

**An Archaeological Evaluation at  
The Former Red Cross Building, Reigate Castle, Reigate.**

**Scheduled Monument SU 61**

**NGR TQ 2533 5047**

**Project No. 5587  
Site Code: RCS12**

**ASE Report No. 2013084  
OASIS ID: Archaeol6-147363**

**Kristina Krawiec**

**With contributions by  
R.Batchelor (QUEST) and D.S. Young (QUEST)**

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**Abstract**

*In February 2013 Archaeology South-East were commissioned to undertake an evaluation of the site of the Former Red Cross Hall, Reigate. The evaluation comprised four trenches, two over the course of the former moat and two located on the lower ground of the car park, and a borehole transect.*

*The two trenches located over the moat confirmed the presence of the upper backfill of the feature but due to the constraints at the site the edge of the moat was not observed. A borehole survey was undertaken in order to characterise the lower fills of the moat and recover samples for analysis. The cores confirmed that the 19<sup>th</sup> century backfill made up a large proportion of the deposits infilling the moat however the basal units included an in situ organic deposit overlying thin laminae of sand. The lower deposits did not yield reliable material for dating but the layer of leaf litter returned a date of 1670 cal AD to post-1950 cal AD (280-10 cal BP). These deposits also yielded pollen and plant macrofossil remains consistent with vegetation growing in and around the moat prior to its backfilling.*

*Trenches 1 and 2 were located on the exterior of the moat and demonstrated the depth of deposits overlying the area. Trench 1 was located along a slope and recorded at least 2m of deposits overlying the natural. No features were observed within this trench.*

*Trench 2 recorded the remains of a 19<sup>th</sup> century house which appears on the Ordnance Survey 1<sup>st</sup> Edition map as Moat House. These remains comprised the sandstone foundation course of a brick built house. This was built over a layer of stiff clay which was used to stabilise the ground. The natural was identified at c 1m below ground level in the southern end of the trench however, it was not reached until c2m below ground level at the northern end of the trench. No features were identified in the small areas where the natural was exposed in this trench.*

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## **1.0 INTRODUCTION**

### **1.1 Site background**

1.1.1 In February 2013 Archaeology South-East, as part of the Centre for Applied Archaeology, University College London, were commissioned on behalf of Reigate and Banstead Borough Council to undertake an archaeological evaluation at the site of the former Red Cross Hall, adjacent to Reigate Castle, Reigate. (NGR: TQ 2533 5047 (hereafter referred to as the site) Figures 1 and 2). Reigate Castle is a Scheduled Ancient Monument (Scheduled Monument: SU61). The evaluation comprised four trenches and a borehole survey.

### **1.2 Location and geology**

1.2.1 The site is located over an area of infilled moat, a large circuit of which is still open and filled with water to the west. The site is bounded to the north by London Road, to the east by Tunnel Road and to the west and south by the landscaped gardens of Reigate Castle.

1.2.2 The site lies at approximately 88maOD and is mainly flat with a grassy scarp to the rear, representing the original moat bank. The northern edge falls away as a vegetated slope towards London Road, while the eastern boundary is represented by a low earthen bank with the vertical edge of Tunnel Road beyond. The British Geological Survey records the underlying geology of the site as Folkestone beds (Sheet 286) which a borehole survey has shown to lie below c.1m of made ground (AP Geotechnics 2012).

### **1.3 Planning background**

1.3.1 The proposed redevelopment of the site comprises the demolition of the existing hall and the construction of a residential block extending across the entire site.

1.3.2 Due to the high potential for the survival of the castle moat to survive within the footprint of the proposed development, along with associated features, a programme of archaeological evaluation was proposed (detailed in this report) in support of a future planning application.

1.3.3 A Written Scheme of Investigation (WSI) for this evaluation was submitted to and approved by English Heritage's Inspector of Ancient Monuments, Paul Roberts prior to the commencement of on-site works. The WSI was also reviewed by Jane Cocoran (English Heritage Scientific Advisor for the Southeast).

### **1.4 Research Aims and Objectives**

1.4.1 The research aims of the project were developed with reference to the Surrey Archaeological Research Framework (SCC 2006). Reigate Castle is noted in this document as being in particular need of research (SCC 2006, 56). The aims of the archaeological investigation were therefore to:

#### **GENERAL AIMS**

- Ascertain whether archaeological remains were present on the site and if so assess the date, survival and condition of said remains.
- Ascertain the character date and quality of ancient remains and deposits.
- Ascertain how they might be affected by the proposed works on the site
- Enable English Heritage to make an informed decision as to the feasibility of the proposed works in light of the potential damage to the archaeological resource.

#### SPECIFIC OBJECTIVES

- Establish the location, and define the limits, of the moat
- Define the profile of the moat
- Date the earliest deposits within the moat fill and establish the events that lead to their deposition (i.e. are they the consequence of silting/deliberate infill etc.)
- Establish the presence absence of any features associated with the Castle and/or moat in other parts of the site.
- Carry out geoarchaeological borehole investigations to characterise the sediments infilling the moat, and if possible, the moat thickness.

1.4.2 The final aim is to make public the results of the archaeological evaluation, subject to any confidentiality restrictions

#### **1.5 Scope of report**

1.5.1 This report outlines the findings of the archaeological evaluation on the 26th November 2012 on the 18<sup>th</sup>-20<sup>th</sup> February 2013, carried out by Kristina Krawiec (Archaeologist), Antonio Reis (Assistant Archaeologist), Rob Cole (Surveyor) and Rob Batchelor (QUEST). The project was managed by Andy Leonard (fieldwork) and Jim Stevenson (post-excavation).

## **2.0 ARCHAEOLOGICAL BACKGROUND**

### **2.1 The Desk Based Assessment**

2.1.1 The following information is taken from a Desk Based Assessment and will not be repeated in full (ASE 2012).

### **2.2 Prehistoric**

2.2.1 Evidence of prehistoric activity in Reigate, and across the Weald is sparse. Some Mesolithic finds have been excavated in the town and finds from all the prehistoric periods have been found in surrounding areas. Environmental evidence suggests that the wider landscape of the Weald was wooded during this period and little evidence remains for Palaeolithic inhabitation of the area. The majority of finds recovered from the Weald are of Mesolithic date and suggest temporary seasonal occupation possibly associated with hunter gatherer activity. Neolithic flint has also been discovered at the same sites as that of earlier Mesolithic material suggesting possible continuation of similar activities in similar locations.

2.2.2 The discovery of Neolithic polished stone axes and pollen evidence suggests woodland clearance with the beginnings of agriculture exploitation. This is continued into the Bronze Age with evidence of agriculture and hunter gathering activities occurring side by side.

2.2.3 A potential Bronze Age site on Park Hill, Reigate Park, south of the study area, was investigated by Oxford Archaeology in 2008, who undertook a detailed magnetometry survey of a potential site where finds had previously been found. The survey identified a small number of anomalies that may be of archaeological origin; predominantly linear cut features possibly relating to enclosure boundaries, or in the case of the curvilinear features, structures such as roundhouses.

### **2.3 Roman**

2.3.1 Evidence for the Romano-British period in Surrey is confined to large settlements and villa sites and the route systems that link them. Specifically in Reigate, there is no evidence for a Roman Settlement within the parish.

### **2.4 Saxon**

2.4.1 There is little evidence from Reigate during the Anglo-Saxon period, with the exception of the occasional find. The place name Cherchefelle, the name under which Reigate is first recorded in the Domesday Survey of 1086, means 'open space by the hill or barrow'. It has been suggested that the parish consisted of several isolated hamlets, with a church, St Mary Magdalene, east of the medieval centre. In the wider area, the Weald was largely covered by the great forest of *Andredeswald*. There is limited archaeological evidence for settlement in this period. It has been suggested that the lack of Anglo-Saxon sites in the Weald may be due to an inability to detect them. The majority of known Anglo-Saxon sites in this area are cemetery sites in places such as Leatherhead and Croydon. However no Anglo-Saxon sites are known within the Study Area.

## **2.5 Medieval**

- 2.5.1 The name Reigate is not in the Domesday Book, although it is believed that Cherchefelle was located there at that time. The manor was granted to William de Warenne when he was created Earl of Surrey in 1090. It was probably Warenne that started work on the castle, and by the late 12th- early 13th-century it had a bailey, becoming one of the main feudal castles of Surrey. It was around this time, in the late 12th century that the planned new town of Reigate, with characteristic long burgage plots was laid out by the lords of the castle, beneath the walls of their fortress.
- 2.5.2 The town would have been a row of houses faced by a religious house, similar to Lewes, which lies between a castle and a religious foundation of the same lords. One main street, the High Street, ran east to west, south of the raised ground on which the castle stood, and north of the opposite ridge on the lower part of which was the priory. Bell Lane ran from the south to the eastern corner of High Street. Nutley Lane, now Pilgrim's way, ran north from the western end of High Street, up the hill, to join the old main road east and west on the chalk downs. The High Street retains its name and position; eastward it is continued as Church Street, westward as West Street. Bell Lane, High Street, and Nutley Lane, now the London road, were north and south lines, equally dominated by the castle.
- 2.5.3 The church of the original Cherchefelle stood south-eastward of the castle, on a sandy knoll not unlike that on which the castle stands, but lower. Apart from medieval remains at the Old Vicarage site excavated in the mid-1980s, there is no evidence for medieval settlement outside of the current town centre. The town was granted a market before 1276. It had three medieval chapels, though little is known of their history. More is known of the Priory, which was founded by another William of Warenne, and his wife Isabel, in 1240.
- 2.5.4 The Site straddles the eastern half of the moat that defined the northern boundary of the outer bailey of the castle. Archaeological work to the east of the Site, during extension work to the Town Hall between 1996 and 2000, partly defined the dimensions of the moat: it was at least 8m in width, and probably 18m in total. The depth could not be ascertained, but excavation ceased for safety reasons at a depth of 3.7m. It contained a number of backfill deposits containing a mix of dateable finds, suggesting it had been completely cleaned out in the 19th century and backfilled with clay.



### **3.0 METHODOLOGY**

#### **3.1 Evaluation Trenches** by Kristina Krawiec

3.1.1 Four trenches were excavated; Trenches 3 and 4 5m x 1.80m across the line of the moat; Trench 2 16m x 1.80m orientated north south to the north of the Red Cross building and Trench 1 8m x 1.80m orientated north west to south east Trenches 1 and 2 were designed to be a random sample of the area to identify any features associated with the castle. Trenches 3 and 4 were located in order to define the extent of the moat.

3.1.2 The trenches were excavated using a JCB fitted with a toothless ditching bucket. Due to the depth of deposits encountered, two sondages were excavated in Trenches 1 and 2 to demonstrate the nature of the overlying deposits. These were photographed and recorded before being immediately backfilled for safety. The remainder of the trenches were taken to the first significant archaeological horizon.

#### **3.2 Boreholes** by QUEST

3.2.1 To accompany Trenches 3 and 4 a borehole transect comprising 5 cores was also drilled in order to profile the moat. The locations of the boreholes were informed by the results of the trenches and were undertaken in accordance with the English Heritage guidance on geoarchaeology and environmental archaeology (English Heritage 2007, Campbell *et al.*, 2011). The lithostratigraphy of the boreholes was described using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel, fine sand, silt, clay and organic material; (4) recording the degree of peat humification and (5) recording the unit boundaries e.g. sharp or diffuse. The results of the lithostratigraphic descriptions are displayed in Tables 6 to 10 (Appendix 1) and Figure 5.

3.2.2 The samples collected within the open-faced gouge were discarded in the field, but units likely to contain archaeobotanical, zooarchaeological or cultural remains were sub-sampled as required. The cores were also inspected by an archaeologist for the retention of any datable finds and to archaeologically record deposits to enable correlation between layers.

3.2.3 Following completion of the borehole survey, a sixth borehole was put down in the location of the best sequence (BH3A). This borehole was recovered using an Eijkelkamp windowless sapler powered by an Atlas Copco TT 2-stroke percussion engine. This coring technique provides a reliable method for the recovery of continuous, undisturbed core samples and provides sub-samples suitable for not only sedimentary and microfossil assessment and analysis, but also macrofossil analysis. The recovered core sample was wrapped in clear plastic to prevent moisture loss, labelled with the depth (metres from ground surface) and orientation (top and base) and returned to Quaternary Scientific (University of Reading) for storage in a purpose built

facility at 2°C. This temperature prevents fungal growth on the core surface, which may lead to anomalous radiocarbon dates, and moisture loss.

### **3.3 Survey methodology**

3.3.1 The trenches and boreholes were surveyed using a combination of differential GPS and Total Station to tie the site to the National Grid.

### **3.2 Environmental assessment methodology by QUEST**

#### **3.3.1 Pollen**

Twelve sub-samples were extracted for an assessment of pollen content from BH1 (3 sub-samples), BH3 (7 sub-samples) and BH5 (2 sub-samples). The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) adding two tablets of the exotic clubmoss *Lycopodium clavatum* to provide a measure of pollen concentration in each sample; (3) deflocculation of the sample in 1% Sodium pyrophosphate; (4) sieving of the sample to remove coarse mineral and organic fractions (>125µ); (5) acetolysis; (6) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of 2.0g/cm<sup>3</sup>); (7) mounting of the sample in glycerol jelly. Each stage of the procedure was preceded and followed by thorough sample cleaning in filtered distilled water. Quality control is maintained by periodic checking of residues, and assembling sample batches from various depths to test for systematic laboratory effects. Pollen grains and spores were identified using the University of Reading pollen type collection and the following sources of keys and photographs: Moore et al (1991); Reille (1992). The assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of pollen grains and spores, and the principal taxa on four transects (10% of the slide) (Table 12, Appendix 1). Microscopic charcoal with at least one axis exceeding 40µm in length was also counted.

#### **3.3.2 Diatoms**

Five sub-samples from BH1 (2 sub-samples), BH3 (2 sub-samples) and BH5 (1 sub-sample) were extracted for the assessment of diatoms. The diatom extraction involved the following procedures (Battarbee et al., 2001):

1. Treatment of the sub-sample (0.2g) with Hydrogen peroxide (30%) to remove organic material and Hydrochloric acid (50%) to remove remaining carbonates
2. Centrifuging the sub-sample at 1200 for 5 minutes and washing with distilled water (4 washes)
3. Removal of clay from the sub-samples in the last wash by adding a few drops of Ammonia (1%)
4. Two slides prepared, each of a different concentration of the cleaned solution, were fixed in mounting medium of suitable refractive index for diatoms (Naphrax)

Duplicate slides, each having two coverslips were made from each sample and fixed in Naphrax for diatom microscopy. The coverslip with the most suitable concentration of the sample preparation was selected for diatom evaluation. A large area of this coverslip was scanned for diatoms at

magnifications of x400 and x1000 under phase contrast illumination using a Leica microscope. The results are displayed in Table 13 (Appendix 1).

### 3.3.3 Macrofossils

Four small bulk samples from the moat fill of BH3 and one from BH1 were selected for macrofossil assessment (seeds, wood, charcoal, insects, Mollusca, Ostracoda, Foraminifera). The extraction process involved the following procedures: (1) measuring the sample volume by water displacement and (2) processing the sample by wet sieving using 300µm and 1mm mesh sizes. Each sample was scanned under a stereozoom microscope at x7-45 magnifications, and sorted into the different macrofossil classes. The concentration and preservation of remains was estimated for each class of macrofossil (Table 14, Appendix 1).

Identifications of the waterlogged seed remains have been made using modern comparative material and reference atlases (e.g. Cappers et al. 2006). Nomenclature used follows Stace (2005). The results are displayed in Table 15 (Appendix 1).

## 3.4 Fieldwork Constraints

3.4.1 The presence of a live electricity service and sub-station prevented the extension of Trench 3 to locate the edge of the moat, the exposed portion of which was wider than that shown on modern mapping. The ingress of water also prevented the excavation of the trenches beyond 1m in depth. The presence of a manhole and service duct prevented the excavation of Trench 2 in its planned location and the orientation of this trench was changed to accommodate this. Likewise the original location of Trench 1 was altered due to the presence of a telegraph pole and buried concrete blocks.

## 3.5 The archive

3.5.1 The archive has been offered to the local museum (Dorking).

3.5.2 Site archive quantification is shown below:

Number of Contexts	21
No. of files/paper record	26
Plan and sections sheets	3
Photographs	46 digital, 8 b/w
Bulk finds	2 bags

Table 1: Archive quantification

## 4.0 RESULTS

### 4.1 Trench 1 (Figure 4)

4.1.1 Trench 1 was located on the northern edge of the site on a vegetated slope and was orientated north west south east. The final dimensions of the trench were 7.60m x 1.80m. The orange silt sand natural subsoil was reached at 91.69m AOD (c.2m below current ground level) at the south eastern end of the trench within a 3m long sondage. No features were observed truncating the natural.

4.1.2 The natural was overlain by a 0.70m thick layer of brown sandy clay [1/004] which contained occasional crushed brick fragments and mortar. This was then overlain by an orange-yellow sandy clay [1/003] 0.20m thick which contained crushed CBM and sandstone and was part of a series of made ground layers seen across the site. This was in turn overlain by a 0.15m thick layer of grey sandy clay [1/002] with occasional crushed CBM and charcoal. This was sealed by a loose topsoil, 0.80m thick which contained black bin bags containing bottles and cans, this was originally a flower bed. Buried within this was a large concrete block, c. 1 tonne, which was one of a series embedded in the slope to prevent vehicular access to the site.

Number	Type	Description	Max. Length	Max. Width	Max. Depth
1/001	Layer	Topsoil	7.60m	1.80m	0.80m
1/002	Layer	Made ground	7.60m	1.80m	0.15m
1/003	Layer	Made ground	7.60m	1.80m	0.20m
1/004	Layer	layer	7.60m	1.80m	0.85m
1/005	Natural				

Table 2: Trench 1 list of recorded contexts

### 4.2 Trench 2 (Figures 3 and 4)

4.2.1. Trench 2 was located along the eastern boundary of the site and was orientated north south. The final dimensions of the trench were 16.0m x 1.80m. The orange silt sand natural subsoil was reached at 91.85m AOD (c.2m below current ground level) at the northern end of the trench within a 2m long sondage. At the southern end of the trench the natural was a light grey mottled sand and was reached at 93.04m AOD (c.1.10m below ground level). No features were observed truncating the natural.

4.2.2 The southern end of the trench was truncated by a large service trench [2/006] which was infilled by a clean stiff mixed clay deposit [2/007] which meant only a 0.50m length of natural was exposed in this area. The natural was overlain by a buried sandy topsoil deposit [2/010] 0.10m thick. Which was in turn overlain by a layer of made ground [2/005] which comprised a brown grey silty clay with crushed CBM throughout. This, and the rest of the trench, was overlain by a demolition deposit [2/002] which was derived from the clearance of the building recorded in the centre of the trench [2/003], see below. The bricks within this deposit were frogged (c.1850's) but not stamped and were of a red fabric (9x4<sub>1/2</sub> x3<sub>1/2</sub> inches).

4.2.3 The majority of the trench was taken up with the sandstone foundations of a

house marked on the 1<sup>st</sup> Edition Ordnance Survey map as Castlebank and on later maps as Moat House. These foundations [2/003] were composed of green sandstone with lime mortar and in places the outline of the overlying courses of brick could be seen. The foundations were divided into four 'rooms' and there is evidence of more than one phase as the 'room' at the northern end of the building was built of brick rendered in concrete. This was infilled by a clean orange sand [2/008] whilst the remainder of the building was backfilled with a demolition deposit [2/004]. A small amount of 20<sup>th</sup> century decorated tile, roof tile and iron nails were noted from this deposit which was otherwise devoid of cultural material.

- 4.2.4 At the northern end of the trench the natural was overlain by the same brown sandy clay [2/010] deposit recorded in Trench 1, [1/004]. This was then overlain by made ground deposit [2/005]. Again no features were observed truncating the natural.

Number	Type	Description	Max. Length	Max. Width	Max. Depth
2/001	Layer	Tarmac/hardcore	16m	1.80m	0.10m
2/002	Deposit	Demolition deposit	16m	1.80m	0.28m
2/003	Wall	foundations			
2/004	Fill	Demolition deposit	5.60m	1.80m	0.27m
2/005	Layer	Made ground	3m	1.80m	0.60m
2/006	Cut	Service trench	1.80m	1.30m	0.70m unex
2/007	Fill	Fill of service trench	1.80m	1.30m	0.70m unex
2/008	fill	Clean sand	2m	1.80m	1.20m unex
2/009	Layer	Brown sandy clay	2.30m	1.80m	0.50m
2/010	Topsoil	Buried topsoil	0.50m	1.80m	0.15m
2/011	Natural	Orange yellow sandy clay/grey sand			

Table 3: Trench 2 list of recorded contexts

### 4.3 Trench 3 (Figure 4)

- 4.3.1 Trench 3 was located at the southern end of the site directly over the line of the infilled moat and was orientated north south. The final length of this trench was 4.50m due to the presence of the sub-station to the north. The natural subsoil was not reached in this trench. The aim of this trench was to locate the edge of the moat but this was not achieved due to the reasons stated above. The water filled circuit of the moat was much wider than the modern mapping suggests which mean the line of the moat may be further to the north.

- 4.3.2 The previous geotechnical work carried out at the site recorded made ground to a depth of 0.80m below ground level. The lowest recorded deposit within this trench was a stiff grey clay with crushed CBM throughout [3/004] which was reached at a depth of 93.47m AOD (c.0.46m) and was not bottomed. This was overlain by [3/003] a mid brown grey sandy clay with frequent crushed CBM, mortar and stones. This has a distinct tip-line which sloped to the north and this along with [3/004] may represent the 19<sup>th</sup>

century backfilling of the moat. These deposits were excavated to a depth of c 93.47m AOD (1m below ground level) and due to water ingress were unable to be excavated deeper.

- 4.3.3 The upper fills of the moat were overlain by a layer of made ground [3/002] and the hardcore and tarmac of the car park [3/001].

Number	Type	Description	Max. Length	Max. Width	Max. Depth
3/001	Layer	Tarmac/hardcore	4.50m	1.80m	0.30m
3/002	Layer	Made ground	4.50m	1.80m	0.26m
3/003	deposit	Upper moat fill	2.75m	1.80m	0.42m
3/004	deposit	moat fill	2.60m	1.80m	0.46m

Table 4: Trench 3 list of recorded contexts

#### 4.4 Trench 4 (Figure 4)

- 4.4.1 Trench 4 was located to the south of Trench 3 and was placed to locate the southern edge of the moat. The trench was orientated north south and the natural was not reached due to the presence of a steep slope to the south which prevented the extension of this trench.

- 4.4.2 The lowest deposit encountered in this trench was a grey brown sandy clay with crushed CBM throughout [4/003] which is equivalent to [3/003] the upper moat fill. The grey clay deposit [3/004] seen in Trench 3 could be seen in the base (93.21mAOD) of Trench 4 but was not excavated due to water ingress. Again the edge of the moat was not revealed in plan but can be presumed to lie beneath the slope to the south of the trench.

Number	Type	Description	Max. Length	Max. Width	Max. Depth
4/001	Layer	Tarmac/hardcore	4.10m	1.80m	0.31m
4/002	Layer	Made ground	4.10m	1.80m	0.30m
4/003	deposit	Upper moat fill	4.10m	1.80m	0.36m

Table 5: Trench 4 list of recorded contexts

#### **4.5 Borehole survey by QUEST**

- 4.5.1 The aims of the geoarchaeological investigations were as follows: (1) to establish the location, limits and profile of the moat; (2) to characterise the sediments infilling the moat, and if possible, the moat thickness; (3) to establish the events that lead to the deposition of the sediments infilling the moat (i.e. are they the consequence of silting/deliberate infill etc.); (4) to radiocarbon date the earliest deposits within the moat fill; (5) to quantify the archaeobotanical (pollen, seeds, wood, diatoms) and zooarchaeological (insects, mollusca, foraminifera, ostracoda) remains within the moat sediments.
- 4.5.2 Five geoarchaeological boreholes (BH1 to BH5) were put down at the site in an attempt to establish the location, limits and profile of the moat, and to characterise the sediments infilling the moat, and if possible, the moat depth. The results of are displayed in Tables 6 to 10, (Appendix 1) and Figures 2 and 5.
- 4.5.3 The results of the geoarchaeological fieldwork indicate a sequence of Folkestone Beds overlain by moat fill and made ground. The Folkestone Beds generally comprised stiff clays, silts and sands with sandstone inclusions. The surface of these deposits is lowest in central boreholes BH2 (91.45m OD) and BH3 (91.49m OD), rising to 92.72m OD in BH1 to the northern end of the transect, and southwards to 93.00m OD in BH5 and 93.95m OD in BH1.
- 4.5.4 The Folkestone Beds tend to range in colour between yellow-brown and orange-red towards the top, becoming greyer with depth. This transition in colour is representative of oxidation of the deposits closer to the surface. Boreholes BH2 and BH3 only contain grey/dark grey Folkestone Beds, most likely due to truncation of their upper surface.
- 4.5.5 Overlying the Folkestone Beds in four of the boreholes was a thin horizon of deposits varying from very dark grey/black organic-rich clay/silty clay, with twig and/or leaf remains, to lighter sands/silty sands of a possible calcareous nature. These sediments were arranged in lenses in BH1 and BH3, whilst only one single unit was recorded in BH2 and BH5. The thickest accumulation of deposits was recorded in BH3 (0.62m); thinner deposits were recorded in BH1 (0.14m), BH2 (0.05m) and BH5 (0.10m), and were absent from BH4. These sediments are considered to represent former sediments of the moat.
- 4.5.6 The deposits overlying the moat fill were thick and highly variable, including horizons of stiff grey clay with concrete, brick/tile and chalk rubble, and sandy gravels. These sediments have been termed 'made ground' but represent material used to infill the moat and raise it to the current level of the Red Cross site. It is highly likely that this process impacted upon the natural deposits that previously accumulated within the moat, causing compaction and in places truncation.
- 4.5.7 The north-south borehole transect has established the presence of moat fill in four of the five boreholes put down. The moat appears to have extended from at least the location of BH1, to between northern boreholes 5 and 4;

this equates to a width of at least 16m but probably <20m. This compares well with previous investigations at the Town Hall to the east which ascertained a width of at least 8m, with 18m the likely total width. Furthermore this width and position coincides with the eastern trajectory of the existing moat (as seen in Figure 2).

- 4.5.8 The moat appears to be symmetrical in shape with its base around 91.45m OD, a depth of 2.80/2.85m BGS, as recorded in BH2 and BH3. The edge of the moat appears to be between 93.00m OD (BH5) and 93.55m OD (BH4). These results compare less well with the results of previous investigations. During the course of the geotechnical investigations at the site (AP Geotechnics, 2012), the Folkestone Beds were not categorically recorded until 3.5m bgs, a depth 90cm deeper than that recorded here. Geoarchaeological investigation of the sediments revealed difficulty in establishing moat fill from the Folkestone Beds; both comprised dark silty to sandy sediments, and a pollen assessment was used to clarify the two (see below). The less detailed nature of the previously undertaken geotechnical investigations is therefore considered to be the most likely reason for the different level indicated for the base of the moat.
- 4.5.9 Similarly, investigations at the Town Hall did not record the base of the moat by 3.7m bgs. In this case it is highlighted that it is unknown if the moat was of variable shape/depth, and also that the surface OD height of the Town Hall may have been different to that of the Red Cross site.
- 4.5.10 The sediments infilling the base of the moat consisted of lenses of organic-rich silt clays with leaf and twig remains and sands, of a possible calcareous nature. These deposits were generally thin, <20cm in BH1, BH2 and BH5, with the greatest thickness recorded in BH3 (0.62m). It is unknown whether these sediments represent the earliest infilling of the moat since activities such as draining and dredging may have been carried out to prevent silting up.
- 4.5.12 However, the sediments that cap the moat fill deposits are highly likely to have been impacted on (i.e. compacted and truncated) by the later deposition of made ground. These sediments were highly variable, including horizons of stiff grey clay with concrete, brick/tile and chalk rubble, and sandy gravels.
- 4.5.13 The lower deposits are a consequence of the natural silting up of the moat. The lenses of sandy material are likely to represent either: colluvial material washed into moat as a consequence of erosion, or building debris discarded into the moat that has subsequently disintegrated. The fine-grained organic-rich sediments including the twigs and leaves have settled out in the still water of the moat. They most likely derived from a nearby source, such as material landing on the water surface from vegetation surrounding the moat, or fine grained material washed into the moat.
- 4.5.14 The subsequent thick horizon of variable deposits were termed 'made ground' but represent the deliberate infilling of the moat to raise it to the current level of the Red Cross Car Park site.



## 5.0 THE ENVIRONMENTAL SAMPLES

### 5.1 Radiocarbon dating by QUEST

- 5.1.1 A programme of radiocarbon dating was carried out to date the earliest deposits of the moat. The moat fill from BH3 was selected to achieve this as it contained the thickest horizon. However, the only material suitable for radiocarbon dating consisted of leaf litter from the upper fill (2.26 to 2.36m BGS). Such remains are considered to be an acceptable target for radiocarbon dating as they are unlikely to have travelled far from source without disintegrating. Whilst organic-rich deposits were recorded lower within the moat fill, they were of unidentifiable and of unknown origin (i.e. may not have been *in situ*).
- 5.1.2 The sample has been radiocarbon dated to 1670 cal AD to post-1950 cal AD (280-10 cal BP). The  $\delta^{13}\text{C}$  (‰) values are consistent with that expected for organic-rich alluvial sediments, and there is no evidence for mineral or biogenic carbonate contamination. This date may be equated with the late medieval/early post-medieval to modern period. It is highlighted however, that this is a minimum age for the moat, since not only does this not represent the very lowest deposits, but because it is unknown if maintenance activities such as drainage/dredging were carried out.

Laboratory code / Method	Material and location	Sample (m OD)	Uncalibrated radiocarbon years before present (yr BP)	Calibrated age BC/AD (BP) (2-sigma, 95.4% probability)	$\delta^{13}\text{C}$ (‰)
BETA-344381 / AMS	leaves, base of moat fill, borehole BH3	2.26 to 2.36	160 ± 30	1670 to post 1950 cal AD (280 to 10 cal BP)	-27.2

Table 11: Results of the radiocarbon dating of BH3

### 5.2 Pollen by QUEST

- 5.2.1 Twelve sub-samples were extracted for an assessment of pollen content from BH1 (3 sub-samples), BH3 (7 sub-samples) and BH5 (2 sub-samples). The results are displayed in Table 12.
- 5.2.2 The four samples focussed on sediments identified as Folkestone Beds in BH3 and BH5 contain only *Pinus* (pine) pollen and pre-Quaternary spores. These identifications are therefore considered to confirm the identification of the Folkestone Bed deposits.
- 5.2.3 The samples assessed from the lower deposits of all three boreholes generally contained a poor to moderate concentration and preservation of pollen towards the base. Further up the sequence, the concentration was very high and in an excellent state of preservation. The samples were dominated by oak (*Quercus*) and grass (*Poaceae*) with elm (*Ulmus*), pine (*Pinus*), alder (*Alnus*), ash (*Fraxinus*) and beech (*Fagus*), sedges (*Cyperaceae*), dandelion (*Lactuceae*), buttercup (*Ranunculus* type), pondweed (*Potamogeton* type), ferns (*Polypodium vulgare* / *Filicales*) and

bracken (*Pteridium aquilinum*). This assemblage probably reflects the presence of plants growing in (e.g. pondweed) and on the edges of (e.g. grasses, sedges and buttercups) the moat, adjacent areas of grass/lawn and a limited number of trees dominated by oak with elm.

5.2.4 The pollen assessment has therefore contributed to the aims of the project by aiding interpretation of the lithostratigraphy and quantifying the concentration and preservation of part of the archaeobotanical assemblage. The assessment has indicated that the pollen is well preserved and abundant. Furthermore, the results of the assessment exceed the original project aims by providing a preliminary reconstruction of the former vegetation composition during the accumulation of the moat fill, and by indicating little variation in the pollen content between each borehole.

### **5.3 Diatoms by QUEST**

5.3.1 Five sub-samples from BH1 (2 sub-samples), BH3 (2 sub-samples) and BH5 (1 sub-sample) were extracted for the assessment of diatoms. The results are displayed in Table 13. The results of the assessment indicate that although remains were preserved in two samples from the top of BH1 and BH3; the preservation was very poor, with identifications not possible.

5.3.2 The diatom assessment has therefore quantified part of the archaeobotanical assemblage and has indicated that the moat fill deposits are unlikely to contain a sufficient concentration and preservation of diatoms to contribute useful information on the former hydrological conditions of the moat.

### **5.4 Macrofossils by QUEST**

5.4.1 Four small bulk samples from the moat fill from BH3 and one from BH1 were selected for macrofossil assessment (seeds, wood, charcoal, insects, mollusca, ostracoda, foraminifera). The results of the assessment are displayed in Table 14.

5.4.2 Waterlogged leaves were recorded in every sample, generally in very high quantities. Waterlogged seeds were also recorded in every sample, but in lower concentrations. Fragments of waterlogged wood and insects were recorded in low concentrations in most samples. Charcoal was recorded in one sample from the base of BH3, and ostracoda/foraminifera were recorded in the single sample from BH1. No mollusca, bone or charred seed/chaff remains were recorded.

5.4.3 The waterlogged seeds underwent a more detailed assessment. This revealed a few seeds of oak (*Quercus*), elder (elm) and hazel (*Corylus avellana*), as well as buttercup (*Ranunculus* sp.), campion/stitchwort (*Silene/Stellaria* sp.), dock/sorrel/knotgrass (*Rumex/Polygonum* sp.) and most likely, fat hen (*Chenopodium* sp.). Similar to the pollen assemblage, the waterlogged seeds recorded probably reflect the presence of plants growing in (e.g. pondweed) and on the edges of (e.g. buttercups) the moat, with a limited number of trees/shrubs including oak, hazel and elder.

5.4.4 The macrofossil assessment has therefore contributed to the aims of the

project by quantifying the concentration and preservation of part of the archaeobotanical and zooarchaeological assemblage. The assessment has indicated that the moat fill contains various types of macrofossil remains – some in greater concentrations and suitable for further investigation, than others. Furthermore, the results of the assessment exceed the original project aims by providing a preliminary reconstruction of the local vegetation composition during the accumulation of the moat fill.

**6.0 DISCUSSION** by Kristina Krawiec and QUEST

**6.1 The Moat**

- 6.1.1 The results of the evaluation confirmed the continuation of the moat which was demonstrated to be backfilled with 19<sup>th</sup> century deposits. The level of the water table prevented deeper excavation of these deposits and the lower fills of the moat were characterised by the borehole survey carried out by QUEST.
- 6.1.2 The moat most likely measures between 16 and 20m in width, spanning from at least BH1 (south) to somewhere between BH5 and BH4. The moat appears to be symmetrical in shape with its base around 91.45m OD towards the centre and its edge between 93.00m OD (BH5) and 93.55m OD (BH4).
- 6.1.3 The sediments infilling the base of the moat consisted of lenses of organic-rich silty clays with leaf and twig remains and sands, of a possibly calcareous nature. These deposits were generally thin, <20cm in BH1, BH2 and BH5, with the greatest thickness recorded in BH3 (0.62m). The sediments that cap the moat fill (termed 'made ground') are highly variable, including horizons of stiff grey clay with concrete, brick/tile and chalk rubble, and sandy gravels. These sediments and the nature of their deposition are highly likely to have impacted upon (i.e. compacted and truncated) the presence and thickness of the original moat deposits.
- 6.1.4 These original fills are a consequence of the natural silting up of the moat over time. The lenses of sandy material are likely to represent either colluvial material washed into moat as a consequence of erosion, or building debris discarded into the moat that has subsequently disintegrated. The fine-grained organic-rich sediments, including the twigs and leaves, have settled out in the still water of the moat. They most likely derived from a nearby source, such as material landing on the surface of water in the moat from surrounding vegetation, or fine grained material washed into the moat. In contrast the later made ground deposits represent the deliberate infilling of the moat to raise it to the current level, above the water table
- 6.1.5 Leaf litter from the top of the thickest sequence of moat infill in BH3 returned a radiocarbon date of 1670 cal AD to post-1950 cal AD (BETA 344381, 280-10 cal BP). This date may be equated with deposition sometime during the late medieval/early post-medieval to modern period. It is highlighted however, that this is a minimum age for the moat, since not only does this not represent the very lowest moat fill deposits in BH3 (which did not contain suitable material for radiocarbon dating), but also because it is likely that maintenance activities such as drainage/dredging were carried out that might have removed earlier moat fills.
- 6.1.6 The archaeobotanical assemblage recovered from the moat fills consisted of moderate to high concentrations of pollen and leaves. Waterlogged seeds and waterlogged wood were common in low concentrations. Diatoms were also sporadically present in low concentrations and in a poor state of preservation. Charcoal was only recorded in one sample. The zooarchaeological assemblage was more limited, with only insect fragments

recorded in the majority of samples. Foraminifera/ostracoda were only recorded in one sample in low numbers and mollusca were absent.

## **6.2 19<sup>TH</sup> Century Activity**

6.2.1 In addition to the moat deposits the remainder of the site was characterised by a series of thick landscaping deposits possibly contemporary with the backfilling of the moat. Trench 1 was located along a slope which demonstrated the natural geology was overlain by up to 2.00m of sandy clay and topsoil.

6.2.2 Trench 2 also encountered deep deposits overlying the natural geology at the southern end of the trench. These were overlain by the foundations of Moat House, a 19<sup>th</sup> century building which appears on the 1<sup>st</sup> edition OS mapping. The trench recorded not only the foundations but also the overlying demolition deposits associated with the clearance of the building. The foundations were constructed using local green sandstone (Reigate Stone) bonded with lime mortar. The demolition rubble indicated the main body of the house was built in red brick which was frogged but unstamped.

6.2.3 The foundations of the building were constructed on a layer of sterile clay presumably imported to the site to stabilise the soft sandy ground. The natural geology exposed in the northern end of the trench was a fine grained mottled grey sand which when compared with the deposits recovered in the boreholes, demonstrates the variation in natural across the site.

## **6.3 Conclusions**

6.3.1 The evaluation carried out at the site of the former Red Cross Hall, Reigate Castle has demonstrated the survival of 19<sup>th</sup> century remains at the site. The main feature recorded were the foundations of a late 19<sup>th</sup> century house, alternately referred to as Castlebank and Moat House in the cartographic evidence. The backfilling of the moat may be contemporary with the construction of this house as part of the development of the site.

6.3.2 The geoarchaeological assessment has addressed the specific research aims in providing a profile of the moat and its likely extent. The Moat fills have also been characterised and have been demonstrated to be a generally thin sequence of original deposits accumulating 'naturally' prior to backfilling in the 19<sup>th</sup> century. The assessment has provided a provisional chronology for the moat fill and demonstrated a sufficient concentration and preservation of certain archaeobotanical and possibly zooarchaeological remains to provide further information on the environmental conditions within and adjacent to the moat at this time. However, this additional information is anticipated to be limited. It is likely that the lack of deeply stratified original fills may be due to periodic clearing of the moat to keep it clear of obstructions. Certainly nothing survives suggesting any medieval waste dumping was occurring.

6.3.3 The investigations at the site have demonstrated that a significant amount of landscaping has occurred and this has led to thick deposits of made ground being used to raise the ground level. The lack of any residual

medieval remains suggests this area was not intensively occupied but there exists the potential for remains to survive below the 19<sup>th</sup> century house deposits. In this the evaluation has helped to characterise the extent and nature of the deposits both within and outside the moat.

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**ACKNOWLEDGEMENTS**

The co-operation and assistance of Paul Roberts and Jane Corcoran of English Heritage and is greatly acknowledged.



**SMR Summary Form**

Site Code	RCS12					
Identification Name and Address	Former Red Cross Building, Reigate Castle, Reigate					
County, District &/or Borough	Reigate and Banstead Borough Council					
OS Grid Refs.	TQ 2533 5047					
Geology	Folkestone Beds					
Arch. South-East Project Number	5587					
Type of Fieldwork	<b>Eval.</b>	Excav.	Watching Brief	Standing Structure	Survey	Other
Type of Site	Green Field	Shallow Urban	<b>Deep Urban</b>	Other		
Dates of Fieldwork	<b>Eval.</b> Feb 2013	Excav.	WB.	Other		
Sponsor/Client						
Project Manager	Andy Leonard					
Project Supervisor	Kristina Krawiec					
Period Summary	Palaeo.	Meso.	Neo.	BA	IA	RB
	AS	MED	<b>PM</b>	Other Modern		
<p>100 Word Summary.</p> <p><i>An archaeological evaluation and borehole survey undertaken in advance of development revealed deposits dating mainly to the 19<sup>th</sup> century. The moat was found to contain shallow original deposits which were sealed by 19<sup>th</sup> century backfill. The original silting layers contained pollen and plant macrofossil remains indicating species growing in and around the edges of the moat prior to backfilling. The site was overlain by up to 2m of sandy clay as part of a phase of landscaping. The foundations of Moat House were also recorded built over these landscaping deposits which were again dated to the 19<sup>th</sup> century.</i></p>						

**OASIS ID: archaeol6-147363**

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**Project details**

Project name	Former Red Cross Building, Reigate Castle
Short description of the project	An archaeological evaluation and borehole survey undertaken in advance of development revealed deposits dating mainly to the 19th century. The moat was found to contain shallow original deposits which were sealed by 19th century backfill. The original silting layers contained pollen and plant macrofossil remains indicating species growing in and around the edges of the moat prior to backfilling. The site was overlain by up to 2m of sandy clay as part of a phase of landscaping. The foundations of Moat House were also recorded built over these landscaping deposits which were again dated to the 19th century.
Project dates	Start: 18-02-2013 End: 20-02-2013
Previous/future work	Not known / Not known
Any associated project reference codes	RCS12 - Sitecode
Type of project	Field evaluation
Site status	Scheduled Monument (SM)
Current Land use	Other 15 - Other
Monument type	MOAT Medieval
Monument type	BUILDING Post Medieval
Methods & techniques	"Augering", "Sample Trenches"
Development type	Small-scale (e.g. single house, etc.)
Development type	Block of flats
Prompt	Scheduled Monument Consent
Position in the planning process	Not known / Not recorded

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**Project location**

Country	England
Site location	SURREY REIGATE AND BANSTEAD REIGATE Former Red Cross, Reigate Castle
Site coordinates	TQ 2533 5047 51 0 51 14 20 N 000 12 15 W Point
Height OD / Depth	Min: 92.00m Max: 93.00m

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### Project creators

Name of Organisation	Archaeology South-East
Project brief originator	English Heritage
Project design originator	Archaeology South-East
Project director/manager	Andy Leonard
Project supervisor	Kristina Krawiec
Type of sponsor/funding body	County Council
Name of sponsor/funding body	Reigate and Banstead Borough Council

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### Project archives

Physical Archive Exists?	No
Digital Contents	"none"
Digital Media available	"Images raster / digital photography","Survey","Text"
Paper Contents	"none"
Paper Media available	"Context sheet","Drawing","Map","Photograph","Plan","Report","Section","Survey"

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### Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	An archaeological evaluation at the Former Red Cross, Reigate Castle, Reigate
Author(s)/Editor(s)	Krawiec, K
Other bibliographic details	2013084
Date	2013
Issuer or publisher	Archaeology South-East

Place of issue or publication    Portslade

Description                    A4 spiral bound report in Arial font 11

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Entered by                    kristina krawiec (K.Krawiec@ucl.ac.uk )

Entered on                    4 April 2013

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**APPENDIX 1: TABLES**

Table 6: Lithostratigraphic description of BH1

Depth (m OD)	Depth (m BGS)	Description	Interpretation
94.72 to 93.78	0 to 0.94	10YR 3/2 to 10YR 4/2; Ag2, Ga1, As1; Dark greyish brown to greyish brown sandy, clayey silt with inclusions of concrete, sandstone, gravel and modern rooting; diffuse contact into:	Made Ground
93.78 to 93.56	0.94 to 1.16	10YR 5/3; As2, Ag1, Ga1; Brown silty sandy clay with concrete, sandstone and brick/tile fragments; sharp contact into:	Made Ground
93.56 to 93.45	1.16 to 1.27	10YR 7/1; Chalk rubble; Light grey chalk rubble; sharp contact into:	Made Ground
93.45 to 93.01	1.27 to 1.71	10YR 6/2; As4; Light brownish grey stiff clay, with very infrequent inclusions of brick/tile fragments, chalk rubble; sharp & uneven contact into:	Made Ground
93.01 to 92.92	1.71 to 1.80	10YR 3/2 with some 10YR 2/1; As3, Sh1; Very dark grey with occasional black organic-rich clay and twigs; sharp contact into:	Moat Fill
92.92 to 92.86	1.80 to 1.86	10YR 3/2 with some 10YR 2/1; As3, Sh1; Very dark grey with occasional black organic-rich clay and twigs WITH lenses of 10YR 7/1; Ga3, Ag1; Light grey calcareous silty sand; unknown contact into:	Moat Fill
92.86 to 92.72	1.86 to 2.00	10YR 5/2; Ga3, Ag1; Greyish brown calcareous silty sand with leaves and twigs; little sample retained; sharp contact into:	Moat Fill
92.72 to 90.72	2.00 to 4.00	10YR 4/1 to 10YR 5/3; Ga2, Ag2; Mottled dark grey stiff variable silty sand to sandy silt with clay, and inclusions of sandstone	Folkestone Beds

Table 7: Lithostratigraphic description of BH2

Depth (m OD)	Depth (m BGS)	Description	Interpretation
94.30 to 94.12	0 to 0.18	Tarmac	Made Ground
94.12 to 93.81	0.18 to 0.49	10YR 5/3; Ga2, Gg1, Ag1; Mottled brown silty gravelly sand; sharp contact into:	Made Ground
93.81 to 93.45	0.49 to 0.85	10YR 5/2 to 10YR 4/2; Gg4; Greyish brown to dark greyish brown gravel with clay, silt, sand, chalk rubble and brick/tile fragment inclusions; sharp contact into:	Made Ground
93.45 to 92.50	0.85 to 1.80	10YR 5/1; As4; Grey clay with very infrequent inclusions of detrital plant remains, gravel and sandstone from 1.00 to 1.80m BGS; sharp contact into:	Made Ground
92.50 to 92.30	1.80 to 2.00	10YR 5/4; As3, Ag1; Yellowish brown silty clay with sand, gravel, sandstone and silt inclusions; diffuse contact into:	Made Ground
92.30 to 91.64	2.00 to 2.66	10YR 5/4 with some 10YR 3/1 mottling; As4; Yellowish brown clay with sandstone inclusions	Made Ground
91.64 to 91.60	2.66 to 2.70	10YR 3/1; As4; Very dark grey clay with traces of organic material and brick/tile fragments; sharp contact into:	Made Ground
91.60 to 91.50	2.70 to 2.80	10YR 5/4 Ga3, As1; Yellowish brown silty sand; sharp contact into:	Made Ground
91.50 to 91.45	2.80 to 2.85	10YR 3/1 to 10YR 2/1; As3, Sh1; Very dark grey to black organic-rich clay with leaves and twigs; diffuse contact into:	Moat Fill
91.45 to 91.30	2.85 to 3.00	10YR 5/1; As2, Ag2; Grey silty clay; diffuse contact into:	Folkestone Beds
91.30 to 90.30	3.00 to 4.00	10YR 4/1 to 10YR 3/1; Ag2, As1, Ga1; Stiff dark grey to very dark grey silty sandy clay with	Folkestone Beds

**Archaeology South-East**  
Former Red Cross Building, Reigate

		sandstone inclusions
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Table 8: Lithostratigraphic description of BH3

Depth (m OD)	Depth (m BGS)	Description	Interpretation
94.39 to 94.24	0 to 0.15	Tarmac	Made Ground
94.24 to 93.94	0.15 to 0.45	10YR 5/4; Ga2, Gg2; Mottled yellowish brown sandy gravel with silt and clay inclusions; sharp contact into:	Made Ground
93.94 to 93.87	0.45 to 0.52	10YR 5/2 to 10YR 4/2; Ga4; Greyish brown to dark greyish brown sand with inclusions of gravel, silt, clay and brick/tile fragments; diffuse contact into:	Made Ground
93.87 to 93.15	0.52 to 1.24	10YR 5/2 to 10YR 5/4; Ga4; Dark greyish brown to yellowish brown sand with silt, clay and gravel inclusions; diffuse contact into:	Made Ground
93.15 to 93.03	1.24 to 1.36	10YR 5/1; As4; Grey clay with inclusions of charcoal, chalk rubble, wood and brick/tile fragments; diffuse contact into:	Made Ground
93.03 to 92.83	1.36 to 1.56	10YR 5/1 to 10YR 5/6; As4; Grey clay with inclusions of charcoal, chalk rubble, wood and brick/tile fragments; diffuse contact into:	Made Ground
92.83 to 92.70	1.56 to 1.69	10YR 5/1; As4; Grey clay with inclusions of charcoal, chalk rubble, wood, brick/tile and large gravel fragments; diffuse contact into:	Made Ground
92.70 to 92.21	1.69 to 2.18	10YR 5/2; Ga2, Gg1, As1; Dark greyish brown gravelly clayey sand with clay pockets and chalk rubble; sharp contact into:	Made Ground
92.21 to 92.13	2.18 to 2.26	10YR 2/1; As2, Sh2; Black organic-rich clay with twigs, leaves, waterlogged wood and sand lenses; sharp contact into:	Moat Fill
92.13 to 92.03	2.26 to 2.36	10YR 2/1; As2, Sh2; Black organic-rich clay with twigs, leaves, waterlogged wood AND 10YR 5/2; Ga4; Yellowish brown sand lenses; sharp contact into:	Moat Fill
92.03 to 91.86	2.36 to 2.53	10YR 5/2; Ga4; Yellowish brown sand; sharp contact into:	Moat Fill
91.86 to 91.83	2.53 to 2.56	10YR 4/2; Ga3, Sh1; Greyish brown organic-rich sand; sharp contact into:	Moat Fill
91.83 to 91.79	2.56 to 2.60	10YR 5/1; As3, Ga1; Grey sandy clay; sharp contact into:	Moat Fill
91.79 to 91.74	2.60 to 2.65	10YR 4/2; Ga3, Sh1; Greyish brown organic-rich sand; sharp contact into:	Moat Fill
91.74 to 91.49	2.65 to 2.80	10YR 5/1 to 10YR 3/1; Ga2, Sh1, As1; Grey to very dark grey lenses of sand, organic-rich sand and clay; sharp contact into:	Moat Fill
91.49 to 90.39	2.80 to 4.00	10YR 4/1 to 10YR 3/1; Ag2, As1, Ga1; Stiff dark grey to very dark grey silty sandy clay with sandstone inclusions	Folkestone Beds

Table 9: Lithostratigraphic description of BH4

Depth (m OD)	Depth (m BGS)	Description	Interpretation
94.45 to 94.05	0 to 0.40	Top soil; diffuse contact into:	Made Ground
94.05 to 93.95	0.40 to 0.50	10YR 4/3; Ga3, Ag1; Brown silty sand with gravel and modern root inclusions; sharp contact into:	Made Ground
93.95 to 93.55	0.50 to 1.00	10YR 5/3 to 10YR 6/8; Ga4; Brown to brownish yellow massive sand with sandstone inclusions between 0.50 and 0.80m BGS; diffuse contact into:	Folkestone Beds
93.55 to 92.67	1.00 to 1.78	10YR 5/3 becoming 10YR 4/3 to 10YR 4/1; Ga4; Brown massive sand; diffuse contact into:	Folkestone Beds
92.67 to 92.45	1.78 to 2.00	10YR 5/3 to 10YR 6/8; Ga4; Brown to brownish yellow massive sand; diffuse contact into:	Folkestone Beds
92.45 to 92.15	2.00 to 2.30	10YR 5/3 to 10YR 6/6; Ga3, As1; Brown to brownish yellow silty sand with traces of red sandstone; sharp contact into:	Folkestone Beds
92.15 to 91.15	2.30 to 3.30	10YR 7/1; Ag3, As1; Light grey stiff silty clay.	Folkestone Beds
91.15 to 90.45	3.30 to 4.00	10YR 4/1 to 10YR 3/1; Ag2, As1, Ga1; Stiff dark grey to very dark grey silty sandy clay with sandstone inclusions	Folkestone Beds

Table 10: Lithostratigraphic description of BH5

Depth (m OD)	Depth (m BGS)	Description	Interpretation
94.39 to 94.19	0 to 0.20	Void	Made Ground
94.19 to 94.12	0.20 to 0.27	Concrete	Made Ground
94.12 to 93.95	0.27 to 0.44	10YR 6/8; Ga4; Yellowish brown sand; sharp contact into:	Made Ground
93.95 to 93.83	0.44 to 0.56	10YR 4/1; Ag2, As2; Dark grey silty clay with sand and gravel; sharp contact into:	Made Ground
93.83 to 93.53	0.56 to 0.83	10YR 5/1; As4; Stiff grey clay with very infrequent inclusions of brick/tile fragments, roots and detrital plant material; unknown contact into:	Made Ground
93.53 to 93.10	0.83 to 1.29	10YR 4/1; Ag2, Ga1, As1; Dark grey clayey sandy silt with sandstone inclusions; sharp contact into:	Made Ground
93.10 to 93.00	1.29 to 1.39	10YR 4/1; Ga2, Ag1, As1; Dark grey Dark grey clayey silty sand with organic-rich inclusions; sharp contact into:	Moat Fill
93.00 to 91.39	1.39 to 3.00	10YR 5/1 to 10YR 5/6; Ag2, As2; Grey to yellowish brown silty clay with sandstone inclusions.	Folkestone Beds



Table12: Results of the pollen assessment

	Borehole number	BH1			BH3							BH5	
	Depth (m BGS)	1.71 to 1.80	1.80 to 1.86	1.86 to 2.00	2.18 to 2.26	2.26 to 2.36	2.56 to 2.60	2.60 to 2.85	2.80 to 3.00	3.30 to 3.35	4.70 to 4.75	1.29 to 1.39	1.70 to 1.80
	Depth (m OD)	93.01 to 92.92	92.92 to 92.86	92.86 to 90.72	92.21 to 92.13	92.13 to 92.03	91.83 to 91.79	91.49 to 91.49	91.49 to 91.39	91.09 to 91.04	89.69 to 89.64	93.10 to 93.00	92.69 to 92.59
	Stratigraphy type	Moat Fill	Moat Fill	Moat Fill	Moat Fill	Moat Fill	Moat Fill	Moat Fill	Folkestone Beds	Folkestone Beds	Folkestone Beds	Moat Fill	Folkestone Beds
Latin name	Common name												
<b>Trees</b>													
<i>Alnus</i>	alder		1		2							1	
<i>Quercus</i>	oak	20	21	2	29	25							
<i>Ulmus</i>	elm	4	1		3								
<i>Tilia</i>	lime							1				1	
<i>Pinus</i>	pine	3		1	1				23	23			
<i>Fraxinus</i>	ash	2											
<i>Fagus</i>	beech				1								
<b>Shrubs</b>													
<i>Calluna vulgaris</i>	heather			2			3	2					
<i>Corylus</i> type	e.g. hazel							4					
<b>Herbs</b>													
Poaceae	grass family	9	17	1	3	11	1	2			1	1	
Cyperaceae	sedge family		1				1	1				1	
Lactuceae	dandelion family	1	1				1	6				1	
<i>Ranunculus</i> type	e.g. buttercup				1								
<b>Aquatics</b>													
<i>Potamogeton</i> type	pondweed		1		1	2							
<b>Spores</b>													
<i>Filicales</i>	fern	1	1		1								
<i>Pteridium aquilinum</i>	bracken				1			1					
<i>Polypodium vulgare</i>	polypody						1						

Pre Quaternary									Present	Present	Present		
<b>Unknown</b>			2										
<b>Unidentifiable</b>			1	1				5					
<b>Total Land Pollen (grains counted)</b>	39	44	10	40	36	6	16	24	23			4	
<b>Concentration*</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Preservation**</b>	<b>5</b>	<b>4</b>	<b>2-3</b>	<b>4-5</b>	<b>5</b>	<b>4</b>	<b>2-3</b>	<b>1-2</b>	<b>1-2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>Microcharcoal Concentration***</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1-2</b>	<b>0</b>	<b>0</b>	<b>0</b>

Key:

\*Concentration: 0 = 0 grains; 1 = 1-75 grains, 2 = 76-150 grains, 3 = 151-225 grains, 4 = 226-300, 5 = 300+ grains per slide

\*\*Preservation: 0 = none, 1 = very poor, 2 = poor, 3 = moderate, 4 = good, 5 = excellent

\*\*\*Microcharcoal Concentration: 0 = none, 1 = negligible, 2 = occasional, 3 = moderate, 4 = frequent, 5 = abundant

Table 13: Results of the diatom assessment

Depth (m BGS)	Depth (m OD)	Stratigraphic unit	Diatom Concentration (0 none to 5 high)	Quality of Preservation (0 none to 5 high)	Diversity
<i>BH1</i>					
1.71 to 1.80	93.01 to 92.92	Moat Fill	2-3	1-2	Low-moderate
1.86 to 2.00	92.86 to 92.72	Moat Fill	0	0	-
<i>BH3</i>					
2.18 to 2.26	92.21 to 92.13	Moat Fill	1	1	Very low
2.56 to 2.60	91.83 to 91.79	Moat Fill	0	0	-
<i>BH5</i>					
1.29 to 1.39	93.10 to 93.00	Moat Fill	0	0	-

Table 14: Results of the macrofossil assessment of samples from BH3

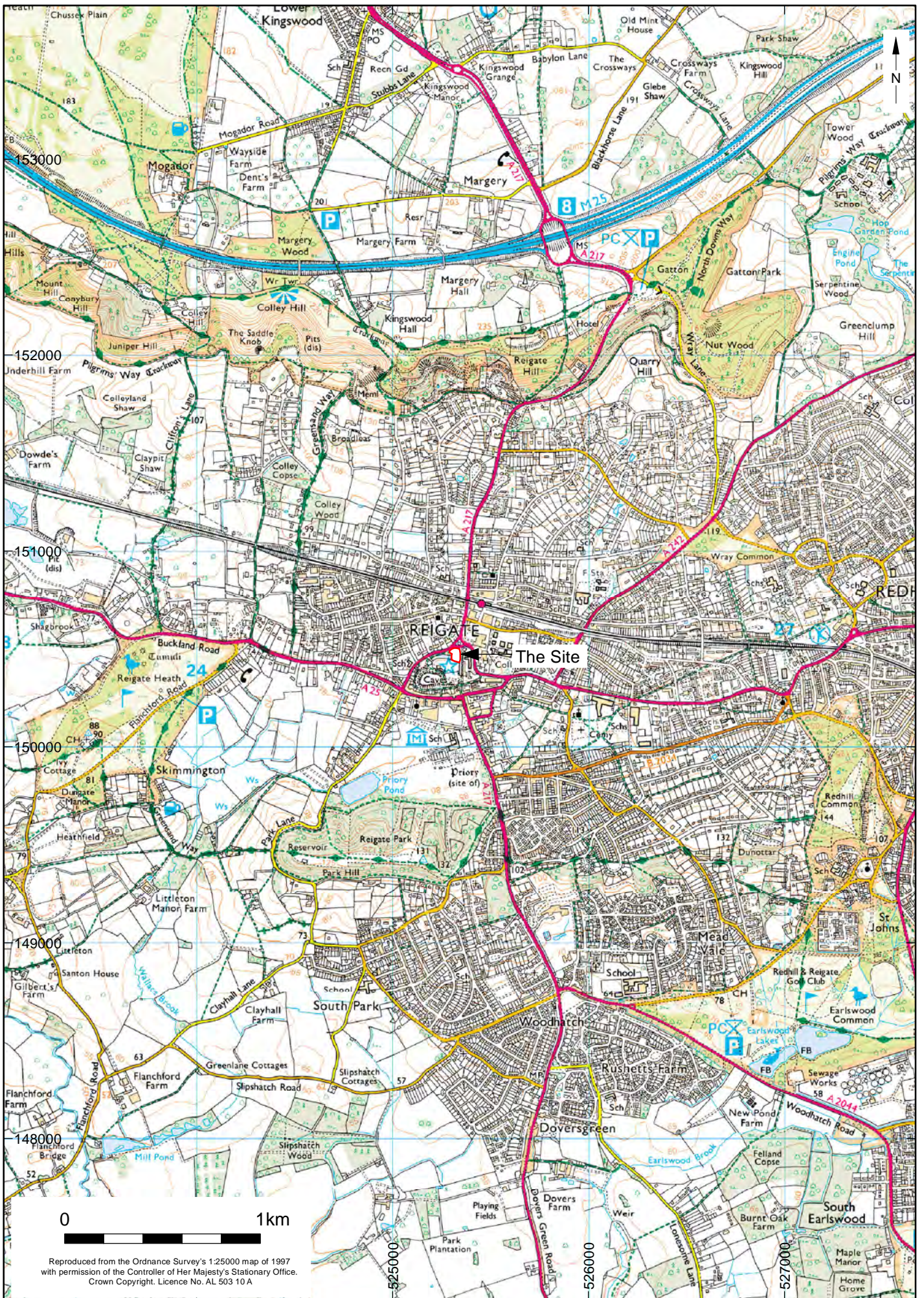
Depth (m BGS)	Depth (m OD)	Stratigraphy type	Fraction (e.g. flot, residue, >300µm)	Charred					Waterlogged			Mollusca		Bone			Insects	Ostracoda/Foraminifera	
				Charcoal (>4mm)	Charcoal (2-4mm)	Charcoal (<2mm)	Seeds	Chaff	Wood	Seeds	Leaves	Whole	Fragments	Large	Small	Fragments			
<b>BH1</b>																			
1.71 to 1.80	93.01 to 92.92	Moat Fill	>1mm	-	-	-	-	-	2	1	5	-	-	-	-	-	-	-	
			>300µm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
			>125µm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
<b>BH3</b>																			
2.18 to 2.26	92.21 to 92.13	Moat Fill	>1mm	-	-	-	-	-	2	1	5	-	-	-	-	-	-	-	
			>300µm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
2.26 to 2.36	92.13 to 92.03	Moat Fill	>1mm	-	-	-	-	-	1	1	5	-	-	-	-	-	-	-	
			>300µm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
2.56 to 2.60	91.83 to 91.79	Moat Fill	>1mm	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
			>300µm	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	
2.60 to 2.85	91.74 to 91.49	Moat Fill	>1mm	1	1	-	-	-	-	1	1	-	-	-	-	-	-	-	
			>300µm	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-

Key: 0 = Estimated Minimum Number of Specimens (MNS) = 0; 1 = 1 to 25; 2 = 26 to 50; 3 = 51 to 75; 4 = 76 to 100; 5 = 101+

Table 15: Results of the waterlogged plant macrofossil (seeds)

Depth (m BGS)	Depth (m OD)	Stratigraphy type	Waterlogged seeds		
			Latin name	Common name	Number
<i>BH1</i>					
1.71 to 1.80	93.01 to 92.92	Moat Fill	<i>Potamogeton</i> sp. <i>Ranunculus</i> cf. <i>repens</i>	pondweed cf. creeping buttercup	6 1
<i>BH3</i>					
2.18 to 2.26	92.21 to 92.13	Moat Fill	<i>Sambucus nigra/racemosa</i> <i>Corylus avellana</i> nut shell <i>Quercus</i> sp. opercula	elder hazel oak	2 1 1
2.26 to 2.36	92.13 to 92.03	Moat Fill	<i>Potamogeton</i> sp.	pondweed	2
2.56 to 2.60	91.83 to 91.79	Moat Fill	<i>Chenopodium</i> sp. <i>Silene/Stellaria</i> sp.	e.g. fat hen campion/stitchwort	3 1
2.60 to 2.85	91.74 to 91.49	Moat Fill	<i>Rumex/Polygonum</i> sp.	dock/sorrel/knotweed	1





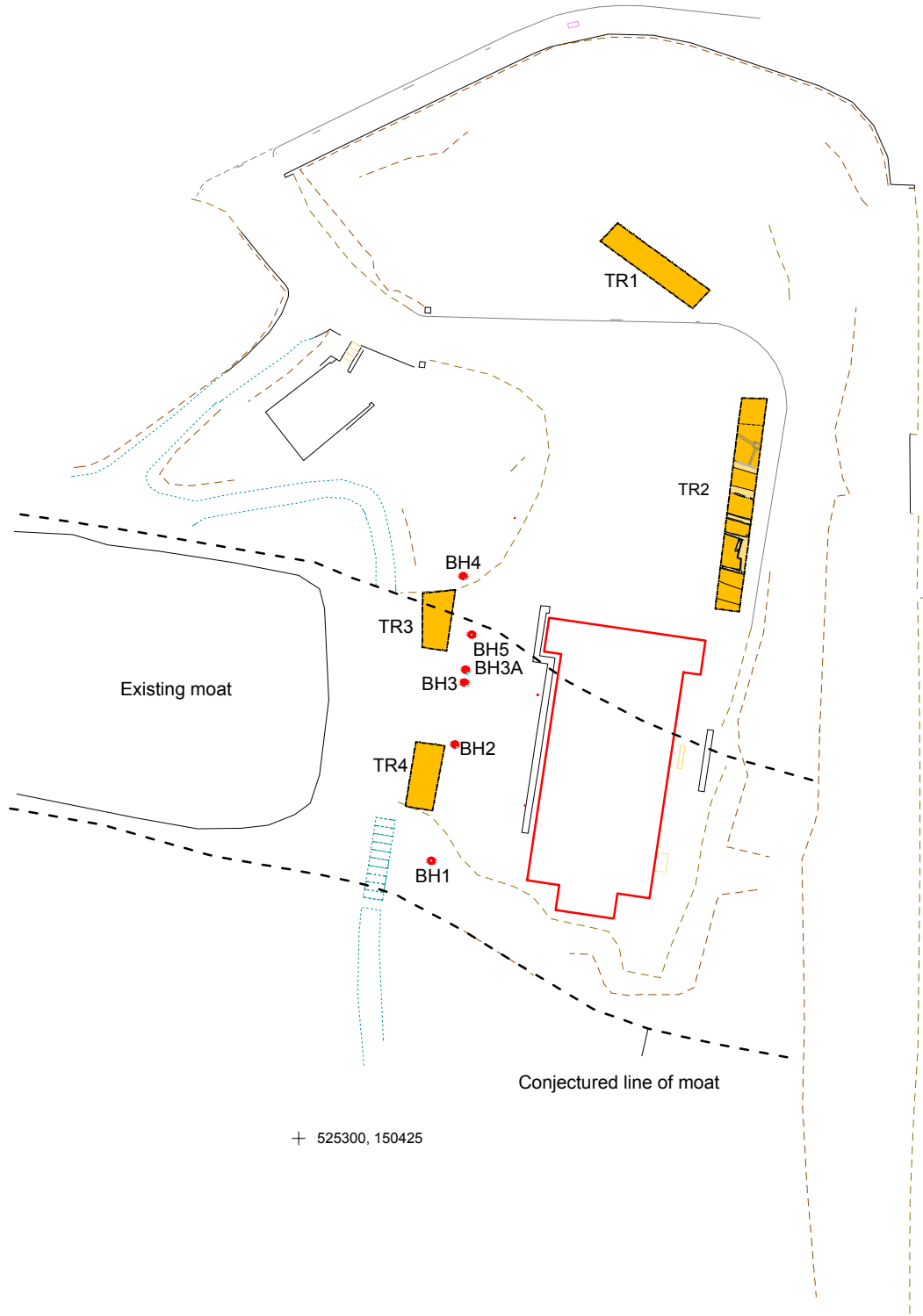
© Archaeology South-East		Red Cross Site, Reigate	
Project Ref: 5587	March 2013	Site location	
Report Ref:	Drawn by: JLR/AR	Fig. 1	



+ 525300, 150525



+ 525350, 150500



Existing moat

Conjectured line of moat

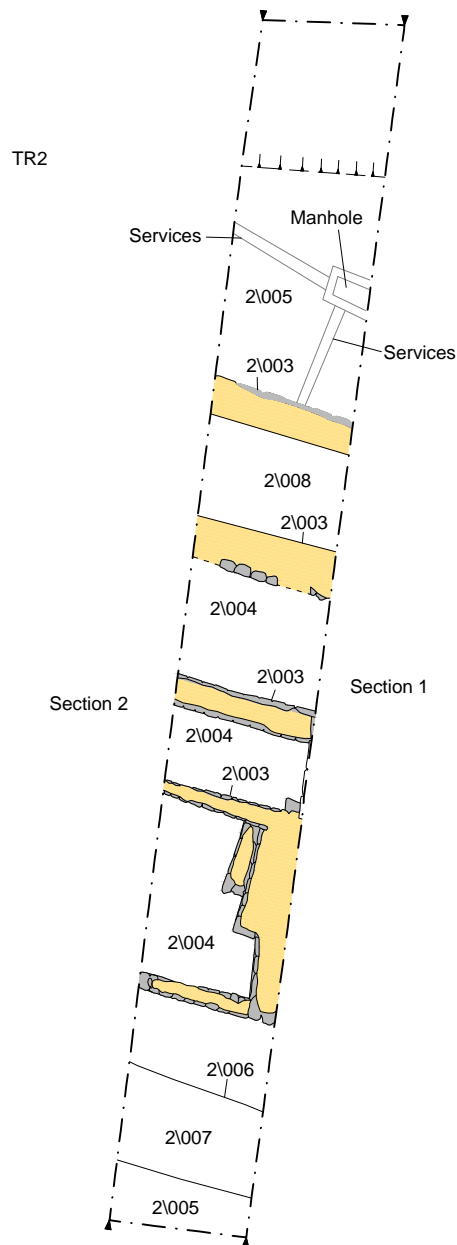
+ 525300, 150425



© Archaeology South-East		Red Cross Site, Reigate	Fig. 2
Project Ref: 5587	March 2013	Trench location	
Report Ref:	Drawn by: AR		



+ 525340, 150480



+ 525340, 150470



- Stone
- Mortar

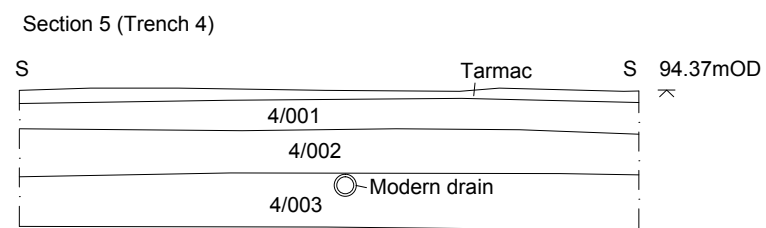
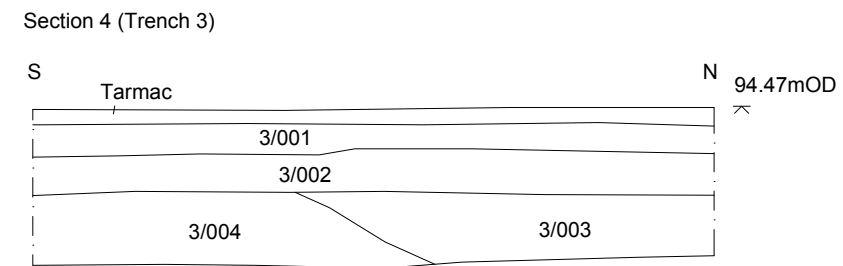
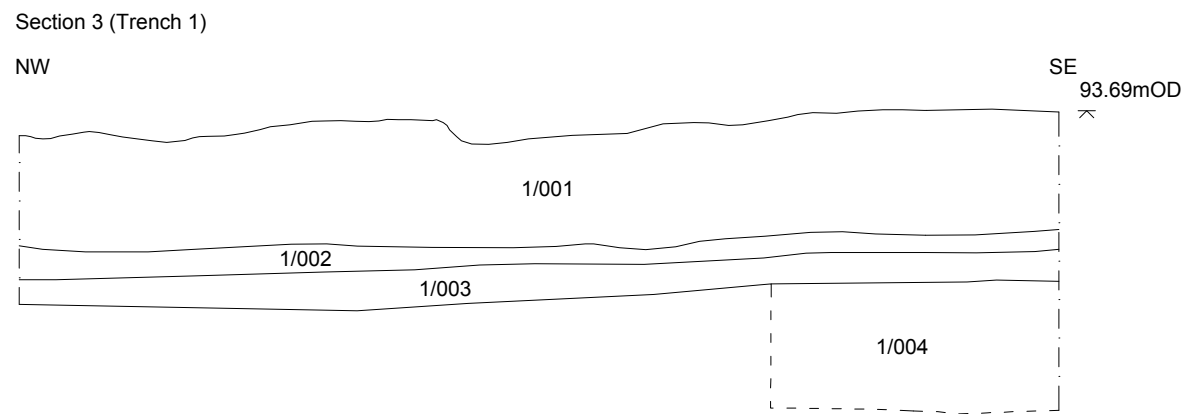
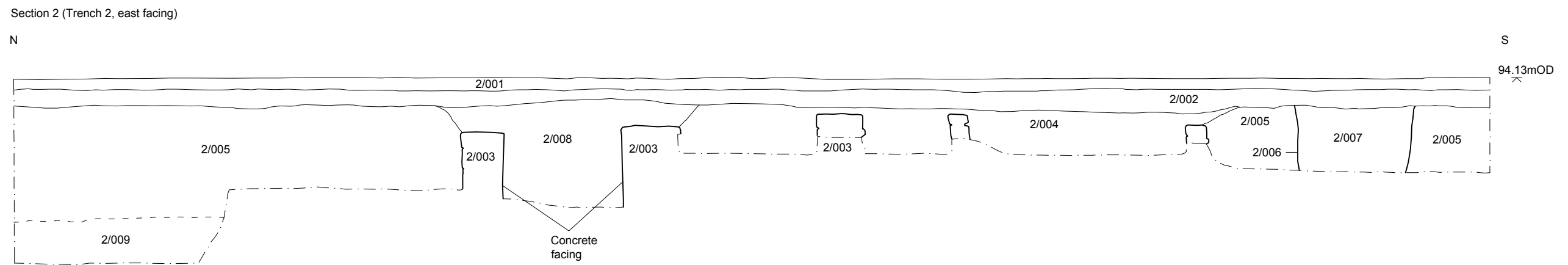
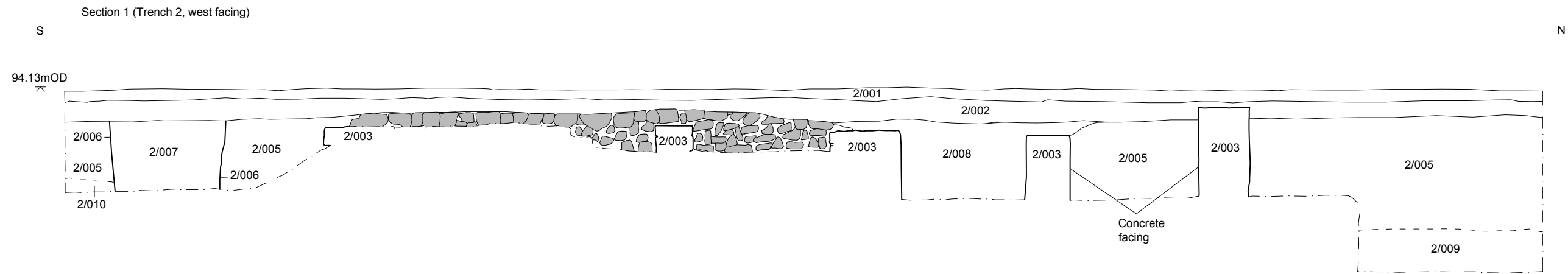


Trench 1, looking south



Trench 1, north east end section

i Archaeology South-East		Red Cross Site, Reigate	Fig. 3
Project Ref: 5587	March 2013	Trench 1, plan and Photographs	
Report Ref:	Drawn by: AR		



■ Sandstone



Trench 1, looking north-east

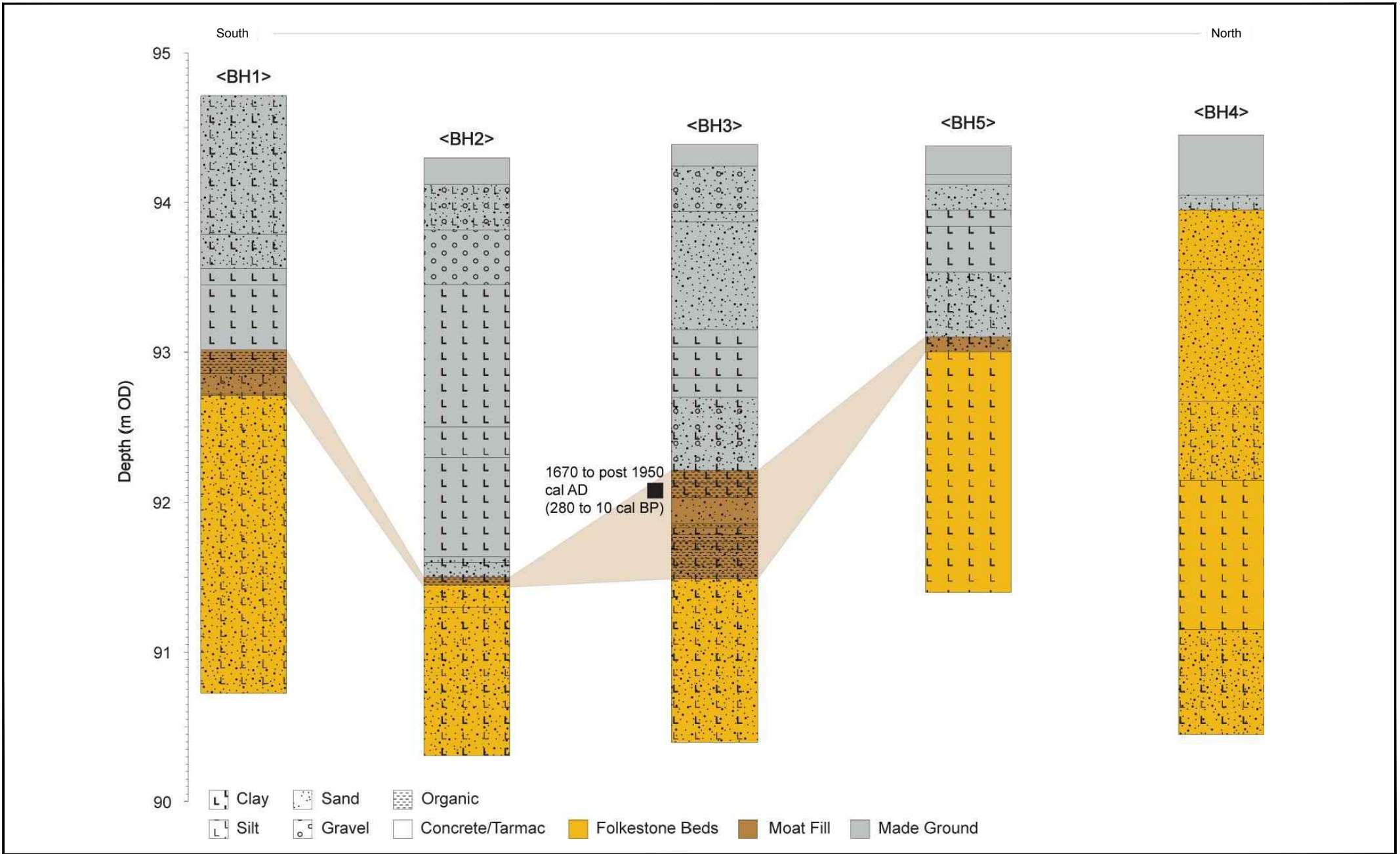


Trench 3, looking west



Trench 4, looking east





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Project Ref: 5587	April 2013	Lithostratigraphy of boreholes BH1 to BH5	
Report Ref:	Drawn by: AR		

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