

Greenwich Peninsula, Tunnel Avenue, Royal Borough of Greenwich: An Archaeological Watching Brief Report

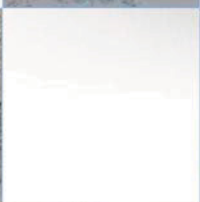
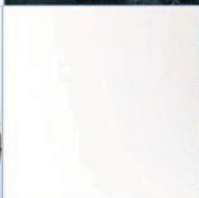
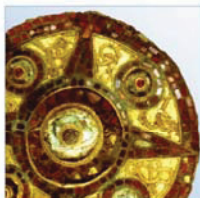
Planning Reference: 02/2903/O

National Grid Reference Number: TQ 2715 8120

AOC Project No: 32151

Site Code: GPF 12

Date: July 2012



Greenwich Peninsula, Tunnel Avenue, Royal Borough of Greenwich: An Archaeological Watching Brief Report

On Behalf of:	RPS Planning 14 Cornhill London EC3V 3ND
National Grid Reference (NGR):	TQ 2715 8120
AOC Project No:	32151
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Date of Fieldwork:	29th May – 1st June 2012
Date of Report:	July 2012

This document has been prepared in accordance with AOC standard operating procedures.

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Non-Technical Summary

Between the 29th of May and 1st June 2012 AOC Archaeology Group undertook a watching brief at the Greenwich Peninsula, Tunnel Avenue, Royal Borough of Greenwich (NGR) TQ 2715 8120. The watching brief was commissioned by RPS Planning and comprised the monitoring of the excavation geotechnical trial pits and boreholes.

Within the boreholes, river terrace gravels were overlain by peat deposits between -0.61m and -1.38m AOD. This was overlain by alluvial clays and modern made ground. The earliest deposits recorded in the trial pits were alluvial clays, these were overlain by modern made ground and concrete slabs. In one case a concrete foundation cut the alluvial deposits; this feature may have been related to early 20th century structure seen on Ordnance Survey maps of the time.

The alluvial deposits appeared to have been subject to horizontal truncation during the phases of construction and demolition which took place on site in the 20th century. Due to the limited nature of the archaeological deposits encountered, and the depth of made ground across the site, it is recommended that no further archaeological fieldwork be undertaken. Publication is expected to be limited to a summary in the London Archaeology Round-up and publication via the Archaeological Data Service (ADS). On completion of the projec, the archive will be deposited with the LAARC.

1. Introduction

- 1.1 The site is located in the northwest of the Royal Borough of Greenwich, situated to the west of Tunnel Avenue and the O2 Arena. The site is centred on National Grid Reference (NGR) TQ 2715 8120 (Figure 1).
- 1.2 The site is roughly rectangular in plan and measures approximately 0.8 hectares. It is bounded to the east and north by Tunnel Avenue, to the south by disused land and to the west by Draw Dock Road (Figure 2). The site previously contained industrial buildings, however after their demolition the site was used to dump large amounts of rubble, resulting in a large spoil heap across much of the site.
- 1.3 The site's development scheme comprises part of a wider scheme of redevelopment of the Greenwich Peninsula; this includes the construction of a 26,000 seat arena and 10,000 dwellings, retail and commercial buildings and associated facilities including transport links.
- 1.4 The watching brief was focused on the monitoring of the excavation of six geotechnical trial pits (Figure 2). This report details the results of the archaeological watching brief undertaken on the excavation of the trial pits.

2 Planning Background

- 2.1 The local planning authority is the Royal Borough of Greenwich Council. Archaeological advice to the borough is provided by Mark Stevenson of the Greater London Archaeological Advisory Service (GLAAS), part of English Heritage.
- 2.2 The site is not located within an Archaeological Priority Area or conservation area and does not contain any listed buildings.
- 2.3 The Museum of London Archaeology Service previously undertook a geoarchaeological assessment in December 2002 (MoLAS 2002).
- 2.4 Planning permission was granted in 2004 (Planning Ref No 02/2903/O); Condition 117 stated that;

"No development shall take place until the applicant has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved by the Local Planning Authority. The relevant works shall only take place in accordance with the detailed scheme pursuant to this condition. The archaeological works shall be carried out by a suitably qualified investigating body acceptable to the Local Planning Authority."

Reason: The development is likely to damage archaeological remains. The applicant should therefore submit detailed proposals in the form of an archaeological project design. The design should be in accordance with English Heritage Guidelines."

- 2.5 The archaeological watching brief was commissioned prior to the commencement of groundworks for the development. A general Written Scheme of Investigation (WSI) has been produced for the development as a whole (CPM 2005) which detailed the methods and standards to which the monitoring would conform.

3 Geology and Topography

- 3.1 The solid geology underlying this site is London Clay; this is overlain by Floodplain Terrace Gravels, the gravels are overlain by alluvial clays and peat deposits.
- 3.2 The site was extremely undulating due to the presence of modern spoil heaps across the site.

4 Archaeological and Historical Background

4.1 The Prehistoric Periods

(Palaeolithic c. 500,000 – 10000 BC; Mesolithic c. 10000 to 4000 BC; Neolithic c. 4000-2200 BC; Bronze Age c. 2200-700 BC and Iron Age c. 700 BC - AD 43)

- 4.1.1 No finds of features of prehistoric date have been recorded at the proposed development site, however, the alluvial and peat deposits which date to the Neolithic/Bronze Age have the potential to contain archaeological and palaeoenvironmental remains.

4.2 The Roman Period (AD 43 – AD 410)

- 4.2.1 The sea level appears to have been lower during the Roman period than today, and there is evidence the marshy areas were drier and extensively used. Several finds of Roman material have been made on the Greenwich Peninsula including glazed pottery which was found off Blackwall Point about 7.6m below ground level.

4.3 The Early Medieval (AD 410 – AD 1066) and Medieval Periods (AD 1066 – AD 1538)

- 4.3.1 It is likely the area was not heavily utilised in the Saxon and medieval period. Greenwich is first mentioned in 14th century documentary records when it was known as East Greenwich. In the early part of the 14th century the Thames had been subject to extensive flooding and a number of water management features such as ditches and river walls were implemented. At this time the area was used as grazing land and divided into many separate field plots. By the 15th century a programme of land reclamation introducing sluices and drains was in place. A sea wall was also constructed just before the Tudor period which would have been perhaps 20m in land from the current river wall. Evidence of these drainage features and field boundaries and river walls may survive in the archaeological record.

4.4 The Post-Medieval (AD 1538 – AD 1900) and Modern Period (AD 1900 to present)

- 4.4.1 During the 17th century the Peninsula remained a patchwork of fields many of which can probably be traced back to the late 14th century. The Peninsula was crossed north-south by Green Lane, which originally have been a medieval drove way. By the late 18th century the area was still mainly marshland, although several more roads had been constructed.
- 4.4.2 The Peninsula remained used for grazing and market gardening until the mid 19th century when industrial works began to spring up along the river bank and later over the whole Peninsula.
- 4.4.3 The site remained largely undeveloped until the early 20th century when warehouses were constructed on the site (Ordnance Survey 1919). These buildings were added to and altered alter in the 20th century but have subsequently been levelled.

5 Aims of the Investigation

- 5.1 The aims of the archaeological watching brief were defined as being:
- To establish the presence/absence of archaeological remains within the site.
 - To determine the extent, condition, nature, character, quality and date of any archaeological remains encountered.
 - To record and sample excavate any archaeological remains encountered.
 - To assess the ecofactual and environmental potential of any archaeological features and deposits.

- To determine the extent of previous truncations of the archaeological deposits.
- To enable the archaeology advisor to the Royal Borough of Greenwich Council to make an informed decision on the status of the condition, and any possible requirement for further work in order to satisfy that condition.
- To make available to interested parties the results of the investigation.

5.2 The specific aims of the archaeological watching brief were defined as being:

- Determine the presence/absence of prehistoric activity on site.
- Determine the presence/absence of medieval activity on site.
- Determine the presence/absence of remains relating to the mapped post-medieval structural sequence.

5.3 The final aim was to make public the results of the investigation, subject to any confidentiality restrictions.

6 Methodology

6.1 The watching brief was carried out between the 29th May and 1st June 2012 and focused on the monitoring of the excavation of six geotechnical trial pits. The pits were excavated to a depth of 3.00m below ground level, by a JBC 3CX using a toothless bucket. Eight boreholes were also excavated (Appendix B). Two of the proposed trial pits (801 and 807) were not excavated, while Trial Pit 803 was excavated while AOC were not present on site.

6.2 Fieldwork procedures followed the Museum of London Archaeological Site Manual (3rd Edition) (MoL 1994) and the Institute for Archaeologists' Code of Conduct (IfA 2010).

6.3 A unique site code, GPF 12, was obtained from the Museum of London prior to the commencement of fieldwork. This was used as the site identifier on all records.

6.4 The excavation, recording and reporting conformed to current best archaeological practice and local and national standards and guidelines:

- English Heritage – Management of Archaeological Projects (EH 1991).
- English Heritage – Archaeological Guidance Paper 3: Standards and Practices in Archaeological Fieldwork (EH 1998).
- English Heritage – Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation (EH 2011).
- Institute for Archaeologists – Standard and Guidance for Archaeological Watching Briefs (IfA 2008a).
- Institute for Archaeologists – Standards and Guidance and Guidelines for Finds Work (IfA 2008b).
- Institute for Archaeologists – Code of Conduct (IfA 2010).
- Rescue/United Kingdom Institute for Conservation – First Aid for Finds (3rd Edition) (2001).
- United Kingdom Institute for Conservation – Guidance for Archaeological Conservation Practice (UKIC 1990).

6.5 Archaeological recording consisted of:

- Limited hand cleaning of sections and surfaces sufficient to establish the stratigraphic sequence exposed.
- A scan for dating evidence from in-situ deposits and spoil.
- Photographic recording of representative exposed sections and surfaces, along with sufficient photographs to establish the setting and scale of the groundworks.
- Written records on pro-forma sheets.
- Plans/Section drawings at suitable scales.
- A record of the datum levels of archaeological deposits, where obtainable.

6.6 The investigation area was accurately located to the National Grid.

6.7 The watching brief was undertaken by Ian Hogg, under the overall direction of Melissa Melikian, Operations Director. The work was monitored by Mark Stevenson of GLAAS.

7 Results

7.1 Trial Pit 802

Depth BGL	Height mOD	Context Number	Description/Interpretation
0.00m	4.12m	(200)	Made Ground
0.30m	3.82m	(201)	Concrete Slab
0.70m	3.42m	(202)	Made Ground
0.90m	3.22m	(203)	Concrete Slab
1.30m	2.82m	(204)	Alluvial Clay

7.1.1 Trial Pit 802 was located in the northwest of the site, it was aligned north-south and measured 2.00m x 0.80m in plan (Figures 2 and 3). The earliest deposit observed was firm dark blueish grey silty clay alluvium (204), observed at a height of 2.82mOD; this deposit contained hydrocarbon contamination. The alluvium was sealed by a pale grey concrete slab [203] which was 0.40m thick. The concrete was overlain by a deposit of loose rubbly silt (202) 0.20m thick, this deposit contained frequent brick and concrete. The rubbly made ground was overlain by a second pale grey concrete slab [201] 0.40m thick; this was sealed by loose grey rubbly silt made ground (200) which was 0.30m thick. No archaeological features were recorded in this trial pit.

7.2 Trial Pit 804

Depth BGL	Height mOD	Context Number	Description/Interpretation
0.00m	3.99m	(400)	Made Ground
0.20m	3.79m	(401)	Concrete Slab
0.50m	3.49m	(402)	Concrete Slab
0.80m	3.199m	(403)	Made Ground
1.20m	2.79m	(404)	Made Ground
2.00m	1.99m	(405)	Alluvial Clay

7.2.1 Trial Pit 804 was located in the southwest of the site, it was aligned north-south and measured 2.00m x 0.80m in plan (Figures 2 and 3). The earliest deposit observed was firm dark blueish grey silty clay alluvium (405), observed at a height of 1.99mOD. The alluvium was sealed by made ground deposit (404), a firm, mid brownish red silty clay with frequent ceramic building material (CBM) flecks; it was 0.80m thick. The deposit was overlain by a second made ground deposit (403), a dark greyish black gravel 0.40m thick. The made ground was overlain by two successive mid grey concrete slabs [402] and [401], these were both 0.30m thick. The pit was sealed by 0.20m of loose brown rubbly silty made ground (400). No archaeological features were recorded in this trial pit.

7.3 Trial Pit 805

Depth BGL	Height mOD	Context Number	Description/Interpretation
0.00m	4.89m	(500)	Made Ground
2.00m	2.89m	(501)	Concrete Slab
2.80m	2.09m	(502)	Alluvial Clay

7.3.1 Trial Pit 805 was located in the south of the site; it was aligned north-south and measured 2.00m x 0.80m in plan (Figure 2). The earliest deposit observed was an alluvial clay deposit (502) observed at a height of 2.09mOD; again it was a blueish grey silty clay with hydrocarbon contamination. The alluvium was overlain by a mid grey concrete slab [501] 0.80m thick. The concrete was sealed by loose brown rubbly silt made ground (500) 2.00m thick. No archaeological features were recorded in this trial pit

7.4 Trial Pit 806

Depth BGL	Height mOD	Context Number	Description/Interpretation
0.00m	4.45m	(600)	Made Ground
1.00m	3.45m	(601)	Concrete Slab
1.60m	1.85m	(602)	Alluvial Clay

7.4.1 Trial Pit 806 was located in the south of the site, it was aligned southwest-northeast and measured 2.00m x 0.80m (Figures 2 and 3). The earliest deposit observed was alluvial clay (602), at a height of 1.85mOD, this deposit consisted of firm dark blueish grey silty clay with hydrocarbon contamination.

7.4.2 The alluvium was cut by a foundation trench [605] which measured 0.80m in length, 0.40m in width and was at least 1.40m deep. It was aligned northwest-southeast, had vertical sides, and the base of the feature was not observed. The cut contained a stepped concrete foundation [604], this was made from pale grey concrete and measured 0.80m in length, 0.40m wide and 2.00m high. The foundation fill (603) consisted of 1.40m thick loose dark grey gravel. The foundation was abutted by a 0.60m thick pale grey concrete slab [601]. The slab was overlain by a 1.00m thick brown rubbly silt made ground (600). No archaeological features were recorded in this trial pit

7.5 Trial Pit 808

Depth BGL	Height mOD	Context Number	Description/Interpretation
0.00m	4.20m	(800)	Made Ground
0.30m	3.20m	(801)	Concrete Slab
0.70m	3.50m	(802)	Made Ground
0.80m	3.40m	(803)	Concrete Slab
1.30m	2.90m	(804)	Concrete Slab
1.90m	2.30m	(805)	Alluvial Clay

7.5.1 Trial Pit 808 was located in the centre of the site, it was aligned north-south and measured 2.00m x 0.60m (Figure 2). The earliest deposit was a blueish grey alluvial clay (805) observed at a height of 2.30mOD. The alluvium was overlain by two successive concrete slabs [804] and [803], both constructed from pale grey concrete, 0.40m and 0.50m thick respectively. The concrete was sealed by a 0.10m thick loose grey rubbly silt made ground (802). The made ground was overlain by another 0.40m thick pale grey concrete slab [801]. The slab was sealed by another made ground deposit (800) very similar to (802) and 0.30m thick. No archaeological features were recorded in this trial pit.

7.6 Trial Pit 809

Depth BGL	Height mOD	Context Number	Description/Interpretation
0.00m	3.74m	(900)	Made Ground
0.20m	3.80m	(901)	Concrete Slab
1.20m	2.54m	(902)	Brick Floor
1.31m	2.43m	(903)	Concrete Slab
1.71m	2.03m	(904)	Alluvial Clay

7.6.1 Trial Pit 809 was located in the southeast of the site, it was aligned east-west and measured 2.00m x 0.80m (Figure 2). The earliest deposit observed was a mid blueish grey silty clay alluvium (904) seen at a height of 2.03m. The alluvium was overlain by a 0.40m thick pale grey concrete slab [903] which formed a base to a brick floor. The base was overlain by the brick floor itself [902], this was constructed from frogged red bricks measuring 225mm x 110mm x 70mm. The bricks were laid on edge in stretcher pattern and were bonded with cement mortar; the floor was 0.11m thick. The floor is likely to date to the early 20th century. The floor was sealed by made ground deposit (901), a loose brown silt containing whole red bricks similar to those in floor [902]; the made ground was 1.00m thick. Deposit (901) was overlain by a reinforced concrete slab [900] 0.20m thick. No significant archaeological features were recorded in this trial pit.

7.7 Boreholes

7.7.1 Eight boreholes were completed across the site (BH 802 – 809) (see borehole logs in Appendix B). All of the boreholes showed river terrace gravels at around 2mOD. In all cases the gravels were overlain by a dark brownish black peat deposit which varied in thickness between 0.60m in the south of the site and 1.90m in the southwest. The peat was overlain by alluvial clays in all cases, the clays varied in thickness between 3.90m in the south and 1.60m in the west, this difference may be due to

truncation by later buildings. The alluvium was invariably overlain by modern made ground and concrete slabs.

8 Finds and Environmental Samples

- 8.1 No finds were retrieved from the site and no environmental samples were taken.

9 Conclusions

- 9.1 During the course of the watching brief alluvial clays were identified in all of the trial pits; in one case this was cut by a concrete foundation of probable 20th century date, this foundation may be related to the buildings seen on the 1919 Ordnance Survey map (Ordnance Survey 1919). Across much of the site concrete slabs, and one brick floor, directly overlay the alluvium and it is likely that truncation had occurred. As well as concrete slabs the alluvium was also overlain by modern made ground deposits, probably associated with demolition of buildings on the site.
- 9.2 The presence of peat deposits in all of the boreholes indicates the potential for prehistoric remains across the site; however considering the depth of overburden overlying the peat it is unlikely that any significant impact will occur to these deposits.
- 9.3 Due to the limited nature of the archaeological deposits encountered, and the depth of made ground across the site, it is recommended that no further archaeological fieldwork be undertaken.

10. Publication and Archive Deposition

- 10.1 Due to the nature of the results at this stage of the archaeological investigation, publication is expected to be limited to a summary in the London Archaeology Round-up and publication via the Archaeological Data Service (ADS) (Appendix C).
- 10.2 On completion of the project, the archive, consisting of paper records, drawings, digital and black and white photographs, and finds, will be deposited with the LAARC.

11 Bibliography

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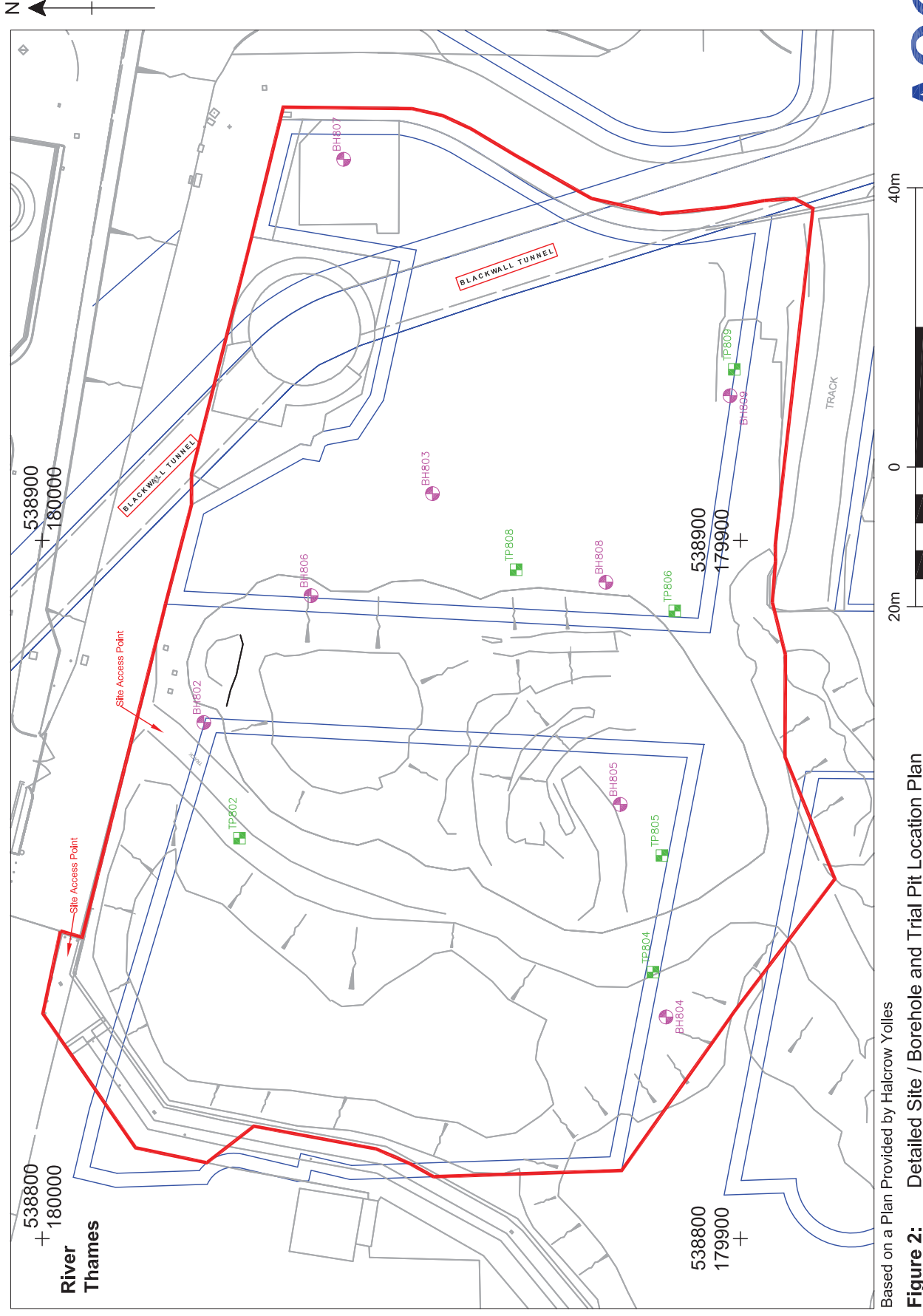
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GREENWICH PENINSULA, TUNNEL AVENUE, ROYAL BOROUGH OF GREENWICH:
AN ARCHAEOLOGICAL WATCHING BRIEF REPORT

Site Location Within London



Figure 1: Site Location



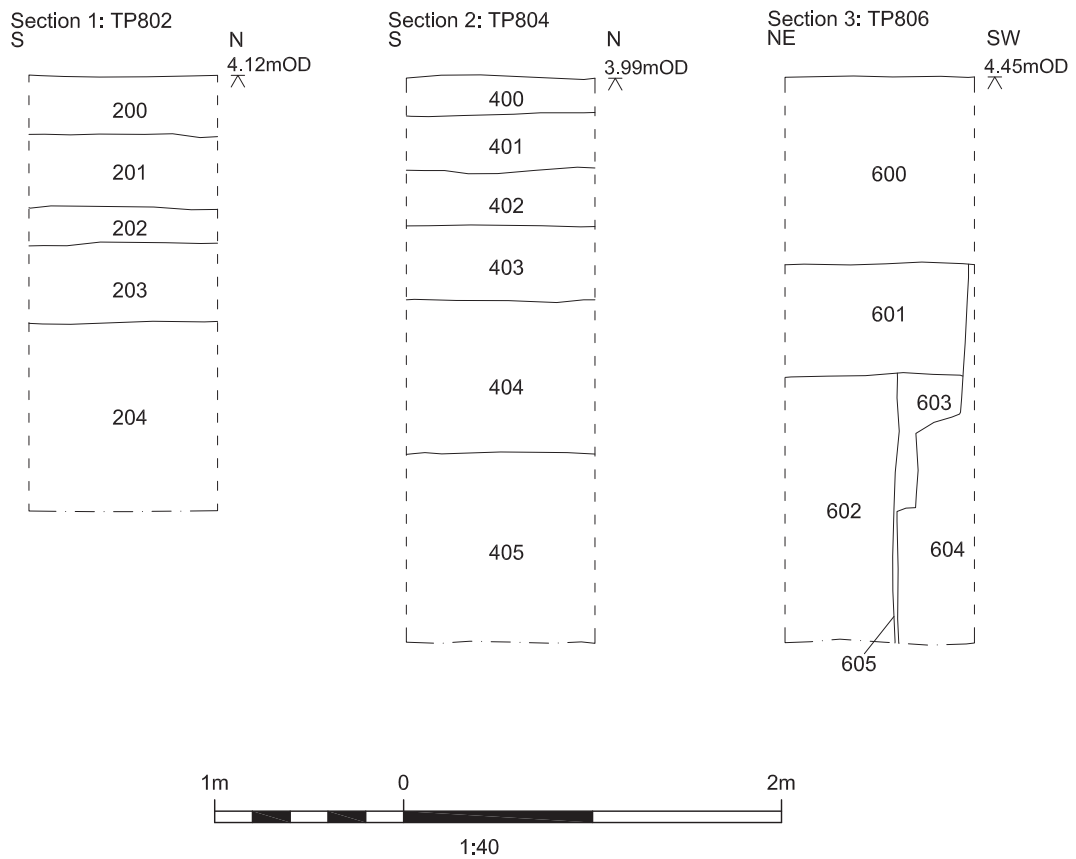


Figure 3: Sample Sections

Appendices

Appendix A – Context Register

Context No.	Context Description	Length	Width	Depth
200	Made Ground	2.00m	0.80m	0.30m
201	Concrete Slab	2.00m	0.80m	0.40m
202	Made Ground	2.00m	0.80m	0.20m
203	Concrete Slab	2.00m	0.80m	0.40m
204	Alluvial	2.00m	0.80m	2.00m
400	Made Ground	2.00m	0.80m	0.20m
401	Concrete Slab	2.00m	0.80m	0.30m
402	Concrete Slab	2.00m	0.80m	0.30m
403	Made Ground	2.00m	0.80m	0.40m
404	Made Ground	2.00m	0.80m	0.80m
405	Alluvium	2.00m	0.80m	1.00m
500	Made Ground	2.00m	0.80m	2.00m
501	Concrete Slab	2.00m	0.80m	0.80m
502	Alluvium	2.00m	0.80m	0.60m
600	Made Ground	2.00m	0.80m	1.00m
601	Concrete Slab	2.00m	0.80m	0.60m
602	Alluvium	2.00m	0.80m	1.40m
603	Foundation Fill	0.80m	0.40m	1.40m
604	Concrete Foundation	0.80m	0.40m	2.00m
605	Foundation Cut	0.80m	0.40m	1.40m
800	Made Ground	2.00m	0.80m	0.30m
801	Concrete Slab	2.00m	0.80m	0.40m
802	Made Ground	2.00m	0.80m	0.10m
803	Concrete Slab	2.00m	0.80m	0.50m
804	Concrete Slab	2.00m	0.80m	0.40m
805	Alluvium	2.00m	0.80m	1.30m
900	Reinforced Concrete	2.00m	0.80m	0.20m
901	Made Ground	2.00m	0.80m	1.00m
902	Brick Floor	2.00m	0.80m	0.11m

903	Concrete Base	2.00m	0.80m	0.40m
904	Alluvium	2.00m	0.80m	1.30m

Appendix B – Borehole Logs



Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD)	Client Quintain Estates	Job Number 20925
	Location	Dates 31/05/2012	Engineer Halcrow	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	E1					MADE GROUND: Dark brown, slightly clayey, gravelly fine to coarse sand with occasional cobbles. Gravel is fine to coarse, angular to subangular flints, concrete and brick fragments, glass and clinkers.		
0.50	B1				(1.40)			
1.00	E2				1.40	Below 1.00m: Frequent ash and damp		
1.00-2.00	B2					Soft, grey slightly sandy, silty CLAY with frequent black specs. (Alluvium)		
2.00-2.45	SPT N=1		0,0/0,0,0,1			Below 2.00m: Very soft		
2.00	E3							
2.00-3.00	L1							
3.00-3.45	SPT N=6		1,1/1,2,1,2			Below 2.90m: Black with frequent decayed rootlets.		
3.00-4.00	B3				(4.40)			
4.00-4.45	SPT N=7		2,1/2,1,2,2			Below 4.00m: Soft, grey silty clay with frequent decayed rootlets.		
4.00	E4							
4.00-5.00	L2							
5.00-5.45	SPT(C) N=4		1,0/1,1,1,1					
5.00-6.00	L3				5.80			
6.00-6.45	SPT(C) N=13		1,1/1,3,4,5		(1.00)	Dark brown, firm, fibrous PEAT with frequent decayed wood. (Alluvium)		
6.00-7.00	L4				6.80 (0.20)			
7.00-7.45	SPT(C) N=42		Water strike(1) at 6.80m. 10,10/10,10,11,11		7.00	Dense, grey, fine to coarse SAND and fine to coarse, angular to subangular GRAVEL. Gravel is fine to coarse, angular to subangular flints. (River Terrace Deposits)		
						Complete at 7.45m		

Remarks

Excavated to 1.50m using machine to clear concrete and brick obstructions.
Backfilled with bentonite upon completion
Barrel refused at 7.45m

Scale (approx)
1:50

Logged By
HP

Figure No.
20925.WS820



**IAN FARMER
ASSOCIATES**

Site

Peninsula Quays

**Number
WS821**

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

Client

Quintain Estates

**Job
Number
20925**

Location

Dates

31/05/2012

Engineer

Halcrow

**Sheet
1/1**

**Depth
(m)**

Sample / Tests

**Water
Depth
(m)**

Field Records

**Level
(mOD)**

**Depth
(m)
(Thickness)**

Description

Legend

Water

0.50

E1

(0.55)

0.55

MADE GROUND: Grey, sandy gravel. Gravel is fine to coarse angular to subangular limestone, brick and concrete fragments.
At 0.40m: Rubber tube

Abandoned at 0.55m



Remarks

Moved 1.50m west due to concrete.

**Scale
(approx)**

1:50

**Logged
By**

HP

Figure No.

20925.WS821



**IAN FARMER
ASSOCIATES**

Site

Peninsula Quays

Number
WS821A

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

Client

Quintain Estates

**Job
Number**
20925

Location

Dates

31/05/2012

Engineer

Halcrow

Sheet
1/1

**Depth
(m)**

Sample / Tests

**Water
Depth
(m)**

Field Records

**Level
(mOD)**

**Depth
(m)
(Thickness)**

Description

Legend

Water

MADE GROUND: Grey, sandy gravel. Gravel is fine to coarse angular to subangular limestone, brick and concrete fragments.



Abandoned at 0.60m

Remarks
Abandoned at 0.60m

**Scale
(approx)**

1:50

**Logged
By**

HP

Figure No.
20925.WS821A



Site Peninsula Quays Zone A	Borehole Number BH802
Boring Method Cable Percussion	Job Number 20925
Casing Diameter 200mm cased to 2.00m 150mm cased to 13.50m	Engineer Halcrow Group Limited
Ground Level (mOD) 4.11	Sheet 1/3
Location 538873.9 E 179976.9 N	
Dates 31/05/2012- 07/06/2012	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1				4.01	(0.10)	MADE GROUND: Dark brown, sandy gravel. Gravel is fine to coarse, angular to subangular limestone flints, concrete and brick fragments.			
					3.81	0.10				
					3.61	(0.20)				
						0.30				
						(0.20)	MADE GROUND: Concrete			
						0.50				
1.00	E1						MADE GROUND: Dark brown, sandy, gravel and occasional ash. Gravel is fine to coarse, angular to subangular flints, concrete and brick fragments and some clinkers.			
1.20-1.65	SPT N=4	1.20	DRY	1,1/1,1,1,1						
1.20-1.65	B2									
1.20-1.65	D1						Soft, grey, slightly sandy, silty CLAY with frequent black specks and occasional decayed rootlets (Alluvium)			
2.00-2.45	UT1 100%	2.00	DRY	8 blows						
2.50	D2					(4.40)				
3.00-3.45	SPT N=6	3.00	DRY	1,1/1,2,1,2						
3.00-3.45	B3									
3.00-3.45	D3									
3.50	E2									
4.00-4.45	UT2 100%	4.00	DRY	20 blows						
4.50	D4									
5.00-5.45	SPT N=4	5.00	DRY	1,1/1,1,1,1	-0.79	4.90	Soft, brown to dark brown fibrous PEAT. (Alluvium)			
5.00-5.45	B4									
5.00-5.45	D5					(1.50)				
6.00-6.45	UT3 70%	6.00	DRY	31/05/2012: DRY 01/06/2012: DRY 50 blows Water strike(1) at 6.40m, rose to 5.40m in 5 mins, sealed at 13.20m.	-2.29	6.40	Medium dense, brown grey to grey, fine to coarse SAND and GRAVEL. Gravel is fine to coarse, angular to subangular flints. (River Terrace Deposits)			
6.50	D6									
7.50-7.95	SPT(C) N=18	7.50	5.40	3,3/3,5,5,5						
7.50-7.95	B5									
7.50-7.95	D7									
9.00-9.45	SPT(C) N=18	9.00	5.40	3,3/4,4,5,5		(6.70)				
9.00-9.45	B6									
9.00-9.45	D8									

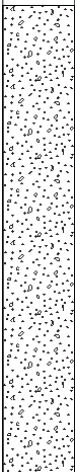
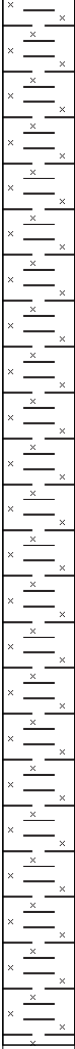
Remarks

30 minutes day works washing down tools on completion
30 minutes standing awaiting installation details
30 minutes standing for bentonite seal between casing

**Scale
(approx)**
1:50

**Logged
By**
HP

Figure No.
20925.BH802

IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH802	
Boring Method Cable Percussion		Casing Diameter 200mm cased to 2.00m 150mm cased to 13.50m			Ground Level (mOD) 4.11		Client Quintain Estates and Development PLC		Job Number 20925	
		Location 538873.9 E 179976.9 N			Dates 31/05/2012-07/06/2012		Engineer Halcrow Group Limited		Sheet 2/3	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.50-10.95 10.50-10.95 10.50-10.95	SPT(C) N=22 B7 D9	10.50	5.40	3,4/5,5,6,6			... as previous		▼2	
12.00-12.45 12.00-12.45	B8 D10			01/06/2012:5.40m		(6.70)				
12.00-12.45	SPT N=22	12.00	5.30	06/06/2012:5.30m 4,4/4,5,6,7						
13.20	D11				-8.99	13.10	Stiff, brown grey to grey, laminated silty CLAY with some white stains (roots) and silty partings. (London Clay Formation)			
13.50-13.95	UT4 100%	13.50	DRY	70 blows						
14.00	D12									
15.00-15.45 15.00-15.45 15.00-15.45	SPT N=22 B9 D13	13.50	DRY	3,3/5,5,5,7						
16.50-16.95	UT5 100%	13.50	DRY	70 blows						
17.00	D14					(8.40)				
18.00-18.45 18.00-18.45 18.00-18.45	SPT N=28 B10 D15	13.50	DRY	3,5/6,7,7,8						
19.50-19.95	UT6 100%	13.50	DRY	91 blows						
Remarks								Scale (approx)	Logged By	
								1:50	HP	
								Figure No. 20925.BH802		



**IAN FARMER
ASSOCIATES**

Site
Peninsula Quays Zone A

**Borehole
Number**
BH802

Boring Method Cable Percussion	Casing Diameter 200mm cased to 2.00m 150mm cased to 13.50m	Ground Level (mOD) 4.11	Client Quintain Estates and Development PLC	Job Number 20925
	Location 538873.9 E 179976.9 N	Dates 31/05/2012- 07/06/2012	Engineer Halcrow Group Limited	Sheet 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
20.00	D16						... as previous			
21.00-21.45 21.00-21.45 21.00-21.45	SPT N=29 B11 D17	13.50	DRY	3,5/7,7,7,8 Water strike(2) at 21.50m, rose to 10.00m in 20 mins. 06/06/2012:DRY	-17.39	(8.40) 21.50	Dense, green grey to grey, silty fine SAND, laminated with clay bands and white fragmented shell. (Lambeth Group)			
22.50-22.83 22.50-22.90 22.50-22.90	SPT 50/180 B12 D18	13.50	8.50	5,9/20,20,10 07/06/2012:8.50m		(3.50)				
24.00-24.33 24.00-24.40 24.00-24.40	SPT 50/175 B13 D19	13.50	8.50	8,10/18,24,8						
24.50	E3						Below 24.50m: Strong hydrocarbon odour and staining			
25.00	W1			07/06/2012:8.50m	-20.89	25.00	Complete at 25.00m			

Remarks

Scale (approx)
1:50

Logged By
HP

Figure No.
20925.BH802




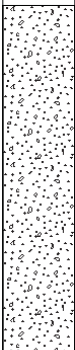

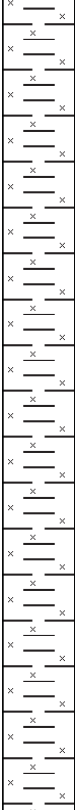
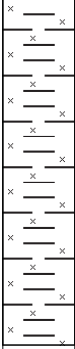
Site Peninsula Quays Zone A	Borehole Number BH803
Boring Method Cable Percussion	Job Number 20925
Casing Diameter 200mm cased to 4.00m 150mm cased to 13.00m	Engineer Halcrow Group Limited
Location 538906.7 E 179944.1 N	Sheet 1/3
Ground Level (mOD) 4.09	Dates 01/06/2012- 08/06/2012

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50	D1 E1				3.89 3.69	(0.20) 0.20 (0.20) 0.40	MADE GROUND: Grey, sandy, gravel. Gravel is fine to coarse, angular to subangular limestone. MADE GROUND: Reinforced concrete			
1.00-1.45 1.00 1.00-1.45	SPT(C) N=22 W1 B1	1.00	1.00	3,2/2,6,7,7 Seepage(1) at 1.10m, rose to 1.00m in 20 mins, sealed at 4.50m.		(2.70)	MADE GROUND: Dark brown, grey sandy gravel. Gravel is fine to coarse, angular to subangular brick, concrete, flints and pieces of steel. Below 0.50m: Clay bands and strong hydrocarbon odour.			
2.00-2.45 2.00-2.45	SPT(C) N=27 B2	2.00	1.20	2,6/6,7,6,8			Below 2.70m: Concrete			
3.30 3.30 3.50-3.95 3.50-3.95 3.50-3.95	D2 E2 SPT N=7 B3 D3	3.50	2.90	1,1/1,2,2,2	0.99	3.10 (1.60)	Soft, grey, slightly sandy, silty CLAY with frequent black specs and decayed rootlets. (Alluvium)			
4.50-4.95 5.00	UT1 100% D4	4.50	DRY	01/06/2012: DRY 06/06/2012: 1.20m 8 blows	-0.61	4.70 (1.00)	Soft, brown to dark brown, fibrous PEAT (Alluvium)			
5.30-5.95 5.30-5.95 5.50-5.95	B4 D5 SPT N=12	5.50	1.90	1,1/1,2,4,5	-1.61	5.70	Medium dense, brown grey, fine to coarse SAND and GRAVEL. Gravel is fine to coarse, angular to subangular flints. (River Terrace Deposits)			
7.00-7.45 7.00-7.45	SPT(C) N=7 B5	7.00	3.50	1,2/1,2,2,2						
8.50-8.95 8.50-8.95	SPT(C) N=16 B6	8.50	4.20	2,3/3,4,4,5		(6.60)				
10.00-10.45	SPT(C) N=24	10.00	6.30	4,5/6,7,6,5						

Remarks

2 hrs slow drilling from 27m to 27.5m
30 minutes washing down tools on completion
30 minutes standing for bentonite seal
Chiselling from 2.70m to 3.10m for 1.5 hours.

Scale (approx) 1:50	Logged By HP
Figure No. 20925.BH803	


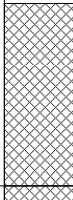

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH803	
Boring Method Cable Percussion		Casing Diameter 200mm cased to 4.00m 150mm cased to 13.00m			Ground Level (mOD) 4.09		Client Quintain Estates and Development PLC		Job Number 20925	
		Location 538906.7 E 179944.1 N			Dates 01/06/2012- 08/06/2012		Engineer Halcrow Group Limited		Sheet 2/3	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-0.45	B7						... as previous			
11.50-11.95 11.50-11.95	SPT(C) N=16 B8	11.50	7.10	2,3/3,4,4,5		(6.60)				
12.50	D6				-8.21	12.30	Very stiff, brown grey to grey laminated, silty CLAY with white staining (London Clay)			
13.00-13.45 13.00-13.45 13.00-13.45	SPT N=31 B9 D7	13.00	11.70	3,5/7,7,8,9						
14.50-14.95	UT2 100%	13.00	DRY	28 blows						
15.00	D8									
16.00-16.45 16.00-16.45 16.00-16.45	SPT N=33 B10 D9	13.00	DRY	3,5/6,8,9,10						
				06/06/2012:DRY 07/06/2012:DRY						
17.50-17.95	UT3 100%	13.00	DRY	31 blows		(10.80)				
18.00	D10						Below 18.0m: Frequent white stains, shells with silty partings			
19.00-19.45 19.00-19.45	SPT N=38 B11	13.00	DRY	6,6/8,9,10,11						
Remarks								Scale (approx) 1:50	Logged By HP	Figure No. 20925.BH803






Boring Method Cable Percussion	Casing Diameter 200mm cased to 4.00m 150mm cased to 13.00m	Ground Level (mOD) 4.09	Client Quintain Estates and Development PLC	Job Number 20925
	Location 538906.7 E 179944.1 N	Dates 01/06/2012- 08/06/2012	Engineer Halcrow Group Limited	Sheet 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
20.50-20.95	U4 100%	1.00	DRY	36 blows			... as previous			
21.00	D11					(10.80)	Below 21.0m: Greenish grey			
22.00-22.45 22.00-22.45	SPT N=50 B12	13.00	DRY	6,8/9,12,13,16			Below 22.00m: Hard			
23.50-23.87 23.50-23.95	SPT 50/220 D12	13.00	13.50	Water strike(2) at 23.10m, rose to 12.10m in 20 mins. 6,15/15,17,18	-19.01	23.10	Very dense, greenish grey to grey, very silty fine SAND laminated with clay bands and some shells. (Lambeth Group)		W2	
25.00-25.33 25.00-25.45	SPT 50/180 D13	13.00	14.70	5,13/17,21,12		(4.00)				
25.50-26.50	B13									
26.50-26.95	D14			07/06/2012:11.90m			Below 26.50m: Strong hydrocarbon odour			
26.50-26.79	SPT 50/135	13.00	11.90	08/06/2012:DRY 9,17/26,24	-23.01	27.10	Very stiff, grey, slightly sandy, slightly gravelly CLAY with hydrocarbon odour. Gravel is fine to coarse, angular to subangular flints.			
27.10 27.10-25.70	E3 B14					(0.90)				
27.50-27.74 27.50-27.95	SPT 28/85 D15			25,22/22,6	-23.91	28.00				
				08/06/2012:			Complete at 28.00m			

Remarks	Scale (approx) 1:50	Logged By HP
	Figure No. 20925.BH803	

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH804		
Boring Method Cable Percussion		Casing Diameter 250mm cased to 1.30m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925		
		Location			Dates 08/06/2012- 11/06/2012		Engineer Halcrow Group Limited		Sheet 1/1		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.80	W1			Water strike(1) at 0.80m, no rise after 5 mins.		(1.20)	MADE GROUND: Dark brown, slightly clayey sandy gravel with some boulders, steel and woods. Gravel is fine to coarse, angular to subangular flints, concrete and brick.		 1		
1.20-1.25	SPT(C) 25*/0 50/50	1.30	0.80	25/50		1.20 (0.20) 1.40	MADE GROUND: Concrete				
							Complete at 1.40m				
Remarks Position moved 1m east to BH804A. Abandoned due to concrete Chiselling from 0.60m to 0.70m for 1 hour. Chiselling from 0.80m to 1.00m for 1 hour. Chiselling from 1.20m to 1.30m for 1.5 hours. Chiselling from 1.30m to 1.40m for 1 hour.										Scale (approx) 1:50	Logged By HP
										Figure No. 20925.BH804	

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH804A	
Boring Method Cable Percussion		Casing Diameter			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
							Engineer Halcrow Group Limited		Sheet 1/1	
		Location			Dates 11/06/2012					
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
						(0.50) 0.50 (0.20) 0.70	MADE GROUND: Dark brown, slightly clayey, sandy gravel with some boulders, steel and woods. Gravel is fine to coarse, angular to subangular flints, concrete and brick. MADE GROUND: Concrete Complete at 0.70m	 		
Remarks Position moved 1m east to BH804B Abandoned due to concrete Chiselling from 0.50m to 0.70m for 3 hours.							Scale (approx) 1:50	Logged By HP	Figure No. 20925.BH804A	



**IAN FARMER
ASSOCIATES**

Site

Peninsula Quays Zone A

**Borehole
Number**

BH804B

Boring Method

Cable Percussion

Casing Diameter

Ground Level (mOD)

Client

Quintain Estates and Development PLC

**Job
Number**

20925

Location

Dates



11/06/2012-
12/06/2012

Engineer

Halcrow Group Limited

Sheet

1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30) 0.30 (0.30) 0.60	MADE GROUND: Dark brown, slightly clayey, sandy gravel with some boulders, steel and woods. Gravel is fine to coarse, angular to subangular flints, concrete and brick. MADE GROUND: Concrete Complete at 0.60m	 	

Remarks

Standing for 40 minutes due to Blacknells in front of position
Abandoned due to concrete
Chiselling from 0.30m to 0.50m for 3.5 hours. Chiselling from 0.50m to 0.60m for 1 hour.

**Scale
(approx)**

1:50

**Logged
By**

HP

Figure No.

20925.BH804B



**IAN FARMER
ASSOCIATES**

Site
Peninsula Quays Zone A

**Borehole
Number**
BH804C

Boring Method
Cable Percussion

Casing Diameter
250mm cased to 3.00m
200mm cased to 13.50m
150mm cased to 31.30m

Ground Level (mOD)

Client
Quintain Estates and Development PLC

**Job
Number**
20925

Location

Dates
12/06/2012-
18/06/2012

Engineer
Halcrow Group Limited

Sheet
1/4

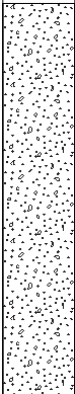
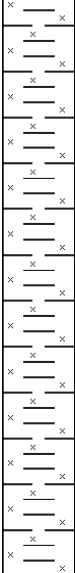
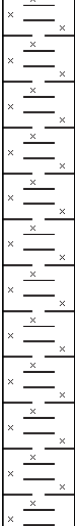




Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
1.50	E1					(1.30)	MADE GROUND: Dark brown, clayey, sandy, gravel. Gravel is fine to coarse, angular to subangular flints, concrete and brick. Between 0.30m and 0.50m: Concrete Between 0.70m and 0.90m: Concrete Below 0.90m: Frequent brick fragments. Below 1.00m: Concrete			
2.00-2.45 2.00-2.45	B1 UT1 N/R	3.00	DRY	19 blows		1.30	Very soft, red brown, silty CLAY with frequent black specks in the matrix (Alluvium) Below 1.50m: Grey			
3.00-3.45 3.00-3.45 3.00-3.45	SPT N=4 B2 D1	3.00	DRY	1,1/1,1,1,1		(3.70)	Below 3.00m: Brown mottled			
4.00-4.45 4.50	UT2 100% D2	4.00	DRY	12/06/2012:DRY 13/06/2012:DRY 20 blows						
5.00-5.45 5.00-5.45	B3 UT3 N/R	5.00	DRY	27 blows		5.00	Soft, dark brown, fibrous PEAT (Alluvium)			
6.00-6.45 6.00-6.45 6.00-6.45	SPT N=5 B4 D3	6.00	DRY	1,1/1,1,2,1		(1.90)				
6.90	W1			Water strike(1) at 6.90m, rose to 4.70m in 15 mins, sealed at 13.00m.		6.90	Medium dense, grey SAND and GRAVEL. Gravel is fine to coarse, angular to subangular flints. (River Terrace Deposits)			
7.50-7.95 7.50-7.95 7.50-7.95	SPT(C) N=12 B5 D4	7.50	4.70	2,2/3,3,3,3						
9.00-9.45 9.00-9.45 9.00-9.45	SPT(C) N=16 B6 D5	9.00	4.70	3,3/3,4,4,5		(5.70)				

Remarks
Undertaken at original BH804 location. Excavated top 1.50m using JCB and backfilled.
Standing for 30 minutes for bentonite seal.

Scale (approx)
1:50

Logged By
HP

Figure No.
20925.BH804C

IAN FARMER ASSOCIATES						Site Peninsula Quays Zone A			Borehole Number BH804C			
Boring Method Cable Percussion		Casing Diameter 250mm cased to 3.00m 200mm cased to 13.50m 150mm cased to 31.30m			Ground Level (mOD)		Client Quintain Estates and Development PLC			Job Number 20925		
		Location					Engineer Halcrow Group Limited			Sheet 2/4		
Depth (m)		Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	Instr
10.50-10.95 10.50-10.95 10.50-10.95		SPT(C) N=14 B7 D6	10.50	4.70	3,3/3,3,4,4		(5.70)	... as previous				
12.00-12.45 12.00-12.45 12.00-12.45		SPT(C) N=19 B8 D7	12.00	12.45	3,3/4,4,5,6		12.60	Stiff, brown grey, fissured, laminated, silty CLAY with some silt partings.				
12.80		D8										
13.50-13.95 13.50-13.95 13.50-13.95		SPT N=25 B9 D9	13.00	DRY	5,5/6,6,6,7							
15.00-15.45		UT4 100%	13.50	DRY	75 blows							
15.50		D10										
16.50-16.95 16.50-16.95 16.50-16.95		SPT N=34 B10 D11	13.50	DRY	6,7/7,9,9,9		(9.40)	Below 16.50m: Encountering some white marks (shells) in the matrix.				
18.00-18.45		UT5 100%	13.50	DRY	90 blows							
18.50		D12										
19.50-19.95 19.50-19.95		B11 D13			13/06/2012:DRY							
19.50-19.95		SPT N=31	13.50	13.20	14/06/2012:13.20m 5,6/7,7,8,9							
Remarks										Scale (approx) 1:50	Logged By HP	
										Figure No. 20925.BH804C		



**IAN FARMER
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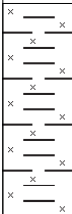
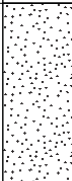
Site Peninsula Quays Zone A	Borehole Number BH804C
Boring Method Cable Percussion	Job Number 20925
Casing Diameter 250mm cased to 3.00m 200mm cased to 13.50m 150mm cased to 31.30m	Engineer Halcrow Group Limited
Location	Sheet 3/4
Ground Level (mOD)	Dates 12/06/2012- 18/06/2012

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
21.00 21.00-21.45 21.00-21.45	W2 B12 UT6 N/R			Water strike(2) at 21.00m, rose to 14.20m in 20 mins. 93 blows		(9.40)	... as previous At 21.00m: Thin band of fine to coarse, gravel.			
22.50-22.81 22.50-22.80 22.50-22.80	SPT 25*/145 50/161 B13 D14	19.50	14.20	10,15/19,23,8		22.00	Very dense, grey, fine silty SAND with clay bands. (Lambeth Group)			
24.00-24.35 24.00-24.10 24.00-24.10	SPT 45/200 B14 D15	24.00	14.20	10,10/14,14,17		(6.10)				
25.50-25.78 25.50-25.80 25.50-25.80 25.90-26.00	SPT 25*/75 50/200 B15 D16 D17	25.50	14.20	25/15,20,15			At 25.90m: Boulder encountered.			
27.00-27.33 27.00-27.30 27.00-27.30	SPT 50/180 B16 D18	27.00	14.20	10,15/,20,20,10		28.10	Hard, grey, laminated, silty CLAY. (Lambeth Group)			
28.50-28.87 28.50-28.90 28.50-28.90	SPT 50/220 B17 D19	29.70	14.20	7,10/15,17,18			Below 29.50m: With frequent shells.			
29.70-30.00 29.70-30.00	B18 D20			14/06/2012:14.20m		(3.30)				

Remarks

Standing for 1hr for bebetonite seal
Chiselling from 25.90m to 26.00m for 1 hour.

Scale (approx) 1:50	Logged By HP
Figure No. 20925.BH804C	

 IAN FARMER ASSOCIATES						Site Peninsula Quays Zone A		Borehole Number BH804C		
Boring Method Cable Percussion		Casing Diameter 250mm cased to 3.00m 200mm cased to 13.50m 150mm cased to 31.30m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
		Location			Dates 12/06/2012- 18/06/2012		Engineer Halcrow Group Limited		Sheet 4/4	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
29.70-29.97	SPT 50/120	31.40	12.50	19,6/,25,25			... as previous			
31.50-31.60 31.50-31.60 31.50-31.55	B19 D21 SPT 25*/0 50/50	31.30	9.50	15/06/2012:12.50m 18/06/2012:9.50m 25/50		31.40 (1.20)	Very dense, blue green fine to medium SAND (Thanet Sand)			
32.50-32.60	D22			18/06/2012:9.50m		32.60				
32.60-32.65	SPT 25*/0 50/50	31.30	9.50	25/50			Complete at 32.60m			
Remarks 2.5hrs freeing casing								Scale (approx) 1:50	Logged By HP	Figure No. 20925.BH804C



**IAN FARMER
ASSOCIATES**

Site Peninsula Quays Zone A		Borehole Number BH805
Boring Method Cable Percussion	Casing Diameter 200mm cased to 4.00m 150mm cased to 13.50m	Ground Level (mOD) 4.62
Client Quintain Estates and Development PLC		Job Number 20925
Location 538862.2 E 179917.2 N		Engineer Halcrow Group Limited
Dates 11/06/2012- 14/06/2012		Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.00	B1						MADE GROUND: Dark brown, clayey, sandy gravel with occasional concrete boulders. Gravel is fine to coarse, angular to subangular flints, concrete, brick, clinker and wood.			
0.50 0.50	D1 E1					(2.10)	Between 1.00m and 1.20m: Concrete. Below 1.20m: Frequent brick fragments			
1.50-1.95 1.50-1.95	SPT(C) N=17 B2	1.50		4,3/4,4,5,4			Between 1.90m and 2.10m: Concrete.			
2.30 2.30 2.50-2.95 2.50-2.95	D2 E2 SPT N=5 B3	2.50		1,1/1,1,1,2	2.52	2.10	Soft, grey, slightly gravelly, slightly sandy, silty CLAY with frequent black specs in the matrix. (Alluvium)			
3.50-3.95	UT1 45%	3.50		9 blows						
4.00	D3					(3.90)	Below 4.00m: Silty clay			
4.50-4.95 4.50-4.95	SPT N=6 B4	5.50		1,1/1,1,2,2			Below 4.50m: Brown mottled			
5.40 5.50-5.95	W1 UT2 45%	5.50		10 blows						
6.00	D4			11/06/2012: 12/06/2012:5.90m	-1.38	6.00	Soft, dark brown fibrous PEAT (Alluvium)			
7.00-7.45 7.00-7.45	B5 SPT(C) N=12	7.00	5.90	Water strike(1) at 6.60m, rose to 5.40m in 20 mins, sealed at 13.00m. 1,2/2,3,4,3	-1.98	6.60	Grey, fine to coarse SAND and GRAVEL. Gravel is fine to coarse, angular to subangular flints. (River Terrace Deposits)			
8.50-8.95 8.50-8.95	SPT(C) N=15 B6	8.50	6.20	2,3/2,4,4,5						
10.00-10.45	SPT(C) N=20	10.00	6.50	3,3/5,4,5,6		(6.50)				

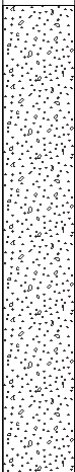

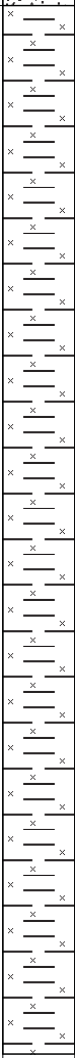
Remarks

Groundwater seepages throughout made ground
30 minutes standing for bentonite seal. 30 minutes standing due to Blackwell's machine in location of borehole.
Chiselling from 1.00m to 1.20m for 1 hour. Chiselling from 1.90m to 2.10m for 0.5 hours.

Scale (approx)
1:50

Logged By
HP

Figure No.
20925.BH805

IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH805	
Boring Method Cable Percussion		Casing Diameter 200mm cased to 4.00m 150mm cased to 13.50m			Ground Level (mOD) 4.62		Client Quintain Estates and Development PLC		Job Number 20925	
		Location 538862.2 E 179917.2 N			Dates 11/06/2012- 14/06/2012		Engineer Halcrow Group Limited		Sheet 2/3	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45	B7						... as previous			
11.50-11.95 11.50-11.95	SPT(C) N=13 B8	11.50	11.95	2,2/2,3,4,4		(6.50)				
13.00-13.45 13.10-13.45	SPT(C) N=44 B9	13.00	13.45	4,5/9,9,11,15	-8.48	13.10	Very stiff, brown grey to blue grey, fissured, laminated, silty CLAY with some silty partings.		▼2	
14.00	D5									
14.50-14.95	UT3 45%	13.50		40 blows						
15.00	D5									
16.00-16.45 16.00-16.45	SPT N=39 B10	13.50	16.45	4,6/8,9,11,11						
17.50-17.95	UT4 45%	13.50		30 blows		(8.70)				
18.00	D4									
19.00-19.45 19.00-19.45	SPT N=41 B11	13.50		5,6/9,9,11,12						
Remarks								Scale (approx)	Logged By	
								1:50	HP	
								Figure No. 20925.BH805		



**IAN FARMER
ASSOCIATES**

Site
Peninsula Quays Zone A

**Borehole
Number**
BH805

Boring Method Cable Percussion	Casing Diameter 200mm cased to 4.00m 150mm cased to 13.50m	Ground Level (mOD) 4.62	Client Quintain Estates and Development PLC	Job Number 20925
	Location 538862.2 E 179917.2 N	Dates 11/06/2012- 14/06/2012	Engineer Halcrow Group Limited	Sheet 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
20.50-20.95	UT5 45%	13.50		30 blows			... as previous			
21.00	D5					(8.70)	Below 21.00m: With some white shells.			
22.00-22.43	SPT 51/275	13.50		Water strike(2) at 21.80m, rose to 13.20m in 20 mins. 4,9/12,12,16,11	-17.18	21.80	Very dense, grey, silty fine SAND. Laminated with clay bonds. (Lambeth Group)		V2	
22.60	D6			12/06/2012:			Between 22.50m and 22.70m: Fine to coarse angular to subrounded flint gravel band with some shells.			
23.00	E3			13/06/2012:9.40m			Below 23.00m: Slight hydrocarbon odour			
23.50-23.86 23.50-23.95	SPT 50/210 B12	13.50	9.40	5,8/14,21,15						
25.00-25.33	SPT 50/180	13.50	6.10	6,15/16,24,10		(6.30)				
26.50-26.78	SPT 50/125	13.50	4.20	11,15/29,21			Below 26.50m: Some shells encountered			
28.00-28.45 28.00-28.45	SPT N=46 B13	13.50	5.10	5,7/9,11,12,14	-23.48	28.10	Stiff to very stiff, grey laminated, silty CLAY with frequent shells. (Lambeth Group)			
29.00	D7					(1.51)				
29.20-29.61	SPT 50/255	13.50	7.70	7,9/11,13,17,9	-24.99	29.61				
				13/06/2012:7.70m			Complete at 29.61m			
				14/06/2012:						

Remarks	Scale (approx) 1:50	Logged By HP
	Figure No. 20925.BH805	



**IAN FARMER
ASSOCIATES**

Site

Peninsula Quays Zone A

**Borehole
Number**

BH807

Boring Method

Cable Percussion

Casing Diameter

Ground Level (mOD)

3.42

Client

Quintain Estates and Development PLC

**Job
Number**

20925

Location

538954.6 E 179956.8 N

Dates


12/06/2012

Engineer

Halcrow Group Limited

Sheet

1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							MADE GROUND: Dark brown, clayey, sandy gravel with frequent concrete boulders and steel, plastic and wood. Gravel is fine to coarse, angular to subangular flints, concrete, brick, clinker, tiles and limestones. Between 0.80m to 0.95m: Concrete floor (or concrete boulder?)		
					2.22	1.20	At 1.20m: Concrete floor (boulders?) Complete at 1.20m		

Remarks

Stopped at 1.20m due to obstruction.
Chiselling from 0.80m to 0.95m for 1 hour. Chiselling from 1.20m to 1.20m for 0.75 hours.

**Scale
(approx)**

1:50

**Logged
By**

HP

Figure No.

20925.BH807



**IAN FARMER
ASSOCIATES**

Site
Peninsula Quays Zone A

**Borehole
Number**
BH807A

Boring Method
Cable Percussion

Casing Diameter
250mm cased to 2.50m
200mm cased to 12.00m
150mm cased to 30.30m

Ground Level (mOD)

Client
Quintain Estates and Development PLC

**Job
Number**
20925

Location

Dates
19/06/2012-
26/06/2012

Engineer
Halcrow Group Limited

Sheet
1/4

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
2.90 3.00-3.45 3.00-3.45	E1 SPT N=2 B1	3.00	DRY	1/1,,1		(2.00)	MADE GROUND: Dark brown, clayey, sandy gravel with frequent tarmac and concrete boulders, steel bars, plastic and wood. Gravel is fine to coarse, angular to subangular flints, concrete, brick, clinker, tiles and limestone.			
3.45	D1					2.00	Between 1.20m to 1.30m: Tarmac			
3.80	D2						At 1.90m: Reinforced concrete (0.75m thick)			
4.00-4.45	UT1	4.00	DRY	11 blows		3.90	Soft, dark brown to grey, slightly sandy, silty CLAY with some black specs and decayed rootlets. (Alluvium)			
4.50	D3					(1.45)				
5.00-5.45 5.00-5.45 5.00-5.45	SPT N=15 B2 D4	5.00	DRY	2,3/3,4,4,4		5.35	Soft, dark brown/grey fibrous PEAT			
5.50	W1			Water strike(1) at 5.35m, rose to 4.30m in 20 mins. 19/06/2012: DRY						
6.00-6.45 6.00-6.45 6.00-6.45	B3 SPT(C) N=10 D5	5.50	4.30	20/06/2012: 4.30m 2,2/2,3,2,3			Medium dense, grey, fine to coarse SAND and GRAVEL. Gravel is angular to subangular flints. (River Terrace Deposits)			
7.50-7.95 7.50-7.95 7.50-7.95	SPT(C) N=17 B4 D6	7.50	4.30	3,5/5,3,5,4		(5.85)				
9.00 9.00-9.45 9.00-9.45	W2 B5 D7			Water strike(2) at 9.00m, rose to 7.00m in 20 mins, sealed at 11.00m. 3,3/4,4,5,5						
9.00-9.45	SPT(C) N=18	9.00	7.00							

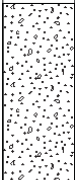
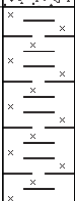
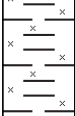
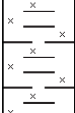
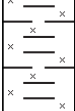
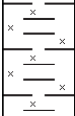
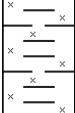
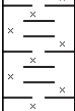
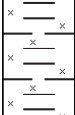
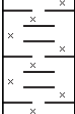
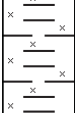
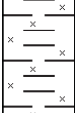
Remarks


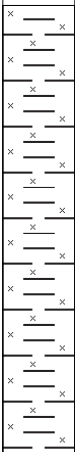
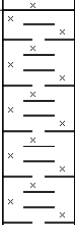
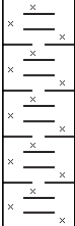
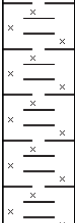
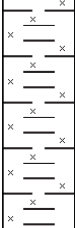
Ground level to 2.00m wase-excauvated/broken out and backfilled by JCB
Water added from 5.35m to 11.20m.

Scale (approx)
1:50

Logged By
HP

Figure No.
20925.BH807A

IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH807A		
Boring Method Cable Percussion		Casing Diameter 250mm cased to 2.50m 200mm cased to 12.00m 150mm cased to 30.30m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925		
		Location									Dates 19/06/2012- 26/06/2012
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
10.50-10.95 10.50-10.95 10.50-10.95	SPT(C) N=24 B6 D8	10.50	7.00	5,5/5,6,6,7		(5.85)	... as previous				
11.50	D9					11.20	Stiff, grey, fissured, laminated silty CLAY (London Clay Formation)				
12.00-12.45	UT2 100%	12.00	DRY	80 blows							
12.50	D10							Below 12.50m: With some white shell fragments.			
13.50-13.95 13.50-13.95 13.50-13.95	SPT N=28 B7 D11	12.00	DRY	6,6/6,7,7,8							
15.00-15.45	UT3 100%	12.00	DRY	80 blows			Below 16.50m: Very stiff				
15.50	D12										
16.50-16.95 16.50-16.95 16.50-16.95	SPT N=37 B8 D13	12.00	DRY	5,6/7,9,10,11		(11.80)					
18.00-18.45	UT4 100%	12.00	DRY	87 blows							
18.50	D14										
19.50-19.95 19.50-19.95	B9 D15										
19.50-19.95	SPT N=42	12.00	18.00	20/06/2012:DRY 21/06/2012:18.00m 10,10/10,10,11,11							
Remarks								Scale (approx) 1:50	Logged By HP	Figure No. 20925.BH807A	

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A			Borehole Number BH807A	
Boring Method Cable Percussion		Casing Diameter 250mm cased to 2.50m 200mm cased to 12.00m 150mm cased to 30.30m			Ground Level (mOD)		Client Quintain Estates and Development PLC			Job Number 20925	
		Location									
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
21.00-21.45	UT5 100%	21.45	DRY	85 blows			... as previous				
21.45	D16					(11.80)					
22.50-22.90 22.50-22.95 22.50-22.95	SPT 50/245 B10 D17	12.00	DRY	10,11/14,14,15,7							
23.00 23.10 23.20-23.60 23.20-23.60 23.20-23.58	D18 W3 B11 D19 SPT 50/225	12.00	14.80	Water strike(3) at 23.10m, rose to 14.80m in 20 mins. 10,10/13,17,20		23.00	Very stiff to hard, blueish grey to greenish grey, silty CLAY with frequent sand bands and frequent . (Lambeth Group)		V3		
24.00-24.37 24.00-24.40 24.00-24.40	SPT 50/220 B12 D20	12.00	14.80	6,15/16,17,17			Below 24.50m: Grey				
25.50-25.73 25.50-25.75 25.50-25.75	SPT 50/75 B13 D21	12.00	14.80	10,14/50							
26.50	W4			21/06/2012:14.80m 22/06/2012:FULL		(6.00)	At 26.10m: Slight smell of hydrocarbon Below 26.50m: With hydrocarbon odour within sand bands.				
27.00-27.35 27.00-27.40 27.00-27.40	SPT 50/200 B14 D22	12.00	0.00	10,14/15,17,18							
28.50-28.78 28.50-28.80 28.50-28.80	SPT 50/125 B15 D23	12.00	0.00	10,15/30,20							
29.20	D24			22/06/2012:FULL 25/06/2012:FULL		29.00	Very stiff to hard, grey slightly cemented silty CLAY with frequent shells. Below 29.30m: No shell fragments				
30.00-30.39	SPT 50/235	12.00	0.00	6,11/12,13,17,8							
Remarks Chiselling from 29.00m to 29.30m for 0.75 hours.								Scale (approx)	Logged By		
								1:50	HP		
								Figure No. 20925.BH807A			



**IAN FARMER
ASSOCIATES**

Site
Peninsula Quays Zone A

**Borehole
Number**
BH807A

Boring Method Cable Percussion	Casing Diameter 250mm cased to 2.50m 200mm cased to 12.00m 150mm cased to 30.30m		Ground Level (mOD)	Client Quintain Estates and Development PLC	Job Number 20925
	Location		Dates 19/06/2012- 26/06/2012	Engineer Halcrow Group Limited	Sheet 4/4

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
30.00-30.40 30.00-30.40	B16 D25					(2.50)	... as previous			
32.00-32.10 32.00-32.10	B17 D26			25/06/2012:FULL		31.50	Very dense, greenish grey slightly, clayey, silty fine SAND (Thanet Sand Formation)			
32.00-32.13	SPT 25*/75 50/50	30.30	5.30	26/06/2012:5.30m 25/50		(1.60)				
33.00-33.09 33.00-33.10	SPT 25*/40 50/45 D27	30.30	5.30	25/50 26/06/2012:5.30m		33.10	Complete at 33.10m			

Remarks Chiselling from 32.00m to 33.00m for 2 hours.								Scale (approx) 1:50	Logged By HP
								Figure No. 20925.BH807A	



Boring Method Cable Percussion	Casing Diameter 200mm cased to 3.00m 150mm cased to 13.00m		Ground Level (mOD) 4.17	Client Quintain Estates and Development PLC	Job Number 20925
	Location 538894 E 179919.3 N		Dates 28/05/2012- 31/05/2012	Engineer Halcrow Group Limited	Sheet 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50 0.50	D1 E1					(1.50)	MADE GROUND: Brown, slightly clayey, slightly silty, gravelly, cobbly, fine to coarse sand. Gravel is fine to coarse, angular to subangular of stone, flint, brick and concrete.		▼1
1.00-1.45	SPT(C) N=36			28/05/2012: 29/05/2012: 3,6/13,7,7,9 Water strike(1) at 1.30m, rose to 1.20m in 20 mins.	2.67 2.47	1.50 (0.20) 1.70	MADE GROUND: Concrete		
1.80 1.80	D2 E2						Very soft, grey, silty CLAY. (Alluvium)		
2.30-2.60	SPT 1*/75 3/225	2.00	DRY	1/1,,1,1					
2.30-2.75	B1								
2.30-2.75	D3								
3.00-3.45	UT1 45%	3.00	DRY	12 blows					
3.50	D4					(3.50)			
4.00-4.45	SPT N=6	4.00	DRY	1,1/1,2,1,2			Below 4.00m: Soft		
4.00-4.45	B2								
4.00-4.45	D5								
5.00	D6								
5.00-5.45	UT2 45%	4.50	DRY	6 blows	-1.03	5.20	Firm, dark brown, very clayey pseudo fibrous PEAT(Alluvium)		▼2
5.30	W1					(1.00)			
6.00-6.45	SPT N=15	6.00	4.00	2,2/3,5,3,4 Water strike(2) at 6.10m, rose to 5.30m in 20 mins, sealed at 13.00m.	-2.03	6.20	Loose, grey, fine to coarse SAND fine to coarse, angular to subrounded flint GRAVEL (River Terrace Deposits)		▼2
6.00-6.45	B3								
6.00-6.45	D7								
7.00-7.45	SPT(C) N=7	7.00	3.80	1,1/2,2,1,2					
7.00-7.45	B4								
8.00-8.45	SPT(C) N=6	8.00	4.90	1,2/1,2,2,1					
8.00-8.45	B5								
9.00-9.45	SPT(C) N=6	9.00	5.10	1,2/1,2,1,2		(6.40)			
9.00-9.45	B6								
10.00-10.45	SPT(C) N=16	10.00	10.45	2,2/3,4,5,4					


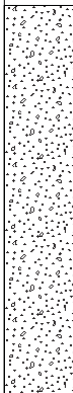
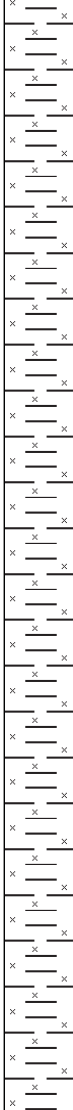
Remarks

30 minutes standing for bentonite seal.
3 hours standing awaiting permit to dig
3 hours slow drilling from 25.10 to 27.90m
Borehole backfilled with bentonite
Chiselling from 1.50m to 1.70m for 0.5 hours.

**Scale
(approx)**
1:50

**Logged
By**
AO

Figure No.
20925.BH808






















































 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH808	
Boring Method Cable Percussion		Casing Diameter 200mm cased to 3.00m 150mm cased to 13.00m			Ground Level (mOD) 4.17		Client Quintain Estates and Development PLC		Job Number 20925	
		Location 538894 E 179919.3 N			Dates 28/05/2012-31/05/2012		Engineer Halcrow Group Limited		Sheet 2/3	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
10.00-10.45	B7						... as previous Below 10.00m: Medium dense			
11.00-11.45 11.00-11.45	SPT(C) N=17 B8	11.00	6.20	3,4/3,4,5,5		(6.40)				
12.00-12.45 12.00-12.45	SPT(C) N=14 B9	12.00	12.45	2,2/3,4,3,4						
12.80	D8				-8.43	12.60	Stiff, grey brown, slightly silty CLAY. (London Clay Formation)			
13.00-13.45 13.00-13.45	B10 D9			29/05/2012:0.70m			Below 13.00m: Laminated			
13.00-13.45	SPT N=22	13.00	6.70	30/05/2012:6.70m 3,4/4,5,6,7						
14.00-14.45	UT3 45%	13.00	DRY	31 blows			Below 14.00m: Occasionally fissured			
14.50	D11									
15.00-15.45 15.00-15.45 15.00-15.45	SPT N=24 B11 D12	13.00	DRY	4,5/5,6,6,7			Below 15.00m: With silty fine sand partings.			
16.00-16.45	UT4 35%	13.00	DRY	39 blows			Below 16.00m: Very stiff, sandy with fine to medium sand sized shell fragments. Sand is fine.			
16.50	D13									
17.00-17.45 17.00-17.45 17.00-17.45	SPT N=41 B12 D14	13.00	DRY	6,9/10,11,10,10		(10.10)				
18.00-18.45	UT5 45%	13.00	DRY	33 blows						
18.50	D8						Below 18.50m: Slightly silty. fissured. No sand or laminations.			
19.00-19.45 19.00-19.45 19.00-19.45	SPT N=26 B13 D15	13.00	DRY	5,4/5,6,6,9						
Remarks								Scale (approx)	Logged By	
								1:50	AO	
								Figure No. 20925.BH808		


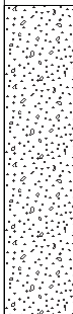
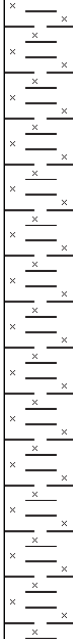



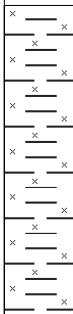
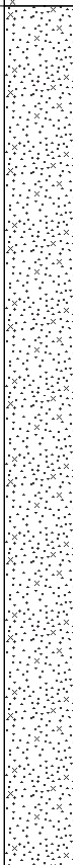

Boring Method Cable Percussion	Casing Diameter 200mm cased to 3.00m 150mm cased to 13.00m	Ground Level (mOD) 4.17	Client Quintain Estates and Development PLC	Job Number 20925
	Location 538894 E 179919.3 N	Dates 28/05/2012- 31/05/2012	Engineer Halcrow Group Limited	Sheet 3/3


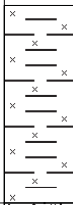
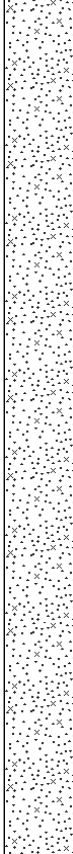
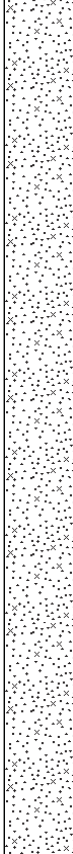
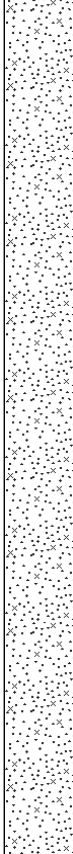
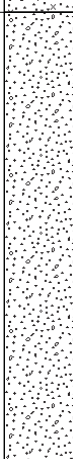
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.00-20.45	U6 45%	13.00	DRY	33 blows			... as previous		
20.50	D16								
21.00-21.45	B14					(10.10)			
22.00-22.45	UT7 40%	13.00	DRY	40 blows					
22.50	D17				-18.53	22.70	Below 22.50m: Sandy		
23.00	D18					(0.80)	Dark grey green, silty, fine to medium SAND with shell fragments. (Lambeth Group)		▽3
23.50-23.83	SPT 50/180	13.00	13.70	Water strike(3) at 23.10m, rose to 12.90m in 20 mins. 9,16/19,21,10	-19.33	23.50	Very dense light grey, slightly clayey, silty fine SAND (Lambeth Group)		
				30/05/2012:13.70m		(1.60)			
24.40 24.50-24.95 24.50-24.95	D19 SPT N=51 D20	13.00	9.90	4,8/10,10,14,17			Below 24.40m: Slightly gravelly Below 24.50m: No clay or gravel		
25.10	D21				-20.93	25.10	Very stiff, silty, sandy grey CLAY with bands of silty, laminated sand and occasional shell fragments. (Lambeth Group)		
25.50-25.80 25.50-25.95 25.50-25.95	SPT 50/145 B15 D22	13.00	10.50	11,13/19,31					
26.50-26.79 26.50-26.95	SPT 50/135 B16	13.00	11.00	8,13/27,23		(2.80)	Below 26.50m: Laminated silty clay with sweet hydrocarbon odour.		
27.50-27.79 27.50-27.95	SPT 50/135 D23	13.00	12.00	9,13/23,27			Below 27.50m: With much fragmented shell		
28.00-28.50 28.30	B17 D24				-23.73	27.90	Very stiff, grey, slightly silty, slightly sandy CLAY with occasional shell fragments and fine to medium rounded black gravel. (Lambeth Group)		
28.50-28.95 28.50-28.95	SPT N=53 D25	13.00	13.90	3,8/10,11,13,19		(1.10)			
					-24.83	29.00	Complete at 29.00m		



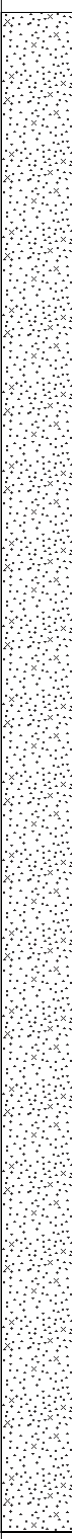
Remarks	Scale (approx)	Logged By
	1:50	AO
	Figure No. 20925.BH808	




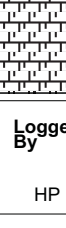
 IAN FARMER ASSOCIATES						Site Peninsula Quays Zone A		Borehole Number BH806		
Boring Method Cable percussion to 40.00m. Rotary open hole to 51.50m. Rotary core to base.		Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
		Location					Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.00-1.00	B1	2.00		1,0/1,1,1,1		(0.10)	MADE GROUND: Concrete floor		▽1	
						0.10				
						(0.20)	MADE GROUND: Reinforced concrete			
0.50	D1					0.30	MADE GROUND: Dark brown sandy gravel			
0.50	E1					(0.20)	MADE GROUND: Concrete			
						(0.10)	MADE GROUND: Dark brown sandy gravel			
1.00-1.45	SPT(C) N=4					(0.10)	MADE GROUND: Concrete			
1.00-1.45	B2					(0.20)	MADE GROUND: Gravel, with water seepage			
						(0.10)	MADE GROUND: Concrete			
						1.00	Soft, dark grey mottled black, slightly sandy, silty CLAY (Alluvium)			
2.00	D2	3.00		15 blows		(0.30)	Soft to very soft, grey mottled black, silty CLAY with occasional pockets of decayed rootlets (Alluvium)		▽2	
2.00	E2					1.30				
2.00-2.50	B3					(0.40)				
2.00-2.50	U1 No Recovery					1.70				
										
										
										
										
										
										
3.00-3.45	SPT N=7	4.00		3,2/1,2,2,2		(2.80)			▽2	
3.00-3.45	B4									
										
										
										
										
										
										
										
										
4.00-4.45	U2 45%	4.50		7 blows			Soft, dark brown, fibrous PEAT (Alluvium)		▽2	
										
4.50	D3									
										
										
										
										
										
										
										
5.00-5.45	SPT N=6	5.20	5.00	1,1/1,1,2,2					▽2	
5.00-5.45	B5									
5.40	W1									
										
										
										
										
										
										
										
6.00-6.45	U3 35%	7.00	5.20	19 blows					▽2	
										
6.50	D4	8.00	5.00	Water strike(2) at 6.30m, rose to 5.40m in 20 mins, sealed at 12.50m.			Wet, medium dense, grey, fine to coarse SAND and GRAVEL. Gravel is fine to coarse, angular to subangular flint (River Terrace Deposits)		▽2	
7.00-7.45	SPT(C) N=10	9.00	5.90	1,2/2,3,2,3					▽2	
7.00-7.45	B6									
8.00-8.45	SPT(C) N=8	9.00	5.90	1,2/2,2,2,2					▽2	
8.00-8.45	B7									
9.00-9.45	SPT(C) N=10	10.00	6.10	2,2/3,3,3,3					▽2	
9.00-9.45	B8									
10.00-10.45	SPT(C) N=12									
Remarks The following 0.60m was initially cleared from the surface with a JCB: MADE GROUND: Dark brown, slightly clayey, sandy gravel. Gravel is fine to coarse, angular to subangular flints, limestone, concrete and bricks. A further 1.40m was then broken out, excavated and backfilled by the JCB prior to boring commencing.								Scale (approx) 1:50	Logged By HP	
								Figure No. 20925.BH806		



<div> IAN FARMER ASSOCIATES</div>							Site Peninsula Quays Zone A		Borehole Number BH806		
Boring Method Cable percussion to 40.00m. Rotary open hole to 51.50m. Rotary core to base.		Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925		
		Location			Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited		Sheet 2/7		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
10.00-10.45	B9						... as previous				
11.00-11.45 11.00-11.45	SPT(C) N=15 B10	11.00	6.50	2,4/4,3,4,4		(5.80)	Stiff to very stiff, fissured, laminated silty CLAY (London Clay Formation)				
12.00-12.45 12.20-12.45 12.50	SPT(C) N=50 B11 D5	12.00	6.90	5,9/12,18,20		12.10					
13.00-13.45	B12			18/06/2012:9.70m							
13.00-13.45	SPT N=27	13.00	7.80	19/06/2012: 3,5/6,6,7,8							
14.00-14.45	U4 6.			25 blows							
14.50	D6										
15.00-15.45 15.00-15.45	SPT N=33 B13	13.00		4,6/7,8,9,9							
16.00-16.45	U5										
17.00-17.45 17.00-17.45	SPT N=39 D7	13.00		3,5/7,10,11,11		(10.10)		At 16.50m: Sand band			
								Below 17.00m: With some white shells			
18.00-18.45	U6										
19.00-19.45 19.00-19.45	SPT 48/295 B14	13.00		5,7/9,12,14,13							
Remarks								Scale (approx) 1:50	Logged By HP		
								Figure No. 20925.BH806			




							Site Peninsula Quays Zone A		Borehole Number BH806	
Boring Method Cable percussion to 40.00m. Rotary open hole to 51.50m. Rotary core to base.		Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
		Location			Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited		Sheet 3/7	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
20.00-20.45	U6	13.00		5,9/12,13,15,10		(10.10)	... as previous		V3	
20.50	D8									
21.00-21.41 21.00-21.45	SPT 50/255 B15									
22.00-22.45 22.00-22.45	SPT N=50 B16	13.00		6,7/9,11,15,15 Water strike(3) at 22.20m, rose to 19.10m in 20 mins.		22.20	Very dense, grey silty, fine SAND inbedded with clay bands. (Lambeth Group)			
23.00-23.40 23.00 23.00-23.45	SPT 50/245 E3 B17	23.00		5,7/12,15,16,7			At 23.00m: Slight hydrocarbon odour.			
24.00-24.35 24.00-24.45	SPT 50/200 B18	24.00		5,12/13,22,15 19/06/2012:9.20m 20/06/2012:						
25.00-25.35 25.00-25.45	SPT 50/200 B19	24.00	6.70	5,11/17,21,12		(5.70)				
25.90 26.00-26.23 26.00-26.45	E4 SPT 50/75 B20	24.00	6.70	5,9/24,26			Below 25.90m: Strong hydrocarbon odour.			
27.00-27.35 27.00-27.45	SPT 50/200 B21	24.00	6.70	13,14/14,18,18						
28.00-28.13 28.00 28.00-28.45 28.50	SPT(C) 25*/75 50/50 D9 B22 D10	13.00	5.90	25/50 20/06/2012:5.90m 21/06/2012:		27.90	Hard, grey cemented silty CLAY with frequent shells. (Lambeth Group)			
29.00-29.45 29.00-29.45	SPT N=50 B23	29.00	4.70	7,11/22,28		(3.40)				
30.00-30.28	SPT 50/125	30.00	5.60	11,12/19,31						
Remarks Chiselling from 27.90m to 28.30m for 1 hour. Water added from 22.20m to 24.50m. Water added from 24.50m to 29.00m. Water added from 29.00m to 34.50m.								Scale (approx)	Logged By	
								1:50	HP	
								Figure No. 20925.BH806		


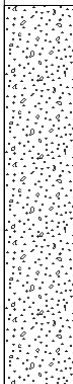
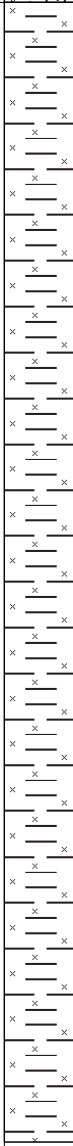
 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH806	
Boring Method Cable percussion to 40.00m. Rotary open hole to 51.50m. Rotary core to base.		Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
		Location			Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited		Sheet 4/7	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
30.00-30.45	B24					(3.40)	... as previous			
31.00-31.45 31.00-31.45	SPT N=50 B25	31.00	31.45	10,13/25,25		31.30	Very dense, light grey to greenish grey, silty fine SAND. (Thanet Sand)			
31.80	D11									
32.00-32.26 32.00-32.45	SPT 50/105 B26	32.00	5.90	12,14/28,22			Below 35.00m: Blueish green			
33.00-33.22 33.00-33.45	SPT 50/70 B27	33.00	6.30	11,17/50						
34.00-34.28 34.00-34.45	SPT 50/125 B28	34.00	4.70	8,13/26,24		(5.70)				
				21/06/2012:4.70m 22/06/2012:4.10m						
35.00-35.28 35.00-35.45	SPT 50/125 B29	34.00	4.10	7,14/23,27			Below 35.00m: Blueish green			
36.00-36.29 36.00-36.45	SPT 50/135 B30	34.00	4.10	8,17/16,34						
				22/06/2012:4.10m 26/06/2012:4.70m						
37.00-37.35 37.00-37.45	SPT 50/200 B31	37.00	4.70	12,14/33,17		37.00				
38.00-38.25	SPT 50/95	37.00	4.70	9,17/35,15		(3.00)	Very dense, grey, gravelly, fine to coarse SAND. Gravel is fine to coarse, angular to subrounded flint. (Thanet Sand)			
39.00-39.22	SPT 50/70	38.20	4.70	9,15/50						
40.00				26/06/2012:4.70m		40.00				
Remarks								Scale (approx)	Logged By	
								1:50	HP	
								Figure No. 20925.BH806		















 IAN FARMER ASSOCIATES								Site Peninsula Quays Zone A		Borehole Number BH806		
Machine : Comacchio 450 Flush : Air / Mist Core Dia: 92 mm Method : Open Hole / Coring			Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925		
			Location			Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited		Sheet 5/7		
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
							 (10.00)	Very dense, grey, silty fine SAND. (Thanet Sand)				
50.00							50.00					
Remarks									Scale (approx)		Logged By	
									1:50			HP
									Figure No. 20925.BH806			


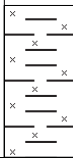
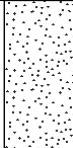
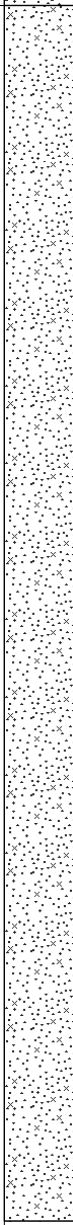
 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH806		
Machine : Comacchio 450 Flush : Air / Mist Core Dia: 92 mm Method : Open Hole / Coring			Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
			Location			Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited		Sheet 6/7	
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
51.50	NR	NR	NR	NR			(1.50)	Structureless CHALK (Dm)			
	100%	100%	65%	51.50			Moderately strong, high density white, unstained CHALK. bedding fractures are approximate frimotal, close to medium spaced (50/140/180), clean and tight and unstained. Flint absent (A4) at 52.40m: Became moderately weak.				
	96%	96%	55%								
	93%	79%	48%				At 54.50m: A3 (medium spaced) (160/80/240) Flint gravel at 53.30m, 53.6, 54m and 54.30m. Between 54.40m and 54.70m: Creamy green, very silty fine sand. Between 54.70m and 54.90m: A4 Below 54.90m: A3 Below 54.90m: Medium spaced (250/330) A2				
	84%	79%	63%				At 55.75m: Flints At 56.00m: Flints Below 56.30m: A2				
53.00							(9.00)	At 57.40m: Flints Below 57.50m: Light grey stain in depth occasional orange brown stains in the matrix. At 57.67: Flint gravel Below 57.84: Fractures are sub-vertical (85/5) closed spaced with no stain			
54.50								At 58.60m: Flint gravels			
56.00								Below 59.34: A2 Fractures medium spaced clayed and unstained formontal. At 58.60m: Flint gravels.			
57.50	100%	93%	83%								
59.00	100%	100%	85%								
Remarks									Scale (approx)	Logged By	
									1:50	HP	
									Figure No. 20925.BH806		

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH806	
Machine : Comacchio 450 Flush : Air / Mist Core Dia: 92 mm Method : Open Hole / Coring			Casing Diameter 250mm cased to 2.50m 200mm cased to 12.50m 150mm cased to 31.50m		Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
			Location		Dates 15/06/2012- 22/06/2012		Engineer Halcrow Group Limited		Sheet 7/7	
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
60.50							(9.00)	... as previous		
							60.50	Complete at 60.50m		
Remarks								Scale (approx) 1:50		Logged By HP
								Figure No. 20925.BH806		

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH809				
Boring Method Cable Percussion		Casing Diameter 250mm cased to 2.00m 200mm cased to 13.00m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925				
		Location									Dates 26/06/2012-02/07/2012		Engineer Halcrow Group Limited
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water				
0.50-1.00	B1	2.50	DRY	1, 1/1, 2, 1, 2 26/06/2012: 27/06/2012: DRY 12 blows		(0.15) 0.15	MADE GROUND: Reinforced concrete						
1.00 1.00	D1 E1					(0.95) 1.10	MADE GROUND: Dark red, very sandy gravel. Gravel is fine to coarse, angular to subangular brick and concrete fragments.						
						(0.60) 1.70	MADE GROUND: Concrete						
2.00-2.45 2.00 2.00 2.00	SPT N=6 B2 D2 E2					(0.20) 1.90	Soft, dark brown to grey, slightly sandy, silty CLAY with frequent black specs and occasional decayed rootlets.						
							Soft, dark brown to dark grey slightly sandy, silty CLAY with frequent black specs and occasional peat pockets. (Alluvium)						
3.00-3.45	U1 45%												
3.50	D3					(2.80)							
4.00-4.45 4.00-4.45	SPT N=6 B3					4.00	DRY			1, 1/1, 1, 2, 2		4.70	
5.00-5.45	U2 45%					4.50	DRY			11 blows		(1.20)	Soft, dark brown, fibrous PEAT (Alluvium)
5.50	D4											5.90	
6.00-6.45	B4	6.00	5.30	Water strike(1) at 5.90m, rose to 5.30m in 20 mins, sealed at 13.00m. 1, 2/2, 2, 2, 3			Medium dense, grey SAND and GRAVEL. Gravel is fine to coarse, angular to subangular flints. (River Terrace Deposits)						
6.00-6.45	SPT(C) N=9												
7.00-7.45 7.00-7.45	SPT(C) N=10 B5												
8.00-8.45 8.00-8.45	SPT(C) N=11 B6												
9.00-9.45 9.00-9.45	SPT(C) N=8 B7	9.00	5.10	1, 2/1, 2, 2, 3		(6.60)							
10.00-10.45	SPT(C) N=14	10.00	6.00	1, 2/3, 3, 4, 4									
Remarks Water added from 6.00m to 12.50m.								Scale (approx) 1:50	Logged By HP	Figure No. 20925.BH809			

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH809	
Boring Method Cable Percussion		Casing Diameter 250mm cased to 2.00m 200mm cased to 13.00m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925	
		Location			Dates 26/06/2012- 02/07/2012		Engineer Halcrow Group Limited		Sheet 2/6	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
10.00-10.45	B8						... as previous			
11.00-11.45 11.00-11.45	SPT(C) N=18 B9	11.00	5.80	1,2/2,3,6,7		(6.60)				
12.00-12.45 12.00-12.45	SPT(C) N=7 B10	12.00	6.10	1,2/1,2,2,2		12.50	Stiff to very stiff, grey, fissured, silty CLAY (London Clay Formation)			
12.80	D5									
13.00-13.45 13.00-13.45	SPT N=27 B11	13.00	DRY	3,5/6,7,7,7						
14.00-14.45	UT1									
14.50	D6									
15.00-15.45 15.00-15.45	SPT N=38 B12	13.00	DRY	3,5/7,9,11,11						
16.00-16.45	UT2									
16.50	D7			27/06/2012:DRY 28/06/2012:6.10m			Below 16.50m: Laminated silty partings			
17.00-17.45 17.00-17.45	SPT N=43 B13	13.00	6.10	4,6/9,10,11,13						
18.00-18.45	UT3 45%	13.00	7.50	36 blows						
18.50	D8					(11.70)	Below 18.50m: Frequent white shells in the matrix			
19.00-19.45 19.00-19.45	SPT N=41 B14	13.00	8.10	4,7/9,9,11,12						
Remarks								Scale (approx)	Logged By	
								1:50	HP	
								Figure No. 20925.BH809		

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH809
Boring Method Cable Percussion		Casing Diameter 250mm cased to 2.00m 200mm cased to 13.00m 150mm cased to 31.50m		Ground Level (mOD)		Client Quintain Estates and Development PLC	Job Number 20925		
		Location		Dates 26/06/2012-02/07/2012		Engineer Halcrow Group Limited	Sheet 3/6		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.00-20.45	UT4						... as previous		
20.50	D9								
21.00-21.45 21.00-21.45	SPT N=42 B15	13.00	12.70	6,7/9,10,11,12					
22.00-22.45	U3					(11.70)			
22.50	D10								
23.00-23.45 23.00-23.45	SPT N=41 B16	13.00	14.40	5,7/8,10,10,13					
24.00-24.45 24.30	U4 D11					24.20 (0.20) 24.40	Grey SAND and GRAVEL. Gravel is fine to coarse, angular to subrounded flints.		
25.00-25.37	SPT 50/220	13.00	20.50	7,11/15,16,19			Dense, grey, silty fine SAND interbedded with clay bands and some shells. (Lambeth Group)		
26.00-26.38 26.00-26.45	SPT 50/230 B17	13.00	23.60	6,9/11,17,18,4		(4.00)			
27.00-27.35	SPT 50/200	13.00	24.00	9,11/15,17,18					
28.00-28.28	SPT 50/125	13.00	5.90	7,15/28,22		28.40	Below 27.90m: Very dense, cemented and with frequent shells.		
29.00-29.45 29.00-29.45	SPT N=50 B18	13.00	6.10	7,9/9,11,15,15			Very stiff, grey, silty CLAY with frequent shells. (Lambeth Group)		
30.00-30.45	SPT N=50	13.00	6.10	6,9/10,12,14,14		(2.60)			
Remarks							Scale (approx) 1:50	Logged By HP	
							Figure No. 20925.BH809		

 IAN FARMER ASSOCIATES							Site Peninsula Quays Zone A		Borehole Number BH809		
Boring Method Cable Percussion		Casing Diameter 250mm cased to 2.00m 200mm cased to 13.00m 150mm cased to 31.50m			Ground Level (mOD)		Client Quintain Estates and Development PLC		Job Number 20925		
		Location			Dates 26/06/2012- 02/07/2012		Engineer Halcrow Group Limited		Sheet 4/6		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
30.00-30.45	B19					(2.60)	... as previous				
31.00-31.15	SPT 25*/75 50/70	13.00	6.10	25/50		31.00	Very dense, greyish green cemented fine to coarse SAND. (Thanet Sand)				
31.50-31.70	D12			02/07/2012:6.10m 03/07/2012:6.20m		(1.00)					
32.00-32.18 32.00-32.45	SPT(C) 25*/75 50/105 B20	31.50	6.20	25/32,18		32.00	Very dense, blueish green to grey, clayey, very silty fine SAND. (Thanet Sand) At 32.00m: Fine to coarse, angular to subrounded gravel. Between 36.30m to 36.80m: Very stiff, blueish green to green, slightly gravelly, slightly sandy clay band. Gravel is fine to coarse, angular to subrounded flints. Between 37.40m to 37.60m: Layer of fine to coarse, angular to subrounded flint gravel band. Below 37.60m: Green, silty, fine sand with occasional fine to coarse, angular to subrounded gravel.				
33.00-33.28 33.00-33.45	SPT(C) 50/125 B21	31.50	6.20	11,14/31,19							
34.00-34.24 34.00-34.45	SPT(C) 50/85 B22	31.50	6.20	13,12/34,16							
35.00-35.25 35.00-35.45	SPT(C) 50/95 B23	31.50	6.20	12,13/35,15							
36.00-36.15 36.00-36.45	SPT(C) 50/0 B24	31.50	6.20	11,14/50		(8.50)					
36.50	D13										
37.00-37.33 37.00-37.45	SPT(C) 49/180 B25	31.50	6.20	11,14/17,21,11							
37.50	D14										
38.00-38.12 38.00-38.45	SPT(C) 25*/70 50/50 B26	31.50	5.30	25/50							
39.00-39.06 39.00-39.45	SPT(C) 25*/0 60/60 B27	31.50	5.30	25/60							
40.00-40.05	50/30 SPT(C) 25*/20	31.50	5.30	25/50							
Remarks Chiselling from 31.00m to 31.50m for 1.5 hours. Chiselling from 31.50m to 31.70m for 1 hour. Water added from 31.50m to 40.10m.								Scale (approx) 1:50	Logged By HP		
								Figure No. 20925.BH809			




**IAN FARMER
ASSOCIATES**

Site
Peninsula Quays Zone A

Borehole Number
BH809

Boring Method Cable Percussion	Casing Diameter 250mm cased to 2.00m 200mm cased to 13.00m 150mm cased to 31.50m		Ground Level (mOD)	Client Quintain Estates and Development PLC	Job Number 20925
	Location		Dates 26/06/2012- 02/07/2012	Engineer Halcrow Group Limited	Sheet 5/6

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
40.00-40.10	D15			03/07/2012:5.30m		(8.50)	... as previous		
				04/07/2012: 04/07/2012: 05/07/2012: 05/07/2012:		40.50	Very dense, greenish grey to grey very silty fine SAND. (Thanet Sand)		
						(12.00)			

Remarks	Scale (approx) 1:50	Logged By HP
	Figure No. 20925.BH809	



Boring Method Cable Percussion	Casing Diameter 250mm cased to 2.00m 200mm cased to 13.00m 150mm cased to 31.50m	Ground Level (mOD)	Client Quintain Estates and Development PLC	Job Number 20925
	Location	Dates 26/06/2012- 02/07/2012	Engineer Halcrow Group Limited	Sheet 6/6

Depth (m)	Sample / Tests		Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
52.50							(12.00)	... as previous		
	TCR	SCR	RQD	FI			52.50	Moderately weak, high density, white, unstained CHALK. Below 52.65m (A3) Strong, very high density fractures horizontal (100/250) clean and tight, unstained. Flints absent occasional orange brown stained in depth. Below 53.00m: A2 Fracture medium spaced (200/600/700) and very light veins in the matrix. At 53.20m: Flint gravel Bedding fractures horizontal, close spaced (150) clean and tight, slightly light grey stained with occasional grey silty At 53.60m: Flint gravel clay veins. Flints absent (D3)		
53.00	100%	100%	100%							
54.50	100%	100%	100%							
55.50	78%	78%	78%				(7.50)	At 55.20m: Angular coarse gravel in the matrix Below 55.83m: Sub vertical fractures (60')		
57.00	100%	87%	80%					Below 56.50m: (B3) Bedding fracture sub horizontal (85'), clean and occasional orange brown on the surfaces. At 56.60m: Coarse angular flint At 57.10m: Fine to coarse, angular to subangular flint gravel. Below 57.25: A2 Bedding fracture horizontal tight and clean with very thin pockets of shells. At 57.80m: Coarse angular flints At 59.9: Fracture (45') flat, smooth, closed and tight with occasional light grey stains on the surface. Between 58.10m and 58.40m: Occasional flint clasts in the matrix		
58.50	68%	61%	61%					At 59.60m: Fracture (45') close, and clean. At 59.75m: Coarse angular flint gravel.		
60.00							60.00			








Remarks

**Scale
(approx)**
1:50



**Logged
By**
HP

Figure No.
20925.BH809

Client Quintain Estates	Job Number 20925
Engineer Halcrow	Sheet 1/1

Description	Legend	Water
MADE GROUND: Dark brown, sandy, gravel. Gravel is fine to coarse, angular to subangular concrete, brick, flints and clinker.		
MADE GROUND: Concrete floor		
MADE GROUND: Dark brown to dark red, clayey gravelly fine to coarse sand. Gravel is fine to coarse, angular to subangular flints, clinker, brick and concrete.		
MADE GROUND: Soft grey, slightly sandy, silty clay with occasional fine to coarse, angular to subangular gravels.		
Soft, grey to dark grey silty CLAY with frequent black specs and organic odour. (Alluvium)		
At 1.00m: Concrete - pit moved 1m north to continue		
Below 2.50m: Black with frequent decayed rootlets.		
Complete at 3.00m		

Remarks		
Scale (approx)	Logged By	Figure No.
1:40	HP	20925.TP802

 IAN FARMER ASSOCIATES						Site Peninsula Quays		Trial Pit Number TP803	
Excavation Method Trial Pit		Dimensions 1.00x 2.00m		Ground Level (mOD)		Client Quintain Estates		Job Number 20925	
		Location		Dates 01/06/2012		Engineer Halcrow		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
					<div> <div>(0.35)</div> <div>0.35</div> <div>(0.25)</div> <div>0.60</div> </div>	MADE GROUND: Reinforced concrete MADE GROUND: Dark brown, slightly clayey gravelly fine to coarse sand. Gravel is fine to coarse, angular to subangular, concrete and brick, flints and occasional clinker. Abandoned at 0.60m			
Plan <div> <div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div> <div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div> <div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div> <div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div> <div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div> <div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div><div>.</div> </div>						Remarks Breaking out from 0.00m to 0.35m for 0.5 hours. 4 inch cast iron pipe at base. Pit moved 1m north to TP803A.			
						Scale (approx) 1:40	Logged By HP	Figure No. 20925.TP803	



**IAN FARMER
ASSOCIATES**

Site

Peninsula Quays

**Trial Pit
Number**

TP803A

Excavation Method

Trial Pit

Dimensions

1.00 x 2.00m

Ground Level (mOD)

Client

Quintain Estates

**Job
Number**

20925

Location

Dates


01/06/2012

Engineer

Halcrow

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.45) 0.45	MADE GROUND: Dark brown, sandy gravel. Gravel is fine to coarse, angular to subangular concrete and brick flints. At 0.30m: Frequent decayed wood floor and some pieces of lead. At 0.45m: Concrete Abandoned at 0.45m		

Plan

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Remarks

Breaking out from 0.45m to 0.45m for 0.75 hours.
Unable to break through concrete. Pit moved 2m north to TP803B.

Scale (approx)



1:40

Logged By

HP

Figure No.

20925.TP803A

 IAN FARMER ASSOCIATES						Site Peninsula Quays		Trial Pit Number TP803B	
Excavation Method Trial Pit		Dimensions 1.00 x 1.50m		Ground Level (mOD)		Client Quintain Estates		Job Number 20925	
		Location		Dates 01/06/2012		Engineer Halcrow		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
					(0.30) 0.30	MADE GROUND: Dark brown, sandy gravel. Gravel is fine to coarse, angular to subangular and brick flints. At 0.30m: Metal structure. Abandoned at 0.30m			
Plan .						Remarks Pit moved back to 1m south of TP803 for TP803C.			
						Scale (approx) 1:40		Logged By HP	Figure No. 20925.TP803B



Peninsula Quays

**Trial Pit
Number**
TP803C

Trial Pit

Dimensions
1.00m x 1.50m

Ground Level (mOD)

Quintain Estates

Job Number	20925
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Location

Dates	01/06/2012
--------------	------------

Halcrow

Sheet
1/1

Dept
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
(Thickness)

Description

Legend

Water

0.60

E1

Water seeping(1) at 0.80m.

MADE GROUND: Concrete

MADE GROUND: Dark brown, sandy gravel. Gravel is fine to coarse, angular to subangular concrete and brick, clinker and some ash.

MADE GROUND: Concrete

Abandoned at 1.20m

Plan

Remarks

Breaking out from 0.00m to 1.20m for 0.75 hours.
Concrete floor at base
Unable to break through concrete. Abandoned after discussion with the engineer.

Scale (approx)

1:40











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


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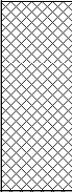

20925.TP803C











Client Quintain Estates	Job Number 20925
Engineer Halcrow	Sheet 1/1

Description	Legend	Water
MADE GROUND: Dark brown to grey, sandy gravel. Gravel is fine to coarse, angular to subangular concrete and brick fragments, flints and limestone.		Σ1
MADE GROUND: Concrete		
MADE GROUND: Dark brown to greenish grey, clayey, gravelly fine to coarse sand. Gravel is fine to coarse, angular to subangular concrete and brick, ash and clinker.		
MADE GROUND: Grey, gravelly, fine to coarse, sand with frequent ash.		
Soft, red, slightly sandy, silty CLAY with red and occasional black stains staining. (Possible made ground)		
Soft, grey to dark grey, slightly sandy, silty CLAY with frequent black specs (Alluvium)		
		
		
At 0.82m: Hydrocarbon odour		
		
Complete at 3.00m		

Remarks Breaking out from 0.20m to 0.60m for 0.5 hours.		
Scale (approx) 1:40	Logged By HP	Figure No. 20925.TP804

 IAN FARMER ASSOCIATES						Site Peninsula Quays		Trial Pit Number TP805	
Excavation Method Trial Pit		Dimensions 1.00 x 3.00m		Ground Level (mOD)		Client Quintain Estates		Job Number 20925	
		Location		Dates 29/05/2012		Engineer Halcrow		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	E1				0.80	MADE GROUND: Dark brown, gravelly fine to coarse sand and cobbles. Gravel is fine to coarse, angular to subangular concrete and brick fragments and clinkers.			
					0.80 (0.10)	MADE GROUND: Concrete			
					0.90 (0.10)	MADE GROUND: Dark brown, gravelly fine to coarse sand and cobbles. Gravel is fine to coarse, angular to subangular concrete and brick fragments and clinkers.			
					1.00 (0.20)	MADE GROUND: Concrete			
1.50	E2				1.20	MADE GROUND: Concrete			
					(1.00)	Soft to firm, brown to dark brown, slightly sandy, silty CLAY. (Alluvium)			
					2.20	Soft, grey to dark grey, slightly sandy, silty CLAY with frequent black specs in the matrix and organic odour.			
					(0.80)				
3.00	E3				3.00	Complete at 3.00m			
Plan .						Remarks Breaking out from 0.80m to 1.20m for 0.75 hours. Stockpile excavated to road level before commencing pit.			
						Scale (approx) 1:40		Logged By HP	
						Figure No. 20925.TP805			

 IAN FARMER ASSOCIATES						Site Peninsula Quays		Trial Pit Number TP806	
Excavation Method Trial Pit		Dimensions 1.00m x 2.60m		Ground Level (mOD)		Client Quintain Estates		Job Number 20925	
		Location		Dates 29/05/2012		Engineer Halcrow		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	E1	Water seeping at back of pit(1) at 1.10m.			(1.00)	MADE GROUND: Dark brown, sandy gravel. Gravel is fine to coarse, angular to subangular granite, flints, brick and concrete fragments and some tar.			
0.80	B1				1.00 (0.15)	At 0.25m: Tarmac Below 0.30m: Frequent boulders (Of tarmac and concrete)			
1.20	E2				1.15	MADE GROUND: Concrete.			
1.60	B2				(1.65)	Soft, dark grey, silty CLAY with frequent decayed rootlets and black specs in the matrix. (Alluvium)			
2.80	E3				2.80	Below 2.20m: Slight smell of hydrocarbon			
						Terminated at 2.80m			
Plan .						Remarks Terminated because of restrictions due to concrete.			
						Scale (approx) 1:40		Logged By HP	
						Figure No. 20925.TP806			

 IAN FARMER ASSOCIATES						Site Peninsula Quays		Trial Pit Number TP808	
Excavation Method Trial Pit		Dimensions 1.00m x 3.00m		Ground Level (mOD)		Client Quintain Estates		Job Number 20925	
		Location		Dates 29/05/2012		Engineer Halcrow		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30	E1		Water(1) at 1.20m.		(0.40)	MADE GROUND: Dark brown, slightly clayey, sandy gravel. Gravel is fine to coarse, angular to subangular flint, concrete, brick and ash.		▽1	
					0.40	MADE GROUND: Reinforced concrete.			
					(0.30)				
					0.70	MADE GROUND: Soft, dark brown to grey sandy, gravelly clay fill. Gravel is fine to coarse, angular to subangular flints, concrete and bricks and occasional clinker.			
					(0.10)				
					0.80				
					(0.20)	MADE GROUND: Dark brown, slightly clayey, sandy gravel. Gravel is fine to coarse, angular to subangular flint, concrete, brick and ash.			
					1.00				
					(0.20)	MADE GROUND: Reinforced concrete			
					1.20				
(0.10)	MADE GROUND: Grey, sandy fine to coarse, angular to subangular flint and concrete gravel fill.								
1.30									
(0.30)									
1.60	MADE GROUND: Concrete.								
(0.10)									
1.70	MADE GROUND: Dark grey, sandy, fine to coarse, angular to subangular flint gravel.								
(1.40)									
1.80	E2					Very soft to soft, dark grey, silty CLAY with decayed rootlets and strong hydrocarbon odour and frequent black specs.			
2.10	B1								
3.10	E3				3.10	Complete at 3.10m			
Plan .						Remarks Breaking out from 0.40m to 1.60m for 2.5 hours.			
						Scale (approx) 1:40	Logged By HP	Figure No. 20925.TP808	



**IAN FARMER
ASSOCIATES**

Site

Peninsula Quays

**Trial Pit
Number
TP809**

Excavation Method

Trial Pit

Dimensions

0.80m x 2.80m

Ground Level (mOD)

Client

Quintain Estates

**Job
Number
20925**

Location

Dates

29/05/2012

Engineer

Halcrow

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.90	E1		Water seeping(1) at 1.70m.		(0.20) 0.20	MADE GROUND: Reinforced concrete		
					(1.60)	MADE GROUND: Dark brown, slightly sandy gravelly brick cobbles. Gravel is fine to coarse, angular to subangular brick and concrete. Below 1.20m: Brick floor Below 1.26: Concrete with steel reinforcing bars to 1.40m.		
					1.80	Soft, dark grey, silty CLAY with frequent decayed rootlets and black specs in the matrix with occasional shells.		
2.60	B1				(1.20)			
3.00	E2				3.00	Complete at 3.00m		

Plan

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Remarks

Breaking out from 0.00m to 1.40m for 1.5 hours.

Scale (approx)

1:40

Logged By

HP

Figure No.

20925.TP809

Appendix C – OASIS Form

Printable version

OASIS ID: aocarcha1-130682

Project details

Project name Greenwich Peninsula

Short description of the project The work comprised the monitoring of the excavation geotechnical trial pits and boreholes. Within the boreholes river terrace gravels were overlain by peat deposits. This was overlain by alluvium and made ground were recorded. The earliest deposits recorded in the trial pits were alluvial clays, these were overlain by modern made ground and concrete slabs. In one case a concrete foundation cut the alluvial deposits; this feature may have been related to early 20th century structure seen on Ordnance Survey maps. The alluvial deposits appeared to have been subject to horizontal truncation during the phases of construction and demolition which took place on site in the 20th century.

Project dates Start: 29-05-2012 End: 01-06-2012

Previous/future work No / Not known

Any project codes associated
reference 32151 - Contracting Unit No.

Any project codes associated
reference GPF 12 - Sitecode

Type of project Recording project

Site status None

Current Land use Vacant Land 1 - Vacant land previously developed

Monument type FOUNDATION Modern

Significant Finds NONE None

Investigation type "Watching Brief"

Prompt Direction from Local Planning Authority - PPS

Project location

Country England

Site location GREATER LONDON GREENWICH GREENWICH Greenwich Peninsula

Postcode SE10 0QE

Study area 0 Hectares

Site coordinates TQ 2715 8120 51 0 51 30 53 N 000 10 02 W Point

Height OD / Depth Min: -2.03m Max: -1.61m

Project creators

Name of
Organisation AOC Archaeology Group

Project brief
originator Local Authority Archaeologist and/or Planning Authority/advisory body

Project design
originator RPS

Project
director/manager Melissa Melikian

Project supervisor Ian Hogg

Type of
sponsor/funding
body Consultancy

Name of
sponsor/funding
body RPS Planning

Project archives

Physical Archive
Exists? No

Physical Archive
recipient LAARC

Digital Archive
recipient LAARC

Digital Contents "Stratigraphic"

Digital Media
available "Images raster / digital photography","Text"

Paper Archive
recipient LAARC

Paper Contents "Stratigraphic"

Paper Media
available "Context sheet","Plan","Report","Unpublished Text"

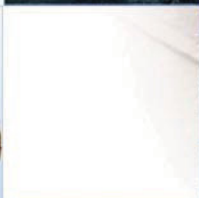
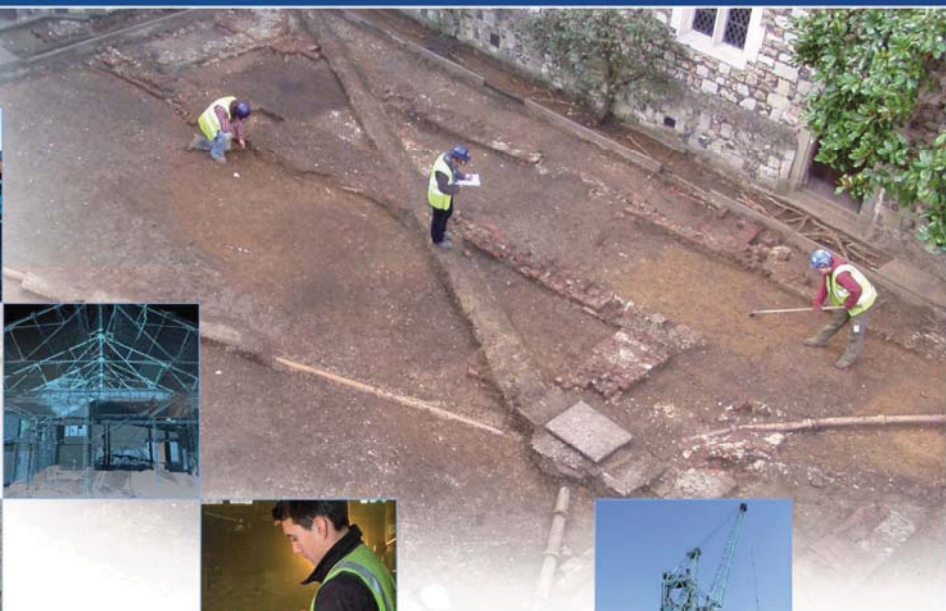
Entered by Ian Hogg (ian.hogg@aocarchaeology.com)
Entered on 20 July 2012

OASIS:

Please e-mail [English Heritage](#) for OASIS help and advice

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