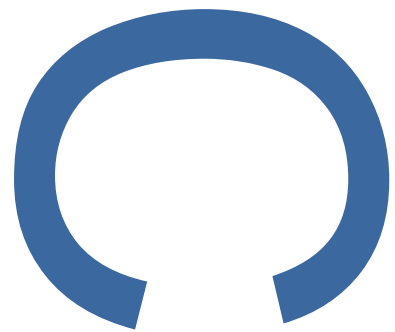


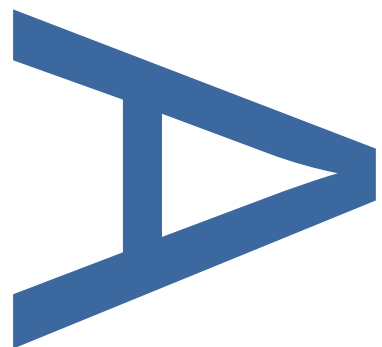
**WOOLWICH POLYTECHNIC  
SCHOOL FOR GIRLS, HUTCHINS  
ROAD, THAMESMEAD, SE28  
AN ARCHAEOLOGICAL WATCHING  
BRIEF ON GEOTECHNICAL WORKS**



**LOCAL PLANNING AUTHORITY:  
LONDON BOROUGH OF GREENWICH**



**SITE CODE: HCN18  
REPORT NUMBER: R13229**



**APRIL 2018**

**PRE-CONSTRUCT ARCHAEOLOGY**

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**WOOLWICH POLYTECHNIC SCHOOL FOR GIRLS, HUTCHINS ROAD,  
THAMESMEAD SE28: AN ARCHAEOLOGICAL WATCHING BRIEF ON  
GEOTECHNICAL WORKS**

**Site Code:** HCN18  
**Central NGR:** TQ 4625 8035  
  
**Local Planning Authority:** London Borough of Greenwich  
**Planning Reference:** 17/3907/F  
**Commissioning Client:** Kier Construction  
**Written/Researched by:** Chloe Sinclair  
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April 2018**

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## **1 ABSTRACT**

- 1.1 This report details the results of an archaeological watching brief on geotechnical investigations at Woolwich Polytechnic School for Girls. The work was undertaken by Pre-Construct Archaeology Limited, and was commissioned by Kier Construction.
- 1.2 The watching brief monitored the excavation of 12 test Pits and six geoarchaeological boreholes between 10<sup>th</sup> and 12<sup>th</sup> of April 2018.
- 1.3 All 12 test pits were excavated to 1 meter below ground level through modern made ground. Only one of these reached a natural layer of clay at 0.35m BGL which was present at various levels across the site. Boreholes revealed up to 1.80m of made ground which overlay the natural deposits. These consisted of natural river terrace gravels/sands, overlain by amorphous peat, greyish blue alluvium, and mottled yellowish brown alluvium. Variations of this sequence were present across the site.
- 1.4 A 0.10m cannon ball and two fired bullets were recovered from the made ground and represent remnants of the previous use of the site as a firing range.
- 1.5 No truncation was noted within the natural deposits which might indicate the survival of an intact peat horizon. No other archaeological structures or features were identified.

## **2 INTRODUCTION**

- 2.1 An archaeological watching brief was undertaken by Pre-Construct Archaeology Limited on land at Woolwich Polytechnic School for Girls, Hutchins Road, Thamesmead, SE28 (Figures 1 and 2). The work was carried out within the perimeters of the development area between 10<sup>th</sup> and 12<sup>th</sup> April 2018.
- 2.2 The watching brief followed the methodology set out within an approved Written Scheme of Investigation prepared by PCA (Pozorski, 2018). The works were intended to locate, define, record and date any surviving archaeological deposits, features or finds on the site.
- 2.3 The site was centred at National Grid Reference TQ 4625 8035 and lay within an Area of High Archaeological Potential as designated by the LPA. The area is designated as number 26 'Royal Arsenal East' and has a high potential for both prehistoric and post-medieval archaeological remains.
- 2.4 The watching brief was designed to refine the current understanding of the subject site in terms of deposit modelling and determine whether further mitigation measures are required.
- 2.5 The archaeological watching brief was monitored by Chloe Sinclair and was project managed by Amelia Fairman and Zbigniew Pozorski, both of Pre-Construct Archaeology Ltd.
- 2.6 The complete archive will be deposited with the LAARC under the unique site code HCN18.

### **3 PLANNING BACKGROUND**

#### **3.1 National Planning Policy Framework (NPPF)**

3.1.1 The National Planning Policy Framework (NPPF) was adopted on 27 March 2012, and now supersedes the Planning Policy Statements (PPSs). The NPPF constitutes guidance for local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications.

3.1.2 Chapter 12 of the NPPF concerns the conservation and enhancement of the historic environment, with the following statements being particularly relevant to the proposed development:

*128. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate Desk-Based Assessment and, where necessary, a field evaluation.*

*129. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.*

3.2 The London Plan

3.2.1 The London Plan, first published July 2011, updated March 2015, includes the following policy regarding the historic environment in central London, which should be implemented through the Local Development Framework (LDF) being compiled at the Borough level:

#### **POLICY 7.8 HERITAGE ASSETS AND ARCHAEOLOGY**

##### **Strategic**

*A London's heritage assets and historic environment, including listed buildings, registered historic parks and gardens and other natural and historic landscapes, conservation areas, World Heritage Sites, registered battlefields, scheduled monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.*

*B Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology.*

##### **Planning decisions**

*C Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.*

*D Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.*

*E New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.*

### **LDF preparation**

*F Boroughs should, in LDF policies, seek to maintain and enhance the contribution of built, landscaped and buried heritage to London's environmental quality, cultural identity and economy as part of managing London's ability to accommodate change and regeneration.*

*G Boroughs, in consultation with English heritage, natural England and other relevant statutory organisations, should include appropriate policies in their LDFs for identifying, protecting, enhancing and improving access to the historic environment and heritage assets and their settings where appropriate, and to archaeological assets, memorials and historic and natural landscape character within their area.*

### **3.3 Local Policy: Archaeology in the Royal Borough of Greenwich**

- 3.3.1 The relevant Development plan framework is provided by the Royal Greenwich Local Plan adopted July 2014. The Plan contains the following policies which provides a framework for the consideration of development proposals affecting archaeological and heritage features.

#### **DH3 Heritage Assets**

*The Royal Borough will protect and enhance the heritage assets and settings of Royal Greenwich, including the Maritime Greenwich World Heritage Site, preserving or enhancing the character or appearance of the 20 Conservation Areas, applying a presumption in favour of the preservation of statutory listed buildings and their settings, giving substantial weight to protecting and conserving locally listed buildings, protecting the three registered parks and gardens, as well as Royal Greenwich's archaeological remains and areas of special character.*

#### **DH(m) Archaeology**

*The Royal Borough will expect applicants to properly assess and plan for the impact of proposed developments on archaeological remains where they fall within 'Areas of High Archaeological Potential (AHAPs)' as shown on Figure 5. In certain instances preliminary archaeological site investigations may be required before proposals are considered.*

*The Royal Borough will seek to secure the cooperation of developers in the excavation, recording and publication of archaeological finds before development takes place by use of planning conditions/legal agreements as appropriate.*

*At identified sites of known archaeological remains of national importance, including scheduled monuments, there will be a presumption in favour of the physical preservation of the remains in situ and to allow for public access and display and to preserve their settings. For sites of lesser importance the Royal Borough will seek to preserve the remains in situ, but where this is not feasible the remains should either be investigated, excavated and removed from the site, or investigated, excavated and recorded before destruction. Appropriate conditions/legal agreements may be used to ensure this is satisfied.*

- 3.3.2 The site is located within an Archaeological Priority Zone as defined by the Royal Borough of Greenwich. There are no World Heritage Sites, Scheduled Ancient Monuments, Historic Battlefields or Historic Wreck designations located within the study site or within its immediate vicinity.

### **3.4 Archaeological Priority Areas (APAs)**

- 3.4.1 According to the London Borough of Greenwich Archaeological Priority Areas Appraisal, an Archaeological Priority Area (APA) is a "defined area where, according to existing information, there is significant known archaeological interest or particular potential for new discoveries."



They exist in every London borough, and were initially created in the 1970s and 1980s by local boroughs and museums. The APA guidelines for the Borough of Barking and Dagenham were updated in 2016, based on updated evidence held in the Greater London Historic Environment Record (GLHER). Relevant sections of this document are outlined below:

#### **EXPLANATION OF ARCHAEOLOGICAL PRIORITY AREAS**

*In the context of the National Planning Policy Framework (NPPF), archaeological interest means evidence of past human activity worthy of expert investigation. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places and of the people and cultures that made them. ...*

*APAs highlight where important archaeological interest might be located based on the history of the area and previous archaeological investigations. They help local planning authorities to manage archaeological remains that might be affected by development by providing an evidence base for Local Plans. This evidence base identifies areas of known heritage assets of historic and archaeological interest and wider zones where there is a likelihood that currently unidentified heritage assets will be discovered in the future. APAs act as a trigger for consultation with the borough's archaeological adviser and are justified by a description of significance which will inform development management advice and decision making. The appraisal can also indicate how archaeology might contribute towards a positive strategy for conserving and enjoying the local historic environment, for example through recognising local distinctiveness or securing social or cultural benefits.*

- 3.4.2 The Royal Arsenal East APA is located within the 1km GLHER search of the study sites. A summary for the reason of the designation and its significance is listed below:

#### **AREA 26 - ROYAL ARSENAL EAST**

##### **Character Description**

*Royal Arsenal East was the area now developed as the new juvenile detention centre west of Belmarsh Prison. The name of this site has been applied to this archaeological area representing as it does the extensive areas to the east of the historic core of the historic Arsenal.*

*Prehistoric artefacts have been recovered from the peat that lies across much of the area to indicate the way this marshland habitat was utilised. Archaeological work undertaken to the immediate west of Belmarsh Prison has produced evidence of two phases of wooden platform with the earliest dating to 3900BC which places it close to the beginning of peat formation at Thamesmead and the rapid changes in sea level that occurred at that time.*

*There is also limited evidence to indicate that the area or parts of it were utilised by people in the Iron Age and Roman period. Attempts to control flooding had varying success despite major breaches in the seventeenth century known as the 'Great Inundation'.*

*Following the 1850s and the creation of ever larger guns the Arsenal expanded further and further eastwards. The isolation of the land meant it could also be used for handling explosives and the whole was linked by a network of broad and narrow gauge railway.*

*The extensive ranges became Thamesmead in 1967 following the sale of the land to the Greater London Council with the current site representing the historic western core of the complex.*

*Two World War II pillboxes survive on the coast at Tripcock Point, but it is anticipated that other defensive elements possibly still remain within the Thamesmead area.*

##### **Potential Research**

- 1. Archaeological investigation of the buried topography of the area to produce an area wide deposit model.*
- 2. Archaeological investigation of the changing environment.*
- 3. Archaeological investigation of the prehistoric structures and artefacts associated with activity peculiar to this marshland environment.*
- 4. Archaeological investigation of the Royal Arsenal structures and artefacts associated with activity peculiar to the extended Royal Arsenal.*
- 5. Archaeological investigation of medieval and post-medieval flood defensive works.*

- 3.4.3 This report is submitted as part of a pre-planning requirement under application 17/3907/F.

## **4 GEOLOGY AND TOPOGRAPHY**

### **4.1 Geology**

- 4.1.1 British Geological Survey shows that a superficial (or drift) deposit of Alluvium lies below the modern layers of the study site. It is composed of clay, silt, peat, sand, and was formed up to 2 million years ago in the Quaternary Period in a local environment dominated by rivers. The rocks were formed from rivers depositing mainly sand and gravel detrital material in channels to form river terrace deposits, with fine silt and clay from overbank floods forming floodplain alluvium, and some bogs depositing peat (British Geological Survey BGS 2016).
- 4.1.2 The bedrock geology is comprised of sedimentary Thanet Formation – sand formed approximately 56 to 59 million years ago in the Palaeogene Period. These rocks were formed in shallow seas with mainly siliciclastic sediments (comprising of fragments or clasts of silicate minerals) deposited as mud, silt, sand and gravel (BGS 2016).
- 4.1.3 Historic borehole data is available from six locations within the site and its surroundings, two located along the eastern perimeter and a further one from the southern perimeter. Borehole TQ48SE98 immediately west of the site on the west side of the Central Way dual carriageway shows that peat was reached at -1.80m OD to a depth of -4.9m OD. Terrace gravels were reached at -5.70m OD (BGS 2017).
- 4.1.4 Two geotechnical investigations on the site in 2017 (Broughton & Revathy 2018) found between 0.80m and 1.60m thickness of made ground throughout the investigations. The made ground was thicker towards the south and south-west, indicating extensive ground raising in this area to consolidate the site. An alluvium was encountered in all but one of the investigations and it was between 1.50 and 3.20m thick. It overlay a layer of peat 2.10m – 3.70m thick. Below was a layer of lower alluvium being 1.10m – 1.70m thick. The Thanet Formation sand with gravel was present at -5.71 to -6.83m OD.

### **4.2 Topography**

- 4.2.1 The site is located c.685m (centre point) southwards of the River Thames and the north and east perimeters bounded by an artificial waterway which feeds into Birchmere Lake, located southeast of the site. The south west perimeter is bounded by residential development, with the southern perimeter bounded by a small wooded area. The western perimeter is bounded by Central Way (A2041), with further residential development located on the other side of the A road.

## **5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

### **5.1 Archaeological and Historical Background**

- 5.1.1 The following background is drawn from a detailed archaeological desk-based assessment prepared for the site by PCA (Bower & Perkins 2017). In summary:
- 5.1.2 The site lies within the Plumstead Marshes which was used as marginal farmland, possibly for seasonal grazing up until its redevelopment by the Royal Arsenal in the mid to late 19<sup>th</sup> century. Borehole evidence has shown that Mesolithic to Bronze Age peat and alluvial layers underlie the multiple phases of land reclamation build up layers that have been added to the area. It would seem that seasonal exploitation of a marsh resource by boat may have occurred but whose activities have not left any tangible trace on the landscape. Chance finds within natural silting and/or peat layers are the most likely outcome. The paucity of the finds in the area coupled with a lack of firm archaeological structures would suggest that the potential for Palaeolithic to Iron Age remains is low to moderate.
- 5.1.3 Roman finds are fairly numerous on the periphery of the Plumstead Marsh area further leading credence to the paleochannel/marshland environmental scenario for the area. The lack of the finds or discoveries from the study area would suggest that the potential for the Roman period is low.
- 5.1.4 The lack of the finds, structures or archaeological discoveries from the study area would suggest that the potential for early medieval or later medieval periods is low.
- 5.1.5 It is from the 16<sup>th</sup> to the mid 20<sup>th</sup> century that the Royal Arsenal expanded its operations into the Arsenal East site and took over the Plumstead Marshes as a firing range. It would appear that its associated earthworks, batteries, barracks and depots have, for the most part, been eradicated from the area through systematic demolition. However, the site has been subject to land reclamation and has seen the addition of make-up layers to form these sites which may have in turn, sealed the natural silting and peat layers below. This is a mixed blessing as its use as a firing range increases the chance of unexploded ordnance (UXO) having littered the site at some point. Although the study site itself managed to escape much of the later development it was located at the far end of a series of firing ranges. Dependent upon the quality of the clean-up operations required to redevelop the land, this would still suggest that the potential for post-medieval remains is moderate.
- 5.1.6 The part of the site was redeveloped to create a recreation and sports grounds, but it is unlikely that further impact was made much beyond the surface to create the fields.

## **6 ARCHAEOLOGICAL METHODOLOGY**

6.1.1 The Written Scheme of Investigation for the site (Pozorski, 2018) outlined the methodology for the archaeological watching brief.

### **6.2 Geo/archaeological investigation strategy**

6.2.1 The geo/archaeological investigations are designed to supplement previous deposit models which were prepared in advance as a first stage of investigation on the site. Upon its review by HE GLAAS and their assessment of the impact of the development on the site, further work may be required.

6.2.2 The geo/archaeological investigations should determine, as far as is reasonably possible, the location extent, date, character, condition, significance and quality of any surviving archaeological remains, and attention should be given to sites and remains of all periods. In addition to the excavation of human made deposits a record of any 'naturally deposited' levels will be made, especially when these are organically preserved and laid down within archaeological periods.

6.2.3 The requirement for additional technical data may be requested by HE GLAAS to complete the deposit model. Following any revisions to the deposit model mitigation in the form of evaluation trial trenching or test pits may be requested. The scope of these and locations will be determined in consultation with Mark Stevenson.

## 7 ARCHAEOLOGICAL RESULTS

### 7.1 Geoarchaeological Boreholes

#### 7.1.1 BH 201

Context Number	Description	Depth B.G.L.	Thickness
12	Modern Made Ground	0-0-1.70m	1.70m
13	Sandy Brown Clay	1.70m-2.20m	0.50m
14	Silty Blue Clay	2.20m-3.40m	1.20m
15	Silty Blue Clay	3.40m-4.50m	1.10m
16	Silty Peat	4.50m-9.30m	4.80m
17	Gravelly Sand	9.30m-NFE	NFE

7.1.2 BH1 was located at a level of 1.26m OD and was dug with a circumference of 0.35m to a depth of 9.30m below ground level. Gravelly Sand [17] was located at -8.04m OD and was sealed by a very organic amorphous layer of silty peat [16] 4.80m thick. This layer was overlaid with an alluvial sequence consisting of greyish blue clay [15] mottled brownish blue clay [14] and yellowish brown clay [13]. This sequence was capped by a layer of modern made ground [12] from which a 0.303 bullet (plate 2) was recovered. This ordnance is believed to be a remnant of the site's previous use as a firing range, operated by Royal Arsenal from the 16<sup>th</sup> to mid 20<sup>th</sup> century.

#### 7.1.3 BH 202

Context Number	Description	Depth B.G.L.	Thickness
1	Modern Made Ground	0.0-1.50m	1.50m
2	Sandy Clay	1.50m-3.70m	2.20m
3	Silty Clay	3.70m-4.30m	0.60m
4	Silty Peat	4.30m-8.90m	4.60m
5	Sandy Gravel	8.90m-NFE	NFE

7.1.4 BH 2 was located at a level of 1.26m OD and dug to a depth of 8.91m below ground level. Sandy gravel [5] was located at -7.64m OD and was overlaid by silty peat [4]. This was overlain by an alluvial sequence consisting of silty clay [3], and sandy clay [2]. This sequence was capped by a layer of modern made ground [1] from which a 0.10m cannon ball was recovered (Plate 1). This ordnance is believed to be a remnant of the sites previous use as a firing range, operated by Royal Arsenal from the 16<sup>th</sup> to mid 20<sup>th</sup> century.

#### 7.1.5 BH 203

Context Number	Description	Depth B.G.L.	Thickness
18	Modern Made Ground	0.0-1.10m	1.10m
19	Silty Clay w/Peat	1.10m-1.60m	0.50m

20	Brown Silty Clay	1.60m-1.80m	0.20m
21	Blue Silty Clay	1.80m-2.00m	1.20m
22	Blue mottled Silty Clay	2.00m-3.00m	1.00m
23	Grey Silty Clay	3.00m-6.70m	3.70m
24	Silty Peat	6.70m-8.80m	2.10m
26	Sandy Gravel	8.80m-NFE	NFE

7.1.6 BH 3 was located a level of 1.54m OD and dug to a depth of 9.70m below ground level. Sandy gravel [26] was located at -9.16m OD. Above this was a layer of silty peat 2.10m thick. This was overlain by an alluvial sequence consisting of silty clay [23], and mottled silty clay [22], blue silty clay [21], brown silty clay [20], and silty clay with peat [19]. This sequence was capped by a layer of modern made ground [18].

7.1.7 BH 204

Context Number	Description	Depth B.G.L.	Thickness
27	Modern Made Ground	0.0-1.80m	1.80m
28	Silty Blue Clay	1.80m-2.40m	0.60m
29	Gravelly Blue Clay	2.40m-2.90m	0.50m
30	Silty Blue Clay	2.90m-5.70m	2.80m
31	Silty Peat	5.70m-9.18m	3.48m
32	Gravelly Sand	9.18m-NFE	NFE

7.1.8 BH 204 was located a level of 1.65m OD and dug to a depth of 9.18m below ground level. Gravelly Sand [32] was located at -7.53m OD and was overlaid by silty peat [31]. This was overlain by an alluvial sequence consisting of silty clay [30], gravelly clay [29], and silty clay [28]. This sequence was capped by a layer of sandy modern made ground [27] from which a peg tile dating from 1680-1900 (Estors, A. personal communication, April 2018) was recovered.

7.1.9 BH 205

Context Number	Description	Depth B.G.L.	Thickness
6	Modern Made Ground	0.0m-1.80m	1.80m
7	Sandy Clay	1.80m-2.30m	0.50m
8	Mottled Silty Clay	2.30m-4.20m	1.90m
9	Silty clay	4.20m-5.30m	1.10m
10	Silty Peat	5.30m-8.90m	3.60m
11	Sandy Gravel	8.90m-NFE	NFE

7.1.10 BH 205 was located a level of 1.33m OD and dug to a depth of 8.9m below ground level. Sandy Gravel [11] was located at -7.57m OD and was overlaid by silty peat [10]. This was overlain by an alluvial sequence consisting of silty clay [9], mottled silty clay [8], and sandy clay [7]. This sequence was capped by a layer of sandy modern made ground [6].

7.1.11 BH 206 was placed within a meter of BH 201 in an attempt to retrieve samples from the natural layers. Due to the inundated ground conditions, the sampling attempt drew blanks hindering both the recovery of sediments and depth measurements.

## 7.2 Test Pits

Test Pit	Description	OD Heights	Findings
1	Made Ground [35]	1.59-0.59m OD	None
2	Made Ground [36]	1.53-0.53m OD	Bullet (SF 2)
3	Made Ground [37]	1.46-0.46m OD	None
4	Made Ground [33] 0.35m thick Sandy Clay [34] 0.65m thick	1.36-0.36m OD	None
5	Made Ground [38]	1.20-0.20m OD	None
6	Made Ground [39]	1.20-0.20m OD	None
7	Made Ground [40]	1.19-0.19m OD	None
8	Made Ground [41]	1.00-0.00m OD	None
9	Made Ground [42]	1.20-0.20m OD	None
10	Made Ground [43]	1.01-0.01m OD	None
11	Made Ground [44]	1.38-0.38m OD	None
12	Made Ground [45]	1.35-0.35m OD	None

7.2.1 12 test pits 0.35m wide were excavated to a depth of 1.00m across the area of proposed development. Each encountered a sandy silty made ground with ceramic building materials and sub-angular stone inclusions to their full depth, excluding TP 4 in which the natural sandy clay was encountered at 1.01m OD.

7.2.2 In TP 2 a 0.0303 fired bullet was recovered (plate 3). This ordnance is believed to be a remnant of the sites previous use as a firing range, operated by Royal Arsenal from the 16<sup>th</sup> to mid 20<sup>th</sup> century. This was removed from site for decommissioning.

## **8 RESEARCH OBJECTIVES AND CONCLUSIONS**

8.1 The aims and objectives for the site were outlined in the WSI (Pozorski, 2018). These were as follows:

- The main aim of the works is to ensure any remains of archaeological significance are identified and recorded during the earthworks stages of the project.
- The investigation aims to recognise deposit model of the site to identify its archaeological potential. In addition to the existing geotechnical data new information may need to be obtained in course of the fieldwork.
- The investigation also aims to address the impact of the proposed development on the site and assess if there is a danger to archaeological material or horizons being lost.
- To establish the level of modern truncation to the site and assess the effect on archaeological horizons
- Do the findings from the site relate to those from the wider area to the south of River Thames?
- Any other locations which may require monitoring or other type of work will be agreed with Mark Stevenson in advance.

## **9 DISCUSSION AND CONCLUSIONS**

9.1.1 The watching brief was carried out as part of the geotechnical investigation of the study area. The test pits and boreholes were designed to establish the geological sequence, as well as the presence and truncation of archaeology. (see figure 2)

9.1.2 Four phases of activity were identified across the study site.

9.1.3 The earliest deposit encountered at Woolwich Polytechnic was a layer of natural sandy gravel (phase 1). The gravel varied in height from -8.90m OD to -9.16m OD and sloped slightly downward towards the east.

9.1.4 Above the gravel was a layer of organic amorphous peat ranging from 2.10 to 6.38m in thickness. Although no dating was recovered from this horizon, it was tentatively dated as Bronze Age (phase 2) based upon comparisons to other sequences within the immediate vicinity.

9.1.5 The peat layer was covered by an undated alluvial sequence which was present across all investigation areas (phase 3). These alluvial layers were separated based on mottling or peat lenses but in comparison to the deposit model are considered to be part of either the upper or lower alluvium. These were represented by silty alluvium ranging from 0.60m-3.20m in thickness overlain by a sandy clay varying from 0.50m to 2.20m in thickness.

9.1.6 The alluvial sequence was covered by a layer of sandy silt modern made ground ranging from 1.10 to 1.80m thick (phase 4). Recovered from the made ground were finds dating from the 17<sup>th</sup> century to modern era including two 0.303 bullets (SF 1, 2) and one 0.10m cannon ball (SF3). The ordnance are of particular relevance to the use of the site as a firing range operated by Royal Arsenal from the 16<sup>th</sup> to the mid-20<sup>th</sup> century (see figure 3).

9.1.7 The survival, and lack of truncation noted within the peat layer may have significant archaeological potential as the excavations at Belmarsh West to the southwest of the site uncovered a north-south and east-west trackway or platform in a similar deposit (Hart, 2010). However, the deeper areas of impact for the proposed development (attenuation tank, manholes) are not expected to impact upon this horizon (see figures 4 and 5).



- 9.1.8 The results of the investigation have been combined with the pre-existing deposit model (see figures 2 and 4). The lower alluvial horizon was not identified during this phase of works but may represent differing collection methods as opposed to an absence of this horizon. The deposit model does indicate some variation in the level of the peat horizon. However, as the peat was directly overlain by alluvial deposits this is likely a result of natural differences in the underlying topography as opposed to modern truncation.
- 9.1.9 The expected foundation depths associated with the new development (see figures 4 and 5) were compared to the projected depth of the peat horizon based upon the results of the investigations. If the development levels remain unchanged, it is unlikely that these will extend to the depth of the peat.
- 9.1.10 Further mitigation measures may take the form of watching brief on deeper areas of impact or evaluation trenches within areas in which the peat horizon would be at risk by the new development. The scope of mitigation has previously been described in the approved WSI (Pozorski, 2018), and will be carried out subject to approval by Mark Stephenson on behalf of Historic England/the Greater London Archaeological Advisory Service.

## **10 ACKNOWLEDGEMENTS**

- 10.1.1 Pre-Construct Archaeology Ltd. would like to thank Kier Construction for commissioning the work.
- 10.1.2 The author wishes to thank Amelia Fairman and Zbigniew Pozorski for project management and editing this report.

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17/04/18 RM

Figure 1  
Site Location  
1:25,000 at A4

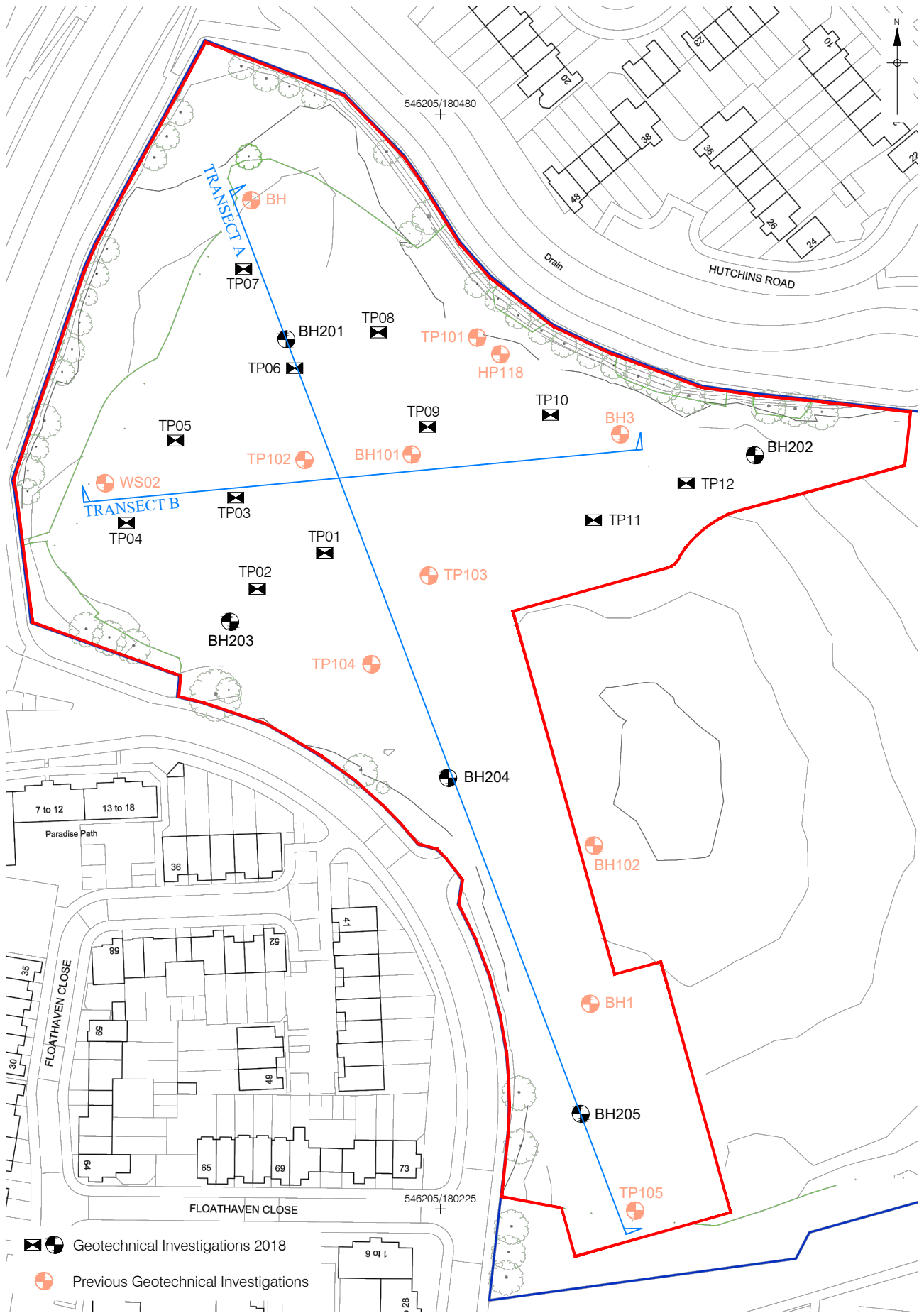
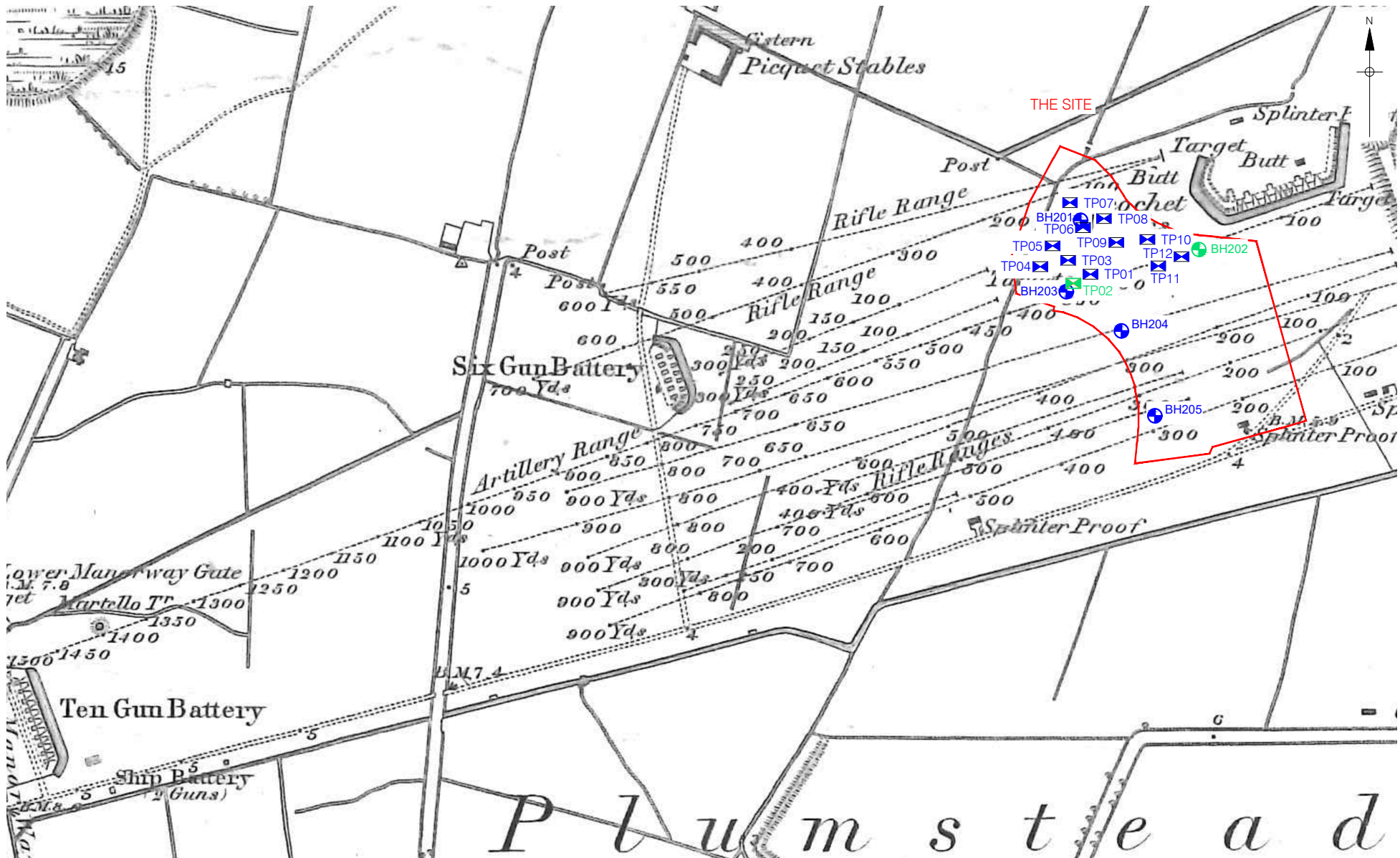


Figure 2  
Borehole and Test Pit Location Plan  
1:1,250 at A4






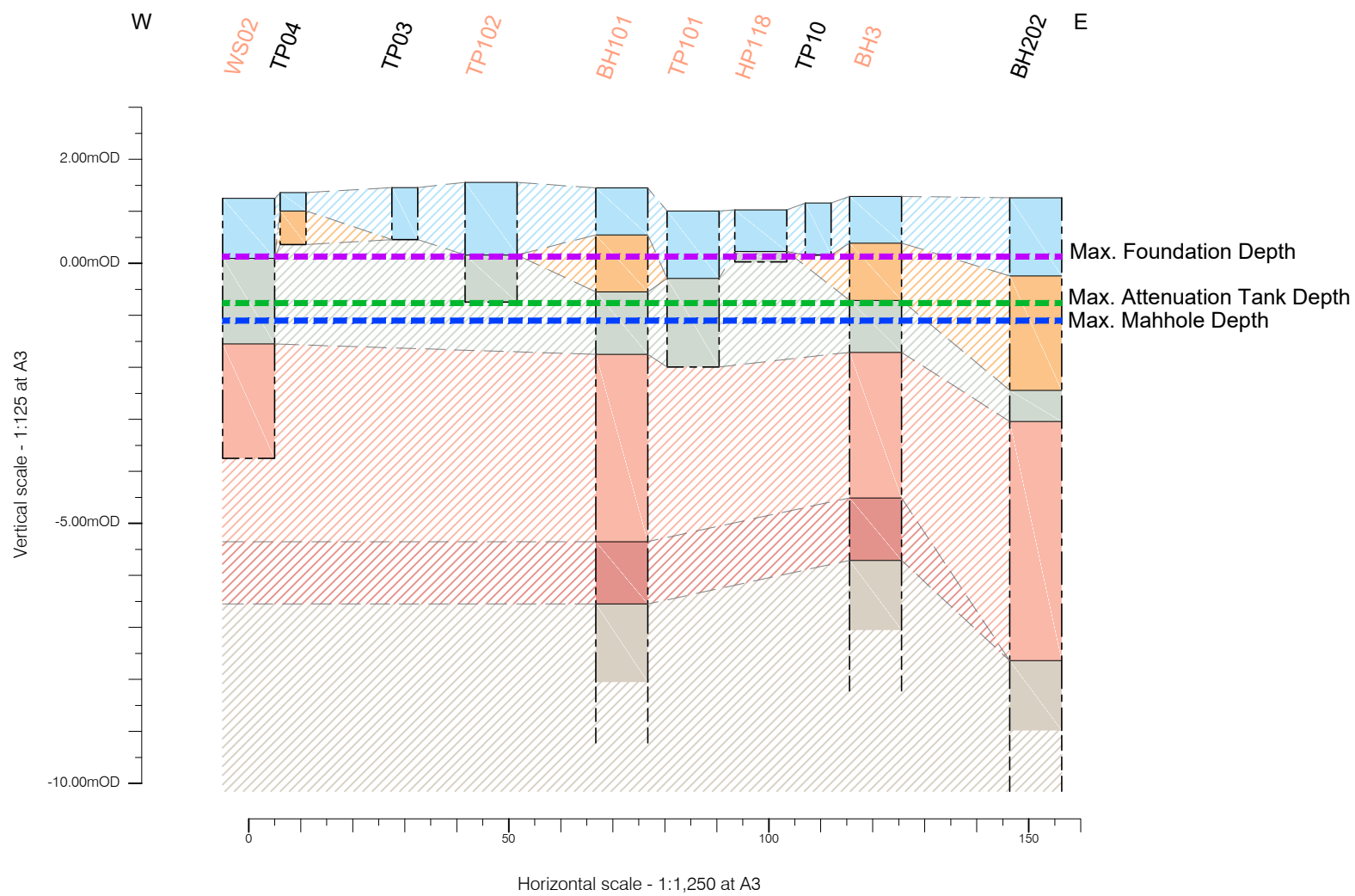
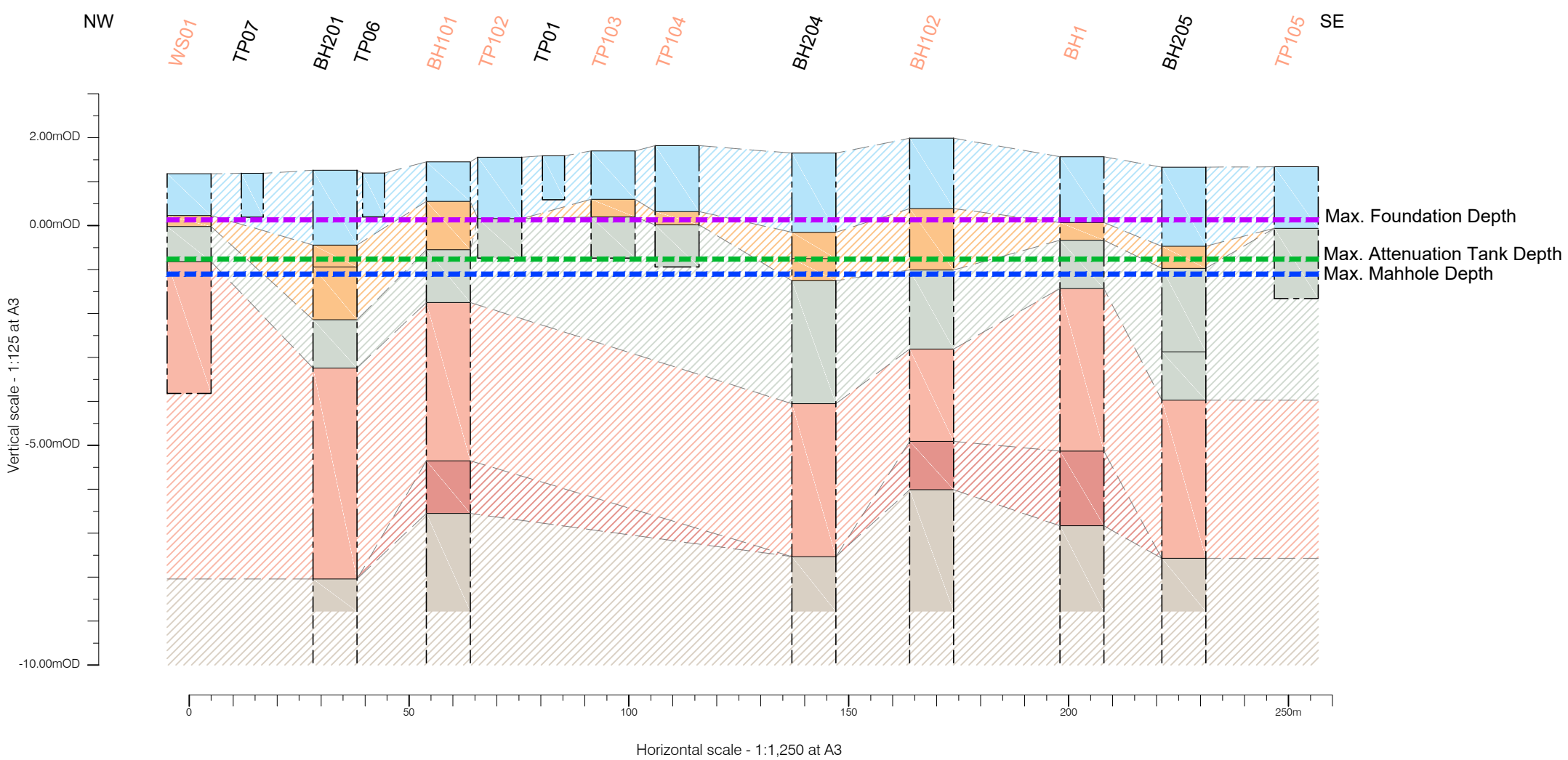
 Location of Cannon Ball and Fired Bullets  
 0 200m

Figure 3  
 Boreholes and Test Pits overlain on Ordnance Survey 1870  
 1:5,000 at A4



- Modern
- Uppermost Alluvial
- Upper Alluvial
- Peat
- Lower Alluvial
- Sand and Gravel

BH201 Geotechnical Investigations 2018

BH101 Previous Geotechnical Investigations

Figure 4  
Transects A and B  
(scales as indicated on drawing)





Figure 5  
Borehole and Test Pit Locations overlain on Masterplan  
1:1,250 at A4



Plate 1: (SF 3), Cannon ball





Plate 2: (SF 2), Bullet



Plate 3: (SF2), Bullet

## APPENDIX 1: BOREHOLE MATRIX

	BH1	BH2	BH3	BH4	BH5
Phase 4 (1680-present)	12	1	18	27	6
Phase 3 (Iron age to Roman?) Natural alluvium	13	2	19	28	7
	14	3	20	29	8
	15		21	30	9
	16		22		10
	17		23		11
			24		
Phase 2 (bronze age?) peat	16	4	24	31	10
phase 1 (sand/ gravel)	17	5	26	32	11
	NFE	NFE	NFE	NFE	NFE

## APPENDIX 2: FINDS INDEX

Context	Small finds	CBM/Worked stone	Pot	Discard
27	0	Peg tile (1680-1900)		yes
1	0.303 Bullet	Marble (1750-1900)		yes
2	0.303 Bullet			yes
3	0.10m Cannon ball			yes

**APPENDIX 3: OASIS FORM****OASIS ID: preconst1-315146****Project details**

Project name	Woolwich Polytechnic School for Girls: An Archaeological Watching Brief on Geotechnical Works
Short description of the project	An archaeological watching brief was carried out on geotechnical investigations at Woolwich Polytechnic School for Girls. The watching brief monitored the excavation of 12 test Pits and six geoarchaeological boreholes and was intended to help refine deposit models previously undertaken. The watching brief identified natural gravels overlain by a peat horizon of possible bronze age date which was in turn overlain by undated alluvium and post-medieval made ground.
Project dates	Start: 10-04-2018 End: 12-04-2018
Previous/future work	Yes / Not known
Any associated project reference codes	HCN18 - Sitecode
Type of project	Recording project
Site status	Area of Archaeological Importance (AAI)
Current Land use	Other 15 - Other
Monument type	LAYER Uncertain
Investigation type	"Test-Pit Survey", "Watching Brief"
Prompt	Planning condition

**Project location**

Country	England
Site location	GREATER LONDON GREENWICH WOOLWICH Woolwich Polytechnic School for Girls
Postcode	SE28 8SA
Study area	44200 Square metres
Site coordinates	TQ 4625 8035 51.502629967083 0.107393859362 51 30 09 N 000 06 26 E Point
Height OD / Depth	Min: -9.16m Max: -8.9m

**Project creators**

Name of Organisation	PCA
Project brief originator	PCA
Project design originator	Zbigniew Pozorski
Project director/manager	Zbigniew Pozorski
Project supervisor	Chloe Sinclair

Type of sponsor/funding body	Developer
Name of sponsor/funding body	Kier Construction

### Project archives

Physical Archive Exists?	No
Digital Archive recipient	LAARC
Digital Archive ID	HNC18
Digital Media available	"Images raster / digital photography", "Text"
Paper Archive recipient	LAARC
Paper Archive ID	HNC18
Paper Media available	"Context sheet", "Matrices", "Miscellaneous Material", "Plan", "Report", "Section"

### Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Woolwich Polytechnic School for Girls: An Archaeological Watching Brief on Geotechnical Works
Author(s)/Editor(s)	Sinclair, C
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