NET Phase Two, Archaeological Watching Brief.

UBU, University Boulevard, B8/9 looking Northeast

For VINCI Construction UK Ltd

Prepared by R. Humphreys and M. Dodd

Report Number: 070/2015

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Client Name:	VINCI Construction UK Ltd / TWA JV
Document Title:	NET Phase Two, Report on an Archaeological Watching Brief
Document Type:	Final Report
Issue/Version Number:	v1.0
TPA Site Code:	CED / UBU / MWN / WTB / FBC / CES
Report No.	070/2015

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Report Number	070/2015
Status	Version 1.0

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SUMMARY

- The NET Phase Two development proposed to build two extensions to the existing NET Line One tram network within Nottingham. These will add 17.5 km to the existing network, bringing it to a total of 32km. The two routes link directly into NET Line One at Nottingham Railway Station.
- Trent and Peak Archaeology (TPA), part of the York Archaeological Trust, were contracted by VINCI Construction UK Ltd to undertake intermittent watching brief/archaeological investigation during the construction of the NET Phase Two trackbed and utilities installation.
- Following the production of a Desk-bsed Assessment (Brown & Kinsley 2006) and an Environment Statement (ES 2006), the following sections were identified for monitoring as part of the watching brief:

    - Chilwell Eskdale Drive (CED)
    - University Boulevard (UBU)
    - Meadows Way Nottingham (MWN)
    - Wilford Toll Bridge (WTB)
    - Fairham Brook Clifton (FBC)
    - Clifton Southchurch Drive (CES)

- The archaeological evidence brought to light during the various stages of watching brief, was generally very low, both in terms of artefacts and features. The most significant results related to palaeo-environmental evidence for prehistoric landscapes along University Boulevard. Particularly for its contribution to our understanding of Bronze Age artefacts previously recovered during the construction of the University lake.

- A small amount of unstratified worked flint was recovered from Fairham Brook, likely dating to the Neolithic and Bronze Age periods. Although no contemporary archaeological features were revealed.

- Generally the impact depth was insufficient to expose deposits of archaeological importance. This was particularly relevant through the more heavily developed sections such as Meadows Way. In the remaining areas, that had not seen substantial modern development, archaeological horizons were more readily observed, although the depositional character of these areas (for example flood plain deposits on University Boulevard) meant that limited human activity had taken place.

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Prepared by R. Humphreys and M. Dodd

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1. INTRODUCTION

1.1 NET Phase Two development comprised two extensions to the existing NET Line One tram network within Nottingham. Upon completion, these will add 17.5 km to the existing network, bringing it to a total of 32km. The two routes link directly into NET Line One at Nottingham Railway Station. The extensions comprise the following:

- A 10km Chilwell route serving the Meadows, the NG2 (former Royal Ordnance Factory) development site, the area's main hospital at QMC, the University of Nottingham, Beeston Town Centre and Chilwell before terminating at Toton Park & Ride site.
- A 7.5 km Clifton route serving the Meadows, the Wilford and Ruddington Lane area, and the Clifton Estate before terminating at Clifton Park & Ride site.

1.2 Trent & Peak Archaeology (TPA), part of the York Archaeological Trust, were contracted by VINCI Construction UK Ltd to undertake intermittent watching brief/archaeological investigation during the construction of the NET Phase Two trackbed and utilities installation.

1.3 Preliminary utilities work commenced in mid 2012, with track bed construction commencing at the beginning of 2013 and continuing until mid 2014. This report presents the results of the archaeological watching brief undertaken by TPA along the route of the development.

2. PROJECT BACKGROUND

2.1 The Chilwell and Clifton routes were the subject of a desk-based study (Brown & Kinsley 2004), later revised to take account of minor route alterations (Brown & Kinsley 2006). An Environmental Statement has been presented by ERM (ES 2006), where Archaeology and Cultural Heritage was dealt with in Chapter 11. Since 2006 there has been little significant change in the route, except that the route no longer passes through the University Park Archaeological Constraints Area. Monitoring of geotechnical ground investigations by SLR Consulting Limited (SLR) has provided further information (SLR 2009A).

2.2 SLR were informed by Mott MacDonald that a planning condition (NET.P6/11) had been imposed on the scheme as follows:

> *"No part of the development within or immediately adjacent to an area which is identified in Tables 11.1 to 11.3 of the Environmental Statement as being of medium or high archaeological potential can commence until a scheme to deal with any archaeological remains on the land covered by that part has been submitted to and approved by the local planning authority.*
>
> *The scheme shall also identify areas where a watching brief is required and also the appropriate measures to be taken during and after construction should any significant archaeological remains be found. The scheme shall also require that any archaeological works carried out on site shall be by a suitably qualified investigating body acceptable to the local planning authority."*

2.3 The Environmental Statement (ES) submitted for the NET schemes (Tables 11.1-11.3 and desk-based study) divided the routes into the following areas of archaeological potential:

- City Centre (combined Chilwell and Clifton routes)
  - Nottingham Station and Meadows Way (low potential)
- Chilwell

- Meadows Way: site of Civil War Fort (medium potential)
- Lenton Priory: remains of priory and village (high potential)
- University Park: village and prehistoric remains (medium potential)
- Beeston: village remains (medium potential)
- Chilwell Terminus: currently-unknown remains, possibly of prehistoric / Roman date (medium potential)
- All other sections of route (low potential)

- Clifton
  - Wilford Toll Bridge: listed building (low potential)
  - Wilford Village Archaeological Constraints Area: village remains (medium potential);
  - Fairham Brook: prehistoric remains (medium potential);
  - Clifton Archaeological Constraints Area: village remains (medium potential)
  - The Farmhouse, Clifton Terminus: currently-unknown remains, possibly of prehistoric / Roman date (medium potential)
  - All other sections of route (low potential).

2.4 SLR were commissioned by Mott MacDonald to prepare a 'scheme to deal with any archaeological remains' for areas of low archaeological potential on both routes, as identified in the ES (SLR 2009b).

2.5 This report details the results of the subsequent program of archaeological watching brief that monitored development work in the following areas (Figure 1):

- Chilwell Eskdale Drive (CED)
- University Boulevard (UBU)
- Meadows Way Nottingham (MWN)
- Wilford Toll Bridge (WTB)
- Fairham Brook Clifton (FBC)
- Clifton Southchurch Drive (CES)

2.6 Mitigation in the form of archaeological watching brief also took place within the areas of high archaeological potential – alongside targeted excavations. The observations from these sites have been included in separate reports, alongside the results of the detailed excavations that took place. The watching brief areas were as follows:

- Beeston Historic Core (BHC)
- Queens Medical College (QMC) / Lenton Priory Gregory Street (LPG)
- Clifton Park & Ride (CLP)

3. SITE TOPOGRAPHY AND GEOLOGY

3.1 The Chilwell route ran north-east from a proposed park and ride site on open land west of the built-up-area at Chilwell, through Chilwell and Beeston, past the south-east side of University Park crossing the A52 and passing through Lenton, from where it turned Southeast then Northeast again to meet the railway station in the city centre (SLR 2009b).

3.2 Through Chilwell, the route passed over the soild geology of Mercia Mudstone, before descending onto the alluvium of an unnamed stream onto the gravel terrace beneath Beeston. It then followed the alluvial floodplain of the River Trent, passed the Southeast side of University Park and through Lenton (Brown & Kinsley 2006).

3.3 The Clifton route ran east from a proposed park and ride site on the south-west edge of the Clifton built-up-area, then turned north-east through Clifton, crossing the Fairham Brook, then following the disused line of the Great Western Railway skirting Wilford, then crossing the River Trent at Wilford Toll Bridge, and continuing north to meet the railway station in the city centre (SLR 2009b).

3.4 The more southerly Clifton route continued across the Trent Valley floodplain, crossing the Trent at Wilford bridge. From here it continued south over the floodplain, to the east of Wilford village, where it climbs onto the south terrace of the Trent, before moving onto the Mercia Mudstone at the southwest edge of West Bridgford. It then turned west across the alluvium of Fairham Brook, and back onto the Mudstone through modern-Clifton (Brown & Kinsley 2006).

3.5 More detailed topographical and geological information is provided within the individual chapters concerning each specific portion of the development route.

4. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

A detailed archaeological desk-based assessment of the entire development route was undertaken by TPA in 2004, with subsequent alterations to take account of minor route changes being produced in 2006 (Brown & Kinsley). The information produced during this study has been summarised below.

4.1 Prehistoric and Roman

Chilwell

4.1.1 At Wheatgrass Farm, grid ref. 4501 3365, air-photo no 58/462/5347 indicates the presence of linear features and a ring shaped feature. Whilst some of the marks may be envelope ploughing, and the ring coincides with a pylon, other marks are unrelated spatially to field boundaries or ploughing. Although undated, these may correspond to ditched enclosures or other features of archaeological significance and are located within 300m of the Chilwell terminus.

4.1.2 Within 100m of the proposed route, opposite Northfield Crescent (grid ref. 4499 3358, photo no. 58/462/5470) small, irregular polygonal 'enclosures' could conceivably be prehistoric systems or represent periglacial features.

4.1.3 400m to the south of the proposed Chilwell Terminus, two Roman coins (SMR0545 and SMR5915) have been found in Highfield Road, Chilwell. Although no major Roman roads are recorded in the region of the development works, two separate finds of coins in close proximity do suggest a Roman site of some significance within the vicinity.

University Boulevard

4.1.4 A Bronze Age sword, human remains and other prestige objects (including a silver cup) were recorded at Highfields Lake, adjacent to University Boulevard, around 1830 (Godfrey 1884: 15-6). Further reports of Bronze Age artefacts and thick peat deposits date to the eastern extension of the University Lake in 1937 (Swinnerton 1937). Colquhon and Burgess report that a 'Ewart-Park'-type sword (Bronze Age) was found in 1902, during excavations at the lake at Highfield House (Nottingham museum 02.14; Colquhoun and Burgess, 1988: 80-1 (no.391, pl.59). Both swords are similar in form, and it may be that it is the same artefact as is represented in Godfrey's account, as both appeared to be of similar size with consistent damage. It may be that the artefact was only *acquired* by Nottingham Museum in 1902.

4.1.5 The well documented phenomenon of Bronze Age deposition of artefacts in watery locations, has been discussed by Scurfield and with both ceremonial deposits and burials being the most likely cause (Scurfield 1997:33).

4.1.6 Additionally, horse skulls and human remains have been recorded in Keighton Meadows, along with a tessellated pavement found there during the early 19th century (Godfrey 1884, 14). Records also indicate that wall foundations, pottery and bronze objects 'of undoubted Roman origin' were found near Highfields House, at an unspecified date. There is no independent documentation of these discoveries and, although they lie north of the lake, Keighton Meadows extends to within 150m of the route.

Fairham Brook

4.1.7 Four flint arrowheads have been recorded within 120m, to the north of the route.

4.2 Medieval

Chilwell

4.2.1 The village of Chilwell is mentioned within the Domesday Book (1086) which suggests the existence of settlement archaeology in the area from, at a minimum, the Saxon period onwards.

University Boulevard

4.2.2 The hamlet of Keighton, located north of the lake in the University Park, is referred to in documents from 1108 until 1387, and pottery finds suggest occupation continued until the 15th century (Barnes 1993; 41, 59-62). Excavated remains have been identified at several locations in the University Park comprising a hollow way, a well and tile kilns (Swinnerton 1955; Coppack 1968; 1977). The latter are likely to have been situated at, or beyond the outskirts of the village due to fire risk, and suggest its eastern limit. All these features lie on the solid geology (Mercia Mudstone) north of the lake and it is unlikely that they extend south into the boggy ground adjacent to the Tottle Brook. By the DH Lawrence Pavillion, the route passes over flat ground where a possible in-filled former course of the Tottle Brook was identified in a watching brief in 2001. An absence of medieval ploughing, a thin topsoil and the presence of the possible palaeochannel suggested that the area has some archaeological potential, though it is possible that the area was levelled during the landscaping of the lake and that features were eradicated.

Lenton

4.2.3 Although the watching brief conducted in this area has not been considered in this report, a summary of Lenton is included to provide context to the general narrative. Lenton was recorded in Domesday Book and therefore late Anglo-Saxon settlement remains may be contained within the area. Also, Lenton Priory was founded between 1106 and 1107, later to be abandoned during the Dissolution in 1538. Currently, the Chapel of St Anthony and a small portion of a column from the main priory Church at the junction of Priory Street and Old Church Street are the only standing building elements. The area also played host to the priory Fair, one of the foremost fairs of the Middle Ages. A detailed reconstruction of the layout in 1516 indicates that a number of permanent structures were constructed on the site as a result (Grieg 1992).

4.2.4 Four mills are also known to have been built in Lenton, and a mill west of Abbey Street has been identified as the site of a mill constructed alongside the Priory (Brown & Kinsley 2006).

4.2.5 Based upon direct observations within the area, it has been shown that structural remains of the Priory may exist very close to the surface, even beneath the modern roads. There may also been filled river channels of the Leen, with associated river-bank structures. The presence of buried soil and timber structures show that the area west of Abbey Street has an exceptionally high archaeological potential (Brown & Kinsley 2006)

4.3 Post-medieval

University Boulevard

4.3.1 A gravel pit was recorded adjacent to the University Boulevard/Lower Road Junction on the 1921 Ordinance Survey County Series (Nottinghamshire) (Longshaw 2002).

Meadows Way

4.3.2 A Civil War fort was located close to the proposed area of development, indicating an increased likelihood of further post-medieval remains. Constructed in 1644, the fort was constructed by the Parliamentarian garrison of Nottingham to defend the dams which controlled the water flow to the meadows on the outskirts of the town. Its name (*Hooper's Sconce*, after its designer) and site were known through the 18th and 19th centuries although it is not easy to accurately relate to modern maps, but the best fit places the sconce directly adjacent to the route. Although the area is now completely built up, it is possible that the outer ditches and other deeper features may survive, and, given the lack of precision of the location, it is possible that the sconce might be crossed by the route.

5. METHODOLOGY

5.1 All work was carried out in accordance with the requirements and standards set out in *Management of Research Projects in the Historic Environment Project Planning Note 3: Archaeological Excavation* (MoRPHE PPN3) (English Heritage 2008), and the requirements and standards set by the Chartered Institute for Archaeologists (CIfA) in their *Standard and Guidance for an Archaeological Watching-Brief* (2008), *Standard and Guidance for archaeological field excavation* (CIfA 1994; revised 2008) *Standard and Guidance for the collection, documentation, conservation and research of archaeological material* (CIfA 2001; Revised 2008); *Code of Conduct* (CIfA 1985; revised to 2008) and *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives (*CIfA, 2009).

General and Specific Aims

5.2 The purpose of any archaeological investigation is to determine and understand the nature, function and character of an archaeological site in its cultural and environmental setting.

5.3 More specifically, the purpose of an archaeological watching brief can be defined as follows:

- To identify the presence of any archaeological remains to be affected by any intrusive aspects of the development and to achieve an appropriate level of *preservation by record, including* (where practical within the constraints of the watching brief and development)*:*
    - recovering evidence for the date, nature and extent of any archaeological features or structures or artefacts which may be discovered during excavation for construction
    - recovering evidence for the past environment preserved in organic sediments which may be exposed during excavation for construction.

- But also, the analysis and publication of the evidence gathered during the watching-brief will need to include interpretation and setting in its historic context, to fully implement the preservation by record mitigation strategy. This includes an assessment of the overall extent, date and state of preservation of archaeological remains, in accordance with Planning Policy Statement 5 (PPS5) for features of less than national significance.

5.4 All works were undertaken with the approval of either the City Archaeologist (Gordon Young) or the Nottinghamshire County Council Archaeologist (Ursilla Spence).

Surveying and setting out

5.5 Excavation areas were surveyed as excavated and tied in to the Ordnance Survey (OS) National Grid and Ordnance datum, using a GPS, Leica CS15/GS15 RTK Differential GNSS. TPA holds full co-ordinate data which can be supplied as DXF/DWG files if necessary.

Mechanical excavation

5.6 Where possible, topsoil and subsoil was removed using a 360° mechanical excavator fitted with a toothless ditching bucket. All such mechanical excavation was undertaken by VINCI contractors, and was observed by suitably qualified Trent & Peak Archaeology staff.

5.7 Where possible, the plant was initially tracked across topsoil defining routes to avoid impacting on freshly exposed archaeological surfaces until they were appropriately recorded and excavated. This was also to avoid causing damage by deep rutting, compaction and displacement under adverse climatic conditions such as heavy rain.

5.8 The location of any artefacts recovered in the topsoil/subsoil was recorded three-dimensionally, and metal detecting of freshly machined areas and topsoil was regularly undertaken.

Hand Excavation

5.9 All fieldwork was carried out in accordance with the code of conduct of The Chartered Institute for Archaeologists. Excavation firstly aimed to establish and record the extent of the archaeological remains exposed following the soil stripping, with a resulting detailed ground plan produced by GPS/Total Station survey. Features then prioritised for excavation were those best preserved, or those where there may have been potential to recover structural remains, palaeo-environmental or industrial evidence.

5.10 Targeted hand excavation aimed to assess the date, form, function and interrelationships of archaeological features on the site. In particular, assessing the structural development of the archaeological components on site and establishing the function of archaeological activity were important research goals detailed within the approved WSI.

5.11 To date the various features identified, sections through cut features were excavated in order to retrieve datable artefacts and environmental samples. Artefacts were either recorded three dimensionally in order to distinguish between feature fills or by spit/context where substantial quantities were encountered.

Recording

5.12 All excavated contexts were fully recorded on TPA written context records giving details of location, composition, shape, dimensions, relationships, finds, samples, cross-references to other elements of the record and other relevant contexts, etc.

5.13 All features were recorded on at least one plan (normally at 1:20 scale) and at least one section drawing (normally at 1:10 scale). A complete post-excavation plan and long section of each trench was prepared. All drawings included co-ordinate data and spot-heights related to the Ordnance Survey Datum and accurate to two decimal places. The level of recording increased relative to the presence of features of archaeological significance.

5.14 All excavated features and deposits were recorded photographically using black and white negative film, in a 35mm or medium format. Additional illustrative photographs were taken using digital photography (minimum four Megapixels). All black and white record photographs were taken using silver based film only, being suitable for long-term storage (Brown 2007 13).

5.15 All finds were recorded by context; and individually significant finds were also individually labelled with a TPA three-letter code (e.g. AAA) and recorded three-dimensionally. All artefacts recovered were retained and removed from site for conservation (if necessary) and specialist examination/analysis (see Section 6). All recording, cleaning, storage and conservation of finds has been carried-out in accordance with the Chartered Institute for Archaeologist's *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* (2001, revised 2008).

Palaeoenvironmental Sampling

5.16 All environmental archaeology was undertaken in accordance with the principles set out in *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation* (English Heritage 2011) and with reference to the Association for Environmental Archaeology's Working Paper No. 2, *Environmental Archaeology and Archaeological Evaluation* (1995).

5.17 Soil samples comprising at least 40 litres per context or 100% of smaller contexts were taken for the recovery of charred plant remains, small bones and finds shall be taken from appropriate contexts. These comprised basal/primary fills of at least 50% of all cut archaeological features and at least 25% of all other anthropogenic soil deposits, including all deposits containing any visible charcoal or other carbonised material and all deposits considered to be of particular interest on the basis of artefactual content or other characteristics.

Site Archive

5.18 Archive consolidation was undertaken immediately following the conclusion of fieldwork. The site record was checked, cross-referenced and indexed.

5.19 The archive has been assembled in accordance with the guidelines set out in Appendix 1, P1 of MoRPHE PPN3 (English Heritage 2008). In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain:

- site matrices where appropriate;
- a summary report synthesising the context records;
- a summary of the artefact record; and
- a summary of any other records or materials recovered.

The integrity of the primary field records shall be preserved and the Contractor shall create security copies in digital, fiche or microfilm format of all primary field records.

5.20 The paper and digital archive will be deposited at Brewhouse Yard Museum, Nottingham, as advised by Nottinghamshire County Council.

Site	Description	Number	Notes
CED (B14+15)	Watching Brief Day Record Sheets	1	
	Permatrace Drawings	1	A3 sheet
	Photograph Record Sheet	1	93 Digital Photographs
UBU (B8+B9)	Context Master	3	
	Context sheets	78	
	Watching Brief Day Record Sheets	192	
	Drawings Record Sheet	2	
	Permatrace Drawings	37	19 x A4 and 18 x A3 sheets
	Photograph Record Sheet	4	4 sheets which were used over multiple sites. UBU shots (44) are highlighted in green. 60 digital photographs
	Environmental Records Sheet	3	
	Small Finds Record Sheet	1	
	All finds	6	1 x pot 5 x glass
	Finds box	1	Box size 40 x 30 x 10 cm
	Other	14	14 Printed and annotated maps of the area. 7 Borehole record sheets 1 Permatrace matrix sketch
MWN	Context Master	2	

(B2)	Context sheets	20	
	Watching Brief Day Record Sheets	32	
	Drawings Record Sheet	1	
	Permatrace Drawings	35	A3
	Photograph Record Sheet	1 + 3 mixed sheets	3 sheets which were used over multiple sites. MWN shots (23) are highlighted in green. 53 digital photographs. 16 Black and white.
	Other		1 x sketched location plan on printed map
WTB (C2)	Context Master	1	
	Watching Brief Day Record Sheets	24	
	Drawings Record Sheet	1	
	Permatrace Drawings	8 (1/7)	5 sheets and 5 annotated duplicate photocopies on standard A4 paper
	Photograph Record Sheet	+3	3 sheets which were used over multiple sites. WTB shots (38) are highlighted in green.
	Other		1 x sketched location plan on printed map
FBC (C4)	Context Master	1	
	Context sheets	30	
	Watching Brief Day Record Sheets	25	
	Drawings Record Sheet	1	
	Permatrace Drawings	5	2 x A4, 3 x A3 sheets.
	Photograph Record Sheet	1+2	2 sheets which were used over multiple sites. FBC shots (9) are highlighted in green. 60 Digital photographs, 60 Black and white photographs
	All finds	33	11 x Flint, 12 sherds pottery, 4 x Coins, 3 x Metal, 3 x Glass
CES (C6+C7 +C9)	Context sheets	1	
	Watching Brief Day Record Sheets	30	
	Drawings Record Sheet	1	
	Permatrace Drawings	8	8 x A4
	Photograph Record Sheet	3	3 sheets which were used over multiple sites. CES shots (48) are highlighted in green.
	Other	8	8 annotated sheets of A4 drawing photocopies.

Table 1: Archive quantification.

5.21 The archive is temporarily stored at the TPA office at Unit 1, Holly Lane, Chilwell, Nottingham, NG9 4AB.

6. RESULTS - Chilwell (B14-15)

6.1 Watching Brief

6.1.1 B14-5 was bounded by SK 51793 36457, SK 51812 36411, SK 50348 35987, SK 50701 36250. The proposed terminus area, to the west of Eskdale Drive, rises gradually to c.60m OD. The western end of Eskdale Drive sits at c.51m AOD sloping to downwards towards the east, along the proposed development route, to a height of c.40m. Excavation was carried out between 16th April and 1st October 2013 over an initial area c.1500m in length (Figure 2)

6.1.2 Adjacent to Bramcote Lane, at the eastern end of the excavation area, a utilities trench was opened to a depth of 4.36m below the present road surface. The tarmac (CED0004) extended for 100mm, overlying a 200mm levelling layer of course rubble hardcore (CED0005). This sealed c.2m of medium brown silty clay (CED0006), overlying medium pinkish brown clayey silt, which contained blue laminations (CED0007). No archaeological features were visible within this trench.

6.1.3 At the far eastern end of the excavation Greenwood Court, work was undertaken to facilitate the removal and replacement of part of a 20th century concrete culvert (CED0008), bisected by the development works, which ran directly beneath the level of the modern road surface (Plate 1). Measuring 1.7m², it was set within a cut of 2.3x2m [CED0009], packed with a light orangish-brown silty clay (CED0010). The surrounding strata consisted of 0.9m of firm orangish-brown silty clay (CED0011), above 0.5m of firm yellowish brown clay (CED0012) which sealed firm, dark orangish-brown clay (CED0013) with dark gray laminations, continuing below the limit of excavation. The culvert replacement works continued to the west, parallel to Eskdale Drive (Approximately 10m north of the road) do a depth of 2.5-3m. No further archaeology was observed.

6.1.4 The excavation of a wide trackbed trench, c. 7m (c.4m deep) was observed, beginning outside Sandby Court (Plate 2) and continuing west through Holkham avenue to Eskdale Drive. No archaeological features were present within the trench, which revealed c.0.7m of demolition/levelling (CED0015) and c.1.7m of redesposited soft, greyish brown, silty clay (CED0016), atop a firm reddish-brown clay with grey laminations [(CED0014), possibly consistent with (CED0013)]. Where the trench cut the modern road surface 100mm of tarmac (CED0004) and 0.7m of hardcore (CED0005) were also present.

6.2 Discussion

6.2.1 The area had been identified as having a low potential for Prehistoric or Roman remains, due to local cropmarks and the recovery of artefacts within the vicinity. However, no archaeological features were recorded during the construction work that took place through the Chilwell section of the development.

7. RESULTS – University Boulevard (B8 and B9) including Lower Road and Fletcher Road (B10 and B11)

7.1 Watching Brief

7.1.1 Located within the area bounded by NGR SK53318 37114, SK53396 37069, SK55060 38507, SK 55166 38475. It consisted of two amalgamated stretches of development, University Boulevard itself, and its south-west extension into Lower Road (Figure 3). The overall topography of the area is fairly flat with a gentle rise within Beeston town centre. University Boulevard sits around 26m AOD, rising to 27m AOD at the junction with Lower Road. Previous borehole and sampling strategies indicated widespread organic deposits of unknown date found in boreholes and window samples with the potential for prehistoric finds in the area. The variable depths and thicknesses of the peat found in the NET Phase Two ground investigations suggest that the deposits south of the University Boulevard are of some complexity, possibly including pond beds and stream channels, though undated at present (SLR 2009b). The work took place intermittently between 25th June 2012 and 8th October 2014 over a distance of 1200m (University Boulevard) and 550m (Lower Road).

7.1.2 Aligned along university Boulevard (North-east/south-west) and inclusive of the Lower Road junction, both areas were machine stripped in preparation for the installation of services and tram tracks. Tram beds were excavated to a depth of 1.2m. The majority of services/utilities were laid beneath the tram bed to a depth of 1.8-2m and where necessary sewer diversion works were excavated to a depth of 4.5m.

7.1.3 The topsoil extended to an average depth of c.0.1m. Below this redeposited layers associated with landscaping and containing industrial waste (clinker) covered the majority of the excavation area to a depth of up to 0.8m. These sat upon thin layers of alluvial silts overlying the natural clays and areas of peat beneath.

Area 01

7.1.4 The topsoil [(UBU2000), c.0.3-0.5m] was stripped in layers to reveal yellowish-orange, sandy-clay subsoil [(UBU2001), c.0.4m] overlying dark brown alluvial clay (UBU2002) over an area of c.220m x 17m. A small network of intercutting ditches was apparent in the central section of the exposed area (Figures 5 & 6).

7.1.5 A substantial U shaped ditch [UBU2005], aligned east/west across the site, was visible for around 30m in the centre of Area 1. Measuring 1.8m x 0.72m, it contained two distinct fills [(UBU2003), (UBU2004)] and may have served as an agricultural boundary ditch (Plate 3). No dating material was recovered, although several large fragments of wood were recovered from the fill. These appear to have belonged to a post with worked points, indicating the presence of a fence close to the ditch. Initially, [UBU2005] appeared to truncate two smaller, perpendicular, linear features. Upon investigation, only [UBU2009] was shown to be archaeologically viable, whilst [UBU2007] was demonstrated to be a natural, geological feature. [UBU2009] was filled with dark yellowish-brown clay (UBU2008) and measured 0.82 x 1.3m, to a depth of 0.16m. In section it appeared to have been truncated by [UBU2005], although their relationship in plan is more ambiguous.

7.1.6 A small, sub circular pit [UBU2017] was located 1m to the south-east of [UBU2005] (Plate 4). A 10l sample of this feature's fill (UBU2016) was removed for further environmental analysis. 0.33 m in diameter and 0.16m it may represent a small post hole, although investigation showed a second, adjacent 'pit' to be the remains of a tree bole [UBU2020].

7.1.7 A second long linear [UBU2015], running parallel to the south-western end of [UBU2005], revealed a rectangular profile (15 x 0.7 x 0.25m) containing evidence of bioturbation. Its yellowish-orange alluvial fill was mottled with organic deposits which may indicate a root bed for hedgerow. Further evidence of organic activity was evidenced by the remains of a tree bole [UBU2018], filled with a dark yellow clay with evidence of decayed root matter (UBU2019) (Plate 5).

7.1.8 A large peaty area (UBU2010) was visible for around 40m across the centre of Area 1 (Plate 6), which may represent a hollow (associated cut [UBU2011]). It continues beyond the south-east trench edge, with an exposed width of 10.5m. An exploratory trench (c.52m) was positioned to across the centre of this deposit (Plate 7), although this quickly filled with water. A second peat layer [(UBU4003), (UBU4005)] was recorded at the northern end of Area 1 and was bisected by environmental trench 17. (UBU4005) contained a number of wood fragments and included areas of fine, dark, alluvial silts. (UBU4003) and (UBU4005) may be a single homogenous layer.

7.1.9 A 1 x 0.45m slot [2042] was placed through an area of dark grey mottled clay (UBU2040), near the south-west end of Area 1, opposite the old Groundsman's cottage. It revealed brownish-yellow clay (UBU2041), likely redeposited natural. Both layers may have been associated with the cottage construction.

Area 02

7.1.10 The topsoil was stripped to reveal an area of c.92 x 10m. Two parallel linear features, running along a north-east/south-west alignment, were investigated within Area 2 (Figure 5). The first appeared to be a small, irregularly shaped, hand dug drain [UBU2036] measuring 1.2m wide, to a depth of 0.3m. Three fills were present within the feature. The upper fill (UBU2032) consisted of reddish-brown building rubble, with inclusions of sandstone and soapstone, representing a demolition layer. Below this was a layer of blackish-grey industrial waste including clinker (UBU2033), suggesting it had been open during the 19th/early 20th century. The primary fill consisted of medium brown, silty clay, representing redeposited natural from the drain's use. This was consistent with the upper fill (UBU2037) of a second 'Swiss Drain' [UBU2039], with angular reddish sandstone/soap stones (UBU2038) set within the bottom of the cut to improve drainage.

Area 03

7.1.11 A third peat spread, (UBU4016), was excavated at the south-western end of the development area within Area 03 which measured c. 89 x 11m, covering Lower Road/Fletcher Road.

7.1.12 This was revealed during the monitoring of the measured reduction of the modern ground surface down to formation level. The layer, recorded as a well saturated very dark brown peat material, measured 29m across. The full depth of the peat was not achieved as it continued beneath the impact depth of the development.

7.1.13 The matrix of the peat comprised organic material with small fragments of wood and other organic components in various states of preservation and decay. Interestingly, (UBU4016) also contained 13 large pieces of worked timber and a reasonable quantity of highly degraded roundwood (Plate 8). The arrangement of the timber, and the fact that there were a few cases where some of the longer examples were interweaving, suggests that these timbers may have represented a collapsed or truncated structure. The overall paucity of substantial timbers does not however indicate that the structure was particularly complex or extensive and may have been the remains of a collapsed fence line.

7.1.14 Three of these timbers were recovered for analysis. The results of the waterlogged assessment are summarised below in section 7.2.

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7.2 Specialist Reports

Borehole Survey

7.2.1 Three boreholes were carried out across the extent of tram phases B8 and B9, to a maximum depth of 1.87m. All cores were 40mm in diameter. Of the 6 cores removed (1.1-2, 2.1-2, 3.1-2), four (1.2, 2.1, 3.1-2) were deemed to be of particular interest and submitted for further environmental analysis.

7.2.2 During further analysis, the cores were assessed visually, with individual deposits identified and characterised, by determining texture following Avery (1973) and variability in colour using a Munsell soil colour chart. All descriptions and processes undertaken conform to guidelines set out by English Heritage (Ayala et al 2007).

7.2.3 Each core was sub sampled at 2cm intervals, with a separate sub sample retained for pollen or geochemical analyses from each level. Modern surfaces, natural geology and river deposits were not described or sampled. A total of 19 samples, averaging one sample per deposit, were selected for further processing and analysis, avoiding deposit boundaries (full report can be found as Appendix 3).

7.2.4 **Borehole BH1 (Lower Road compound).** Following the strip of tarmac and overburden, the first bore recorded deposits to a depth of 0.9m. These deposits comprised of (in sequence) 0.25m dark, blackish grey, silty peat, interpreted as an alluvial wash over the peat. This was followed by 0.41m of soft, fibrous peat with slight red laminations and a further 0.24m of similar material but inclusive of small, wood fragments.

7.2.5 The second bore measured 0.88m in length, making the total depth 1.78m. The initial 0.25m appeared to be a continuation of the soft, fibrous peat (with wood fragments). This overlay a more compacted, lighter peat layer (medium brown) with frequent evidence of bioturbation (0.45m deep). Finally, the bore removed 0.4m of medium yellowish-brown, riverine clays which contained a moderate quantity of small, sub-rounded stones (up to 25mm).

7.2.6 **Borehole BH2**. The first bore (2.1) revealed 0.25m of modern surface deposits (silty clay), a fine, silty clay subsoil (0.31m) and fine clayey silt layer (0.22m). All three could be considered a dark greyish brown with firm compaction, with some evidence for bioturbation in the subsoil. Below these deposits, a peat layer was observed (0.32m) consisting of very dark brown, organic silts with an observed sand lense near the base of the layer.

7.2.7 At the beginning of the second bore (2.2), a sandy peat layer (0.3m, 40% sand/60% peat) represents the base of the peat deposits. Below, medium brown silty-sand with occasional peat contaminates (0.3m) overlies dark yellowish-brown riverine clays (0.17m) giving a total bore depth of 1.87m.

7.2.8 **Borehole BH3.** The upper layer of the first bore (3.1) consisted of 0.1m of topsoil (very dark brown, clayey silt. Beneath the topsoil sat 0.17m of very dark, greyish-brown, clayey-silt which contained inclusions of clinker. This redeposited levelling layer overlay 0.15m of medium reddish-yellow fine clay, which contained some peat leaching towards its terminus. Representing an alluvial deposition it capped 0.16m of greyish-black, organic peat.

7.2.9 The second bore (3.2) began with 0.18m of dark, greyish-black peat; a continuation of the terminal layer of the primary bore. Below was 0.12m of alluvial deposition consisting of a fine, medium grey clay. A further 0.42m of dark, greyish-brown alluvial clay was removed before natural gravels and silts were encountered at 1.3m and removed to a depth of 0.3m.

Discussion - Peats and Soils

7.2.10 The primary peat deposits appear to have formed from a nutrient enriched alder carr environment, as suggested by the presence of alder wood, false cone fragments and especially nitrogen fixing nodules, the latter especially indicative of growth *in situ*. Seeds of wetland taxa and scrub were well represented and grass/sedge leaf fragments were frequently identified. Collectively, these remains suggest an environment similar to the floodplain around a river or a low lying area subject to inundation and fluctuating ground water, rather than an acidic peat bog.

7.2.11 The upper part of Core 1.2 was composed predominantly of fen or mire peat, changing from a basal very compact highly organic soil containing seeds reflective of a drier or damp environment (deposit 4) gradually becoming wetter to form wet organic silty clay soil containing seeds of creeping buttercup (deposit 3)

7.2.12 Core 2.1 deposits exhibited red mottling within the minerogenic clay deposits, becoming particularly abundant within deposit 3. This suggests that the deposits had undergone intermittent waterlogging rather than being permanently wet (Burnham 1980) and the sequence may be representative of a gleyed soil profile. Gley soils are those in which the profile morphology reflects periodic waterlogging. Gley morphology develops where pore spaces are filled by water containing dissolved organic substances which results in the reduction and solution of iron compounds and causes red patches or mottles to develop (Curtis, Courtney & Trudgill 1976).

7.2.13 It is likely that the clay deposits within Core 2.1 represent alluvial deposits from periods of inundation that have translocated down through the soil profile. Geochemical analysis of these deposits could be utilised to accurately interpret the nature and origin of the clays. The lowermost layer in Core 2.1 (Deposit 7) was the only one to contain significant botanical remains, implying that it has remained waterlogged with oxygen excluded since deposition. This concurs with the interpretation for this core profile as showing a riverbank flood plain with better drained areas becoming increasingly drier as sediment accumulates over time, although remaining subject to episodic waterlogging and alluvial inundation.

7.2.14 Core 3 deposits display a similar picture, with a wet woodland landscape over the sandy natural possibly riverine deposits becoming drier over time yet remaining subject to intermittent waterlogging and episodic inundation.

Discussion - Wood

7.2.15 Many of the samples contained an abundance of wood fragments, particularly those within core 1.2. However, many of the fragments were very small and poorly preserved preventing accurate identification. The only taxa identified were hazel and alder, particularly abundant within cores 1.2 and 3.1. Deposit 4 within core 3.1 contained nine alder fragments in total. However, it is possible the fragments have derived from one larger piece of wood within the deposit. Alder is the fen carr vegetation classification maximum (Burnett 1964) and is ideally suited to fluctuating or standing shallow water with moderate nutrient status. Consequently, these small trees are encountered regularly on river banks or in wet hollows or scrub woodland. They are often the tallest (maxim) vegetation on riverbank floodplains as a result, and characterise this sort of landscape.

7.2.16 Birch can also tolerate wet growing conditions, although not to the same extent as alder. It copes well with impoverished soils and grows quickly, so would act as a pioneer taxon for land recently formed as a result of succession and sedimentation over woodland carr. Hazel can grow on drier or damp ground with moderate nutrient status so would imply pockets of ground with intermittent waterlogging only.

Discussion - Seeds and Macros

7.2.17 Hazel buds and bud scales within deposit 4 of core 1.2 are signifiers of seasonality, synonymous with early spring.

7.2.18 Many of the plant macrofossils taxa recovered are indicative of wetland environments, in particular those recovered from the upper parts of Core 1.2. Together with abundances of wood and grasses/sedges, these deposits represent peat formation from a wet woodland carr landscape. Deposits 2 and 3 within core 1.2 are primarily indicative of this type of environment with the identification of alder and hazel wood fragments, and the presence of seeds representative of open water or reed swamp including branched bur-reed, hemp-agrimony and brown sedge. However, sample 60-62cm from core 1.2 contained seeds common to less waterlogged environments. Fools parsley and fat hen are more commonly associated with enriched soils and cultivation and are both common crop weeds.

7.2.19 Other seeds indicative of damp rather than wetland places included buttercups, raspberry and blackberry, noted within the lower levels of both Cores 2.1 and 3.1. These remains and the others recorded for each level concur with the woodland taxa to suggest a locality that was moderately better drained in places.

7.2.20 In contrast to Cores 2 and 3, Core 1 represents a locus that is becoming increasingly wetter over time towards modern day whilst 2 and 3 suggest land that is drying out.

Discussion - Pollen

7.2.21 Each sample processed was also assessed for pollen preservation and the potential for subsequent pollen analysis. Many of the samples contained well preserved pollen grains and spores that would be suitable for submission for processing. Many of the types indentified included small grasses, ferns, alder, birch, willow and plantain. Pollen can be used to reconstruct the local and regional environment and is particularly valuable when analysing peat deposits, especially when used in conjunction with the plant macrofossil results. Sub samples for pollen analysis can be taken at close increments and give a sequential representation of the environment and environmental change through time.

Radiocarbon Dating - *By SUERC*

7.2.22 A total of 3 deposits were selected from the borehole survey for radiocarbon dating. All 3 samples consisted of dried peat and were analysed by SUERC (Scottish Universities Environmental Research Centre).

7.2.23 The samples analysed are listed as follows:

Core 1.2 – Deposit 4
Core 2.1 – Deposit 7
Core 3.1 – Deposit 4

7.2.24 The summary results are presented below and the full certificates are included within the Appendices:

Laboratory Code SUERC-53984 (GU34330)
Context Reference: Deposit 4
Sample Reference: Core 1.2
Material: Dried peat
δ^{13}C relative to VPDB: -29.0 ‰
Radiocarbon Age BP: 4367 ± 29
Calibrated Date: (68.2%) 3012–2922 CalBC / (95.4%) 3087–2907CalBC

Laboratory Code SUERC-53985 (GU34331)
Context Reference: deposit 7
Sample Reference: Core 2.1
Material: Dried Peat
δ^{13}C relative to VPDB -29.4 ‰
Radiocarbon Age BP 3302 ± 27
Calibrated Date: (68.2%) 1616–1533 CalBC / (95.4%) 1640–1507 CalBC

Laboratory Code SUERC-53986 (GU34332)
Context Reference: Deposit 4
Sample Reference: Core 3.1
Material: Dried Peat
δ^{13}C relative to VPDB -28.1 ‰
Radiocarbon Age BP 4762 ± 27
Calibrated Date: (68.2%) 3633–3524 CalBC / (95.4%) 3640–3384 CalBC

7.2.25 The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error. The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

7.2.26 Carefully selected from the waterlogged deposits identified during the borehole survey, these results provide important evidence that contributes to our understanding of the prehistoric environment along University Boulevard. Taken in conjunction with the borehole observations, these dates clearly demonstrate that a wetland carr landscape was present at least between the Middle Neolithic and Middle Bronze Age periods. Such evidence works well with existing archaeological data for the area given the recovery of high status Bronze Age artefacts from the University lake, indicating an important wetland landscape associated with ceremonial deposition.

Waterlogged Wood Assessment - By P. Flintoft and R. Townsend

Summary

7.2.27 A total of 13 worked timbers and numerous pieces of roundwood were identified within peat deposit 4016 during the UBU Watching Brief. Of these, three timbers were recovered (environmental sample numbers: 216, 217, 218) and forwarded for assessment.

7.2.28 None of the roundwood was sampled as it was deemed to be in an extremely poor condition. The sample strategy for the larger timbers included the collection of any timber which displayed wood working evidence and/or sap/bark which could be used as a dating agent or for technology analysis.

7.2.29 Each of the collected timbers are briefly described below;

Environmental sample number 216, context 0005

7.2.30 Timber 216 measures 0.17m max/0.07m min in width, 0.51m max/0.40m min in length and 0.09m max/0.02 min thick. Analysis revealed that it had been radially split once and then split five more times tangentially to a rough point. Wood working evidence at the distal end is

suggestive of a flat bladed axe whilst the proximal end has largely degraded. Both sapwood and bark were identified. Using the Humber wetlands scoring system (table 1) it is possible to classify the timber for its condition upon analysis. The timber scored a 3/4 which lends itself for C_{14} dating and species identification (Van de Noort et al 1995).

Plate 9: Photograph showing timber 216

Sample Two, context 0006, environmental sample number 217

7.2.31 The timber measures 0.16m max/0.05m min in width, 0.25m max/0.12m min in length and 0.09m max/0.02 min in thickness. Analysis of the timber revealed that the proximal end has been split twice radially and split two further times tangentially to a rough point. The distal end of the timber is suggestive of a flat blade strike. A single tool mark was identified on the timber and both sapwood and bark are present. Using the Humber wetlands scoring system it can be possible to classify the timber for its condition upon analysis. The timber scores a 3/4 (see table 1) which lends itself to full analysis and has the potential to be forwarded for both dendrochronological and C_{14} dating (Van de Noort et al 1995).

Plate 10: Photograph showing timber 217

Sample Three, context 0007, environmental sample number 218

7.2.32 The timber measures 0.08m max/0.02m min in width, 0.37m max/0.34m min in length and 0.04m max/0.01m min thick. Analysis of the timber revealed that it had been radially split once and then split a further six times tangentially to a point. The distal end of the timber is

suggestive of a flat blade strike; the proximal end has degraded. No other wood working evidence or tool marks were detected. Although sapwood was identified, no bark was present. The Humber wetlands scoring system can be used to classify the timber for its condition upon analysis. The timber scores a 3/4 (see table 1) but no dating methods are considered as been is suitable for this sample (Van de Noort et al 1995).

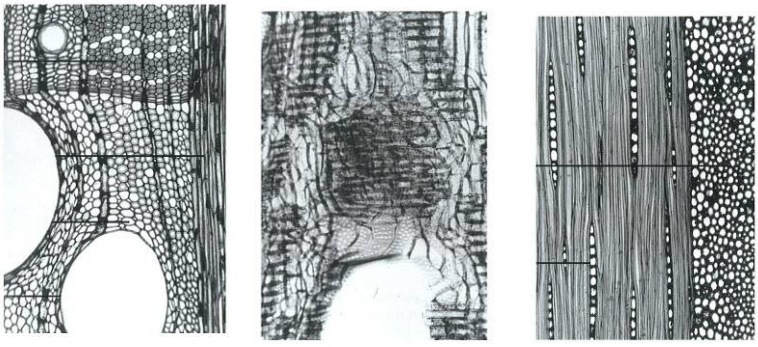
Plate 11 : Photograph showing timber 218

	Museum Conservation	Technology analysis.	Woodland management	Dendro-chronology	Species ID
5	+	+	+	+	+
4	-	+	+	+	+
3	-	+/-	+	+	+
2	-	+/-	+/-	+/-	+
1	-	-	-	-	+/-
0	-	-	-	-	-

Table 1: Humber wetlands scoring system for preserved wood (Van de Noort et al 1995)

Species Identification

7.2.33 A small sample of the timber was taken and prepared for thin section examination under a Zeiss D-7082 Oberkochen microscope. Thin sections (Plate 12) across the transversal, radial and tangential planes of the wood were analysed for distinctive cellular growth patterns (Hoadley, 2000). Nomenclature follows Schwiengruber (Schwiengruber, 1990a).



Transversal *Radial* *Tangential*

Plate 12: Thin sections from the wood samples

Results

7.2.34 A sample of 216 was examined at x10 and x100 magnification. Examination of the transversal plane revealed a diffuse porous, semi ring porous vessel arrangement and apotracheal diffuse parenchyma which is particularly reminiscent of *Alnus* s.p (alder) and *Corylus avellana* (hazel). The ray width rarely exceeded 1 cells width and the height was observed as been between 3 and 25 which confirm that it is *Alnus* s.p (alder) (Schwiengruber).

7.2.35 A thin section of 217 revealed diffuse porous, semi ring porous vessel arrangement and apotracheal diffuse parenchyma. The ray height was observed as been between 3-25 cells and rarely exceeded 1 cell width. These attributes strongly indicate that this sample is *Alnus* s.p (Hather 2000).

7.2.36 Timber 218 appears to be *Alnus* s.p (alder) although it is not as conclusive as the sample from 217. The cellular structure of this sample has begun to collapse and a clear transversal section could not be achieved. An assessment of the radial and transversal sections were however reminiscent of alder.

Discussion

7.2.37 All three timbers displayed evidence of wood working. There appears to have been a deliberate effort to shape the wood into a point, presumably to use it to penetrate the ground and use them as upright posts or stakes. The conversion of the wood into stakes/posts appears to have been completed with small flat and curved instruments such as an axe or adze.

7.2.38 The information gleaned from the boreholes suggests that much of the area monitored as part of the Watching Brief was marshy and boggy in the past. The species of trees commonly found in damper environments include *Alnus* s.p (Alder) and *Corylus avellana* (Hazel). If both species were in abundance in the local environment as is suggested by the borehole data, the timber was presumably locally sourced.

7.2.39 The evidence derived from the borehole data and the timber suggests that the past environment was undoubtedly wet and boggy. The timbers, which appear to have been sourced from the immediate area, may have been used as a fence line and it is not inconceivable that these were used to delineate an area between a particularly wet part of the landscape and a more usable dryer area.

7.2.40 Although the species of wood makes these timbers unsuitable for dendrochronologial dating, their stratigraphic origins prove that they post-date the Bronze-Age horizons identified within the borehole survey. No further work has been recommended for these pieces and due to the difficulties associated with conservation they have been discarded.

7.3 Discussion

7.3.1 By revealing significant alluvial deposits and accumulations of peat bog it is clear that this part of the development was previously part of a wetland environment associated with the Trent. Consequently, it is unsurprising that this marginal environment has seen little archaeological activity pre-dating the modern period.. Of the limited remains encountered, these appear to be associated with post-medieval land division and drainage.

7.3.2 The borehole survey which investigated the underlying peat deposits provided evidence for a wetland carr landscape across much of the area. Selective radiocarbon dating of the recovered material has proven that this landscape was present during at least the Neolithic and Bronze Age periods. Such information adds to the existing picture of a important wetland landscape associated with ceremonial deposition – as evidenced by the discovery of high

status Bronze Age artefacts during the construction of the University lake during the 19th century.

8. RESULTS – Meadows Way (B2)

8.1 Watching Brief

8.1.1 The Meadows Way portion of the development was divided into two areas for archaeological monitoring, East and West (Figure 7). Meadows Way East was bounded by SK 57287 38936, SK 57289 38924, SK 56948 38818, SK 56944 38827 and measured c.350m in length. Meadows Way West was bounded by SK 56729 39788, SK 5674038762, SK 56554 38588, SK 56515 38599 and covered a distance of c.250m. The Meadows is an inner city suburb located approximately 1.3km south of Nottingham City Centre. It is situated at *c.* 28m AOD on a bedrock of sandstone, with alluvial superficial deposits. Within these two areas, the work was undertaken in two phases, 'Phase 1 - Services and Utilities', and 'Phase 2 - Track Bed'. Work was carried out on Phase 1 between 25th July and 30th August 2012 and Phase 2, between 4th March and 20th August 2013.

MWN 1 – Utilities

8.1.2 A single area of deep excavation was monitored, measuring 10m x 2m wide and *c*. 5m deep (Figure 9). Although much of the excavation was obscured by sheet piling, it was possible to observe the south facing section (Plate 13). For reasons of health and safety, it was not possible to investigate and record the deposits in detail. The visible stratigraphy comprised an upper layer of topsoil (0001) formed over a series of made ground deposits including, a dark blackish brown redeposited soil (0002), a disturbed tarmac layer (0003), a dark brown rubble layer (0004), a dark brown/black demolition layer (0005), a possible brick feature (0006), a light brown sandy silt (0007), and a light greyish brown silty clay (0008). The base of the sequence was not visible as this was below the water table.

8.1.3 Due to the quantity of red brick and building material, it is likely that the lower deposits. (0005) and (0006) represent demolition relating to occupation in the Meadows area during the 19th Century.

8.1.4 Further to the south-west, three trial trenches were excavated in order to assess the depth of existing services. The deepest of these was approximately 1.2m deep. The stratigraphic sequence consisted of a yellowish mid brown topsoil (0009) overlying a mid greyish brown subsoil (0010). As they were excavated within the backfill of existing service trenches, no archaeology was observed.

MWN 2 – Trackbed works

8.1.5 The Meadows Way East trackbed was excavated to a depth of 0.9m through the existing tarmac pavement (MWN0007) and concrete foundations (MWN0008) revealing several demolition and levelling layers [(MWN0009), (MEN0010), (MWN0011), (MWN0012), (MWN000013), (0014)], which presumably related to the area's modern development.

8.1.6 Close to the junction between Meadows Way and Queens Walk, a linear wall (MWN0015) was visible from 0.6m within the north facing edge of excavation. Constructed of two courses of stretchers, it ran diagonally across the excavation area, aligned north-west/south-east, with a length of 22m. A second wall of identical construction and orientation (MWN0019), was observed over a length of 8m, and may represent a continuation of (MWN0015). A surface layer of Staffordshire engineering (blue) bricks (MWN0018), covering an area c.2m x 3m, was uncovered adjacent to the west of (MWN0019). This surface probably formed a courtyard or floor surface associated with the adjacent buildings (Plate 14). Abutting (MWN0015) was a two roomed outbuilding (MWN0016), constructed with a single course of stretchers, measuring 5m x 1.2, with a central dividing wall (Plate15; Figure 8).

8.1.7 A layer of hardcore, (MWN0009) was identified towards the north-eastern end of the development area and continued beneath the tarmac (MWN0007) and pavement (MWN0029) surfaces to the south-west. Both of these later deposits were also overlying a further

demolition layer of soft brown silty sand which contained moderate quantities of brick fragments [(MWN0020), (MWN0032)]. Opposite the Thomas and Betts Outlet, a wall consisting of two courses of stretchers (MWN0035) was visible from 0.84-1.08m within the section below the demolition layer. This represented the lowest coursing of demolished 19th Century structures. The wall was built into a mixed layer of ash, sand and clinker deposits (MWN0033) which may have acted as a levelling layer.

8.1.8 An L-shaped trench was excavated at the western corner of the Sheriffs Way roundabout. Beneath the tarmac (MWN0021) and bedding/levelling (MWN0022) a demolition layer of medium orange-brown, sandy silt (MWN0023) was observed. This deposit contained moderately frequent fragments of brick, and was observed to a depth of 0.5m. Below this point, a firm, medium orange-brown clayey silt was observed at the base of the excavation (1.2m BGL).

8.1.9 Three small trenches were excavated on the grass verge separating Meadows Way and Queens Road. Below 0.2m of topsoil (MWN0025), lay 0.7m of made ground, brown sandy-silt, this contained a moderate amount of brick fragments and suggested recent demolition and levelling. A concrete layer (MWN0027) at 0.9m, c.0.2m thick, capped a further layer of brick rubble within a loose brown sandy-silt matrix (MWN0028). This represents a late 19th Century/early modern demolition layer and overlain by previous phase of the local road network. A further trench, excavated to the west of these initial sondages, revealed only made ground (MWN0025), no archaeology was observed.

8.1.10 Opposite Gritley Mews, the rectangular, trackbed trench was dug to a depth of c.0.7m revealing a rectangular structure (MWN0034), measuring 1.65m x 0.9m, (Plate 16, Figure 9). Arranged as stretchers, only a single course of red bricks were revealed (110mm x 220mm), probably dating to the 19th Century. The area within and surrounding the structure was filled with demolition deposits (MWN0032).

8.1.11 Located further to the west opposite Kelso Gardens, additional structures were visible at the base of the trackbed (0.7m BGL) (Figure 9). As with MWN East, these lay beneath the tarmac (MWN0041), white, limestone hardcore (MWN0042) and demolition layer (MWN0043). A series of small, interconnecting rooms were visible on the north-west side of the trench. These appeared to continue into the trench edge and may have formed part of an industrial complex or domestic outbuildings. All walls were constructed of a single course of stretchers, with bricks measuring c.220mm x 110mm x 80mm. Unlikely to be significant structural elements, these were probably the remains of interior walls. The most north-easterly structure (MWN0036) measured 1.9m x 1.25m (continuing into the section edge), with three bricks remaining of what appeared to be an internal dividing wall, whilst the second structure (MWN0037), 1.6m to the west, measured 3.8m x 1.2m, with an internal diving wall creating two rooms measuring 2m x 1.2m and 1.8m x 1.2m respectively. The similarities between these buildings suggest a contemporary construction date during the 19th Century period. Between and within the brick structures was a demolition layer, consistent with (MWN0032) in the Meadows Way East development area; West of (MWN0037) this merged to a darker brownish-black layer (MWN0039), containing high levels of CBM, interspersed with areas of sand (MWN0038).

8.1.12 Opposite Beardsley Gardens a small L-shaped wall (MWN0044) of a single course, was observed at a depth of c.0.7m within the ubiquitous demolition layer (MWN0032), beneath the Meadows Way tarmac (MWN0041) and hardcore (MWN0042). The relationship of (MWN0044) to other structural remains [(MWN0045) and (MWN0062)] is unclear but their construction appears consistent with the 19th Century remains uncovered along the development route and are likely contemporary.

8.1.13 Moving west, opposite the large Homebase on Queens Drive, a linear wall (MWN0047), 11m in length and two courses wide, ran along the centre of the trackbed trench (Plate 17). A similar structure (MWN0057) was excavated c.8.5m from the pavement edge adjacent to no. 6 Saffron Gardens; two courses, 5m along its widest edge, turning at 90˚ into the limit of

excavation. It is likely that these represent 'yard' areas associated with 19th century terraced properties.

8.1.14 Moving south-west, close to the Meadows Way junction with Saffron Gardens, three courses of a redbrick wall (MWN0059) were visible, orientated Northeast - Southwest (Plate 18). Measuring c.7m in length, this may represent the exterior wall of an industrial structure constructed from the same bricks (220x110x80mm) and sandy mortar (light, yellowish-white) as the surrounding domestic terraces.

8.1.15 Further south along Meadows Way were the remains of a ceramic drain (MWN0055) encased in bricks (MWN0054), observed at a depth of c.0.7m (Plate 19). These remains were adjacent to a series of interconnected linear walls [(MWN0050), (MWN0051), (MWN0052), (MWN0053), (MWN0056). These may represent external domestic areas associated with the 19th Century terraced housing. Constructed with the same style of red bricks found across the majority of other structures on the site (c.220x110x80mmm) (MWN0050) is a sizable, two course wall, 8.2m along its longest edge which continues at 90˚ into the limit of excavation.

8.1.14 Past Saffron Gardens, opposite Crammond Close, the north-west facing section revealed 5 courses of a red-brick wall with English coursing (MWN0068), measuring 1.34m x 0.6m. The wall was not visible in plan within the trench (Plate 20). No continuation of the wall or connecting structures were visible, however to the south of the wall sat a ceramic drain pipe (MWN0069) 180mm in diameter, which could indicate that it belonged to a larger industrial or domestic structure. Within the base of the trench, a single course of a linear wall (MWN0063) with irregular brickwork ran north-east/south-west for 5.9m. It is probable that this represents the damaged exterior wall to one of the 19th century terraced houses. It stopped on its southern end by another exterior wall (MWN0064) which continued at 90˚ beyond the limit of excavation. (MWN0063) was abutted by an interior wall (MWN0065), comprising a single course of stretchers, also continuing into the trench edge at approximately 90˚ (Plate 21). There was evidence of internal buttressing on the eastern side of (MWN0063). Adjacent to (MWN0063) a further linear wall (MWN0067), orientated north-west/south-east, bisected the trackbed trench. Consisting of two visible courses of stretches, it conformed to the same 19th Century construction template as all the other buildings revealed within Meadows Way West. All structures were surrounded by the same demolition debris layer (MWN0032) and covered by the white, levelling hardcore (MWN0042) and road tarmac (MWN0041).

8.2 Discussion

8.2.1 The main objective of the watching brief along Meadows Way was to identify remains of the Parliamentarian fort, *Hooper's Sconce.* Constructed in 1644, documentary records had indicated that the remains of the fort were located within the vicinity of the development route, near to the junction of Wilford road and Waterway St West.

8.2.2 Throughout the development works, the only remains of archaeological interest to be observed were the foundations of 19th century residential structures. No remains or artefacts were identified that could indicate an earlier phase of activity within the development route. However, the limited impact depth of the groundworks means that landscaping relating to the development of the area since the 19th century may have concealed evidence of earlier activity. Given that natural geology was rarely observed these results cannot be relied upon to help determine the location of the civil war fortification.

9. RESULTS – Wilford Toll Bridge and Compton Acres (C2-C3)

9.1 Watching Brief

9.1.1 Wilford Toll Bridge is located in the Meadows area of Nottingham, *c.* 1.6km south of Nottingham City Centre, at *c.* 28m A.O.D. The bridge crosses the River Trent connecting Victoria Embankment and the Meadows to the north with Wilford to the south of the river. The excavation area encompassed three areas either side of the toll bridge (Figure 10). The northern area (Area 01) was bounded by NGR SK 56933 38222, SK 56945 38218, SK 5691638170, SK 5693038169. Immediately South of the river, Area 02 was bounded by NGR SK 56899 38096, SK 56915 38090, SK 5689738017, SK 5688238018. The final 'L'-shaped area (Area 3) was bounded by NGR SK 56830 37911, SK 56843 37905, SK 56840 37852, SK 56860 37833, SK5 6788 37855, SK 56814 37887. This area was also later extended during construction to include the eastern rail embankment which ran parallel to Iremongers pond. The bridge development is c.120m in length. The distance from the south of the Toll House to the junction with Coronation Avenue is 300m, with the development area continuing for a further 200m east along Coronation Avenue.

9.1.2 Although there is no recorded evidence of Prehistoric or Roman activity within the proposed development area, mapping by Chapman (1785) and Sanderson (1835) showed Wilford as a long village hugging the east bank of the Trent. At the end of the village the proposed tram route intercepts with the eastern mapped limit of habitation, suggesting medieval or post medieval archaeology may have been preserved there.

9.1.3 Wilford Compton Acres represents a long, narrow section of the development route, stretching from the north-east corner of Wilford, following the route of the disused Great Northern Railway tracks, to the intersection with Clifton Boulevard. This is approximately 4km south of the city of Nottingham at a height of 30m OD. The proposed development area is bounded by NGR SK 56938 37795, SK 57011 37760, SK 56685 35366, SK 56664 35377.

9.1.4 Monitoring of these areas took place between the 25th July 2012 and 7th August 2013.

Area 01

9.1.6 An area of excavation for electrical cable diversion was observed adjacent to the northern end of Wilford Toll Bridge. The stratigraphic sequence of the north-west facing section consisted of a layer of topsoil (WTB0005), overlaying a mid-dark brown subsoil (WTB0006), a layer of iron ore deposit (WTB0007), and a dark reddish brown sub soil (WTB0008) (Plate 22). No archaeological features were observed.

Area 02

9.1.7 A rectangular utilities trench of *c.* 2 x 1m was observed to the south of the bridge on Main Road. The stratigraphic sequence consisted of a layer of tarmac (WTB0001), overlaying a creamy yellow layer of hardcore (WTB0002) and yellowish brown sand and gravels (WTB0003) which is cut by a modern drain ([WTB0004], filled by (WTB0009) (Plate 23).

9.1.8 To the east of the existing road, a utilities trench of 300x0.5x0.5m bisected what appeared to be the north-east rail embankment (see below, Area 3). Below 0.1m of modern turf (WTB0010), this was demonstrated to consist of c.0.5m mid greyish-brown, redeposited silty-clay (WTB0011) which sealed a dark brown silty-sand (WTB0012). No dating material was recovered from either layer.

9.1.9 During excavation of the existing road surface, a layer of stones was revealed at a depth of c.0.2m. Sealed by the modern tarmac (WTB0001), this consisted of roughly squared cobbles (WTB0013) (average size 150x100x100mm) overlying a bedding deposit (WTB0014), consisting of silty clay and gravel which extended for 500m below the cobbles. This sealed a gravel ballast layer (WTB0015), 0.28m deep. The final deposit visible in section was 0.14m of a dark brownish-black, burnt deposit (WTB0016). It is probable that the surface dates to the late post-medieval or early modern period, however, no datable finds material was recovered.

9.1.10 Further work involved exposing the south-eastern bridge support (WTBF.01) for reinforcement. In profile it revealed a limestone lintel (WTB0020) support atop a brick foundation (WTB0021) and concrete base (WTB0022). The lintel was encased in a brick structure (WTB0019) and topped with a steel plate (WTB0018) which had been sealed by the modern road surface (WTB0001).

9.1.11 Adjacent to the bridge on the south-west side of the river, a possible flood-bank was excavated to a depth of 1m (Plate 24). Beneath the modern topsoil (WTB0023), alternating layers of firm reddish-brown silty clay (WTB0026) and dark greyish-black silty clay (WTB0027), with organic inclusions were truncated by a steep cut with sharp base break of slope [WTB0025] which could indicate the historic construction of flood defences.

9.1.12 The northern end of the north-west railway embankment was excavated to a depth of 1m revealing c.0.1m of topsoil (WTB0028) and c.0.6m of redeposited clay (0029) which continued acting as a mixed levelling layer was present to 0.67m with an ash deposit (0030) continuing past the limit of excavation.

Area 03

9.1.13 Four railway embankments, associated with the Great Northern Railway bordered Areas 02 and 03 (See above for north-west and north-eastern embankments). Exploratory slots were excavated to a depth of 0.9-1m below the present footpath. The majority of the embankments consisted of a single course of limestone which had decayed to form clay-like deposits in places (0031). This was overlain by c.0.01m of dark blackish-brown topsoil (0032).

9.1.14 A deep drill (pile hole) was sunk to a depth of 10.5m at the southern end of the eastern rail embankment. Made ground ceased at 3m below the present surface. With the exception of the visible earthworks representing the remains of the railway embankment, no further archaeology was visible across the extent of this area.

Compton Acres (C3)

9.1.15 Works were observed either side of Wilford Lane, just south of Beckett School, at Ruddington Lane (on the north side and towards Fairham Brook), from Clifton Boulevard to Clifton Lane. On the north side of Ruddington Lane the bank adjacent to the work units near the industrial estate had been stripped and revealed a pinkish–brown clay silt (WCA0002), most probably the result of soil being redeposited from the made bank, below the topsoil and turf (WCA0001) (Plate 25).

9.1.16 Aside from the railway embankments, no archaeological features were observed in these areas.

9.2 Discussion

9.2.1 This portion of the development route was located on an area of floodplain adjacent to the Trent. With minimal impact into the underlying alluvial deposits, it is unsurprising that very little of archaeological interest was revealed. The main evidence for human activity within the area was limited to the various earthworks created during the construction of the Great Northern Railway.

10. RESULTS – Fairham Brook (C4)

10.1 Watching Brief

10.1.1 The Fairham Brook portion of the development route was bounded by NGR SK 56682 35372, SK 56694 35331, SK 56002 35084, SK55978 35124, with a total length of approximately 750m. (Figure 11).

10.1.2 In a meeting held on the 18th April 2012 between Trent & Peak Archaeology, VINCI Construction UK and the City Archaeologist for Nottingham, it was agreed that this section of the development would be the subject of a fieldwalking survey before determining the precise method of archaeological mitigation. However, a site visit shortly after this meeting reported that the field was under dense crop and thus fieldwalking would not be possible until the crop was harvested and the field weathered. The potential alteration in programme for the NET2 groundworks meant that fieldwalking was no longer a practical response. Consequently, it was proposed that the earthworks and stripping were conducted as part of a watching brief, with a controlled strip under archaeological supervision.

10.1.3 The groundworks were divided into two phases, Phase one took place between the 23th July and the 18th August 2012 and Phase two took place from the 14th January 2013 to 11th March 2013.

Phase one

10.1.4 The site was stripped from east to west removing the topsoil (FBC1000) and subsoil (FBC1001) within the limits of the development area. Machining revealed a superficial alluvial geology, into which a single pit had been cut, alongside a number of drainage features and the remains of ridge and furrow earthworks (Figure 12).

10.1.6 Within the subsoil a number of worked flints were recovered (AAA; AAC to AAG). The fresh breaks on the artefacts suggest that these were manufactured in the area and an analysis of the used technology indicates that they were produced during the Neolithic or Early Bronze Age periods. However, these were surface finds and were not associated with any cut features, and so there is little evidence to indicate the type of activity that occurred at this location during these periods.

10.1.7 Following the topsoil strip, traces of several furrows (Plate 26) (e.g. FBC1006, FBC1008) were observed within the site and were plotted using a GP. The only artefact to be retrieved from these furrows was a single fragment of glass from (FBC1007).

10.1.8 Other features included a drainage culvert [FBC1004] (Plate 27, Figure 13) and a drainage gully [FBC1010]. The drainage culvert was a dry stone, L-shaped feature cut into the subsoil, orientated Northwest - Southeast and Southwest - Northeast. The cut containing the stones had steep sides and a broad flat base, and was cutting the NW-SE aligned drainage gully (FBC1010). It is possible that the two features were in some way related. No artefacts were recovered from any of these features.

10.1.9 In the centre of the site, a Northeast - Southwest orientated boundary was represented by at least three phases of slightly offset ditches, [FBC1012], [FBC1025] and later [FBC1023]). It was cut into the subsoil, presenting a “V” shaped profile and was observed over a length of c. 7 metres. Within ditch [FBC1012], the basal fill (FBC1015) contained a glass bottle (AAM) (Plate 28, Figure 14).

10.1.10 A later drainage gully, [FBC1027] was recorded cutting the earlier curvilinear ditch [FBC1023]. Excavation of this feature produced only a few artefacts, including fragments of coal, CBM and fragments of post-medieval domestic pottery. These materials date from the modern period, and demonstrate that these features are remains of recent human activity.

10.1.11 The feature numbered [FBC1028], a drainage culvert was also cleaned and hand excavated (Plate 29). It differed from the other drainage features due to the presence of a stone capping. It was orientated West Southwest – East Northeast, and was observed over a distance of c.41 metres, although the full extent of the feature was not revealed by machining.

10.1.12 Finally, a pit [FBC1030] was found during stripping, located approximately in the centre of the C4 area (Plate 30, Figure 13). It presented a sub-rounded shape with moderately steep sides, becoming gradually smoother towards the base. No dateable artefacts were recovered from this feature.

Phase two

10.1.14 Phase Two represents the topsoil stripping which took place to the west of the brook and the track bed trench which was excavated to a maximum depth of 1.5m.

10.1.15 The topsoil extended to a depth of 0.1m (FBC2000) with mid greyish-brown subsoil (FBC2001) continuing for a further 0.4m beneath. This overlay 0.8mm of mid blue-grey clay (FBC2002) and finally a light reddish-brown clayey silt (FBC2003) which continued beneath the limit of excavation. No archaeological activity was visible within this area.

10.1.16 Where the development route traversed the public footpath to the west, a 12x3m trench was opened across it. Excavated to a depth of 0.3m; with 0.1m of modern tarmac (FBC2004) overlying 0.08m of ballast which sealed a mixed levelling layer, containing CBM.

10.2 Finds

Flints

10.2.1 A total of 11 pieces of worked flint were recovered from the subsoil during the stripping of the site. These pieces have been summarised in the table below.

Finds Code	Context	Description	Weight (g)
ABA	1001 D	Blade flake – c.40% dorsal cortex, with several previous blade removals indicated by dorsal scars. Also evidence of platform preparation to enable blade removal.	6.27
ABB	1001 C	Tertiary debitage chip, damage to edge may either be natural or from expedient tool use..	1.19
ABC	1001 C	Small tertiary debitage flake, dorsal scars indicate previous blade removal.	0.31
ABD	1001 C	Plough damaged debitage flake	4.51
ABE	1001 D	Tertiary debitage flake. Broad with hinge termination and dorsal scars indicating previous flake removal.	4.84
ABF	1001 A	Notched flake. c.25% cortex at terminal end, multiple dorsal scars showing single platform. Partially backed on proximal margin, with opposing notch.	4.85
ABG	1001 A	Retouched flake. Broken, proximal end missing. Dorsal scars indicate multipolar flake removal. Abrupt retouch along margin	2.35
ABH	1001 A	Piercer. c.40% cortex on dorsal face, multiple scars indicating narrow blade production. Point formed from abrupt retouch at distal end, and continuing up one lateral margin – perhaps creating a hollow scraper. Proximal end missing.	7.64
ABI	1001	Multidirectional core. c.50% cortex remaining. Irregular broad flake removal.	13.14

ABJ	1001 A	Small bladelet. c.5% cortex on dorsal surface. Damage to lateral margin may be from usage	0.46
ABK	1001 D	Multidirectional core fragment. c.30% cortex remaining. Partial damage from thermal fracturing.	45.34

10.2.2 Within this small assemblage there was a consistent use of dark brownish-grey flint, with a moderately thick white cortex when present. This material was probably derived from local head deposits. One exception was the piercer, ABH, which was a dark grey colour with a thin, worn cortex, indicating a river cobble. The general condition of the flint was good, none of the pieces were patinated and the edges appeared relatively fresh which is indicative that they were close to their primary context – although none were recovered from cut archaeological features.

10.2.3 The material was a fairly even mixture of cores, debitage flakes and tools, including some retouched flakes. Unfortunately it lacked strong diagnostic pieces particular to any one period of prehistory. Even the two tools; the possible notched piece (ABF) and the piercer (ABH) are fairly ubiquitous tool types. Overall, the majority of the assemblage exhibits more Neolithic/Early Bronze Age characteristics than any other period, with evidence of platform preparation and broad flake production, plus notched pieces - features particularly common in the L. Neolithic period. Although the piercer does stand out, not only because of the different raw material, but the evidence for narrow blade production on a piercer and may more confidently be attributed to the E. Neolithic.

Pottery

10.2.4 A small quantity of pottery was recovered during the watching brief, and much of this material was found in the topsoil during machine stripping. With the exception of one medieval sherd, the assemblage has been attributed to the post-medieval periods. Given the lack of settlement and industrial activity on the site, it is likely that this was introduced though agricultural activities. The material has been summarised in the table below.

Code	Description	Period	Context	Weight (g)
AAF	Base, 14th-15th C. wide mouthed bowl	Med	1000	35.0
AAG	Body, decorated stoneware	P/M	1000	13.0
AAH	Body, stoneware	P/M	1000	3.0
AAI	Rim, whiteware, blue transfer pattern	P/M	1000	6.0
AAJ	Rim, whiteware, blue transfer pattern	P/M	1000	2.0
AAK	Rim, whiteware	P/M	1000	2.0
AAL	Body, transfer writing	P/M	1000	3.0
AAM	Body, White glaze, blue stripe	P/M	1000	2.0
AAN	Base, earthenware, brown int. glaze	P/M	1026	18.0
AAO	Body, stoneware	P/M	1020	2.0
AAR	Body	P/M	1011	3.0
AAY	Rim, handle scar. Blackware/earthenware, dark brown external glaze	P/M	1001E	111.0

Metalwork and Glass

10.2.5 A small quantity of metalwork and glass was also retrieved during the fieldwork. Much of the material is dated to either the post-medieval or modern period, and as with the pottery, is likely to have been deposited through agricultural activities. One important exception was a small fragment of glass bead (AAP) recovered from the probable pit (1021). Artefacts such as

this are difficult to date visually, but are known to have been manufactured from later prehistory through to the early medieval period. This material has been summarised in the table below.

Code	Material	Description	Period	Context	Weight (g)
AAA	Metal (Cu)	Coin - 1917 penny	Modern	2001	9.0
AAB	Metal (Cu)	Coin - 1920 penny	Modern	2001	9.0
AAC	Metal (Cu)	Coin - halfpenny?	Modern	2001	5.0
AAD	Metal (Cu)	Coin - 1918 farthing	Modern	2001	3.0
AAE	Metal (Cu)	Clip/buckle	Modern	2001	11.0
AAX	Metal (Cu)	Fragment	P/M	1000	5.0
AAP	Glass	Bead fragment, blue. Prehistoric through to AS in date.	Pre-AS	1021	<1.0
AAU	Glass	Rim, green	P/M	1020	3.0
AAV	Glass	Complete clear bottle	P/M	1015	99.0

10.3 Discussion

10.3.1 The worked flint recovered along the Fairham Brook section of the development is a clear indicator that there was prehistoric activity within the vicinity. This is further supported by the previously known archaeological evidence with four additional flints known from nearby properties. However, the exact nature of this activity is difficult to define as there were no archaeological features found in association with these artefacts.

10.3.2 With the exception of a single undated pit, the only features to be revealed were associated with post-medieval drainage. Given the topography of this area, (bisected by the Fairham Brook) it is likely that this has always been a marginal landscape and therefore not conducive to permanent settlement. Consequently, it is unsurprising that there were no archaeological features of any significance identified during these groundworks.

11. RESULTS – Southchurch Drive (C7)

11.1 Watching Brief

11.1.1 Clifton is located approximately 6km south-west of Nottingham City Centre (Figure 15). The Southchurch Drive portion of the development route was approximately 300m long and was bounded by SK 55585 34686, SK 55599 34680, SK 55485 34395, SK 55471 34394. The average elevation in this portion of the development was 42m OD, rising to a maximum of 45m A.O.D opposite Clifton library.

11.1.2 The route passed just to the east of the site of Glapton, now buried under the Clifton housing estates. The extent of Glapton is first mapped in detail on the map of Clifton in 1763, delineating the estate of Sir Gervas Clifton. It was considered possible that archaeological features may have survived the construction of these estates.

11.1.3 Prior to the commencement of fieldwork and forming part of the development strategy, a series of organic deposits of unknown date were recovered from environmental boreholes and window samples along Southchurch Drive. These may coincide with a small stream flowing east-west through the settlement of Glapton, shown on Sanderson's map of 1835 (Sanderson 1835).

CES 1 - Utilities

11.1.4 The utilities works began in July 2012. At the southern end of the development area, adjacent to Lanthwaite Road, an area of excavation for the installation of drainage pipes was opened. The trench was partially lined with sheet piling and was excavated to a depth of approximately 2m, although the lower stratigraphy was obscured by water.

11.1.5 The stratigraphic sequence visible in the south-east facing section consisted of a layer of tarmac (CES0001) overlaying a layer of hardcore (CES0002), a reddish brown brick and rubble layer (CES0003), a dark greyish black clay (CES0004), and a dark brown clay (CES0005) (Plate 31). Beneath (CES0003) in the north-west facing section mid dark brown silty clay (CES0009), and reddish brown silty clay (CES0010) were visible. No archaeological finds or features were identified within this trench.

11.1.6 Immediately to the south-west, continuing along Southchurch Drive, two small exploratory trenches measuring 1.5x1.5x0.8m and 1x1x0.8m did not reveal any archaeological features within the rubble layer (CES0003).

11.1.7 Further utilities trenches excavated on the corner of Lanthwaite Road and opposite Clifton Leisure Centre showed a thick layer of made ground beneath the tarmac (CES0017) overlying silty alluvial clays [(CES0018), (CES0019), (CES0020)], but no archaeological features were visible.

11.1.8 At the junction with Green Lane, a new services trench exposed Post Medieval/Victorian services (CES0021) within a 2m thick layer of made ground [dark reddish brown silty clay (CES0022)] at a depth of around 1.8m. No further archaeological features were observed to a depth of over 3m. Immediately to the south-west of the Green Lane roundabout junction, beneath the pavement, a small cable trench (0.3m wide x 1.3m deep) contained only 100mm of tarmac (CES0001), above 200mm of hardcore (CES0002) before revealing natural pinking grey silty clays (CES0023). This stratigraphy remained consistent to the south-east side of the junction. On the opposite side of the junction, opposite Lloyds TSB and the Post Office, modern paving slabs (CES0024), rather than tarmac, overlaid 0.3m of hardcore/ballast (CES0002) which sealed a dark greyish brown silty clay (CES0025), with frequent bioturbation, above a light greyish brown silty clay (CES0026). This stratigraphic sequence remained consistent as the trench was extended northwards along Southchurch Drive.

11.1.9 At the northern end of the development area, adjacent to Rivergreen, a narrow trench (0.6 wide x 1.7m deep) beneath the modern paving slabs (CES0024) lay 0.3m of hardcore [(CES0002), limestone and gravel ballast)]. This overlay redeposited natural; medium reddish brown clay (CES0027), laminated with medium blue clay, which continued to a depth of 1.4m above a layer of natural blue clay (CES0028).

CES 2 – Trackbed

11.1.10 The trackbed works began in March 2013. The rail box cut was c.5m wide and c.1m deep. The proposed development area stratigraphy remained largely consistent across the extent of the trench. Beneath 100mm of tarmac (CES0001) was a further 100mm of reinforced concrete (CES0029) which sealed 300mm of limestone/granite aggregate (CES0002). Below the levelling layer was c.300mm of mixed demolition rubble (CES0030) capping the natural clay layers (CES0031).

11.1.11 Two features with archaeological potential were identified within the trackbed trench (Figure 16). A single post hole [CES3002], filled with a dark greyish brown silty clay (CES3003), was excavated in the base of the rail box cut trench (Plate 32). At the very northern end of Southchurch Drive, the box cut was bisected by a single, linear with a 'U'-shape profile [CES3000] measuring 2.1m in width and 0.4m deep (Plate 33). This was filled with dark greyish brown silty clay (CES3001), similar in consistency to (CES3003).

11.2 Discussion

11.2.1 Although there was a possibility of revealing remains associated with the historic core of Glapton, just two undated features were identified within the development area. The significance of these observations is evidently limited by the lack of information associated with them, specifically dating evidence. Furthermore, their presence in isolation prevents any reasonable estimations relating to their original function.

12. Discussion and Conclusion

12.1 The environmental statement for the NET 2 scheme assessed the entire development route for its archaeological potential. Each of the sections discussed within this report had consequently been designated as areas of low or medium archaeological potential and were subject to a programme of archaeological monitoring whilst ground works were taking place. In this section, the resulting observations are discussed with reference to their overall significance.

12.2 The Chilwell section of the development was monitored due to a moderate potential for archaeological remains based upon the nearby undated cropmarks and findspots of Roman coins. However, no archaeological features were recorded during the construction work that took place here. It is possible that previous development of the area had resulted in significant landscaping that may have removed any archaeological remains. However, it is more likely that any former activity evidenced by the findspots and cropmarks was isolated to areas not within the area of development.

12.3 The route along University Boulevard was highlighted as an area of interest because it passed close to the medieval hamlet of Keighton and an area of prehistoric significance. Although there were no known features of significance to target within the development route itself, and none were found during the construction works. The only archaeological features were post-medieval in date and appeared to be related to land management activities, with ditches serving as boundaries and enabling drainage.

12.4 The excavation work along University Boulevard did reveal various alluvial deposits and areas of peat bog. The subsequent borehole survey which investigated the peat deposits provided evidence for a wetland carr landscape that would have dominated the area during the Neolithic and Bronze Age periods. Although no artefacts or features were found relating to these periods, previous discoveries within the nearby lake demonstrate that this environment was an important wetland landscape. Similar peat formations along the Trent are notable for attracting deposition of artefacts (Knight & Howard 2004; 55) and although no artefacts were recovered, future investigation should precede on the basis that appropriate pre-conditions for votive deposition exist here.

12.5 The main objective of the watching brief along Meadows Way was to identify remains of the Parliamentarian fort, *Hooper's Sconce.* The only archaeological remains to be observed were the foundations of 19th century residential structures, with no residual artefacts from earlier periods of activity. However, these observations should not necessarily be relied upon to inform further conclusions about the location of Hooper's Sconce. The limited impact depth of the ground works means that it was not possible to reveal any deposits pre-dating the 19th century development of the area. It is therefore possible that the development route may have passed over a truncated portion of the fortification without any visible evidence to acknowledge this.

12.6 Although no previous archaeological discoveries had been recorded at the Wilford crossing, the potential for exposing alluvial deposits containing useful environmental information was considered. There was also the possibility of exposing evidence linked to the historic core of Wilford. However, the actual development had minimal impact upon the alluvial deposits, and nothing of archaeological interest was revealed. The only evidence for human activity within the area was that associated with the construction of the Great Northern Railway.

12.7 The alluvial deposits associated with the Fairham Brook were also considered to potentially contain important environmental information. Further significance was also attributed on the basis that worked flints had been recovered from the nearby area. However, the observations made during fieldwork indicated that this was historically a marginal environment requiring significant drainage, even for agricultural use. The small amount of worked flint recovered from the exposed deposits does provide evidence that humans were active within the area, at least as far back as the Neolithic period. However, the exact nature of this activity is difficult to define as there were no archaeological features found in association with these artefacts.

12.8 Within the final section to be monitored as a watching brief, just two undated features were identified along Southchurch Drive. It was suspected that evidence associated with the village of Glapton may have been revealed during the development, but the lack of dating material or information indicating their function means that these observations are of limited significance.

12.9 The archaeological evidence brought to light during the various stages of watching brief, was generally very low, both in terms of artefacts and features. The most significant results related to environmental evidence for the prehistoric landscape along University Boulevard. Particularly for its contribution to our understanding of Bronze Age artefacts previously recovered from the University lake.

12.10 There are several explanations for the paucity of archaeological evidence. The most obvious is the fact that the areas monitored as a watching brief had been carefully identified as having only low or medium archaeological potential. Otherwise the evidence is a reflection of landscape development and local topography. Throughout more well-developed areas the impact depth was usually insufficient to expose deposits of archaeological importance. This was particularly relevant through the more heavily developed sections such of Meadows Way. In the remaining areas that had not seen substantial development, potentially archaeological horizons were more readily observed, particularly through University Boulevard, Wilford Bridge and Fairham Brook. Although the alluvial deposits that were often encountered were in themselves indicators that these areas were unsuitable for permanent habitation.

13. Bibliography

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Appendix 1 - Plates

Plate1: Chilwell: Bisected Culvert (CED0008) near Greenwood Court.

Plate 2: Chilwell: Wide trench near Sandby Court with concrete trackbed foundations. North facing shot.

Plate 3: University Boulevard: East facing view of Area 1 after topsoil removal showing west facing section of [UBU2005]

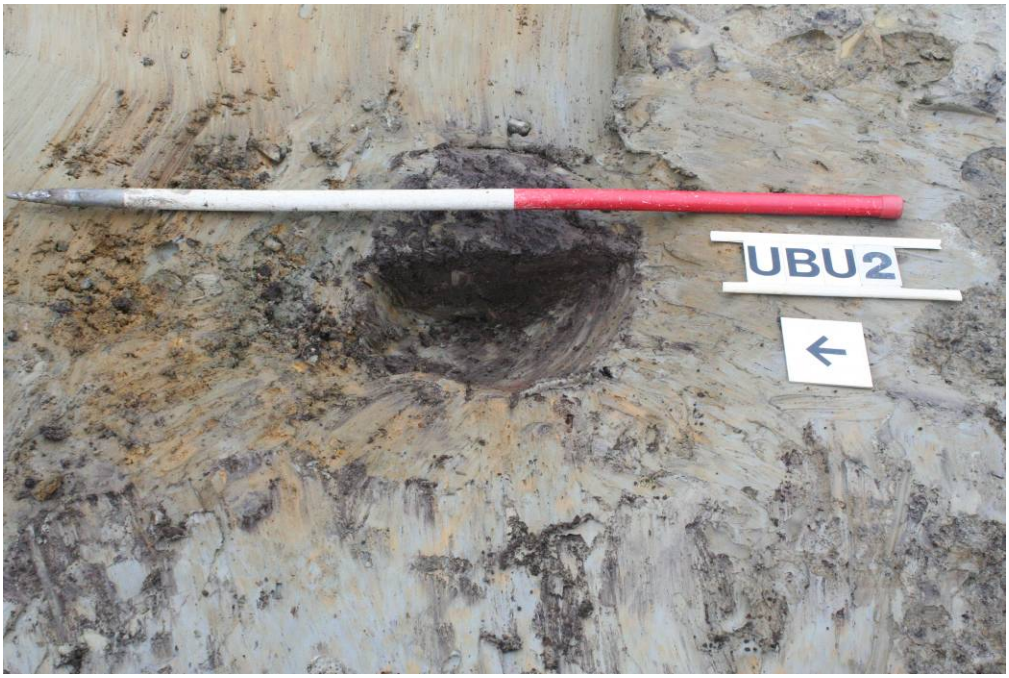

Plate 4: University Boulevard: East facing view of [UBU2017] in half section

Plate 5: University Boulevard: South-east facing view of [UBU2018] in half section

Plate 6: University Boulevard: Plan view of (UBU2010) area

Plate 7: University Boulevard: East facing view of Environmental Trench 18.

Plate 8: University Boulevard: Waterlogged wood from within (UBU0005), (UBU0006) and (UBU0007)

Plate 13: Made ground deposits within deep excavation

Plate 14: Meadows Way: Staffordshire engineering brick surface (MWN0018) adjacent to wall (MWN0019). Looking West.

Plate 15: Meadows Way: Outbuildings (MWN0016) abutting linear wall (MWN0015). Looking East.

Plate 16: Meadows Way: Building remains (MWN0034). Looking Northeast.

Plate 17: Meadows Way: Linear wall opposite Homebase (MWN0047). Looking West.

Plate 18: Meadows Way: Linear 19th century wall (MWN0059). Possible industrial structure. Looking South.

Plate 19: Meadows Way: Ceramic Drain (MWN0055). Looking East.

Plate 20: Meadows Way: Five courses of red brick, 19th century wall (MWN0068) not visible in plan and ceramic drain (MWN0069). Looking Northwest.

Plate 21: Meadows Way: Plan view of walls (MWN0063), (MWN0064) and (MWN0065). Looking Southeast.

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Plate 23: Wilford Toll Bridge: Small trench containing modern drain cut [WTB0004] in Area 02. Looking Southwest.

Plate 24: Excavation of flood plain adjacent to Wilford Toll Bridge including (WTB0023) and (WTB0026). Looking North.

Plate 25: Section of disused Great Northern Railway embankment (WCA0001) and (WCA0002)

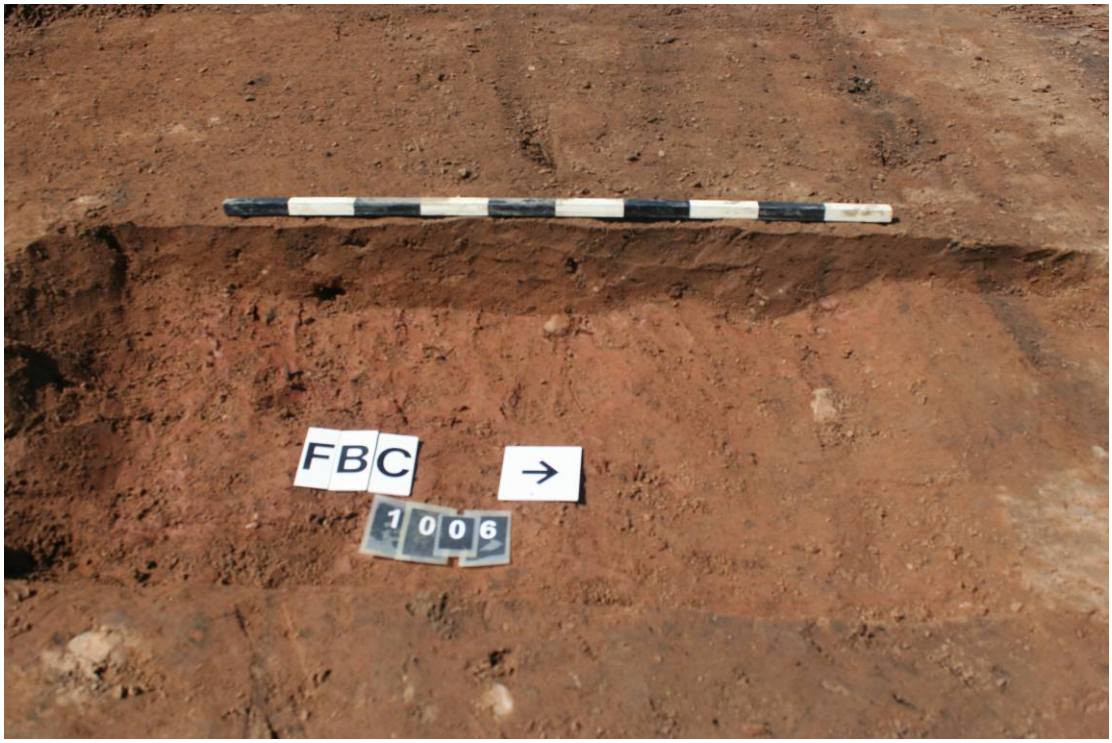

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Plate 28: Ditch [1012], looking Southwest.

Plate 29: Drainage culvert [1028] looking East.

Plate 30: Pit [1030] looking East.

Plate 31: Clifton Southchurch Drive: South-east facing section containing (CSD0001), (CSD0002), (CSD0003), (CSD0004), (CSD0005). Looking Northwest.

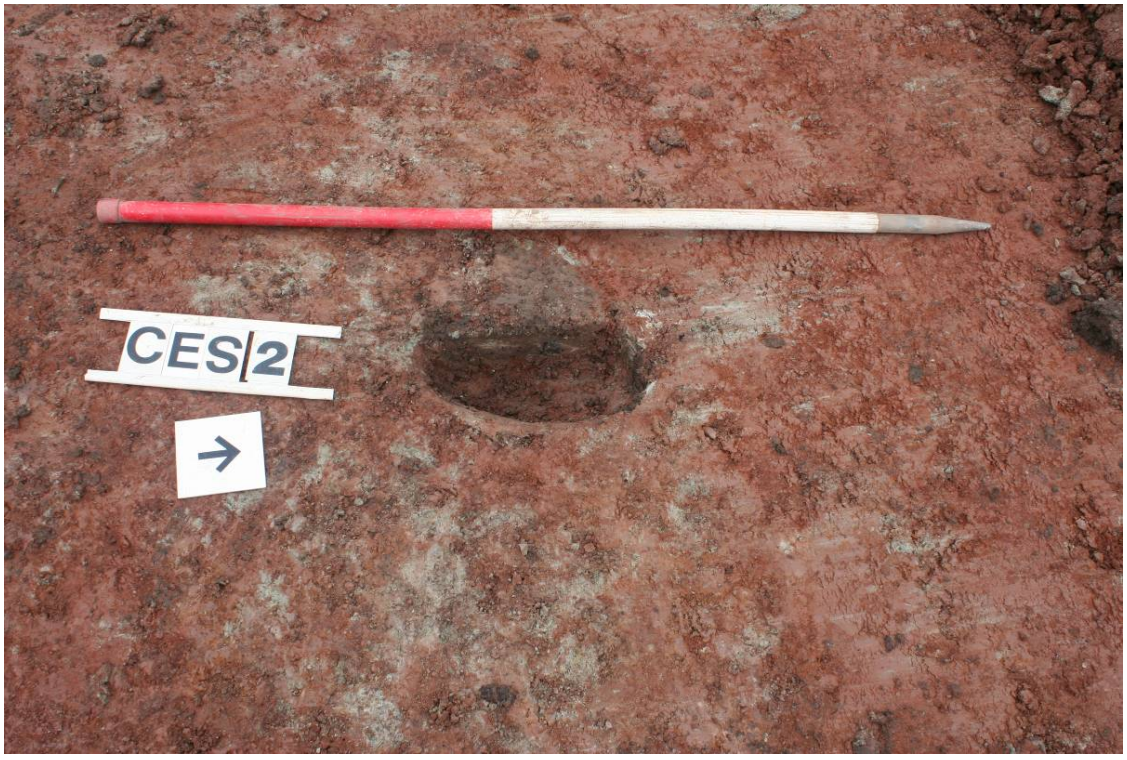
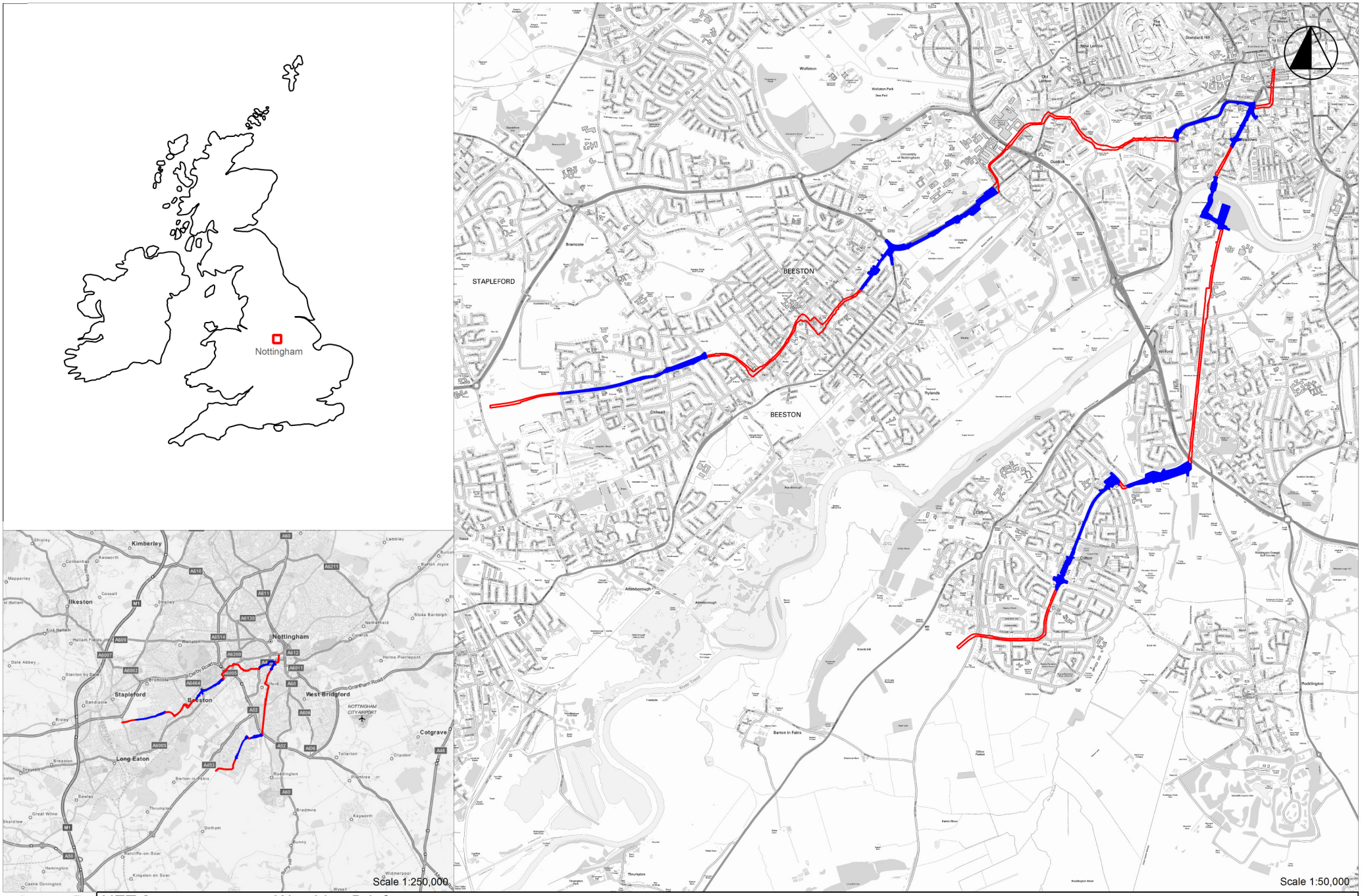


Plate 32: Clifton Southchurch Drive: Post hole [3002] with fill (CSD3003) within the base of the rail box cut. Looking West.

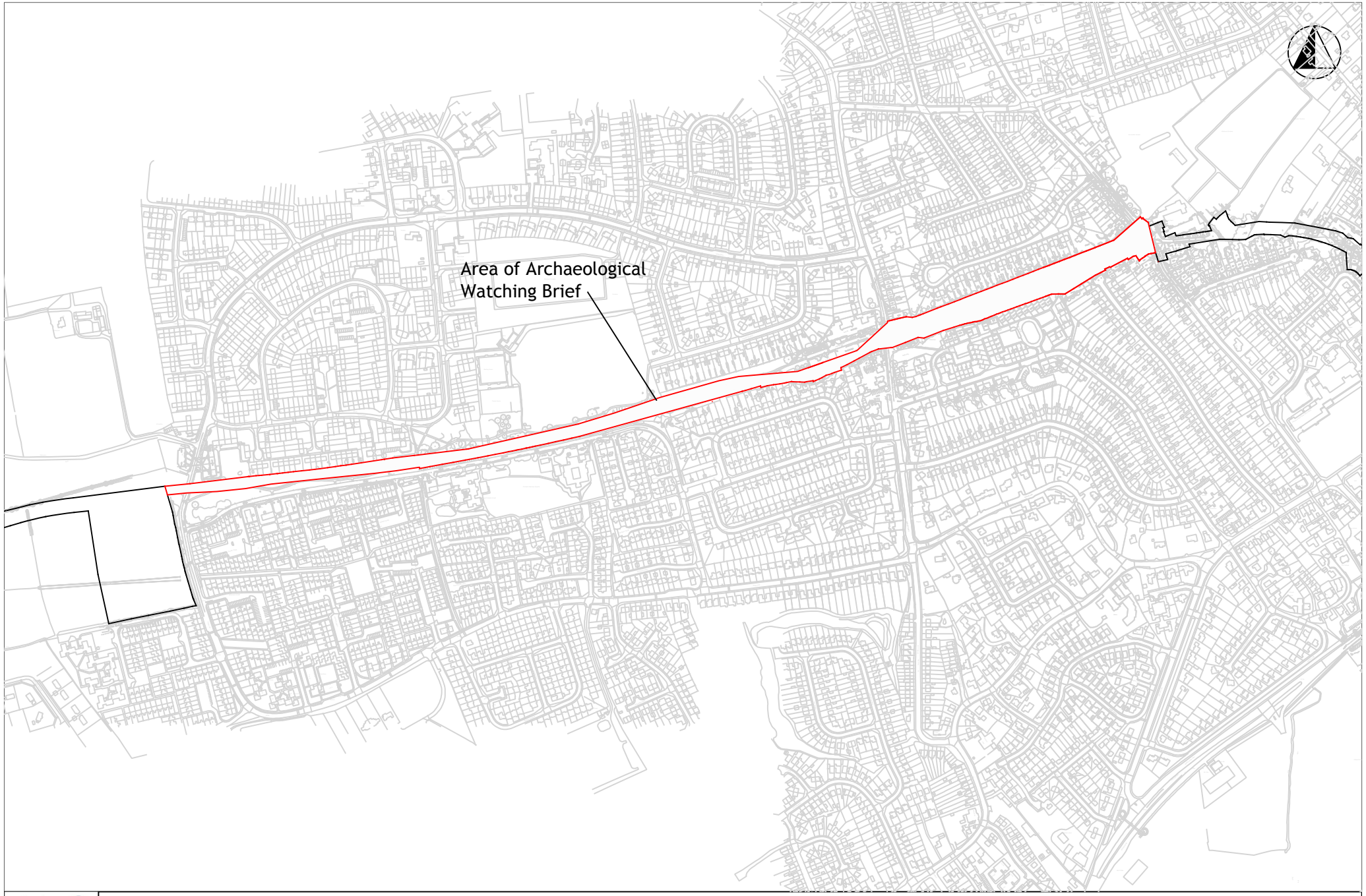
Plate 33: Clifton Southchurch Drive: Linear [CSD3000] and fill (CSD3001) within the rail box cut. L.

Appendix 2 - Figures

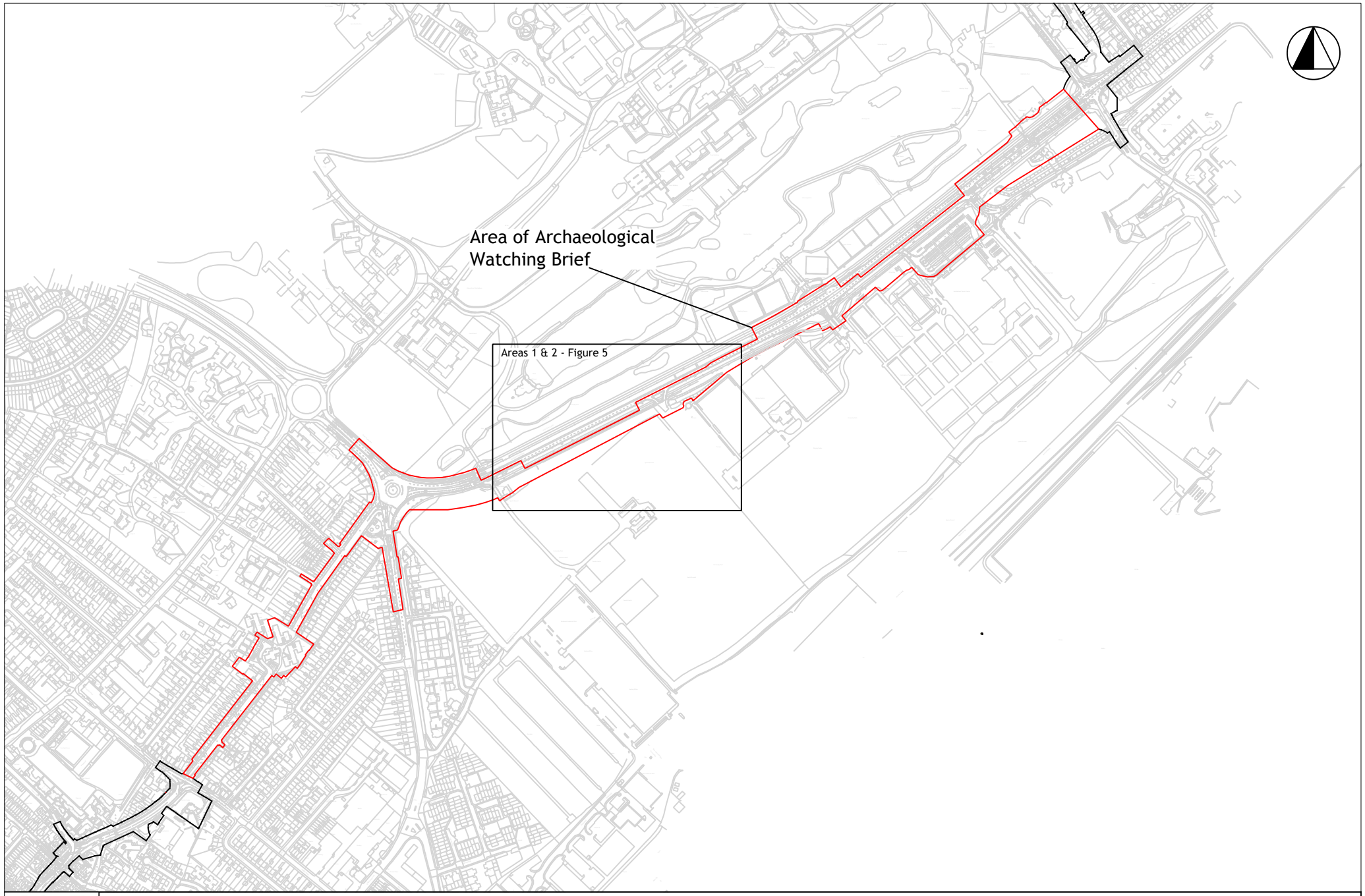


NET 2	Watching Brief	
Figure 1	Location of Development Route (Watching Brief Areas In Blue)	Revised by:
Initials: MD	Scale at A4 - As Shown	Date: 08/06/2015

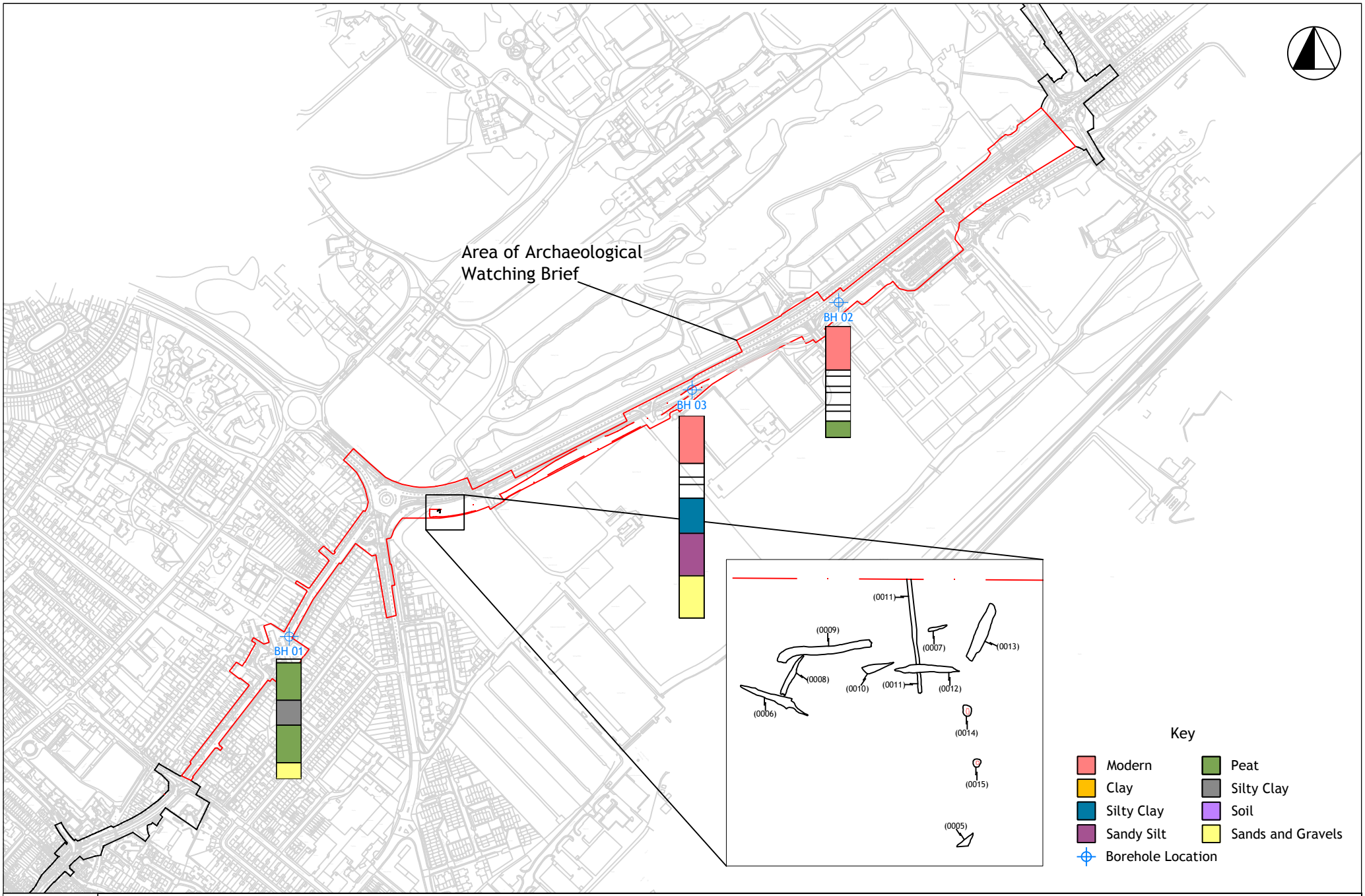
Trent & Peak ARCHAEOLOGY



Trent & Peak ARCHAEOLOGY	NET 2	CED - Chilwell Eskdale Drive
	Figure 2	Area of Archaeological Watching Brief (Outlined in Red)
	Scale at A4 - 1:7500	Initials:MD/TL



Trent & Peak ARCHAEOLOGY	NET 2	UBU - University Boulevard
	Figure 3	Area of Archaeological Watching Brief (Outlined in Red)
	Scale at A4 - 1:7500	Initials:MD/TL



Trent & Peak ARCHAEOLOGY

NET 2
Figure 4
Scale at A4 - 1:7500

UBU - University Boulevard
Locations of Auger Survey and Waterlogged Wood
Initials:MD/TL

Area 2

[2039]

[2036]

[2017]

(4003)

[2018]

[2015]

(2010)

[2020]

[2007]

[2005]

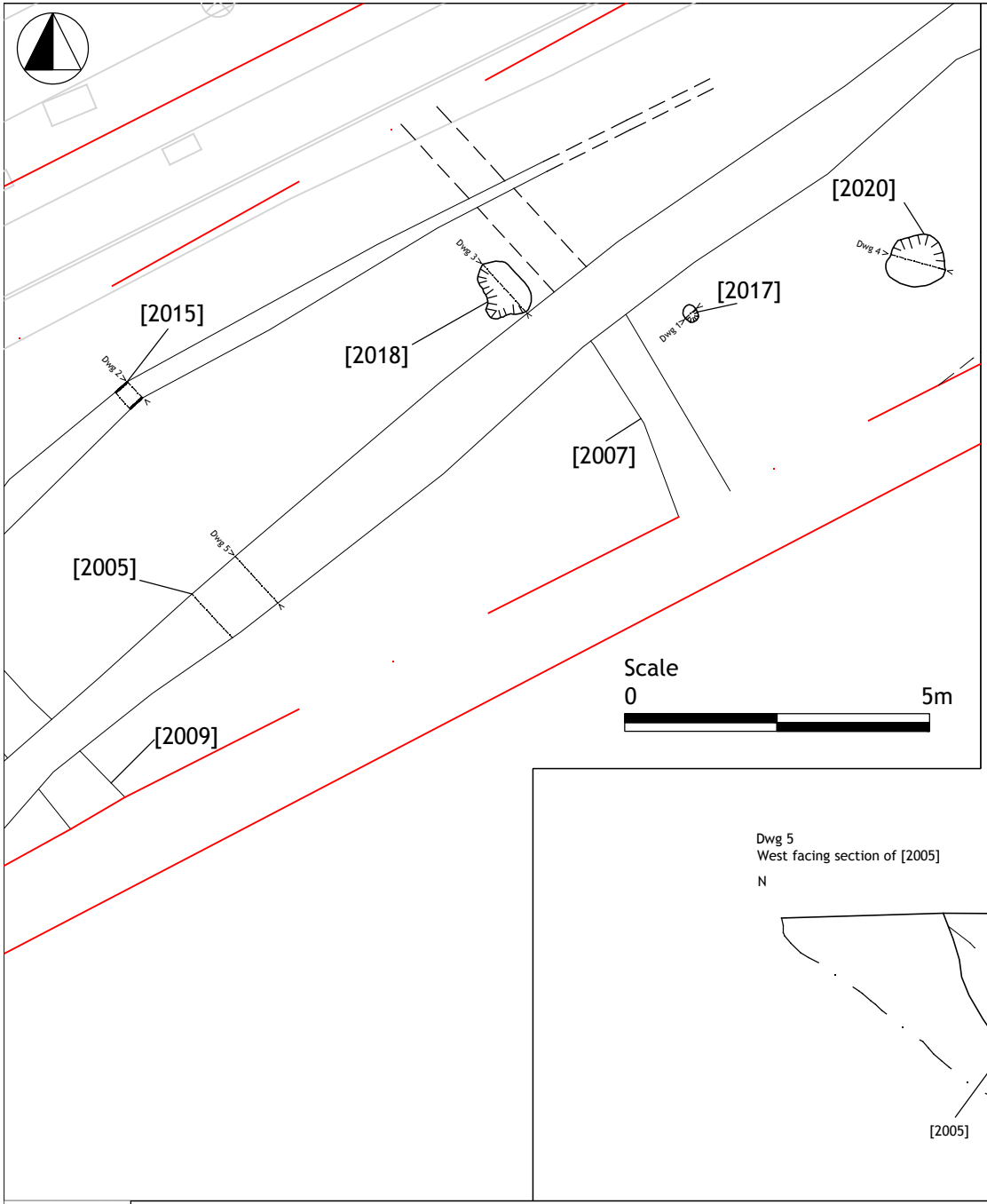
[2009]

[2042]

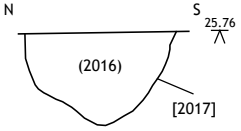
(2040)

Area 1

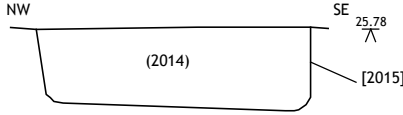
Trent & Peak ARCHAEOLOGY	NET 2	UBU - University Boulevard
	Figure 5	Archaeological Features Within Areas 1 and 2
	Scale at A3 - 1:1000	Initials:TL



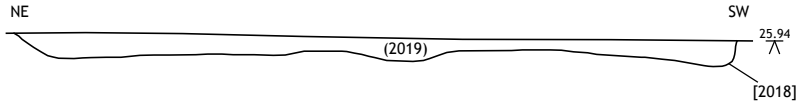
Dwg 1
West facing section of [2017]



Dwg 2
South-West Facing Section of [2015]

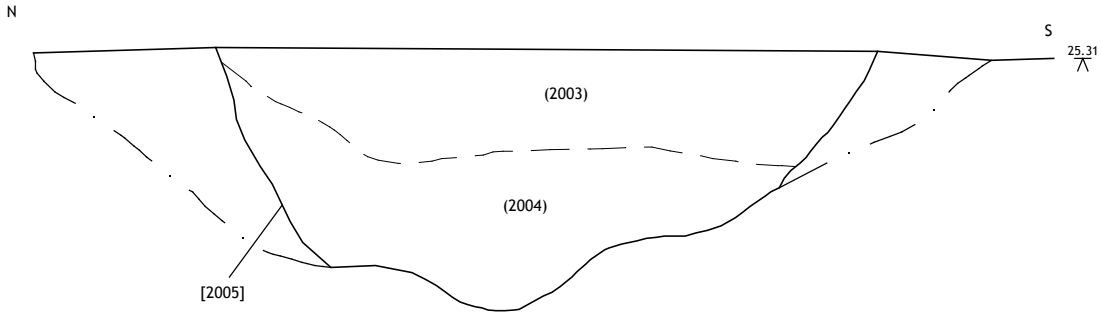


Dwg 3
North-West facing section of [2018]



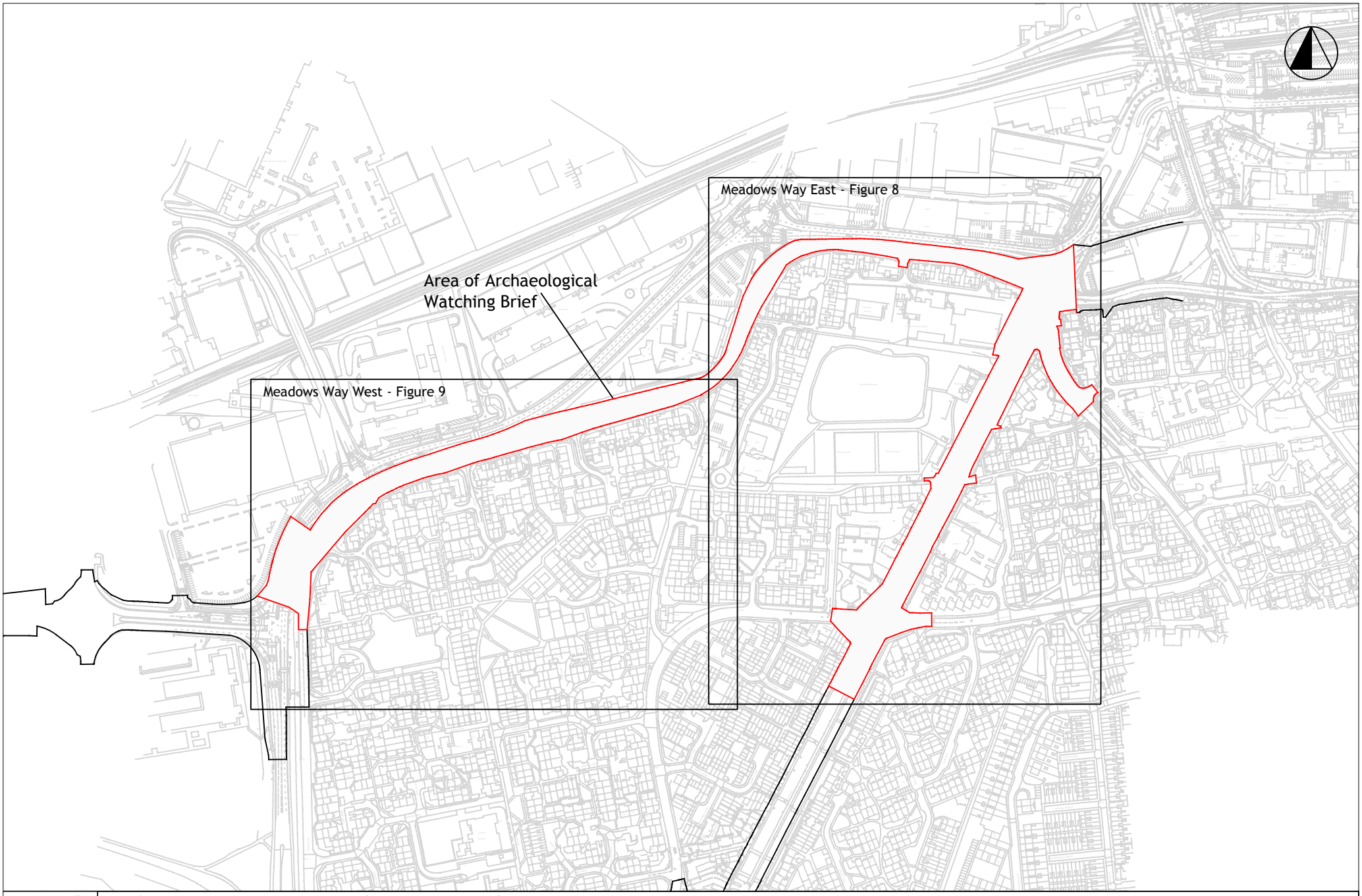
Dwg 4
North - East facing section of [2020]

Dwg 5
West facing section of [2005]



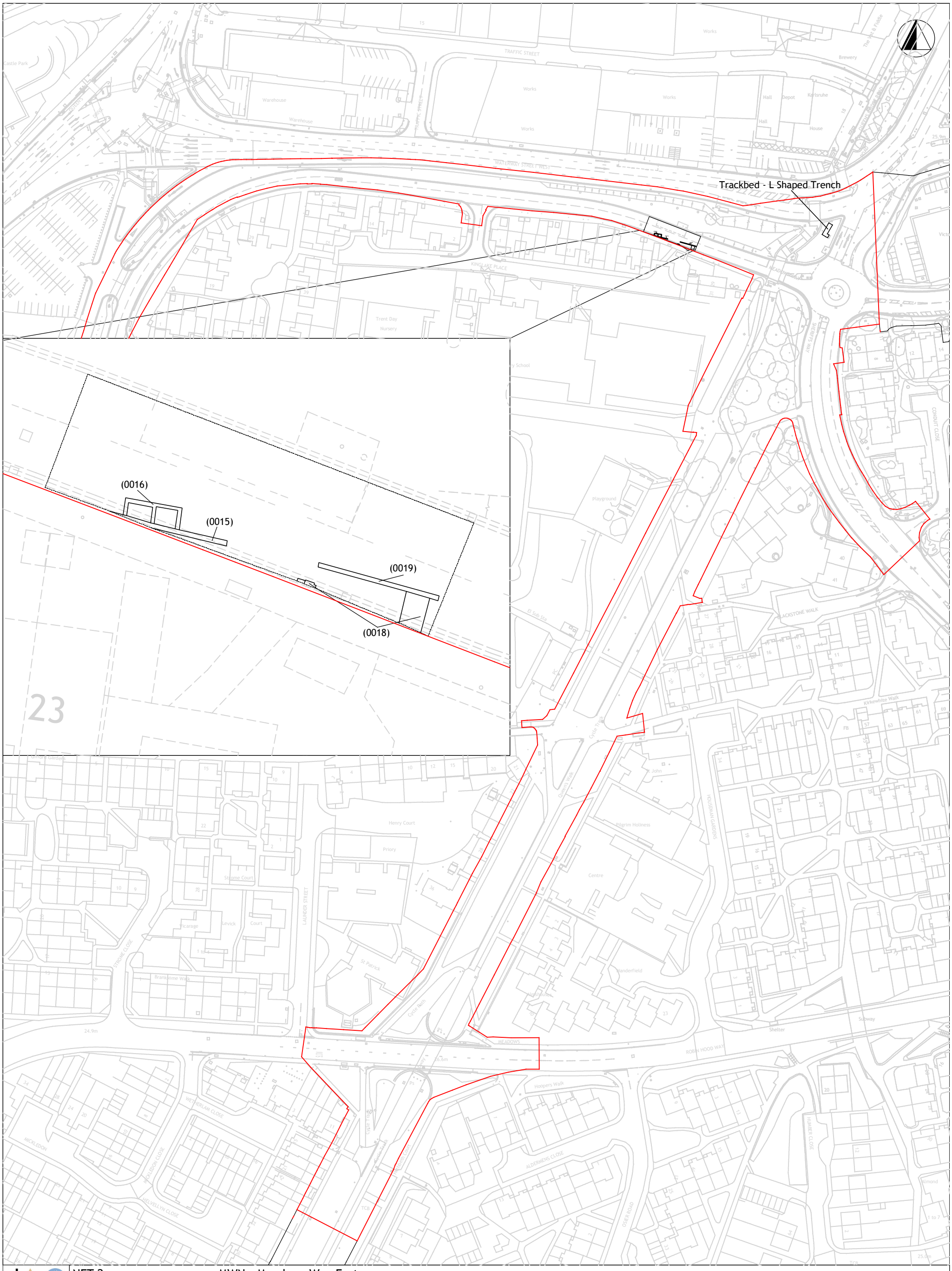
NET 2	UBU - University Boulevard
Figure 6	Area 1 sections
Initials: TL	Scale at A4 - Sections - 1:20, Plan - 1:200

Trent & Peak ARCHAEOLOGY



Trent & Peak ARCHAEOLOGY

NET 2	MWN - Meadows Way Nottingham
Figure 7	Area of Archaeological Watching Brief (Outlined in Red)
Scale at A4 - 1:5000	Initials:TL/MD



NET 2	MWN - Meadows Way East
Figure 8	Meadows Way East - Archaeology Observed
Initials:TL	Scale at A3: Background - 1:1500, Inset Detail - 1:200

Trent & Peak ARCHAEOLOGY

Utilities Watching Brief - Deep Trench

Utilities Watching Brief - Trial Holes

Trackbed - Trial Holes

(0034)

(0044)

(0045)

(0062)

(0047)

(0057)

(0058)

(0059)

(0055)

(0054)

(0056)

(0053)

(0050)

(0052)

(0032)

(0032)

(0051)

(0066)

(0032)

(0063)

(0065)

(0064)

(0032)

(0067)

(0038)

(0038)

(0036)

(0039)

(0037)

(0037)

(0032)

Police Station

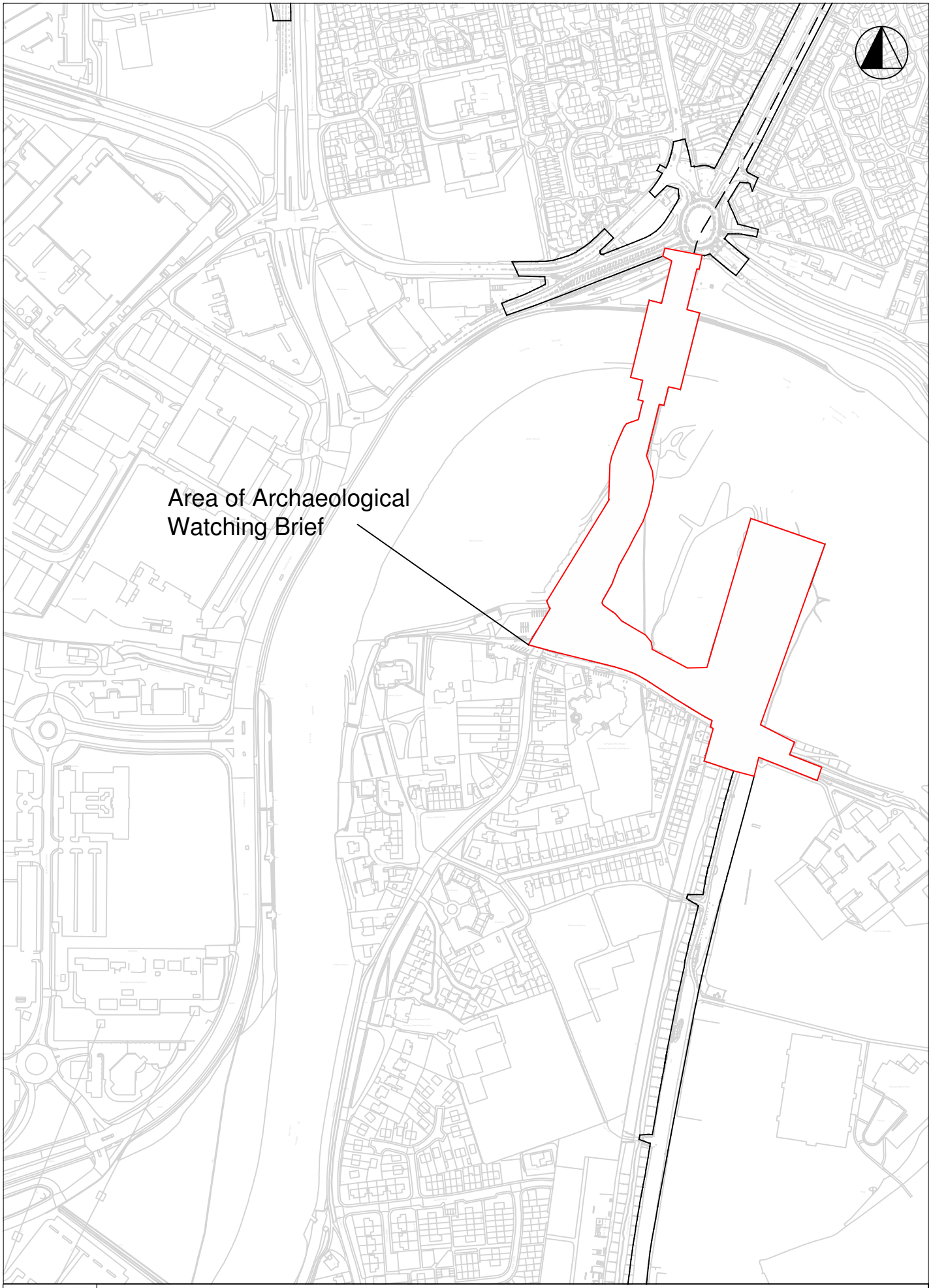
Furlong House

Wilford

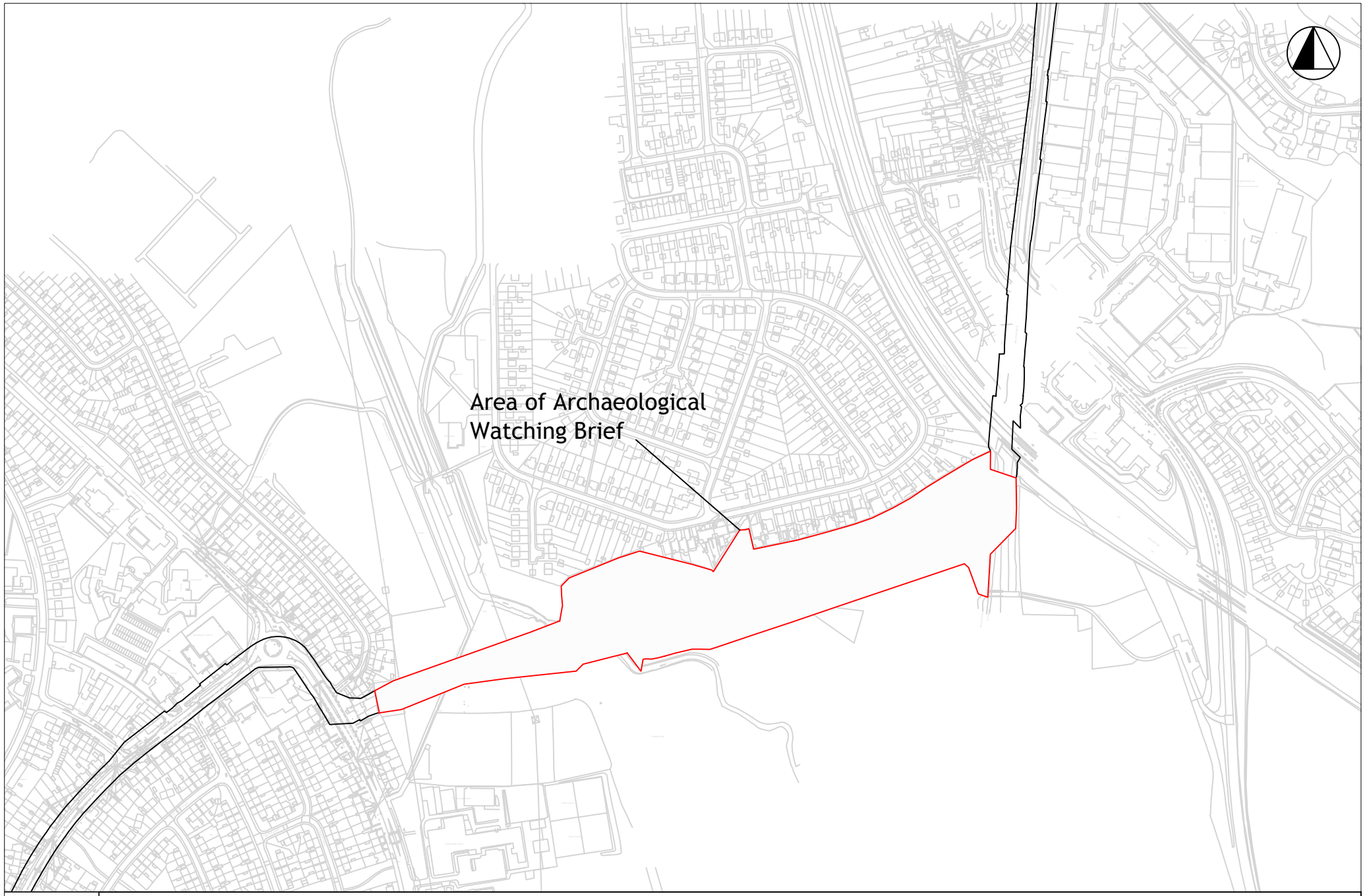
Gilford Gardens

NET 2	MWN - Meadows Way West
Figure 9	Meadows Way West - Archaeology Observed
Initials:TL	Scale at A3: Background - 1:1250, Inset Detail - 1:200

Trent & Peak ARCHAEOLOGY



Trent & Peak ARCHAEOLOGY	NET 2	WTB - Wilford Toll Bridge
	Figure 10	Area of Archaeological Watching Brief
	Initials: MD	Scale at A4 - 1:5000



Trent & Peak ARCHAEOLOGY

NET 2	FBC - Fairham Brook Clifton
Figure 11	Area of Archaeological Watching Brief (Outlined in Red)
Scale at A4 - 1:5000	Initials:TL

[1006]

[1030]

[1008]

(1028)

[1025]

[1023]

[1027]

[1025]

[1023]

[1027]

Scale 1:500

(1031)

(1029)

[1030]

Scale 1:20

[1004]

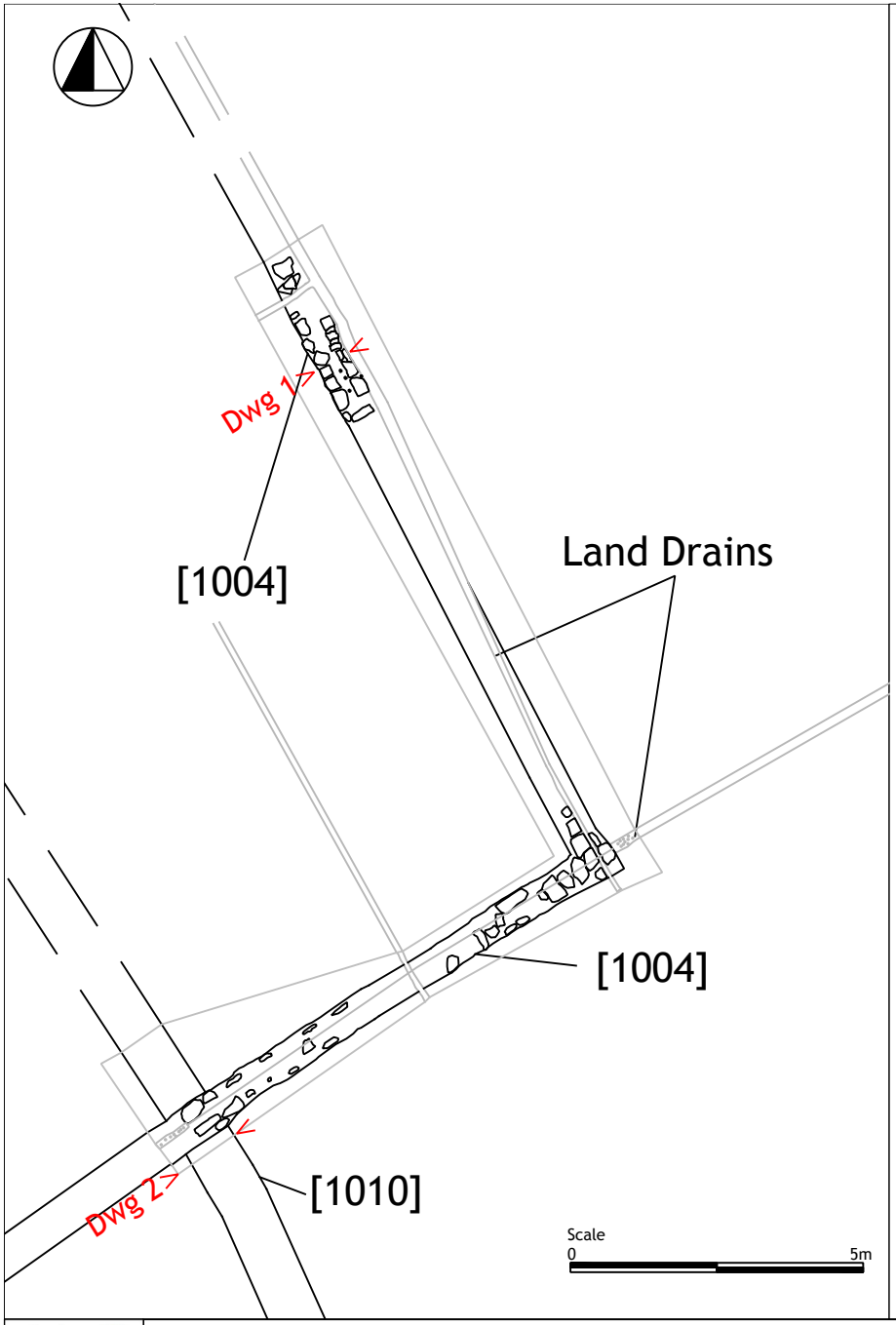
Land Drains

[1004]

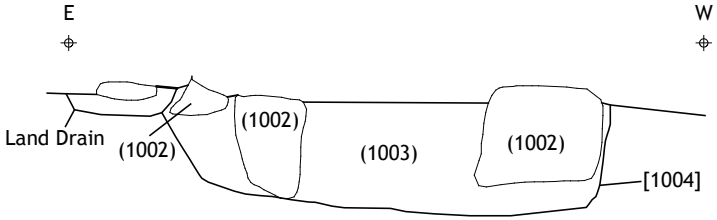
[1010]

Scale 1:125

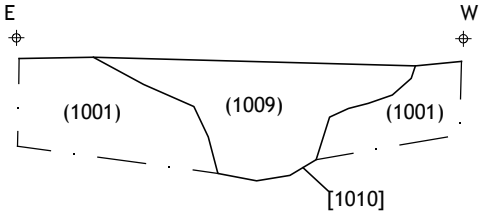
Trent & Peak ARCHAEOLOGY	NET 2	FBC - Fairham Brook Clifton
	Figure 12	Archaeological Features Within Area 1
	Initials: TL	Scale at A3 - 1:2000 (unless stated otherwise)



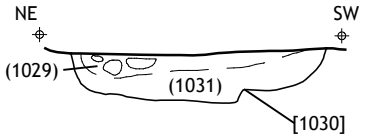
Dwg 1
North facing Section of [1004]



Dwg 2
North facing Section of [1010]



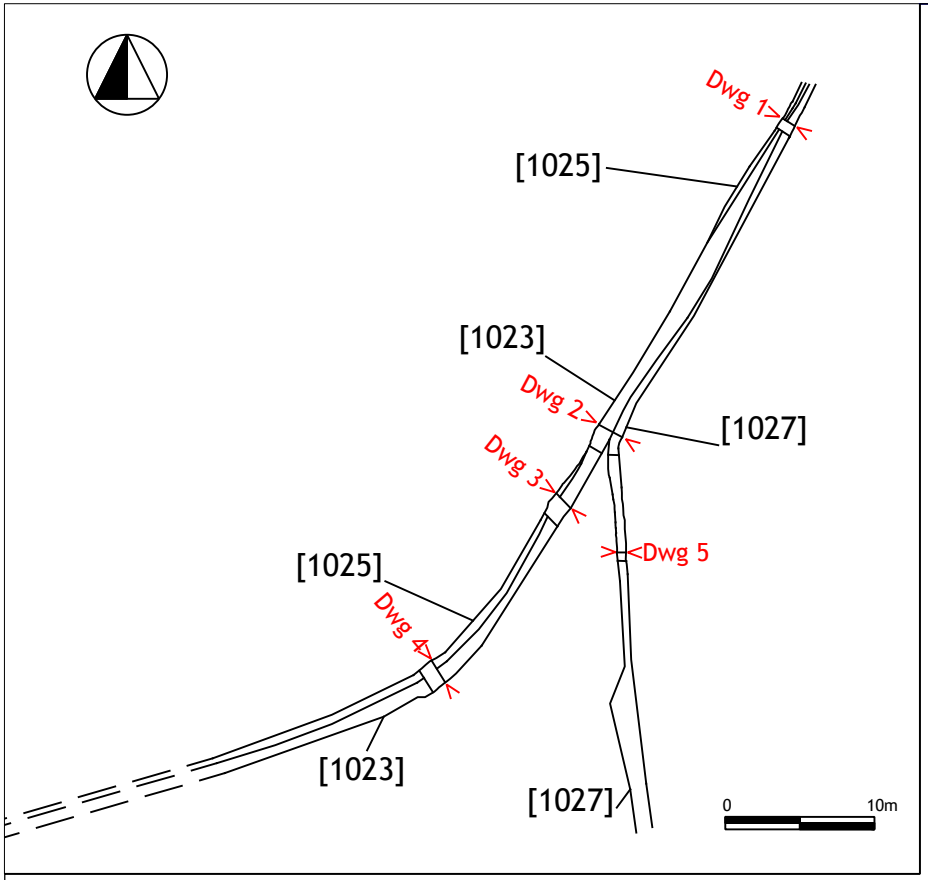
Dwg 3
North-West facing Section of Pit [1030]



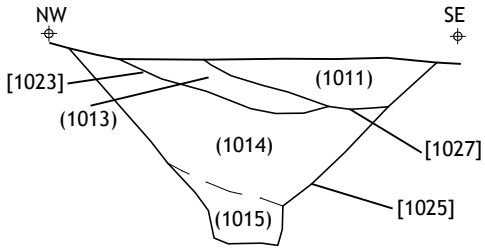
Trent & Peak ARCHAEOLOGY

NET 2
Figure 13
Initials: TL

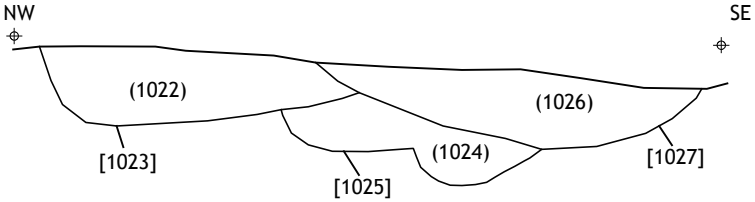
FBC - Fairham Brook Clifton
Sections Showing Land Drains and Pit [1030]
Scale at A4 - All Sections 1:20



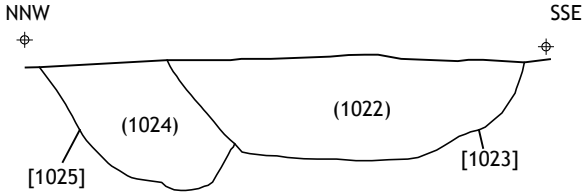
Dwg 1
South-West facing Section of [1027]



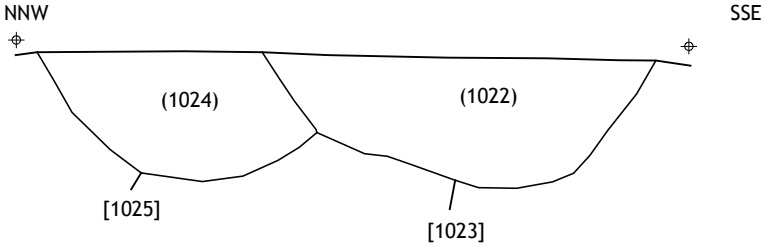
Dwg 2
South-West facing Section of [1027]



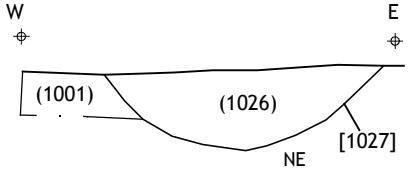
Dwg 3
South-South-West facing Section of [1023]



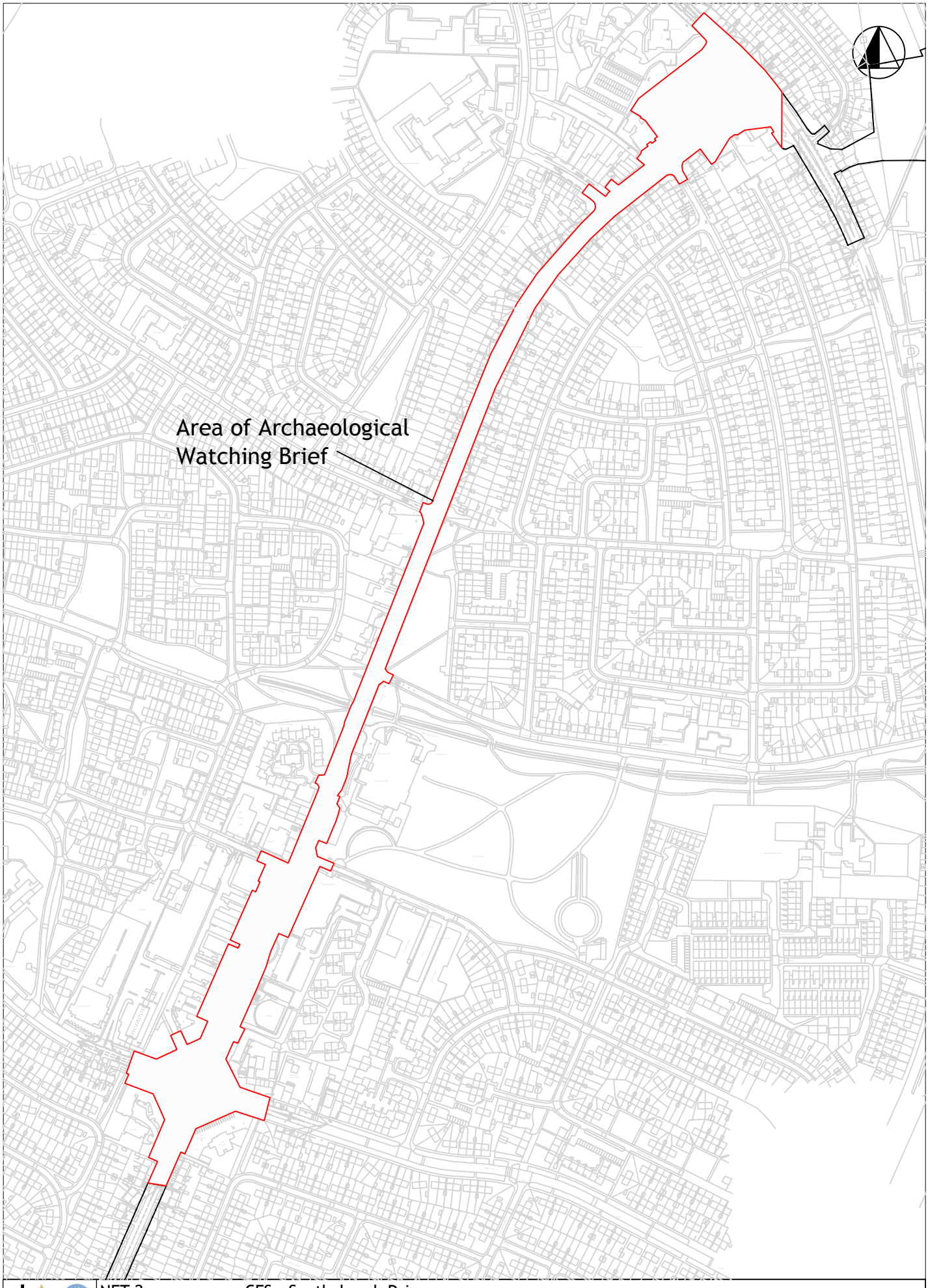
Dwg 4
South-South-West facing Section of [1023]



Dwg 5
South facing Section of [1027]



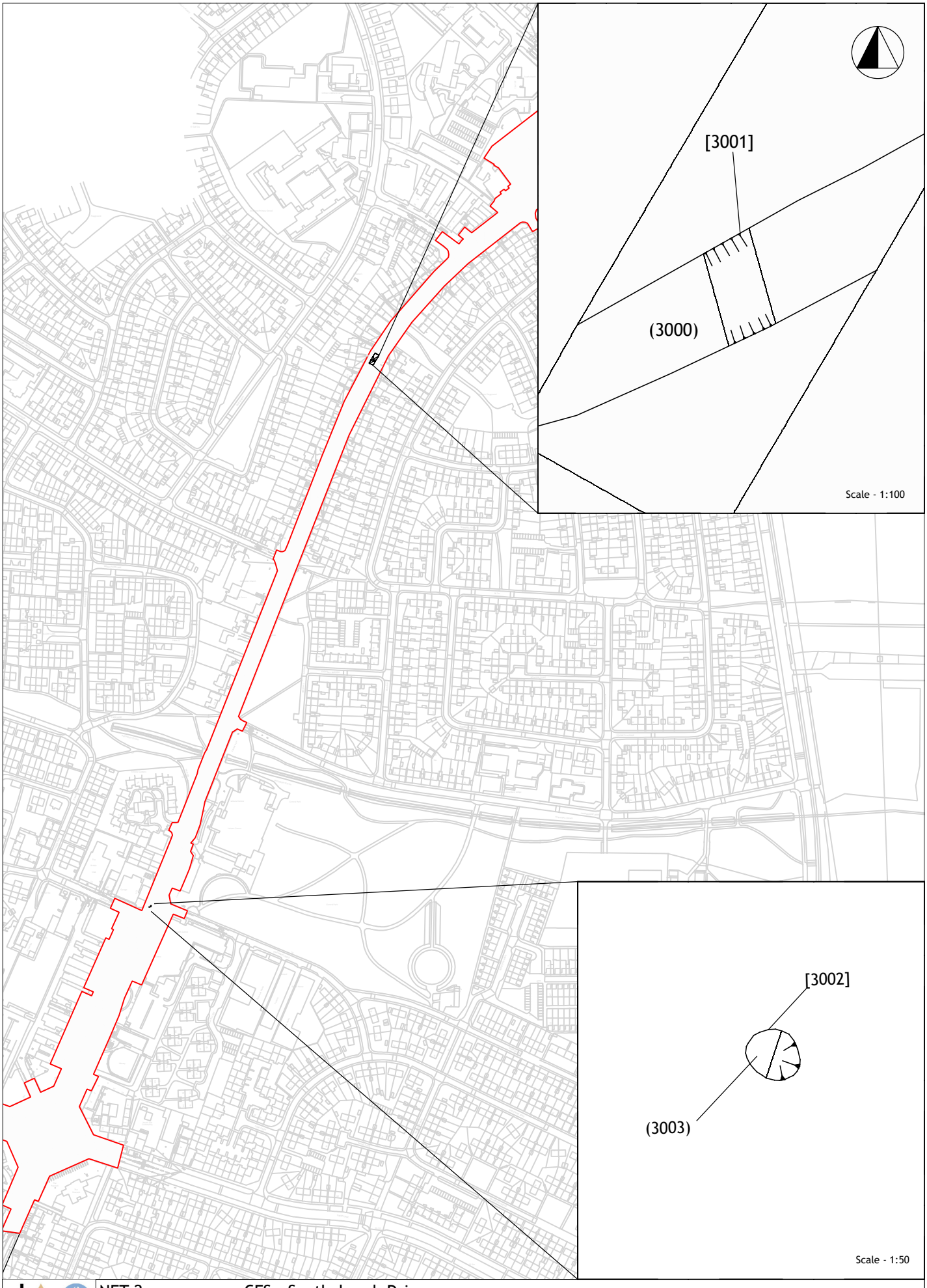
Trent & Peak ARCHAEOLOGY	NET 2	FBC - Fairham Brook Clifton
	Figure 14	Ditch Sections Within Area 1
	Initials: TL	Scale at A4 - All Sections 1:20



Trent & Peak ARCHAEOLOGY

NET 2
Figure 15
Initials: TL

CES - Southchurch Drive
Area of Archaeological Watching Brief (Outlined in Red)
Scale at A4 - 1:5000



Trent & Peak ARCHAEOLOGY

NET 2	CES - Southchurch Drive
Figure 16	Archaeological Features Within the Area
Initials: MD	Scale at A4 - 1:5000 (unless stated otherwise)

Appendix 3 – UBU Borehole Assessment and Logs

THE DICKSON LABORATORY
FOR BIO-ARCHAEOLOGY

UBU

Core Assessment

NORTHLIGHT HERITAGE

REPORT: 85

PROJECT ID: 4271181

ENVIRONMENTAL REPORT

Northlight Heritage

Dickson Laboratory for Bio-Archaeology
Block 2.01 • Kelvin Campus • West of Scotland Science Park
2317 Maryhill Rd • Glasgow G20 OSP • *tel*: 0141 258 3597
email: northlight@yorkat.co.uk • *web*: www.northlight-heritage.co.uk

Report by: Sharon Carson with Jennifer Miller
Edited by: Jennifer Miller

Northlight Heritage is a trading name of York Archaeological Trust for Excavation and Research Limited
York Archaeological Trust for Excavation and Research Limited
Registered Office: 47 Aldwark, York YO1 7BX
A Company Limited by Guarantee Registered in England No. 1430801
Registered Charity In England & Wales (No.509060) and Scotland (SCO42846)

Contents

1. Summary

Four cores were submitted for specialist analysis to characterise the nature of the deposits and extract and identify any botanical remains they may contain. Core 1.2 contained peats indicative of a wet fen carr environment succession from wet grassland with increasing water levels in more recent deposits. Botanical preservation was good, with potential for pollen analysis to gain a more detailed understanding of local vegetation succession in response to increasing water levels over time. Core 2.1 was composed of minerogenic deposits with alternation of clays and soils overlying a basal peaty layer from moderately wet wooded floodplain. This core shows sediment accumulation over time to soil that is intermittently inundated but not permanently waterlogged. Core 3.1 and 3.2 contained clay soils with waterlogging related mottling. This indicates sediment accumulation and episodic inundation succession over wet woodland carr and the sandy natural.

Many of the deposits contained well preserved pollen grains with potential for further analysis to characterise the wider landscape. Background sediment samples have been dried for AMS potential wherever possible in order to place the sequence of events into a chronological framework.

2. Introduction

A total of four cores were submitted for specialist analysis including deposit characterisation and subsequent sub sampling, processing and botanical identification. The samples were processed and analysed to determine the range of botanical remain preserved within the deposits. It was anticipated that analysis of these samples would assist in determination of the depositional and post depositional nature of the peats, soils and clays. This will contribute to the overall understanding of the site geomorphology and landscape and environmental changes over time.

3. Methodology

Core Description and Sampling

The cores were assessed visually, with individual deposits identified and characterised, achieved by determining texture following Avery (1973) and variability in colour using a Munsell soil colour chart. All descriptions and processes undertaken conform to guidelines set out by English Heritage (Ayala et al 2007).

Each core was sub sampled at 2cm intervals, with a separate sub sample retained for pollen or geochemical analyses from each level. Modern surfaces, natural geology and river deposits were not described or sampled. A total of 19 samples, averaging one sample per deposit, were selected for further processing and analysis, avoiding deposit boundaries.

Sample Processing & Recording

The sub samples were wet sieved using a µ500 Endicot sieve and sorted using a Nikon 93756 binocular microscope at variable magnifications with associated Schott KL-1500 LCD cold light source. Identifiable botanical remains were extracted and retained wet for identification and interpretation. A small amount of the remaining mixed organic detritus was mounted on a slide and scanned with a Ceti high magnification binocular microscope at varying magnifications to assess the

potential for pollen preservation. The remaining sorted organic material was dried for subsequent submission for AMS dating. This methodology avoids the potential for single entity dated materials having translocated through the sediment column in antiquity to cause dating inversions. Results are tabulated numerically or using a '+' tally scale, from rare (+), occasional (++), frequent (+++), common (++++) to abundant (+++++).

Botanical Material Identification

Wood identification was undertaken with reference to Schweingruber (1990) using the reflected light of a Zenith metallurgical microscope at X63 magnification and Ceti microscope at X100and X400 magnifications. Seed identification was undertaken with reference to Beijerinck (1947), Cappers (2006) and the Dickson botanical reference collection and pollen was identified using Moore et al (1991). Bud and bud scale identification was achieved using Tomlinson (1985). Plant nomenclature follows Stace (1997).

4. Results

Results are given in Table 1.

Core 1.2

Core 1.2 contained layers of peat with varying minerogenic component. The plant macrofossil assemblages indicate a gradual succession to nutrient rich wet fenland from ruderal soils in response to increasing ground water levels.

Deposit 1

Sample 0-2cm

Described as a fibrous loam peat with a loose structure and very black in colour, with frequent obvious large organic inclusions. The sample contained vegetative remains indicative of a carr environment including wood and grasses. One fragment of wood was identifiable as possible alder (cf *Alnus*) but no other significant botanical remains were recovered. Alder nitrogen fixing nodules were recorded, suggesting *in-situ* presence of alder trees. No pollens grains were noted. The alder wood concurs with the wet carr environment including potentially shallow standing water, with the loose structure and large inclusions suggesting a fairly rapid sediment accumulation. The presence of invertebrate remains concurs with the base-rich environment and implies significant aerobic microbiotic activity. The high microbe activity and rapid sedimentation would concur with the relatively poor identifiable botanical assemblage recorded.

Deposit 2

Sample 10-12cm

The deposit was described as black fibrous loam peat, fairly compact with minute mineral inclusions and frequent inclusions of grass and wood. The peat was fairly humified and composed of amorphous organic material and abundant grasses with wood indicative of a carr environment. The compaction, minerogenic component and greater humification than deposit 1 would suggest slower accumulation of peat. Two fragments of wood were identified as hazel (*Corylus*) and occasional branched bur-reed (*Sparganium erectum*) seeds were recovered, together with seeds of white sedge (*Carex curta*), possible greater tussock sedge seeds (*Carex paniculata*) and hemp-agrimony

(*Eupatorium cannabinum*). This combination of finds suggests wet flushes over nutrient enriched (basic) soil, suggesting fen carr rather than more acidic marshland. The small mineral inclusions imply flooding episodes where the already very wet environment is intermittently inundated. Pollen grains were noted and the sample has potential for further pollen analysis to further characterise the environment.

Deposit 2

Sample 18-20cm

Also within deposit 2, this sample was of a similar composition to the 10-12cm subsample, with alder wood recovered, but fewer monocot (grass/sedge) leaf fragments observed. The seed assemblage included brown sedge (*Carex disticha*) and hemp-agrimony which concur with the continuation of the wetland environment, and one birch (*Betula* sp) seed. The sample contained well preserved pollen grains including small grass (Poaceae) types.

Deposit 3

Sample 42-44cm

This layer was dark grey compact, organic silty clay, highly humified and organic preservation was moderately good, implying a base-rich, wet environment. However, the mineral content and dark grey to brown colour are suggestive of a wet soil rather than a peat deposit. Seeds of creeping buttercup (*Ranunculus repens*) and water germander (*Teucrium scordium*) are highly suggestive of damp/wet grassland, riverbanks or marshes. Pollen grains were fairly well preserved and included small grass types and sedge (Cyperaceae) types. The presence of the Deposit 3 wet soil below the fen peat in Deposit 2 is strongly indicative of increasing ground water levels in the immediate vicinity above this depth.

Deposit 3

Sample 48-50cm

The second sample processed from deposit 3 contained similar botanical components to sample 42-44cm although no seeds were recovered. Wood fragments were frequent but only four were sufficiently preserved to allow accurate identification as alder. Pollen and spore preservation was good and grains were identifiable as small grass types, ferns, alder, possible birch and possible plantain (*Plantago* sp). The pollen grains identified concur with the interpretation of wet grassland within an open scrub environment.

Deposit 4

Sample 60-62cm

Described as a black loamy peat, the deposit was fairly extensive and organic in appearance with a very compact structure. Although peat like, the seed taxa recovered from this deposit suggest it is more indicative of a highly organic soil. Seeds of fool's parsley (*Aethusa cynapium*) and fat hen (*Chenopodium album*) are common weeds often associated with cultivation and enriched soils. Invertebrate remains concur with the base-rich nature of this deposit. Pollen and spore preservation was good and some ferns and grains of grass were observed. Analysis of the pollen would add further insight into the landscape conditions at the time.

Deposit 4

Sample 68-70cm

The second sample processed from deposit 4 contained a similar botanical assemblage as sample 60-62cm, although no seeds were found. One hazel bud and three hazel bud scales were recovered which can be attributed to early spring deposition. One alder false cone scale was recorded, and invertebrate remains were noted. The presence of hazel and invertebrates would imply that the nutrient status remained at least moderate. No pollen grains were observed within this sample, possibly a result of high microbial activity.

Core 2.1

The deposits within core 2.1 were described as minerogenic with a low organic input. They consisted of alternating clay and silty clay deposits. The silty clay deposits were typically of a loose fine crumb structure and are suggestive of buried soils sealed by later alluvial clay deposits. However, this could also be the result of gleying (translocation of clay) due to waterlogging, since all of the deposits have some degree of mottling and the sub soil horizon of the sequence is clay. A combination of both factors is quite feasible.

Deposit layers 1, 2, 3, 4, 5 and 7 were sub-sampled and examined (see Table 1), but only one deposit (deposit 7) from this core was described as a peat or highly organic humified compact soil and contained an abundance of organic material including wood, grasses and seeds, with identifiable botanical remains absent from all other deposits examined from this core. Of note were the rare possible hammerscale fragments noted in deposit 2 (46-48cm) that may imply metal working in the immediate vicinity, perhaps to utilise readily available groundwater.

Deposit 7

Sample 86-88cm

Deposit 7 sample 86-88cm contained a variety of identifiable seeds including raspberry (*Rubus idaeus*), blackberry (*Rubus fruticosus sl*), buttercup (*Ranunculus* sp), creeping buttercup (*Ranunculus repens*), alder (*Alnus*) and common water-starwort (*Callitriche stagnalis*). One alder false cone scale was also recovered. This combination of taxa suggests open scrub woodland with drier and significantly wetter areas, as are often to be seen on the floodplain of a river. The sample indicated a good potential for pollen analysis and ruderal weed types were noted.

Core 3.1-3.2

Core 3 deposits are strongly indicative of sediment accumulation within an area subject to intermittent inundation and fluctuating waterlogging. The lower deposits within Core 3.1 (deposit 4) suggest standing water *in situ,* above which the ground becomes drier, although remaining subject to episodic waterlogging. Deposit 5 below this contained a mixture of sands and silts over the natural gravels. Collectively the column profile indicates succession from standing water over sandy natural in the lower column to a wet ruderal open landscape with periodic waterlogging in the more recent past.

Deposit 1

Sample 40-42cm

The deposit was described as compact smooth dark grey clay with frequent red mottles, particularly at the top of the deposit. The sample did not contain any organic components and no evidence pollen grains were noted.

Deposit 2

Sample 50-52cm

The deposit was described as a clay loam with a loose blocky structure and variable colours, but predominantly a dark grey brown. Roots, amorphous organic material and occasional charcoal flecks were noted but no identifiable botanical remains were covered. Occasional grass pollen grains were also present that might add more to the interpretation of the landscape at this level in the column. The presence of charcoal flecking suggests human activities in the area that may relate to the landscape use at this period of deposition. The predominance of clay within the loam means that in-wash of charcoal from close by during episodic inundation cannot be excluded. The mottling of this deposit would further imply at least waterlogging with clay translocation.

Deposit 3

Sample 58-60cm

Deposit 3 was described as black silty clay organic soil with a loose fine crumb structure and an abundance of well humified organic material. Amorphous organic material was abundant, with roots, small wood fragments and occasional grasses and seeds. Two blackberry seeds were recovered and pollen grains and spores were noted which included fern types (Polypodiaceae), alder, and small grass types. The well humified nature of this deposit implies slow to moderate sediment accumulation at this period in the column in what would have been a fairly stable open grassland environment at the time.

Deposit 4

Sample 74-76 cm

This deposit was very dark grey compact silty clay with abundant organic content. The sample contained numerous grass/sedge (monocot) fragments, with frequent roots and fragments of wood, although only two were identifiable, both alder. Alder nitrogen fixing nodules were notable, implying growth *in-situ* of these trees. One seed of yellow sedge (*Carex* cf *viridula* sl) concurs with the alder to imply wet woodland, whilst buttercup, blackberry and raspberry indicate that there were also drier areas within the locality. Although very organic, no pollen was visible. However, pollen grains may have adhered to the abundant organic material and not been visible.

Deposit 4

Sample 84-86cm

Very similar in composition to level 74-76cm, this sample contained a greater abundance of grasses. Seven fragments of wood were identifiable as alder and possibly all originate from the same piece of wood. Alder nitrogen fixing nodules imply growth at the scene. No seeds were recovered, but well preserved pollen and spores of ferns, alder and small grasses were noted.

Core 3.2- Extension of 3.1

Deposit 5

Sample 110-112cm

Described as very compact fine sandy silt, this was a fairly extensive deposit of alternating grey silt and yellow brown sandy lenses. The deposit may well be part of the succession of underlying superficial geological deposits made up of sands and gravels. The sample did not contain any notable botanical components other than abundant roots and no pollen grains or spores were observed.

5. Discussion

A possible fragment of hammerscale was found in Core 2.1 deposit 2. The presence of it could be significant in the interpretation of anthropogenic activities within the immediate locus. Hammerscale is typically found within the vicinity of the anvil as a result of metalworking (Starley 1995). However, the fragment could have been transported from any location due to the local riverine environment and not necessarily originated within the immediate locality.

Peats and Soils

The primary peat deposits appear to have formed from a nutrient enriched alder carr environment, as suggested by the presence of alder wood, false cone fragments and especially nitrogen fixing nodules, the latter especially indicative of growth *in situ*. Seeds of wetland taxa and scrub were well represented and grass/sedge leaf fragments were frequently identified. Collectively, these remains suggest an environment similar to the floodplain around a river or a low lying area subject to inundation and fluctuating ground water, rather than an acidic peat bog.

The upper part of Core 1.2 was composed predominantly of fen or mire peat, changing from a basal very compact highly organic soil containing seeds reflective of a drier or damp environment (deposit 4) gradually becoming wetter to form wet organic silty clay soil containing seeds of creeping buttercup (deposit 3)

Core 2.1 deposits exhibited red mottling within the minerogenic clay deposits, becoming particularly abundant within deposit 3. This suggests that the deposits had undergone intermittent waterlogging rather than being permanently wet (Burnham 1980) and the sequence may be representative of a gleyed soil profile. Gley soils are those in which the profile morphology reflects periodic waterlogging. Gley morphology develops where pore spaces are filled by water containing dissolved organic substances which results in the reduction and solution of iron compounds and causes red patches or mottles to develop (Curtis, Courtney & Trudgill 1976).

It is likely that the clay deposits within Core 2.1 represent alluvial deposits from periods of inundation that have translocated down through the soil profile. Geochemical analysis of these deposits could be utilised to accurately interpret the nature and origin of the clays. The lowermost layer in Core 2.1 (Deposit 7) was the only one to contain significant botanical remains, implying that it has remained waterlogged with oxygen excluded since deposition. This concurs with the

interpretation for this core profile as showing a riverbank flood plain with better drained areas becoming increasingly drier as sediment accumulates over time, although remaining subject to episodic waterlogging and alluvial inundation.

Core 3 deposits display a similar picture, with a wet woodland landscape over the sandy natural possibly riverine deposits becoming drier over time yet remaining subject to intermittent waterlogging and episodic inundation.

Wood

Many of the samples contained an abundance of wood fragments, particularly those within core 1.2. However, many of the fragments were very small and poorly preserved preventing accurate identification. The only taxa identified were hazel and alder, particularly abundant within cores 1.2 and 3.1. Deposit 4 within core 3.1 contained nine alder fragments in total. However, it is possible the fragments have derived from one larger piece of wood within the deposit. Alder is the fen carr vegetation classification maximum (Burnett 1964) and is ideally suited to fluctuating or standing shallow water with moderate nutrient status. Consequently, these small trees are encountered regularly on river banks or in wet hollows or scrub woodland. They are often the tallest (maxim) vegetation on riverbank floodplains as a result, and characterise this sort of landscape.

Birch can also tolerate wet growing conditions, although not to the same extent as alder. It copes well with impoverished soils and grows quickly, so would act as a pioneer taxon for land recently formed as a result of succession and sedimentation over woodland carr. Hazel can grow on drier or damp ground with moderate nutrient status so would imply pockets of ground with intermittent waterlogging only.

Seeds and Macros

Hazel buds and bud scales within deposit 4 of core 1.2 are signifiers of seasonality, synonymous with early spring.

Many of the plant macrofossils taxa recovered are indicative of wetland environments, in particular those recovered from the upper parts of Core 1.2. Together with abundances of wood and grasses/sedges, these deposits represent peat formation from a wet woodland carr landscape. Deposits 2 and 3 within core 1.2 are primarily indicative of this type of environment with the identification of alder and hazel wood fragments, and the presence of seeds representative of open water or reed swamp including branched bur-reed, hemp-agrimony and brown sedge. However, sample 60-62cm from core 1.2 contained seeds common to less waterlogged environments. Fools parsley and fat hen are more commonly associated with enriched soils and cultivation and are both common crop weeds.

Other seeds indicative of damp rather than wetland places included buttercups, raspberry and blackberry, noted within the lower levels of both Cores 2.1 and 3.1. These remains and the others recorded for each level concur with the woodland taxa to suggest a locality that was moderately better drained in places.

In contrast to Cores 2 and 3, Core 1 represents a locus that is becoming increasingly wetter over time towards modern day whilst 2 and 3 suggest land that is drying out.

Pollen

Each sample processed was also assessed for pollen preservation and the potential for subsequent pollen analysis. Many of the samples contained well preserved pollen grains and spores that would be suitable for submission for processing. Many of the types indentified included small grasses, ferns, alder, birch, willow and plantain. Pollen can be used to reconstruct the local and regional environment and is particularly valuable when analysing peat deposits, especially when used in conjunction with the plant macrofossil results. Sub samples for pollen analysis can be taken at close increments and give a sequential representation of the environment and environmental change through time.

6. References

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Geoarchaeological assessment data

Borehole Log

Trent & Peak ARCHAEOLOGY

Borehole number: BH 01	
Location: BHC Lower Road Compound	
Drilling method: Van Walt percussion auger	Logged by: P. Watkin
	Vertical scale: 1:10

Description	Legend	Depth (thickness) m	Comments / Samples
Deposit 1		0.03m (0.03m)	Peat
Deposit 2		0.33m (0.30m)	Peat
Deposit 3		0.53m (0.20m)	Waterlogged Soil
			Sub-sample 1 (95.4%) 3087-2907 calBC
Deposit 4		0.83m (0.30m)	Peat
		0.96m (0.13m)	Sands and Gravels
End of borehole			

Geoarchaeological assessment data

Borehole Log

Trent & Peak ARCHAEOLOGY

Borehole number: BH 02	
Location: BHC Lower Road Compound	
Drilling method: Van Walt percussion auger	Logged by: P. Watkin
	Vertical scale: 1:10

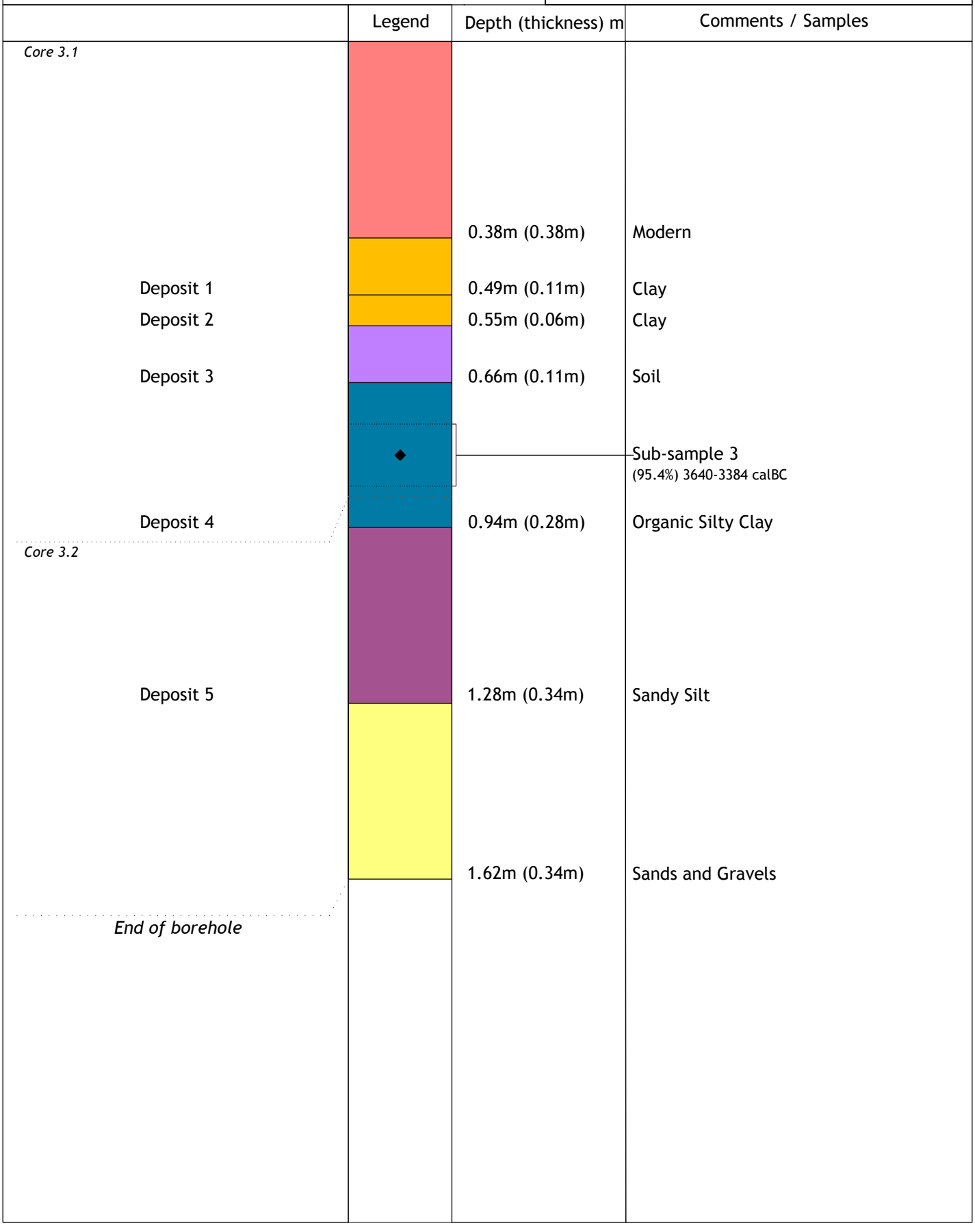
Description	Legend	Depth (thickness) m	Comments / Samples
		0.35m (0.35m)	Modern
Deposit 1		0.40m (0.05m)	Clay
Deposit 2		0.48m (0.08m)	Clay
Deposit 3		0.53m (0.05m)	Silty Clay
Deposit 4		0.63m (0.10m)	Silty Clay
Deposit 5		0.68m (0.05m)	Silty Clay
Deposit 6		0.76m (0.08m)	Silty Clay
Deposit 7		0.89m (0.13m)	Peat
			Sub-sample 2 (95.4%) 1640-1507 calBC
End of borehole			

Geoarchaeological assessment data

Borehole Log

Trent & Peak ARCHAEOLOGY

Borehole number:	BH 03
Location:	BHC Lower Road Compound
Drilling method:	Van Walt percussion auger
Logged by:	P. Watkin
Vertical scale:	1:10



Appendix 4 – Radiocarbon Dating

Scottish Universities Environmental Research Centre

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RADIOCARBON DATING CERTIFICATE

14 July 2014

Laboratory Code	SUERC-53984 (GU34330)
Submitter	Alison Wilson Trent & Peak Archaeology Unit 1, Holly Lane Chilwell, Nottingham NG9 4AB
Site Reference	UBU
Context Reference	Deposit 4
Sample Reference	Core 1.2
Material	Dried peat : Humic Acid dated
$\delta^{13}C$ relative to VPDB	-29.0 ‰
Radiocarbon Age BP	4367 ± 29

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

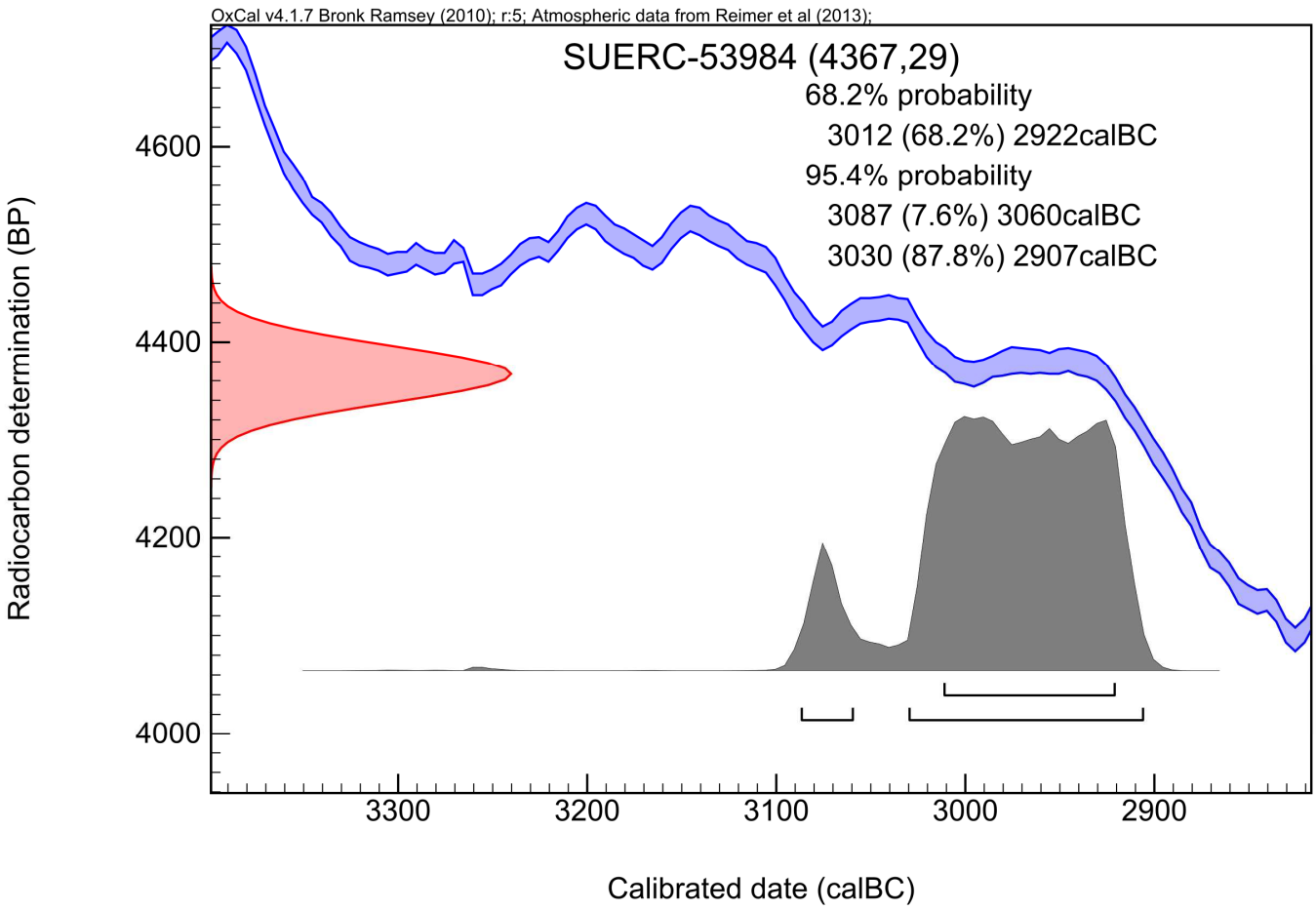
The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- Date :- 14/07/2014

Checked and signed off by :- Date :- 14/07/2014

Calibration Plot



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RADIOCARBON DATING CERTIFICATE

14 July 2014

Laboratory Code	SUERC-53985 (GU34331)
Submitter	Alison Wilson Trent & Peak Archaeology Unit 1, Holly Lane Chilwell, Nottingham NG9 4AB
Site Reference	UBU
Context Reference	Deposit 7
Sample Reference	Core 2.1
Material	Dried peat : Humic Acid dated
$\delta^{13}C$ relative to VPDB	-29.4 ‰
Radiocarbon Age BP	3302 ± 27

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

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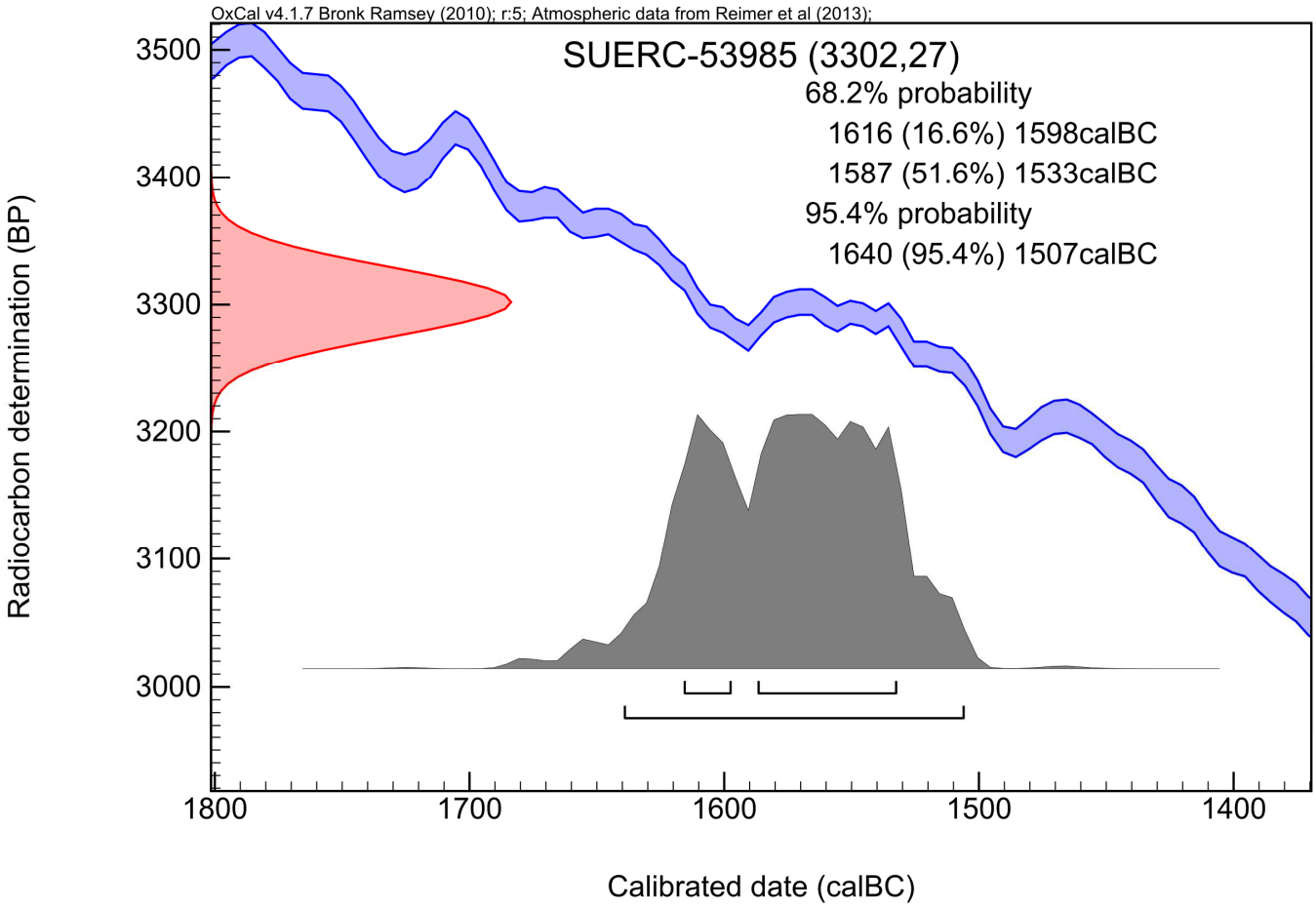
Conventional age and calibration age ranges calculated by :- Date :- 14/07/2014

Checked and signed off by :- Date :- 14/07/2014

Calibration Plot



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RADIOCARBON DATING CERTIFICATE

14 July 2014

Laboratory Code	SUERC-53986 (GU34332)
Submitter	Alison Wilson Trent & Peak Archaeology Unit 1, Holly Lane Chilwell, Nottingham NG9 4AB
Site Reference	UBU
Context Reference	Deposit 4
Sample Reference	Core 3.1
Material	Dried peat : Humic Acid dated
$\delta^{13}C$ relative to VPDB	-28.1 ‰
Radiocarbon Age BP	4762 ± 27

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

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Conventional age and calibration age ranges calculated by :- Date :- 14/07/2014

Checked and signed off by :- Date :- 14/07/2014

Calibration Plot