Birmingham Smithfield Development
Birmingham
West Midlands

Archaeological Watching Brief

for
GIP UK Ltd.

CA Project: MK0069
CA Report: MK0069_1

October 2019

Andover Cirencester Exeter Milton Keynes Suffolk

Birmingham Smithfield Development
Birmingham
West Midlands

Archaeological Watching Brief

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LIST OF ILLUSTRATIONS

SUMMARY

Project Name: Birmingham Smithfield Development
Location: Birmingham, West Midlands
NGR: 407372 286326
Type: Watching Brief
Date: 13-19 June 2019
Location of Archive: Birmingham Museum and Art Gallery
Site Code: BSD19

An archaeological watching brief was undertaken by Cotswold Archaeology for GIP UK during pre-application groundworks associated with the potential redevelopment of the site at Birmingham Smithfield Development, Birmingham, West Midlands.

Principle interest in the site derives from the potential for the presence of medieval activity in the form of buried remains of a moated manor and associated structures identified in the north-eastern part of the site through rescue excavation in the 1970s.

The groundworks comprised the excavation of 22 hand-dug test pits and boreholes which reached the underlying natural substrate at depths ranging from 0.8m to 5.9m below present ground level.

No features or deposits of archaeological significance were identified during these groundworks, and no artefactual material pre-dating the modern period was recovered, despite two boreholes WS18 and WS19 being located in close proximity to the anticipated location of the former moat and manor platform.

Borehole WS18, revealed natural substrate at 0.8m bpgl, and was located in the putative location of the moat surrounding the former manor. The recorded depth of natural substrate and the evidence of the recorded sample do not, however, suggest infilled moat material. The evidence could, however, suggest that this borehole lay adjacent to the infilled moat, allowing for a margin of error in historical recording. WS19, located inside the putative circuit of the moat, revealed 'made ground' to 2.4m bpgl, again with no evidence of infilled moat material. This could indicate substantial levels of ground reduction or modification in the area, especially where one may anticipate evidence of the former house platform perhaps at less great depth.

1. INTRODUCTION

1.1 In June 2019 Cotswold Archaeology (CA) carried out an archaeological watching brief for GIP UK Ltd at Birmingham Smithfield Development, Birmingham, West Midlands (centred at NGR: 407372 286326; Fig. 1). The watching brief was undertaken to accompany a potential planning application to Birmingham City Council (BCC) for the redevelopment of the site.

1.2 The scope of the works was agreed during discussions between CA and BCC's Principal Conservation Officer, Chris Patrick (BCCPCO), with a subsequent detailed *Written Scheme of Investigation* (WSI) produced by CA (2019) and approved by the BCC acting on the advice of the BCCPCO.

1.3 The fieldwork was carried out in accordance with the *National Planning Policy Framework* (MHCLG 2019) and also followed the S*tandard and guidance for an archaeological watching brief* (CIfA 2014).

The site

1.4 The proposed development area measures approximately 16.8ha in extent, and comprises the former Wholesale Markets Precinct, including market buildings, warehouses, associated infrastructure and car parking. The site is bounded to the west by Pershore Street, to the south by Barford Street, to the east by Rea Street and to the north by the B4100 (Moat Lane / Digbeth). The site lies at approximately 112m above Ordnance Datum (aOD), on relatively level ground.

1.5 The underlying bedrock geology of the area is mapped as mudstone of the Sidmouth Mudstone Formation, formed approximately 228 to 250 million years ago in the Triassic Period; and sandstone of the Helsby Sandstone Formation, formed approximately 242 to 247 million years ago in the Triassic Period (BGS 2019). No superficial deposits are recorded for the area. The natural substrate revealed within the boreholes comprised a mixture of silty sandy clays.

2. ARCHAEOLOGICAL BACKGROUND

2.1 The archaeological background has been presented in detail as part of a desk-based assessment (DBA) produced by Atkins (2010). The following text is summarised from

the DBA text, and is supplemented by a Heritage Gateway search to cover any more recent discoveries.

Prehistoric period (pre-AD 43)

2.2 The extent of known prehistoric settlement and associated activity within the wider Birmingham area has become better informed in recent years as a result of archaeological investigation, prior to which the picture was largely based on chance finds of flint, stone and bronze artefacts. Systematic fieldwalking programmes east of Sutton Coldfield have resulted in the discovery of Mesolithic and Neolithic artefact scatters (Hodder, 2004; 25). Added to this, there have been excavations of Bronze Age burnt mounds and the discovery through systematic survey of others in the region; excavations along the line of the M6 Toll motorway in Sutton Coldfield have also revealed Bronze Age and Iron Age sites (Hodder, 2004; 45). The identification of these sites suggests it is likely that the less-urbanised parts of the city could retain further surviving buried remains, but conversely the built-up areas of the city centre and its surroundings are far less likely to retain extensive remains and in fact, to date within the study area no substantial prehistoric remains have been recorded.

Roman period (AD 43 – AD 410)

2.3 Very little evidence of activity during the Roman period has been recorded within the city centre, with the exception of finds of Roman coins during the construction of sewers in Dudley Street. Although there was never a Roman town here, several sites are known in the wider city area, which provide evidence for the wider area of military, agricultural/industrial and domestic activity. A fort and associated vicus dating from the 1st century AD and occupied until approximately AD 200 is known at Metchley in Edgbaston, in the grounds of the University and Queen Elizabeth Hospital, several miles from the city centre. Farmsteads have been discovered, at King's Norton, Sutton Coldfield and elsewhere, and kilns, field systems, lengths of at least three roads and other archaeological and palaeoenvironmental remains have been recorded too (Hodder 2004, 49).

Early medieval and medieval periods (AD 410 – 1539)

2.4 Medieval Birmingham developed on a sandstone ridge and much of the present day city centre is situated on the same ridge and has spread along it, and to the west. It is thought that the central part of the settlement, *c.*1km to the north of the site, was the original focus of settlement sometime during the early medieval period. However, despite a number of archaeological investigations in the area, no physical evidence

has yet been recovered, nor is there any documentary evidence, with the exception of the form of the place-name which provides the only indication of pre-11th century activity. Birmingham is an Anglo-Saxon name which has been interpreted as "land-unit of Beorma's people" (Bassett 2000, 8). It has been suggested tentatively that the shape of the Parsonage moat, situated to the west of the site may reflect the location of a late Saxon manor, of similar shape and size to others in the country, but this is based only on its depiction in much later maps (Hodder 2004, 80).

2.5 At the time of the Domesday Survey, Birmingham was one of several small settlements within the boundary of the present city and one of the least important, comprising nine peasant households representing a population of about 50 and having a value of £1. At this time Birmingham was situated on the edge of Arden, an extensively wooded part of Warwickshire, much of which was not colonised until the 11th century. Between the 11th and 14th centuries the population of Warwickshire is thought to have at least doubled, as was the case elsewhere during the period. This stimulated other changes over the same period. For example a network of market centres and towns developed, particularly from the mid-12th century onwards, and included amongst these was Birmingham.

2.6 The settlement took its first real step toward becoming an urban centre in 1166 when Peter de Birmingham bought the rights to hold a weekly market, to be held at his castrum (Bassett 2000, 2). This "castle" probably refers to the site of the moated manor house, although there is no firm archaeological evidence for when the site was initially developed and what form it took. This market charter, given by Henry II was the first to be issued in Warwickshire, probably giving the town a significant economic boost (McKenna 2005, 10). The town flourished and over the following centuries grew in size and stature, its heart focused on St Martin's Church, the Manor and the market area. Birmingham achieved regional importance over the next two centuries, becoming one of the three largest towns in Warwickshire. During this period the settlement shared many of the characteristics of a borough, since sometime after obtaining the market charter, by 1275, the burgesses of the town were being summoned to attend Parliament.

2.7 As described above very little evidence exists in the archaeological record of occupation in the Birmingham city area prior to the medieval period and it is suggested that the town may have been a new creation around the 12th century (Hodder 2004, 83). The evidence for this is derived from a number of archaeological investigations

and desk-based assessments predominantly associated with modern development in the city and concentrated around the Digbeth and Deritend areas of the city. It has also been suggested elsewhere that the purchase of the market charter in 1166 may have been contiguous with the initial medieval development, or deliberate foundation, of the town (Holt 1985, 4-5) and the distinctive triangular formation of the market place, with St Martin's on its south-west side, is also considered indicative of this theory (Bassett, 2000, 2). Alternatively the moated manor site may represent the focus and impetus for initial development of the manor of Birmingham, during the later 11th and early 12th centuries. As noted at this time Birmingham was situated on the edge of Arden an area in which moated sites are a distinctive feature of the regional settlement pattern, though the majority of these date between the 13th and 14th centuries. The circular shape of the Birmingham moat and also the sub-circular shape of the Parsonage moat are indicative of an earlier phase of moat-building in the region, estimated to be around 1150 (Mould & Litherland 1995).

2.8 The origins of the two moats and their possible relationship to each other are not known though they may originally have represented the manorial site and its home farm. Both moated sites are located on the Birmingham Fault, a geological feature which occurs where the Mercia Mudstone deposits on the east and south-east have been let down (Watts 1980, 17). This fault is reflected in the steep slope from the Bull Ring down to Digbeth and the River Rea. This is also associated with a line of natural springs and wells which would have made the area a prime development focus in these early years and obviously influenced the installation of the moats in each case.

2.9 If the town was newly established in the 12th century its arrangement comprising the circular moated manor site, parish church, market place and High Street beyond, is very similar to one of the small Medieval planned towns of the Welsh Marches such as Kilpeck or Richards Castle, though there is no evidence that the Birmingham site was defended. The early town also contained housing to the north of the market place and possibly to the west, a deer park to the east, and a wet area to the south as the land dropped away into the River Rea, exploited for water-using industries.

2.10 Excavations at Park Street and Moor Street to the north and north-east of the site revealed elements of the probable town boundary ditch, in places 7m wide and 2m deep, which defined the rear of burgage plots, themselves recorded by archaeological investigations, set out early in the medieval period along Digbeth, forming the boundary between the nascent town and the manorial deer park. This might have

extended as far north as the junction of the High Street and New Street and south to the Parsonage moat. The rest of the boundary would have been formed by the watercourse that joined the two moats. This apparently explains its 14th century name, the Hersum (lord's or lordship) ditch (Hodder 2004, 84; Patrick & Ratkai, 2009).

Post-medieval and modern periods (1539 to present)

2.11 Evidence for the more recent periods of activity and occupation in the study area and the wider Birmingham area derive far more extensively from documentary, illustrative, cartographic and archaeological evidence. There is documentary evidence for the use of water for domestic and industrial purposes, for example the location of wells and mills such as the Lady Well, Lady Well Mill, the Malt / Moat Mill and the Town Mill. Much of the archaeological evidence relates to industry, including workplaces, power sources, raw materials, products and waste products and the transport network that carried them (Hodder 2004, 133). Excavations in the city centre have revealed evidence of metalworking, leather tanning, milling, glassmaking, bone working, hemp and flax processing, button making and brick, tile and pottery manufacture (at Edgbaston Street, Park Street, Moor Street, Floodgate Street, and elsewhere, at Manzoni Gardens and the Coach Station, Rea Street). They have also shed light on aspects of the domestic lives of the city's people, co-existing alongside and around their industrial enterprises.

2.12 As late as 1731 the watercourse running between the Parsonage moat and the Birmingham manor site formed the southern boundary of the city. However, by 1766 Thomas Gooch was given permission by an Act of Parliament to develop much of the area to the south. Rapid growth ensued and by 1778 Birmingham moated manor was surrounded by streets and buildings. In the 17th and 18th centuries small-scale industry and associated housing characterised the area, and by the 18th century the manor and its structures had been given over to wire manufacture (Mould & Litherland 1995, 8). By 1816 the whole manor site had been sold off, demolished and all valuable materials removed. Around the same time the Parsonage moat was infilled and the site levelled. In the late 1820s a turnpike road was constructed though the area to connect Worcester Street with Bromsgrove Street.

2.13 Massive growth in the urban population in the 19th century, the construction of Smithfield Market, in part on the former moated manor site, and social changes - in part brought about by the industrial revolution -contributed to the general decline of the inner city area. The urban poor lived in insanitary, often old buildings commonly

situated in "courts". Social change for the better began to gather pace late in the 19th century with the instatement of Joseph Chamberlain as leader of the City Council and corresponded with a general improvement in the economy of the city, brought about in part by improving rail links. This re-established the status of the area and in particular the wholesale and livestock markets and surrounding industries. Later, in the 20th century the markets again declined as a result of changing country-wide economic trends and in no small part as a result of the blitz in 1940. Redevelopment in the 1970s levelled the markets area, once again and the present day Wholesale Markets were established (Mould & Litherland 1995, 9).

3. AIMS AND OBJECTIVES

3.1 The objectives of the archaeological works were:

- to monitor 25 hand-dug test pits associated with geotechnical site investigation works, and to identify, investigate and record all significant buried archaeological deposits revealed on the site during the course of these site investigation works; and,
- at the conclusion of the project, to produce an integrated archive for the project work and a report setting out the results of the project and the archaeological conclusions that can be drawn from the recorded data.

3.2 If significant archaeological remains were identified, reference was to be made to *The Archaeology of the West Midlands: A framework for research* (Watt 2011), so that the remains could, if possible, be placed within their local and regional context.

4. METHODOLOGY

4.1 The fieldwork followed the methodology set out within the WSI (CA 2019). An archaeologist was present during intrusive groundworks comprising a total of 22 hand-dug test-pits and boreholes. In total 25 boreholes were undertaken rather than 25; with four of these not monitored under archaeological conditions (Fig. 2). Non-archaeologically significant deposits were removed by the contractors under archaeological supervision (Fig. 4).

4.2 Where archaeological deposits were encountered written, graphic and photographic records were compiled in accordance with CA *Technical Manual 1*: *Fieldwork Recording Manual*.

4.3 The archive from the watching brief is currently held by CA at its office in Milton Keynes. Subject to the agreement of the legal landowner the site archive will be deposited with the Birmingham Museum and Art Gallery. A summary of information from this project, set out within Appendix B, will be entered onto the OASIS online database of archaeological projects in Britain.

5. RESULTS (FIGS 2-5)

5.1 The natural substrate, comprising a mix of silty/sandy clays, was revealed in 13 of the boreholes monitored. WS18, situated within the anticipated footprint of the former medieval moat, revealed the natural substrate at only 0.8m bpgl. Whereas the deposits in WS19 revealed that the natural substrate lay at 2.4m bpgl. The average depth of the natural substrate across the site was c.3.2m bpgl. In borehole WS12 the natural substrate was revealed at 5.8m bpgl, the deepest recorded example.

5.2 No features or deposits of archaeological significance were identified during groundworks and, despite visual scanning of spoil, no artefactual material pre-dating the modern period was recovered.

6. DISCUSSION

6.1 Although there is evident archaeological potential within the site it lies at an uncertain depth. The watching brief identified no evidence of archaeological remains within the area of observed groundworks but it was clear from the evidence of the borehole survey that natural substrate lies at depths greater than 3m bpgl toward the south of the site and somewhat less depth moving northwards, with some pockets at less than 1m depth bpgl. This could indicate that surviving remains of the former moated manor may yet survive in pockets in the north-east of the site cutting the less truncated or degraded natural deposits. The ‘made ground’ deposits, of relatively recent origin, were recorded between 0.8m and up to 6m bpgl, and represent substantial remodelling of the site, mainly in the 20th century. The variation in thickness of ‘made ground’ across the site is likely a reflection of both quite substantial ground reduction in places as well as raising of former ground levels during phases of construction in the later 20th century.

6.2 The three most northerly boreholes (WS18, WS19 and WS23) revealed the natural substrate at depths between 0.8 to 2.4m bpgl, less deep on average than in the southern half of the site, which may indicate a better potential for the presence of archaeological remains in this part of the site. Notably it is this part of the site in which the former moated manor is located.

6.3 Borehole WS18, revealed natural substrate at 0.8m bpgl, and was located in the putative location of the moat surrounding the former manor. The recorded depth of natural substrate and the evidence of the recorded sample do not, however, suggest infilled moat material. The evidence could, however, suggest that this borehole lay adjacent to the infilled moat, allowing for a margin of error in historical recording. WS19, located inside the putative circuit of the moat, revealed 'made ground' to 2.4m bpgl, again with no evidence of infilled moat material. This could indicate substantial levels of ground reduction or modification in the area, especially where one may anticipate evidence of the former house platform perhaps at less great depth.

7. CA PROJECT TEAM

7.1 The fieldwork was undertaken, and this report written, by James Coyne. The illustrations were prepared by Amy Wright. The archive has been compiled by Emily Evans, and prepared for deposition by Hazel O'Neill. The project was managed for CA by Mark Hewson.

8. REFERENCES

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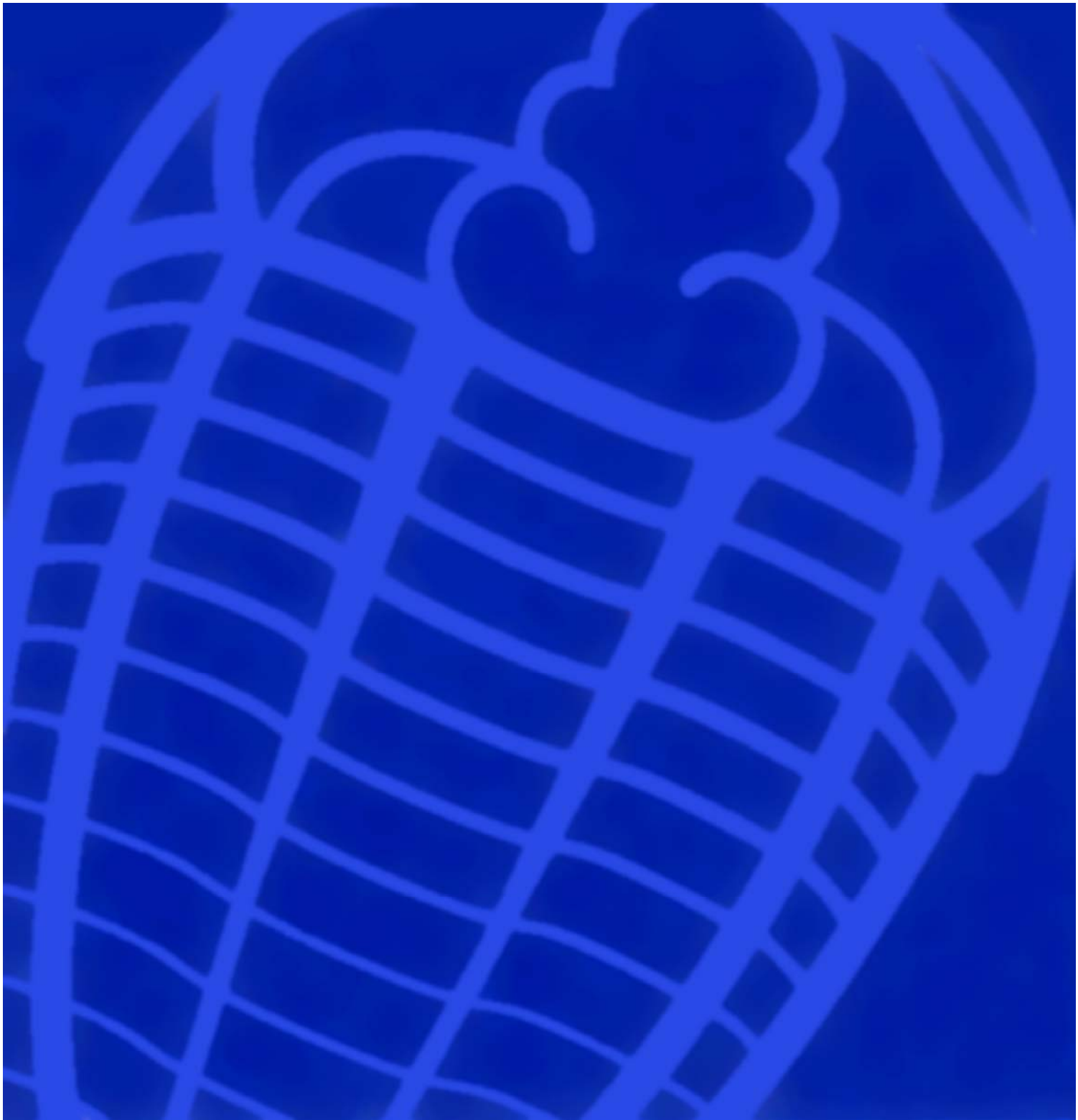
APPENDIX A: BOREHOLE LOGS

APPENDIX A



GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	13/06/2019
Diameter:	100mm
Depth Cased:	0.00m
National Grid:	E: 407368.23 N: 286235.99
Ground Level:	+106.98mAOD
Final Depth:	5.00m

Borehole:	WS1
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	GW

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.30	106.68		0.30	B		
MADE GROUND. Dark greyish brown clayey gravelly SAND. Gravel is fine to coarse angular to rounded quartzite, brick, ash, concrete, ceramic, wood and glass. PID reading at 0.30m - 0.3ppm. PID reading at 0.70m - 0.3ppm. PID reading at 1.20m - 2.0ppm.					0.30 0.70 1.20	ES ES B		
					1.20	ES		
Orange brown gravelly slightly silty SAND. Gravel is fine to coarse sub-rounded to rounded quartzite (Superficial Deposits). PID reading at 2.20m - 5.6ppm.		2.20	104.78		2.20	B		
					2.20	ES		
Firm pale brown and reddish brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse rounded quartzite. (Superficial Deposits). PID reading at 3.00m - 1.4ppm.		3.00	103.98		3.00	B		
					3.00	ES		
Orange brown silty gravelly SAND. Gravel is medium to coarse rounded quartzite. (Superficial Deposits). (Strata noted as "very wet".) PID reading at 4.00m - 2.5ppm.		4.00	102.98	▼ 4.00	4.00	B		
Borehole Complete at 5.00m		5.00	101.98					

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
▽	Water Strike
▼	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Groundwater encountered at 4.00m.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. Borehole collapsed up to 2.00m.
6. 50mm ID HDPE monitoring standpipe installed from 2.00m (slotted from 2.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

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Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	19/06/2019
Diameter:	100mm
Depth Cased:	2.00m

Borehole:	WS2
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	RS

National Grid: E: 407383.83 N: 286242.32
Ground Level: +106.96mAOD
Final Depth: 6.00m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.								
MADE GROUND. Brown clayey (becoming slightly clayey) gravelly SAND with occasional clay pockets. Gravel is fine to coarse sub-angular to rounded brick, quartzite and concrete. PID reading at 0.25m - 0.0ppm. PID reading at 0.50m - 0.0ppm. PID reading at 1.20m - 7.3ppm.		0.25	106.71		0.25 0.25 0.50 0.50 1.00 1.20 1.20	B ES B ES D B ES		
MADE GROUND. Firm friable brown and dark brown sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to rounded brick, quartzite and coal. PID reading at 1.60m - 6.8ppm.		1.60	105.36		1.60 1.60	D ES		
Firm friable brown and pale brown sandy slightly gravelly CLAY. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits). PID reading at 1.90m - 0.2ppm.		1.90 2.00	105.06 104.96		1.90 2.00 2.00	D B ES		
Pale yellowish brown becoming reddish brown very gravelly silty SAND. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits).				▼ 3.00	3.00	B		
Firm pale brown sandy slightly gravelly CLAY. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits).		3.50	103.46		3.50 3.50	D ES		
Firm reddish brown slightly sandy CLAY with rare fine to medium quartzite gravel. (Reworked Mercia Mudstone Group).		3.90	103.06		3.90 4.00 4.00	D B ES		
Stiff and very stiff reddish brown and blueish grey slightly sandy CLAY with occasional siltstone lithorelicts. (Weathered Mercia Mudstone Group - Zone 4a).		5.00	101.96		5.00	B		
Borehole Complete at 6.00m		6.00	100.96					

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Strata damp from 3.00m
4. 50mm ID HDPE monitoring standpipe installed from 6.00m (slotted from 6.00m to 2.00m) in a gravel filter, bentonite seal from 2.00m to 0.30m, with a lockable cover at surface.

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Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
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Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019
Diameter:	100mm
Depth Cased:	0.00m

Borehole:	WS3
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

National Grid: E: 407481.01 N: 286210.54
Ground Level: +106.72mAOD
Final Depth: 0.46m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.30	106.42		0.35	B		
MADE GROUND. Grey sandy slightly clayey GRAVEL of fine to coarse angular to sub-angular hardcore, tarmac, brick, ash and clinker. PID reading at 0.35m - 0.2ppm.		0.46	106.26		0.35	ES		
Borehole Complete at 0.46m								

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 0.46m - unable to penetrate concrete obstruction - borehole terminated.
3. No groundwater encountered.
4. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019 to 18/06/2019
Diameter:	100mm
Depth Cased:	1.60m

National Grid:	E: 407474.26 N: 286214.46
Ground Level:	+106.68mAOD
Final Depth:	1.60m

Borehole:	WS4
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.27	106.41		0.27	B		
MADE GROUND. Purplish brown very sandy GRAVEL with a medium cobble content. Gravel is medium to coarse sub-angular to angular hardcore. Cobbles are hardcore. PID reading at 0.30m - 0.3ppm.		0.45	106.23		0.30 0.60	ES B		
MADE GROUND. Dark grey and greyish brown slightly silty very gravelly SAND with a low cobble content. Gravel is fine to coarse angular to sub-rounded brick, ash, slag and hardcore. Cobbles are slag and brick. PID reading at 0.60m - 0.8ppm. PID reading at 0.90m - 0.4ppm.					0.60 0.90 0.90 1.20	ES D ES D		
Borehole Complete at 1.60m		1.60	105.08					

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Minimal liner recovery from 1.20m-1.60m.
4. Obstruction at 1.60m - unable to penetrate - borehole terminated.
5. No groundwater encountered
6. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019
Diameter:	100mm
Depth Cased:	0.00m

Borehole:	WS5
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

National Grid: E: 407528.66 N: 286233.28
Ground Level: +106.92mAOD
Final Depth: 0.95m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.								
MADE GROUND. Brown and light brown gravelly (becoming very gravelly) slightly clayey (and in parts clayey) SAND with a medium cobble content and occasional clay pockets. Gravel is fine to coarse angular to sub-rounded quartzite, brick, sandstone, concrete and rare clinker. Cobbles are quartzite and brick. PID reading at 0.35m - 0.5ppm. PID reading at 0.80m - 0.4ppm.		0.33	106.59		0.35 0.35	B ES		
Borehole Complete at 0.95m		0.95	105.97		0.80 0.80	B ES		

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 0.95m - unable to penetrate obstruction - borehole terminated.
3. No groundwater encountered.
4. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019 to 18/06/2019
Diameter:	100mm
Depth Cased:	0.00m
National Grid:	E: 407516.18 N: 286147.56
Ground Level:	+106.92mAOD
Final Depth:	2.30m

Borehole:	WS6
Sheet 1 of 1	
Logged By:	CJB/SJW
Checked By:	ML
Drilled By:	EB

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.10	106.82		0.15	B		
MADE GROUND. Greyish brown silty sandy GRAVEL of fine to coarse sub-angular hardcore, slag and ash.					0.15	ES		
PID reading at 0.15m - 0.0ppm.		0.35	106.56		0.35	B		
MADE GROUND. Orange brown becoming reddish brown silty gravelly SAND with a low cobble content. Gravel is fine to coarse sub-angular to rounded brick, quartzite, slag, sandstone and plastic. Cobbles are brick, slag and quartzite.					0.35	ES		
PID reading at 0.35m - 0.0ppm.					0.50	B		
PID reading at 1.20m - 0.0ppm.					1.00	B		
					1.20	D		
					1.20	ES		
PID reading at 1.75m - 0.0ppm.					1.75	ES		
Possible sandstone boulder at 1.75m-2.00m.					1.75	D		
Borehole Complete at 2.30m		2.30	104.62					

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. No liner recovery from 2.00m - 2.30m.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. No groundwater encountered.
6. 50mm ID HDPE monitoring standpipe installed from 2.30m (slotted from 2.30m to 1.50m) in a gravel filter, bentonite seal from 1.50m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019 to 18/06/2019
Diameter:	100mm
Depth Cased:	0.00m
National Grid:	E: 407534.70 N: 286182.08
Ground Level:	+106.81mAOD
Final Depth:	3.30m

Borehole:	WS7
Sheet 1 of 1	
Logged By:	CJB/SJW
Checked By:	ML
Drilled By:	EB

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.35	106.46		0.35	B		
MADE GROUND. Dark grey silty sandy GRAVEL with a low cobble content. Gravel is fine to coarse sub-angular slag, brick, quartzite, hardcore, ash and coal. Cobbles are slag. PID reading at 0.35m - 0.0ppm. PID reading at 0.50m - 0.0ppm.					0.35 0.50 0.50	ES B ES		
MADE GROUND. Firm friable brown sandy slightly gravelly (and in parts gravelly) CLAY. Gravel is fine to coarse angular to rounded brick, quartzite, ceramic, ash, coal and slag. PID reading at 1.20m - 0.0ppm.		1.20	105.61		1.20 1.20	B ES		
PID reading at 2.00m - 0.2ppm. From 2.00m - In parts tending to clayey SAND.					2.00 2.00	B ES		
PID reading at 3.00m - 0.2ppm.					3.00	ES		
Borehole Complete at 3.30m		3.30	103.51					

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Borehole:	WS8
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

Project Number: 28268
Project Name: Smithfield, Digbeth, Birmingham
Client: Land Lease
Engineer: Atkins
Date Drilled: 17/06/2019
Diameter: 100mm
Depth Cased: 0.00m

National Grid: E: 407554.95 N: 286282.77
Ground Level: +106.71mAOD
Final Depth: 0.55m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.32	106.39		0.40	B		
MADE GROUND. Greyish brown very gravelly slightly silty SAND with a medium cobble content. Gravel is angular to sub-rounded quartzite, hardcore, concrete, clinker and slag. Cobbles are hardcore and concrete. PID reading at 0.40m - 0.1ppm.		0.55	106.16		0.40	ES		
Borehole Complete at 0.55m								

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 0.55 - unable to penetrate concrete obstruction - borehole terminated.
3. No groundwater encountered.
4. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019
Diameter:	100mm
Depth Cased:	2.00m
National Grid:	E: 407508.66 N: 286279.28
Ground Level:	+106.94mAOD
Final Depth:	3.90m

Borehole:	WS9
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.								
MADE GROUND. Dark brown gravelly to very gravelly slightly clayey SAND with a medium cobble content. Gravel is angular to sub-rounded brick, concrete, hardcore, ceramic, quartzite, clinker and slag. Cobbles are concrete and brick. PID reading at 0.80m - 0.3ppm.		0.76	106.18		0.76 0.76 0.80	B ES ES		
MADE GROUND. Dark brown gravelly to very gravelly slightly clayey SAND. with a low cobble content. Gravel is fine to coarse angular to sub-rounded clinker, slag, brick, concrete and mortar. Cobbles are clinker and slag. PID reading at 1.20m - 16.3ppm. PID reading at 2.00m - 22.9ppm.		1.20	105.74		1.20 1.20 2.00 2.00	B ES D ES		
MADE GROUND. Orange GRAVEL and COBBLES of angular to sub-angular brick. PID reading at 2.50m - 157.3ppm.		2.50	104.44		2.50 2.50	D ES		
MADE GROUND. Brown, light brown and orange brown slightly clayey slightly gravelly SAND. Gravel is angular to sub-rounded quartzite, brick and ceramic. PID reading at 2.90m - 13.2ppm. PID reading at 3.00m - 133.9ppm.		2.90 3.25	104.04 103.69		2.90 2.90 3.00 3.25 3.25	D ES ES B ES		
MADE GROUND. Orange, orange brown and in parts brown GRAVEL and COBBLES with occasional silty sand pockets. Gravel is fine to coarse sub-angular brick and mortar. Cobbles are brick. PID reading at 3.25m - 9.0ppm.		3.90	103.04					
Borehole Complete at 3.90m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	20/06/2019
Diameter:	100mm
Depth Cased:	0.00m

Borehole:	WS10
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	RS

National Grid: E: 407496.92 N: 286154.49
Ground Level: +106.90mAOD
Final Depth: 5.00m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.								
		0.26	106.64		0.26	B		
MADE GROUND. Dark brown and dark grey clayey gravelly SAND with a medium cobble content. Gravel is fine to coarse angular to sub-angular brick, ash, glass, concrete and slag. Cobbles are brick.					0.30	ES		
					0.60	ES		
		1.00	105.90		1.00	B		
MADE GROUND. Firm friable greyish brown and brown slightly sandy slightly gravelly CLAY with occasional sand pockets. Gravel is fine to coarse angular to rounded brick, quartzite, ash, glass and slag.					1.00	ES		
					2.00	B		
					2.00	ES		
		2.80	104.10		2.80	D		
MADE GROUND. Dark greyish brown and dark grey very gravelly slightly clayey SAND. Gravel is fine to coarse sub-angular brick and ash.					2.80	ES		
		3.70	103.20	▼ 3.70	3.70	D		
MADE GROUND. Greyish brown very clayey gravelly SAND with frequent clay pockets. Gravel is fine to coarse angular to sub-angular brick, ash and ceramic.		3.90	103.00		3.90	D		
					4.00	B		
MADE GROUND. Dark grey sandy slightly gravelly clayey SILT, in parts tending to silty gravelly SAND. Gravel is fine to coarse angular to sub-angular brick and ceramic.					4.00	ES		
		5.00	101.90					
Borehole Complete at 5.00m								

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.00m - unable to dig further.
3. Unable to case borehole due to angled in-situ brick work within hand pit.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. Groundwater encountered at 3.70m.
6. Borehole collapsed up to 4.00m.
7. 50mm ID HDPE monitoring standpipe installed from 4.00m (slotted from 4.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	18/06/2019
Diameter:	100mm
Depth Cased:	0.00m
National Grid:	E: 407452.08 N: 286230.65
Ground Level:	+106.68mAOD
Final Depth:	3.90m

Borehole:	WS11
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.26	106.42		0.30	B		
MADE GROUND. Purplish brown very gravelly SAND with a medium cobble content. Gravel is fine to coarse angular to sub-angular hardcore. Cobbles are hardcore. PID reading at 0.30m - 0.7ppm.		0.50	106.18		0.30 0.55 0.55	ES B ES		
MADE GROUND. Brown, light brown, dark brown and occasionally dark grey and orange brown variably clayey and silty gravelly SAND with a low to medium cobble content. Gravel is fine to coarse angular to rounded brick, ash, slag, clinker, quartzite, concrete, coal, ceramic and sandstone. Cobbles are brick, concrete and slag. PID reading at 0.55m - 1.8ppm. PID reading at 1.00m - 6.2ppm. PID reading at 1.10m - 3.4ppm. PID reading at 1.30m - 3.4ppm. PID reading at 1.90m - 0.9ppm. PID reading at 2.00m - 0.7ppm. PID reading at 2.40m - 0.4ppm. PID reading at 2.50m - 0.5ppm.		2.70	103.98		1.00 1.10 1.10 1.30 1.30 1.90 1.90 2.00 2.00 2.40 2.40 2.50	D D ES D ES D ES D ES D ES D		
POSSIBLE MADE GROUND. Firm friable light greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-rounded quartzite. (Possible Buried Topsoil). PID reading at 2.70m - 0.4ppm.		3.00	103.68	▼ 3.00	2.50 2.70 2.70 3.00 3.00	ES D ES D ES		
Light yellowish brown and orange brown silty gravelly (and in parts very gravelly) SAND with a medium cobble content and occasional clay pockets. Gravel is fine to coarse sub-angular to sub-rounded quartzite and sandstone. Cobbles are quartzite. (Superficial Deposits). PID reading at 3.00m - 0.3ppm.		3.90	102.78					
Borehole Complete at 3.90m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Groundwater encountered at 3.00m.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. 50mm ID HDPE monitoring standpipe installed from 3.90m (slotted from 3.90m to 3.50m) in a gravel filter, bentonite seal from 3.50m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	14/06/2019
Diameter:	100mm
Depth Cased:	2.00m

Borehole:	WS12
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	EB

National Grid: E: 407403.55 N: 286083.08
Ground Level: +106.95mAOD
Final Depth: 6.00m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.								
MADE GROUND. Dark greyish brown very gravelly slightly silty SAND with a medium cobble content. Gravel is fine to coarse angular to sub-rounded brick, slag, ash, clinker and quartzite. Cobbles are slag. PID reading at 0.30m - 0.0ppm. PID reading at 0.70m - 0.0ppm. PID reading at 1.00m - 0.0ppm.		0.25	106.70		0.25 0.30 0.70 0.70 1.00 1.10	B ES B ES ES B		
MADE GROUND. Firm friable brown gravelly slightly sandy CLAY with a low cobble content. Gravel is fine to coarse sub-angular to rounded brick and quartzite. Cobbles are brick. PID reading at 2.00m - 0.0ppm.		1.70	105.25		1.70 2.00 2.00	B B ES		
MADE GROUND. Dark grey very gravelly silty SAND. Gravel is fine to coarse angular to sub-angular ash, slag and clinker.		2.80	104.15		2.80	B		
MADE GROUND. Greyish brown very clayey gravelly (and in parts very gravelly) SAND with frequent sandy clay pockets. Gravel is fine to coarse sub-angular brick, concrete, slag, rare wood and rounded quartzite. Slight solvent-type odour noted at 3.80m. PID reading at 3.00m - 1.4ppm.		3.00	103.95		3.00 3.00 4.00 5.00	B ES B B		
				▼ 5.50				
Pale brown and greenish grey clayey gravelly SAND. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits).		5.80	101.15		5.80 5.80	B ES		
Borehole Complete at 6.00m		6.00	100.95					

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
▽	Water Strike
▼	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.10m - unable to dig further.
3. Strata damp at 5.50m.
4. Borehole collapsed up to 5.00m.
5. 50mm ID HDPE monitoring standpipe installed from 5.00m (slotted from 5.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019
Diameter:	100mm
Depth Cased:	2.00m

Borehole:	WS13
Sheet 1 of 1	
Logged By:	CJB
Checked By:	ML
Drilled By:	EB

National Grid: E: 407432.02 N: 286070.36
Ground Level: +106.87mAOD
Final Depth: 5.20m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.20	106.67		0.20	B		
MADE GROUND. Light grey clayey sandy GRAVEL of medium to coarse sub-angular hardcore. PID reading at 0.20m - 0.0ppm.		0.28	106.59		0.20	ES		
MADE GROUND. Greyish brown and dark grey silty sandy GRAVEL with a low cobble content. Gravel is fine to coarse sub-angular to rounded ash, quartzite, clinker, brick and occasional slag. Cobbles are slag and concrete. PID reading at 0.28m - 0.0ppm. PID reading at 0.50m - 0.0ppm. From 0.50m - Becoming clayey. PID reading at 1.00m - 0.2ppm.					0.28	B		
					0.28	ES		
					0.50	B		
					0.50	ES		
					1.00	B		
					1.00	ES		
					1.20	D		
MADE GROUND. Firm orange brown and reddish brown sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded brick, ash, quartzite and ceramic.		2.00	104.87		2.00	B		
MADE GROUND. Orange brown silty sandy GRAVEL of fine to coarse sub-angular brick and sub-rounded slag. PID reading at 2.40m - 0.1ppm.		2.40	104.47		2.40	D		
					2.40	ES		
					3.00	B		
MADE GROUND. Brown and greenish brown silty gravelly SAND. Gravel is sub-angular to sub-rounded brick, ash, coal and quartzite. PID reading at 3.45m - 0.0ppm.		3.45	103.42		3.45	B		
					3.45	ES		
POSSIBLE MADE GROUND. Dark grey silty SAND. Slight organic odour noted. (Possible Buried Topsoil).		4.00	102.87	▼ 4.00	4.00	B		
Dark grey and greenish grey clayey gravelly SAND. Gravel is fine to coarse sub-rounded quartzite. (Superficial Deposits). PID reading at 4.30m - 0.0ppm.		4.30	102.57		4.30	B		
					4.30	ES		
Borehole Complete at 5.20m		5.20	101.67					

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Groundwater encountered at 4.00m.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. 50mm ID HDPE monitoring standpipe installed from 5.20m (slotted from 5.20m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	14/06/2019 to 17/06/2019
Diameter:	100mm
Depth Cased:	0.00m
National Grid:	E: 407411.49 N: 286101.28
Ground Level:	+106.91mAOD
Final Depth:	3.00m

Borehole:	WS14
Sheet 1 of 1	
Logged By:	SJW/CJB
Checked By:	ML
Drilled By:	EB

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.								
MADE GROUND. Soft brown and reddish brown sandy slightly gravelly CLAY with frequent sand pockets. Gravel is fine to coarse sub-angular brick and rounded quartzite. PID reading at 0.40m - 0.0ppm.		0.40	106.51		0.40	B		
					0.40	ES		
MADE GROUND. Dark grey gravelly slightly clayey slightly silty SAND. Gravel is fine to coarse sub-angular to rounded brick, ash, quartzite, slag, clinker and occasional concrete, glass and metal. PID reading at 0.70m - 0.0ppm.		0.70	106.21		0.70	B		
					0.70	ES		
		0.90	106.01		0.90	B		
		1.10	105.81		0.90	ES		
					1.10	B		
					1.10	ES		
MADE GROUND. Brown silty gravelly SAND. Gravel is fine to coarse sub-rounded to rounded quartz and rare sub-angular brick.		1.70	105.21		1.70	D		
		2.00	104.91		2.00	B		
					2.00	ES		
MADE GROUND. Firm brown and orange brown sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded brick and quartz. PID reading at 1.10m - 0.0ppm.								
MADE GROUND. Greyish brown and occasionally orange brown clayey sandy GRAVEL of fine to coarse sub-angular to sub-rounded quartzite, brick and occasional concrete.		3.00	103.91		3.00	S		
MADE GROUND. Dark brown clayey sandy GRAVEL of fine to coarse sub-angular to sub-rounded quartzite, ash, brick, clinker and slag. PID reading at 2.00m - 0.0ppm.								
Borehole Complete at 3.00m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.10m - unable to dig further.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. 50mm ID HDPE monitoring standpipe installed from 3.00m (slotted from 3.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
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Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	19/06/2019
Diameter:	100mm
Depth Cased:	2.00m

Borehole:	WS15
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	RS

National Grid: E: 407383.08 N: 286283.71
Ground Level: +106.88mAOD
Final Depth: 5.00m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.23	106.65		0.23	B		
MADE GROUND. Purplish brown slightly silty SAND and GRAVEL of fine to coarse sub-angular hardcore. PID reading at 0.25m - 0.0ppm.		0.45	106.43		0.25 0.45	ES B		
MADE GROUND. Dark greyish brown gravelly slightly silty SAND. Gravel is fine to coarse sub-angular to rounded brick, ash, slag, quartzite and concrete. PID reading at 0.50m - 0.0ppm.		1.00	105.88		0.50 1.00	ES D		
MADE GROUND. Brown and orange sandy GRAVEL of fine to coarse sub-angular brick.					2.00	D		
Firm and stiff brown and blueish grey gravelly slightly sandy CLAY with some sand pockets. Gravel is fine to coarse sub-angular to rounded quartzite. (Superficial Deposits). PID reading at 2.20m - 0.1ppm.		2.20	104.68		2.20 2.20	B ES		
Firm reddish brown and blueish grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular siltstone and sub-rounded to rounded quartzite. (Reworked Mercia Mudstone Group).		3.00 3.25	103.88 103.63		3.00 3.25 3.25	D B ES		
Firm becoming stiff reddish brown and light greenish grey slightly sandy CLAY with frequent mudstone and siltstone lithorelicts. (Weathered Mercia Mudstone Group - Zone 3).					4.00	B		
Borehole Complete at 5.00m		5.00	101.88					

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.00m.
3. Minimal recovery noted in 1.00m-2.00m liner.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. No groundwater encountered.
6. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019
Diameter:	100mm
Depth Cased:	2.00m
National Grid:	E: 407500.60 N: 286313.07
Ground Level:	+106.70mAOD
Final Depth:	4.00m

Borehole:	WS16
Sheet 1 of 1	
Logged By:	CFM
Checked By:	ML
Drilled By:	RS

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.								
		0.35	106.35		0.35	B		
MADE GROUND. Brown clayey gravelly SAND with a medium cobble content. Gravel is fine to coarse angular to sub-rounded brick, quartzite, concrete, slag and clinker. From 0.60m - with some clay pockets.					0.40	ES		
		0.85	105.85		0.85	B		
MADE GROUND. Dark brown clayey gravelly SAND with a low cobble content. Gravel is angular to sub-rounded ash, quartzite, clinker, slag, concrete and brick. Cobbles are clinker and brick.					0.90	ES		
		1.20	105.50		1.20	B		
MADE GROUND. Dark brown and in parts grey slightly silty clayey gravelly (and in parts very gravelly) SAND with a medium cobble content. Gravel is angular to sub-rounded slag, clinker, brick and concrete. Cobbles are slag. Slight becoming moderate sulphur-type odour noted. PID reading at 1.20m - 7.3ppm. PID reading at 2.00m - 1.2ppm.					1.20	ES		
					2.00	B		
					2.00	ES		
		3.00	103.70		3.00	ES		
MADE GROUND. Grey sandy GRAVEL with a medium cobble content. Gravel is fine to coarse sub-angular slag, clinker and rare brick. Cobbles are slag and clinker. Moderate sulphur-type odour noted. PID reading at 3.00m - 9.5ppm.					3.00	B		
		3.75	102.95		3.75	B		
MADE GROUND. Firm brown, light brown and in parts dark brown gravelly slightly sandy CLAY with a low cobble content. Gravel is fine to coarse sub-angular to sub-rounded brick, quartzite, clinker, ash and wood. Cobbles are brick. PID reading at 3.75m - 0.6ppm.					3.75	ES		
		4.00	102.70					
Borehole Complete at 4.00m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. Borehole collapsed up to 2.75m.
6. 50mm ID HDPE monitoring standpipe installed from 2.75m (slotted from 2.75m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Borehole:	WS17
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	EB

Project Number: 28268
Project Name: Smithfield, Digbeth, Birmingham
Client: Land Lease
Engineer: Atkins
Date Drilled: 18/06/2019
Diameter: 100mm
Depth Cased: 0.00m

National Grid: E: 407477.35 N: 286133.10
Ground Level: +106.93mAOD
Final Depth: 6.00m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.30	106.63		0.35	B		
MADE GROUND. Dark grey very gravelly SAND. Gravel is fine to coarse sub-angular concrete, ash and brick. PID reading at 0.35m - 0.0ppm.		0.45	106.48		0.35	ES		
					0.45	B		
MADE GROUND. Orange brown very silty slightly gravelly SAND with a low cobble content. Gravel is fine to coarse sub-angular hardcore, slag, brick, siltstone and concrete. Cobbles are slag. PID reading at 0.50m - 0.0ppm. From 0.60m to 0.75m - slag boulder.		1.10	105.83		0.50	ES		
					0.60	B		
					0.75	B		
					1.00	D		
		1.40	105.53		1.10	D		
					1.10	ES		
MADE GROUND. Dark grey very clayey gravelly SAND with frequent clay pockets. Gravel is fine to coarse angular to sub-angular ash, slag and brick and sub-rounded quartzite. PID reading at 1.10m - 3.3ppm.					1.40	B		
		1.80	105.13		1.80	ES		
MADE GROUND. Orange brown very silty slightly gravelly SAND. Gravel is fine to coarse sub-angular hardcore, slag, brick, siltstone and concrete.		2.00	104.93		2.00	B		
MADE GROUND. Firm friable dark grey gravelly slightly sandy CLAY. Gravel is fine to coarse sub-angular slag, ash and brick.		2.80	104.13		2.80	D		
		3.00	103.93		3.00	B		
MADE GROUND. Dark grey very sandy slightly silty GRAVEL of fine to coarse sub-angular slag, ash and brick.					3.00	ES		
MADE GROUND. Brown and orange brown gravelly slightly clayey SAND. Gravel is fine to coarse sub-angular brick and mortar.								
MADE GROUND. Brown and reddish brown sandy GRAVEL of fine to coarse angular to sub-angular brick, wood and slag. PID reading at 3.00m - 90ppm.					4.00	B		
		4.50	102.43		4.50	B		
POSSIBLE MADE GROUND. Firm friable dark grey slightly sandy silty CLAY with rare fine quartzite gravel. Slight organic odour noted. (Possible Buried Topsoil). PID reading at 4.50m - 0.0ppm.		4.75	102.18		4.50	ES		
					4.75	D		
					5.00	D		
Firm becoming stiff blueish grey and orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits).								
		5.60	101.33		5.60	B		
Stiff reddish brown and pale greenish grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to sub-rounded siltstone, quartzite and mudstone. (Reworked Mercia Mudstone Group).		6.00	100.93					
Borehole Complete at 6.00m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.00m - unable to dig further.
3. Unable to case borehole due to slag cobbles / boulders in hand pit.
4. No groundwater encountered.
5. Borehole collapsed up to 3.50m.
6. 50mm ID HDPE monitoring standpipe installed from 3.50m (slotted from 3.50m to 2.50m) in a gravel filter, bentonite seal from 2.50m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Borehole:	WS18
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	GW

Project Number: 28268
Project Name: Smithfield, Digbeth, Birmingham
Client: Land Lease
Engineer: Atkins
Date Drilled: 13/06/2019
Diameter: 100mm
Depth Cased: 0.00m

National Grid: E: 407363.16 N: 286425.09
Ground Level: +106.94mAOD
Final Depth: 1.50m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.33	106.61		0.33	D		
MADE GROUND. Purplish brown very sandy slightly silty GRAVEL of medium to coarse angular to sub-angular hardcore.		0.40	106.54		0.35 0.40	ES B		
MADE GROUND. Reddish and purplish brown very sandy variably clayey and silty GRAVEL with a low cobble content (from 0.65m). Gravel is fine to coarse medium to coarse hardcore. Cobbles are hardcore.		0.80 1.00	106.14 105.94		0.50 0.80 1.00	ES ES B		
Reddish brown very silty clayey SAND with clay bands. (Probable Weathered Helsby Sandstone Formation).		1.50	105.44		1.40	ES		
Stiff becoming very stiff friable red brown slightly sandy CLAY with some becoming many mudstone and siltstone lithorelicts. (Probable Weathered Helsby Sandstone Formation).								
Borehole Complete at 1.50m								

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Document 4.144

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.00m - unable to dig further.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. 50mm ID HDPE monitoring standpipe installed from 1.50m (slotted from 1.50m to 0.50m) in a gravel filter, bentonite seal from 0.50m to 0.20m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Borehole:	WS19
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	GW

Project Number: 28268
Project Name: Smithfield, Digbeth, Birmingham
Client: Land Lease
Engineer: Atkins
Date Drilled: 13/06/2019
Diameter: 100mm
Depth Cased: 0.00m

National Grid: E: 407419.82 N: 286402.28
Ground Level: +106.86mAOD
Final Depth: 4.45m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.25	106.62		0.25	D		
MADE GROUND. Dark greyish brown very clayey gravelly SAND. Gravel is fine to coarse angular to rounded brick, concrete, quartzite, glass and ceramic.					0.25	ES		
PID reading at 0.25m - 0.0ppm.		0.60	106.26		0.60	D		
MADE GROUND. Brown clayey gravelly SAND. Gravel is fine to coarse angular to sub-angular concrete, plastic, ceramic and sandstone.					0.60	ES		
PID reading at 0.60m - 0.0ppm.					1.00	B		
PID reading at 1.00m - 0.0ppm.					1.00	ES		
From 1.50m - Becoming very clayey.				▼ 1.30				
MADE GROUND. Dark greenish grey slightly clayey silty SAND with frequent wood fragments. Slight organic odour noted. (Possible Buried Topsoil).		1.90	104.96		1.90	ES		
PID reading at 1.90m - 0.0ppm.					2.00	B		
Firm reddish brown and light greenish grey slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to rounded quartzite and siltstone. (Reworked Mercia Mudstone Group).		2.40	104.46		2.50	ES		
At 2.50m - Dark grey and brown sandy pocket with large root.		2.85	104.02		3.00	B		
Stiff becoming very stiff (from 4.00m) reddish brown and light greenish grey slightly sandy CLAY with occasional siltstone lithorelicts. (Weathered Mercia Mudstone Group - Zone 4a).					4.00	D		
Borehole Complete at 4.45m		4.45	102.42					

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand dug service avoidance pit excavated to 1.20m.
3. Groundwater encountered at 1.30m.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. Borehole backfilled to 2.00m; 50mm ID HDPE monitoring standpipe installed from 2.00m (slotted from 2.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	20/06/2019
Diameter:	100mm
Depth Cased:	1.00m

Borehole:	WS21
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	RS

National Grid: E: 407390.53 N: 286380.95
Ground Level: +106.91mAOD
Final Depth: 2.30m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.23	106.68		0.23	B		
MADE GROUND. Purplish brown very sandy slightly silty GRAVEL of fine to coarse angular to sub-angular hardcore. PID reading at 0.25m - 0.0ppm.		0.40	106.51		0.25	ES		
MADE GROUND. Dark grey very sandy slightly silty GRAVEL of fine to coarse sub-angular brick, hardcore, concrete and ash.					1.00	D		
POSSIBLE MADE GROUND. Dark grey and brown sandy silty CLAY. (Possible Buried Topsoil). PID reading at 1.20m - 0.0ppm.		1.20	105.71		1.20 1.20	D ES		
Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular sandstone. Occasional roots and rootlets. (Superficial Deposits). PID reading at 1.60m - 0.0ppm.		1.60 1.80	105.31 105.11		1.60 1.60 1.80 2.00	D ES D B		
Orange brown slightly silty SAND with frequent sandstone lithorelicts. (Weathered Helsby Sandstone Formation).		2.30	104.61					
Borehole Complete at 2.30m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.00m - unable to dig further.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Borehole:	WS22
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	EB

Project Number: 28268
Project Name: Smithfield, Digbeth, Birmingham
Client: Land Lease
Engineer: Atkins
Date Drilled: 14/06/2019
Diameter: 100mm
Depth Cased: 0.00m

National Grid: E: 407345.58 N: 286220.05
Ground Level: +106.98mAOD
Final Depth: 5.70m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
CONCRETE.		0.25	106.73		0.25	B		
MADE GROUND. Brown very gravelly silty SAND with occasional soft clay pockets. Gravel is fine to coarse sub-angular hardcore and sub-rounded quartzite. PID reading at 0.25m - 0.0ppm.		0.35	106.63		0.25 0.35 0.35	ES B ES		
MADE GROUND. Dark greyish brown clayey gravelly SAND with a medium cobble content and occasional clay pockets. Gravel is fine to coarse sub-angular to rounded brick, concrete, ash and quartzite. Cobbles are concrete. PID reading at 0.35m - 0.1ppm. From 0.70m - With some silty pockets. Slight organic odour noted. PID reading at 0.70m - 0.1ppm.		0.90 1.25	106.08 105.73		0.50 0.70 0.70 0.90 1.25 1.25	B B ES B ES B		
MADE GROUND. Dark grey very clayey gravelly SAND with occasional clay pockets. Gravel is fine to coarse sub-angular sandstone and rare brick, and sub-rounded quartzite.				▼ 2.00	2.00 2.00	B ES		
Grey becoming orange brown silty gravelly SAND with rare clay pockets. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits). PID reading at 1.25m - 0.0ppm. PID reading at 2.00m - 0.1ppm.		2.85	104.13		2.85 2.85	B ES		
Firm becoming stiff (from 3.00m) light brown slightly gravelly silty CLAY. Gravel is fine to coarse rounded quartzite. (Superficial Deposits).					3.00 4.00	B D		
Firm becoming stiff and very stiff reddish brown and greenish grey slightly sandy CLAY with occasional becoming frequent mudstone and siltstone lithorelicts. (Weathered Mercia Mudstone Group - Zone 4a tending with depth to Zone 3). PID reading at 4.20m - 0.5ppm.		4.20	102.78		4.20 4.20 5.00	B ES B		
Borehole Complete at 5.70m		5.70	101.28					

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Strata damp from 2.00m.
4. Borehole terminated at limit of windowless sampler drilling equipment.
5. 50mm ID HDPE monitoring standpipe installed from 5.60m (slotted from 5.60m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	13/06/2019
Diameter:	100mm
Depth Cased:	0.00m

Borehole:	WS23
Sheet 1 of 1	
Logged By:	SJW
Checked By:	ML
Drilled By:	GW

National Grid: E: 407353.66 N: 286347.33
Ground Level: +106.64mAOD
Final Depth: 2.40m

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.25	106.39		0.25	D		
MADE GROUND. Reddish brown very sandy silty GRAVEL of fine to coarse sub-angular hardcore. PID reading at 0.25m - 0.0ppm.		0.40	106.24		0.25 0.40 0.50	ES B ES		
MADE GROUND. Reddish brown variably clayey and silty gravelly SAND with rare clay pockets. Gravel is fine to coarse sub-angular hardcore and concrete. PID reading at 0.50m - 3.0ppm.		1.20	105.44		1.20	ES		
Reddish brown silty gravelly SAND. Gravel is fine to coarse rounded quartzite. (Superficial Deposits). PID reading at 1.20m - 0.0ppm.		1.45 1.55	105.19 105.09		1.45 1.55 1.55	B D ES		
Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse rounded quartzite. (Superficial Deposits).					2.00	B		
Reddish brown silty SAND with rare quartzite gravel. (Weathered Helsby Sandstone Formation). PID reading at 1.55m - 0.0ppm.		2.40	104.24					
Borehole Complete at 2.40m								

Samples/Tests
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ES Environmental Sample
- HV Hand Shear Vane
- NR No Recovery
- Water Strike
- Water Level

Other Information:
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Borehole terminated at limit of windowless sampler drilling equipment.
4. No groundwater encountered.
5. Borehole collapsed up to 2.00m.
6. 50mm ID HDPE monitoring standpipe installed from 2.00m (slotted from 2.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019 to 18/06/2019
Diameter:	100mm
Depth Cased:	0.00m
National Grid:	E: 407480.86 N: 286086.31
Ground Level:	+106.86mAOD
Final Depth:	6.00m

Borehole:	WS24
Sheet 1 of 1	
Logged By:	CJB/SJW
Checked By:	ML
Drilled By:	EB

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.23	106.63		0.25	B		
MADE GROUND. Greyish brown and dark grey silty sandy GRAVEL of fine to coarse sub-angular to sub-rounded quartzite, hardcore, slag and clinker. PID reading at 0.25m - 0.0ppm.		0.40	106.46		0.25	ES		
					0.40	B		
		0.65	106.21		0.40	ES		
MADE GROUND. Brown and occasionally reddish brown clayey sandy GRAVEL of fine to coarse sub-angular to sub-rounded brick, quartzite, concrete, ash and clinker. PID reading at 0.25m - 0.0ppm.		0.80	106.06		0.65	B		
					0.65	ES		
					0.80	B		
					0.80	ES		
					1.20	ES		
MADE GROUND. Orange brown silty gravelly SAND. Gravel is fine to coarse sub-angular to sub-rounded brick and ash. PID reading at 0.65m - 0.0ppm.					1.20	B		
MADE GROUND. Dark grey and occasionally reddish brown clayey sandy GRAVEL with a medium cobble content and occasional clay pockets. Gravel is fine to coarse sub-angular to sub-rounded slag, clinker, coal, brick, quartzite and mudstone. Cobbles are slag. PID reading at 0.80m - 0.0ppm. PID reading at 1.20m - 0.0ppm. At 1.50m - Slag cobble.		2.00	104.86		2.00	B		
					2.00	ES		
		2.60	104.26		2.60	D		
		2.80	104.06		2.80	D		
					3.00	B		
MADE GROUND. Firm friable grey sandy slightly gravelly CLAY. Gravel is fine to coarse angular to rounded quartzite, glass, brick and slag. PID reading at 2.00m - 4.6ppm.		3.50	103.36		3.50	B		
					3.50	ES		
MADE GROUND. Pale orange brown slightly silty gravelly SAND. Gravel is fine to coarse sub-angular brick.								
MADE GROUND. Dark grey very gravelly silty SAND with frequent clay pockets (from 3.00m-3.20m). Gravel is fine to coarse sub-angular ash, wood and brick.		4.00	102.86		4.00	B		
MADE GROUND. Firm friable brown and pale yellowish brown sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular brick and sub-rounded to rounded quartzite. PID reading at 3.50m - 0.3ppm.		4.45	102.41		4.45	D		
		4.55	102.31		4.55	ES		
		4.75	102.11		4.75	D		
MADE GROUND. Dark grey silty very gravelly SAND. Gravel is fine to coarse sub-angular ash, wood and brick.				▼ 5.00	5.00	B		
					5.00	ES		
MADE GROUND. Soft brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse rounded quartzite and angular ceramic.								
POSSIBLE MADE GROUND. Dark brown slightly sandy silty CLAY with rare fine to medium quartzite gravel. Slight organic odour noted. (Possible Buried Topsoil). PID reading at 4.55m - 0.0ppm.		6.00	100.86					
Firm friable blueish grey, greenish grey and yellowish brown sandy slightly gravelly CLAY tending with depth to clayey SAND. Gravel is fine to coarse sub-rounded to rounded quartzite. (Superficial Deposits). At 5.00m - Slight hydrocarbon odour noted. PID reading at 5.00m - 1.9ppm.								
Borehole Complete at 6.00m								

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
▽	Water Strike
▼	Water Level

Other Information:

1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.10m - unable to dig further.
3. Groundwater encountered at 5.00m.
4. Borehole backfilled upon completion.

GIP Ltd. Ground Investigation & Piling Limited
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT
Tel: 01902 459558
Email: info@gipuk.com
www.gipuk.com

Windowless Sampler Borehole Log

Project Number:	28268
Project Name:	Smithfield, Digbeth, Birmingham
Client:	Land Lease
Engineer:	Atkins
Date Drilled:	17/06/2019
Diameter:	100mm
Depth Cased:	2.00m
National Grid:	E: 407473.84 N: 286052.85
Ground Level:	+106.95mAOD
Final Depth:	5.50m

Borehole:	WS25
Sheet 1 of 1	
Logged By:	CJB
Checked By:	ML
Drilled By:	EB

Description of Strata	Legend	Depth (m bgl)	Level (mAD)	Water Level (m bgl)	Samples/Tests Depth (m bgl)	Samples/Tests Type	SPT 'N' Value [U100 Blows] Hand Vane	Installation /Backfill
TARMAC.		0.30	106.65		0.29	B		
MADE GROUND. Dark brown silty sandy GRAVEL of fine to coarse sub-angular to sub-rounded quartzite, ash, coal, concrete and hardcore. PID reading at 0.30m - 0.1ppm.		0.50	106.45		0.29 0.50 0.50	ES B ES		
MADE GROUND. Brown and reddish brown clayey sandy GRAVEL of fine to coarse sub-angular to sub-rounded quartzite, brick, slag, ash and clinker. PID reading at 0.50m - 0.0ppm.		1.00	105.95		1.00 1.20	B D		
MADE GROUND. Brown and reddish brown silty sandy GRAVEL. of fine to coarse sub-angular to sub-rounded quartzite and occasional slag, ash and clinker.		1.50	105.45		1.50 1.50	B ES		
MADE GROUND. Orange brown and brown becoming yellowish brown and dark brown very clayey gravelly SAND with frequent sandy clay pockets. Gravel is fine to coarse sub-angular to sub-rounded quartzite, brick, slag, ash and clinker. PID reading at 1.50m - 0.0ppm. PID reading at 2.00m - 0.2ppm.					2.00	B		
MADE GROUND. Brown, orange brown and occasionally greyish brown very clayey gravelly (and in parts very gravelly) SAND. Gravel is fine to coarse quartzite, slag, clinker, ash and sandstone. PID reading at 3.00m - 0.0ppm.		3.00	103.95		3.00 3.00 4.00	B ES B		
Yellowish brown becoming greyish brown and greenish grey silty gravelly SAND. Gravel is fine to medium sub-rounded quartzite. (Superficial Deposits). PID reading at 5.00m - 0.0ppm.		5.00	101.95	▼ 5.00	5.00 5.00	B ES		
Borehole Complete at 5.50m		5.50	101.45					

Samples/Tests

U	Undisturbed
D	Disturbed
B	Bulk
W	Water
S/C	SPT/CPT
ES	Environmental Sample
HV	Hand Shear Vane
NR	No Recovery
	Water Strike
	Water Level

Other Information:

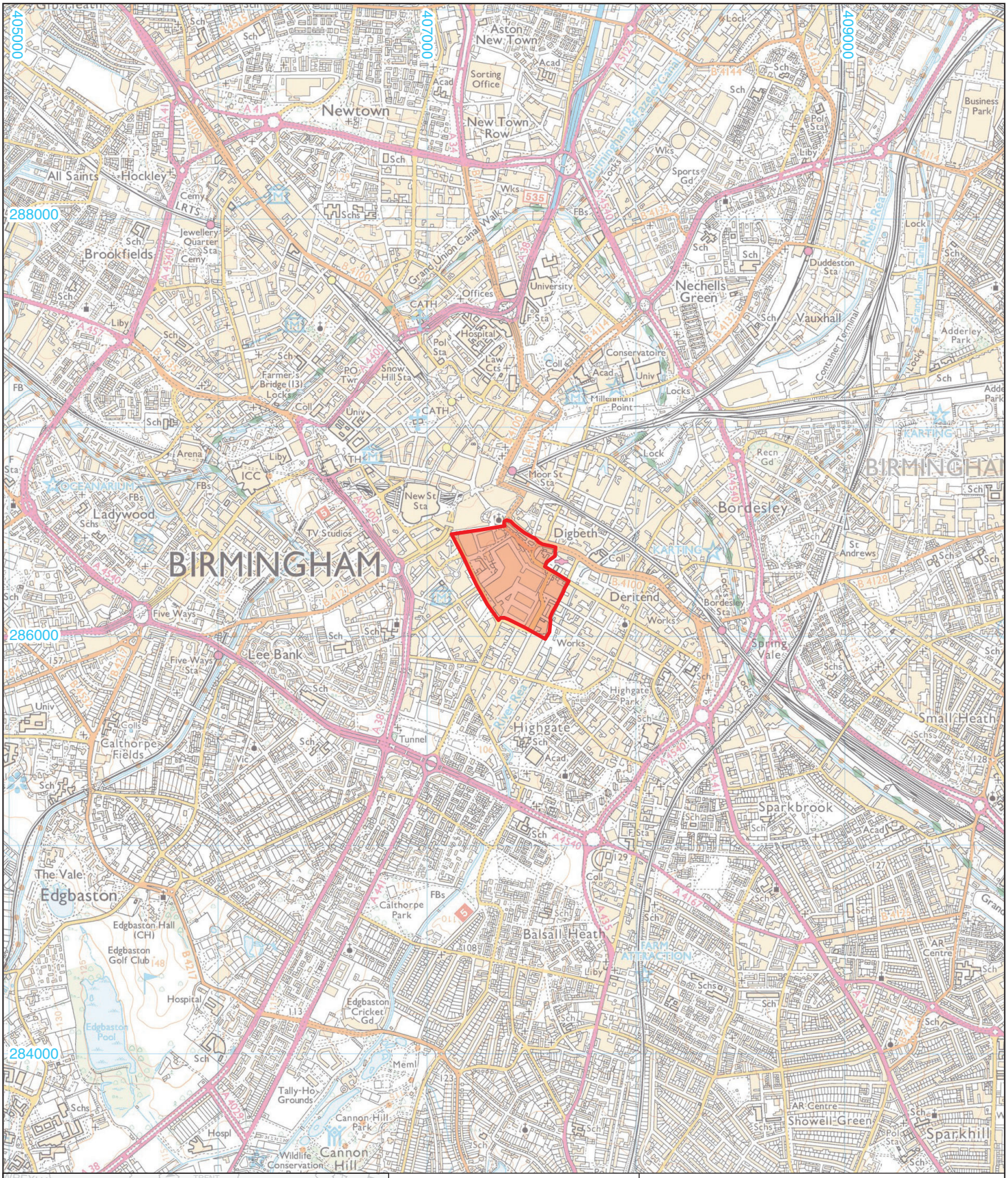
1. Surface hardstanding penetrated using concrete corer.
2. Hand-dug service avoidance pit excavated to 1.20m.
3. Unable to case beyond 3.50m due to obstructions.
4. Groundwater encountered at 5.00m
5. Borehole terminated at limit of windowless sampler drilling equipment.
6. Bentonite seal from 5.50m to 5.00m; 50mm ID HDPE monitoring standpipe installed from 5.00m (slotted from 5.00m to 1.00m) in a gravel filter, bentonite seal from 1.00m to 0.30m, with a lockable cover at surface.

APPENDIX B: OASIS REPORT FORM

PROJECT DETAILS		
Project Name	Birmingham Smithfield Development, Birmingham, West Midlands	
Short description	An archaeological watching brief was undertaken by Cotswold Archaeology for GIP UK during pre-application groundworks associated with the potential redevelopment of the site at Birmingham Smithfield Development, Birmingham, West Midlands. Principle interest in the site derives from the potential for the presence of medieval activity in the form of buried remains of a moated manor and associated structures identified in the north-eastern part of the site through rescue excavation in the 1970s. The groundworks comprised the excavation of 22 hand-dug test pits and boreholes which reached the underlying natural substrate at depths ranging from 0.8m to 5.9m below present ground level. No features or deposits of archaeological significance were identified during these groundworks, and no artefactual material pre-dating the modern period was recovered, despite two boreholes being located in close proximity to the anticipated location of the former moat and manor platform. Borehole WS18, revealed natural substrate at 0.8m bpgl, and was located in the putative location of the moat surrounding the former manor. The recorded depth of natural substrate and the evidence of the recorded sample do not, however, suggest infilled moat material. The evidence could, however, suggest that this borehole lay adjacent to the infilled moat, allowing for a margin of error in historical recording. WS19, located inside the putative circuit of the moat, revealed 'made ground' to 2.4m bpgl, again with no evidence of infilled moat material. This could indicate substantial levels of ground reduction or modification in the area, especially where one may anticipate evidence of the former house platform perhaps at less great depth.	
Project dates	13-19 June 2019	
Project type	Archaeological watching brief	
Previous work	Not known	
Future work	Unknown	
PROJECT LOCATION		
Site Location	Birmingham Smithfield Development, Birmingham, West Midlands	
Study area (M^2/ha)	16.8ha	
Site co-ordinates	407372 286326	
PROJECT CREATORS		
Name of organisation	Cotswold Archaeology	
Project Brief originator	Birmingham City Council	
Project Design (WSI) originator	Cotswold Archaeology	
Project Manager	Mark Hewson	
Project Supervisor	James Coyne	
MONUMENT TYPE	None	
SIGNIFICANT FINDS	None	
PROJECT ARCHIVES	Intended final location of archive (museum/Accession no.)	Content (e.g. pottery, animal bone etc)

Physical	Birmingham Museum and Art Gallery	None
Paper	Birmingham Museum and Art Gallery	WSI, Photographic registers, borehole recording sheets
Digital	Birmingham Museum and Art Gallery	Database, digital photos
BIBLIOGRAPHY		

CA (Cotswold Archaeology) 2019 *Birmingham Smithfield Development, Birmingham, West Midlands: Archaeological Watching Brief.* CA typescript report **MK0069_1**



Cotswold Archaeology

Andover 01264 347630
Cirencester 01285 771022
Exeter 01392 573970
Milton Keynes 01908 564660
Suffolk 01449 900120
w www.cotswoldarchaeology.co.uk
e enquiries@cotswoldarchaeology.co.uk

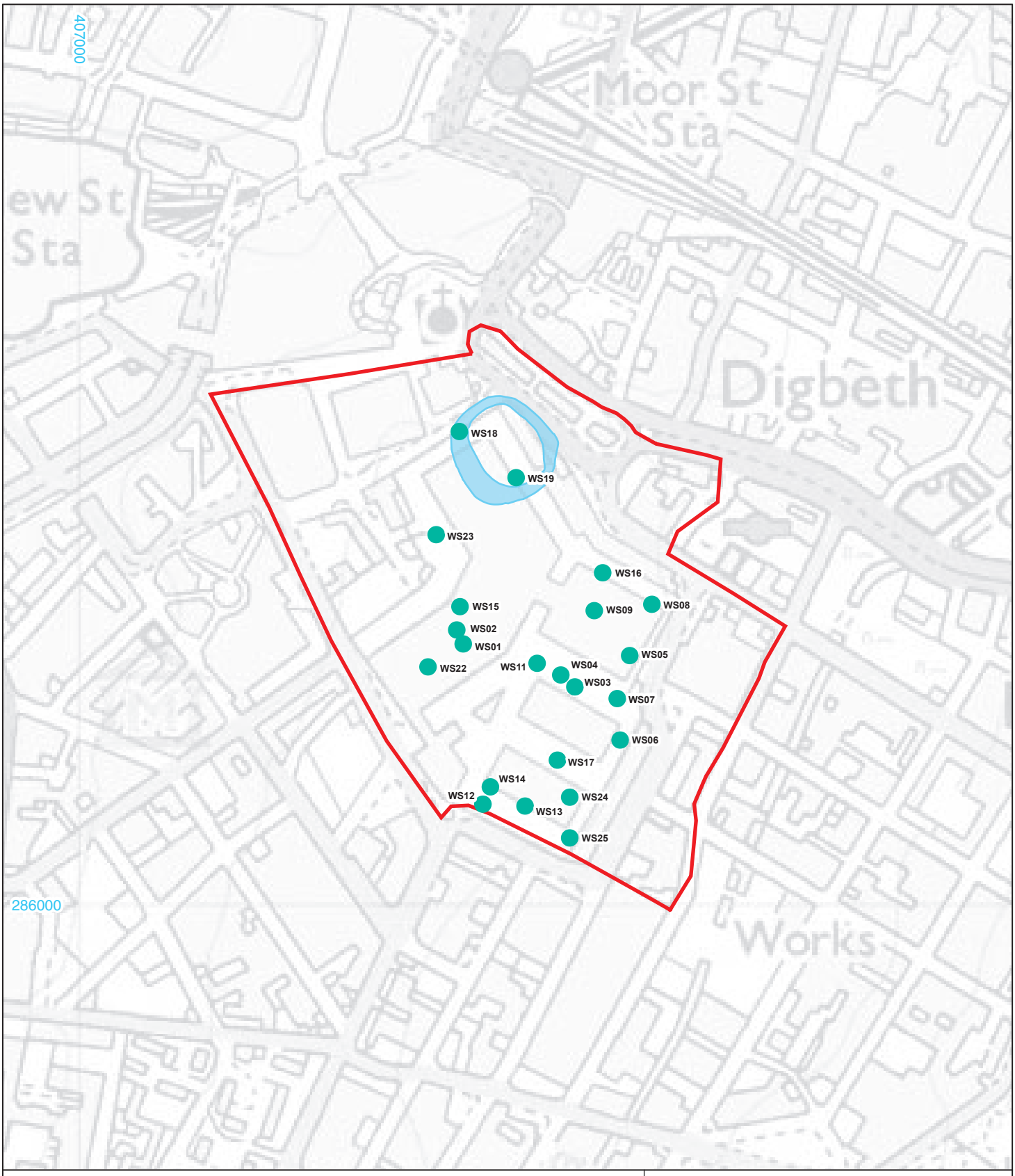
PROJECT TITLE

Birmingham Smithfield Development, Birmingham, West Midlands

FIGURE TITLE

Site location plan

DRAWN BY	**EE**	*PROJECT NO.*	**MK0069**	*FIGURE NO.*
CHECKED BY	**DJB**	*DATE*	**24/06/2019**	**1**
APPROVED BY	**MH**	*SCALE@A4*	**1:25,000**	



Site boundary

Boreholes

Medieval moat

N

0 1:5,000 250m

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Andover 01264 347630
Cirencester 01285 771022
Exeter 01392 573970
Milton Keynes 01908 564660
Suffolk 01449 900120
w www.cotswoldarchaeology.co.uk
e enquiries@cotswoldarchaeology.co.uk

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FIGURE TITLE

Site plan showing test pit and borehole locations

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General view of site looking south-east

Cotswold Archaeology

Andover 01264 347630
Cirencester 01285 771022
Exeter 01392 573970
Milton Keynes 01908 564660
Suffolk 01449 900120
w www.cotswoldarchaeology.co.uk
e enquiries@cotswoldarchaeology.co.uk

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FIGURE TITLE

Photograph: general view of site looking south-east

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APPROVED BY	**MH**	*SCALE@A4*	**NA**	

General view of borehole WS02, looking north

General view of borehole WS02, looking south

Cotswold Archaeology

Andover 01264 347630
Cirencester 01285 771022
Exeter 01392 573970
Milton Keynes 01908 564660
Suffolk 01449 900120
w www.cotswoldarchaeology.co.uk
e enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

Birmingham Smithfield Development, Birmingham, West Midlands

FIGURE TITLE

Photographs of Borehole WS02

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APPROVED BY	**MH**	*SCALE@A4*	**NA**	

Borehole WS11 Sample 2-3m (0.5m divisioned scale)

Cotswold Archaeology

Andover 01264 347630
Cirencester 01285 771022
Exeter 01392 573970
Milton Keynes 01908 564660
Suffolk 01449 900120
w www.cotswoldarchaeology.co.uk
e enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

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FIGURE TITLE

Borehole WS11 Sample, 2-3m

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CHECKED BY	**AO**	*DATE*	**31/07/2019**	**5**
APPROVED BY	**MH**	*SCALE@A4*	**NA**	

Cotswold Archaeology

Andover Office

Stanley House
Walworth Road
Andover
Hampshire
SP10 5LH

t: 01264 347630

Cirencester Office

Building 11
Kemble Enterprise Park
Cirencester
Gloucestershire
GL7 6BQ

t: 01285 771022

Exeter Office

Unit 1, Clyst Units
Cofton Road
Marsh Barton
Exeter
EX2 8QW

t: 01392 573970

Milton Keynes Office

Unit 8 - The IO Centre
Fingle Drive, Stonebridge
Milton Keynes
Buckinghamshire
MK13 0AT

t: 01908 564660

Suffolk Office

Unit 5, Plot 11, Maitland Road
Lion Barn Industrial Estate
Needham Market
Suffolk
IP6 8NZ

t: 01449 900120

e: enquiries@cotswoldarchaeology.co.uk