (**101**) below. Beneath this was a 0.9m thick deposit of mixed loam, ash, stone and brick rubble overburden (**102**).



Plate 5: Trench 1 looking north

4.3 TRENCH 2

4.3.1 Trench 2 was aligned north-north-west/south-south east, and was placed across the central part of the study area on the western side of Johnson Street. The trench measured 20 x 2m (Fig 5), and was excavated to a maximum depth of 0.84m (Plate 6). Archaeological remains of interest dating to the post-medieval period were encountered, including probable cultivation horizons (layers **41** and **42**) and a possible post hole (**48**). Physical evidence for the development of the area during the late eighteenth and nineteenth centuries was provided by the remains of several brick-built walls (**45**, **47** and **49**).



Plate 6: View across Trench 2, showing the sequence of layers excavated

4.3.2 A layer of light yellow-brown silty clay (**43**) that contained abundant small fragments of sandstone was exposed at the base of the excavated trench, at a depth of *c* 0.8m below the modern ground surface. This clearly represented the natural drift geology, and was overlain across the majority of the trench by a 0.38m thick layer of sticky, silty clay (**42**), which contained numerous inclusions of charcoal. Several sherds of pottery, with a date range spanning the seventeenth and eighteenth centuries, were recovered from this layer. An absence of any artefacts of a later date, moreover, suggested that layer **42** had sustained little post-depositional disturbance. It seems possible that layer **42** was a post-medieval garden soil or plough soil.

4.3.3 Layer **42** was cut by a sub-circular feature (**48**) in the north-eastern part of the trench (Plate 7). Feature **48** had a diameter of 0.32m, with moderately sloping sides to a maximum depth of 0.9m (Fig 5). The size and form of this feature was consistent with its function as a post hole, an interpretation supported by the presence of numerous stones packed around the edge, indicative of a post pipe. The remainder of post hole **48** was filled with mid-grey-brown silty clay that yielded a single fragment of pottery, to which a probable seventeenth-century date has been ascribed.



Plate 7: Post hole 48 prior to excavation

- 4.3.4 Layer **42** was overlain in the southern part of the trench by a deposit (**41**) of dark grey, sticky, silty clay. This appeared to represent the upper spits of layer **42**, but had been subject to some post-depositional disturbance associated with the late eighteenth- and nineteenth-century development of the site.
- 4.3.5 At the north-north-western end of the trench, layer **42** was cut by a 0.46m wide brick wall (**45**). This comprised hand-made bricks, set in a lime-based mortar, indicative of a late eighteenth- or early nineteenth-century construction date. The northern side of wall **45** was abutted by a thin concrete surface (**44**).
- 4.3.6 A second wall (**47**) was exposed a short distance to the south. Wall **47** was aligned north-east/south-west, was two-courses wide, and comprised hand-made bricks. A wall of similar construction (**49**), aligned north-west/south, was identified in the north-east-facing section of the trench, and may have formed part of the same structure (Fig 4).
- 4.3.7 The uppermost excavated deposits represented levelling associated with the modern surfacing. These comprised two thin lenses of crushed sandstone (**38** and **39**) that seemingly formed part of a drainage system. These lenses were overlain by a 0.16m thick layer of crush shale (**37**) and compacted rubble (**50**), which were sealed by a 0.08m deep deposit of hardcore and tarmac surfacing.

4.4 TRENCH 3

- 4.4.1 Trench 3 measured 15 x 1.65m, and was excavated to a maximum depth of 3.2m below the modern ground surface (Plate 8); the depth of the trench precluded physical access for Health and Safety considerations, so the exposed remains were recorded from the ground surface. The trench was aligned north-east/south-west, and was situated in the private car-parking area to the rear of the buildings fronting Great Moor Street (Fig 6). The trench was targeted on the footprint of a row of back-to-back cottages along Back Johnson Street depicted on the Ordnance Survey map of 1848 (Fig 2).
- 4.4.2 The remains of a wall (306) were encountered in the south-western part of the trench, at a depth of 1.6m below the modern ground surface (Plate 9). The fabric of the wall comprised rough sandstone blocks with a rubble core, forming a foundation that was 0.5m wide. The south-western side the wall was faced with small hand-made bricks. The top of a second wall (307) was revealed some 5m to the north-east, at a depth of 1.8m. Wall 307 was similarly 0.5m wide, and comprised rough sandstone blocks with a rubble core. The remains of another wall (308) were identified at a distance of 3.3m to the north-east of wall 307. This was of the same form and fabric as wall 306 and 307, and was almost certainly of a contemporary construction.



Plate 8: General view of Trench 3, looking south-west



Plate 9: Wall 306, looking south

- 4.4.3 Between these two walls the trench was excavated to a depth of 2.6m at which the edge of a flat stone slab (**312**), which is likely to have represented the vestiges of a flagstone floor. This had evidently been disturbed previously, as large fragments of flagstones were identified in the overlying deposit of demolition rubble.
- 4.4.4 The north-eastern part of the trench was excavated to a depth of 1.7m, onto a 1.5m-wide concrete slab (**309**) that was set on a foundation of machine-made bricks, indicative of a late nineteenth- or twentieth-century construction date. A layer of mixed ash and brick fragments (**310**) was revealed to the south-west of slab **309**, with a mixed layer of grey brown sand, ash and gravel **311** to the north-east. At the north-eastern end of the trench, within the north-east-facing section of the trench, was a 0.32m-wide vertical column (**313**) composed of hand-made bricks. This may have represented the remains a buttress for an external wall just beyond the end of the trench, but further excavation was prohibited by the proximity to the road.

The trench was overlain with 0.1m of tarmac (**300**) and 0.2m of associated levelling material (**301**), below which was 0.9m of mixed rubble overburden (**302**). Beneath this was 2m of mixed brick, stone and ash demolition rubble (**303**), which sealed the remains of stone-built walls **306**, **307** and **308**, and putative floor **312**.

4.5 TRENCH 5

4.5.1 Trench 5 was aligned north-north-west/south-south-east, and was placed across a car park to the west of Johnson Street. It was targeted on the location of a railway siding depicted on the Ordnance Survey map of 1893 (Fig 3). The trench measured 17 x 2m (Fig 7), and was excavated to a maximum depth of 1.9m (Plate 10). The trench was not excavated to the proposed length of 20m due to the presence of live electrical cables immediately to the south and a footpath atop a steeply sloping bank to the north. No features of archaeological interest were identified in the excavated trench, and no artefacts were recovered.



Plate 10: General view of Trench 5

- 4.5.2 The lowest deposit encountered in the excavated trench was a layer of mid-brown gravel (23), which was exposed at a depth of 1.8m below the modern ground surface (Fig 5). This clearly represented a natural geological deposit, and was overlain by a 1.2m thick layer of compact, mid-brown clay that contained numerous small fragments of sandstone (22). This appeared to be a modern levelling deposit, and was perhaps associated with landscaping works following the removal of the railway.
- 4.5.3 Layer 22 was cut by two modern features: a large, linear, north-east/south-west-aligned feature (21), which contained mixed coarse sand and rubble; and an east/west-aligned concrete pipe (20), which had a diameter of 180mm and lay within a construction trench that had been backfilled with hardcore. The uppermost surface of the trench comprised a 0.05m thick layer of compacted dark brown clay (19), which formed a levelling for tarmac (01).

4.6 TRENCH 6

- 4.6.1 Trench 6 was aligned north-north-west/south-south east, and was placed across the lower terrace in the southern corner of the study area. The trench was targeted on a square-shaped building depicted on the Ordnance Survey map of 1848 that appeared to be associated with an iron foundry, and a block of workers' housing (Fig 2). The trench measured 20 x 2m, and was excavated to a maximum depth of 2.1m (Fig 8). However, the buried remains of two structures of archaeological interest (Structures **30** and **32**) were exposed and, following consultation with AECOM and GMAAS, the trench was extended to the north-east to establish the extent, nature and date of these remains.
- 4.6.2 The natural geology was exposed at the base of the excavated trench, and was very similar to that identified in Trench 5. This layer was cut by two square structures (**30** and **32**) with stepped foundations, which represented the earliest archaeological remains encountered in the trench (Fig 6). The upper surface of each structure measured 1.4m square, and both were of brick construction, comprising hand-made bricks bonded with a lime-based mortar, indicative of a late eighteenth- or early nineteenth-century date. Both contained two 0.7m wide, L-shaped channels in their upper surface, suggestive of an industrial function (Plate 11). The channels were filled with a deposit of sticky grey clay (**31**), which continued to the south-west of the structures as a linear feature cut into the natural geology. Clay **31** contained crumbly fragments of iron, which perhaps derived the iron foundry depicted on historical mapping.
- 4.6.3 Structures **30** and **32** were sealed by a thick layer of modern levelling material (**28**), which comprised mid-greyish brown clay with gravel. This layer was cut by several cast-iron pipes at the south-eastern end of the excavated trench, and a concrete pipe (**27**). The uppermost levels of the trench comprised a 0.05m thick layer of compacted cinders and gravel (**03**), and crushed sandstone blocks (**02**), which represented a levelling deposit of the tarmac surface (**01**).



Plate 11: Structural remains exposed in an excavated extension to Trench 6

4.7 TRENCH 7

- 4.7.1 Trench 7 was aligned east-north-east/west-south-west, and was excavated across a car park on the lower terrace in the eastern part of the study area. It was placed across the central part of an iron foundry depicted on the Ordnance Survey map of 1848 (Fig 2). The trench measured 20 x 2m, and was excavated to a maximum depth of 2.3m (Plate 12). No features of archaeological interest were identified in the excavated trench, and no artefacts were recovered.
- 4.7.2 A thick deposit of mid-brown to light yellowish-grey gravel (*17*) was exposed at the base of the excavated trench. This material was excavated to depth in a sondage placed across the trench, which showed that layer *17* had an increased clay content with depth, but nevertheless almost certainly represented the natural geology. It is possible that the upper levels of this deposit derived from modern landscaping activity associated with the removal of nineteenth-century railway infrastructure, although firm evidence was lacking.
- 4.7.3 Layer *17* was cut by a north/south-aligned construction trench (*07*) in the north-eastern part of the trench (Fig 9). This contained wooden ducting, which housed a steel pipe (*06*). Layer *17* was also cut by 300mm diameter cast-iron pipe that crossed the central part of the trench. The uppermost levels of the trench comprised a 0.05m layer of cinders and gravel (*03*), and crushed sandstone blocks (*02*), which represented a levelling deposit for tarmac (*01*).



Plate 12: General view of Trench 7

4.8 TRENCH 8

- 4.8.1 Trench 8 was aligned east-north-east/west-south-west, and was placed across a car park on the lower terrace in the eastern part of the study area. It was targeted on the northern part of an iron foundry depicted on the Ordnance Survey map of 1848 (Fig 2). The trench measured 20 x 2m, and was excavated to a maximum depth of 1.9m (Plate 13). No features of archaeological interest were identified in the excavated trench, and no artefacts were recovered.
- 4.8.2 The lowest deposit encountered in Trench 8 was a fine grey clay (**I5**), exposed at the base of a sondage excavated across the north-eastern end of the trench (Fig 10). Layer **I5** was situated at a depth of 1.9m below the modern ground surface, and almost certainly represented a natural geological horizon. This layer was overlain by two bands of material: a reddish-brown coarse gravel (**I1**); and a mixed coarse yellow sand (**I2**). These both appeared to have been deposited as part of the same landscaping activity, which is likely to have been associated with the removal of nineteenth-century railway infrastructure. The uppermost levels of the trench comprised a 0.05m layer of compacted cinders and gravel (**O3**), and crushed sandstone blocks (**O2**), which represented a levelling deposit for tarmac (**O1**).



Plate 13: General view of Trench 8

4.9 TRENCH 9

- 4.9.1 Trench 9 was aligned north/south, and was placed across the upper terrace on the eastern side of Johnson Street across the footprint of industrial buildings depicted on the Ordnance Survey map of 1848 (Fig 2). The trench spanned two car park in different ownership, and was excavated in two stages. The southern part was opened in 2011, and comprised a trench measuring 11 x 2m, that was excavated to a maximum depth of 1.3m (Fig 11). Archaeological remains of interest dating to the post-medieval period included buried soils (layers **51** and **68**) and stone walls (**58** and **65**). Physical evidence for the development of the area subsequently was provided by the remains of several brick-built walls (**62**, **63**, **64** and **67**). The trench was extended by 8m to the north in 2013, although buried remains had been destroyed by the insertion of modern service cables.
- 4.9.2 A layer of light yellow-brown silty clay (**69**) that contained abundant small fragments of sandstone was exposed at the base of the excavated trench. This layer was very similar to deposit **43** in Trench 2, and clearly represented the natural drift geology. This was overlain by a buried soil horizon (**68**) in the northern part of the trench, and a very similar, but stratigraphically isolated deposit (**51**) that was exposed in the central part of the trench (Fig 9). Soil horizon **68/51** comprised an homogeneous mid-brown, sticky, silty clay, which was very similar to layer **42** in Trench 2. Several sherds of pottery, with a date range spanning the seventeenth and eighteenth centuries, were recovered from the excavation of this layer. It seems likely that this layer represented the vestiges of a post-medieval garden or ploughsoil.
- 4.9.3 In the northern part of the trench, layer **68** was cut by the foundations for a substantial east/west-aligned wall (**58**). Wall **58** was 0.57m wide and survived to a height of 0.78m, and comprised sandstone blocks set in a coarse mortar (Plate 14). The western end of the wall had been cut by a brick wall (**57**), whilst the eastern end continued beyond the edge of the excavated trench. The position of this wall corresponded broadly with a square-shaped building depicted on an enclosure map of the area dating to 1793.



Plate 14: General view of the northern end of Trench 9, showing stone wall **58**

- 4.9.4 In the southern part of the excavated trench, layer **51** was cut by the foundations for another substantial stone-built wall (**65**). This was aligned north-west/south-east, and was similarly composed of sandstone blocks set in a coarse mortar (Plate 15). The position and alignment of this wall corresponded broadly with a boundary feature depicted on the 1793 enclosure map.



Plate 15: General view of the southern end of Trench 9, showing stone wall 65

- 4.9.5 Physical remains that represented the expansion of Bolton during the later eighteenth and nineteenth centuries included a series of brick-built structures that were exposed throughout the trench. At the southern end of the trench, a wall (**63**) composed of hand-made bricks and bonded with a lime-based mortar was exposed in the east-facing section of the trench. Wall **63** was aligned north-west/south-east, and overlay stone foundation **65** (Plate 11).
- 4.9.6 Situated 0.18m from the southern end of wall **65**, and similarly exposed in the east-facing section of the trench, was the end of another wall (**64**). This was composed of machine-pressed bricks, indicative of a late nineteenth- or early twentieth-century construction date. Wall **64** was almost certainly associated with another section of wall (**62**), situated on the eastern side of stone foundation **65** (Plate 15). Wall **62** was aligned north-east/south-west across the trench, and was composed of machine-pressed bricks. The position of this wall corresponded broadly with a small rectangular building depicted on the Ordnance Survey map of 1893 (Fig 3). A further structure (**67**) of machine-pressed brick construction was exposed at the southern end of the excavated trench. This appeared to form the corner of a small building of late nineteenth- or early twentieth-century date.

- 4.9.7 In the northern part of the trench was north-west/south-east-aligned structure **57**. This comprised two parallel walls, set 0.64m apart, forming a linear channel that may have been intended as a flue. The surviving bricks in the north-western part of the structure were all hand-made, and bonded with a lime-based mortar. The south-eastern section, however, incorporated machine-pressed bricks bonded with a dark grey mortar, which probably represented a late nineteenth-century repair work. Flue **57** was filled with a combination of ash, cinders and fragments of brick.
- 4.9.8 Situated a short distance to the south of flue **57** was a rectangular structure (**61**), which was similarly composed of hand-made bricks set in a lime-based mortar. Structure **61** measured 1.05 x 0.84m, and survived to a maximum height of eight courses (Plate 16). It was filled with a loose deposit of cinders, suggesting that it may perhaps have been a chimney associated with flue **57**. The position of flue **57** and putative chimney **61** corresponded broadly with a size house depicted on the Ordnance Survey map of 1848.



Plate 16: General view of the northern end of Trench 9, showing possible chimney **61**

- 4.9.9 The north-western corner of chimney **61** was abutted by an east/west-aligned wall (**60**). Wall **60** comprised hand-made bricks set in a lime-based mortar, and survived to a maximum height of eight courses. Notwithstanding that the wall was not keyed into the fabric chimney **61**, it nevertheless seems likely that it was of a contemporary construction, and may also have represented the remains of the size house shown on mid-nineteenth-century mapping (Fig 2).
- 4.9.10 The structural remains exposed in the trench were sealed beneath a layer (**54**) of mixed demolition rubble, which had a maximum depth of 1.2m. This was overlain by a levelling material (**53**) for the modern tarmac surface (**52**).

- 4.9.11 The trench was extended by 8m to the north in 2013. This section of the trench was aligned north-east/south-west, and was excavated to a maximum depth of 1.2m. However, the south-western end of the trench could not be excavated to a depth greater than 0.27m due to the presence of live electric cables.
- 4.9.12 A layer of light to mid-brown sandy silt (**907**), clearly representing the natural geology, was exposed at the base of the excavated trench. This was overlain by a 0.15m thick layer of friable, slightly sticky, greyish-brown sandy clay (**906**).
- 4.9.13 Layer **906** and the natural geology was cut at the north-eastern end of the trench by a 1m wide stone-capped drain (**908**). The fabric of the drain comprised walls composed of hand-made bricks with a flagstone capping (Plate 17).
- 4.9.14 Drain **908** was sealed by a 0.25m thick deposit of loose mixed cinder and brick fragments (**905**), which was overlain by a compacted layer of ash and demolition rubble (**904**), which had a depth of 0.3m. The uppermost deposits in the excavated trench comprised a levelling layer of crushed sandstone and gravel (**903**), 0.15m of compacted rubble levelling material (**902**), and further levelling material (**901**) for the modern tarmac surfacing (**900**).



Plate 17: The remains of drain **908** exposed in the north-eastern part of the trench

4.10 TRENCH 10

- 4.10.1 Trench 10 was aligned east/west, and was placed across a car park on the upper terrace in the eastern part of the study area. The central section of the trench was excavated in 2011, and the western part was opened during the second stage of the evaluation in 2013. The eastern part of the trench lay over the steep embankment down to the lower terrace, and could not be accessed safely. The section of the trench opened in 2011 measured 9.25 x 2m, and was excavated to a maximum depth of 3.5m (Fig 12). It was targeted on a block of back-to-back cottages depicted on the Ordnance Survey map of 1848 (Fig 2). No features of archaeological interest were encountered in this section of the trench.
- 4.10.2 Excavation revealed a thick deposit of mixed rubble, sand, gravel and clay (70). This was excavated to a depth of 2.3m at the eastern end of the trench (Plate 18), although the base of the deposit was not reached, and the natural geology was not exposed. A variety of nineteenth- and twentieth-century objects were recovered from deposit 70. It is likely that it was associated with modern landscaping activity.



Plate 18: General view of the central part of Trench 10, excavated in 2011

- 4.10.3 Deposit 70 was sealed by a layer of compacted rubble (54), which had a maximum depth of 1.2m. This similarly contained fragments of pottery to which a late nineteenth- and twentieth-century date may be ascribed. The uppermost levels of the trench comprised a 0.05m layer of compacted cinders and gravel (53), which represented a levelling deposit for the modern tarmac surfacing (52).

- 4.10.4 The western part of the trench, investigated in 2013, measured 7 x 1.65m and was excavated to a maximum depth of 0.96m. The *in-situ* structural remains of nineteenth-century buildings were exposed in the trench (Plate 19).
- 4.10.5 The remains of a three-course wide wall (**1007**), aligned broadly east/west, was exposed at the western end of the excavated trench. The fabric of this wall comprised hand-made bricks laid in a stretcher bond and set in lime-based mortar, consistent with an early nineteenth-century construction date. Two other walls (**1008** and **1009**), both aligned broadly north/south, were associated with wall **1007**, and were probably of a contemporary construction. Another wall (**1010**) lay parallel and to the east of wall **1007**, and similarly comprised hand-made bricks set in lime-based mortar. All these walls were exposed at a depth of *c* 0.54m below the modern ground surface (Plate 19).



Plate 19: The western end of Trench 10, showing walls **1007**, **1008**, **1009** and **1010**

- 4.10.6 Excavation to the east of walls **1007**, **1008**, **1009** and **1010** continued to a depth of 0.96m below the modern ground surface. The remains of a drain (**1012**) comprising hand-made bricks and a stone capping lay parallel to wall **1009**. Wall **1013** was also parallel to walls **1007**, **1008**, **1009** and **1010**, extending north from the trench edge for *c* 1m before turning east for *c* 1m and terminating. The north/south-aligned section of the wall was three-courses wide, and the eastern return two courses (Plate 20). A further two-course wide eastern return of this wall lay to the south and, to the south-east, the end stub of a two-course wide wall. The fabric of all these sections of wall comprised hand-made bricks, although no mortar survived.
- 4.10.7 The remains of another wall (**1014**) were exposed at the south-eastern end of the trench, lying parallel to the other excavated walls. This similarly comprised hand-made bricks, with traces of lime-based mortar.



Plate 20: The remains of brick walls exposed in the eastern part of Trench 10, excavated in 2013

- 4.10.8 The trench was overlain by 0.05m tarmac (**1001**) and 0.05m of levelling material (**1002**), which sealed a 0.45m-thick layer of compacted mixed clay loam overburden (**1003**) that contained fragments of brick, stone, ash, cinder and slate. Below this, in the south-eastern part of the trench, between walls **1010** and **1014**, was a 0.12m thick layer of dark cinders (**1004**) with an underlying 0.28m thick layer of mixed dark sandy clay loam (**1005**). This sealed a light brown silty sand (**1006**) containing fragments of brick.

4.11 TRENCH 11

4.11.1 Trench 11 was aligned north-east/south-west, and was placed across the lower terrace in the eastern part of the study area. It was targeted on a row of back-to-back cottages depicted on historical mapping (Fig 2). The trench measured 23 x 2m, and was excavated to a maximum depth of 1.4m (Plate 21). The vestiges of brick-built structures (walls **04** and **05**) were encountered (Fig 13).



Plate 21: General view of Trench 11

4.11.2 A thick deposit of mid-brown to light yellowish-grey gravel (**08**) was exposed at the base of the excavated trench. This material was excavated to depth in a sondage placed across the trench, which showed that layer **08** almost certainly represented the natural geology. It is possible that the upper levels of this deposit had been redeposited as a result of modern landscaping activity associated with the removal of nineteenth-century railway infrastructure, although firm evidence was lacking.

4.11.3 The natural gravel was cut in the south-east corner of the trench by a wall (**04**) composed of hand-made bricks bonded with a lime-based mortar, forming the corner of a building (Fig 13). Wall **04** was two-courses wide, and survived to a maximum height of 0.5m (Plate 22). The location of this wall corresponded with the position of the Union Buildings depicted on the Ordnance Survey map of 1848, and may have presented the corner of a cellar associated with this building. However, no internal floors or other associated features were exposed in the excavated trench.



Plate 22: Wall 04 exposed in the south-east corner of Trench 11

4.11.4 The remains of a second brick-built structure (05) were exposed in the northern part of the trench (Fig 13). This comprised two parallel walls composed of machine-pressed bricks, bonded with a dark grey mortar, indicative of a late nineteenth- or early twentieth-century construction date. Structure 05 was aligned east/west across the trench, and may have represented a drain (Plate 23).



Plate 23: Structure 05 exposed in the northern part of Trench 11

4.11.5 The uppermost levels of the trench comprised a 0.05m layer of compacted cinders and gravel (03), and crushed sandstone blocks (02), which represented a levelling deposit for tarmac (01).

4.12 TRENCH 12

- 4.12.1 Trench 12 measured 20 x 1.65m, and was excavated to a maximum depth of 3.05m (Plate 24). It was aligned north-east/south-west, and was located at the southern side of the Bollings Yard car park. The trench was targeted on the footprint of industrial buildings depicted on historical mapping (Figs 2 and 3).
- 4.12.2 A layer of mid-brown sandy clay (**1211**), clearly representing the natural geology, was exposed at the base of the excavated trench. This appeared to be dipping to the south-west, reflecting the natural topography of the area. The surface of layer **1211** was exposed at a depth of 1.65m at the north-eastern end of the trench, to 2.7m at the south-western end. The natural geology had been cut by a large intrusion at the south-western end of the trench. The fill of this cut comprised a layer of fine yellow sand (**1209**) and a layer of mixed dark clay loam (**1210**), which contained fragments of brick, stone, ash and cinder. These appeared to be fill deposits layers within a large construction cut for a retaining wall at the side of the railway cutting to the south-east.
- 4.12.3 Fills **1209** and **1210** were sealed by a layer of mixed dark clay loam (**1208**), containing ash, stone and cinders, and dark brown sandy loam (**1207**). These layers provided a levelling material for a substantial concrete slab (**1205**), which was exposed at a depth of 0.62m below the modern ground surface in the north-eastern part of the trench. This was sealed beneath a layer of mixed demolition rubble (**1203**), levelling material (**1202**) and tarmac (**1201**).



Plate 24: General view across Trench 12, looking north-east

4.13 TRENCH 13

- 4.13.1 This trench measured 20 x 1.65m, and was excavated to a maximum depth 2m (Plate 25). It was aligned north-east/south-west, and was located at the north side of the Bollings Yard car park. The trench was targeted on the footprint of an industrial building depicted on historical mapping (Figs 2 and 3).
- 4.13.2 A layer of mid-brown sandy clay (**1309**), clearly representing the natural geology, was exposed at the base of the excavated trench at a depth of 2m. This was cut by a series of brick-lined drains (**1306** and **1307**), several live electricity cables in the central part of the trench, and a square-shaped feature filled with black cinders (**1208**) at the south-western end of the trench.
- 4.13.3 The drains and the natural geology in the north-eastern part of the trench were sealed by a concrete slab (**1305**), the top of which was exposed at a depth of 0.9m. The slab provided a solid foundation for a modern brick square structure with a concrete cap (**1204**), the top of which was exposed at a depth of 0.4m.
- 4.13.4 Concrete structure **1305** in the north-eastern part of the trench, and the natural geology in the south-western part, was overlain by a thick deposit of demolition rubble (**1302**). This was sealed beneath levelling material (**1301**) for the modern tarmac surface (**1300**).



Plate 25: General view along Trench 13, looking north-east

4.14 OVERVIEW OF THE FINDS

- 4.14.1 In total, 74 artefacts were recovered from the programme of archaeological evaluation, comprising 51 artefacts from the trenches excavated in 2011, and an additional 24 fragments from 2013. The assemblage was dominated by small pieces of ceramic vessels (55 fragments), which account for the majority of the collected material, with lesser amounts of glass bottles and vessels (eight fragments), clay tobacco pipe (six fragments), and iron (four fragments). Other classes of material commonly recovered from archaeological investigations were present in surprisingly small amounts: only two fragments of animal bones, comprising a fragment of a butchered cow femur and a burnt sheep, were recovered from Trench 10; and industrial residues, comprising tiny fragments of iron-working residues were recovered from Trench 6.
- 4.14.2 The bulk of the assemblage was derived from demolition layers and, as such, is considered as unstratified. The material is mostly domestic in function and can be generally dated to the late eighteenth and twentieth centuries. Most of the objects were domestic in function and of relatively low status.
- 4.14.3 The pottery assemblage comprised fragments of various utilitarian, kitchen and tablewares. The fragments of utilitarian and kitchenwares represented a range of material typical of late eighteenth- and nineteenth-century domestic assemblages, and included storage jars, bottles, jugs, dishes, chamber pots and flower pots. The tablewares included dishes, cups, and bowls, which all appeared to be of a nineteenth- or twentieth-century date.
- 4.14.4 The earliest material within the pottery assemblage comprised a few fragments of coarseware vessels recovered from soil horizons in trenches 2 and 9, together with demolition deposits in Trench 3, to which a seventeenth- or early eighteenth-century date may be ascribed (Plates 26 and 27). The handle of a fineware cup of a similar date was recovered from post hole 48 in Trench 2.
- 4.14.5 The small group of six fragments of clay tobacco pipes comprised short sections of stems, which all had narrow- and medium-sized bores. As a group, the clay tobacco pipes probably have a date range spanning the eighteenth and nineteenth centuries. No maker's marks or stamps were present, and as such their provenance cannot be ascertained.
- 4.14.6 In conclusion, the most interesting artefacts recovered from the evaluation trenches are undoubtedly the fragments of seventeenth-/eighteenth-century pottery recovered from soil horizons in trenches 2, 3 and 9. The remainder of the small finds assemblage is of limited archaeological significance which, in all probability, represents the dumping of domestic refuse on the site during the later nineteenth and twentieth centuries.



Plate 26: Fragments of pottery recovered from layer 42 (Trench 2)



Plate 27: Fragments of pottery recovered from layer 51 (Trench 9)

4.15 PALAEO-ENVIRONMENTAL ASSESSMENT

- 4.15.1 **Quantification:** two environmental bulk samples were taken for the assessment of plant remains during the programme of evaluation trenching: one sample from layer **42** (Trench 2); and a second from layer **51** (Trench 9). The principal objectives of the assessment were to confirm whether the two layers from which the samples were taken represented a buried soil, and to establish the potential for significant palaeo-environmental evidence.
- 4.15.2 **Methodology:** the samples were hand-floated and the flot was collected on a 250 micron mesh and air dried. The flot was scanned with a stereo microscope and the plant material recorded and provisionally identified (Table 1). Botanical nomenclature follows Stace (1997). The total number of seeds and the components of the matrix 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).
- 4.15.3 **Assessment and discussion:** the results of the assessment are shown in Table 1. Both samples contained large amounts of heat-affected vesicular material (HAVM), with both charcoal and coal fragments present. Charcoal was more frequent in layer **42** (Trench 2), and included a mixed assemblage of oak (*Quercus*) and short-lived ring porous taxa, together with roundwood, twigggy pieces and possible heather (*Calluna vulgaris*) charcoal. Charred stems from herbaceous plants were also recorded. A few charred weeds seeds were identified in the sample taken from layer **42** and heather and or heath (*Erica* sp) seeds were recorded with an undifferentiated seed from the daisy/dandelion (*Asteraceae*) family. No charred seeds were identified in the sample taken from layer **51** (Trench 9). Occasional waterlogged or modern seeds were identified in both samples, and these may have been preserved in waterlogged conditions, or they may be modern intrusions.
- 4.15.4 A single fragment of bone was noted the sample taken from layer **51**, whilst insect remains were observed in both samples and, like the seeds, may be preserved either by waterlogging or are intrusive. Slight evidence of metal working was observed in layer **42**.

Trench No	Ctx No	Type	Flot Vol ml	Flot description	Plant remains	Potential
2	42	Layer	450	Charcoal >2mm (5) mixed taxa, round wood, twigggy fragments, cf <i>Calluna vulgaris</i> , charred, herbaceous stems Coal (5), HAVM (5), insect remains (1), modern roots (1), metallic spheres (1)	CPR seeds (1) cf <i>C. vulgaris</i> , undiff Asteraceae WPR/modern seeds (1) <i>Carex</i> ,	Good for charcoal
9	51	Layer	500	Charcoal >2mm (2), Coal (5), HAVM (5), bone (1)	WPR/modern seeds (1) <i>Carex</i> , <i>Rumex</i>	None

Table 1: Assessment of charred and waterlogged plant remains

- 4.15.5 **Conclusion and Potential:** the character of the sampled layer suggests that burnt debris was being discarded in the area, contributing to the build-up of the deposit. The sample taken from layer **42** (Trench 2) contains an interesting assemblage of charred remains, and has the potential to inform an understanding of the fuel types used in Bolton prior to industrialisation. It may also have the potential to inform about possible activities that were taking place, such as smithing or other metal-working activities.
- 4.15.6 Huntley and Stallibrass (1995, 206), Hall and Huntley (2007, 207), and *The North West Regional Research Framework* (Newman and McNeil, 2007), have all highlighted the paucity of archaeobotanical records from post-medieval deposits in northern England, and as this is a period of enormous change it has high potential for research. Hall and Huntley (2007, 255) state that suitable deposits ‘from any site of post-medieval date’ should be studied. It is thus concluded that the charred assemblage recovered from layer **42** has legitimate research potential.
- 4.15.7 This assessment has demonstrated that some charred plant remains have been preserved on the site. It is recommended that the scope of any further archaeological works carried out on the site should include provision for an appropriate programme of environmental sampling.

5. DISCUSSION

5.1 INTRODUCTION

5.1.1 The archaeological evaluation of the site for the proposed transport interchange in Bolton has provided a valuable indication of the nature and extent of the buried archaeological resource within the area. The results obtained from the evaluation have also furnished an indication of the potential of this resource, and specifically the potential to help address a series of archaeological research objectives. These were drawn from the initiatives for archaeological research of the industrial and modern periods stated in the current *Archaeological Research Framework for North West England* (Newman and McNeil 2007; McNeil and Newman 2007), and included:

- *Initiative 6.10*: ‘Sample appropriate deposits for palaeo-environmental evidence wherever possible to gain information on the exploitation of plants and animals...’ (Newman and McNeil 2007, 119). Similarly, Huntley and Stallybrass (1995, 206) and Hall and Huntley (2007, 207) have both highlighted that there are very few archaeobotanical records from post-medieval deposits in northern England, and as this is a period of enormous change it has high potential for research;
- *Initiative 7.6*: ‘A study of the development of workers’ housing in Greater Manchester should be undertaken to examine the development of different housing types...’ (McNeil and Newman 2007, 139);
- *Initiative 7.7*: ‘Study the material culture of industrial workers’ households...’ (*ibid*);
- *Initiative 7.12*: ‘Study the development of the agrarian landscape in those parts of the region that have previously attracted little attention’ (*op cit*, 142);
- *Initiative 7.25*: ‘Where threatened with possible redevelopment excavations are required of now undeveloped and cleared former working class areas regarded as slums’ (*op cit*, 147);
- *Initiative 7.41*: ‘The retention of later period artefacts and their routine analysis as part of all archaeological excavation projects’ (*op cit*, 156).

5.1.2 For the purposes of discussing the archaeological potential, the study area may be usefully considered as comprising two components, based on the topography of the site: the lower terrace in the southern part of the study area; and the upper terrace in the northern part of the site.

5.2 LOWER TERRACE

- 5.2.1 The lower terrace has been investigated quite comprehensively via the excavation of trenches 5, 6, 7, 8 and 11. The survival of archaeological remains within this part of the site seems to reflect largely the route of the nineteenth-century railway cuttings. It seems that the original ground surface was broadly similar to that currently on the upper terrace, around trenches 2, 9 and 10, and sloped gradually downwards to the south and south-east. During the second half of the nineteenth century, the railway was constructed and appears to have entered the area at the south at roughly the present level, running north-west and then descending into a series of the railway cuttings across the site. The banks that currently exist between the lower and upper terraces are the landscaped remnants of the northern side of these railway cuttings. The trenches located within the area of these cuttings showed that nearly all archaeological remains had been removed by the cuttings, and that the area had been filled subsequently with large tips of levelling material, presumably as part of modern landscaping activity. The only structural remains identified in this part of the site were located in Trench 11, where the foundations of a probable cellar associated with the former Union Buildings were exposed.
- 5.2.2 Some structures had survived to the south, in Trench 6, suggesting that there may be foundations surviving in an east/west band at the southern edge of the area, where the railway came in before dropping into the cuttings. However, it seems unlikely that any buried remains will survive between this and the banks to the north (Fig 16).

5.3 UPPER TERRACE

- 5.3.1 The upper terrace has been investigated via the excavation of trenches 1, 2, 3, 9, 10, 11, 12 and 13. This part of the site lies beyond the area destroyed by the railway cuttings, with well-preserved archaeological remains surviving beneath modern surfacing in some places (Fig 16). Several deposits and structural remains of archaeological interest survived within trenches 2, 3, 9 and 10. These included a deposit of garden or ploughsoil of post-medieval origin, which is likely to survive across parts of the upper terrace, offering some potential to yield important artefactual and palaeo-environmental evidence.
- 5.3.2 The well-preserved remains of stone-built structures of probable post-medieval original were also identified. The position of at least one of the structures exposed in Trench 9 corresponds to a building depicted on the enclosure map of 1793. The parallel sections of stone walls exposed in Trench 3 may similarly represent the surviving basement walls from the cottages shown on the historic mapping for the site. It was not possible to establish the layout of these buildings from the remains exposed within the confines of the evaluation trench, although the construction of the walls suggests that these were early workers' houses, with stone block walls and a rubble core, and possibly with later hand-made brick repairs or additions.

- 5.3.3 The archaeological remains exposed in the north-western part of Trench 10, excavated in 2013, suggest that elements of the industrial buildings, possibly dating to the mid-nineteenth century, have survived *in-situ* beneath the modern ground surface in the south-western corner of the site. These appear to have extended further to the north, around the north-eastern end of Trench 9.
- 5.3.4 Archaeological remains across some parts of the upper terrace, however, had clearly been destroyed during the twentieth century. Trench 1 revealed that the area behind the modern buildings on the corner of Johnson Street and Great Moor Street had been heavily disturbed by modern service trenches, and no remains of archaeological significance were observed in that area. Similarly, the eastern part of the proposed development area, investigated via evaluation trenches 11, 12 and 13, were also proven to have been heavily disturbed by works for the railway cutting and later works associated with the construction of the car park. Trenches 12 and 13 both contained a large amount of rubble resulting from the demolition of the nineteenth-century industrial building that had occupied the site, but no evidence of surviving basements was present within the trenches.

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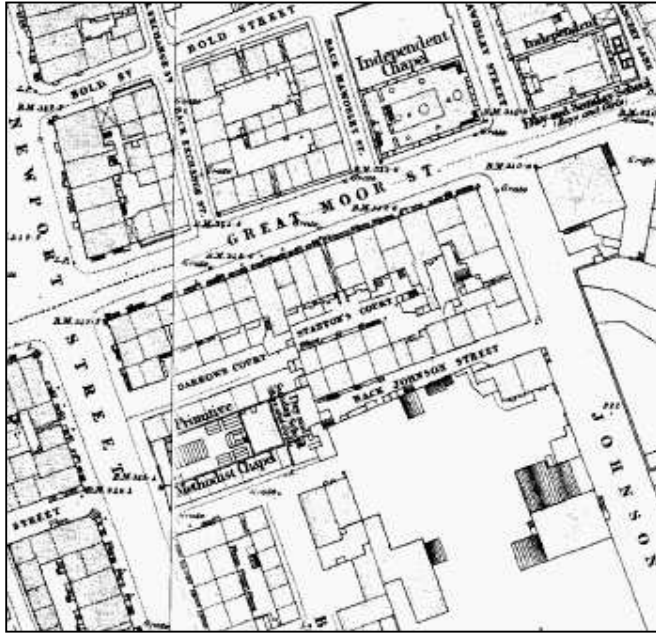
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APPENDIX 1: WRITTEN SCHEME OF INVESTIGATION



Bolton Triangle, Bolton, Greater Manchester

Archaeological Evaluation

Updated Written Scheme of Investigation



Oxford Archaeology North
November 2013

Proposals

The following Updated Written Scheme of Investigation is offered in response to a request from AECOM to carry out a second stage of archaeological evaluation of land situated between Bradshawgate, Great Moor Street, Newport Street and Bolton train station, in Bolton, Greater Manchester.

1. BACKGROUND

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 AECOM, acting on behalf of Transport for Greater Manchester (TfGM), has invited Oxford Archaeology North to submit an Updated Written Scheme of Investigation for a programme of archaeological evaluation trenching of land in Bolton, Greater Manchester (centred at NGR 371810 408940). The site is bounded by Bradshawgate, Great Moor Street, Newport Street and Bolton train station, and is used presently for car-parking purposes.

1.1.2 The scheme of trenching forms a second stage of archaeological evaluation of the site. The first stage of works, carried out in June and July 2011, comprised the excavation of nine trial trenches, which were targeted on the footprint of buildings depicted on historical maps. The results obtained from these trenches indicated that buried archaeological remains of considerable local and potentially regional interest survive *in-situ* across the northern part of the study area, occupying the higher ground to the south of Bollings Yard. In particular, structural remains and buried soil horizons dating provisionally to the seventeenth and eighteenth centuries were exposed at depths less than 1m below the modern ground surface. These remains offer some potential to address selective objectives drawn from the initiatives for archaeological research of the industrial and modern periods stated in the current Archaeological Research Framework for North West England. Conversely, the trial trenches placed across the southern part of the site, occupying the lower ground adjacent to the railway, revealed that development and landscaping works carried out after the mid-nineteenth century have destroyed most archaeological remains in this area (OA North 2011).

1.1.3 The current, second stage of evaluation, will comprise the excavation of an additional six trenches across the northern part of the study area. These will be placed in the locations specified in the original Written Scheme of Investigation, and shown in Figures 1 and 2.

1.2 OXFORD ARCHAEOLOGY

1.2.1 Oxford Archaeology has over 35 years of experience in professional archaeology, and can provide a professional and cost effective service. OA is an Institute for Archaeologists Registered Organisation (No 17), and is thus bound by the IfA's Code of Conduct and required to apply the IfA's quality standards. All work on the project will be undertaken in accordance with relevant professional standards, including:

- IfA's *Code of Conduct*, (1999); *Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology*, (1999);
- *The European Association of Archaeologists Principles of Conduct for Archaeologists Involved in Contract Archaeological Work* (1998).

2. METHOD STATEMENT

2.1 TRENCHING RATIONALE

2.1.1 The original Written Scheme of Investigation (WSI), devised by AECOM in 2011, allowed for the excavation of 13 trenches. The positions of the trenches were targeted on a range of buildings and features that represent the development of Bolton from the late eighteenth century as an industrial town of regional importance. Eight of these trenches were partially or wholly excavated in 2011, although access to the remaining trenches was not possible. The current, second stage of works, is intended to complete the scope of evaluation that was specified originally. This will involve the complete excavation of four trenches (1, 3, 12 and 13), and elements of two trenches (9 and 10) that were excavated partially in 2011. In addition, a contingency 10m of trenching may be excavated should any archaeological remains be exposed which require further clarification as to their nature, date or function. The contingency trenching will only be implemented following consultation with AECOM and the curatorial archaeologist with the Greater Manchester Archaeological Advisory Service (GMAAS).

- *Trench 1:* will be placed in the north-western part of the study area, and will be aligned broadly north/south parallel to Johnson Street. It will measure 10 x 2m, and will be targeted on the footprint of single-depth workers' housing fronting onto Back Johnson Street, depicted on the Ordnance Survey map of 1848 (Figure 1);
- *Trench 3:* this trench will similarly be placed in the north-western part of the study area, and will be targeted on the footprint of a row of back-to-back cottages along Back Johnson Street depicted on the Ordnance Survey map of 1848 (Figure 1). The trench will be aligned broadly east/west, and will measure 15 x 2m;
- *Trench 9:* the majority of this trench was excavated in 2011. Archaeological remains of interest dating to the post-medieval period were encountered, including buried soil horizons and stone walls. The remaining element of this trench will measure 5 x 2m;
- *Trench 10:* much of this trench was similarly excavated in 2011. The remaining portion will measure 12 x 2m, and will be targeted on the footprint of domestic buildings shown on historical mapping;
- *Trench 12:* this trench will measure 20 x 2m, and is intended to investigate former industrial buildings in the north-eastern part of the study area;
- *Trench 13:* this trench will measure 20 x 2m, and will be aligned north-east/south-west across the footprint of a former industrial building.

2.1 METHODOLOGY

- 2.2.1 Excavation of the uppermost levels of modern overburden/demolition material will be undertaken by a machine of appropriate power fitted with a toothless ditching bucket to the top of the first significant archaeological level. The work will be supervised closely by a suitably experienced archaeologist. Spoil from the excavation will be stored in a stockpile, and then returned to the excavation area upon completion of the archaeological works.
- 2.2.2 Machine excavation will then be used to define carefully the extent of any surviving structures and other remains. Thereafter, structural remains will be cleaned manually to define their extent, nature, form and function.
- 2.2.3 Archaeological structures and features will be recorded using *pro-forma* sheets which are in accordance with those used by CfA. Similar object record and photographic record *pro-formas* will be used. All written recording of survey data, contexts, artefacts and ecofacts will be cross referencable from *pro-forma* record sheets using sequential numbering.
- 2.2.4 A full and detailed photographic record of individual contexts will be maintained and similarly general views from standard view points of the overall site at all stages of the excavation will be generated. Photography will be undertaken digital photography, and records will be maintained on special photographic *pro-forma* sheets.
- 2.2.5 ***Finds policy:*** finds recovery and sampling programmes will be in accordance with best practice (following current Institute for Archaeologists' guidelines) and subject to expert advice in order to minimise deterioration. OA has close contact with Ancient Monuments Laboratory staff at the University of Durham and, in addition, employs in-house artefact specialists with considerable expertise in the finds management of sites of all periods and types, who are readily available for consultation.
- 2.2.6 ***Sampling Strategy:*** a programme of palaeoenvironmental sampling will be undertaken in accordance with the guidelines provided by English Heritage (2002). The sampling programme will proceed under the guidance of the in-house palaeoenvironmental expertise (Elizabeth Huckerby).
- 2.2.7 Samples will be collected for technological, pedological, palaeoenvironmental and chronological analysis as appropriate and subject to palaeoenvironmental survival. Samples for deposit characterisation, potential radiocarbon dating, and macrofossil analysis will be between 40 and 60 litres in volume. Flotation of suitable samples will be undertaken off site following completion of the fieldwork. Any requirement for detailed analysis would be undertaken using the laboratory facilities of the Institute of Environmental and Biological Sciences at Lancaster University, to which OA North has full access.



Figure 1: Trench location superimposed on the Ordnance Survey map of 1848

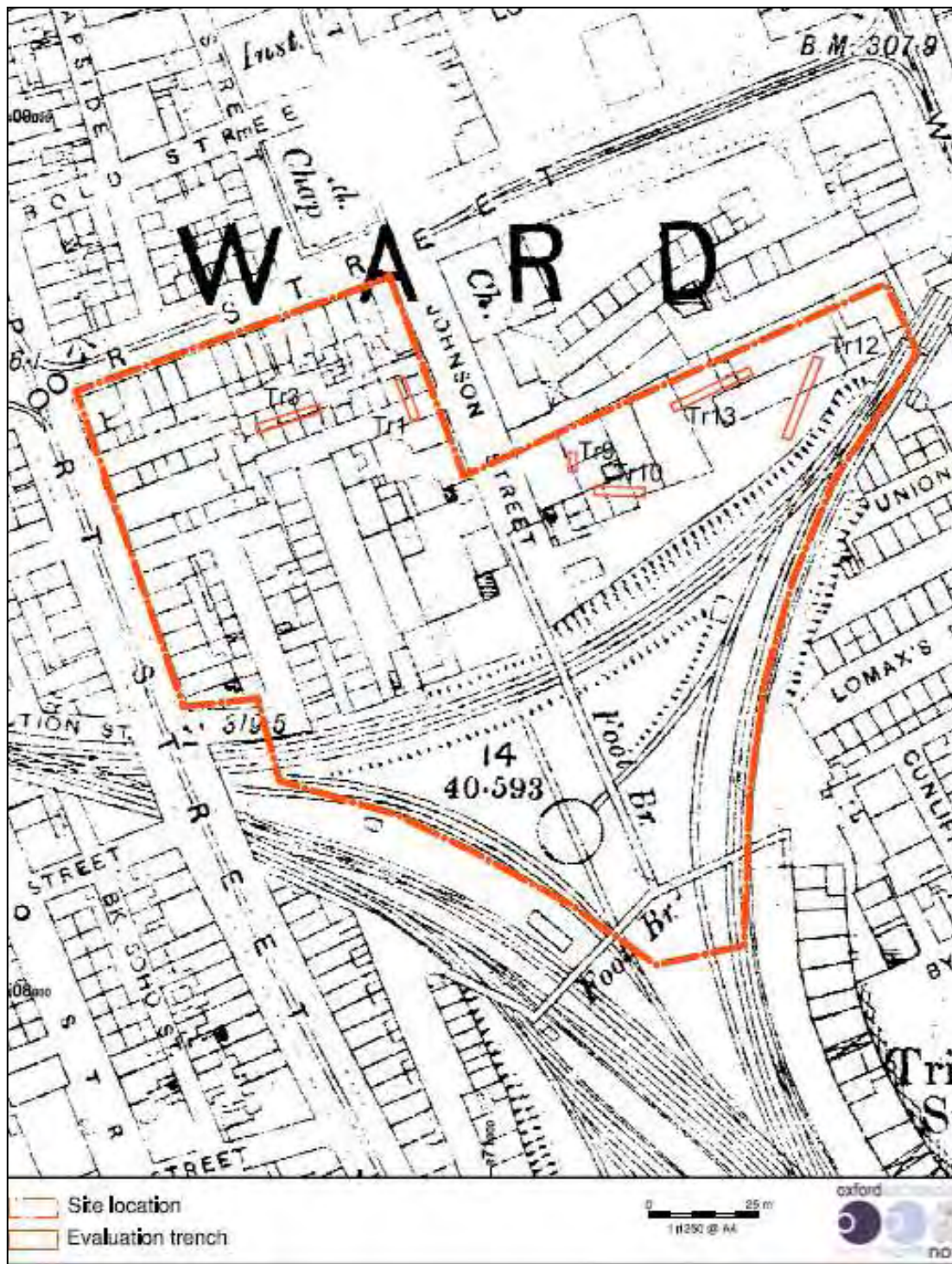


Figure 2: Trench location superimposed on the Ordnance Survey map of 1893

- 2.2.8 **Report:** the results obtained from the evaluation trenching will be presented as an addendum to the report compiled following the first stage of evaluation in 2011. The combined, written synthetic report will be submitted to the Client for comment within four weeks of completion of fieldwork. The report will be produced in accordance with the guidelines of *MAP2* and *MoRPHE*, and will include: a title page detailing site address; author/originating body; client's name and address; a non-technical summary of the findings of the fieldwork; a description of the archaeological background; a description of the methodologies used during the fieldwork; a description of the findings of the fieldwork; plans of each of the trenches showing the archaeological features exposed; interpretation of the archaeological features exposed and their context within the surrounding landscape; specialist assessment reports on the artefactual/ecofactual/industrial remains from the site; appropriate photographs of specific archaeological features; a plan showing areas of archaeological sensitivity as defined by the evaluation; a consideration of the importance of the archaeological remains present on the site in local, regional and national terms; and recommendations for further archaeological work, if any, that would be appropriate to mitigate the impact of the development proposals.
- 2.2.9 **Archive:** the results of the archaeological investigation will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects, 2nd edition, 1991*) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990). 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. As part of the archiving process, the on-line OASIS (On-line Access to Index of Archaeological Investigations) form will be completed.
- 2.2.10 **Timescales:** it is anticipated that the evaluation trenching will be carried out as a continuous programme of works. A two-week period should be allowed to complete the works, including the initial reinstatement of the trenches.
- 2.2.11 On the first day of the fieldwork, OA North will accurately locate through measured survey the exact position of the trenches to be excavated. The trench locations will then be scanned for live services with a CAT prior to any mechanical excavation.

2.3 HEALTH AND SAFETY

- 2.3.1 OA North provides a Health and Safety Statement for all projects and maintains a Safety Policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (3rd Edition, 1997).
- 2.3.2 OA North undertakes to safeguard, so far as is reasonably practicable, the health, safety and welfare of its staff and of others who may be affected by our work. This applies in particular to providing and maintaining suitable premises, ensuring the safety of all equipment supplied by the Company, and providing all reasonable safeguards and precautions against accidents. OA North will also take all reasonable steps to ensure the health and safety of all persons not in their employment, such as volunteers, students, visitors, and members of the public (this includes trespassers).
- 2.3.3 OA North is fully familiar with and will comply with all current and relevant legislation, including, but not limited to:
- The Health and Safety at Work Act (1974);
 - Management of Health and Safety at Work Regulations (1999);
 - Manual Handling Operations Regulations 1992 (as amended in 2002);
 - The Construction (Design and Management) Regulations (2007);
 - The Control of Asbestos Regulations (2006);
 - Confined Spaces Regulations (1997);
 - The Workplace (Health, Safety and Welfare) Regulations (1992);
 - Construction (Health, Safety and Welfare) Regulations (1996);
 - The Health and Safety (Miscellaneous Amendments) Regulations (2002);
 - The Work at Height Regulations (2005);
 - The Control of Substances Hazardous to Health Regulations (2002);
 - The Health and Safety (First-Aid) Regulations (1981);
 - The Regulatory Reform (Fire Safety) Order (2005);
 - The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995);
 - The Provision and Use of Work Equipment Regulations (1998);
 - Lifting Operations and Lifting Equipment Regulations (1998).
- 2.3.4 **Insurance:** OA North has professional indemnity to a value of £2,000,000, employer's liability cover to a value of £10,000,000 and public liability to a value of £15,000,000.

2.4 STAFFING PROPOSALS

- 2.4.1 The project will be under the overall charge of **Ian Miller BA FSA** (OA North Senior Project Manager) to whom all correspondence should be addressed.
- 2.4.2 The evaluation will be directed by **Graham Mottershead** (OA North Project Officer). Graham has developed considerable expertise of industrial buildings and excavating historic industrial sites, particularly in Greater Manchester. Graham directed the initial stage of archaeological evaluation of the Bolton Triangle site.
- 2.4.3 Assessment of other finds categories will be undertaken by OA North's in-house finds specialist **Christine Howard-Davis BA** (OA North Finds Manager). Christine has extensive knowledge of all finds of all periods from archaeological sites in northern England.
- 2.4.4 **Elizabeth Huckerby BA MSc MIFA** (OA North Environmental Manager) is OA North's palaeoenvironmental advisor, providing technical input not just to analysis but also in the design of sampling strategies, including for dating purposes. She has extensive knowledge of the palaeoecology of the North West, and has contributed to all of the English Heritage-funded volumes of the Wetlands of the North West. Elizabeth has also undertaken palaeoenvironmental work for a variety of projects including Davenham Moss (Cheshire), Briarfield (Lancashire), Littlewater (Cumbria), and the medieval moated farmstead at Risleigh (Cheshire).
- 2.4.5 Any requirement for conservation work will be undertaken by **Jennifer Jones**, the AML contract conservator based at the University of Durham. Jennifer is a nationally-recognised specialist in conservation, and is readily available to provide advice on the treatment of any finds recovered from the evaluation.
- 2.4.6 It is not possible at this stage to provide details of the archaeological technicians that will be involved in the project, although all will have the relevant experience of industrial archaeology.

2.5 MONITORING

- 2.5.1 Monitoring meetings will be established with the Client and the archaeological curator at the outset of the project. The aims of monitoring are to ensure that the archaeological works are undertaken within the limits set by the WSI, and to the satisfaction of the curatorial archaeologist at GMAAS. The curatorial archaeologist will be given at least five days' notice of when work is due to commence, and will be free to visit the site by prior arrangement with the project director.

ILLUSTRATIONS

Figures

Figure 1: Location map

Figure 2: Location of the evaluation trenches superimposed on the Ordnance Survey map of 1848

Figure 3: Location of the evaluation trenches superimposed on the Ordnance Survey map of 1893

Figure 4: Plan of Trench 1

Figure 5: Plan and section of Trench 2

Figure 6: Plan of Trench 3

Figure 7: Plan and section of Trench 5

Figure 8: Plan of Trench 6

Figure 9: Plan of Trench 7

Figure 10: Plan of Trench 8

Figure 11: Plan and section of Trench 9

Figure 12: Plan of Trench 10

Figure 13: Plan of Trench 11

Figure 14: Plan of Trench 12

Figure 15: Plan of Trench 13



Figure 1: Site location



Figure 2: Excavated trenches superimposed on the Ordnance Survey map of 1848

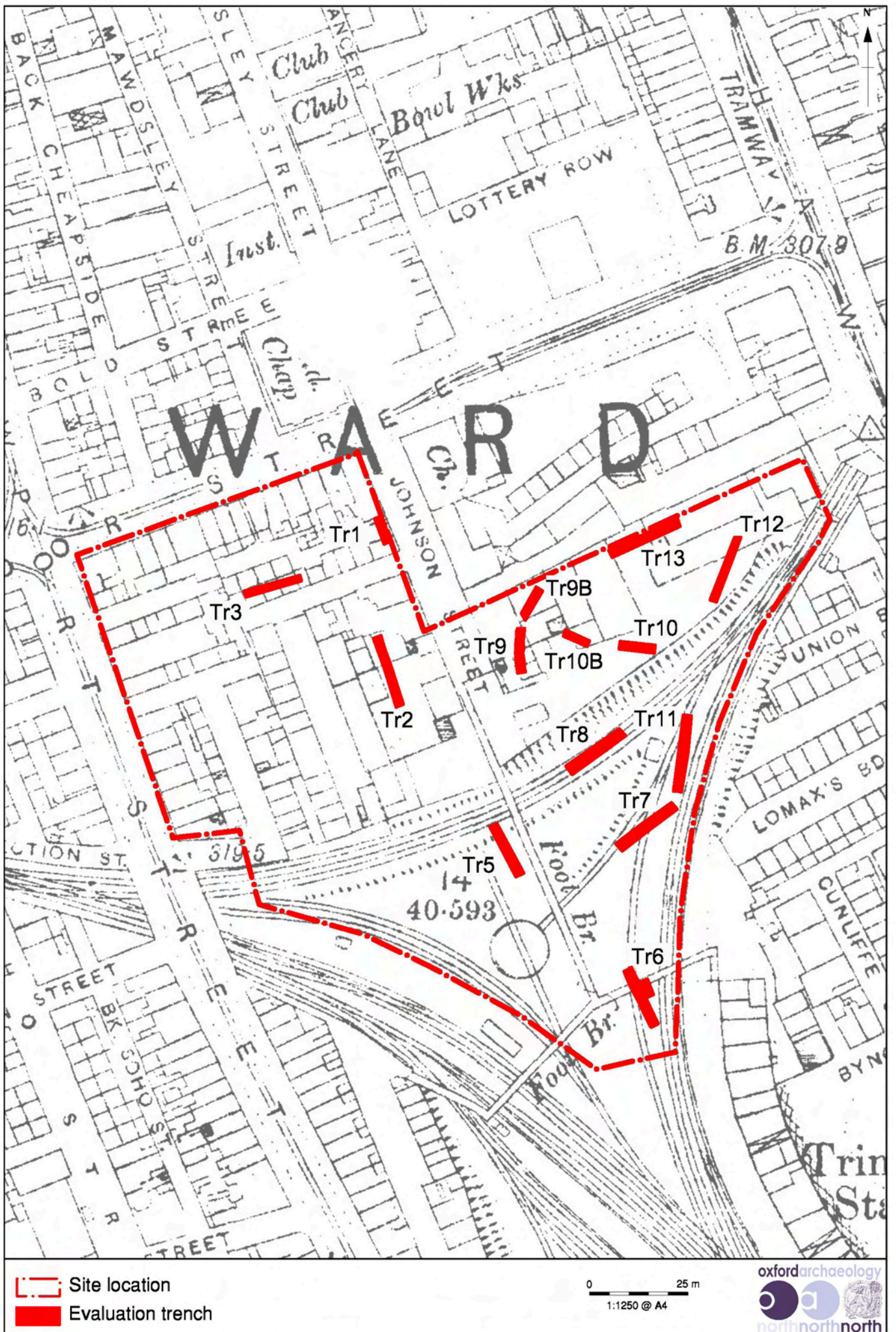
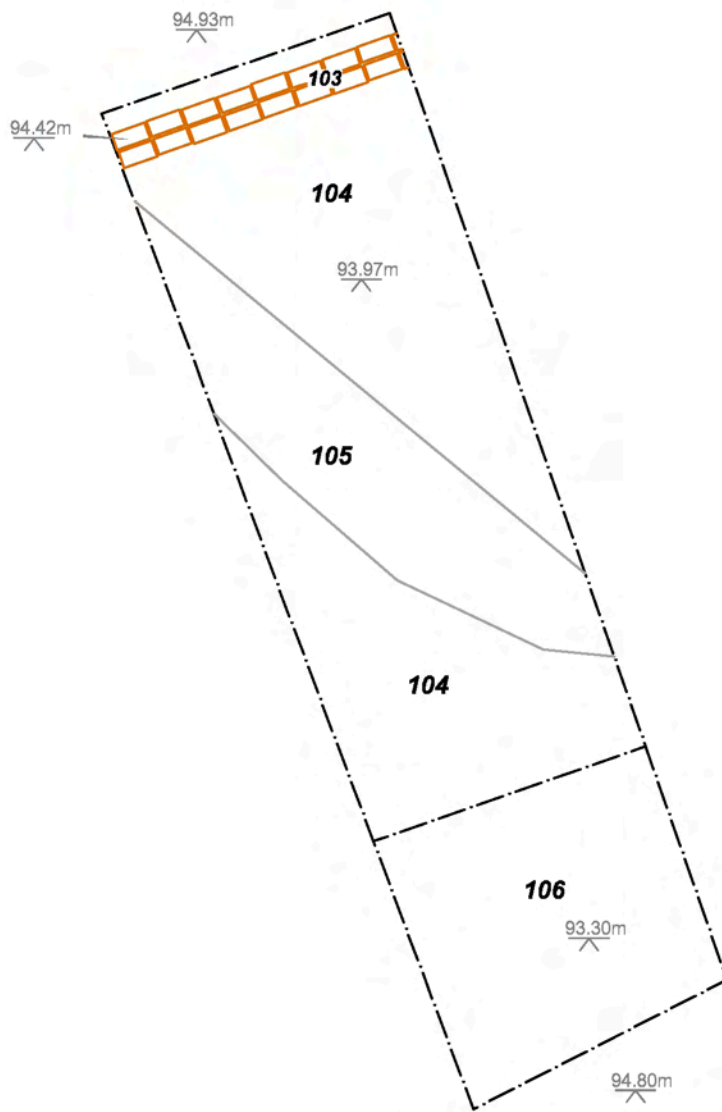


Figure 3: Excavated trenches superimposed on the Ordnance Survey map of 1893



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Figure 4: Plan of Trench 1

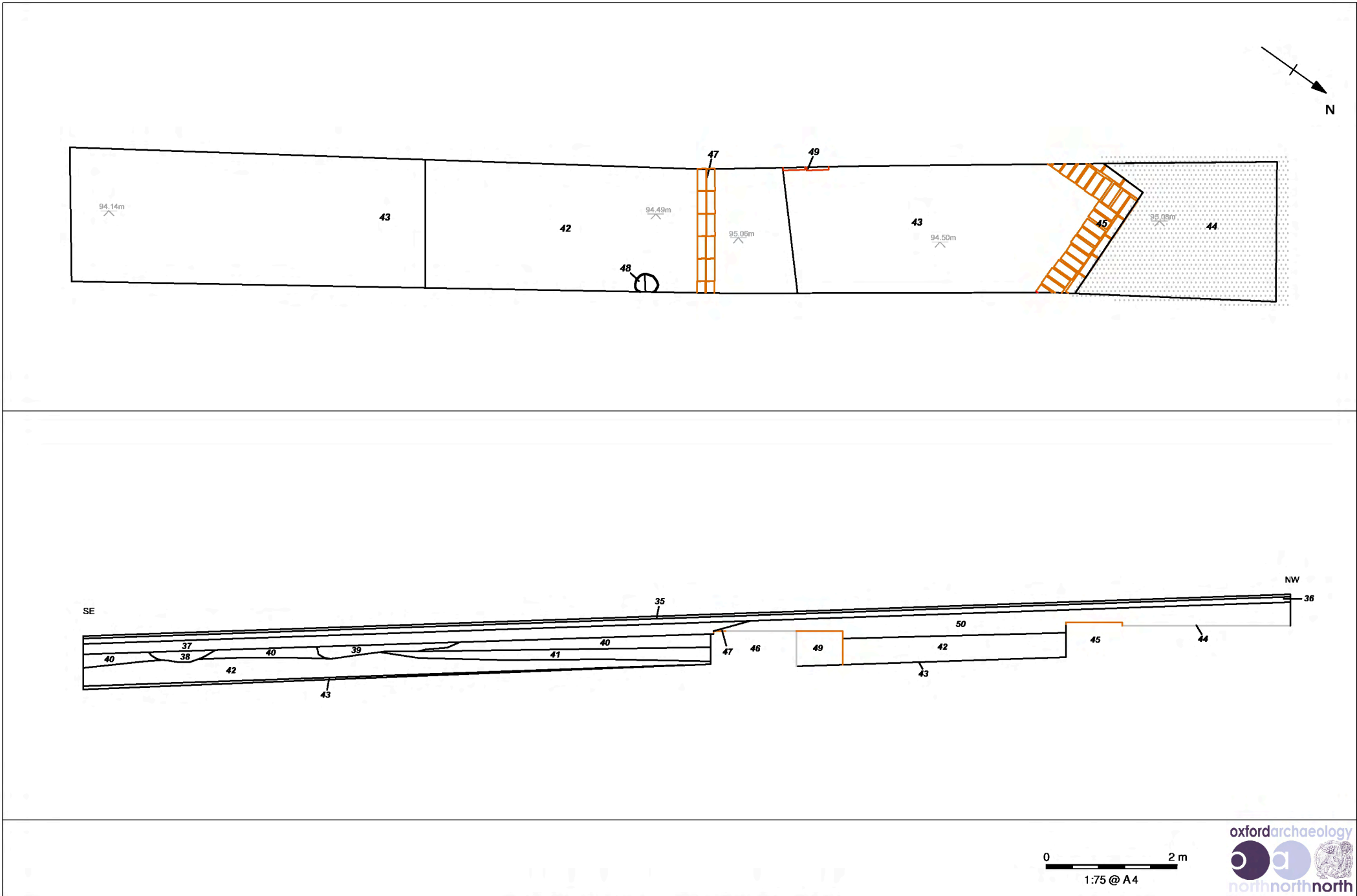
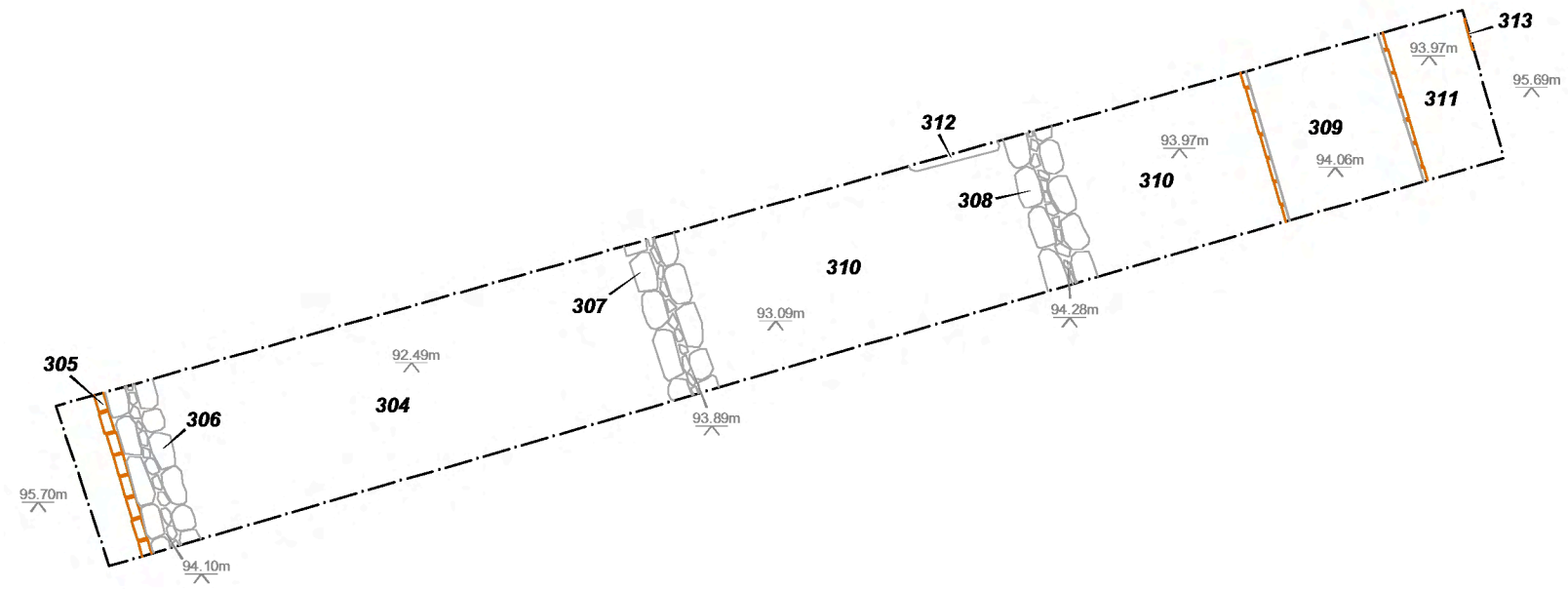
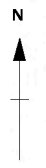
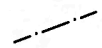


Figure 5: Plan and section of Trench 2



 Limit of excavation

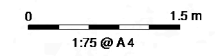


Figure 6: Plan of Trench 3

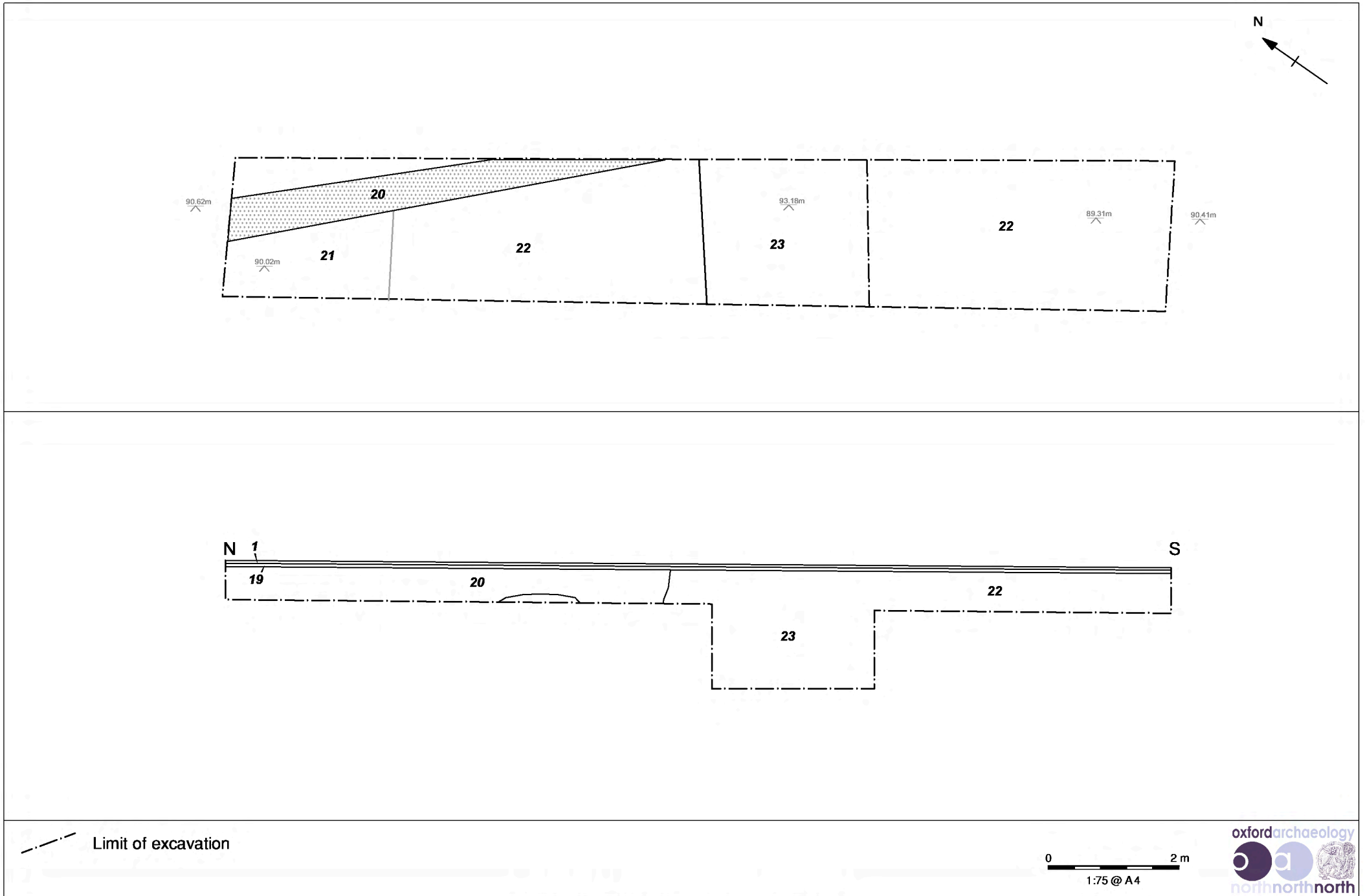
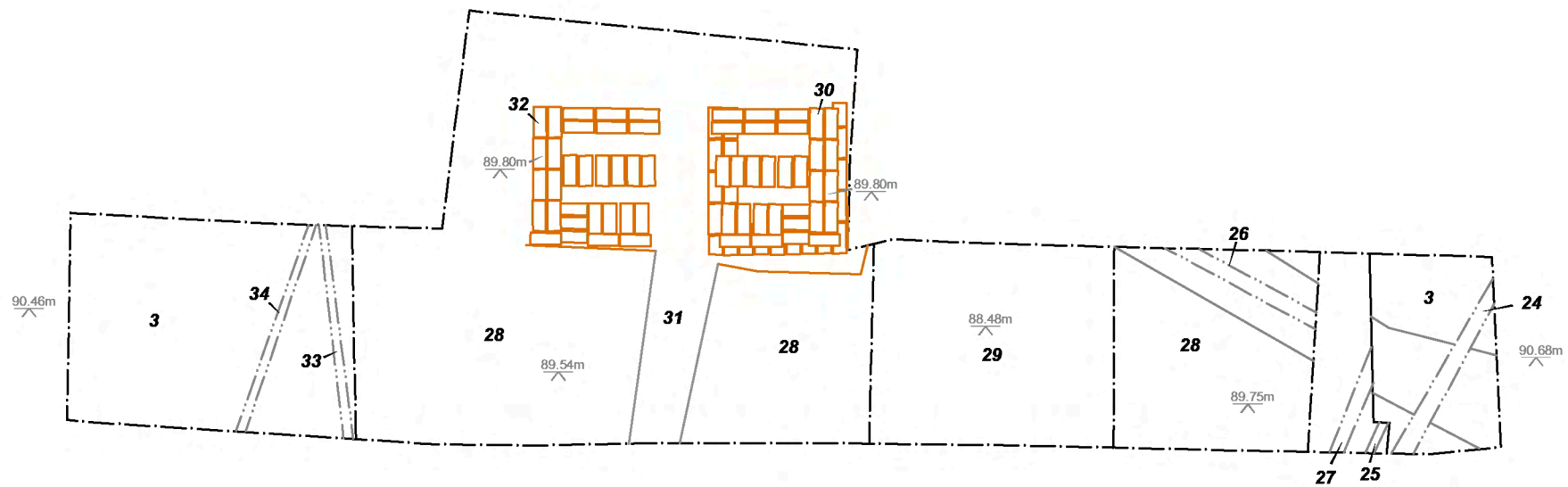
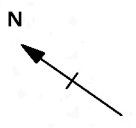


Figure 7: Plan and section of Trench 5



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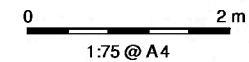


Figure 8: Plan of Trench 6

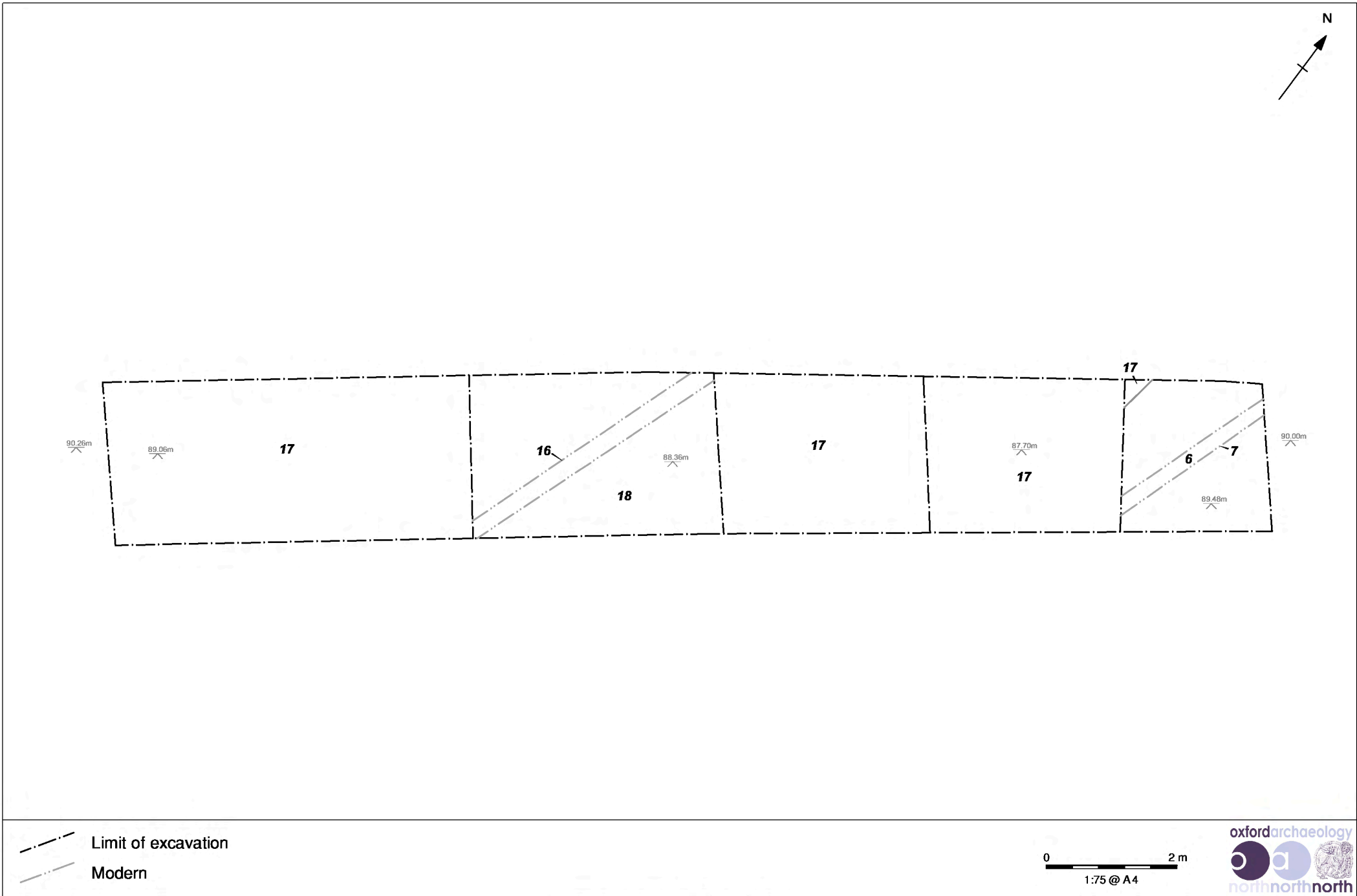


Figure 9: Plan of Trench 7

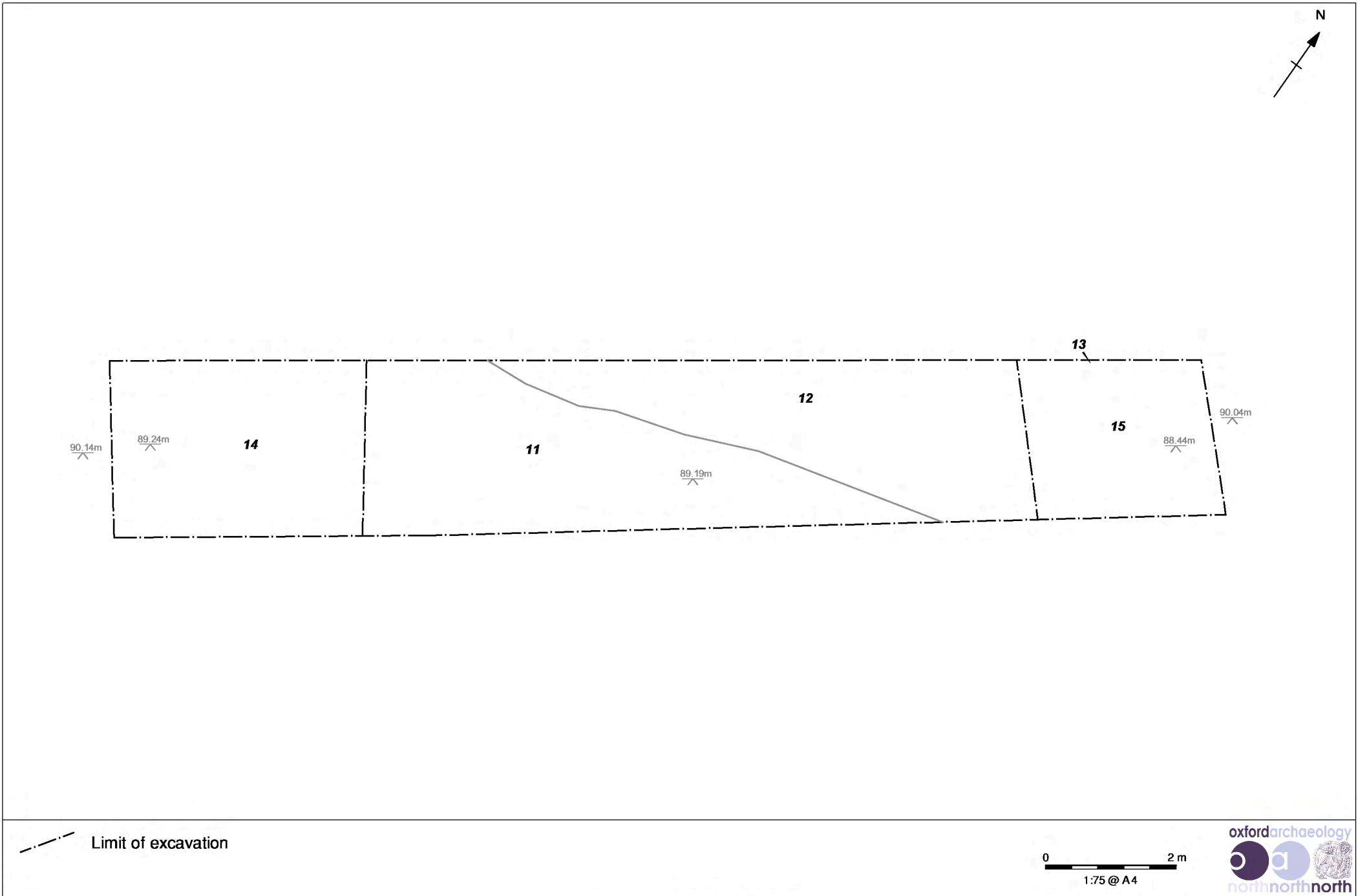
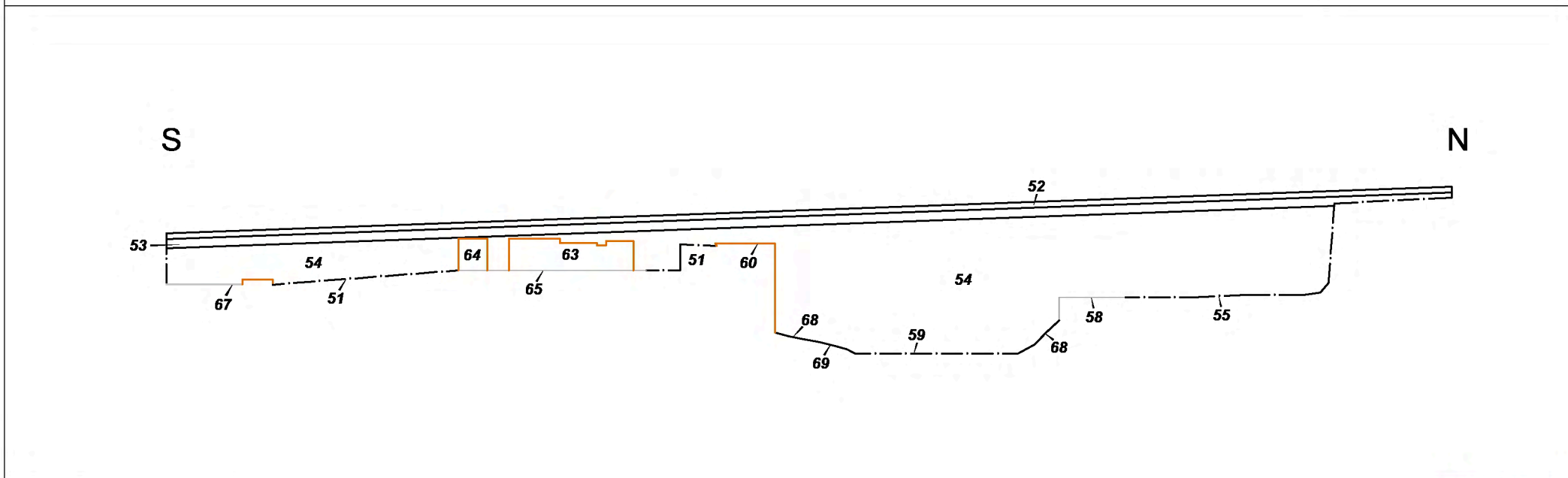
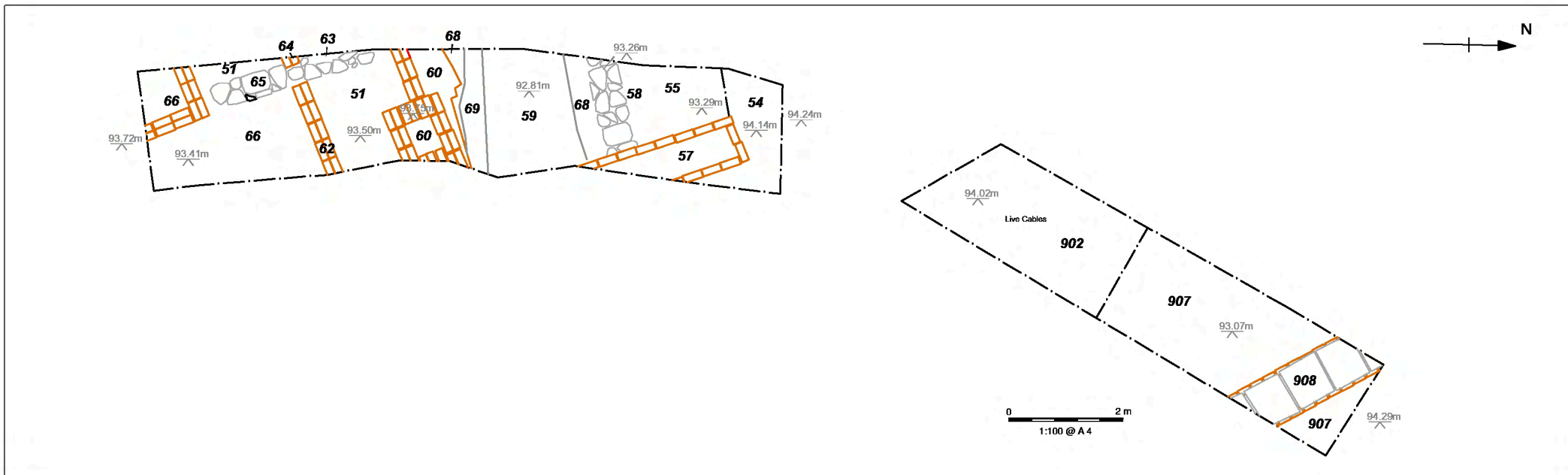


Figure 10: Plan of Trench 8

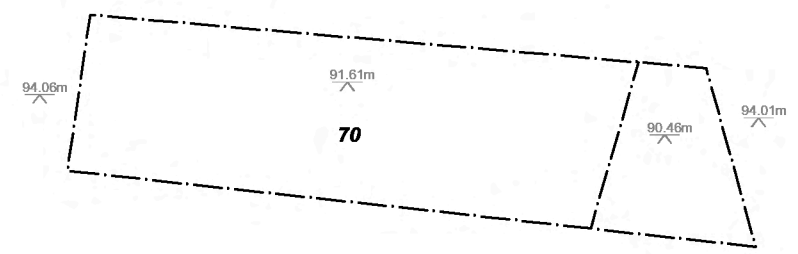
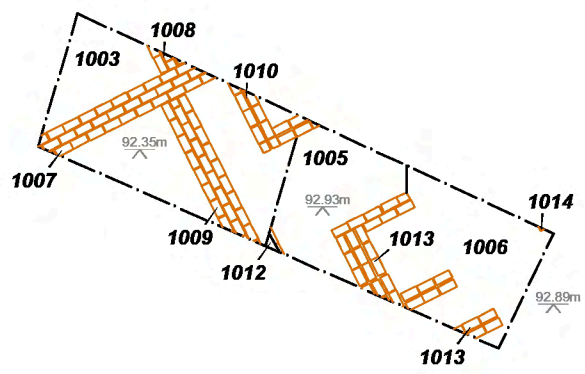


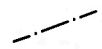
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Figure 11: Plan and section of Trench 9



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1:100 @ A4



Figure 12: Plan of Trench 10

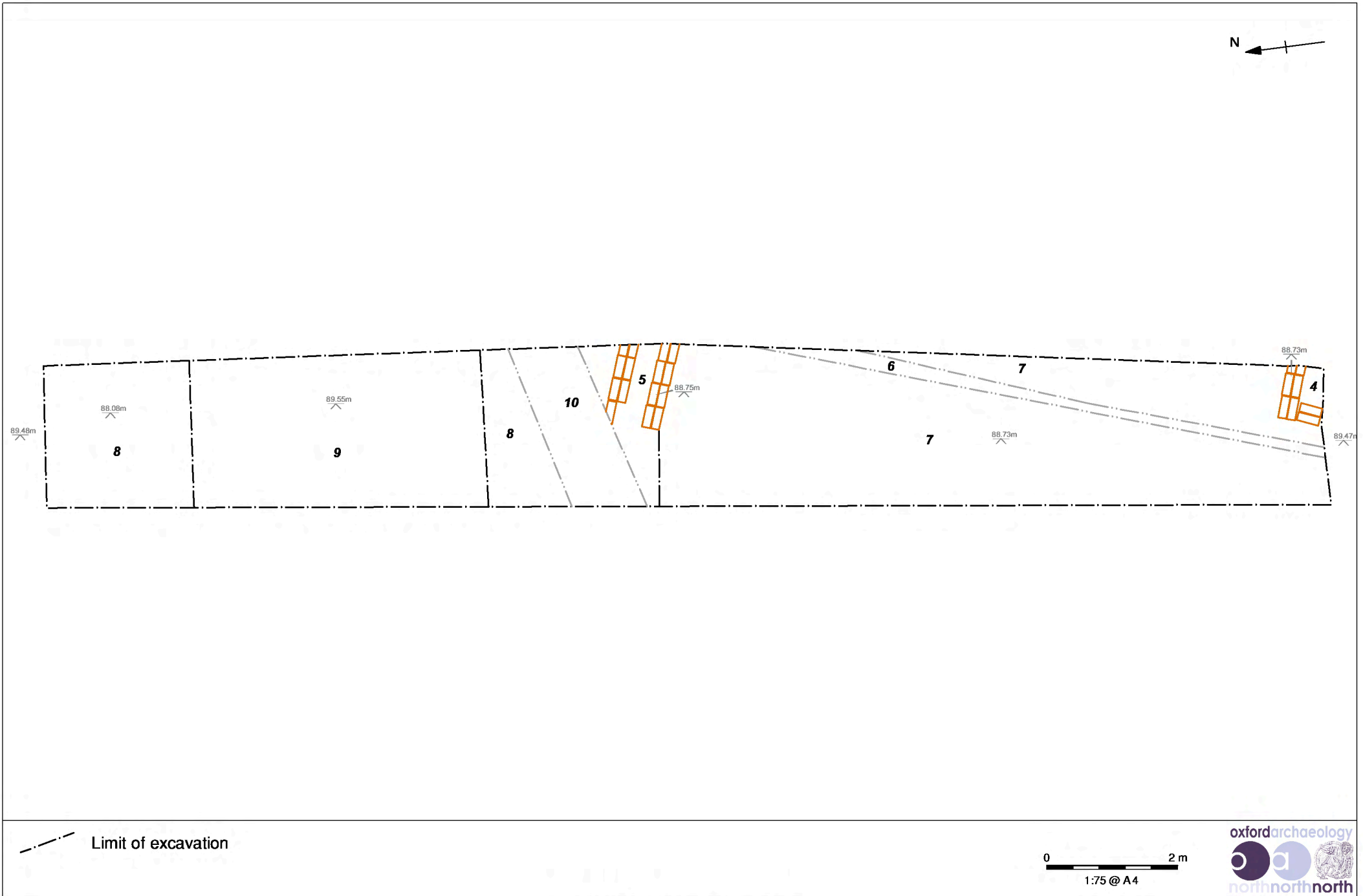
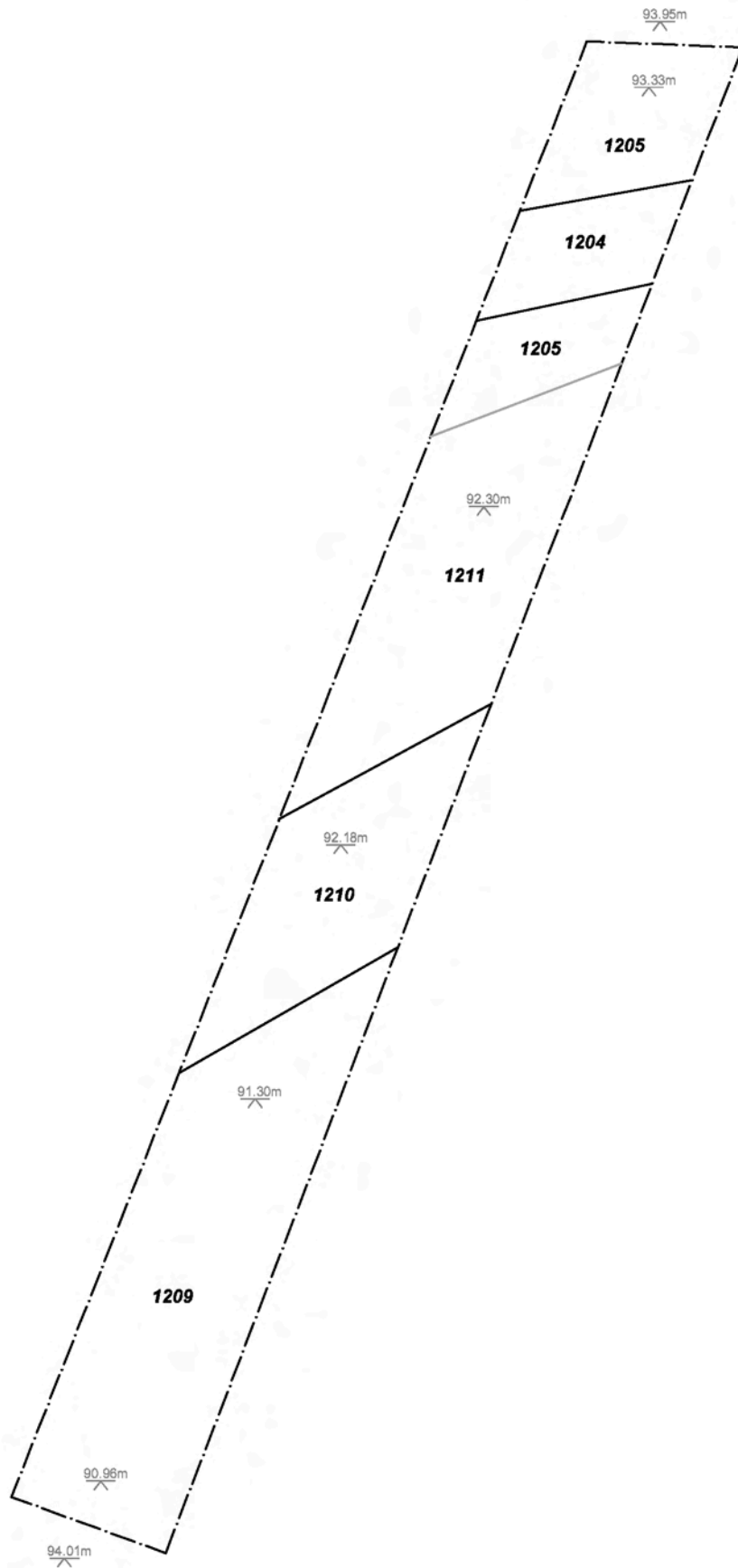


Figure 13: Plan of Trench 11



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Figure 14: Plan of Trench 12

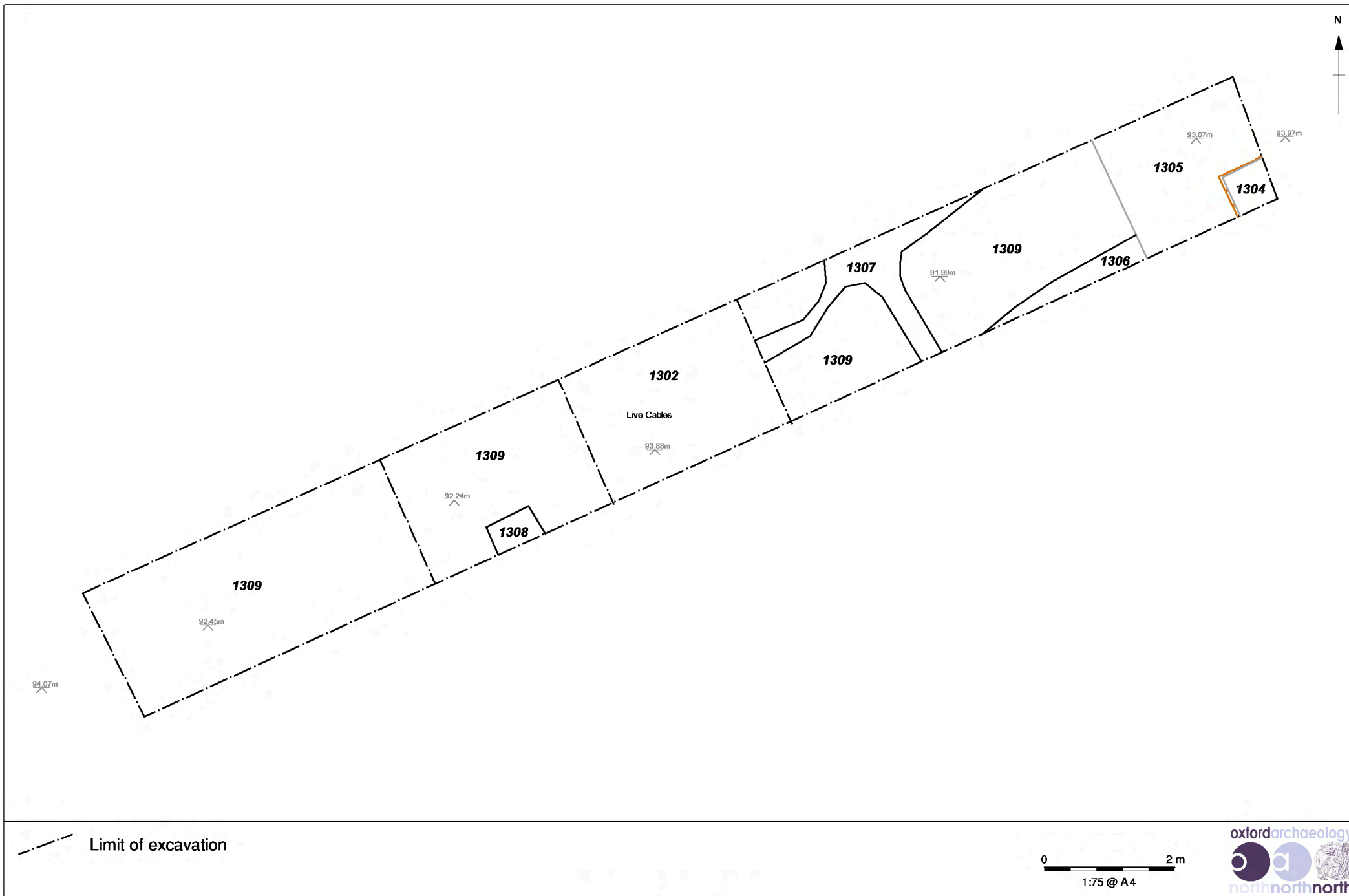


Figure 15: Plan of Trench 13