University of Salford MANCHESTER

Archaeological Evaluation:

Land at Kingmoor Park, Kingstown, Carlisle

Client: HOW Planning/Stobart Group

Technical Report: Rachael Reader

Report No: 06/2014

Contents

Summary

The Centre for Applied Archaeology (C*f*AA) was commissioned by HOW Planning (on behalf of Stobart Group) to undertake an archaeological evaluation at land located off Dukes Drive, Kingstown, Carlisle (centred on NY 38360 59741). The programme of archaeological work consisted of eleven evaluation trenches, targeting geophysical anomalies identified during a previous survey (Watson 2013). This was carried out in order to determine the presence, extent, depth, state of preservation and significance of the archaeological resource to enable informed recommendations and future mitigation for any surviving archaeological remains.

The study area is currently enclosed fields, used as pasture for sheep. An archaeological desk-based assessment of the wider area revealed that no sites are known within the current study area, however that there was potential for below ground archaeological remains which could be detected by geophysical survey (Gregory and Arrowsmith 2008). C*f*AA was commissioned by HOW Planning to carry out the geophysical survey, which was done by GSB Prospection on C*f*AA's behalf (Watson 2013), the results of which are discussed within this report.

A total of eleven trenches target the geophysical anomalies. No features of archaeological significance were revealed. Many of the trenches were criss-crossed with recent field drains, some of which corresponded to the geophysical anomalies. Other features encountered were found to be natural in origin, with several tree boles and geologically derived features.

1. Introduction

1.1 Background

The Centre for Applied Archaeology (C*f*AA) was commissioned by HOW Planning (on behalf of Stobart Group), to undertake an archaeological geophysical survey and evaluation at land off Dukes Drive, Kingmoor Industrial Park, Kingstown, Carlisle. This was conducted as part of a planning application for an Ambient Distribution Centre (HOW Reference August 2013).

GSB Prospection, on behalf of C*f*AA, conducted a geophysical survey of the area affected by the development (Watson 2013; see appendix 4). On the basis of the geophysical anomalies identified, a Written Scheme of Investigation was prepared by Mr Adam Thompson of C*f*AA and amended by Mr Jeremy Parsons of Cumbria Historic Environment Service. The work was carried out according to local and national planning policies and in line with Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluation

1.2 Location, Topography and Current Land Use

The excavation area is located in Kingstown, approximately 5km NW of Carlisle (centred on NY 38360 59741) and is bound by Dukes Drive to the south and east, an unnamed track to the north and enclosed fields to the west. The land is currently used as three enclosed fields for sheep pasturing, measures 6.4ha and is located on gently sloping land, which slopes from north to south, from c25-18m AOD.

The underlying solid geology, as mapped by the British Geological Society (www.bgs.ac.uk) consists of Stanwix shales, overlain with Devensian superficial deposits. The soils are of the Clifton Association (711n), which are slowly permeable seasonally waterlogged reddish fine and coarse loamy soils (SSEW 1983).

1.3 Personnel

The project was conducted by professional archaeologists from the Centre for Applied Archaeology. On-site excavations were conducted by Rachael Reader and Andrew McGuire. This report was compiled, illustrated and written by Rachael Reader. The project was managed by Adam Thompson.

1.4 Monitoring

Jeremy Parsons, Historic Environment Officer for Cumbria Historic Environment Service monitored the archaeological works.

2. Historical Background

2.1 Introduction

An archaeological desk-based assessment from 2008 identified no known archaeological sites or features from documentary research, but did highlight the potential for below-ground archaeological remains which could be revealed through a programme of geophysical survey (Gregory and Arrowsmith 2008). This was carried out November 2013 and did identify several anomalies, however none of which were identified as being archaeological in origin (Watson 2013).

2.2 Historical Background

An archaeological desk-based assessment was carried out by University of Manchester Archaeological Unit (UMAU), which covered the larger Kingmoor Park area (Gregory and Arrowsmith 2008, 6-7). The results of which are summarised below:

Prehistoric

No prehistoric sites or finds are known within the proposed development area, though across the Solway Plain, cropmarks dating to the later prehistoric/Romano-British period have been located by a number of aerial surveys (Higham & Jones 1975; Bewley 1994). Within the vicinity of the proposed development area, cropmarks have been mapped by English Heritage as part of *Hadrian's Wall National Mapping Programme Project* (Boutwood 2005), including a late prehistoric/Romano-British settlement at Cargohill, *c.* 0.6km west of the proposed development area, and at second at Grinsdale Camp, *c.* 1km to the south, adjacent to the River Eden. Other cropmarks which may date to this period are also found c. 0.4km to the southwest of the proposed development area.

Roman

During the Roman period the proposed development area was located *c.* 2km north of Hadrian's Wall and *c.* 0.9km west of the Roman road linking Carlisle with the Roman outpost fort at Netherby. No Roman sites or finds are known within the proposed development area, but a Roman coin has been found *c.* 0.4km to the north. This coin was a denarius of Trajan and dates to the late first-early second century.

Medieval

During the medieval period, the proposed development area lay within the township of Cargo. This place-name may have a pre-Norman ancestry (Armstrong *et al* 1950, 94-5) but the township is not recorded until the twelfth century, as a manor and demesne of John de Lacy, Constable of Chester (Nicolson & Burn 1777, 454; Hutchinson 1794-7, 582; Wellan 1860, 181). The village of Cargo (CHER No. 6110) is located *c.* 0.8km to the south-west of the proposed development area and it has been suggested that this settlement represents the core of the medieval township (OANorth 2003, 13). It is possible that the proposed development area functioned as agricultural land linked with this medieval settlement, evidenced in the morphology of the field boundaries across a substantial

portion of the proposed development area. These field boundaries are plotted on the 1839 tithe map of Cargo township and their width and reverse 'S' morphology is consistent with the later enclosure within a medieval open field. The tithe apportionment indicates that all of these fields have the element 'Sunny Side' within their field-names suggesting that originally they formed one single field, named as such due to its southerly facing aspect. Other finds and sites across the wider area which also date to the medieval period include a silver penny of Henry II.

Post-Medieval

No enclosure award is recorded for Cargo (Tate 1978) and the date at which this suggested medieval field system was enclosed is uncertain. The majority of field boundaries shown within the proposed development area on the Cargo tithe map of 1839 are still extant, though one on the eastern side of the proposed development area has been removed and is now visible as a low earthwork. The tithe map also plots the position of a farmstead within the proposed development area known as 'Brunthill' or 'Burnthill'. This had probably been established by the late eighteenth century, as a site denoted as 'Burnt Hill'is plotted in this approximate location on Donald's county map of 1774. The Brunthill farmstead sits within the northern edge of the enclosed field system suggesting that it was contemporary with, or later than, the episode of enclosure. The Brunthill farm complex sits outside the proposed development area.

Nineteenth and Twentieth Century

The form of the proposed development area during the nineteenth and century can be discerned through reference to the 1839 tithe map and the OS surveys of 1863 and 1899. They indicate that the proposed development area continued in use as agricultural land. The OS surveys also plot the positions of a 'boiling well' located in the vicinity of the Cargo Beck and two nineteenth century railways situated to the east and west of the proposed development area.

Statutory Sites

There are no sites within the proposed development area which have statutory protection.

2.3 Archaeological Background

The Centre for Applied Archaeology was commissioned to undertake a geophysical survey of the proposed development area by HOW Planning LLP, in advance of the construction of an Ambient Distribution Centre at the Kingmoor Park Site. GSB Prospection carried out the geophysical survey on C*f*AA's behalf in November 2013. The survey did not record any responses which could be readily identified as being of archaeological interest, however a number of uncertain features were identified, as well as the presence of an old field boundary (Watson 2013).

Jeremy Parsons (Cumbria Historic Environment Service) requested that an archaeological evaluation through trial trenching should be conducted to ascertain the nature and origin of the uncertain features identified. A Written Scheme of Investigation was prepared and proposed ten trenches, located over several of the discrete anomalies identified during the geophysical survey (Thompson 2013) (see Appendix 4)

3. Methodology

3.1 Excavation Methodology

The trenches were excavated using a mechanical excavator, with a 1.60m wide toothless ditching bucket, down to archaeological features or natural geology. The machine excavation was supervised by a professional archaeologist at all times. The evaluation trenches were placed across the study area to assess the nature and origin of the geophysical anomalies identified.

After machine excavation, all further excavations proceeded by hand. Eleven trenches were excavated in total (see fig. 22) and the programme of work took place 23rd January - 7th February 2014. Several of the trenches were affected by flooding and where necessary, a pump was employed to clear the water out.

3.2 Recording Methodology

Separate contexts were recorded individually on Centre for Applied Archaeology (CfAA) pro-forma context sheets (Appendix 1 – Context List), plans and sections were recorded on CfAA pro-forma drawing sheets at an appropriate scale (1:10, 1:20, 1:50) depending on the complexity of the data and features encountered. All drawings were individually identified and cross referenced, contexts enumerated and principal layers and features annotated with OD level information.

Photography of all relevant phases and features were undertaken with digital formats. General working photographs were taken during the archaeological works, to provide illustrative material covering the wider aspects of the archaeological work undertaken (Appendix 3 – Photographic Archive).

All finds were recorded by context, with significant 'small finds' located within three dimensions to the nearest 10mm, bagged and labelled separately.

All fieldwork and recording of archaeological features, deposits and artefacts were carried out to acceptable archaeological standards. All archaeological works carried out by the CfAA are carried out to the standards set out in the Code of Conduct of the Institute for Archaeologists.

4. Archaeological Descriptions

4.1 Introduction

In this report, all fills, layers and structural features are in rounded brackets **(***)** and cuts are in square brackets **[***]**. Features will be named and denoted by their principal cut number (see appendix 1 for a list of contexts).

4.2 Trench 1

Fig. 1 General shot of trench 1

Trench 1 was located within the north-eastern corner of the study area and was located to target two parallel linears running NE-SW which were identified during the geophysical survey. The trench measured 20.00 x 1.80m and was orientated NW-SE. The general composition of the trench consisted of 0.40m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles.. (001) sealed the features described below, from west to east.

At the west end of the trench was **(040)**, which was a fairly compact dark brownish grey clayey silt with occasional small (>0.05m) sub rounded pebbles. This measured 3.00 x 0.30m and was orientated NW-SE, and continued to run NW into the section. To the east of (040) but not physically related, was **(041)**, which was an electrical wire, encased in timber. It measured 1.80 x 0.10m, and ran beyond the trench edge. To the north-east of (041) was **(042)**, which was a fairly loose dark blackish grey clayey silt with rare small (>0.05m) sub rounded pebbles. This was formed in a sub-circular depression measuring 0.60m in diameter and continuing beyond the north-east trench edge. The deposit also bleached out to a light whitish grey sandy silt around the edges.

Located 3.50m to the south east of (042) and **[043]**, which was a linear running NE-SW, beyond the trench edges forming a broad U-shape, with a fairly steep NE side and fairly shallow SW side. Located 3.20m to the south-east of [043] was **(044)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. This also sealed a red clay pipe, measuring 0.05m in diameter and filled **[045]**, which was a vertical sided linear running NE-SW, beyond the trench edges. This measured 0.30m in width but its depth was only excavated to the top of the pipe to 0.11m. [045] appeared to cut **(046)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. This deposit also contained lenses of compact light reddish pink silty clay and rare fragments of red ceramic. This was stratigraphically above **[047]**, which was a vertical sided linear, running N-S, measuring 4.50 x 0.30m and continued running S beyond the trench edge.

Running NE from [047] was **(049)**, which was a fairly compact dark brownish grey clayey silt, with rare small (>0.05m) sub rounded pebbles. This formed a linear measuring 0.20m wide. The relationship between (049) and [047] was not established. Also running NE-SW between [047] and [045] is **(048)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear shape, measuring 0.20m wide and may be the continuation of (049). Immediately adjacent to [047] but not physically related was **(075)**, a fairly compact light yellowish grey clayey silt with no inclusions noted. This was within a broadly circular depression with a very shallow profile and measured *c*0.50m in diameter and 0.04m in depth. These features were stratigraphically above **(003)**, which was the natural geology and was a very compact light reddish pink compact clay with frequent inclusions of small – medium (>0.10m) sub rounded stones.

Fig. 2 Field drains [045] – (049)

4.3 Trench 2

Trench 2 was also located within the north-eastern corner of the study area, to the south of trench 1 and was located to target an sub-circular anomaly *c.*15m in diameter, as well as an old field boundary and sub-circular ferrous anomaly, measuring *c.*10m in diameter, immediately south-east. The trench measured 30.00 x 1.80m and was orientated NW-SE.

The general composition of the trench was the same as trench 1 and consisted of up to 0.30m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below, from west to east.

At the west end of the trench is **(079)**, a light brownish grey silty clay with no inclusions noted. This was approximately 1m in diameter and continued beyond the south-west trench edge however there was very little shape to it. To the east was **(057)** which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running N-S, measuring 0.25m wide and appeared to cut **(080)**, which was a light brownish grey silty clay with no inclusions noted. This was *c*2m in diameter and like (079), continued beyond the south-west trench edge and had very little shape or definition. Approximately 11m to the east of (057) was **(058)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NE-SW, measuring 0.25m in width and continuing beyond the trench edges.

Approximately 3m east of (058) was **[077]**, which was a broadly U-shaped linear running NE-SW beyond the trench edges, *c.*0.40m wide and surviving to a maximum of 0.10m in depth. 1.6m to the east of (077) was **(076)**, which was a dark brownish grey clayey silt with no inclusions noted. This formed a linear, running parallel with [077], measured 0.50m wide and continued beyond the trench edges. To the east of (076) was **(059)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running N-S measuring 1.75 x 0.30m, continuing beyond the southern trench edge. Immediately east, but not physically related to (059) was **(060)**, which was a very compact dark orangish brown silty sand with abundant small – medium (>0.10m) sub rounded pebbles. At its maximum, it measured 7m in width, however it was also amorphous in shape. At the eastern extreme of the trench was **(061)**, which was an electrical wire, probably the continuation of (041) however only the wire was revealed. These features were stratigraphically above (003).

4.4 Trench 3

Trench 3 was located towards the south part of the easternmost field and was located to target an anomaly which appeared to form a sub-oval enclosure, as well as any potential features which may have been associated with this. The trench measured 30.00 x 1.80m and was orientated NE-SW.

The general composition of the trench consisted of 0.50m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below, from north to south.

At approximately 5m from the northern trench edge is **(031)**, which is a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. A red ceramic pipe was also within this fill, which was a square shape and c.0.10m in width. (031) was stratigraphically above **[032]** which was a vertical sided linear running NW-SE, beyond the trench edges (see fig. 3). This was excavated to a depth of 0.16m. Located *c.*4m SW of [032] was **(033)**, a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NW-SE beyond the trench edges and measured 0.25m in width. Approximately 4m SW of (033) was **(034)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NW-SE beyond the trench edges and measuring 0.25m in width. Located *c.*3m to the SW of (034) was **(035)**, which was a fairly compact light yellowish grey sandy clay with rare small (>0.05m) sub-rounded pebbles. It formed a sub-circular shape *c.*0.80m in diameter, however it was fairly amorphous around the edges. The profile fairly uneven with gently sloping sides however the profile revealed a further two circular hollows which had fairly steep sides at the base (see fig. 4). Immediately SW of (035) but physically unrelated was **(036)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear shape, running NW-SE, beyond the trench edges and measured 0.25m in width. Approximately 3.75m to the SW of (036) is **(037)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NW-SE beyond the trench edges and measured 0.25m in width. Approximately 3.80m to the SW of (037) was **(038)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NW-SE, measuring 0.25m in width and running beyond the trench edges. 4m to the SW of (038) was **(039)**, which was a fairly compact dark brownish grey clayey silt with no inclusions

noted. This formed a linear running NW-SE, measuring 0.25m in width and running beyond the trench edges. These features were stratigraphically above (003).

Fig. 3 [032] with a square ceramic drain in the fill (031)

Fig. 4 (035), showing the uneven profile and amorphous shape

4.5 Trench 4

Trench 4 was located to the south-east of trench 3 and targeted the south-east part of the putative enclosure. The trench measured 20.00 x 1.80m, however it consisted of two ten metre lengths of trench forming an 'r' shape.

The general composition of the trench consisted of 0.30m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

At the SE end of the NW-SE orientated part of the trench was **(072)** which was a dark brownish grey clayey silt with no inclusions noted. Part of a square drain was exposed at the SW extreme of linear. This measured 0.25m in width. To the NW of (072) was **(071)**, a dark brownish grey clayey silt with no inclusions noted. This formed a linear running NE-SW and was visible for 3m and measured 0.25m wide. To the NE of (071) was the continuation of (072), with a square ceramic pipe exposed 0.65m below the current ground surface (see fig. 6). (072) appeared to be cut into **(073)**, which was a fairly compact light yellowish grey clay with occasional small (>0.05m) sub rounded pebbles. This appeared across the trench, however its thickness varied across the trench, between 0.10 – 0.30m. These features were stratigraphically above (003).

Fig. 5 Drain (072) cut into clay layer (073)

Fig. 6 Square ceramic pipe within (072), cut into (073)

4.6 Trench 5

Fig. 7 General shot of trench 5

Trench 5 was located within the northern half of the study area, within the second field. This targeted several discrete features found during the geophysical survey including small (*c*2m diameter) circular features and a linear *c*.20m in length running E-W. The trench measured 30.00 x 1.80m and was orientated NE-SW

The general composition of the trench consisted of 0.35m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

2.40m from the NE end of the trench was **(013)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles and a rounded ceramic pipe. This was stratigraphically above **[014]**, which was a vertical sided linear running E-W which was excavated to a depth of 0.16m. This was cut into **(015)**, which was a very compact dark reddish brown silty sand with abundant small (>0.05m) sub rounded pebbles (see fig. 8). This ran E-W and was broadly linear, measuring 1.20m wide. Approximately 1m to the SW was **(016)**, which was also a very compact dark reddish brown silty sand with abundant small (>0.05m) sub rounded pebbles. Again, this was broadly linear and measured 1m in width. Further SW was **(017)**, a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub-rounded stones and a rounded

ceramic pipe. This was stratigraphically above **[018]** which was a vertical sided linear measuring 0.30m wide and excavated to a depth of 0.08m. Further SW along the trench was **(019)**, which was a fairly loose dark reddish brown clayey sand with occasional small (>0.05m) sub-rounded pebbles. This was broadly linear, running NW-SE across the trench, however it measured no more than 0.05m wide and 0.03m deep. Approximately 5.5m to the SW of (019) was **(020)** which was a fairly compact dark reddish brown silty sand with frequent small (>0.05m) sub rounded pebbles. This was stratigraphically above **[021]**, which was a broadly U-shaped linear running NW-SE, varying in width between 0.50 – 0.75m. Approximately 1.5m to the SW of [021] was **(030)** which was a fairly compact dark brownish grey clayey silt with no inclusions noted, running across the trench E-W and measuring 0.30m wide. These features were stratigraphically above (003).

Fig. 8 [014] cutting into (015)

4.7 Trench 6

Fig. 9 General shot of trench 6 – pre-excavation

Trench 6 was located to the SE of trench 5 and targeted a linear geophysical anomaly which was orientated broadly E-W and measuring *c.*20m in length. The trench measured 10.00 x 1.80m and was orientated NE-SW.

The general composition of the trench consisted of 0.40m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

Approximately 2m from the NE trench edge was **(026)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles and a rounded ceramic pipe, as well as larger fragments above it. This was stratigraphically above **[027]**, which was a vertical sided linear running E-W across the trench and measuring 0.30m wide. Immediately SW of [027] but physically unrelated was **(028)**, which was a light yellowish grey sandy clay with no inclusions. This deposit was within a shallow sub-circular depression, measuring 0.50m wide and 0.03m deep. To the SW was **(029)**, which was a very loose dark brownish grey silty clay which bleached out to a light whitish grey round the edges. This was sitting in a sub-oval shaped depression, measuring 1.30 x 0.55 x 0.11m. These features were stratigraphically above (003).

4.8 Trench 7

Fig. 10 General shot of trench 7

Trench 7 was located within the north-western corner of the study area and targeted two geophysical anomalies. The trench measured 30.00 x 1.80m and was orientated N-S.

The general composition of the trench consisted of 0.40m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

At the north end of the trench was **(004)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NW-SE across the width of the trench and measured 0.25m wide. Approximately 1m south of (004) was **(005)** which was a dark yellowish grey silty clay with occasional small (>0.05m) rounded pebbles. This sat within a sub-oval depression with a relatively shallow profile. Its dimensions were 0.60 x 0.40 x 0.06m. Further south along the trench was **(006)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded stones. A red, rounded ceramic pipe was also within this deposit. This lay stratigraphically above **[007]**, which was a vertical sided linear, running E-W and excavated to a depth of 0.10m, to the top of the ceramic pipe. [007] ran beyond the trench edges and measured 0.25m in width. Running parallel to [007] and 1.80m to the south was **(008)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running E-W and measuring 0.25m in width. Further south along the trench was **(009)**, which was a fairly compact dark brownish grey silty clay with

no inclusions noted. This formed a linear running broadly E-W and measuring 0.30m in width. Approximately 2m to the S of (009) was **(010)**, which was a light yellowish grey clayey silt with no inclusions noted. This was broadly circular, however with poorly defined edges and very similar to (005) in characteristics. Approximately 2m S of (010) was **(011)**, which was a fairly compact dark brownish grey clayey silt with occasional small (>0.05m) sub rounded pebbles. Also contained with this deposit was a rounded ceramic pipe, measuring 0.05m in diameter. This lay stratigraphically above **[012]**, which was a vertical sided linear running broadly E-W across the trench, measuring 0.30m in width and excavated to a depth of 0.10m. These features were stratigraphically above (003).

4.9 Trench 8

Fig. 11 General shot of trench 8, including flooding

Trench 8 was located within the second field, running adjacent from trench 5 and targeted three discrete geophysical anomalies. These were broadly circular in shape and were approximately 2m in diameter. The trench measured 15.00 x 1.80m and was orientated NW-SE, with an extension at the SE end measuring 5.00 x 3.40m.

The general composition of the trench consisted of 0.30m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

Towards the SE end of the trench was **(022)**, which was a fairly compact mid pinkish brown sandy clay with rare small (>0.05m) sub-rounded pebbles. This deposit became gradually sandier as it interfaced with the natural (003). This lay stratigrpahically above **[023]**, which was a broad, curving linear, running broadly N-S beyond the trench edges however this was not a uniform shape or width, visible for 2.00m in length, 0.80m at its maximum width and 0.18m in depth. To the SE of [023] was **(024)**, which was a fairly compact mid pinkish brown sandy clay with frequent small (>0.05m) sub-rounded pebbles. There were several lenses of mid pinkish grey silty clay which resembled rooting impressions within this deposit. This lay stratigraphically above **[025]**, which was a sub-oval feature with shallow sloping sides to a relatively flat base. These features were stratigraphically above (003).

4.10 Trench 9

Fig. 12 General shot of trench 9

Trench 9 was located in the NE corner of field 1, between trenches 1 and 2 and targeted two linear anomalies identified in the geophysical survey which broadly ran N-S, were 10-15m in length and approximately 2m in width. The trench measured 20.00 x 1.80m and was orientated NE-SW.

The general composition of the trench consisted of 0.30m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

7m from the NE trench edge was **(050)**, which was a fairly loose light orangish brown sandy clay with occasional small (>0.05m) rounded pebbles. This formed a broad linear running NW-SE across the trench and measured 1.10 x 0.24m. This generally had a relatively uneven profile (see fig. 15) with a fairly narrow base.

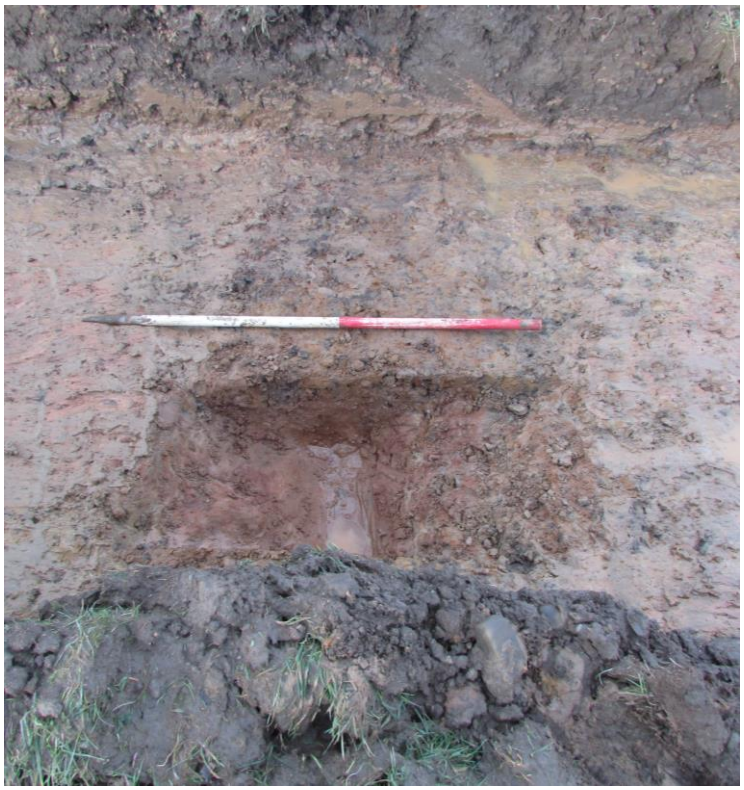


Fig. 13 (050) showing uneven profile

Immediately south-west of (050) was **(051)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. A rounded ceramic pipe measuring 0.05m in diameter was also within this deposit. (051) lay stratigraphically above **[052]**, which was a vertical sided linear running NW-SE across the trench and measuring 0.30m in width. This was excavated to a depth of 0.05m. [052] appear to cut **(053)**, which was a fairly compact light yellowish grey sandy clay with rare small (>0.05m) rounded pebbles. This formed an amorphous shape with ill defined edges and a very shallow profile (see fig. 14)

Fig. 14 [052] cutting through (053)

To the south-west of (053) was **(054)**, which was a dark blackish grey clayey silt with rare small (>0.05m) rounded pebbles. The deposit also bleached out to a light whitish grey sandy silt around the edges. This sat in a linear shaped depression which ran NE-SW and had a relatively shallow but uneven profile (see fig. 15)

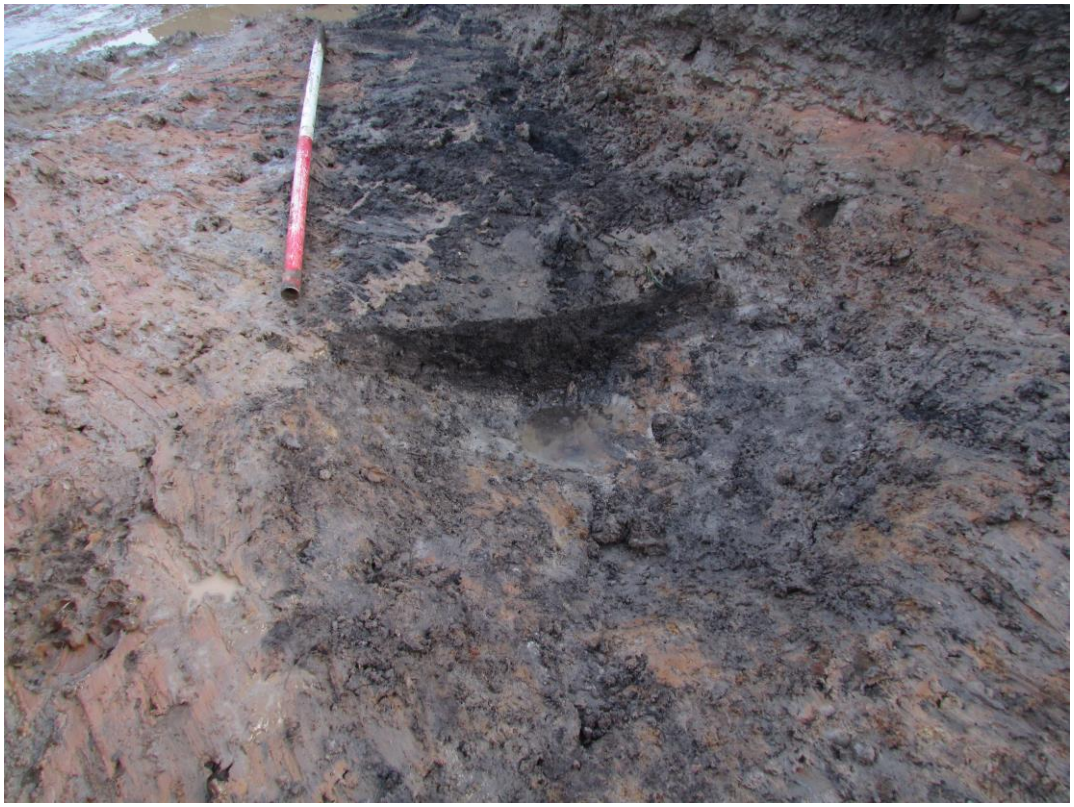


Fig. 15 (054) showing the bleaching of the deposit and slightly uneven profile

Approximately 3m to the SW of (054) was **(055)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NW-SE and measuring 0.25m in width. At the SW end of the trench was **(056)**, which was a very compact mid orangish brown silty sand with abundant inclusions of small (>0.05m) sub rounded stones. This was visible in an area measuring 2m in length and covering the width of the trench. These features lay stratigraphically above (003).

4.11 Trench 10

Fig. 16 General shot of trench 10

Trench 10 was located in the southern part of the study area and ran adjacent from trench 3. The geophysical survey detected a possible enclosure, the boundary of which was explored through trenches 3, 4 and 11. Trench 10 was located to target any potential internal features associated with this possible enclosure. The trench measured 30.00 x 1.80m and was orientated NW-SE.

The general composition of the trench consisted of 0.40m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

Towards the middle of the trench was **(069)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running N-S and measured 0.25m wide. Immediately SE and physically related to (069) was **(070)**, which was also a fairly compact dark brownish grey clayey silt with no inclusions noted. This formed a linear running NE-SW and measured 0.25m wide. These features were stratigraphically above (003).

4.12 Trench 11

Trench 11 was located in the southern part of the study area and ran adjacent from trench 10. This was located to target the putative enclosure boundary and any possible internal features. The trench measured 21.00 x 1.80m and was orientated NE-SW.

The general composition of the trench consisted of 0.40m of topsoil **(001)**, which was a fairly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles. (001) sealed the features described below.

At the NE end of the trench was **(062)**, which was a fairly compact dark brownish grey clayey silt, with no inclusions noted. This formed a linear running NW-SE across the trench and measured 0.25m wide. 3.5m to the SW of (062) was **(063)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted. This again formed a linear running NW-SE across the trench and measuring 0.25m in width. 4.5m SW of (063) was **(065)**, which was a fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. There was also a rounded ceramic pipe measuring 0.05m in diameter within this deposit. This lay stratigraphically above **[066]**, which was a vertical sided linear running NW-SE, measuring 0.30m wide and excavated to a depth of 0.13m. This feature was cut into **(064)**, which was a very compact dark brownish grey silty clay with rare small (>0.05m) rounded pebbles. (064) was sat within a fairly amorphous shaped depression which measured 1.40 x 0.80 x 0.23m and continued beyond the eastern trench edge (see fig.). This had a fairly shallow profile with a fairly uneven base. To the SW of (064) was **(078)**, which was a light yellowish grey clayey silt with rare small (>0.05m) sub rounded pebbles. This deposit was sat within an amorphous shaped feature with a very uneven profile, being shallower on the southern side (see fig. 17)

Fig. 17 [066] cutting into (064)

Fig. 18 (078) showing the uneven profile and shape

2m SW of (078) was **(067)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted, forming a linear running NW-SE across the trench and measuring 0.25m in width. Approximately 4.5m to the SE of (067) was **(068)**, which was a fairly compact dark brownish grey clayey silt with no inclusions noted, forming a linear running NW-SE across the trench and measuring 0.25m in width. These features lay stratigraphically above (003).

5. Archaeological Results

5.1 Introduction

No features of archaeological significance were encountered, with many features either being natural/geological in origin or relatively recent field drains which tended to be spaced apart 3-4m. However the results are discussed in conjunction with the geophysical survey results. No finds of any archaeological significance were encountered during the evaluation.

5.2 Trench 1

The two linears identified in the geophysical survey could not be definitively identified during the excavation, however [043] which appears to be one of the old field boundary ditches may have caused a geophysical response. The other linear response may have been caused by (041), which was an old wire. Although this was visible in trench 2, this crossed a ferrous anomaly which may have prevented the linear anomaly being traced geophysically. The other linear features identified in this trench are field drains, with very similar fills. (042) and (075) were natural root boles.

5.3 Trench 2

The geophysical anomalies, including the field boundary and the broadly circular one were not identified archaeologically. However the circular anomaly did appear to coincide with a slight circular depression which was only visible on the surface after heavy rainfall (see fig. 19). The field boundary itself was visible as a low rise in the landscape but did not manifest itself archaeologically. Instead, two ditches (077) and (076) flanking it were visible archaeologically but appeared to be very shallow and badly denuded. The ferrous anomaly identified in the geophysics appears to coincide with (060). This natural deposit of sands and gravels appeared to be affected by iron panning which may have caused the response. Trench 9 also identified this. (079) and (080) appeared to be natural features and had similar fills to others excavated.

Fig. 19 Possible reason for the geophysical anomaly, investigated by trench 2, appears to be a slight depression on the surface, seen here after heavy rainfall (looking SW)

5.4 Trenches 3, 4 and 11 (possible enclosure)

The putative enclosure investigated by trenches 3, 4 and 11 coincided with the position of field drains. The possible reason for the geophysical survey detecting these field drains and not others, is that the drains identified were square in shape. This was confirmed as [032] in trench 3 and (072) in trench 4. These field drains were spaced apart *c*.4m. (035) identified in trench 3 may coincide with one of the ferrous anomalies identified in the survey, and this was identified as a probable root bole. The vast majority of features in trench 4 also appeared to be field drains, with the exception of (064) and (078) which again appeared to be natural root boles. (064) did prove to be an exception as the infill was much more clayey and compact than some of the other natural features. This feature may be archaeological in origin, however its amorphous shape and lack of finds equally argue against this conclusion.

5.5 Trench 5

[014], [017] and (030) were identified as field drains and (015), (016), (019) and [021] were identified as natural/geological in origin. None of the features could be definitively identified as the geophysical responses although [021] may correspond to one of them.

5.6 Trench 6

Trench 6 appears to have positively identified the linear anomaly shown in the geophysical survey as a field drain. The reason why it may have given a strong magnetic response is

that this particular drain had several large fragments of ceramic above it within the fill as well (see fig. 20)

Fig. 20 Drain [027] with fragments of drain within the fill (026) also, possibly eliciting the magnetic response on the geophysical survey

The only other feature encountered, (029), appears to be a natural root bole.

Trench 7

Trench 7 was criss-crossed with field drains all running NW-SE, with the excavation of [007] and [012] confirming this. (005) and (010) were natural root boles. The geophysical anomalies were not positively identified within this trench, however the anomalies do not necessarily have to manifest themselves archaeologically and could be down to subtle changes in the soil or isolated metal finds within the topsoil.

Trench 8

Very few features were encountered in trench 6 and both features encountered ([023] and [025]) appear to be natural/geological in origin. These may coincide with the geophysical anomalies detected but the features on the ground were slightly different in shape.

Trench 9

[052] and (055) were confirmed as field drains with (050), (053) and (054) were natural/geological in origin. (056) at the SW end of the trench corresponds to the ferrous anomaly which was also identified in trench 2 and was again, natural in origin. The two linears appear to coincide with (050) and (055).

Trench 10

Trench 10 did not target any geophysical anomalies specifically but was placed to investigate any potential internal features which could be associated with the 'enclosure'. Having proven that this was not an enclosure, there were no features of archaeological significance within this trench. The two features encountered were field drains.

6. Conclusions

No features of archaeological significance were encountered during the evaluation, with manmade features proving to be twentieth century field drains. The wire encountered in trenches 1 and 2 may be associated with the RAF base which once stood to the north. Other features investigated were found to be either natural or geological in origin.

The archaeological results to an extent confirm the geophysical survey results, in that the anomalies identified were not thought to be archaeological in origin. The vast majority of the anomalies identified in the geophysics could be confirmed through the evaluation. However this raises the question as to why many of the field drains did not show up on the geophysical survey. One suggestion is that the ones which did show up as discrete trends were either square in shape (as in trenches 3 and 4) or had further fragments of fired ceramic (trench 6) which would elicit a stronger response on the geophysics. However, as the traverse interval was 1m, it is entirely possible that the survey would not detect the discrete trends of the field drains as they were spaced *c*4m apart or more and only measured 0.25m wide. A smaller traverse interval has the potential to detect these narrower features.

7. Archive

The archive comprises of annotated field drawings, site registers and digital photographs. This archive is currently held by the Centre for Applied Archaeology and a copy of this report will be forwarded to HOW Planning and Stobart Group following the publication of the site report.

A copy of this report will also be deposited with the Cumbria Historic Environment Service.

8. Acknowledgments

The Centre for Applied Archaeology would like to thank Elizabeth MacFayden of HOW Planning for facilitating the works at the site. C*f*AA would also like to thank Jeremy Parsons for providing monitoring support and advice through Cumbria Historic Environment Service. The geophysical survey was conducted by Emma Watson, James Lawton and Claire Stephens of GSB Prospection. The report was compiled by Emma Watson. The archaeological evaluation was conducted by Rachael Reader and Andrew McGuire of C*f*AA. The report was compiled and illustrated by Rachael Reader. The project was managed by Adam Thompson.

9. Sources

Bibliography

Gregory, R.A. 2008 *Brunthill, Kingmoor Park, Carlisle: Archaeology and Cultural Heritage Assessment* Unpublished UMAU Report, University of Manchester

Thompson, A. 2013 *Written Scheme of Investigation for Archaeological Evaluation Trenching and Geophysical Survey Report at Kingmoor Park, Brunthill, Carlisle* Unpublished C*f*AA Report, University of Salford

Watson, E. 2013 *Geophysical Investigation Conducted at the Site of Kingmoor Brunthill, Carlisle* Unpublished GSB Prospection Report G1380

Maps

County Map

T Donald 1774 Map of Cumberland

Tithe Map

1839 Plan of Cargo Township in the Parish of Stanwix, Cumberland (CRO DRC 8/42)

Ordnance Survey Maps

Ordnance Survey 1868, 6in to 1 mile, Cumberland sheet XVI
Ordnance Survey 1863. 1:2500, Cumberland sheet XIV.10
Ordnance Survey 1863, 1:2500, Cumberland sheet XIV.11
Ordnance Survey 1901, 1:2500, Cumberland sheet XIV.10
Ordnance Survey 1901, 1:2500, Cumberland sheet XIV.11
Ordnance Survey 1926, 1:2500, Cumberland sheet XIV.10
Ordnance Survey 1926, 1:2500, Cumberland sheet XIV.11
Ordnance Survey 1946, 1:2500, Cumberland sheet XIV.11
Ordnance Survey 1972, 1:2500, NY3659-3759
Ordnance Survey 1973, 1:2500, NY3859
Ordnance Survey 1973, 1:2500, NY3659-3759
Ordnance Survey 1973, 1:2500, NY3860-3960

Appendix 1: Context List

Context	Trench	Description
(001)	Site	Topsoil: airly loose dark brownish grey clayey silt with occasional small (>0.05m) sub-rounded pebbles
(002)	VOID	VOID
(003)	Site	Very compact light reddish pink compact clay with frequent inclusions of small – medium (>0.10m) sub rounded stones – natural geology
(004)	7	Fairly compact dark brownish grey clayey silt with no inclusions noted, formed a linear running NW-SE, 0.25m wide
(005)	7	Dark yellowish grey silty clay with occasional small (>0.05m) rounded pebbles, within a sub-oval depression with a relatively shallow profile. 0.60 x 0.40 x 0.06m
(006)	7	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded stones. Fill of [007]
[007]	7	Vertical sided linear, running E-W and excavated to a depth of 0.10m, 0.25m wide
(008)	7	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running E-W and measuring 0.25m in width
(009)	7	Fairly compact dark brownish grey silty clay with no inclusions noted. Formed a linear running broadly E-W, 0.30m wide
(010)	7	Light yellowish grey clayey silt with no inclusions noted. Broadly circular, with poorly defined edges and very similar to (005) in characteristics
(011)	7	Fairly compact dark brownish grey clayey silt with occasional small (>0.05m) sub rounded pebbles. Also a rounded ceramic pipe, measuring 0.05m in diameter. Fill of [012]
(012)	7	Vertical sided linear running broadly E-W, measuring 0.30m in width and excavated to a depth of 0.10m
(013)	5	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles and a rounded ceramic pipe. Fill of [014]
[014]	5	Vertical sided linear running E-W which was excavated to a depth of 0.16m
(015)	5	Very compact dark reddish brown silty sand with abundant small (>0.05m) sub rounded pebbles. E-W, broadly linear, measuring 1.20m wide
(016)	5	Very compact dark reddish brown silty sand with abundant small (>0.05m) sub rounded pebbles. Again, this was broadly linear and measured 1m in width
(017)	5	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub-rounded stones and a rounded ceramic pipe. Fill of [018]
[018]	5	vertical sided linear measuring 0.30m wide and excavated to a

		depth of 0.08m
(019)	5	Fairly loose dark reddish brown clayey sand with occasional small (>0.05m) sub-rounded pebbles. Linear, running NW-SE maximum 0.05m wide and 0.03m deep
(020)	5	Fairly compact dark reddish brown silty sand with frequent small (>0.05m) sub rounded pebbles. Fill of [021]
[021]	5	Broadly U-shaped linear running NW-SE, varying in width between 0.50 – 0.75m
(022)	8	Fairly compact mid pinkish brown sandy clay with rare small (>0.05m) sub-rounded pebbles. Fill of [023]
[023]	8	Broad, curving linear, running broadly N-S, not a uniform shape or width, max 2.00m x 0.80m x 0.18m
(024)	8	Fairly compact mid pinkish brown sandy clay with frequent small (>0.05m) sub-rounded pebbles
[025]	8	Sub-oval feature with shallow sloping sides to a relatively flat base
(026)	6	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles and a rounded ceramic pipe, as well as larger fragments above it. Fill of [027]
[027]	6	Vertical sided linear running E-W across the trench and measuring 0.30m wide
(028)	6	Light yellowish grey sandy clay with no inclusions. Within a shallow sub-circular depression, measuring 0.50m wide and 0.03m deep
(029)	6	Very loose dark brownish grey silty clay which bleached out to a light whitish grey round the edges. In a sub-oval shaped depression, measuring 1.30 x 0.55 x 0.11m
(030)	5	Fairly compact dark brownish grey clayey silt with no inclusions noted, E-W and measuring 0.30m wide
(031)	3	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. Red ceramic pipe was also within this fill, square shape and c.0.10m in width. Fill of [032]
[032]	3	Vertical sided linear running NW-SE, 0.16m deep
(033)	3	Fairly compact dark brownish grey clayey silt with no inclusions noted, 0.25m in width
(034)	3	Fairly compact dark brownish grey clayey silt with no inclusions noted, 0.25m wide
(035)	3	Fairly compact light yellowish grey sandy clay with rare small (>0.05m) sub-rounded pebbles, sub-circular shape *c.*0.80m in diameter
(036)	3	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear shape, running NW-SE, 0.25m wide
(037)	3	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running NW-SE, 0.25m in width
(038)	3	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running NW-SE, 0.25m in width
(039)	3	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running NW-SE, 0.25m in width
(040)	1	Fairly compact dark brownish grey clayey silt with occasional

		small (>0.05m) sub rounded pebbles, measured 3.00 x 0.30m and was orientated NW-SE
(041)	1	Electrical wire, encased in timber, measured 1.80 x 0.10m
(042)	1	Fairly loose dark blackish grey clayey silt with rare small (>0.05m) sub rounded pebbles, in a sub-circular depression measuring 0.60m in diameter
[043]	1	Linear running NE-SW, beyond the trench edges forming a broad U-shape, with a fairly steep NE side and fairly shallow SW side
(044)	1	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles sealing a red clay pipe, measuring 0.05m in diameter. Fill of [045]
[045]	1	Vertical sided linear running NE-SW, measured 0.30m in width
(046)	1	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles. Fill of [047]
[047]	1	Vertical sided linear, running N-S, measuring 4.50 x 0.30m
(048)	1	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear, measuring 0.20m wide
(049)	1	Fairly compact dark brownish grey clayey silt, with rare small (>0.05m) sub rounded pebbles, formed a linear measuring 0.20m wide
(050)	9	Fairly loose light orangish brown sandy clay with occasional small (>0.05m) rounded pebbles. Linear running NW-SE, measured 1.10 x 0.24m. Relatively uneven profile with a fairly narrow base.
(051)	9	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebbles with rounded ceramic pipe measuring 0.05m in diameter. Fill of [052]
[052]	9	Vertical sided linear running NW-SE across the trench and measuring 0.30m in width. Excavated to a depth of 0.05m
(053)	9	Fairly compact light yellowish grey sandy clay with rare small (>0.05m) rounded pebbles. Amorphous shape with ill defined edges and a very shallow profile
(054)	9	Dark blackish grey clayey silt with rare small (>0.05m) rounded pebbles. Sat in a linear shaped depression which ran NE-SW and had a relatively shallow but uneven profile
(055)	9	Fairly compact dark brownish grey clayey silt with no inclusions noted. Formed a linear running NW-SE, 0.25m wide
(056)	9	Very compact mid orangish brown silty sand with abundant inclusions of small (>0.05m) sub rounded stones. Same as (060)
(057)	2	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running N-S, measuring 0.25m wide
(058)	2	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running NE-SW, measuring 0.25m in width
(059)	2	Fairly compact dark brownish grey clayey silt with no inclusions noted. Linear running N-S measuring 1.75 x 0.30m
(060)	2	Very compact dark orangish brown silty sand with abundant

		small – medium (>0.10m) sub rounded pebbles. 7m in width, amorphous shape. Same as (056)
(061)	2	Electrical wire
(062)	11	Fairly compact dark brownish grey clayey silt, with no inclusions noted. Formed linear running NW-SE, 0.25m wide
(063)	11	Fairly compact dark brownish grey clayey silt, with no inclusions noted. Formed linear running NW-SE, 0.25m wide
(064)	11	Very compact dark brownish grey silty clay with rare small (>0.05m) rounded pebbles. Within amorphous shaped depression 1.40 x 0.80 x 0.23m. Shallow profile and uneven base
(065)	11	Fairly compact dark brownish grey clayey silt with rare small (>0.05m) sub rounded pebblesand rounded ceramic pipe, 0.05m diameter. Fill of [066]
[066]	11	Vertical sided linear running NW-SE, measuring 0.30m wide and excavated to a depth of 0.13m. Cut into (064)
(067)	11	Fairly compact dark brownish grey clayey silt with no inclusions noted, forming a linear running NW-SE, 0.25m wide
(068)	11	Fairly compact dark brownish grey clayey silt with no inclusions noted, forming a linear running NW-SE, 0.25m wide
(069)	10	Fairly compact dark brownish grey clayey silt with no inclusions noted, formed a linear running N-S and measured 0.25m wide
(070)	10	Fairly compact dark brownish grey clayey silt with no inclusions noted, formed linear running NE-SW, 0.25m wide
(071)	4	Dark brownish grey clayey silt with no inclusions noted. This formed a linear running NE-SW and was visible for 3m and measured 0.25m wide
(072)	4	Dark brownish grey clayey silt with no inclusions noted. Part of a square drain was exposed at the SW extreme of linear, 0.25m in width
(073)	4	Fairly compact light yellowish grey clay with occasional small (>0.05m) sub rounded pebbles, 0.10 – 0.30m thick
(074)	VOID	VOID
(075)	1	Fairly compact light yellowish grey clayey silt with no inclusions noted. Within a broadly circular depression, shallow profile 0.50 x 0.04m
(076)	2	Dark brownish grey clayey silt with no inclusions noted. Linear, running parallel with [077], measured 0.50m wide
[077]	2	U-shaped linear running NE-SW, *c.*0.40m wide and surviving to a maximum of 0.10m in depth
(078)	11	Light yellowish grey clayey silt with rare small (>0.05m) sub rounded pebbles. Within amorphous shaped feature with a very uneven profile
(079)	2	Light brownish grey silty clay with no inclusions noted, *c*1m in diameter, amorphous shape
(080)	2	Light brownish grey silty clay with no inclusions noted, *c*2m in diameter, amorphous shape

Appendix 2: Figures

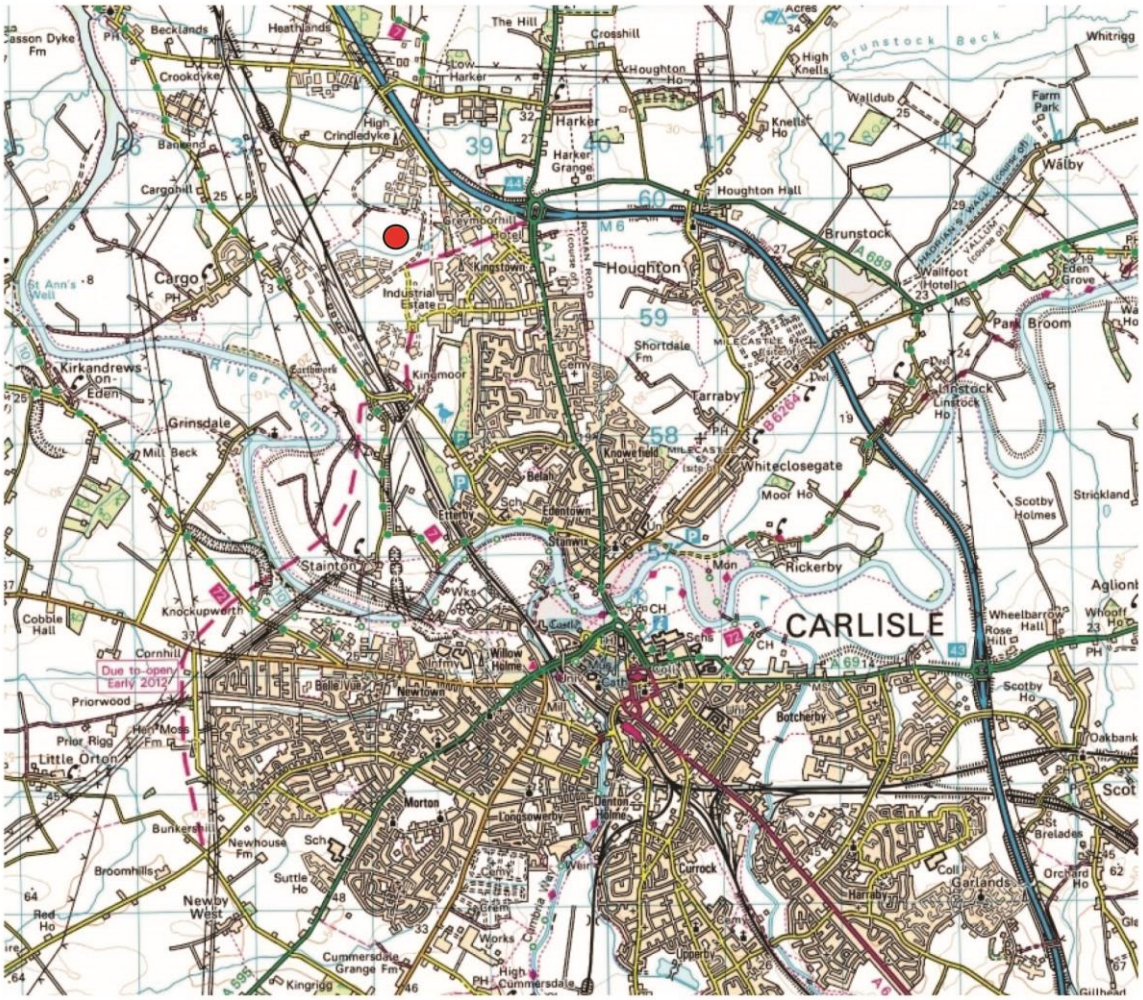
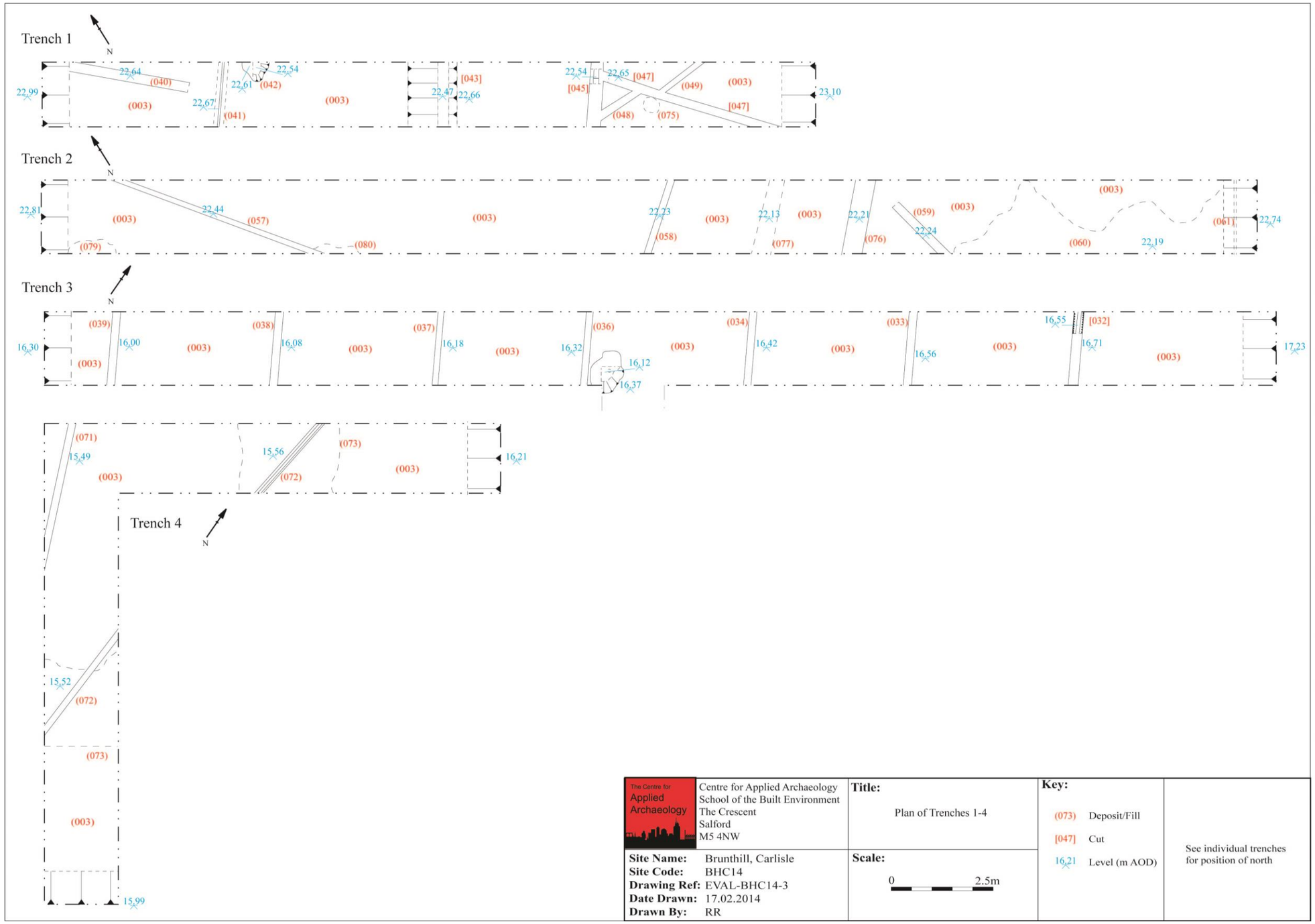


Fig. 21

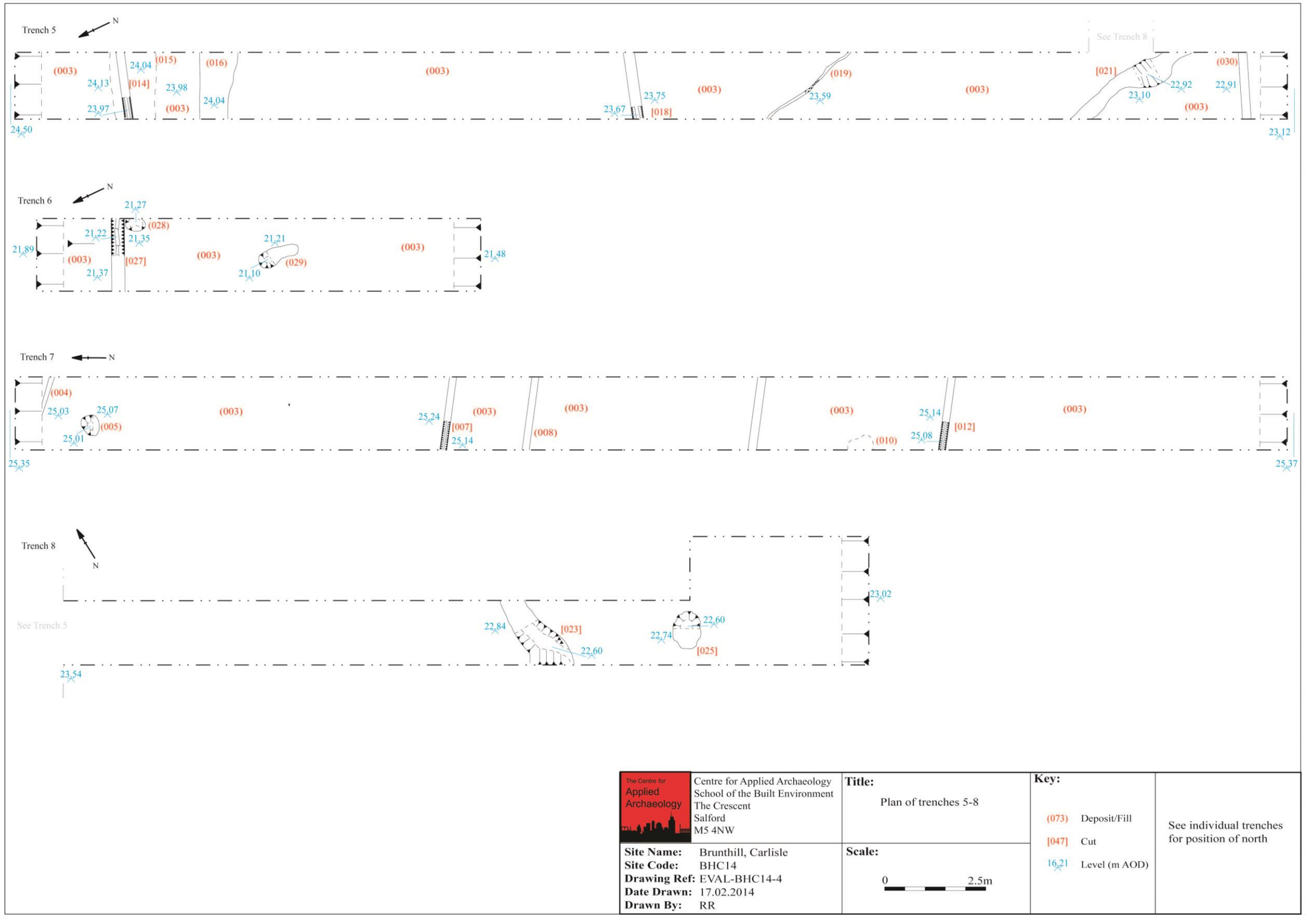
The Centre for Applied Archaeology	Centre for Applied Archaeology School of the Built Environment The Crescent Salford M5 4NW	**Title:** Location of trenches (overlaid on geophysical anomalies, courtesy of GSB Prospection Ltd)	**Key:** Trench	N
Site Name: Brunthill, Carlisle **Site Code:** BHC14 **Drawing Ref:** EVAL-BHC14-2 **Date Drawn:** 17.02.2014 **Drawn By:** RR		**Scale:** See above		

Fig. 22



The Centre for Applied Archaeology	Centre for Applied Archaeology School of the Built Environment The Crescent Salford M5 4NW	**Title:** Plan of Trenches 1-4	**Key:** (073) Deposit/Fill [047] Cut 16.21 Level (m AOD)	See individual trenches for position of north
	Site Name: Brunthill, Carlisle **Site Code:** BHC14 **Drawing Ref:** EVAL-BHC14-3 **Date Drawn:** 17.02.2014 **Drawn By:** RR	**Scale:** 0 — 2.5m		

Fig. 23



The Centre for Applied Archaeology	Centre for Applied Archaeology School of the Built Environment The Crescent Salford M5 4NW	**Title:** Plan of trenches 5-8	**Key:** (073) Deposit/Fill [047] Cut 16.21 Level (m AOD)
Site Name: Brunthill, Carlisle **Site Code:** BHC14 **Drawing Ref:** EVAL-BHC14-4 **Date Drawn:** 17.02.2014 **Drawn By:** RR		**Scale:** 0 2.5m	See individual trenches for position of north

Fig. 24

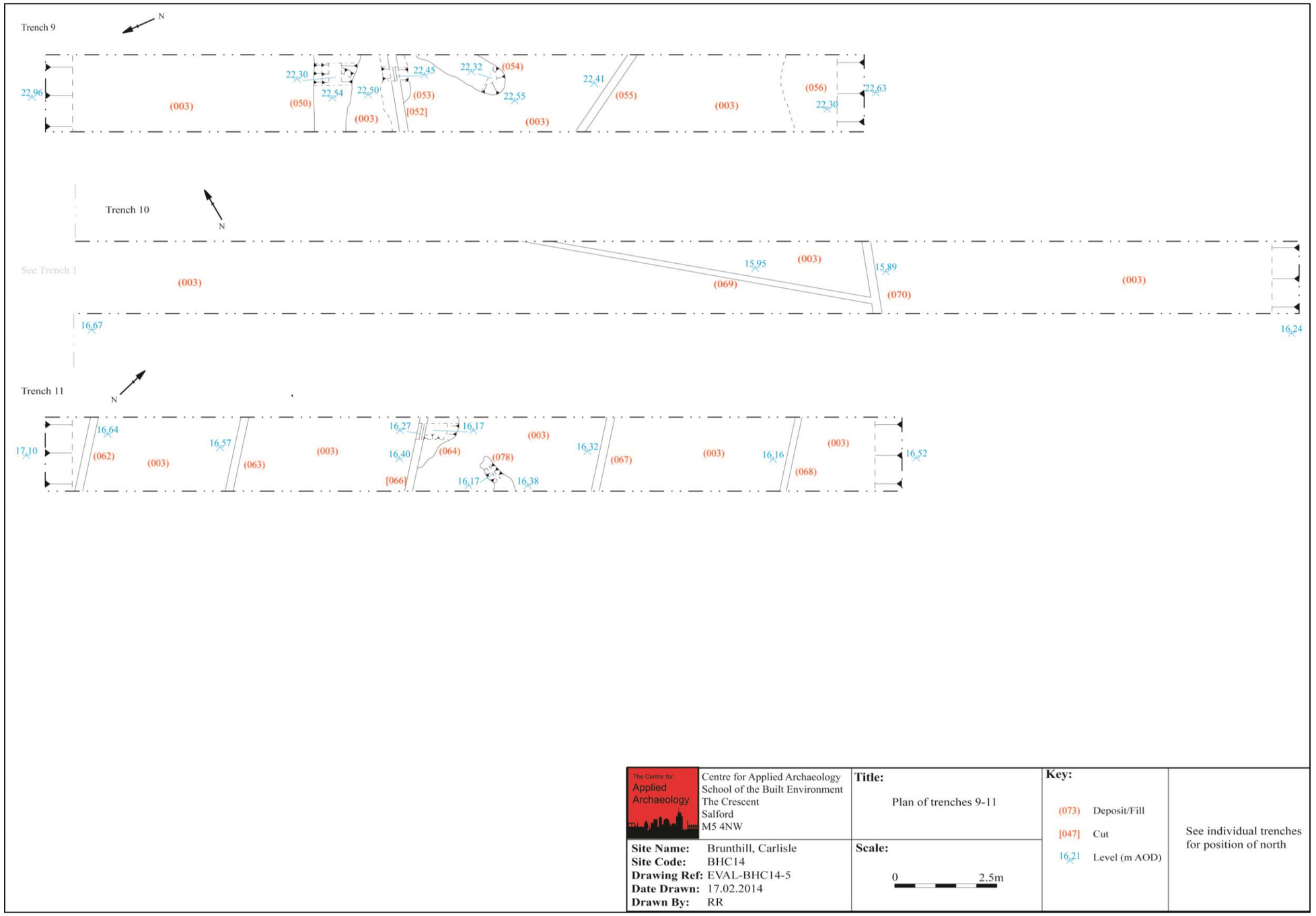

Trench 9
N
22.96
(003)
22.30
(050)
22.54
22.50
(003)
22.45
(053)
[052]
22.32
(054)
22.55
(003)
22.41
(055)
(003)
(056)
22.30
22.63
Trench 10
N
See Trench 1
(003)
16.67
15.95
(003)
(069)
15.89
(070)
(003)
16.24
Trench 11
N
17.10
16.64
(062)
(003)
16.57
(063)
(003)
16.27
16.40
[066]
16.17
(064)
(078)
16.17
16.38
(003)
16.32
(067)
(003)
16.16
(068)
(003)
16.52
The Centre for Applied Archaeology
Centre for Applied Archaeology
School of the Built Environment
The Crescent
Salford
M5 4NW
Title:
Plan of trenches 9-11
Key:
(073) Deposit/Fill
[047] Cut
16.21 Level (m AOD)
See individual trenches for position of north
Site Name: Brunthill, Carlisle
Site Code: BHC14
Drawing Ref: EVAL-BHC14-5
Date Drawn: 17.02.2014
Drawn By: RR
Scale:
0
2.5m

Fig. 25

Appendix 3: Photographic Register

Frame	Fig. Number	Trench	Description	Direction Facing
001		5/8	General Shot (Pre-Excavation)	S
002	Fig. 7	5/8	As 001	S
003		8	As 001	NE
004		8	As 001	NE
005		8	As 001	NW
006		8	As 001	NW
007	Fig. 8	5	Cut of drain [014] through (015)	NW
008		5	As 007	NE
009		5	As 007	NE
010		5	Detail/close up of [014]	NE
011		5	As 010	NE
012		5	As 007	NE
013		5	[018] & (017) drain at 15m	NW
014		5	Close-up of [018]	NW
015		5	[018]	SW
016		5	(019) possible natural feature	NW
017		5	As 016	N
018		5	As 016	N
019		7	Field Drain (004) and (005)	E
020		5	[021]/(020) possible natural feature	N
021		5	As 020	N
022		5	As 020	N
023		5	As 020	N
024		5	As 020	NE
025		5	As 020	N
026		5	As 020	N
027		5	As 020	E
028		7	Pre-Excavation shot [007]/(008)	W
029		7	Pre-Excavation shot (009)	W
030		7	Pre-Excavation shot [012]	W
031		7	Post-Excavation shot (005)	W
032		7	As 031	S
033		7	Working Shot	S
034	Fig. 10	7	As 033	S
035		7	Post- Excavation shot [007]/(008)	W
036		7	[007]	W
037		7	[012]	W
038		7	As 037	W
039		8	Pre-Excavation shot showing flooding in Trench 8	NW
040	Fig. 11	8	As 039	NW
041		8	Pre-Excavation shot [023]/(022)	N
042		8	Pre-Excavation shot [025]/(024)	SE
043		8	Post-Excavation shot [025]	SW

044		8	As 043	SE
045		8	Post-Excavation shot [023]	W
046		8	As 045	N
047		8	General shot of trench 8	NW
048	Fig. 9	6	Pre-Excavation shot of trench 6	NE
049		6	Pre-Excavation shot of drain [037] and (026)	NW
050		6	Pre-Excavation shot (029)	S
051		6	As 050	N
052	Fig. 20	6	Post-Excavation shot [027] & (026)	NW
053		6	Post-Excavation shot of natural feature (029)	W
054		6	As 053	W
055		6	As 053	S
056		3	Field drain (033)	W
057		11	Flooding in trench	S
058		11	As 057	S
059		10	As 057	E
060		10	As 057	E
061		3	Field drain [032]	W
062		3	Field drain (034)	W
063		3	Field drain (036)	W
064		3	Field drain (037)	W
065		3	Field drain (038)	W
066		3	General shot	NE
067		3	Field drain (039)	SW
068	Fig. 3	3	Post-Excavation shot field drain [032]	NW
069	Fig. 4	3	Post-Exc (035)	SW
070		3	As 069	NW
071	Fig. 1	1	Field drains [045] – (049)	NE
072		1	As 071	NW
073	Fig. 2	1	Field drains [047]	NW
074		1	General shot	NW
075		1	General shot	NW
076		1	Old wire (041)	NE
077		1	As (076)	NE
078		1	Root bole (042) and (041)	NW
079		1	As 078	SW
080		1	As 078	SE
081		1	As 078	SE
082		1	As 078	NW
083		1	Field drains [045] and [047]	SW
084		1	Root bole (075)	NE
085		9	Compact gravels & sand at S end of trench (056)	NW
086		9	General shot	NE
087	Fig. 12	9	As 086	NE
088	Fig. 13	9	Natural linear (050)	NW
089		9	As 088	NE
090		9	As 088	SE
091		9	(054)	SW

092		9	As 091	NW
093	Fig. 15	9	As 091	NE
094		9	(055)	NW
095		9	As 094	NE
096	Fig. 14	9	[053] and (053)	NW
097		2	(057) and (058) – Field Boundary	NE
098		2	General shot	NW
099		2	(060) Natural gravels – v compact	SW
100		2	General shot	NW
101		2	(059)	N
102		2	(058)	SW
103		2	(057)	NW
104		2	General shot	SE
105		2	Depression on surface – likely to indicate geophysical anomaly	SE
106	Fig. 19	2	As 105	SW
107		11	(062)	NE
108		11	As 107	N
109		11	(063)	SE
110		11	(062) and (063)	NE
111		11	[066] and (064)	SE
112		11	(078) pre-excavation	NW
113		11	(067)	SE
114		11	[066] and (064) post-excavation	NW
115	Fig. 17	11	As 114	NW
116		11	As 114	NW
117	Fig. 18	11	(078) post-excavation	W
118		10	Drains (069) and (070)	NW
119		10	As 118	NW
120	Fig. 16	10	General shot	NW
121		4	General shot	NW
122		4	Drain (072)	W
123		4	Drain (071)	NW
124	Fig. 6	4	Drain (072)	SW
125	Fig. 5	4	Section showing (073) clay (072) cut in	SW

Appendix 4: Geophysical Survey

GEOPHYSICAL SURVEY REPORT G1380

Geophysical Investigation conductued at the site of Kingmoor Brunthill, Carlisle

Client:

The Centre for Applied Archaeology

On behalf of:

GSB PROSPECTION Ltd

Celebrating over 25 years at the forefront of Archaeological Geophysics

University of Salford MANCHESTER

GSB Survey Report No. G1380

Geophysical Investigation conducted at the site of Kingmoor Brunthill, Carlisle

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Survey Personnel

Field Co-ordinator:	Emma Watson Bsc PGDip
Report Author:	Emma Watson Bsc PGDip
Project Assistants:	James Lawton BSc MSc, Claire Stephens BA MA

Dates

Fieldwork:	18 – 19 November 2013
Report:	9 December 2013
Report Approved:	Dr John Gater MIfA FSA

Background Project Details

NGR	NY 383 597
Location	Within the grounds of Kingmoor Business Park leading north from Kingmoor Hub roundabout. Approximatively 5km north-west of Carlisle.
HER/SMR	Cumbria HER
District	Cumbria
Parish	Kingmoor CP
Topography	Ground slopes gently from the north down to the south
Current Land Use	Pasture
Soils	Clifton association (711n): Slowly permeable seasonally waterlogged reddish fine and coarse loamy soils (SSEW 1983)
Geology	Bedrock: Stanwix Shales. Superficial deposits: Devensian (BGS 2013)
Archaeology	No sites or finds are known to have been discovered within the survey area however evidence of archaeological activity within the wider environs span from the Roman period to as late as the Twentieth Century
Survey Methods	Detailed magnetometer survey (fluxgate gradiometer)
Study Area	6.4ha

Aims

To locate and characterise any anomalies of possible archaeological interest within the study area. The work forms part of a wider archaeological assessment being carried out by **The Centre for Applied Archaeology** on behalf of **HOW Planning LLP**

Summary of Results

The magnetic survey at Kingmoor Brunthill has not recorded any responses which would readily be identified as being of archaeological interest. Uncertain features have been identified as such due to a lack of further supporting evidence and other features within the area.

An old field boundary has been identified which is still visible on the ground as an area of raised earth and was still present on OS mapping in the late Twentieth Century.

Method

All survey grid positioning was carried out using Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS equipment. The geophysical survey area is georeferenced relative to the Ordnance Survey National Grid by tying in to local detail and corrected to the site survey plan provided by the client. These tie-ins are presented in Figure T1. Please refer to this diagram when re-establishing the grid or positioning trenches.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1m	0.25m

All survey work is carried out in accordance with the current English Heritage guidelines (EH 2008).

Data Processing

Data processing was performed as appropriate using an in-house software package (GeoSuB) as outlined below.

Magnetic Data
Zero Mean Traverse, Step Correction (De-stagger) and Interpolation (on the Y axis).

Interpretation

When interpreting the results several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, pedology, topography etc.). Anomalies are categorised by their potential origin. Where responses can be related to very specific known features documented in other sources, this is done (for example: *Abbey Wall*, *Roman Road*). For the generic categories levels of confidence are indicated, for example: *Archaeology – ?Archaeology*. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification *?Archaeology*. Details of the data plot formats and interpretation categories used are given in the Appendix Technical Information at the end of the report.

General Considerations

Site conditions were generally good, surface water present across the area did not cause hindrance whilst walking
Certain areas within proposed boundary were unsuitable for survey due to felled trees in the north and to the south areas that were cordoned off with hazard tape and other obstructions such as trees.

1.0 Survey Results - Magnetometer Survey

Archaeology / ?Archaeology

1.1 There are no obvious responses that could be assigned, with any degree of confidence, to either of the above categories.

Uncertain Origin

1.2 There are various trends and isolated areas of magnetic enhancement which are difficult to interpret. Areas 1 and 2 display a scattering of small linear responses no more than 20m in length and a small number of discrete anomalies. Area 3 has fewer uncertain magnetic responses. To the south of this is a faint curvilinear response approximately 50m in diameter forming a teardrop shape.

Old Field Boundary

1.3 An old field boundary shows that Area 3 was once divided into two smaller fields. The boundary runs north-east/south-west parallel to existing field boundaries almost central to Area 3. Evidence of this feature can also be seen on the ground as a linear mound of raised earth.

Ferrous / Magnetic Disturbance

1.4 Ferrous responses are assumed to be modern in origin and are prominent around field edges and scattered within the fields.

2.0 Conclusions

2.1 The magnetic survey at Kingmoor has not detected any definite archaeological type anomalies in any of the survey areas. While few response have uncertain origins, it is not believed they are archaeologically significant.

References

BGS 2013	British Geological Survey, Geology of Britain Viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html 1:50,000 scale geology, centred on NY 383 597. Accessed 09/12/2013
EH 2008	*Geophysical Survey in Archaeological Field Evaluation*. English Heritage, Portsmouth.
OS 2013	http://www.old-maps.co.uk 1976-1993, 1:10,000 scale, Cumberland, centred on NY 383 597. Accessed 29/11/2013
SSEW 1983	*Soils of England and Wales. Sheet 1, Northern England*. Soil Survey of England and Wales, Harpenden.

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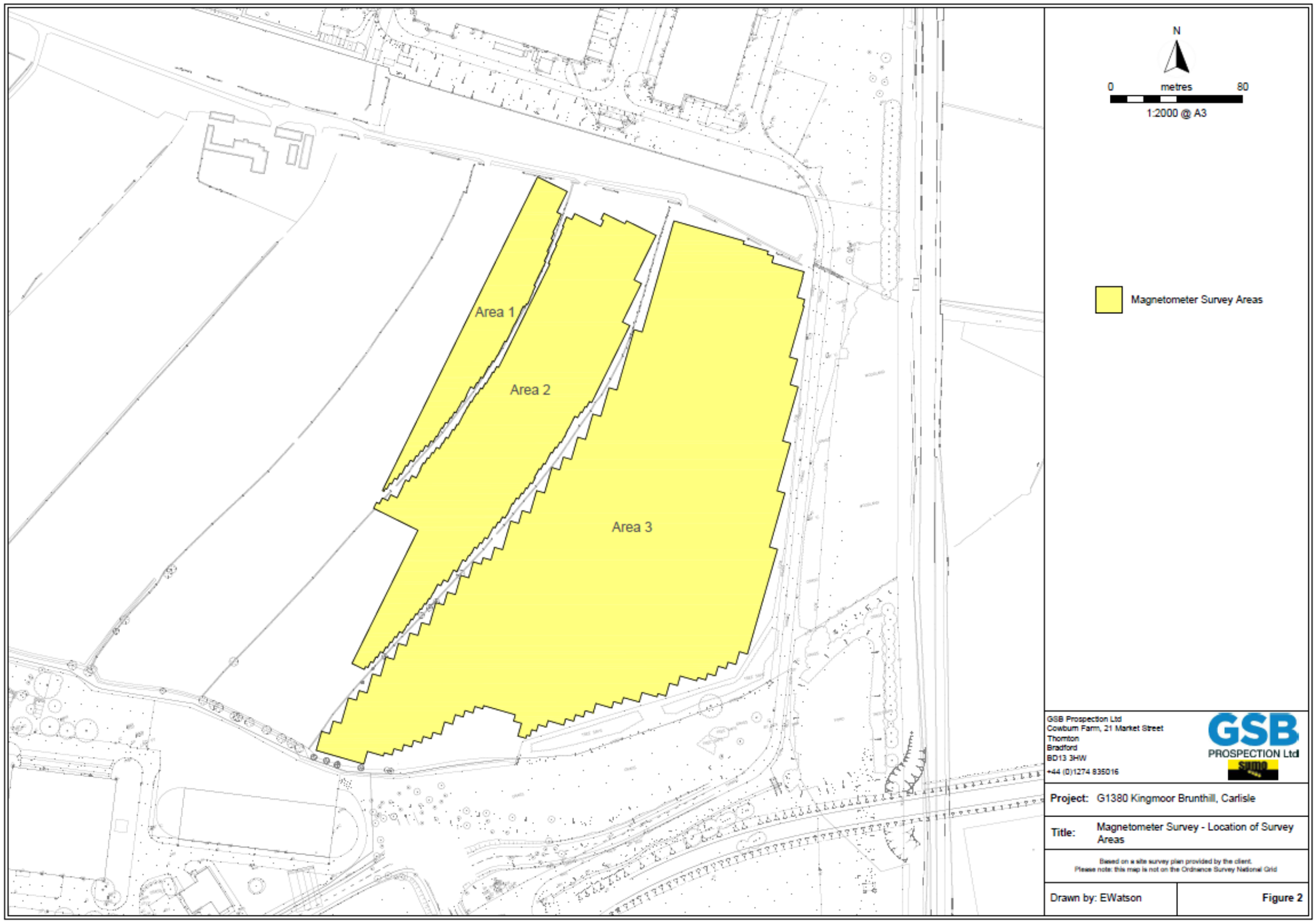
Project: G1380 Kingmoor Brunthill, Carlisle

Title: Site Location Diagram

Drawn by: JMT

Figure 1


Area 1
Area 2
Area 3
N
0
metres
80
1:2000 @ A3
Magnetometer Survey Areas
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Project: G1380 Kingmoor Brunthill, Carlisle
Title: Magnetometer Survey - Location of Survey Areas
Based on a site survey plan provided by the client.
Please note: this map is not on the Ordnance Survey National Grid
Drawn by: EWatson
Figure 2


N
0
metres
80
1:2000 @ A3
2
nT
-1
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Project: G1380 Kingmoor Brunthill, Carlisle
Title: Magnetometer Survey [All Areas] - Greyscale Plot
Based on a site survey plan provided by the client.
Please note: this map is not on the Ordnance Survey National Grid
Drawn by: CES
Figure 3


N
0
metres
80
1:2000 @ A3
Ferrous
Area of Magnetic Disturbance
Uncertain Origin
(discrete anomaly / trend)
Old Field Boundary
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Project: G1380 Kingmoor Brunthill, Carlisle
Title: Magnetometer Survey [All Areas] - Interpretation
Based on a site survey plan provided by the client.
Please note: this map is not on the Ordnance Survey National Grid
Drawn by: EWatson
Figure 4

Appendix - Technical Information: Magnetometer Survey

Instrumentation: Geoscan FM36/256 and Bartington *Grad*601-2

Both the Geoscan and Bartington instruments operate in a gradiometer configuration which comprises two fluxgate sensors mounted vertically a set distance apart; on the Geoscan instruments this is 0.5m, on the Bartington, 1m. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried by hand, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method. Having two gradiometer units mounted laterally with a separation of 1000mm, the Bartington instrument can collect two lines of data per traverse.

Data Processing

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (Destagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.
Interpolation	When geophysical data are presented as a greyscale, each data point is represented as a small square. The resulting plot can sometimes have a 'blocky' appearance. The interpolation process calculates and inserts additional values between existing data points. The process can be carried out with points along a traverse (the x axis) and/or between traverses (the y axis) and results in a smoother greyscale image.

Display

XY Trace Plot	This involves a line representation of the data. Each successive row of data is equally incremented in the Y axis, to produce a stacked profile effect. This display may incorporate a hidden-line removal algorithm, which blocks out lines behind the major peaks and can aid interpretation. The advantages of this type of display are that it allows the full range of the data to be viewed and shows the shape of the individual anomalies. The display may also be changed by altering the horizontal viewing angle and the angle above the plane.
Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.
3D Surface Plot	This is similar to the XY trace, but in 3 dimensions. Each data point of a survey is represented in its relative position on the x and y axes and the data value is represented in the z axis. This gives a digital terrain, or topographic effect.

Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall,* etc.) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

Archaeology	This term is used when the form, nature and pattern of the response are clearly or very probably archaeological and /or if corroborative evidence is available These anomalies, whilst considered anthropogenic, could be of any age.
?Archaeology	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
Increased Magnetic Response	An area where increased fluctuations attest to greater magnetic enhancement of the soils, but no specific patterns can be discerned in the data and no visual indications on the ground surface hint at a cause. They may have some archaeological potential, suggesting damaged archaeological deposits.
Industrial / Burnt-Fired	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
Old Field Boundary	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions.
Ridge & Furrow	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases the response may be the result of more recent agricultural activity.
Ploughing	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
Natural	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions. Smaller, isolated responses which do not form such obviously 'natural' patterns but which are, nonetheless, likely to be natural in origin may be classified as *?Natural*.
Uncertain Origin	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of *? Archaeology* and *?Natural* or (in the case of linear responses) *?Archaeology* and *?Ploughing*; occasionally they are simply of an unusual form.
Magnetic Disturbance	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present. They are presumed to be modern.
Ferrous	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

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