PN1883/2

birmingham archaeology

Archaeological Watching Brief on Geotechnical Investigations

UNIVERSITY OF BIRMINGHAM

REGISTERED IFA ORGANISATION

Project No. 1883/2

November 2008

Hull College

Queen's Garden, Hull

Archaeological Watching Brief on Geotechnical Investigations

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Version: v1a	**Version Date:** 20.01.2009.	
File location: *P:\PROJECTS BY NO\1800-1899\1883 Hull College Phase 2 GPR and WB\05_Post Excavation & Post Fieldwork\01_Reports\02_Final Report\01_Cover and Text\1883 Hull WB Report v0c.doc*		

for
Taylor Young Architects

On behalf of

Hull College

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Hull College Phase 2

Archaeological Watching Brief, November 2008

TABLE OF CONTENTS

SUMMARY

Birmingham Archaeology was commissioned in November 2008 by Taylor Young, acting on behalf of Hull College, to undertake an archaeological watching brief as part of geotechnical work involved with proposed redevelopment of Hull College, Queen's Gardens, Hull.

The watching brief located areas of the Queen's Dock wall in three of five test pits excavated with the potential for good structural survival of the wall.

In addition, the results of the geotechnical investigations have been integrated into the Geographic Information Software (GIS) to create a below-ground deposit model. There appears to be a layer of brown-grey sand-silt or sand-clay that extends across the entire site that may correspond with a former ground level. The presence of brick fragments in this material noted in the majority of bore-holes/ window-slots may suggest that the material is redeposited material designed to raise the level of the ground. The date of this material is however unknown.

The base of this material corresponds with a grey-brown sand-silt that does not contain brick fragments and this may represent the transition to the natural alluvial layers of the River Hull.

HULL COLLEGE, QUEEN'S GARDEN, HULL.

Archaeological Watching Brief on Geotechnical Investigations, November 2008

1. INTRODUCTION

1.1.1. Birmingham Archaeology was commissioned by Taylor Young on behalf of Hull College to undertake an archaeological watching brief during the geotechnical work and ground penetrating radar survey at Hull College, Queens Gardens, Hull (hereinafter referred to as the site).

1.1.2. This report outlines the results of the watching brief carried out during November 2008 on geotechnical investigations, in accordance with guidelines laid down in Planning Policy Guidance Note 16 (DoE 1990). The project conformed to the Institute for Archaeologists Standard and Guidance for Archaeological Watching Briefs (IFA 2001

2. LOCATION AND GEOLOGY

2.1.1. The site is located in the centre of Kingston Upon Hull, situated on flat land to the west of the River Hull, and is centred on NGR TA 510106 429070 (Fig. 1).

2.1.2. The underlying geology consists of Holocene tidal flat deposits of clay and silt overlying Burnham Chalk Formations.

2.1.3. The watching brief consists of the excavation of five test pits targeted over the original line of the Queens Dock Wall, while the GPR work was conducted over ground along the line of North Walls (Fig. 2)

3. AIMS AND OBJECTIVES

3.1.1. The principal objective of the watching brief was to record any archaeological features, structures, deposits, or horizons exposed during intrusive groundworks across the site.

3.1.2. It was also hoped to model below-ground deposits highlighted by the geotechnical investigations. and

3.1.3. The specific aims of the project were;

- Record below-ground structures located within the test-pits during geotechnical investigations.
- Interpret the results of the geotechnical bore-hole and window-slot logs.
- Combine this with previous results from the Archaeological Evaluation and the Ground-Penetrating Radar Survey.

4. ARCHAEOLOGICAL BACKGROUND

4.1.1. The historical background to the site has been detailed in the report on the archaeological evaluation undertaken on the site (Mann 2008).

5. METHODOLOGY

5.1.1. Groundworks comprised the excavation of five test pits with the use of a machine fitted with a toothless ditching bucket. This was monitored by a suitably qualified archaeologist and complemented with the salvage recording of any archaeological deposits and features revealed during works.

5.1.2. All stratigraphic sequences were recorded, even where no archaeology was present. Features were planned at a scale of 1:20, and sections were drawn of all cut features and significant vertical stratigraphy at a scale of 1:20. A comprehensive written record was maintained using a continuous numbered context system on *pro-forma* cards. Written records and scale plans were supplemented by photographs using black and white monochrome, colour slide and digital photography.

5.1.3. Recovered finds were cleaned, marked and remedial conservation work undertaken as necessary. Treatment of all finds conformed to guidance contained within the Birmingham Archaeology Fieldwork Manual and *First Aid for Finds* (Watkinson and Neal 1998).

5.1.4. The full site archive includes all artefactual remains recovered from the site. The site archive will be prepared according to guidelines set down in Appendix 3 of the Management of Archaeology Projects (English Heritage, 1991), the Guidelines for the Preparation of Excavation Archives for Long-term Storage (UKIC, 1990) and Standards in the Museum Care of Archaeological collections (Museum and Art Galleries Commission, 1992). The paper archive will be deposited with the appropriate repository subject to permission from the landowner.

6. RESULTS

6.1.1. Test Pit 1 (Fig. 3, Plate 1)

The dock wall **104** was located at a depth of 0.25m below the modern ground surface (4.60m AOD) and was constructed with orange red handmade bricks measuring 9.5 x 4.5 x 2.5 inches in size and bonded with a concrete mortar. The wall measured 0.85m in width, and survived to a depth of at least 0.7m (9 courses). To the north of **104** was a layer of grey silt that contained brick fragments **102**, while to the south of the wall was a modern drain infilled by a white gravel **103**.

Overlying these layers and wall **104** was a layer of brown silty clay **101** 0.15m in thickness that represented a levelling layer for the modern brick car park surface **100** 0.1m in thickness.

6.1.2. Test Pit 2 (Fig. 4, Plate 2)

The dock wall **204** was located at a depth of 0.32m below the modern ground surface (4.45m AOD) and was constructed of orange handmade bricks measuring 9.5 x 4.5 x 2.5 inches in size. Bonded by a cement mortar **204** measured 0.7m in width and survived to a height of at least 0.8m (10 courses). To the north side of **204** was a layer of black silt containing stone and chalk fragments **202** throughout. Overlying **202** was a layer of grey silt that contained fragments of brick rubble **201**.

Cutting **201** and running across the top of wall **204** on a northwest to southeast alignment was a modern pipe **203**. The service trench had cut through the wall structure resulting in damage to the brickwork at this point.

Overlying **203** was the brickwork for the modern car park surface **200** that measured 0.1m in thickness.

6.1.3. Test Pit 3

Test Pit 3 was not excavated for health and safety reasons.

6.1.4. Test Pit 4 (Fig. 5, Plate 3)

The dock wall **406** was located at a depth of 0.9m below the modern ground surface (4.60m AOD) and was constructed with red handmade bricks (9 x 5 x 3 inches in size) and was bonded by a white cement mortar. The wall survived to a height of at least 0.3m. Sealing the wall was a layer of black silt/ash that contained fragments of broken brick throughout **405**.

Cut through **405** to the southwest of the wall was the cut for a modern gas pipe **403** that had been filled with a light brown silty clay **404**. Overlying **404** and the remainder of the test pit was a layer of concrete/stone made ground **401** 0.25m in thickness. This was overlain by the tarmac layer of the car park **400** which measured 0.1m in thickness.

6.1.5. Test Pit 5 (Fig. 6)

The earliest layer encountered in Test Pit 5 was a black silty sand that contained large amounts of ash/charcoal **504** at a depth of 0.85m below the modern ground surface (*c* 4.50m AOD). Overlying **504** was a thin layer of grey silty clay **503** 0.15m in thickness, which was sealed by a thin layer of yellow silty clay **502** 0.2m in depth.

Sealing **502** was a layer of silty brick demolition rubble **501** 0.4min thickness which was overlain by the tarmac car park surface for the area **500**.

6.1.6. Test Pit 6 (Fig.7, Plate 4)

The dock wall **604** was located at a depth of 1.05m below the modern ground surface (4.25m AOD) and was constructed of orange handmade bricks measuring 9.5 x 4.5 x 2.5 inches in size and which were bonded by a white cement mortar. Wall **604** survived to a height of at least 0.8m. To the immediate northeast of the wall was a layer of brick rubble **605** which likely represents tumble from the dock wall itself. This was overlain by a layer of yellow silty clay **603** measuring *c* 1.1m in thickness.

Overlying **603** and the remainder of the test pit was a layer of black ash/clinker material **602** 0.7m in thickness. This was sealed by a layer of brown silty clay **601** 0.2m in depth. Overlying **601** was the topsoil layer for the area, a brown organic clay **600** 0.15m in thickness.

7. GROUND MODEL OF ARCHAEOLOGICAL DEPOSITS

7.1.1. Using the data from boreholes and window samples undertaken by Faber Maunsell at various points around the Hull College Campus (Fig. 8), and the data obtained from the archaeological evaluation carried out previously by

Birmingham Archaeology (Mann 2008, Table 1, Appendix 1 and 2) a ground model was constructed showing the potential levels of surviving archaeology in the development area (Fig. 8, 9 and 10).

7.1.2. The model was constructed using the ArcGIS data processing tool by using the depths of the underlying geology recorded during the borehole/ trenching process to create a 3D representation of these layers (Fig. 8). The depths of recorded layers of modern made ground/demolition material were used to give an indication of the likely level of surviving archaeology below.

7.1.3. In areas where there was no data available due to lack of boreholes or trenching (largely areas below standing buildings and car parks) the implied archaeological level was set at the nearest highest recorded value for that area. It is likely however, that in these areas and in particular those areas disturbed by building foundations, the levels may vary from those shown.

7.1.4. The results show that in the areas disturbed by the construction and subsequent backfill of the Queen's Dock the levels of modern backfill/demolition material are significantly deeper than the rest of the development area, with up to 8m of backfill in places. The dock wall (as located during the test pitting of the area) is shown surviving at a much higher level on the southern and northern extents of the dock, although the northern extent to the west of the development area has been estimated using surviving maps as the exact location was not determined during the watching brief.

7.1.5. The watching brief on the test pits excavated to determine the presence of the Queen's Dock wall located the wall in all but one of the excavations. Due to the limited depth of the test pits it was difficult to determine the exact state of preservation of the dock wall beyond these levels. However, the presence of the dock wall in the majority of the test pits suggests that the underground survival of the structure is likely to be fairly good. The dock wall was located at a depth of between 0.50m and 0.70m below the present ground level (4.45 to 4.60m AOD).

7.1.6. The absence of the dock wall within Test Pit 5 is likely to be down to the placement of the test pit rather than the wall not existing in this area. It is likely the dock wall exists at a similar level to that of Test Pit 4 further to the southeast of the area of Test Pit 5.

7.1.7. The base of the dock was located in four of the bore-holes/ window slots at around 8.00 to 9.00 m below the present ground level (-2.70 to -3.90m AOD). In two locations structure may have been associated with the dock floor. Wood sleepers were located in Borehole 4 between 8.00 and 8.30m below the current ground level. The base of the dock was also located in Borehole 17 as a brick structure.

7.1.8. The medieval remains of the Town Wall and the stone structures located in Trench B were located around 3.1 to 3.3m AOD. The exception was the Town Wall in Trench C that was located at a depth of 2.40m AOD. This may be resultant from the destruction of the town wall at this location or the robbing of material from this area.

7.1.9. Examination of the ground investigation data does not allow a substantial increase in the understanding of the depths of archaeological material. However, it does allow a greater understanding of the below-ground build up of material.

7.1.10. Examination of the bore-hole data both north and south of the Queen's Dock supports the supposition that the whole of this area was subject to dramatic land reclamation prior to the construction of the dock. A layer of brown-grey sand silt or clay silt is located across the site at an average depth of around 2.00 to 3.00m below the current ground level (*c* 2.70 to 3.60m+ AOD).

7.1.11. The nature of this land reclamation is still unclear but it can be suggested that the presence of brick within deposits to depths of up to 5m below the current ground level would suggest that the reclamation has occurred in the late-medieval and post-medieval periods. The absence of deposits of industrial waste and the predominance of grey-brown silt-clays or sand-silts across the site may suggest that the land was reclaimed as part of a process of channel clearance within the River Hull and subsequent land reclamation that resulted in the shifting of the course of the river to the east.

7.1.12. The fact that brick material is not located below 5.0m (around -0.10 to 0.20m AOD) would suggest that this is the level of the natural mud flats and the material above is subsequent reclamation material.

7.1.13. The data is insufficient to make substantial conclusions at this stage. However, there is a noticeable change in the material within the locations around bore-holes at 12A, 13 and 14 in one location that may suggest a former channel running across the site, or inversely survival of material in this location that has been eradicated elsewhere by channel migration. The material in this location has a grey-brown clay silt constituent as opposed to the clay composition located elsewhere. The base of this material is between -0.50 to -0.80m AOD and may represent a channel that existed through the mud flats at the time of initial reclamation.

7.1.14. Below these layers survival of a peat layer has been noted between *c* 9.0m and 11.0m below the present ground surface. Boreholes 2, 4, 9 and 16 with a wide spread across the site suggest the survival of this peat layer is across the entire site but is intermittent. The data is insufficient to make any further conclusions.

8. GROUND PENETRATING RADAR SURVEY

8.1.1. A detailed account of the ground-penetrating radar survey is provided in Birmingham Archaeology Report 1883/1. The following provides a reproduction of the summation of this report.

8.1.2. The objective of the survey was to identify the presence of the medieval Town Wall and associated structures along the length of its projected northern course towards the River Hull. The results were severely limited due to the nature of the subsoil (heavy clay content and noisy areas of surrounding made ground). Consequently, the survey did not identify remains possibly related to the medieval Town Wall (or associated structures) within the area of the survey grids. The attenuation of signal strength and noise interference curtailed the depth of the survey to *c* 2m. Previous archaeological investigations within the survey area (referred to by Mann 2008: Section 2.1.6) recorded remains of the medieval town wall at approximately 3.7m below ground surface level. The Town Wall remains may therefore survive at a deeper level, or of course, outside the survey area.

8.1.3. The survey did reveal a series of high amplitude linear features which indicate the presence of below-ground anomalies at depths of up to *c.*2m; these are interpreted as most probably relating to modern infrastructure and services.

8.1.4. One anomaly (Feature M, seen as two areas on anomaly) could be tentatively suggested as being of archaeological interest and might possibly relate to the remains of collapsed material from a previous structure(s) on site, although it is more likely to relate to material disturbed or deposited through the development of the College buildings and infrastructure.

9. IMPLICATIONS

9.1.1. The results of this stage of the work has allowed a greater understanding of the below ground archaeology. The originally defined areas of archaeological significance remain unchanged (Fig. 2). However, further definition and understanding of the remains has been achieved.

9.1.2. The watching brief has further defined the nature of the Queen's Dock and its location. The dock was seen as of low archaeological potential but was recommended for an archaeological watching brief during any proposed development. It is now clear that the dock wall survives to a relatively shallow depth below the current ground surface of between 0.5 to 0.7m. The ground-penetrating radar supports the presence of the Queen's Dock Walls within the location of Test Pits 1 and 2 and it suggests that the depth is relatively shallow throughout this particular location. The depth of the basin is also known to be around 8.0 to 9.0m below the current ground level. This should allow for a targeted watching brief on the dock wall remains.

9.1.3. Unfortunately the ground-penetrating radar survey has not allowed accurate pinpointing of the Town Walls. The presence of redeposited clay may have masked signals elsewhere as suggested by the survey in Area B and because of this all excavation over the probable location of the Town Wall should be limited to the depths suggested by Trench D (about 3.1m AOD, approximately 1.5m below ground level).

9.1.4. The presence of services either side of North Wall Street appear to survive to a depth of around 0.7m below the current ground level and there is a strong suggestion that there are no remains in this initial depth of material. It is known that the wall have been adopted for the line of services and because of this the services may overlay the Town Wall.

9.1.5. The anomaly described as Feature M may relate to further evidence of towers to the north of the town wall as possibly located in Trench C and D. It is therefore recommended that below-ground excavations are treated with caution within the area of the wall and north of it. The Town Wall is regarded as nationally significant and therefore a policy of preservation *in situ* is likely to be recommended. This means any piling or below-ground foundation design should seek to avoid these areas or re-use former piles.

9.1.6. The level of the material originally interpreted as channel deposits in the evaluation stage of the work can now be seen to be a continuous layer across the site that may be resultant from the reclamation of the tidal mud flats that bordered the River Hull. The likelihood that any deposits that exist 2.0 to 3.0m or greater below the current ground level will be disturbed is low. Piling is the most likely solution during construction and it is the nature of these piles which

is likely to affect the archaeology. Piling solutions should be discussed with the Hull City Planning Archaeologist prior to implementation.

9.1.7. All the results of the survey and likely implications are subject to discussion with the Hull City Planning Archaeologist however, the levels of archaeological implications are likely to remain unchanged from those discussed in the evaluation report (Mann 2008, see Fig. 2).

10. ACKNOWLEDGEMENTS

10.1.1. The project was commissioned by Taylor Young, on behalf of Hull College. Thanks are due to Tim Warriner and Matt Weir of Faber Maunsell for their co-operation and assistance throughout the project. The assessment was undertaken by Phil Mann who also produced the written report which was illustrated by Helen Moulden and Ellie Ramsey and edited by Chris Hewitson who also monitored the project for Birmingham Archaeology.

11. REFERENCES

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Appendix 1

Point Name	Full Depth	Ground Level (m) AOD	Top of Medieval Walls (m) AOD	Top of Dock Wall/ Floor (m) AOD	Top of 18/19th c. brick walls (m) AOD	Top of Brown-grey sand clay/ silt (m) AOD	Base Brown-grey sand-clay/ silt (m) AOD	Base of Brown-grey sand-silt (m) AOD	Peat Layer (m) AOD
BH 2	39.70	4.20				3.00	-0.20	-6.65	-6.65
BH 4	45.00	4.80		-3.50				-4.60	-5.10
BH 5	24.00	5.10		-3.90				-5.90	
BH 7	23.50	5.35				3.35	1.15	-5.65	
BH 8a	44.00	5.15				3.35	0.65	-7.85	
BH 9	24.00	5.25				4.05	0.25	-5.25	-6.95
BH 10									
BH 11a	24.40	5.25				2.85	0.25	-5.95	
BH 12a	42.00	5.25				3.25	-0.75	-7.35	
BH 13	24.40	5.20				2.70	-0.50	-6.70	
BH 14	45.00	5.20				2.80	-0.80	-6.60	
BH 16	46.00	5.30			2.20	1.30	-0.10	-3.70	-5.30
BH 17	8.00	5.30		-2.70					
TP 1	1.20	4.80		4.60					
TP 2	1.20	4.80		4.45					
TP 3	1.20	5.15							
TP 4	1.20	5.30		4.60					
TP 5	3.50	5.30				2.50			
TP 6	2.20	5.30		4.25					
WS 1	0.80	5.10							
WS 1a									
WS 4	8.30	5.20				3.10	0.20		
WS 5	8.50	5.35				3.15	0.55	-3.15	
WS 6	8.00	5.10		-2.90					
WS 7	8.00	5.30				3.60	1.30		
TR A East	3.75	4.19							
TR A West	3.3	4.39				2.99			

Point Name	Full Depth	Ground Level (m) AOD	Top of Medieval Walls (m) AOD	Top of Dock Wall/ Floor (m) AOD	Top of 18/19th c. brick walls (m) AOD	Top of Brown-grey sand clay/ silt (m) AOD	Base Brown-grey sand-clay/ silt (m) AOD	Base of Brown-grey sand-silt (m) AOD	Peat Layer (m) AOD
TR B North	2.05	4.18	3.27						
TR B South	2.3	4.18	3.1						
TR C	2.75	4.65	2.4						
TR D	2.3	4.78	3.1						
TR E East	3.00	4.75							
TR E West	2.15	4.78				3.35			
TR F North	1.95	5.26							
TR F South	4.30	5.28				2.74			
TR G North		5.31							
TR G South	1.60	5.31							
TR H North	1.05	5.31				4.08			
TR H South	0.95	5.31				4.26			
TR I North	1.05	5.36				4.44			
TR I South	1.75	5.49				3.49			
TR J East	2.75	5.13				2.53			
TR J West	1.20	5.13							
TR K North	1.30	5.28							
TR K South	1.10	5.28							
TR L East	0.80	5.36							
TR L West	1.10	5.36							

Table 1: Geotechnical Data

Appendix 2

Selected Geotechnical Borehole Results

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 5.00m, 200mm to 8.00m	**Casing Diameter** 250mm to 5.00m, 200mm to 8.00m	**BOREHOLE No.** BH2
Equipment Dando 3000			
Drill Fluid			
Drill Crew D NEWELLL	**Logged by** TW	**Compiled by** md	**Checked by**
Dates Drilled Start 11/11/2008 End 14/11/2008		19/11/2008 20/11/2008	

Date & Time	Casing Depth (m)	Water Depth (m) (Flush Return) %	Sample/Core Recovery Depth (m) From To	Type	No.	TCR %	SCR %	RQD %	SPT Blows /N Core Size (mm)	Fracture Spacing	Description of Strata	Depth (Thickness) (m)	Level	Legend
11/11											MADE GROUND: Tarmacadam.	(0.10) 0.10		
											MADE GROUND: Composed of dark grey yellow sandy angular to subangular fine to coarse gravel of limestone. Sand is fine to coarse.	(0.15) 0.25		
			1.00	ES	1							(0.95)		
			1.20-1.65	D	2				S1		MADE GROUND: Composed of brown silty sandy angular to subangular fine to coarse gravel of limestone, chalk, flint and brick. Sand is fine to coarse.	1.20		
			1.20-1.70	B	3									
											MADE GROUND: Composed of very soft brown sandy gravelly clay. Gravel is angular to subrounded fine to coarse of brick, coal and chalk. Sand is fine to coarse.	(1.40)		
			2.00	ES	4									
			2.00-2.45	D	5				S5					
			2.00-2.50	B	6							2.60		
											MADE GROUND: Composed of soft black silty sandy slightly gravelly clay. Gravel is angular fine to coarse of brick and concrete. Sand is fine to coarse.			
			3.00	ES	7									
			3.00-3.45	U	8					25/450		(1.40)		
			3.50	D	9									
			3.50-3.95	D	10				S8					
			3.50-4.00	B	11									
			4.00	ES	12							4.00		
			4.00-4.45	U	13					15/45	Very soft thinly laminated brown grey very clayey sandy SILT. Sand is fine to medium locally coarse. Rare organic fragments throughout.			
			4.50	D	14									
			4.50-4.95	D	15				S6		Below 4.40m: Grades into silt.			
			4.50-5.00	B	16									
			5.00-5.45	U	17					10/450				
			5.50	D	18						Below 5.50m: Becoming very soft.			
			5.50-5.95	D	19				S7					
			5.50-6.00	B	20									
11/11	6.00	DRY												
			6.00-6.45	U	21					15/				
12/11	6.00													
			6.50	D	22									
			6.50-6.95	D	23				S3					
			6.50-7.00	B	24									
			7.00-7.45	U#B	25							(6.00)		
			7.50-7.95	D	26				S2					
			7.50-8.00	B	27									
			8.00-8.45	U#B	28									
			8.50-8.95	D	29				S2					
			8.50-9.00	B	30									
			9.00-9.45	U#B	31									
			9.50-9.95	D	32				S3					
			9.50-10.00	B	33									
			10.00	ES	34							10.00		
											Soft to very soft dark grey clayey sandy			

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was backfilled on completion with materials arising.
3. The borehole was advanced by chiselling methods from 29.00m to 29.40m (1 hour).
4. Groundwater was encountered at 8.50m during boring and rose to 8.30m after 5 mins,8.20m after 10 mins,8.20m after 15 mins,8.20m after 20 mins.
5. Groundwater was encountered at 20.00m during boring and rose to 18.30m after 5 mins,17.90m after 10 mins,17.80m after 15 mins,17.80m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH2 (1 of 4)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 5.00m 200mm to 8.00m	**Casing Diameter** 250mm to 5.00m 200mm to 8.00m	**BOREHOLE No.** **BH2**
Equipment Dando 3000			
Drill Fluid			
Drill Crew D NEWELLL	**Logged by** TW	**Compiled by** md	**Checked by**
Dates Drilled **Start** 11/11/2008 **End** 14/11/2008		19/11/2008 20/11/2008	

Date & Time	Casing Depth (m)	Water Depth (m) (Flush Return) %	Sample/Core Recovery Depth (m) From	To	Type	No.	TCR %	SCR %	RQD %	SPT Blows /N Core Size (mm)	Fracture Spacing	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
			10.00	10.45	U	35					15/	SILT with pockets/partings of fibrous peat. Sand is fine to coarse.	10.00		
			10.00	10.50	D	36					350		(0.85)		
			10.50	10.95	D	37				S6					
			10.50	11.00	B	38							10.85		
			11.00		ES	39						Stiff locally very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chert, chalk, mudstone and sandstone. Sand is fine to coarse.			
			11.00	11.45	U	40					70/ 450				
			11.50		D	41									
			11.50	11.95	D	42				S29					
			11.50	12.00	B	43									
			12.00	12.45	U	44					100/ 450				
			12.50		D	45						Between 12.50m and 15.50m: Very stiff.			
			12.50	12.95	D	46				S46					
			12.50	13.00	B	47									
			13.00	13.45	U	48					100/ 450				
			13.50		D	49									
			13.50	13.95	D	50				S41					
			13.50	14.00	B	51									
			14.00	14.45	U#B	52									
			14.50	14.95	D	53				S34					
			14.50	15.00	B	54							(7.55)		
		(0)	0.00	29.95	100	16	0								
			15.00	15.45	U	55					85/ 450				
			15.50		D	56									
			15.50	15.95	D	57				S					
			15.50	16.00	B	58									
			16.00	16.45	U	59					0/				
			16.50		D	60									
			16.50	16.95	D	61				S28					
			16.50	17.00	B	62									
			17.00	17.45	U	63					85/ 450				
			17.50		D	64									
			17.50	17.95	D	65				S29					
			17.50	18.00	B	66									
12/11	8.00	DRY													
			18.00	18.45	U	67					60/ 450				
13/11	8.00	DRY											18.40		
			18.50		D	68						Stiff locally firm to stiff thinly laminated light brown silty sandy CLAY. Sand is fine to medium.			
			18.50	18.95	D	69				S23					
			18.50	19.00	B	70									
			19.00		ES	71							(1.60)		
			19.00	19.45	U#B	72									
			19.50	19.95	D	73				S27					
			19.50	20.00	B	74									
			20.00	20.45	D	75				S18			20.00		
												Medium dense brown silty fine and medium			

Remarks
(See notes & keysheets)

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH2 (2 of 4)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 25.50m 120mm to 45.00m	**Casing Diameter** 250mm to 25.50m 120mm to 28.50m	**BOREHOLE No.** **BH4**
Equipment Dando 2000 Knebel			
Drill Crew D. Newell **Dates Drilled** **Start** 05/11/2008 **End** 14/11/2008	**Logged by** MW 12/11/2008	**Compiled by** clm 13/11/2008	**Checked by**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
05/11									MADE GROUND: Composed of dark grey brown slightly sandy to sandy gravelly to very gravelly silt. Gravel is angular to rounded fine to coarse of brick and quartz.	(1.20)		
			1.00		ES	1						
			1.00		ES	1						
			1.00		ES	1				1.20		
			1.20	1.65	D	2	S6		MADE GROUND: Composed of firm grey and black very gravelly clay. Gravel is angular to subrounded medium to coarse of slate, brick, chalk and flint. Occasional fragments of wood.			
			1.20	1.70	B	3						
			2.00		ES	4						
			2.00		ES	4						
			2.00		ES	4						
			2.00	2.45	D	5	S5					
			2.00	2.50	B	6						
			3.00		ES	7						
			3.00		ES	7						
			3.00		ES	7						
			3.00	3.45	U#B	8				(4.30)		
			3.00		W	52						
			3.50	3.95	U	9	S4					
			4.00		ES	9						
			4.00		ES	9						
			4.00		ES	9						
			4.00	4.50	B	10	C9		Below 4.60m: Many cobble sized brick fragments.			
			5.00		ES	11						
			5.00		ES	11						
			5.00		ES	11						
			5.00	5.45	U#B	12						
			5.50	5.95	D	13	S81/ 95			5.50		
			5.50	6.00	B	14			MADE GROUND: Possible intact brick wall.			
			6.00		ES	15						
			6.00		ES	15						
			6.00		ES	15						
			6.00	6.50	B	16	C75/ 10*					
			7.00	7.50	B	17	C75/ 0*			(2.50)		
			8.00	8.50	B	18	C75/ 0*			8.00		
									MADE GROUND: Wood sleepers.	(0.30)		
05/11	8.50	DRY								8.30		
06/11	8.50	2.65							Soft grey SILT.			
			9.00		ES	19				(1.10)		
			9.00		ES	19						
			9.00		ES	19						
			9.00	9.45	U	20		30/ 350		9.40		
			9.50		D	21			Dark brown spongy fibrous PEAT.			
			9.50	9.95	D	22	S7			(0.50)		
			9.50	10.00	B	23				9.90		
			10.00	10.45	U	24		35/	Soft dark grey SILT/CLAY with some grey peat plant remains.			

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 5.50m to 8.30m (6 hours) and 25.00m to 25.50m (1 hour).
3. See installation details on final sheet.
4. Groundwater was encountered at 3.00m during boring and rose to 1.90m after 5 mins,1.90m after 10 mins,1.90m after 15 mins,1.90m after 20 mins.
5. Groundwater was encountered at 19.30m during boring and rose to 12.70m after 5 mins,10.80m after 10 mins,9.90m after 15 mins,9.50m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH4 (1 of 6)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 25.50m 120mm to 45.00m	**Casing Diameter** 250mm to 25.50m 120mm to 28.50m	**BOREHOLE No.** **BH4**
Equipment Dando 2000 Knebel			
Drill Crew D. Newell **Dates Drilled** **Start** 05/11/2008 **End** 14/11/2008	**Logged by** MW 12/11/2008	**Compiled by** clm 13/11/2008	**Checked by**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
								400				
										(1.10)		
			10.50		D	25						
			10.50-10.95		D	26	S9					
			10.50-11.00		B	27						
			11.00-11.45		U	28		115/		11.00		
			11.00		ES	51		450	Stiff grey brown slightly sandy to sandy gravelly CLAY. Gravel is angular to subangular fine to medium of chalk, flint and sandstone with occasional coal. Sand is fine to coarse.			
			11.00		ES	51						
			11.00		ES	51						
			11.00		ES	51						
			11.50		D	29						
			11.50-11.95		D	30	S36					
			11.50-12.00		B	31						
			12.00-12.45		U	32		115/ 450				
			12.50		D	33						
			12.50-12.95		D	34	S35					
			12.50-13.00		B	35						
			13.00-13.45		U	36		120/ 450				
			13.50		D	37						
			13.50-13.95		D	38	S41					
			13.50-14.00		B	39						
			14.00-14.45		U	40		80/ 450				
			14.50		D	41						
			14.50-14.95		D	42	S28					
			14.50-15.00		B	43						
			15.00-15.45		U#B	44				(8.30)		
			15.50-15.95		D	45	S20		Below 15.50m: Locally grades into sandy silt			
			15.50-16.00		B	46						
			16.00-16.45		U	47		5 450				
			16.50		D	48			Below 16.50m: Locally with pockets/partings of silt/clay.			
			16.50-16.95		D	49	16					
			16.50-17.00		B	50						
06/11	17.00	14.10										
			17.00-17.45		U	53		75/ 450				
07/11	17.00											
			17.50		D	54						
			17.50-17.95		D	55	S21					
			17.50-18.00		B	56						
			18.00-18.45		U	57		60/ 450				
									Below 18.35m: Locally thinly laminated.			
			18.50		D	58						
			18.50-18.95		D	59	S18					
			18.50-19.00		B	60						
			19.00-19.45		U#B	61						
									Below 19.30m: Predominantly coarse sand.	19.30		
			19.50-19.95		D	62	S14		Medium dense brown speckled white silty medium to coarse SAND with occasional angular and subangular fine gravel of chalk.	(0.70)		
			20.00-20.45		U	64		40		20.00		
									Firm thinly laminated grey brown silty sandy			

Remarks
(See notes & keysheets)

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH4 (2 of 6)

Drilling Method Cable Percussion	**Borehole Diameter** 250mm to 15.00m, 200mm to 24.00m	**Casing Diameter** 250mm to 15.00m, 200mm to 24.00m	**BOREHOLE No.** BH5
Equipment Dando 2000			
Drill Crew D. NEWALL	**Logged by** DH	**Compiled by** md	**Checked by**
Dates Drilled Start 29/10/2008 End 03/11/2008	04/11/2008	05/11/2008	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
29/10									MADE GROUND: Compact rubble and clay fill. (Driller's description).			
			1.00		ES	1				(1.70)		
			1.20	1.24	B	2	C50/ 35*					
										1.70		
29/10	2.00	DRY							MADE GROUND: Composed of brown slightly silty sandy angular to subrounded fine to coarse gravel of concrete, flint, brick and quartz with many subangular concrete cobbles (<120mm). Sand is fine to coarse. Driller notes wood, glass, and metal fragments.			
			2.00		ES	3						
30/10	2.00	DRY	2.00	2.45	U	4		60/ 450		(1.30)		
			2.50		D	5						
			2.50	2.95	D	6	S11					
			2.50	3.00	B	7						
										3.00		
			3.00		ES	8			MADE GROUND: Composed of dark brown black gravelly fine to coarse sand. Gravel is subangular to subrounded predominatly fine and medium of concrete, brick and flint with many subangular to subrounded concrete cobbles (<100mm). Strong hydrocarbon odour.			
			3.00	3.45			S37					
			3.00	3.45	B	9				(0.50)		
										3.50		
			4.00		ES	10			MADE GROUND: Composed of angular to rounded fine to coarse gravel of concrete, brick and flint. Cobbles are subangular to subrounded of concrete (<160mm) with frequent shards of green glass (<40mm). 1 no. intact yellow brick noted (100mm x 110mm x 60mm)			
			4.00	4.45			S42					
			4.00	4.45	B	11				(1.50)		
										5.00		
			5.00		ES	12			MADE GROUND: Composed of firm grey slightly sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse of brick, flint and concrete. 1 No. subrounded cobble of concrete (80mm).			
			5.00	5.45	U	13		45/ 350		(0.60)		
			5.50		D	14						
			5.50	5.95	D	15	S13			5.60		
			5.50	6.00	B	16						
			6.00		ES	17			MADE GROUND: Composed of firm slightly gravelly sandy clay with many cobbles. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of concrete, brick and quartz. Cobbles are angular to subrounded of brick and concrete (<100mm). 1 no. piece of steel (100mm x 100mm)	(0.90)		
			6.00	6.45			S50					
			6.00	6.45	B	18				6.50		
			7.00		ES	19			MADE GROUND: Composed of dark grey clayey locally very clayey sandy angular to rounded fine to coarse gravel of brick, flint, concrete and cement with occasional glass fragments (<40mm). Sand is fine to coarse.			
			7.00	7.45			S28					
			7.00	7.45	B	20				(1.50)		
30/10	8.00	DRY										
			8.00		ES	21				8.00		
31/10	8.00	1.60	8.00	8.45	B	22	C11		MADE GROUND: Composed of grey sandy angular to rounded fine to coarse gravel of brick, concrete, wood and glass. Sand is fine to coarse.	(1.00)		
			9.00		ES	23				9.00		
			9.00	9.45	U	24		20/ 450	Soft dark grey silty slightly sandy CLAY with rare subangular to subrounded fine to coarse gravel of flint. Sand is predominantly fine and medium.			
			9.50		D	25				(1.00)		
			9.50	9.95	D	26	S9					
			9.50	10.00	B	27						
			10.00	10.45	U	28		25/		10.00		
									Soft dark grey slightly sandy SILT with			

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 1.20m to 1.70m (2 hours) and 3.40m to 3.70m (1 hour).
3. The borehole was advanced by chiselling methods from 4.10m to 4.35m (1 hour) and 6.25m to 6.65m (1 hour).
4. The borehole was advanced by chiselling methods from 12.90m to 13.00m (30 mins) and 23.50m to 24.00m (1 hour)..
5. See installation details on final sheet.
6. Groundwater was encountered at 2.50m during boring and rose to 2.00m after 5 mins,1.70m after 10 mins,1.50m after 15 mins,1.45m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH5 (1 of 4)

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH5
Equipment	Dando 2000	250mm to 15.00m 200mm to 24.00m	250mm to 15.00m 200mm to 24.00m		
Drill Crew	D. NEWALL	Logged by	Compiled by	Checked by	
Dates Drilled	Start 29/10/2008 End 03/11/2008	DH 04/11/2008	md 05/11/2008		

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
								450	occasional pockets (<5mm) and lenses of pale brown sandy clay. Sand is fine.	10.00		
			10.50		D	29				(1.00)		
			10.50-10.95		D	30	S7					
			10.50-11.00		B	31						
			11.00-11.45		U	32		35/ 450	Firm dark grey silty slightly sandy CLAY with occasional pockets of pale yellow clay (<10mm). Sand is fine.	11.00 (0.25) 11.25		
			11.50		D	33						
			11.50-11.95		D	34	S19					
			11.50-12.00		B	35						
			12.00-12.45		U	36		110/ 450	Stiff locally very stiff grey brown slightly sandy slightly gravelly CLAY. Sand is predominantly fine. Gravel is predominantly subangular to rounded fine and medium of flint, chalk, siltstone and mixed lithologies.			
			12.50		D	37						
			12.50-12.95		D	38	S35					
			12.50-13.00		B	39						
			13.00-13.45		U	40		120/ 450				
			13.50		D	41						
			13.50-13.95		D	42	S43					
			13.50-14.00		B	43						
			14.00-14.45		U	44		120/ 450				
			14.50		D	45						
			14.50-14.95		D	46	S42					
31/10	15.00	DRY	14.50-15.00		B	47						
			15.00-15.45		U	48		60/ 450	[illegible] between 15.00m: With occasional subrounded flint and chalk cobbles.			
03/11	15.00	5.00								(7.75)		
			15.50		D	49						
			15.50-15.95		D	50	S18					
			15.50-16.00		B	51						
			16.00-16.45		U	52		60/ 450				
			16.50		D	53						
			16.50-16.95		D	54	S19					
			16.50-17.00		B	55						
			17.00-17.45		U	56		65/ 450				
			17.50		D	57						
			17.50-17.95		D	58	S19					
			17.50-18.00		B	59						
			18.00-18.45		U	60		55/ 400				
			18.50		D	61						
			18.50-18.95		D	62	S15					
			18.50-18.95		B	63						
			19.00-19.45		D	64	S22			19.00		
			19.00-19.50		B	65			Medium dense brown silty fine and medium SAND with occasional thin clay laminae.	(0.90)		
			20.00-20.45		U#B	66			Firm, locally stiff, thinly laminated brown sandy CLAY with rare subrounded fine to	19.90		

Remarks
(See notes & keysheets)

Scale 1:50

	Project	Contract No.	
TUGRO	HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell		CON083130
		Figure No.	BH5 (2 of 4)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Drill Crew** B. HAWES **Dates Drilled** Start 29/10/2008 End 31/10/2008	**Borehole Diameter** 250mm to 5.50m, 200mm to 23.00m **Casing Diameter** 250mm to 5.00m, 200mm to 23.00m **Logged by** MW 03/11/2008 **Compiled by** md 05/11/2008 **Checked by**	**BOREHOLE No. BH7**	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From–To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
29/10								Grass over TOPSOIL.	(0.30) 0.30		
								MADE GROUND: Concrete and brick (Driller's description).	(0.70) 1.00		
								MADE GROUND: Composed of soft brown clayey silty fine sand.			
			1.50-1.95	U#B	1				(1.00) 2.00		
			1.50-1.95	B	2						
			2.00	CD	3						
			2.00-2.15			S2/ 100		MADE GROUND: Composed of very soft brown locally black sandy silt/clay with occasional cobbles of brick.			
			2.00	K	3						
			2.00	V	3						
	1.80	DRY	2.00-2.45	B	5				(1.30) 3.30		
	2.40	DRY	2.50-2.95	U	6		12/ 450				
			3.00	CD	8						
			3.00-3.25			S3/ 200					
			3.00	K	8						
			3.00	V	8						
	2.90	DRY	3.00-3.45	B	10			Very soft brown sandy CLAY locally grading into sandy silt. Sand is fine.			
	3.40	DRY	3.50-3.95	U#B	11				(0.90) 4.20		
			3.50-3.95	B	12						
			4.00-4.45	B	14	S2/ 125					
			4.00	CD	15						
			4.00	K	15			Soft locally very soft grey brown sandy SILT locally grading into sandy SILTt/CLAY. Sand is fine to coarse.			
			4.00	V	15						
			4.00	W	25						
	4.40	DRY	4.50-4.95	U	16		12/ 450				
			4.90	W	78						
			5.00-5.15			S2/ 100					
			4.90	W	78						
	4.90	DRY	5.00-5.45	B	19						
			5.00	CD	20						
			5.00	K	20						
29/10	6.00	DRY	5.00	V	20						
			5.50-5.95	B	22						
	5.30	DRY	5.50-5.95	U#B	21						
30/10	6.00	4.00	6.00-6.45	B	2	S1/ 225					
	6.40	WET	6.50-6.95	U#B	26			Below 6.50m: Grading into grey brown slightly sandy silt.			
			6.50-6.95	B	27						
	6.80	WET	7.00-7.45	B	29	S10					
	7.40	WET	7.50-7.95	U	30		14/ 450		(6.80) 10.60		
	7.40	WET	8.00-8.45	B	33	S4					
	8.40	WET	8.50-8.95	U	34		18/ 350				
	8.40	WET	9.00-9.45	B	37	S7		At 9.00m: Dark brown grey. Slight organic odour.			
	9.40	WET	9.50-9.95	U	38		18/ 350				
	9.40	WET	10.00-10.45	B	41	S5					

Remarks (See notes & keysheets)
1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. See installation details on final sheet.
3. Groundwater was encountered at 19.00m during boring.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH7 (1 of 4)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Drill Crew** B. HAWES **Dates Drilled** Start 29/10/2008 End 31/10/2008	**Borehole Diameter** 250mm to 5.50m, 200mm to 23.00m **Casing Diameter** 250mm to 5.00m, 200mm to 23.00m **Logged by** MW 03/11/2008 **Compiled by** md 05/11/2008 **Checked by**	**BOREHOLE No.** BH7	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From–To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
	10.40	WET	10.95-11.00	U	42		15/		11.00		
			11.00-11.45			S6	400	Firm, becoming stiff with depth slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded medium chalk. Sand is fine to coarse.			
			11.00-11.45	B	45						
	11.40	WET	11.50-11.95	U	46						
			11.50-11.95	B	47						
	11.80	WET	12.00-12.45	U	49	S20					
			12.50-12.95	U	50				(3.00)		
	12.40	WET	13.00-13.45	B	53	S47					
			13.50-13.95	U	54						
	13.40	WET	13.50-13.95	B	55						
	13.80	WET	14.00-14.45	B	57	S32			14.00		
								Stiff locally firm grey brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine and medium of chalk and mudstone. Sand is fine to coarse.			
	14.40	WET	14.50-14.95	U	58						
			14.50-14.95	B	59						
	14.90	WET	15.00-15.45	B	61	S31					
			15.50-15.95	U	62						
	15.40	WET	15.50-15.95	B	63						
	15.90	WET	16.00-16.45	B	65						
	16.40	WET	16.50-16.95	U	66				(5.00)		
			16.50-16.95	B	67						
	16.90	WET	17.00-17.45	U	69	S15					
	17.40	WET	17.50-17.95	B	70						
			17.50-17.95	B	71						
	17.80	WET	18.00-18.45	B	73	S25					
	18.40	WET	18.50-18.95	U	74						
			18.50-18.95	B	75						
30/10	19.00	WET									
									19.00		
31/10	19.00	WET	19.00-19.45	B	77	S33		Stiff locally soft grey brown slightly sandy gravelly CLAY. Gravel to angular to subrounded fine and medium of chalk and mudstone. Sand is fine to coarse.			
	19.90	DRY	20.00-20.45	D	79			Below 20.00m: Becomes stiff.			

Remarks
(See notes & keysheets)

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH7 (2 of 4)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter**	**Casing Diameter**	**BOREHOLE No.** **BH8A**
Equipment Dando 2000	250mm to 5.50m 200mm to 23.50m 150mm to 28.90m 120mm to 44.00m	250mm to 5.50m 200mm to 23.50m 150mm to 23.50m 120mm to 37.40m	
Drill Crew B. Hawes **Dates Drilled** **Start** 05/11/2008 **End** 27/11/2008	**Logged by** DH 07/11/2008	**Compiled by** ren 17/11/2008	**Checked by**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
05/11									Grass over MADE GROUND: Composed of soft to firm brown sandy slightly gravelly silt. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of brick. Rare organic fragments (<20mm).	(1.80)		
			1.50		ES	1						
	1.40	DRY	1.50-1.95		D	2	C7					
			1.50-1.95		B	3						
										1.80		
									MADE GROUND: Composed of firm brown becoming black locally gravelly silty clay. Gravel is angular coarse of brick. Occasional cobbles of brick.	(0.50)		
										2.30		
			2.50		ES	4						
	2.40	DRY	2.50-2.95		U	5		20/ 450	MADE GROUND: Composed of firm brown locally mottled blue grey locally slightly sandy clay with occasional angular fine to coarse gravel of brick.			
			2.95-3.00		ES	6				(1.30)		
	2.40	DRY	3.00-3.45		D	7	S12		Below 2.90m: Becoming black.			
			3.00-3.45		B	8						
			3.50		ES	9						
	3.40	DRY	3.50-3.95		U	10		34/ 450		3.60		
									Firm grey brown slightly sandy SILT/CLAY. Sand is fine to coarse.			
			3.95-4.00		ES	11				(0.90)		
	3.40	DRY	4.00-4.45		D	12	S16					
			4.00-4.45		B	13						
			4.50		ES	14				4.50		
	4.40	DRY	4.50-4.95		U	15		20/ 450	Soft brown grey slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk, mudstone, quartz and rare flint. Sand is fine to coarse.			
			4.95-5.00		ES	16						
	4.40	DRY	5.00-5.45		D	17	S5					
			5.00-5.45		B	18						
	5.40	DRY	5.50-5.95		U	19		16/ 450	Below 5.50m: Locally dark grey and black.			
			5.95-6.00		ES	20						
	5.40	DRY	6.00-6.45		D	21	S5					
			6.00-6.45		B	22						
	6.40	DRY	6.50-6.95		U	23		5/ 450				
			6.95-7.00		ES	24						
	6.40	DRY	7.00-7.45		D	25	S4					
			7.00-7.45		B	26						
	7.40	DRY	7.50-7.95		U	27		28/ 200				
			7.95-8.00		ES	28			Below 8.00m: Becomes black.			
	7.40	DRY	8.00-8.45		D	29	S5					
			8.00-8.45		B	30						
	8.40	DRY	8.50-8.95		U	31		22/ 450				
										(8.50)		
			8.80		W	76						
			8.95-9.00		ES	32						
	8.40	DRY	9.00-9.45		D	33	S7					
			9.00-9.45		B	34						
	9.40	DRY	9.50-9.95		U	35		20/ 450				
									Below 9.90m: Locally grades into grey brown and black silt/clay.			
			9.95-10.00		ES	36						

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. Aquifer protection was carried out by sealing the base of the hole at a depth of 5.50m and continuing in reduced diameter casing.
3. The borehole was advanced by chiselling methods from 20.50m to 20.80m (1 hour) and 22.20m to 23.00m (2 hours).
4. Aquifer protection was carried out by sealing the base of the hole at a depth of 23.50m and continuing in reduced diameter casing.
5. See installation details on final sheet.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH8A (1 of 6)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter**	**Casing Diameter**	**BOREHOLE No.** **BH8A**
Equipment Dando 2000	250mm to 5.50m 200mm to 23.50m 150mm to 28.90m 120mm to 44.00m	250mm to 5.50m 200mm to 23.50m 150mm to 23.50m 120mm to 37.40m	
Drill Crew B. Hawes **Dates Drilled** **Start** 05/11/2008 **End** 27/11/2008	**Logged by** DH 07/11/2008	**Compiled by** ren 17/11/2008	**Checked by**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From–To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
	9.40	DRY	10.00-10.45	D	37	S6					
			10.00-10.45	B	38						
	10.40	DRY	10.50-10.95	U	39		30/ 450				
			10.95-11.00	ES	40						
	10.40	DRY	11.00-11.45	D	41	S10					
			11.00-11.45	B	42						
	11.40	DRY	11.50-11.95	U	43		35/ 450				
			11.95-12.00	ES	44			Below 12.00m: Occasional plant remains.			
	11.40	DRY	12.00-12.45	D	45	S25					
			12.00-12.45	B	46						
	12.40	DRY	12.50-12.95	U	47		65				
			12.50-12.95	B	48						
	12.90	DRY	13.00-13.45	D	49	S36			13.00		
			13.00-13.45	B	50			Stiff grey brown sandy CLAY with occasional subangular fine to coarse gravel of chalk. Sand is fine to coarse.			
	13.40	DRY	13.50-13.95	U	51		80				
05/11	14.00	DRY									
			13.95-14.00	ES	52						
06/11	14.00	13.70	14.00-14.45	B	54						
	13.40	DRY	14.00-14.45	D	53	S47					
	14.40	DRY	14.50-14.95	U	55		65/ 450				
			14.95-15.00	ES	56			Below 15.00m: Locally grades into silty clay.			
	14.40	DRY	15.00-15.45	D	57	S23					
			15.00-15.45	B	58						
			15.00	ES	59						
	15.40	DRY	15.50-15.95	U	60		40/ 450				
			15.95-16.00	ES	61				(6.00)		
	15.40	DRY	16.00-16.45	D	62	S21					
			16.00-16.45	B	63						
	16.40	DRY	16.50-16.95	U	64		0/ 300				
			16.95-17.00	ES	65						
	16.40	DRY	17.00-17.45	D	66	S23					
			17.00-17.45	B	67						
	17.40	DRY	17.50-17.95	U	68		75/ 450				
			17.95-18.00	ES	69						
	17.40	DRY	18.00-18.45	D	70	S26					
			18.00-18.45	B	71						
	18.40	DRY	18.50-18.95	U	72		30/ 450				
			18.95-19.00	ES	73				19.00		
	18.40	DRY	19.00-19.45	D	74	S15		Medium dense grey brown slightly silty fine and medium SAND with rare subangular medium to coarse gravel of sandstone.			
			19.00-19.45	B	75						
			19.50	ES	77						
	19.40	FULL	19.50-19.95	U	78		100/ 400		(1.50)		
			19.95-20.00	ES	79						

Remarks 6 (See notes & keysheets) Groundwater was encountered at 15.00m during boring and rose to 9.80m after 5 mins,9.00m after 10 mins,8.90m after 15 mins,8.80m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH8A (2 of 6)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Drill Crew** **Dates Drilled** Start 10/11/2008 End 11/11/2008	**Borehole Diameter** 250mm to 6.00m 200mm to 18.50m 23mm to 24.00m	**Casing Diameter** 250mm to 6.00m 200mm to 13.00m 150mm to 23.50m	**BOREHOLE No. BH9**
	Logged by MW 12/11/2008	**Compiled by** ren 25/11/2008	**Checked by**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
10/11			0.20		D	1			MADE GROUND: Composed of tarmacadam over brown slightly sandy silty clay. At 0.20m: Concrete.	(1.20)		
			0.20		B	2						
			0.30		CD	3						
			0.30		K	3						
			0.30		V	3						
			0.50		CD	4						
			0.50		V	4						
			0.50		K	5						
			1.00		CD	5				1.20		
			1.20-1.65				C10		MADE GROUND: Composed of firm locally fissured brown locally black, brown and blue grey locally slightly sandy clay with rare gravel. Gravel is fine, subangular of sandstone.			
			1.00		K	5						
			1.00		V	5						
			1.20-1.65		D	6						
			1.20		B	7						
			2.00		CD	8						
			2.00		K	8						
			2.00		V	8						
	1.90	DRY	2.00-2.45		U	9		18/		(2.30)		
			2.45-2.50		CS	10		450	Below 2.50m: Brown and black slightly sandy silt/clay with rare gravel of brick.			
			2.50-2.95		D	11	S7					
	1.90	DRY	2.50		B	12						
			3.00		CD	13						
			3.00		K	13						
			3.00		V	14						
	2.80	DRY	3.00-3.45		U	14		60/				
			3.45-3.50		CS	15		450		3.50		
			3.50-3.95		D	16	S9		Firm grey brown slightly sandy SILT. Sand is fine to coarse.			
			3.50		B	17						
			4.00		CD	18						
			4.00		K	18						
			4.00		V	18				(1.50)		
	3.90	DRY	4.00-4.45		U	19		32/				
			4.45-4.50		CS	20		450				
			4.50-4.95		D	21	S12					
			4.50		B	22						
			5.00		CD	23				5.00		
			5.00		V	23			Very [illegible] dark grey slightly sandy silty CLAY. Sand is fine to coarse.			
			5.00		V	23						
			5.00		B	24						
	4.90		5.00-5.45		U#B	25						
			5.50-6.03				S1/ 150					
	4.90	DRY	5.00		B	26						
			5.50-5.95		C	27						
			5.50		B	28						
			6.00		CD	2						
			6.00		K	2						
			6.00		V	29						
			6.00-6.45		U	30		11/				
			6.45-6.50		CS	31		400				
			6.50-6.95		C	32	S1/ 75					
			6.50		B	33						
		FULL	7.00-7.45		U#B	34						
			7.00		B	35						
			7.50-7.95		C	36	S1/ 450*					
		FULL	7.50		B	37				(5.50)		
			8.00-8.45		U#B	38						
			8.00		B	39						
			8.00-8.95		C	40						
			8.50		D	41						
			8.50-8.95				S1/ 450*					
		FULL	9.00-9.45		U#B	42						
			9.00		B	43						
	9.00	FULL	9.50-9.95		C	44	S1/ 450*					
			9.50		B	45						
			10.00-10.45		U	46		64/				

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. Aquifer protection was carried out by sealing the base of the hole at a depth of 3.00m and continuing in reduced diameter casing.
3. The borehole was advanced by chiselling methods from 12.20m to 12.50m (1.25 hours).
4. Aquifer protection was carried out by sealing the base of the hole at a depth of 18.50m and continuing in reduced diameter casing.
5. The borehole was advanced by chiselling methods from 20.60m to 20.90m (1.5 hours) and 23.60m to 24.00m (1 hour).

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH9 (1 of 4)

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH9
Equipment	Dando 2000	250mm to 6.00m 200mm to 18.50m 23mm to 24.00m	250mm to 6.00m 200mm to 13.00m 150mm to 23.50m		
Drill Crew Dates Drilled	Start 10/11/2008 End 11/11/2008	Logged by MW 12/11/2008	Compiled by ren 25/11/2008	Checked by	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
								450				
			10.45-10.50		CS	47				10.50		
		FULL	10.50-10.95		C	48	S8		Firm grey brown sandy gravelly CLAY. Gravel is angular to subrounded fine to medium of chalk, coal, sandstone and mudstone. Sand is fine to coarse.			
			10.50		B	49						
			11.00-11.45		U	50		60/ 350				
			11.45-11.50		CS	51				(2.00)		
			11.50-11.95		C	52	S13		At 11.70m: Bands/pockets of dark brown/black spongy PEAT.			
		FULL	11.50		B	53						
10/11	10.50	0.00	11.70		CD	54						
			11.70		K	54						
11/11	10.50	6.80	11.70		V	54			At 12.20m: Sandstone cobble/boulder.			
			11.70		D	55						
		FULL	11.70		B	56						
	11.80		12.00-12.45		U#B	57				12.50		
			12.50-12.95				S18		Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of chalk, flint and sandstone. Sand is fine to coarse.			
			12.00		B	58						
			12.50-12.95		C	59						
			12.50		B	60						
			12.50		CD	61						
			12.50		K	61						
			12.50		V	61						
	12.80	DRY	13.00-13.45		U	62		100/ 450				
			13.45-13.50		CS	63						
			13.50-13.95		C	64	S28					
			13.50		B	65						
	13.00	DRY	14.00-14.45		U	66		110/ 450				
			14.45-14.50		CS	67						
			14.50-14.95		C	68	S38					
	13.00	DRY	14.50		B	69						
			15.00-15.45		U	70		100/ 450				
			15.45-15.50		CS	71				(6.00)		
	13.00		15.50-15.95		C	72	S34					
		DRY	15.50		B	73						
			16.00-16.45		U	74		110/ 450				
			16.45-16.50		CS	75						
	13.00		16.50-16.95		C	76	S47					
			16.50		B	77						
			17.00-17.45		U	78		80/ 450				
		DRY	17.45-17.50		CS	79						
			17.50-17.95		C	80	S37					
	13.00		17.50		B	81						
		DRY	18.00-18.45		U#B	82						
			18.00		B	83						
	13.00	6.80	18.50		D	84				18.50		
			18.50		B	85			Medium dense brown very clayey fine and medium SAND.			
			18.50		CD	86						
	6.80		18.50		K	86						
			18.50		V	86						
	18.80	6.80	19.00-19.45		C	87	S21			(1.40)		
			19.00		B	88						
			19.90		D	89			Probably extremely weak structureless CHALK recovered as firm comminuted chalk.	19.90		

Remarks (See notes & keysheets)

6 See installation details on final sheet.

7 Groundwater was encountered at 4.70m during boring and rose to 4.30m after 5 mins,4.10m after 10 mins,3.80m after 15 mins,3.50m after 20 mins.

8 Groundwater was encountered at 18.20m during boring and rose to 15.10m after 5 mins,11.20m after 10 mins,8.70m after 15 mins,6.80m after 20 mins.

Scale 1:50

	Project	Contract No.
TUGRO	HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	CON083130
		Figure No. BH9 (2 of 4)

Drilling Method Cable Percussion	**Borehole Diameter** 250mm to 7.00m, 200mm to 12.00m, 150mm to 24.50m	**Casing Diameter** 250mm to 7.00m, 200mm to 12.00m	**BOREHOLE No.** **BH11A**
Equipment Dando 2000			
Drill Crew	**Logged by** MW	**Compiled by** md	**Checked by**
Dates Drilled Start 30/10/2008 End 03/11/2008	03/11/2008	05/11/2008	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
30/10									MADE GROUND: Tarmacadam.	(0.20) 0.20		
			0.30		CD	1			MADE GROUND: Composed of firm brown sandy gravelly clay. Gravel is angular to subrounded fine to coarse of brick, chalk, coke and mudstone. Occasional cobbles of brick.			
			0.30		K	1						
			0.30		V	1						
			0.30		D	2						
			0.30		B	3						
			0.50		CD	4						
			0.50		K	4						
			0.50		V	4				(2.20)		
			1.00		CD	5						
			1.00		K	5						
			1.00		V	5						
			1.20-1.65		D	6						
			1.20		B	7						
	1.70	DRY	2.00-2.45		D	8						
			2.00		B	9						
			2.00		CD	10						
			2.00		K	10				2.40		
			2.00		V	10			MADE GROUND: Composed of soft to firm grey sandy clay with occasional subangular to subrounded fine to coarse gravel of coke, chalk, brick and flint.			
			2.40		D	11						
	2.00	DRY	2.40		B	12						
	2.80	DRY	3.00-3.45		D	13	C9			(1.30)		
			3.00		B	14						
			3.00		CD	15						
			3.00		K	15						
			3.00		V	15						
			3.70		D	16				3.70		
			3.70		B	17			MADE GROUND: Composed of soft grey brown sandy clay, locally with some cobbles of brick.			
			4.00		CD	17						
			4.00		K	17						
			4.00		V	17						
			4.00-4.45		U	18		22/		(1.30)		
			4.50-4.95		B	21	S4	450				
	4.80	2.20	5.00-5.45		U	22		24/ 450	Firm locally soft grey brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine and medium of chalk, coal, flint, sandstone and mudstone. Sand is fine to coarse.	5.00		
			5.50-5.95		B	25	S3		At 5.00m: Brown clay/silt.			
	5.70	2.20	6.00-6.45		U	26		2 450				
	6.30	FULL	6.50-6.95		B	29	S11					
	6.80	FULL	7.00-7.45		U	30		18/ 450				
			7.50-7.95		B	33	S10		At 7.50m: Grey brown silt parting.			
	7.80	FULL	8.00-8.45		U	34		22/ 450		(6.20)		
			8.50-8.95		B	37	S13		Below 8.50m: Locally grades into silty clay.			
	8.90	FULL	9.00-9.45		U	38		27/ 450				
			9.50-9.95		B	41	S13					
	9.80	FULL	10.00-10.45		U	42		52/				

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 1.70m to 1.90m (45 mins) and 10.30m to 11.15m (45 mins).
3. The borehole was advanced by chiselling methods from 21.70m to 21.90m (30 mins) and 22.60m to 22.90m (1 hour 45 mins).
4. The borehole was advanced by chiselling methods from 23.50m to 23.80m (1 hour 30 mins).
5. See installation details on final sheet.
6. Groundwater was encountered at 5.00m during boring and rose to 4.40m after 5 mins,3.60m after 10 mins,2.80m

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH11A (1 of 4)

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH11A
Equipment	Dando 2000	250mm to 7.00m 200mm to 12.00m 150mm to 24.50m	250mm to 7.00m 200mm to 12.00m		
Drill Crew Dates Drilled	Start 30/10/2008 End 03/11/2008	Logged by MW 03/11/2008	Compiled by md 05/11/2008	Checked by	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
								450				
			10.50	10.95	B	45	S17					
	10.80	FULL	11.00	11.45	U	46		100/ 450				
									Stiff brown sandy slightly gravelly CLAY. Gravel is subangular to rounded, fine to coarse flint and chalk. Sand is fine to coarse.	11.20		
			11.50	11.95	B	49	S27					
30/10	10.80	FULL										
31/10	10.80	6.80	12.00	12.45	U	50		100/ 450				
	12.00	DRY	12.50	12.95	B	53	S42					
			13.00	13.45	U	54		110/ 450				
	12.00	DRY	13.50	13.95	B	57	S42					
			14.00	14.45	U	58		100/ 450				
	12.00	DRY	14.50	14.95	B	61	S45					
			15.00	15.45	U	62		100/ 450				
	12.00	DRY	15.50	15.95	B	65	S44			(8.40)		
			16.00	16.45	U	66		100/ 450				
	12.00	DRY	16.50	17.00	B	69	S43					
	12.00	DRY	17.00	17.45	U	70		100/ 450	Below 17.00m: Driller notes occasional boulders.			
			17.50	17.95	B	73	S44					
			18.00	18.45	U	74		100/ 450				
			18.50	18.95	B	77	S45		Below 18.50m: Locally grades into sandy gravelly silt.			
31/10	19.00	6.40										
03/11	19.00	1.90	19.00 19.00		U#B B	78 79						
	19.00	1.90	19.60 19.60		D B	80 81				19.60		
	19.80	4.70	20.00	20.00	B	83	S25		Medium dense clayey slightly gravelly fine to coarse SAND. Gravel is subangular and subrounded fine to coarse of mixed lithologies.			

Remarks (See notes & keysheets) 7

after 15 mins,2.20m after 20 mins.
Groundwater was encountered at 19.00m during boring and rose to 15.10m after 5 mins,9.70m after 10 mins,6.40m after 15 mins,6.40m after 20 mins.

Scale 1:50

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** / **Casing Diameter**		**BOREHOLE No.** **BH12A**
Equipment Dando 2000 Knebel	250mm to 6.00m / 250mm to 6.00m 200mm to 17.50m / 200mm to 19.00m 150mm to 22.00m / 150mm to 22.00m 120mm to 42.00m / 120mm to 37.00m		
Drill Crew	**Logged by** DH	**Compiled by** md	**Checked by**
Dates Drilled Start 04/11/2008 End 21/11/2008	07/11/2008	12/11/2008	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
04/11			0.20		D	1			MADE GROUND: Composed of brown to dark brown slightly gravelly to gravelly clayey sand. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint, quartz, brick and chalk with occasional rootlets (<2mm).	(0.20) 0.20		
			0.20		B	2						
			0.30		ES	3						
			0.50		ES	4						
			1.00		ES	5			MADE GROUND: Composed of subangular to subrounded fine to coarse gravel in a silty sand matrix with occasional brick fragments (<30mm) locally intermixed with brown sandy clay.	(1.40)		
	NIL	DRY	1.20-1.65		D	6	C7					
			1.20		B	7				1.60		
04/11	1.90	DRY							MADE GROUND: Concrete.	(0.40)		
			2.00		ES	8				2.00		
05/11	1.90	DRY	2.00		B	10			Very soft brown locally grey brown slightly clayey SILT with occasional pockets of (<10mm) of yellow and orange silt. Below 2.60m: Grades into silty clay.			
	1.90	DRY	2.00-2.45		D	9						
			2.60		D	11				(1.50)		
			2.60		B	12						
			3.00		ES	13						
	2.80	DRY	3.00-3.45		U	14		12/ 450				
			3.45-3.50		ES	15				3.50		
			3.50-3.95		D	16	S8		Loose grey brown to brown silty fine SAND with occasional pockets (<10mm) of dark grey organic silt and occasional partings and lenses (<5mm) of fine to medium sand.			
			3.50		B	17						
	3.80	DRY	4.00-4.45		U	18		32/ 450				
			4.00		ES	20						
			4.45-4.50		ES	19			Below 4.50m: Grades into sandy silt.			
			4.50-4.95		D	21	S9					
			4.50		B	22				(2.50)		
	4.80	DRY	5.00-5.45		U	23		24/ 450				
	4.80	DRY	5.00		ES	25						
			5.45-5.50		ES	24						
			5.50-5.95		D	26	S8					
			5.50		B	27						
	5.90	5.20	6.00-6.45		U	28				6.00		
			6.00-6.45		B	29		250	Very soft grey brown slightly sandy silty CLAY. Sand is fine.			
			6.50-6.95		D	30	S1/ 225		Between 6.50m and 7.50m: With occasional pockets/partings of silty fine sand.			
			6.50		B	31						
	6.80	450.00	7.00-7.45		U	32		22				
			7.00-7.45		B	33						
			7.50-7.95		D	34	S1/ 150					
			7.50		B	35						
	7.80	FULL	8.00-8.45		U	36		21		(4.00)		
			8.00-8.45		B	37						
			8.50-8.95		D	38	S1/ 450					
			8.50		B	39						
	8.80	FULL	9.00-9.45		U	40		18				
			9.00-9.45		B	41						
			9.50-9.95		D	42	S1/ 450					
			9.50		B	43						
	9.80	450.00	10.00-10.45		U	44		32/		10.00		
									Firm dark grey brown slightly sandy slightly			

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 1.60m to 1.80m (1.25 hours).
3. Aquifer protection was carried out by sealing the base of the hole at a depth of 16.00m and continuing in reduced diameter casing.
4. The borehole was advanced by chiselling methods from 21.10m to 21.50m (1 hour).
5. See installation details on final sheet.
6. Groundwater was encountered at 5.60m during boring and rose to 5.40m after 5 mins,5.20m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH12A (1 of 6)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter**	**Casing Diameter**	**BOREHOLE No.** **BH12A**
Equipment Dando 2000 Knebel	250mm to 6.00m 200mm to 17.50m 150mm to 22.00m 120mm to 42.00m	250mm to 6.00m 200mm to 19.00m 150mm to 22.00m 120mm to 37.00m	
Drill Crew **Dates Drilled** **Start** 04/11/2008 **End** 21/11/2008	**Logged by** DH 07/11/2008	**Compiled by** md 12/11/2008	**Checked by**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
								450	gravelly CLAY. Sand is fine and medium. Gravel is angular to rounded predominantly fine and medium of mixed lithologies.	10.00		
			10.45-10.50		ES	45			Between 10.50m and 11.50m: With occasional			
			10.50-10.95		D	46	S7		pockets of (<50mm) grey fine sand.			
			10.50		B	47						
	10.80	FULL	11.00-11.45		U	48		33/ 450		(2.60)		
			11.45-11.50		ES	49						
			11.50-11.95		D	50	S11					
			11.50		B	51						
	11.80	FULL	12.00-12.45		U	52		58				
			12.00-12.45		B	53						
05/11	12.50	FULL	12.50-12.95		D	54	S10					
			12.50		B	55				12.60		
06/11	12.50	DRY	12.60		D	56			Stiff brown sandy slightly gravelly CLAY. Sand is predominantly fine and medium. Gravel is predominantly angular to rounded fine and medium of mixed lithologies with partings and lenses of fine and medium light brown sand (<3mm). Below 13.50m: Becomes stiff brown and sandy.			
			12.60		B	57						
			12.60		ES	58						
	12.90	DRY	13.00-13.45		U	59		120/ 450				
			13.45-13.50		CS	60						
			13.50-13.95		D	61	S37					
			13.50		B	62						
			14.00-14.45		U	63		110/ 450				
			14.45-14.50		CS	64						
			14.50-14.95		D	65	S39					
			14.50		B	66						
			15.00-15.45		U	67		100/ 450				
			15.45-15.50		CS	68						
			15.50-15.95		D	69	S42					
			15.50		B	70				(6.40)		
			16.00-16.45		U	71		450				
			16.45-16.50		CS	72			Below 16.50m: Gravel is angular to rounded			
			16.50-16.95		D	73	29		fine to coarse.			
			16.50		B	74						
			17.00-17.45		U	75		81/ 450				
			17.45-17.50		CS	76						
			17.50-17.95		D	77	S30					
	12.90	DRY	17.50		B	78						
			18.00-18.45		U	79		80/ 450				
			18.45-18.50		CS	80						
			18.50-18.95		D	81	S27					
			18.50		B	82						
	12.90	DRY	19.00-19.45		U	83		24/		19.00		
			19.00		B	84		450	Medium dense grey green clayey fine to coarse SAND.			
	12.90	9.80	19.50-19.95		D	85	S20					
			19.50		B	86						
			19.50		W	86				(1.50)		
			19.50		W	86						
			19.50		ES	87						

Remarks 7 (See notes & keysheets) Groundwater was encountered at 19.20m during boring and rose to 17.20m after 5 mins,15.30m after 10 mins,12.10m after 15 mins,9.80m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH12A (2 of 6)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Drill Crew** **Dates Drilled** Start 18/11/2008 End 20/11/2008	**Borehole Diameter** 250mm to 7.50m, 200mm to 11.00m **Casing Diameter** 250mm to 6.90m, 200mm to 9.80m **Logged by** MW 21/11/2008 **Compiled by** md 26/11/2008 **Checked by**	**BOREHOLE No.** BH13	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
18/11	0.00	DRY							MADE GROUND: Composed of grey brown clayey gravelly fine to coarse sand with occasional cobbles of brick. Gravel is angular to subrounded fine to coarse of brick and quartzite. Between 0.30m and 0.50m: Possibly insitu concrete.			
			0.30		D	1						
			0.30		B	2						
			0.30		CD	3						
			0.30		K	3						
			0.30		V	3						
			0.50		CD	4						
			0.50		K	4						
			0.50		V	4				(2.50)		
			1.20-1.65				C11					
			1.00		CD	5						
			1.00		K	5						
			1.00		V	5						
			1.20-1.65		D	6						
			1.20		B	7			Below 2.00m: Becomes very sandy and gravelly.			
			2.00-2.45		D	8	C10					
			2.00		B	9						
			2.00		CD	10						
			2.00		K	10						
			2.00		V	10			Firm grey brown slightly sandy CLAY/SILT with rare angular fine gravel of chalk.	2.50		
			2.50		D	11						
	2.00	DRY	2.50		B	12						
			2.50		CD	13						
			2.50		K	13						
			2.50		V	13						
			3.00-3.45		U	14		31/				
			3.50-3.95		B	17	S9	450				
									Below 3.70m: Locally dark grey/black.			
			3.70		D	18						
			3.70		B	19						
			4.00-4.45		U	20		32/				
			4.00-4.45		U	20		450		(3.20)		
			4.50-4.95		B	23	S12					
			4.50		CD	24						
			4.50		K	24						
			4.50		V	24						
			4.70		CD	25						
			4.70		K	25						
			4.70		V	25						
	4.50	DRY	5.00-5.45		U	26		3				
			5.50-5.95		B	29	S9	450				
			5.70		CD	30				5.70		
			5.70		K	30			Soft dark grey sandy CLAY. Sand is fine to coarse.			
			5.70		V	30						
	5.80	DRY	6.00-6.45		U	31		33/ 450				
	6.40	5.30	6.50-6.85		B	34	S1/ 50					
			6.50		CD	35						
			6.50		K	35				(2.30)		
			6.50		V	35						
	6.90	5.30	7.00-7.45		U	36		11/				
			7.00		B	37		450				
			7.50-7.88		B	39	S7/ 375*					
			7.50		CD	40						
			7.50		K	40						
	6.90	5.30	7.50		V	40				8.00		
	7.90	FULL	8.00-8.45		U#B	41			Very soft grey brown sandy locally very sandy locally gravelly to very gravelly CLAY. Gravel is angular to surounded fine and medium of chalk, flint and rare sandstone. Sand is fine to coarse. Occasional subrounded cobbles of chalk.			
			8.00		B	42						
			8.50-8.95		B	44	S1/ 450*					
	8.90	FULL	9.00-9.45		U#B	45						
			9.00		B	46						
			9.50-9.95		B	48	S2/ 300					
	9.80	FULL	10.00-10.45		U#B	49				(3.90)		

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 1.60m to 1.90m (1 hour 45 mins).
3. The borehole was advanced by chiselling methods from 21.20m to 21.50m (1 hour 30 mins) and 24.20m to 24.50m (1 hour).
4. See installation details on final sheet.
5. Groundwater was encountered at 6.10m during boring and rose to 5.40m after 5 mins,5.30m after 10 mins,5.30m after 15 mins,5.30m after 20 mins.

Scale 1:50

UGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH13 (1 of 4)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Drill Crew** **Dates Drilled** Start 18/11/2008 End 20/11/2008	**Borehole Diameter** 250mm to 7.50m 200mm to 11.00m **Casing Diameter** 250mm to 6.90m 200mm to 9.80m **Logged by** MW 21/11/2008 **Compiled by** md 26/11/2008 **Checked by**	**BOREHOLE No.**	**BH13**

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From–To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
			10.00-10.50	B	50						
			10.50-10.95	B	52	S6					
18/11	9.80	FULL									
19/11	9.80	5.30	11.00-11.45	U#B	53						
			11.00	B	54						
		5.30	11.50-11.95	B	56	S1/ 450*					
			11.50	W	57						
			11.50	W	57				11.90		
		DRY	11.90	D	58			Stiff grey sandy locally slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse flint, chalk and sandstone. Sand is fine to coarse.			
			11.90	B	59						
			11.90	CD	60						
			11.90	K	60						
			11.90	V	60						
			12.50-12.95			S47					
		DRY	12.00-12.45	U	61		70/ 450				
			12.50-12.95	B	64						
			13.00-13.45	U	65		12/ 450				
		DRY	13.50-13.95	B	68	S46					
		DRY	14.00-14.45	U	69		120/ 450				
			14.50-14.95	B	72	S46					
		DRY	15.00-15.45	U	73		74/ 450				
									(6.70)		
			15.50-15.95	B	76	S21					
			16.00-16.45	U	77		7[illegible] 450				
			16.50-16.95	B	80	S22		Below 16.50m: Slightly silty.			
			17.00-17.45	U	81		90/ 450				
		DRY	17.50-17.95	B	84	S32					
			18.00-18.45	U	85		90/ 450				
		5.40	18.50-18.95	B	88	S33					
		5.40	18.60	D	89				18.60		
			18.60	B	90			Medium dense grey brown sandy locally very sandy angular to subrounded fine and medium GRAVEL of chalk. Rare flint cobbles.			
			18.60	CD	91						
			18.60	K	91				(0.80)		
			18.60	V	91						
			19.40	D	92				19.40		
			19.50-19.95			S17		Firm grey brown sandy CLAY. Sand is fine to coarse.			
	19.40	5.50	19.40	CD	95						
			19.40	K	95						
			19.40	V	95						

Remarks (See notes & keysheets) 6 Groundwater was encountered at 18.50m during boring and rose to 13.20m after 5 mins,9.70m after 10 mins,7.10m after 15 mins,5.40m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH13 (2 of 4)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 6.00m; 200mm to 23.00m; 120mm to 45.00m	**Casing Diameter** 250mm to 4.50m; 200mm to 23.00m; 120mm to 45.00m	**BOREHOLE No.** **BH14**
Equipment Dando 2000; Knebel			
Drill Crew B Hawes	**Logged by** MW	**Compiled by** md	**Checked by**
Dates Drilled Start 10/11/2008; End 01/12/2008	13/11/2008	20/11/2008	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
10/11									MADE GROUND: Sand (Driller's description).	(0.10) 0.10		
									MADE GROUND: Hardcore (Driller's description).	(1.10)		
										1.20		
			1.50		CD	1			MADE GROUND: Composed of firm brown locally dark grey sandy gravelly clay. Gravel is angular to subrounded fine to coarse brick, chalk, sandstone and flint. Sand is fine to coarse.	(0.80)		
			1.50		K	1						
			1.50		V	1						
	1.40	DRY	1.50-1.95		D	2	C7					
			1.50-1.95		B	3				2.00		
									Soft brown sandy silty CLAY.			
			2.50		CD	4			Below 2.50m: Rare subrounded gravel	(1.10)		
			2.50		K	4						
			2.50		V	4						
	2.40	DRY	2.50-2.95		B	6	S1/ 225					
									Soft dark grey sandy SILT/CLAY. Sand is fine to coarse.	3.10		
			3.50		CD	7						
			3.50		K	7						
			3.50		V	7						
	3.50	DRY	3.50-3.95		D	8	C5					
			3.50-3.95		B	9						
			4.50		CD	10						
			4.50		K	10						
			4.50		V	10						
	4.40	DRY	4.50-4.95		D	11						
			4.50-4.95		B	12						
			4.50-4.95				C7					
			5.50		CD	13						
			5.50		K	13						
			5.50		V	13						
10/11	6.00	DRY										
	5.40	DRY	5.50-5.95		U	14		12/	Below 6.00m: Gravel is fine subangular of chalk. Tending to a silt.			
11/11	6.00	5.70	6.00-6.15		B	1	S2/ 100	450				
	6.40	WET	6.50-6.95		U	18		7/				
			6.60		W	79		300		(7.40)		
	6.40	WET	7.00-7.30		B	21	S3/ 200					
	7.40	WET	7.50-7.95		U#B	22						
			7.50-7.95		B	23						
	7.90	WET	8.00-8.25		B	25	S2/ 125					
	8.40	WET	8.50-8.95		U	26		20/ 400				
	8.40	WET	9.00-9.23		B	29	S2/ 100		Below 9.00m: Grades into dark grey clay.			
	9.40	WET	9.50-9.95		U	30		18/ 450				
	9.40	WET	10.00-10.35		B	33	S3/					

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 21.80m to 22.00m (1 hour) and 22.00m to 23.00m (3 hours 30 mins).
3. See installation details on final sheet.
4. Groundwater was encountered at 19.00m during boring and rose to 10.20m after 5 mins,9.70m after 10 mins,9.40m after 15 mins,9.10m after 20 mins.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH14 (1 of 6)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 6.00m; 200mm to 23.00m; 120mm to 45.00m	**Casing Diameter** 250mm to 4.50m; 200mm to 23.00m; 120mm to 45.00m	**BOREHOLE No.** **BH14**
Equipment Dando 2000; Knebel			
Drill Crew B Hawes	**Logged by** MW	**Compiled by** md	**Checked by**
Dates Drilled Start 10/11/2008; End 01/12/2008	13/11/2008	20/11/2008	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
							225					
	10.40	WET	10.50	10.95	U	34		12/ 450	Soft grey brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of chalk and sandstone. Sand is fine to coarse.	10.50		
	10.40	WET	11.00	11.35	B	37	S4/ 225			(1.30)		
	11.40	WET	11.50	11.95	U	38		25/ 450		11.80		
	11.40	WET	12.00	12.45	B	41	S14		Stiff brown sandy gravelly CLAY. Gravel is subangular fine to coarse chalk and flint. Sand is fine to coarse.			
	12.40	DRY	12.50	12.95	U	42		80/ 450				
	12.40	DRY	13.00	13.45	B	45	S30		Below 13.00m: Gravel is angular to subrounded fine to coarse of chalk, sandstone, mudstone and occasional coal.			
	13.40	DRY	13.50	13.95	U	46		60/ 450				
	13.40	DRY	14.00	14.45	B	49	S23					
			14.00		CD	50						
			14.00		K	50						
			14.00		V	50						
	14.40	DRY	14.50	14.95	U	51		60/ 450				
	14.40	DRY	15.00	15.45	B	54	S21					
	15.40	DRY	15.50	15.95	U	55		60/ 450		(7.20)		
			16.00	16.45	B	58						
			16.00	16.45			S15					
	16.40	DRY	16.50	16.95	U	59		0/ 450				
	16.40	DRY	17.00	17.45	B	62	S18					
	17.40	DRY	17.50	17.95	U	63		35/ 450				
	17.40	DRY	18.00	18.45	B	66	S18					
	18.40	DRY	18.50	18.95	U	67		60/ 400				
	18.40	WET	19.00	19.45	B	70	S21		Medium dense brown silty fine SAND with occasional subangular fine chalk gravel and rare chalk cobbles.	19.00		
	19.90	7.00	20.00	20.45	D	71	C25					

Remarks
(See notes & keysheets)

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH14 (2 of 6)

Drilling Method Cable Percussion & Rotary	**Borehole Diameter** 250mm to 2.20m; 200mm to 25.00m; 120mm to 46.00m	**Casing Diameter** 250mm to 2.20m; 200mm to 25.00m; 120mm to 32.45m	**BOREHOLE No.** **BH16**
Equipment Dando 2000; Knebel			
Drill Crew B.Hawes	**Logged by** TW 17/11/2008	**Compiled by** ren 10/11/2008	**Checked by**
Dates Drilled Start 10/11/2008; End 26/11/2008			

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
10/11									MADE GROUND: Tarmacadam.	(0.05) 0.05		
									MADE GROUND: Composed of brown gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of limestone, brick and concrete.	(0.55) 0.60		
			1.00		ES	1			MADE GROUND: Composed of black sandy angular to subrounded fine to coarse gravel of slag and clinker. Sand is fine to coarse of ash.	(0.30) 0.90		
	1.40	DRY	1.50-1.95		D	2	C10		MADE GROUND: Composed of soft brown slightly gravelly clay. Gravel is angular to subangular fine to coarse of chalk, flint and brick.	(1.30)		
			1.50-1.95		B	3						
10/11	1.40	DRY	1.60		W	4				2.20		
									MADE GROUND: Insitu brick.	(0.30)		
13/11	2.50	1.60	2.50-2.95		D	5	C1/ 450*		MADE GROUND: Composed of black clayey gravelly silt. Gravel is angular fine to coarse of brick.	2.50		
			2.50-2.95		B	6						
			2.50		CD	7						
			2.50		K	7				(1.00)		
			2.50		V	7						
			3.50		B	8				3.50		
			3.50		CD	9			MADE GROUND: Insitu brick.			
			3.50		K	9				(0.50)		
			3.50		V	9						
	3.90	WET	4.00-4.15		D	10	C1/ 150		MADE GROUND: Composed of soft brown silty sandy slightly gravelly clay. Gravel is angular fine to coarse of brick. Sand is fine to medium.	4.00		
			4.00-4.45		B	11						
			4.50		CD	12						
			4.50		K	12				(1.40)		
			4.50		V	12						
	4.90	DRY	5.00-5.45		U	13		15/ 450				
			5.50-5.95		B	16	S6		Very soft brown silty sandy CLAY. Sand is fine to coarse.	5.40		
			5.50		V	17						
			5.50		CD	17						
			5.50		K	17						
	5.90	DRY	6.00-6.45		U#B	18						
			6.00-6.45		B	20						
	6.40	DRY	6.50-6.85		B	22	S3/ 200					
										(3.10)		
	6.90	WET	7.00-7.45		U	23		12/ 450				
	6.90	WET	7.50-7.95		B	26	S1/ 225					
	7.90	WET	8.00-8.45		U	27		12/ 450				
	7.90	WET	8.50-8.95		B	30	S4			8.50		
									Soft thinly laminated brown grey sandy SILT. Sand is fine to coarse.	(0.50)		
	8.90	WET	9.00-9.45		U	31		20/ 450		9.00		
			9.00		W	98			Firm brown organic CLAY with many pockets/partings of fibrous peat.			
	8.90	WET	9.50-9.95		B	34	S9					
										(1.60)		
	9.90	WET	10.00-10.45		U	35		30/				

Remarks (See notes & keysheets)

1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was advanced by chiselling methods from 2.20m to 2.50m (45 mins) and 3.50m to 4.00m (1 hour 20 mins).
3. The borehole was advanced by chiselling methods from 22.90m to 24.10m (3 hours) and 25.00m to 26.00 (2.5 hours).
4. Aquifer protection was carried out by sealing the base of the hole at a depth of 26.00m and continuing in reduced diameter casing.
5. See installation details on final sheet.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL; Hull College; Faber Maunsell	**Contract No.** CON083130
		Figure No. BH16 (1 of 6)

Drilling Method	Cable Percussion & Rotary	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH16
Equipment	Dando 2000 Knebel	250mm to 2.20m 200mm to 25.00m 120mm to 46.00m	250mm to 2.20m 200mm to 25.00m 120mm to 32.45m		
Drill Crew	B.Hawes	Logged by	Compiled by	Checked by	
Dates Drilled	Start 10/11/2008 End 26/11/2008	TW 17/11/2008	ren 10/11/2008		

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
								450				
	9.90	WET	10.50	10.95	B	38	S14					
									Stiff brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk, chert, mudstone and sandstone. Sand is fine to coarse.	10.60		
	10.90	WET	11.00	11.45	U	40		30/ 450				
	10.90	WET	11.50	11.95	B	43	S22					
			12.00	12.45	U	44		30/				
			12.00		W	69		450				
	11.90	DRY	12.50	12.95	B	47	S20					
			13.00		CD	48						
			13.00		K	48						
			13.00		V	48						
	12.90	DRY	13.00	13.45	U	49		80/				
	13.00	DRY	13.50	13.95	B	52	S28	450				
	13.50	DRY	14.00	14.45	U	53		80/ 350				
	13.90	DRY	14.50	14.95	B	56	S32			(7.90)		
	14.90	DRY	15.00	15.45	U	57		50/ 450				
	14.90	DRY	15.50	15.95	B	60	S15					
	15.90	WET	16.00	16.45	U	61		2 450				
	15.90	WET	16.50	16.95	B	64	S15					
	16.90	WET	17.00	17.45	U	65		40/ 350				
13/11	16.90	WET										
14/11	16.90	12.00	17.50	17.95	B	68	S20					
	18.00	12.00	18.00	18.45	U	70		60/ 450				
	18.00	8.00	18.50	18.95	B	73	S23			18.50		
									Medium dense slity sandy subangular and subrounded fine to coarse GRAVEL of flint, chalk and sandstone. Sand is fine to coarse.			
	18.90	8.90	19.00	19.45	U	74		60/				
			19.00		CD	78		400				
			19.00		K	78						
			19.00		V	78						
	18.90	8.90	19.50	19.95	B	77	S25					
	19.90	9.20	20.00	20.45	U	79		60/				

Remarks (See notes & keysheets)

6 Groundwater was encountered at 16.00m during boring as a seepage.

7 Groundwater was encountered at 18.50m during boring and rose to 12.70m after 5 mins,10.90m after 10 mins,9.00m after 15 mins,8.60m after 20 mins.

8 Groundwater was encountered at 2.20m during boring and rose to 2.15m after 5 mins,2.05m after 10 mins,2.02m after 15 mins,1.96m after 20 mins,1.94m after 25 mins,1.89m after 30 mins,1.85m after 35 mins,1.83m after 40 mins,1.80m after 45 mins,1.78m after 50 mins,1.76m after 55 mins,1.77m after 60 mins.

Scale 1:50

	Project	Contract No.
TUGRO	HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	CON083130
		Figure No. BH16 (2 of 6)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Drill Crew** **Dates Drilled** Start 03/11/2008 End 03/11/2008	**Borehole Diameter** 250mm to 8.00m **Casing Diameter** 250mm to 8.00m **Logged by** MW 04/11/2008 **Compiled by** md 05/11/2008 **Checked by**	**BOREHOLE No.**	**BH17**

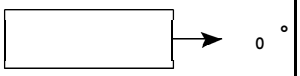
Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
03/11									MADE GROUND: Tarmacadam.	(0.10) 0.10		
									MADE GROUND: Subbase and brick (Driller's description).	(1.10)		
										1.20		
	1.40	DRY	1.50-1.95		D	1	C11		MADE GROUND: Composed of black clayey locally gravelly fine to coarse sand of ash. Gravel is subangular to rounded fine to coarse of coke, ash and brick.			
			1.50-1.95		B	2						
			1.50		CD	3						
			1.50		K	3						
			1.50		V	3				(1.80)		
	2.40	DRY	2.50-2.95		D	4	C16					
			2.50-2.95		B	5						
			2.50		CD	6						
			2.50		K	6						
			2.50		V	6				3.00		
									MADE GROUND: Composed of firm brown sandy gravelly clay. Gravel is subangular and subrounded fine to coarse brick. Sand is fine to coarse.	(0.40) 3.40		
	3.40	DRY	3.50-3.95		D	7	C5					
			3.50-3.95		B	8						
			3.50		CD	9			MADE GROUND: Composed of firm locally soft sandy gravelly clay. Gravel is subangular and subrounded fine and medium brick, chalk, sandstone and coke. Sand is fine to coarse.			
			3.50		V	9						
			3.50		K	9						
	4.40	DRY	4.50-4.88		D	10	C1/ 150		Below 4.50m Strong hydrocarbon odour.	(2.40)		
			4.50-4.95		B	11						
			4.50		CD	12						
			4.50		K	12						
			4.50		V	12						
	5.40	DRY	5.50-5.95		D	13	C1/ 225					
			5.50-5.95		B	14						
			5.50		CD	15				5.80		
			5.50		K	15			MADE GROUND: Composed of cobble and boulder sized fragments of brick and concrete.			
			5.50		V	15						
	6.40	DRY	6.50-6.95		D	16	C17					
			6.50-6.95		B	17						
			6.50		CD	18						
			6.50		K	18				(2.00)		
			6.50		V	18						
	7.40	DRY	7.50-7.84		D	19	C50/ 185					
			7.50-7.95		B	20						
			7.50		CD	21				7.80		
03/11	8.00	DRY	7.50		K	21			MADE GROUND: Composed of brick, concrete obstruction (Driller's description).	(0.20) 8.00		
			7.50		V	21						
									End of Borehole			

Remarks (See notes & keysheets)
1. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
2. The borehole was backfilled on completion with materials arising.
3. See installation details on final sheet.
4. Groundwater was not apparent during boring.

Scale 1:50

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** BH17 (1 of 2)

Method of Excavation	JCB 3CX	**Plan**	**TRIAL PIT No.** TP1
Surface Dimensions	1.85m x 0.60m		
Date Excavated Start	06/11/2008		
End	06/11/2008		



Logged by	**Compiled by**	**Checked by**
MW	ren	
06/11/2008	09/12/2008	

In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Brick setts.	(0.08)		
							0.08		
						MADE GROUND: Concrete.	(0.12)		
							0.20		
			0.30	ES	1	MADE GROUND: Composed of grey brown slightly			
			0.30	ES	2	silty gravelly fine and medium sand. Gravel is angular to subrounded fine to coarse			
			0.50	ES	3	chalk, flint, coke and brick. Rare cobble	(0.60)		
			0.50	B	4	sized brick fragments. (both sides of dock			
			0.50	ES	5	wall)			
			0.50	B	6	Top of Dock wall 0.2m			
			0.60	ES	7				
			0.60	B	8		0.80		
						MADE GROUND: Fine brown gravel fill around plastic survice pipes running parallel with	(0.20)		
			1.00	ES	9	dock wall. (outside dock wall)	1.00		
			1.00	D	10	MADE GROUND: Grey sandy gravelly clay.	(0.20)		
			1.00	ES	11	Gravel is angular to sub angular fine to			
			1.00	D	12	coarse of brick. Sand is fine to coarse ashy. (inside dock wall)	1.20		
						MADE GROUND: Grey sandy gravelly clay. Gravel is angular to sub angular fine to coarse of brick. Sand is fine to coarse. (outside dock wall) MADE GROUND: Black sand and gravel. Gravel ios angular to sub angular fien to coares of clinker and brick. Sand is fine to coarse ashy. (inside dock wall)			
						End of Trial Pit			

Remarks (See notes & keysheets)

1 The walls of the pit were stable during excavation.
2 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
3 On completion the trial pit was backfilled with compacted arisings.
4 Groundwater was not apparent during excavation.

Scale 1:25

FUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** TP1 (1 of 1)

Method of Excavation JCB 3CX	**Plan**	0 °	**TRIAL PIT No.** TP2
Date Excavated Start 06/11/2008 End 06/11/2008			
Logged by MW 06/11/2008	**Compiled by** clm 13/11/2008	**Checked by**	

In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Brick setts.	(0.08)		
							0.08		
						MADE GROUND: Concrete.	(0.12)		
							0.20		
			0.30	ES	1	MADE GROUND: Composed of grey brown slightly silty gravelly fine and medium sand. Gravel is angular to rounded fine to coarse flint, brick, chalk, quartz, coke and slag. Occasional cobbles of brick.			
			0.50	ES	2				
			0.50	B	3				
			0.50	ES	4	At 0.35m: Dock wall and concrete service trench.	(1.00)		
						At 0.60m: Grey brown sandy gravelly silt with occasional chalk cobbles (inside dock wall).			
			1.00	ES	5				
						End of Trial Pit	1.20		

Remarks (See notes & keysheets)

1 The walls of the pit were stable during excavation.
2 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
3 On completion the trial pit was backfilled with compacted arisings.
4 Groundwater was not apparent during excavation.

Scale 1:25

FUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** TP2 (1 of 1)

Method of Excavation JCB 3CX	**Plan**	0 °	**TRIAL PIT No.** TP3
Date Excavated Start 09/12/2008 End			
Logged by	**Compiled by** ren 09/12/2008	**Checked by**	

In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Composed of yellow brown fine gravel.	(0.20)		
							0.20		
			0.30	ES	1	MADE GROUND: Composed of firm brown sandy gravelly clay. Gravel is angular to subangular fine to coarse of brick. Sand is fine to coarse.	(0.30)		
			0.50	ES	2		0.50		
						MADE GROUND: Composed of firm dark brown sandy gravelly clay. Gravel is angular to rounded fine to coarse of sandstone, brick, and chalk. Sand is fine to coarse.	(0.70)		
			1.00	ES	3				
						End of Trial Pit	1.20		

Remarks (See notes & keysheets)

1 The walls of the pit were stable during excavation.
2 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
3 On completion the trial pit was backfilled with compacted arisings.
4 Groundwater was not apparent during boring.

Scale 1:25

FUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** TP3 (1 of 1)

Method of Excavation JCB 3CX	**Plan**	0 °	**TRIAL PIT No.** TP4
Date Excavated Start 06/11/2008 End 06/11/2008			
Logged by MW 06/11/2008	**Compiled by** clm 13/11/2008	**Checked by**	

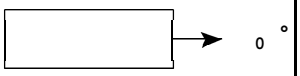
In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Tarmacadam.	(0.08)		
							0.08		
						MADE GROUND: Concrete.	(0.22)		
			0.30	ES	1		0.30		
						MADE GROUND: Composed of brown gravelly fine to coarse sand. Gravel is subangular	(0.20)		
			0.50	ES	2	medium and coarse limestone (Sub-base).	0.50		
						MADE GROUND: Composed of black gravelly fine to coarse sand of ash. Gravel is subangular and subrounded medium and coarse			
			0.80	ES	3	slag, clinker and brick. Top of Dock Wall at 0.7m	(0.70)		
			1.00	ES	4				
						End of Trial Pit	1.20		

Remarks (See notes & keysheets)

1 The walls of the pit were stable during excavation.
2 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
3 On completion the trial pit was backfilled with compacted arisings.
4 Groundwater was not apparent during excavation.

Scale 1:25

FUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** TP4 (1 of 1)

Method of Excavation JCB 3CX	**Plan** 	**TRIAL PIT No.**	**TP5**
Date Excavated Start 06/11/2008 End 06/11/2008			
Logged by MW 06/11/2008	**Compiled by** clm 13/11/2008	**Checked by**	

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Tarmacadam.	(0.10) 0.10		
						MADE GROUND: Composed of light brown very gravelly fine to coarse sand with medium cobble content. Gravel is angular to subrounded fine to coarse of brick and concrete. Cobbles are subangular of brick (60mm x 70mm x 50mm) and concrete (<70mm).	(0.40) 0.50		
						MADE GROUND: Composed of light orange brown slightly gravelly slightly sandy clayey silt. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of flint, brick, concrete and sandstone. At base: Occasional cobbles of angular to subangular concrete (<80mm).	(0.20) 0.70 (0.40) 1.10		
			1.50	ES	1	MADE GROUND: Composed of very dark grey black gravelly fine and medium sand. Gravel is subangular fine to medium of concrete, brick, masonry and rare shells and ceramic fragments with occasional roots and rootlets (<5mm).			
			2.00	B	2	MADE GROUND: Composed of black organic slightly gravelly fine sand. Gravel is subangular to rounded fine to medium of brick, concrete, clinker, slag, flint and quartz with occasional roots and rootlets (<15mm).	(1.70)		
			2.50	ES	3				
			2.80	ES	4		2.80		
			2.80	B		MADE GROUND: Composed of firm to stiff brown gravelly sandy locally sandy slightly silty clay with rare gravel. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of brick, concrete, quartz and ceramic. Between 2.80m and 2.90m: Intermixed with angular to subrounded fine to coarse gravel of weak chalk with rare cobbles of strong chalk (<120mm).	(0.70)		
						End of Trial Pit	3.50		

Remarks (See notes & keysheets)

1 The walls of the pit were stable during excavation.
2 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
3 On completion the trial pit was backfilled with compacted arisings.
4 Groundwater was not apparent during excavation.

Scale 1:25

FUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** TP5 (1 of 1)

Method of Excavation

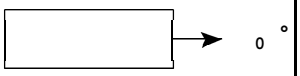
Date Excavated Start 06/11/2008
End 06/11/2008

Logged by MW 14/11/2008

Compiled by clm 14/11/2008

Checked by

Plan



TRIAL PIT No. TP6

In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Composed of grey brown very clayey to clayey slightly gravelly fine to coarse sand. Gravel is angular to rounded fine to coarse of chalk, brick, concrete and flint. Rare brick fragments (<100mm).	(0.75)		
							0.75		
						MADE GROUND: Composed of dark grey brown/black very sandy angular to rounded fine to coarse gravel of quartz, brick, slag and clinker. Sand is fine and medium. Occasional cobbles of brick and slag (<70mm).	(0.30)		
							1.05		
						MADE GROUND: Composed of brown slightly silty gravelly fine and medium sand. Gravel is subangular to subrounded fine to coarse of quartz, flint and brick.	(0.65)		
			1.50	ES	1				
			1.50	B	2				
							1.70		
						Light orange brown silty fine SAND with rare rounded gravel of flint.	(0.50)		
			2.00	ES	3				
			2.00	B	4				
						End of Trial Pit	2.20		

Remarks (See notes & keysheets)
1 The walls of the pit were stable during excavation.
2 Groundwater was encountered at 1.00m during excavation as a seepage.

Scale 1:25

FUGRO

Project
HULL COLLEGE, KINGSTON UPON HULL
Hull College
Faber Maunsell

Contract No. CON083130

Figure No. TP6 (1 of 1)

302/03

Drilling Method Window Sampler	**Borehole Diameter**	**Casing Diameter**	**BOREHOLE No.** **WS1**
Equipment Window Sampler			
Drill Crew T.Warriner	**Logged by** TW	**Compiled by** ren	**Checked by**
Dates Drilled **Start** 09/12/2008 **End**	09/12/2008	09/12/2008	

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
								MADE GROUND: Paving slab.	(0.10) 0.10		
								MADE GROUND: Composed of brown fine to coarse sand.	(0.10) 0.20		
								MADE GROUND: Composed of black clayey sand and gravel. Gravel is angular to subangular fine to coarse of brick and concrete. Sand is fine to coarse.	(0.60)		
								At 0.80m: Concrete.	0.80		
								End of Borehole			

Remarks 1 (See notes & keysheets) Groundwater was not apparent during boring.

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS1 (1 of 1)

Drilling Method Window Sampler **Equipment** Window Sampler **Drill Crew** **Dates Drilled** **Start** 17/11/2008 **End** 17/11/2008	**Borehole Diameter** **Casing Diameter** **Logged by** MW 17/11/2008 **Compiled by** md 26/11/2008 **Checked by**	**BOREHOLE No.** **WS4**	

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
17/11	0.00							MADE GROUND: Composed of brown gravel medium angular over sandy limestone gravel. Gravel is fine to coarse, angular to subangular.	(0.40)		
			0.30		ES	9			0.40		
								MADE GROUND: Composed of brick rubble. Concrete wall on south face of pit.	(0.60)		
			1.00		B	1			1.00		
	1.00		1.00-1.45				S4	MADE GROUND: Composed of brown sandy silt with some gravel of brick and chalk medium to coarse angular to subangular.	(0.20)		
			1.10		ES	10			1.20		
								MADE GROUND: Composed of black gravelly sandy silt with occasional fragments of wood. Gravel is angular to subrounded fine to coarse of coke and slag. Below 1.20m: Becomes very sandy and very gravelly	(0.30)		
									1.50		
								Soft to firm brown very sandy SILT. Sand is fine.	(0.10)		
									1.60		
								Soft brown grey very sandy SILT/CLAY. Sand is fine to coarse.	(0.50)		
			2.00		B	2			2.10		
	2.00		2.00-2.45				S4	Soft brown grey slightly sandy to sandy CLAY. Sand is fine to coarse.			
			3.00		B	3					
	3.00		3.00-3.45				S5				
			4.00		B	4		Below 4.00m: Occasional organic fragments.			
	4.00		4.00-4.45				S7				
								Between 4.70m and 4.80m: Locally frequent organic fragments.			
			5.00		B	5		Below 5.00m: Grades into sandy silt/clay.			

Remarks (See notes & keysheets)
1 Prior to window sampling a Cable Avoidance Tool (CAT) survey was carried out. Services were not located.
2 Hole terminated at 6.00m (clients decision) due to hole collapsing between 3.00m and 5.00m.
3 See installation details on final sheet.
4 Groundwater was not apparent during boring.

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS4 (1 of 3)

Drilling Method Window Sampler **Equipment** Window Sampler **Drill Crew** **Dates Drilled** **Start** 17/11/2008 **End** 17/11/2008	**Borehole Diameter** **Casing Diameter** **Logged by** MW 17/11/2008 **Compiled by** md 26/11/2008 **Checked by**	**BOREHOLE No.** **WS4**	

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
	5.00		5.00-5.45			S5		(6.20)		
	6.00		6.00 6.00-6.45	B	6	S5				
			7.00 7.00-7.45	B	7	S7				
			8.00 8.00-8.45	B	8	S6				
17/11	8.30						End of Borehole	8.30		

Remarks
(See notes & keysheets)

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS4 (2 of 3)

Drilling Method Window Sampler **Equipment** Window Sampler **Drill Crew** **Dates Drilled** **Start** 17/11/2008 **End** 17/11/2008	**Borehole Diameter** **Casing Diameter** **Logged by** MW 17/11/2008 **Compiled by** md 26/11/2008 **Checked by**	**BOREHOLE No.** **WS4**

Description	Depth (m)	Level	
Bentonite Seal	0.50		Flush stopcock box cover. Pipe diameter 50mm to 1.50m.
Gravel Filter	1.50		
Bentonite Seal	8.30		Base of Hole

Remarks
(See notes & keysheets)

Not to Scale

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS4 (3 of 3)

Drilling Method Window Sampler **Equipment** Window Sampler **Drill Crew** **Dates Drilled** **Start** 05/12/2008 **End** 05/12/2008	**Borehole Diameter** **Casing Diameter** **Logged by** MW 05/12/2008 **Compiled by** md 26/11/2008 **Checked by**	**BOREHOLE No.** **WS5**	

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
05/12	0.00		0.00	0.00			S0/ 0*	MADE GROUND: Composed of clayey sand and gravel. Gravel is angular to subangular fine to coarse of brick and concrete. Sand is fine to coarse.	(0.20) 0.20		
			0.30		ES	9		MADE GROUND: Composed of firm brown sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse of chalk and coal.			
			0.50		ES	10					
			0.50		B	12			(1.00)		
			1.00		ES	11					
	1.00		1.00	1.45			S1				
			1.00		B	13			1.20		
								MADE GROUND: Composed of very soft black grey brown sandy silt with occasional angular medium to coarse gravel of brick.			
			1.50		B	1					
			1.50	1.95			S8		(1.00)		
			2.00		B	2					
	2.00		2.00	2.45			S5		2.20		
								Firm grey brown sandy CLAY with rare subrounded fine gravel of quartzite.	(0.50)		
									2.70		
								Soft to firm brown veined grey and locally yellow sandy CLAY. Sand is fine to coarse. Below 2.90m: Locally very sandy.			
			3.00		B	3					
	3.00		3.00	3.45			S8				
								Below 3.60m: Mottled grey.	(2.10)		
			4.00		B	4					
	4.00		4.00	4.45			S4				
									4.80		
								Soft brown sandy to very sandy SILT/CLAY. Sand is fine and medium.			
			5.00		B	5					

Remarks (See notes & keysheets)
1 Prior to window sampling a Cable Avoidance Tool (CAT) survey was carried out. Services were not located.
2 See installation details on final sheet.
3 Groundwater was not apparent during boring.

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS5 (1 of 3)

Drilling Method	Window Sampler	Borehole Diameter	Casing Diameter	BOREHOLE No.	WS5
Equipment	Window Sampler				
Drill Crew		Logged by	Compiled by	Checked by	
Dates Drilled	Start 05/12/2008	MW	md		
	End 05/12/2008	05/12/2008	26/11/2008		

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
	5.00		5.00	5.45			S1		(0.50)		
								Soft to firm grey brown very sandy SILT. Sand is fine to coarse.	5.30		
			5.50	5.95			S8		(0.50)		
								Soft to firm grey brown sandy locally very sandy SILT/CLAY. Sand is fine to coarse. Between 5.90m and 6.00m: Silty fine sand.	5.80		
			6.00		B	6			(0.30)		
	6.00		6.00	6.45			S5				
								Dark grey brown silty fine SAND.	6.10		
									(0.30)		
								Very soft brown sandy to very sandy SILT. Sand is fine to coarse.	6.40		
									(0.60)		
			7.00		B	7			7.00		
	7.00		7.00	7.45			S5	Dark grey slightly silty fine SAND.			
	7.60								(1.50)		
			8.00		B	8					
			8.00	8.45			S4				
	8.30										
05/12								End of Borehole	8.50		

Remarks
(See notes & keysheets)

Scale 1:25

	Project	Contract No.
TUGRO	HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	CON083130
		Figure No. WS5 (2 of 3)

Drilling Method Window Sampler **Equipment** Window Sampler **Drill Crew** **Dates Drilled** **Start** 19/11/2008 **End** 19/11/2008	**Borehole Diameter** 87mm to 4.00m, 78mm to 8.00m **Casing Diameter** **Logged by** TW 19/11/2008 **Compiled by** clm 03/12/2008 **Checked by** BC 05/12/2008	**BOREHOLE No.**	**WS6**

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
19/11	0.00							MADE GROUND: Composed of light brown becoming dark grey silty locally clayey sandy gravel. Sand is fine to medium of ash. Gravel is angular to subangular fine to coarse of brick, concrete, coke, slag, sandstone.	(0.30) 0.30		
								MADE GROUND: Composed of black ashy locally silty subangular to subrounded fine to medium gravel of coke and slag.	(0.70)		
			1.00		B	1			1.00		
			1.00-1.45				S11	MADE GROUND: Composed of soft to firm brown silt.	(1.10)		
			2.00		B	2			2.10		
	2.00		2.00-2.45				S10	MADE GROUND: Composed of grey brown slighty clayey locally clayey sandy angular to subrounded fine to coarse gravel of brick, sandstone, chalk, quartzite. Occasional cobbles of concrete and brick.	(0.10) 2.20		
								MADE GROUND: Composed of very soft grey brown very sandy silt with rare gravel and rare cobbles. Gravel is angular medium of brick. Cobbles are subangular of concrete.	(1.30)		
			3.00		B	3			3.50		
	3.00		3.00-3.45				S4	MADE GROUND: Composed of black gravelly silt. Gravel is angular to subangular fine to coarse of brick and ash. Moderate to strong creosote odour.	(0.70)		
			4.00		B	4			4.20		
	4.00		4.00-4.45				S5	MADE GROUND: Composed of very soft grey brown slightly sandy locally sandy silt with occasional brick and metal fragments. Sand is fine to coarse.	(0.30)		
								MADE GROUND: Composed of grey brown silty subrounded to angular fine to coarse gravel of chalk, quartzite, sandstone, brick and coke.	4.50 (0.65)		
			5.00		B	5					

Remarks (See notes & keysheets)
1 Prior to window sampling a Cable Avoidance Tool (CAT) survey was carried out. Services were not located.
2 On completion the window sample borehole was backfilled with materials arising.
3 Groundwater was not apparent during boring.

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130	
		Figure No. WS6 (1 of 2)	

Drilling Method Window Sampler **Equipment** Window Sampler **Drill Crew** **Dates Drilled** **Start** 19/11/2008 **End** 19/11/2008	**Borehole Diameter** 87mm to 4.00m, 78mm to 8.00m **Casing Diameter** **Logged by** TW 19/11/2008 **Compiled by** clm 03/12/2008 **Checked by** BC 05/12/2008	**BOREHOLE No.**	**WS6**

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
	5.00		5.00	5.45			S5	MADE GROUND: Composed of soft grey brown clay with ocasional gravel and cobbles. Gravel is subangular fine to coarse of brick. Cobbles are subangular of brick.	5.15 (0.60)		
								MADE GROUND: Composed of grey brown locally dark grey silty gravelly locally very gravelly medium sand. Gravel is rounded to angular fine to coarse of brick, quartzite, coke and chalk (slight odour at base of strata).	5.75 (0.25)		
	6.00		6.00		B	6			6.00		
			6.00	6.45			S5	MADE GROUND: Composed of soft grey clay with occasional gravel and rare cobbles. Gravel is angular coarse of brick. Cobbles of slag.	(1.00)		
	7.00		7.00		B	7			7.00		
			7.00	7.45			S10	MADE GROUND: Composed of dark grey brown locally dark brown silty sandy angular to rounded medium to coarse gravel of brick, quartzite, chalk, sandstone and rare fragments of plastic pipe (slight odour).	(1.00)		
19/11	8.00		8.00		B	8			8.00		
								End of Borehole			

Remarks
(See notes & keysheets)

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS6 (2 of 2)

Drilling Method Window Sampler **Equipment** **Drill Crew** **Dates Drilled** Start 19/11/2008 End 19/11/2008	**Borehole Diameter** Casing Diameter 87mm to 4.00m 78mm to 5.00m 67mm to 8.00m **Logged by** TW 19/11/2008 **Compiled by** clm 04/12/2008 **Checked by** BC 05/12/2008	**BOREHOLE No.**	**WS7**

Date & Time	Run Depth (m)	Run Time (secs) (Recovery (%))	Sample/Test Details: Depth (m) From	To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
19/11	0.00							MADE GROUND: Composed of very soft to soft brown sandy silt. Sand is fine. Rare brick fragments.	(1.00)		
			1.00		B	1			1.00		
			1.00-1.45				S0/ 450	MADE GROUND: Composed of yellow brown becoming grey brown slightly silty fine sand with rare angular medium to coarse gravel of brick and coal.	(0.70)		
								Soft grey brown sandy CLAY with rare subangular medium gravel of chalk.	1.70		
			2.00		B	2					
	2.00		2.00-2.45				S4		(0.70)		
								Soft grey brown sandy CLAY. Sand is fine to coarse.	2.40		
			3.00		B	3		Between 3.00m and 4.00m: No recovery.			
	3.00		3.00-3.45				S9		(1.60)		
			4.00		B	4			4.00		
	4.00		4.00-4.45				S6	Soft brown veined blue grey CLAY.	(0.20)		
								Soft brown SILT.	4.20		
									(0.80)		
			5.00		U#B	5			5.00		
								Grey brown sandy SILT. Sand is fine to			

Remarks (See notes & keysheets)
1 Prior to window sampling a Cable Avoidance Tool (CAT) survey was carried out. Services were not located.
2 On completion the window sample borehole was backfilled with materials arising.
3 Groundwater was not apparent during boring.

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS7 (1 of 2)

Drilling Method Window Sampler **Equipment** **Drill Crew** **Dates Drilled** Start 19/11/2008 End 19/11/2008	**Borehole Diameter** Casing Diameter 87mm to 4.00m 78mm to 5.00m 67mm to 8.00m **Logged by** TW 19/11/2008 **Compiled by** clm 04/12/2008 **Checked by** BC 05/12/2008	**BOREHOLE No.**	**WS7**

Date & Time	Run Depth (m)	Run Time (secs) (Recovery) (%)	Sample/Test Details: Depth (m) From To	Type	No.	Results	Description of Strata	Depth (Thickness) (m)	Level	Legend
	5.00		5.00-5.45			S7	coarse.	5.00		
			6.00	U#B	6		Below 6.00m: Grades into soft to very soft brown sandy silt.			
	6.00		6.00-6.45			S4		(3.00)		
			7.00	B	7					
	7.00		7.00-7.45			S4				
19/11	8.00		8.00	B	8			8.00		
			8.00-8.45			S22	End of Borehole			

Remarks
(See notes & keysheets)

Scale 1:25

TUGRO	**Project** HULL COLLEGE, KINGSTON UPON HULL Hull College Faber Maunsell	**Contract No.** CON083130 **Figure No.** WS7 (2 of 2)

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0 1 2 3 4 5 6 7 Kilometres

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Figure 1: Site Location

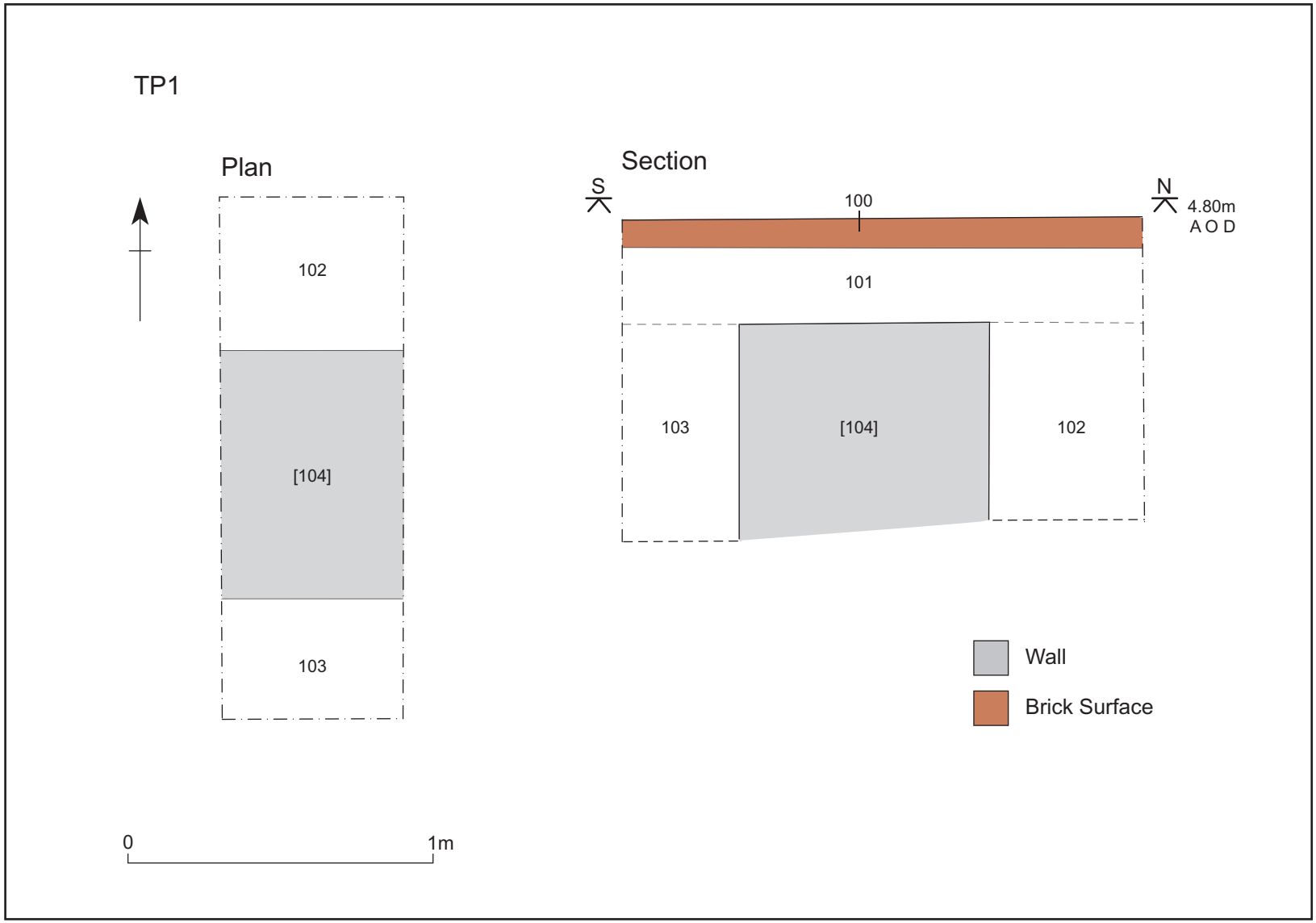

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Figure 03: Test Pit 1 Plan & Section

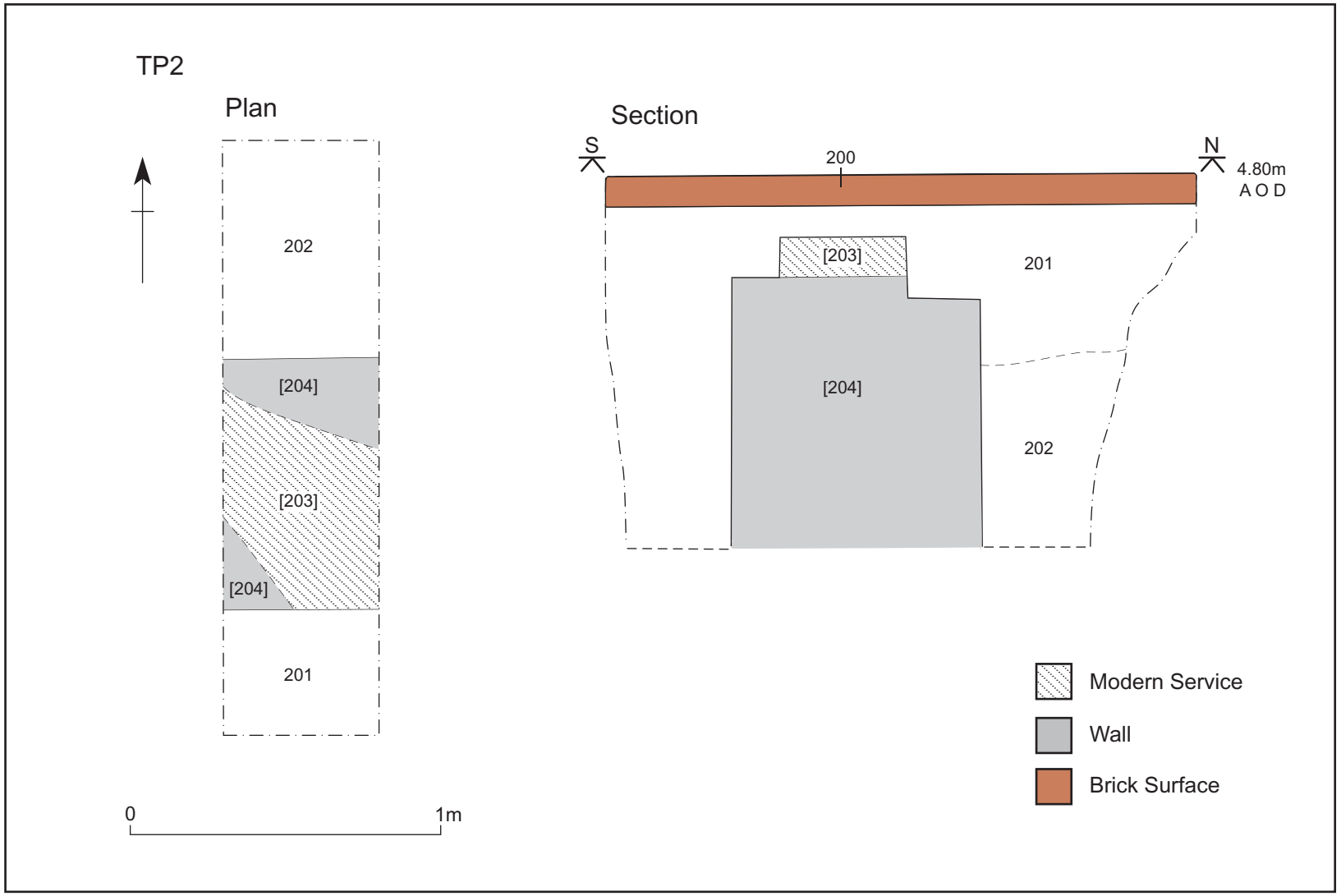

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Figure 04: Test Pit 2 Plan & Section

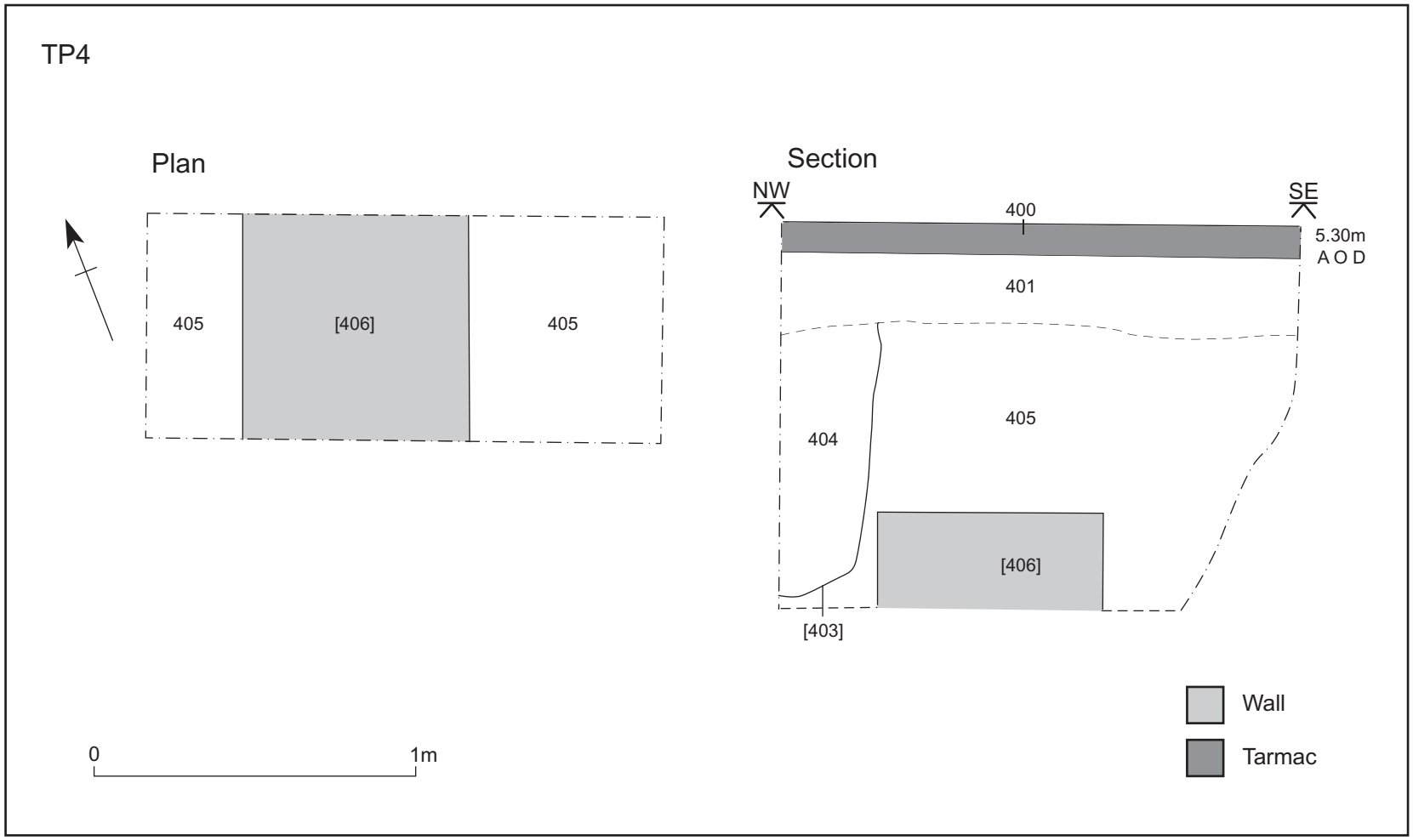

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Figure 05: Test Pit 4 Plan & Section

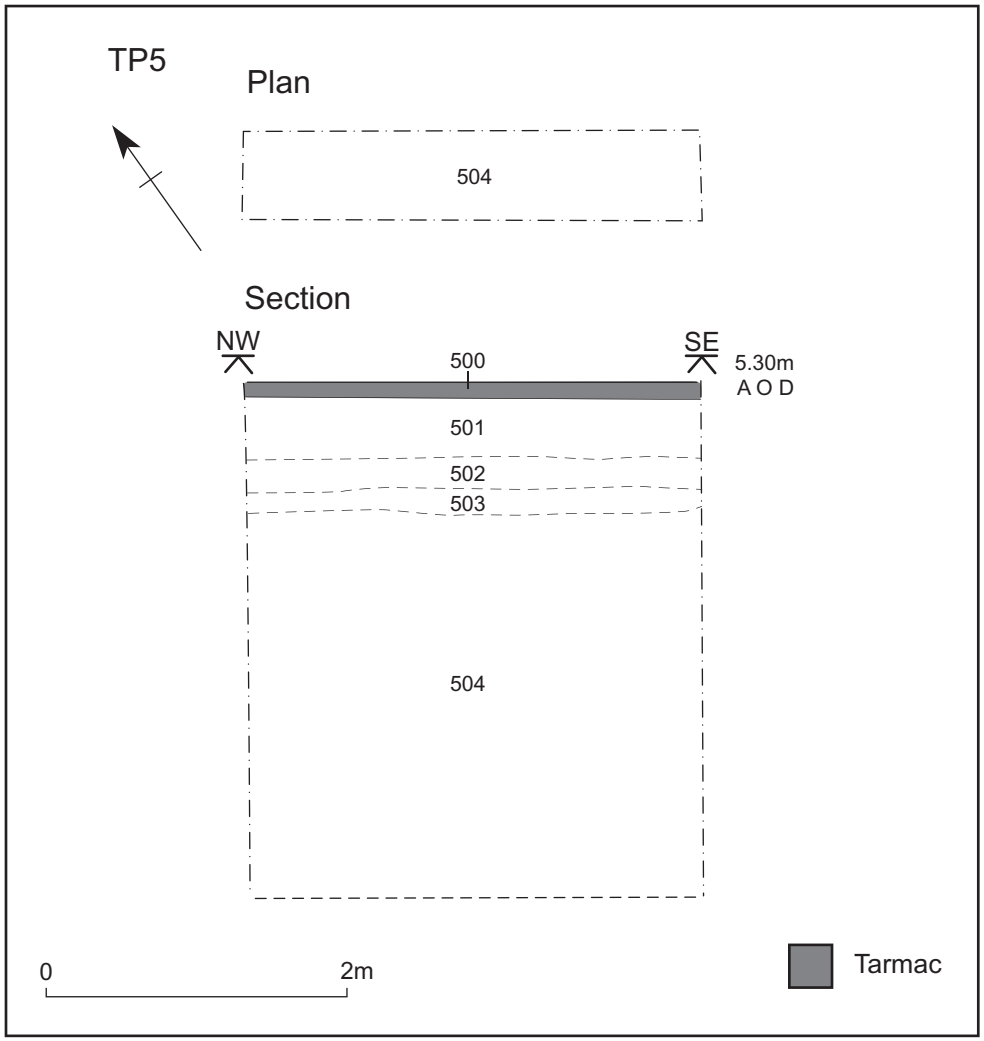

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Figure 06: Test Pit 5 Plan & Section

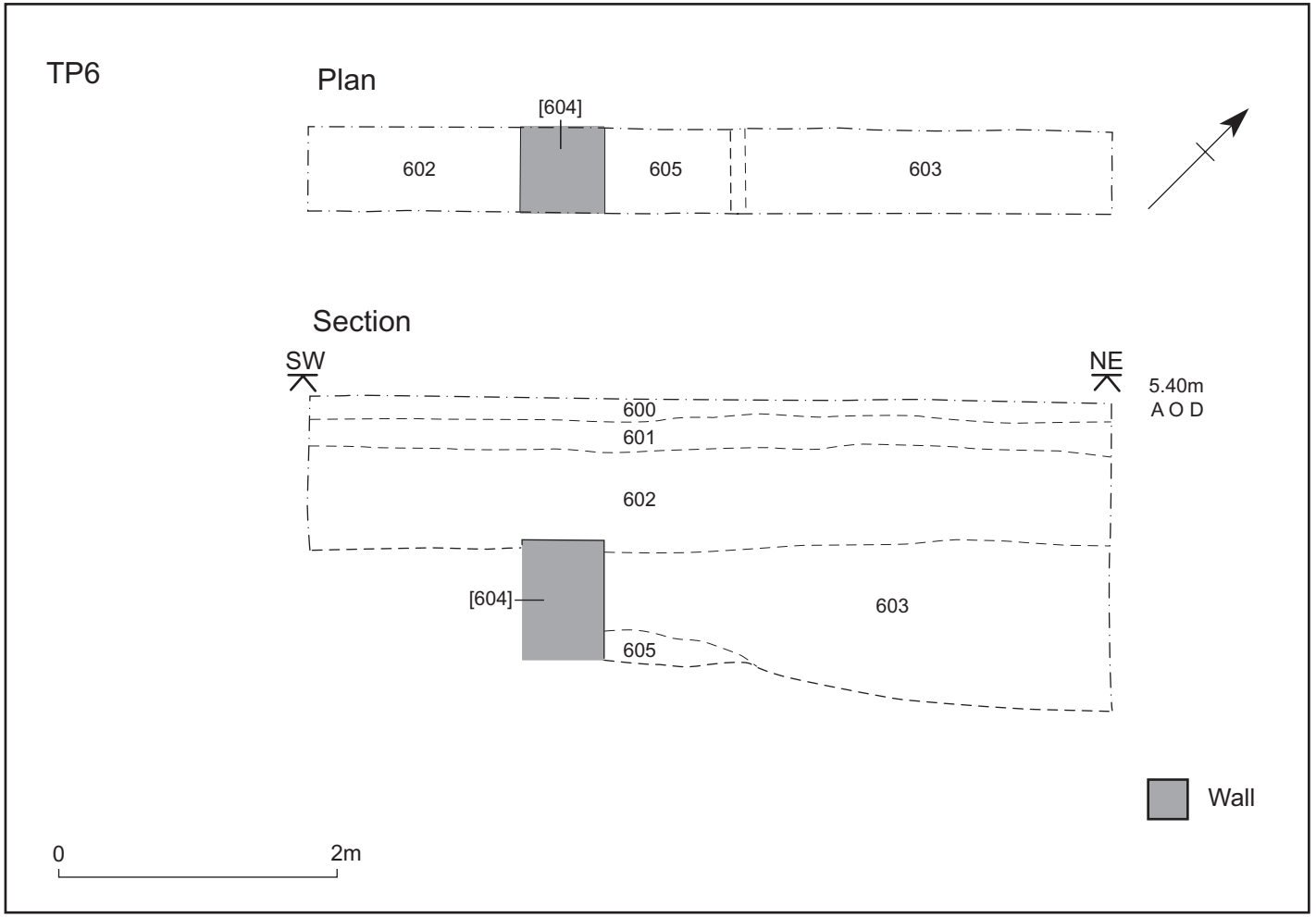

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Figure 07: Test Pit 6 Plan & Section

N

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Hull College, Queens Gardens, Hull
Archaeological Assessment

0 5 10 20 30 40
Meters

Trench Locations
Testpit
Borehole
Window Slot

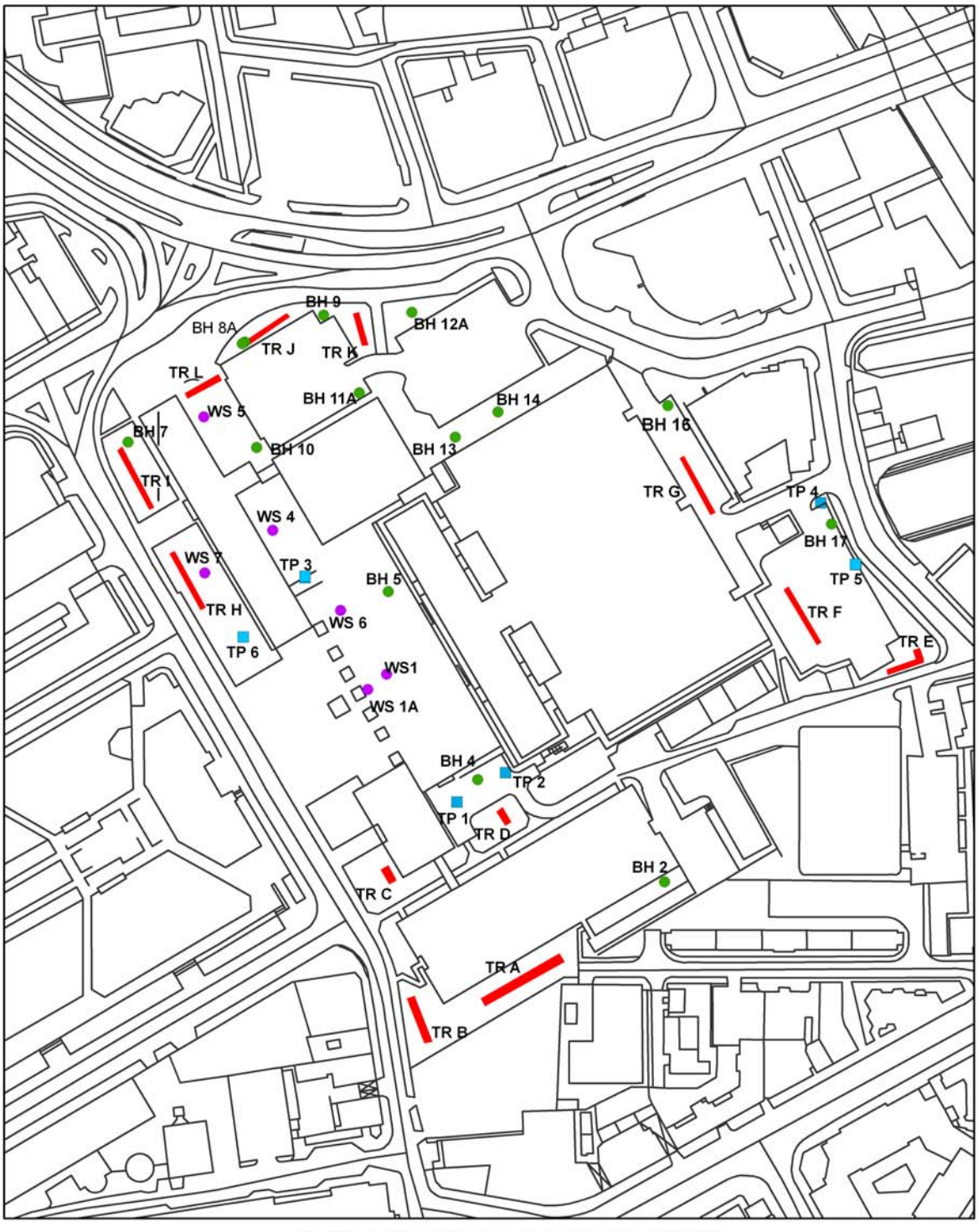

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Figure 08: Location of Trenches, Boreholes and Test Pits

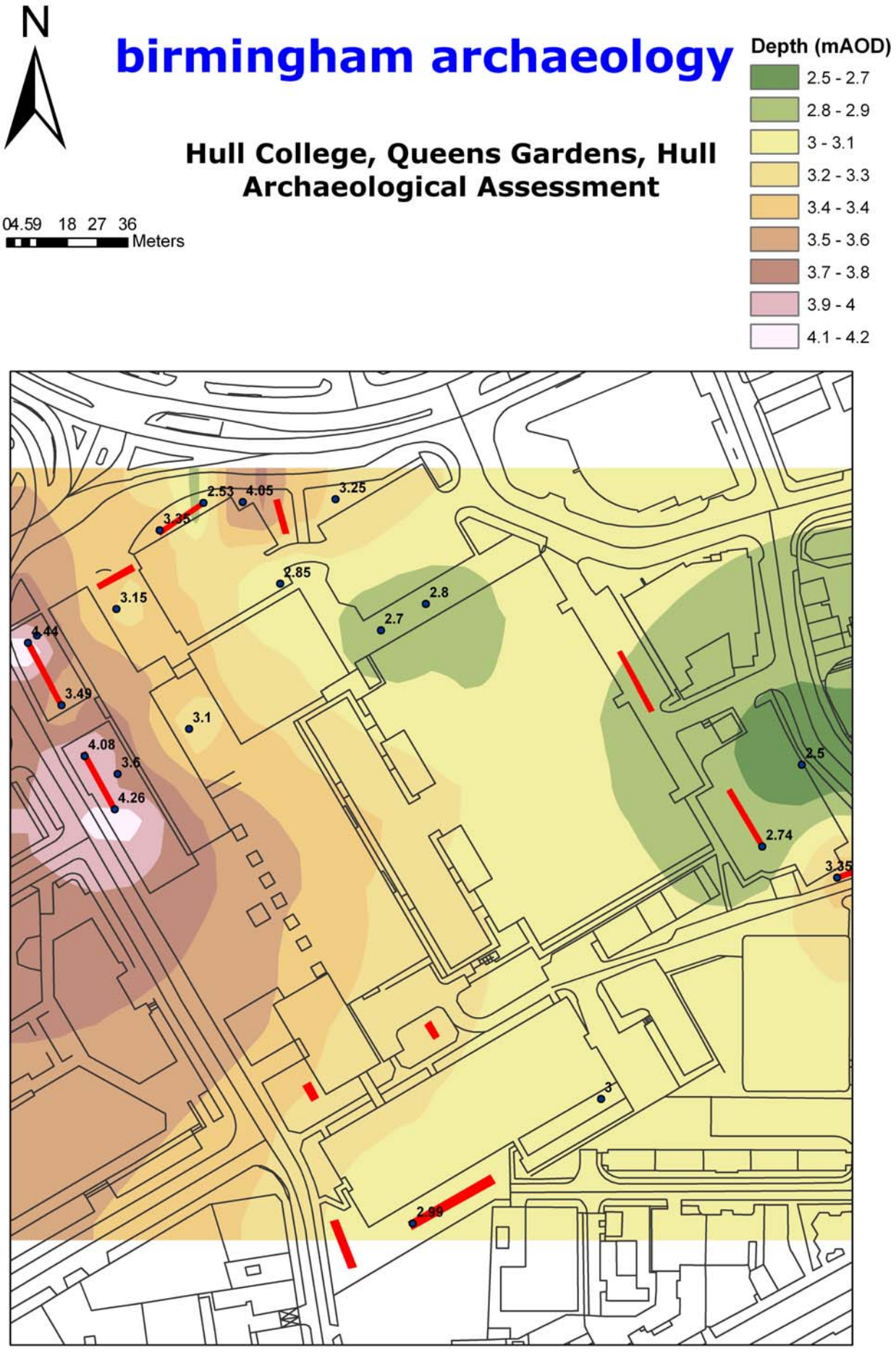

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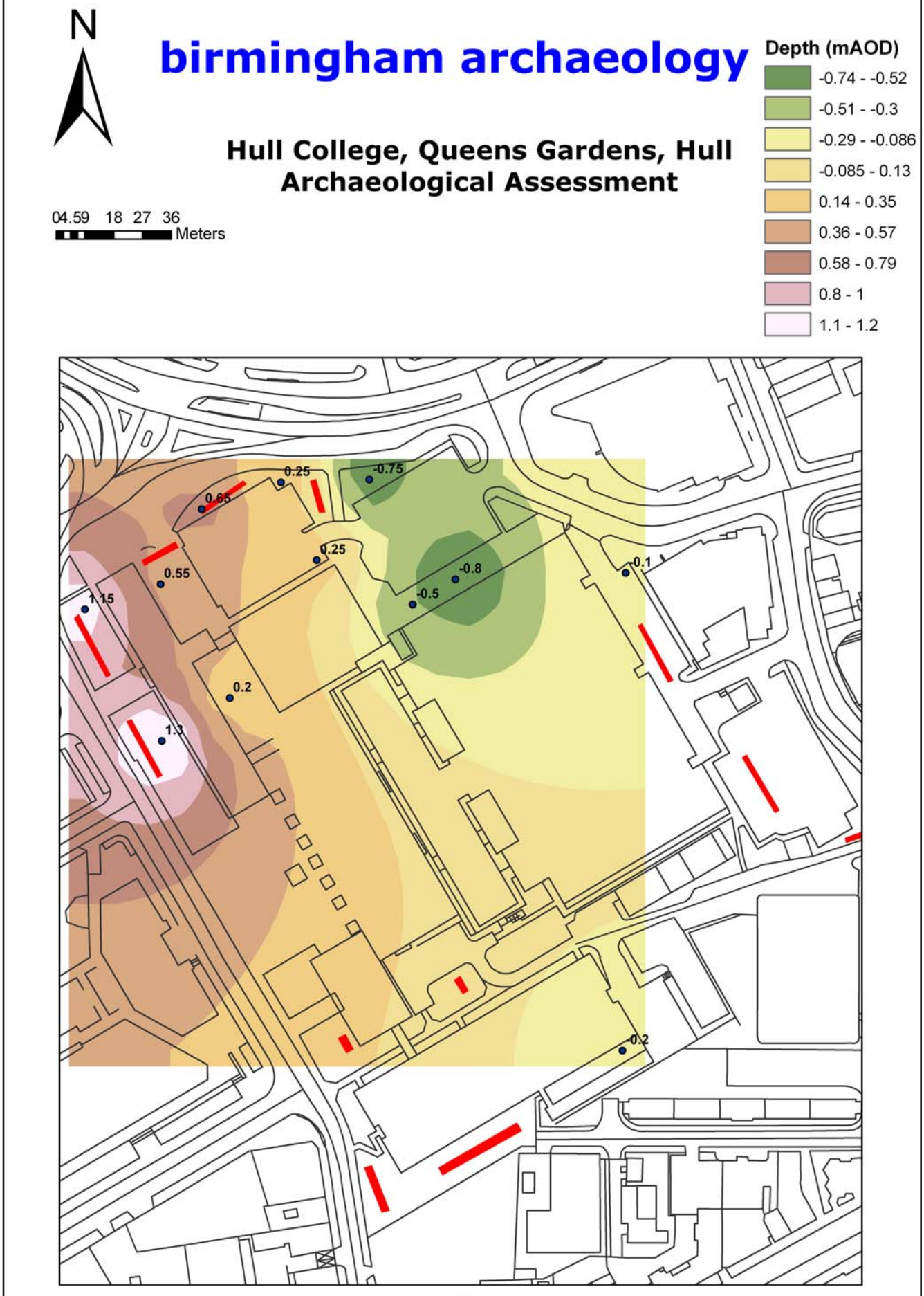
Figure 09: Ground model of upper surface of brown-grey sand clay/silt layer



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Hull College, Hull

Figure 10: Ground model of lower surface of brown-grey sand clay/silt layer

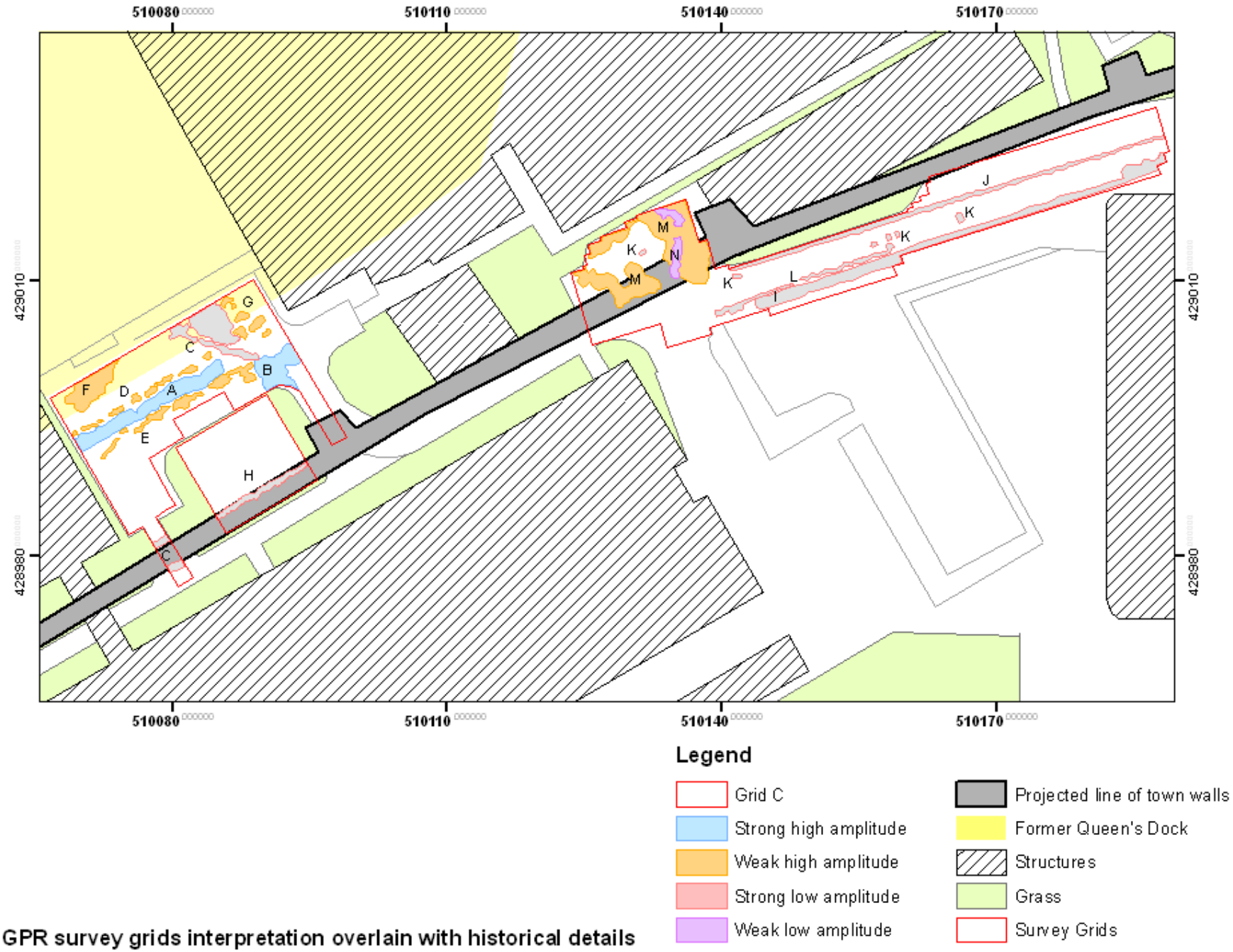

Fig 11 GPR survey grids interpretation overlain with historical details

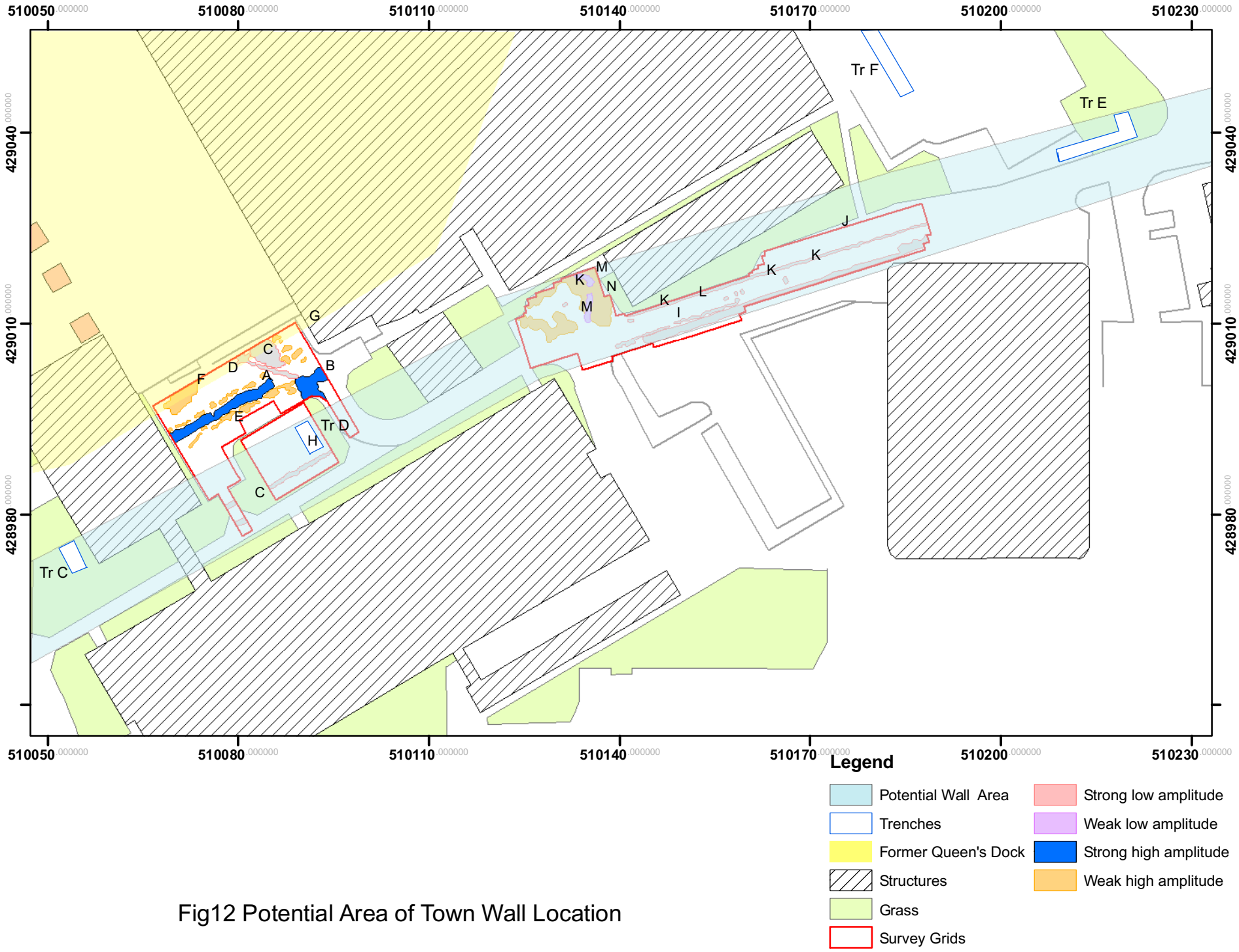

Fig12 Potential Area of Town Wall Location

Plate 1

Plate 2

Plate 3

Plate 4