

Joule Consulting Engineers Limited

Talbot Mill, Manchester

Geo-environmental Site Assessment

11264

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RSK GENERAL NOTES

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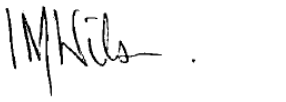
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EXECUTIVE SUMMARY

Site description and proposed development	The site is situated off Ellesmere Street to the south of Manchester city centre. It is currently occupied by a complex of former mill buildings, originally constructed around 1855. The proposed development of the site comprises the residential refurbishment of the mill buildings and demolition of courtyard buildings to create a new external works landscape for the residents with the construction of a new ten storey residential building in the north of the site.
Purpose of assessment	The purpose of the assessment is to further assess potentially complete contaminant linkages identified in the preliminary risk assessment, from which appropriate measures can be defined to allow the safe redevelopment for residential end-use. The assessment will also support a planning application for residential redevelopment of the site and designed to provide information on the underlying ground conditions to enable an assessment of the engineering properties of soils beneath and adjacent to building foundations and to investigate the depth and engineering properties of the sandstone bedrock.
Existing report	A geo-environmental preliminary risk assessment (PRA) was completed by Delta-Simons in January 2017. The object of the report was to identify likely environmental and geotechnical constraints to the proposed development associated with soil and groundwater conditions. The PRA noted several potential sources of contamination: • potential site-wide made ground from previous development • hydrocarbons and asbestos relating to an above ground supply tank, boiler room and garage • contaminated soils, groundwater and hazardous ground gases from historical uses of site. The report recommended a phase of intrusive investigations be undertaken to assess the potential subsurface contamination present at the site.
Conceptual model	RSK used the information provided in the Delta-Simons PRA to develop several potentially complete contaminant linkages: • contaminant linkage (1): risks to future site users from direct contact pathways with potentially contaminated soils on site • contaminant linkage (2): risk to future site users and buildings in the event of gas build-up from on and off-site sources (methane and carbon dioxide) • contaminant linkage (3): risk to groundwater in underlying Secondary A aquifer with subsequent downward migration to the principal aquifer by leaching of contaminants from on-site sources and vertical migration of contaminants • contaminant linkage (4): risk to surface water course via surface run-off and/or lateral migration of contaminated water • contaminant linkage (5): risk to building infrastructure from chemical attack via sulphate impacted soil and groundwater.

SITE ASSESSMENT	
Site investigation	RSK carried out intrusive investigation work in two phases: phase 1 took place between 14 and 18 May 2018 with subsequent groundwater and gas monitoring in June, and phase 2 took place between 26 and 30 November. The phase 1 intrusive investigation consisted of four boreholes to bedrock and at least 9.0m in to bedrock, two machine excavated trial pits to target historic features, and 17 hand dug trial pits inside and outside the existing mill buildings to inspect current foundations. Additionally, chemical and geotechnical laboratory analysis, in-situ testing, and subsequent groundwater and gas monitoring were collected from all deep boreholes. The phase 2 intrusive investigation consisted of seven hand dug trail pits inside the existing mill buildings to inspect current foundations with subsequent chemical analysis. Following the findings of phase 1, water testing of the adjacent canal arm (upstream and downstream) was carried out.
Refined conceptual site model	The laboratory data were compared to generic assessment criteria to evaluate whether the pollutant linkages in the conceptual model require further consideration or mitigation measures. The linkages found to be complete and that may require mitigation measures are: • Linkage 1 - Direct contact via dermal contact, ingestion and inhalation of dust and asbestos fibres by future site residents in landscaped areas by shallow soil impact due to historic site activities and/or made ground and demolition material • Linkage 3 - leaching of contaminants in shallow soil due to historic site activities to groundwater • Linkage 6 - Contaminants associated with historic site uses permeating potable water supply pipes.
CONCLUSIONS AND RECOMMENDATIONS	
Environmental assessment	To mitigate direct contact linkages to future site residents it is recommended that either a cover layer of clean material is used within landscaped areas or the made ground at JBH04 and JTP25 is excavated to remove the source. Ground gas concentrations at the site were generally low and the resulting gas assessment gave the site a classification of Green. The concentrations of PAH in made ground and in a sample of groundwater taken from JBH03, which indicates a slight exceedance of benzo(a)pyrene indicate that leaching to groundwater could be a relevant pollutant linkage.
Geotechnical assessment	The investigation findings confirm that the existing mill buildings are supported off sandstone/masonry pad and strip footings founded within the sand/gravel of the Glaciofluvial deposits and locally sandstone, i.e. JTP11. Given the presence of competent sandstone at estimated depths of 1.90m to 2.70m bgl, locally 3.50m+ at JTP31A, it is considered that spread footings would be suitable for supporting the new building. The depth of such foundations may vary considerably where former foundations/sub-structures are encountered and the new foundations need to be extended beneath these into the underlying competent sandstone strata, the depth to which is also likely to vary across the building. Deep excavations will require support and

	may require dewatering. Alternatively, pile foundations taken to the underlying competent sandstone would provide a suitable alternative. The recommended sub-grade soil CBR value for preliminary road pavement design is just less than 2% for the existing made ground. The available chemical data indicates an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-2 with a Design Sulphate Class of DS-2.
Recommendations including issues for further assessment	To mitigate direct contact linkages to future site residents it is recommended that either a cover layer of clean material is used within landscaped areas or the made ground at JBH04 and JTP25 is excavated to remove the source. The linkage of permeation of plastic utilities was found to be potentially complete, with numerous exceedances of the GAC for shallow soil. It is recommended that barrier pipes are used and a targeted investigation is carried out once the route of the planned water supply is known to potentially mitigate against the use of barrier pipes. Ground gas assessment resulted in a classification of green, indicating that gas protection measures are not required.
The information given in this summary is necessarily incomplete and is provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.	

1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned by Joule Consulting Engineers Limited ('The Engineer') on behalf of Capital and Centric (Adored) ('the Client') to carry out a geo-environmental assessment of the site known as Talbot Mill located in Manchester city centre. Capital and Centric (Adored) is the overall client but for the duration of the investigation Joule Consulting Engineers Limited dealt with the day-to-day queries.

It is understood the proposed end use of the development is residential.

This report is subject to the RSK service constraints given in Appendix A.

A summary of legislation and policy relating to contaminated land is given in Appendix B.

1.1 Background

The proposed development is subject to planning permission 117595/FO/2017 which was granted on 22 March 2018. Within the planning application, Condition 6 refers specifically to undertaking further investigation should a preliminary risk assessment (PRA) identify potential sources and impacts of ground contamination, groundwater contamination and/or ground gas. The condition specifically states:

> *'In the event of the Preliminary Risk Assessment identifying risks which in the written opinion of the Local Planning Authority require further investigation, the development shall not commence until a scheme for the investigation of the site and the identification of remediation measures (the Site Investigation Proposal) has been submitted to and approved in writing by the City Council as local planning authority.*
>
> *The measures for investigating the site identified in the Site Investigation Proposal shall be carried out, before the development commences and a report prepared outlining what measures, if any, are required to remediate the land (the Site Investigation Report and/or Remediation Strategy) which shall be submitted to and approved in writing by the City Council as local planning authority.'*

1.2 Objective

The purpose of this assessment is to further assess potentially complete contaminant linkages identified in the preliminary risk assessment, from which appropriate measures can be defined to allow the safe redevelopment for residential end-use. Additionally, the work will provide an assessment of the engineering properties of soils beneath and adjacent to the existing building foundations to investigate the depth and engineering properties of the sandstone bedrock for the proposed site development.

1.3 Scope

The scope and layout of this investigation has been designed in line with the recommendations of BS5930: 2015 Code of practice for ground investigations, which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards, CLR11

(Environment Agency, 2004a), BS 10175: 2011 (BSI, 2011), and guidance on land contamination reports issued by the Environment Agency (2010a).

The project was carried out in line with the initial brief as set out in the Joule Consulting document titled 'Talbot Mill – Site Investigation, Specification for Site Investigation'. The scope of work was agreed in RSK's proposal (ref. 11264-TL01 (rev1), dated 24 January 2018) and included:

- borehole drilling – four boreholes to bedrock and at least 9.0m into bedrock
- trial pitting – two machine excavated trial pits
- hand pitting – 19 hand dug puts (1.5m to 2.0m deep)
- in-situ and ex-situ testing
- groundwater and ground gas monitoring
- reporting.

Due to access constraints within areas of the mill buildings, Joule Consulting requested the intrusive investigation be carried out in two phases. Phase 1 comprised the borehole drilling, two machine excavated trial pits, six external hand dug trial pits and ten internal hand dug trial pits within the accessible areas of the mill buildings. Phase 2, undertaken approximately seven months later, comprised the excavation of three hand dug trial pits in previously inaccessible locations during phase 1, two additional hand dug trial pits added later by Joule, and the re—dig of two previously excavated hand dug trial pits.

Following the first issue of this report, it was recommended upstream and downstream water sampling of the canal be undertaken to further assess a potentially complete contaminant linkage. This water sampling was carried out as part of the phase 2 intrusive investigation works.

1.4 Preliminary geotechnical category

Based on the information provided by the Engineer and knowledge of the prevailing ground conditions, a Geotechnical Category 2 has been assumed for the purposes of this report.

1.5 Existing reports

The following report detailing previous work at the site was made available to RSK:

- Delta-Simons Environmental Consultants Limited. Geo-environmental Preliminary Risk Assessment: Talbot Mill, Ellesmere Street, Manchester. Presented to Capital and Centric Ltd. Issued January 2017. Reference 16-1144.01.

1.6 Limitations

The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have

not been disclosed by the investigation and therefore could not be considered. It should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows may vary from those reported due to seasonal, or other, effects.

2 THE SITE

2.1 Site location and description

The site is situated off Ellesmere Street to the south of Manchester city centre. It is currently occupied by a complex of former mill buildings, originally constructed around 1855. The former buildings, referred to as Mill 1 and Mill 2, are situated within a local conservation area. The buildings are five storeys high and typically comprise load bearing masonry external walls with 'Jack Arch' floors and roofs, although Mill 1 has timber floors at ground, first and third floors. The floors are supported on cast iron columns. There are various outbuildings on site, notably the 'Timekeepers Cottage', which is proposed to be rebuilt as part of the development.

The mills are currently used by several businesses including textile works, storage and warehousing. A construction firm, developing a site across the road from Talbot Mill, used the third floor as office space during phase 1 of the intrusive works. During phase 2 of the investigation, the mill buildings had been vacated and were being stripped of any cabling and furniture by a building contractor.

The external courtyard which is partly cobbled and partly covered in concrete is used as a car park by users of the mill buildings.

During the initial site walkover carried out by RSK prior to site works, the northwest corner of the site was occupied by several drums, batteries, above ground storage tanks and mechanical excavators within a gated compound. This equipment was removed prior to commencement of the investigation works.

The site access is via an archway off Ellesmere Street, which is to the south of the site. The site is bordered by Burton Place to the east, Worsley Street and Timber Wharf to the north and an inlet of the Bridgewater Canal to the west.

An indicative postcode for the site is M15 4JY and National Grid reference is 382704 397296. A site location plan is shown on Figure 1.

2.2 Proposed development

The proposed development of the site comprises the residential refurbishment of the mill buildings and demolition of courtyard buildings to create a new external works landscape for the residents. Mill 1 is to be extensively rebuilt to the rear with a new steel frame and an additional storey. Mill 2 is to have its roof removed and the building increased by two storeys. Access will be maintained through the existing archway. There is no car parking planned within the scheme. To the north, parallel to Worsley Street a new ten storey framed building is to be constructed.

The proposed development layout is depicted on the client drawing produced by shedkm referenced TM SKM (00)021 d, dated 27th June 2018, which is included in the figures section.

3 EXISITNG PRELIMINARY RISK ASSESSMENT

3.1 Review of existing PRA report

The following section provides a review of a PRA that was issued by Delta-Simons in January 2017.

The objection of the Delta-Simons report was to identify likely environmental and geotechnical constraints associated with soil and groundwater conditions that may affect the proposed development of the site.

3.1.1 Environmental information

3.1.1.1 Geology

The 1:50,000 British Geological Survey (BGS) Geological Map for the Site (Sheet 85, Manchester) indicates that much of the Site is not underlain by drift deposits apart from the southern boundary of the site which is shown to be underlain by glaciofluvial sheet deposits of Devensian age, comprising sand and gravel. The underlying bedrock is the Chester Pebble Beds Formation (sandstone) of Triassic age. Given the current development, it is likely to be Made Ground overlying the Glaciofluvial Sheet Deposits at the site.

> **RSK Comment:** With reference to the BGS the underlying bedrock is named the 'Chester Formation'.

3.1.1.2 Hydrogeology

The Environment Agency (EA) classifies the superficial glaciofluvial sheet deposits at the southern boundary of site as a Secondary A Aquifer, whilst the Chester Pebble Beds Formation is classified as a principal aquifer. The EA data also indicates that the site is not in a designated groundwater Source Protection Zone. The Envirocheck® Report indicates there are no licensed groundwater abstraction records from groundwater located within 1 km of the site.

3.1.1.3 Hydrology

The nearest surface water feature is a basin connected to the Bridgewater Canal, adjacent to the west of the Site. The Bridgewater Canal is located approximately 40m north of the site.

3.1.1.4 Coal Authority

A Coal Mining Report obtained as part of the PRA indicates that the site is not within an area, which could be affected by past, present or future underground or opencast mining. There are no known mine entries on-site or within 20m of the site boundary.

3.1.1.5 *Radon*

The site is located within a low probability radon area, as less than 1% of homes are above the action level. Radon protective measures are not required.

3.1.1.6 *Site history*

The earliest reviewed map of 1848 indicates the site to be undeveloped. By 1891 the site is occupied by Talbot Mills (cotton and braid). Most of the area is covered by buildings with a chimney and tank located in the north-east. The building layout has changed slightly by 1950 with several buildings extended. A warehouse is shown encroaching to the north by 1999, but no longer shown on the 2006 map. By 2016 the site is recorded as a works, the layout of the site has changed very little since it was first developed prior to 1891.

3.1.1.7 *Previous reports*

The Delta Simons PRA report referred to and reviewed a ground investigation report at Talbot Mill' Peter Cowshill Limited, issued in March 2004 was reviewed by Delta-Simons. The ground investigation comprised the excavation of six machine dug trial pits, to a maximum depth of 3.0m below ground level (bgl). Made Ground was encountered in all locations, to a maximum depth of 2.0m bgl. Sandstone bedrock was encountered between 0.6m and 2.0m (bgl). Chemical analysis results for soil samples tested have been compared to GAC for residential end use without home grown produce. Elevated concentrations of chromium and lead were identified.

3.1.2 Initial conceptual site model

The following sections lists the findings of the preliminary Conceptual site model (CSM) presented in the Delta-Simons PRA. Where appropriate, RSK have commented on the adequacy of the CSM.

3.1.2.1 *Potential sources of contamination*

Potential sources of contamination identified in the Delta-Simons PRA included:

- potential made ground deposits site-wide from previous development of the site
- hydrocarbons and asbestos related to boiler room, engine room, storage of drums, AST in the northwest corner of the site and the existing garage
- contaminated soils, groundwater and hazardous ground gases from historical uses of the site as cotton mill, garage, varnishing works, sheet metal works and linen works.

RSK comment – Delta-Simons do not consider the historic off-site land uses to be a potential source however, given the heavy industrial nature of the immediate surrounding buildings, RSK consider the nearby dye-works, saw mill, garages, engineering works and in-filled land to be a potential source of hydrocarbons, metals, VOCs, PAHs and hazardous ground gases.

3.1.2.2 *Potential receptors*

Potential receptors identified in the Delta-Simons PRA included:

- construction workers

- neighbouring site users
- future residents
- groundwater in the underlying Secondary A aquifer and Principal Aquifer
- surface waters
- building infrastructure.

RSK comment – RSK considers potential risks to construction workers to be managed through health and safety procedures, including CDM (construction design management) regulations.

3.1.2.3 Summary of plausible pathways

Potential contaminant pathways identified in the Delta-Simons PRA included:

- direct contact, ingestion or inhalation of soil bound contaminants / dust / asbestos fibres
- inhalation of vapours associated with contamination
- migration of ground gas into on-site buildings causing asphyxiation or risk of explosion
- leaching of contamination into groundwater followed by migration of groundwater to the wider groundwater environment or surface waters.

RSK comment – RSK considers the contaminant pathways proposed by Delta-Simons as all being viable pathways but would add sulphate impacted soil and groundwater resulting in chemical attack on buried concrete and risks to water supply pipes via penetration.

3.1.2.4 Potentially complete contaminant linkages

To allow specific assessment of potentially complete individual contaminant linkages at the site RSK has used the information provided in the Delta-Simons PRA report to develop several potentially complete contaminant linkages. The risk classification has been undertaken in accordance with CIRIA C552. There is a summary of this in Appendix C.

- contaminant linkage (1): risks to future site users from direct contact pathways with potentially contaminated soils on site
- contaminant linkage (2): risk to future site users and on and off-site buildings in the event of gas build-up from on and off-site sources (methane and carbon dioxide):
- contaminant linkage (3): risk to groundwater in underlying Secondary A aquifer with subsequent downward migration to the Principal Aquifer by leaching of contaminants from on-site sources and vertical migration of contaminants
- contaminant linkage (4): risk to surface water course via surface run-off and/or lateral migration of contaminated water:
- contaminant linkage (5): risk to building infrastructure from chemical attack via sulphate impacted soil and groundwater.

- contaminant linkage (6): risk to potable water supply pipes from permeation of contaminants in soil and groundwater.

3.1.3 Geotechnical constraints

The Delta-Simons PRA report stated that the existing foundations are likely to be founded on shallow weathered sandstone bedrock. They go on to note that the viability of spread foundations is dependant on the depth to competent strata. If the depth is too great, alternative foundations such as piling may be considered.

In terms of geotechnical risks, Delta-Simons identified a potential risk from shallow groundwater and flooding, along with a risk of encountering hard strata or obstructions at depth due to previous development of the site.

3.1.4 Recommendations

The report recommended a phase of intrusive investigations be undertaken to assess the potential subsurface contamination present at the site and to provide geotechnical information of the ground conditions for preliminary foundation design.

4 SITE INVESTIGATION METHODOLOGY

RSK carried out intrusive investigation work in two phases. Phase 1 was undertaken between 14 and 18 May 2018 with subsequent groundwater and gas monitoring site visits in June. Phase 2 was undertaken between 26 and 30 November 2018. The ground investigation has been carried out using intrusive ground investigation techniques in general accordance with the recommendations of BS5930: 2015 Code of practice for ground investigations, which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. The exploratory holes were logged by an engineer in general accordance with the recommendations of BS 5930:2015 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1). Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

4.1 Sampling strategy and methodology

To assess the significance of the potentially complete pollutant linkages identified in the Delta Simons PRA report and listed in section 3.1.2.4 of this report, the site investigation was undertaken inside the current mill buildings and within the external courtyard to obtain both geotechnical and environmental data.

The techniques adopted for the investigation have been chosen considering the anticipated ground conditions, existing land use and the proposed development. Four boreholes were drilled in the external courtyard using dynamic sampling with rotary follow-on technique using a Commachio drill rig; 16 trial pits were excavated by hand inside the mill buildings along external walls and central supporting beams, and ten trial pits were excavated using a mixture of hand tools and a machine (5t tracked excavator). Combined gas and ground water monitoring wells were installed in all exploratory boreholes.

4.1.1 Health, safety and environment considerations

All subcontractors were inducted on to the site-specific RSK health and safety plan before site works began. Prior to the investigation, all exploratory hole locations were cleared via a full geophysical (GPR) survey. A full review of service plans was undertaken, and as a final check, each trial pit and borehole was scanned with a cable avoidance tool (CAT). All boreholes commenced with a hand dug pit to 1.2m bgl.

An RSK permit to dig was completed for each investigation location.

4.1.2 Investigation locations

The investigation and the soil descriptions were carried out in general accordance with ‘BS 5930:1999. Code of Practice for Site Investigations’ (BSI, 1999). An exploratory hole location plan is presented on Figure 2 and the exploratory hole records are presented in Appendix D.

The exploratory hole locations and naming system were devised by Joule Consulting. RSK located the exploratory holes with reference to physical features present on the site

at the time of investigation in line with the 'Site Investigation Site Plan' (referenced 251-05-SI40-A).

Table 1 below provides a summary and rationale for the exploratory hole locations.

Table 1: Exploratory hole and monitoring well location rationale

Investigation Phase	Investigation Type	Exploratory hole number	Response zone	Rationale
Phase 1 (May 2018)	Rotary boreholes	JBH01	Deep install to target groundwater within sandstone bedrock	Drilling through made ground and superficial deposits to allow logging and sampling of soils with 9.0m of rotary coring through sandstone bedrock. Boreholes located within footprint of proposed ten storey apartment-block to assess underlying bedrock quality for foundation design.
		JBH02		
		JBH03		Drilling through made ground and superficial deposits to allow logging and sampling of soils with 9.0m of rotary coring through sandstone bedrock. Boreholes located within external courtyard adjacent to existing mill buildings to assess depth of underlying bedrock and groundwater depth.
		JBH04		
	Hand excavated trial pits	JTP01 – JTP07	N/A	Locations within Mill 1, hand excavated to approximately 1.5m-2.0m to expose the form / depth and bearing of existing foundations.
		JTP10, JTP10A, JTP12		Locations within Mill 2, hand excavated to approximately 1.5m-2.0m to expose the form / depth and bearing of existing foundations.
	Mixture of machine and hand excavated trial pits	JTP20 - JTP25		External pits located in the courtyard and within the entrance arch via a mixture of machine and hand excavation to a depth of approximately 1.5m-2m to expose the form/depth and bearing of existing foundations.
		JTP30		Machine excavated to expose the canal arm wall (approx. 2m-2.5m deep) and to establish the location and condition of a high-level culvert in this area.
		JTP31 and JTP31A		Machine excavated into the base of the chimney to expose the mass and bearing of the chimney base.
Phase 2 (November 2018)	Hand excavated trial pits	JTP11, JTP13, JTP14	N/A	Locations within Mill 2, hand excavated pit to approximately 1.5m-2.0m to expose the form / depth and bearing of existing foundations.

Investigation Phase	Investigation Type	Exploratory hole number	Response zone	Rationale
		JTP32 and JTP33		Locations within the north of Mill 2, hand excavated pit to approximately 1.5m-2.0m in a raised area to expose the form / depth and bearing of existing foundations.
		Re-dig of JTP10A		Location within Mill 2, hand excavated pit to approximately 1.5m-2.0m to confirm the form / depth and bearing of existing foundations.
		Re-dig of JTP30		Hand excavated pit in external area of site to the north of Mill 2 to confirm the formation of the canal arm wall

4.1.3 Soil sampling, in-situ testing and laboratory analysis

The sampling and in-situ testing strategy was designed to characterise the made ground and natural soils and rock beneath the site, and to provide information on the mechanical characteristics of the underlying soils for geotechnical design purposes.

The rotary drilling was carried out with a Commachio hydraulic drill rig. The drilling consisted of dynamic sampling followed by rotary coring. Water was used as the drilling flush medium. A clear Perspex liner was incorporated within the inner barrel to maximise the quality of core recovery. The cores were retained in rigid core liners and placed into core boxes.

Soils collected for laboratory analysis were collected in a variety of containers appropriate to the anticipated testing suite required. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

Environmental samples and geotechnical samples (including SPTs, bulk bags and disturbed samples) were taken and are recorded together with their depths on the exploratory hole records in Appendix D. The environmental samples were transported to the laboratory in chilled cool boxes. Laboratory chain of custody forms can be provided if required. Samples of made ground, superficial deposits and rock cores were tested for a range of determinants for environmental and geotechnical purposes.

Soil samples were analysed for a selection of the following:

- pH, metals, sulphate and cyanide
- total petroleum hydrocarbon using criteria working group (TPHCWG) including benzene, toluene, ethylbenzene and xylene (BTEX)
- speciated polycyclic aromatic hydrocarbon (PAH)
- total organic content.

Soils sampled from made ground deposits only were also analysed for the following:

- asbestos analysis followed by asbestos quantification in those samples where asbestos was identified.

- leachable metals.

Standard penetration tests (SPTs) were carried out within the made ground and the unconsolidated natural strata at regular intervals of approximately 1m intervals until bedrock was encountered. The tests were undertaken in accordance with BS EN ISO 22476-3:2005 using a hammer, which had been calibrated for efficiency. Test results are given on the borehole records presented in Appendix D.

Geotechnical tests undertaken on samples obtained from the intrusive investigation are listed below, the main purpose of which was to determine the physical properties of the underlying soils and rocks. The testing was undertaken in accordance with BS 1377:1990 Method of Tests for Soils for Civil Engineering Purposes or, where superseded, by the relevant part of BS EN ISO 17892:2014 Geotechnical investigation and testing - Laboratory Testing of Soil. The tests were carried out within RSK's UKAS accredited laboratory.

- moisture content
- liquid/plastic limits
- particle size distribution
- california bearing ratio
- sulphate, chloride and PH suite.

Rock core samples were analysed for the following:

- point load index
- unconfined compressive strength
- sulphate, chloride and PH suite.

Soil analysis results are presented in Appendix E and geotechnical laboratory analysis results are presented in Appendix F.

4.1.4 Groundwater monitoring and levelling

Depths to groundwater were recorded using an electronic interface probe during subsequent monitoring visits. The groundwater monitoring data are given in Appendix H.

4.1.5 Groundwater developing, sampling and analysis

After the installation of groundwater monitoring wells, the installations were developed at least one week before sampling.

Groundwater samples were retrieved using a United States Environment Protection Agency (USEPA) approved low-flow purging and sampling methodology. The low-flow method relies on moving groundwater through the well screen at approximately the same rate as it flows through the geological formation. This results in a significant reduction in the volume of water extracted before sampling and significantly reduces the amount of disturbance of the water in the monitoring well during purging and sampling. Drawdown levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) are monitored during low-flow purging and sampling, with stabilisation indicating that purging is complete, and sampling can begin. As the flow rate used for purging, in most cases, is the same or only

slightly higher than the flow rate used for sampling, and because purging and sampling are conducted as one continuous operation in the field, the process is referred to as low-flow purging and sampling.

In-situ water quality measurements undertaken during the low-flow sampling process are provided in Appendix I.

The groundwater samples were collected in containers appropriate to the anticipated testing suite required. The containers were filled to capacity and placed in a cool box to minimise volatilisation. Samples were transported directly to the testing laboratory under chain of custody documentation.

Groundwater samples were analysed for the following:

- metals and pH
- hardness, chloride, sulphate and DOC suite
- TPHCWG including BTEX
- PAH.

The results certificates of groundwater analysis are presented in Appendix G.

4.1.6 Surface water sampling

Following the phase 1 investigation it was recommended that samples of the Bridgewater Canal are taken and chemically assessed. Two samples of surface water; an upstream sample taken from the arm of the canal immediately adjacent to the site and a downstream sample taken from the Bridgewater Canal, were collected using a long-arm bailer. The surface water samples were collected in containers appropriate to the anticipated testing suite required. The containers were filled to capacity and placed in a cool box to minimise volatilisation. Samples were transported directly to the testing laboratory under chain of custody documentation.

Surface water samples were analysed for the following:

- metals and pH
- hardness, chloride, sulphate and DOC
- biological oxygen demand
- total suspended solids
- TPH banded testing
- PAH.

The results certificates of surface water analysis are presented in Appendix Q.

4.1.7 Ground gas monitoring

Six monitoring rounds have been undertaken over a period of three months, to provide data to support the conceptual model. Monitoring included periods of falling atmospheric pressures and after/during rainfall.

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO_2), methane (CH_4) and oxygen (O_2) in percentage by volume, while hydrogen sulphide

(H_2S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round, all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

The atmospheric pressure before and during monitoring, together with the weather conditions, was recorded.

The ground gas monitoring visits were undertaken during a variety of pressure events. Table 2 includes a summary of the atmospheric conditions during the monitoring visit and the three days preceding the visit. The data for the preceding three days has been taken from the weatherunderground website (www.weatherunderground.com) for the closest identified weather station, located in Hulme, Manchester (weather station reference ISTRETFO2).

Table 2: Atmospheric trends during gas monitoring

Date	Atmospheric pressure (three preceding days)			Atmospheric pressure recorded on gas analyser during ground gas monitoring
	3	2	1	
23/05/2018	1022	1018	1024	1023
29/05/2018	1023	1020	1022	1016
14/06/2018	1016	1019	1019	996
20/06/2018	1013	1017	1022	1009
05/07/2018	1021	1022	1018	1008
16/07/2018	1023	1021	1017	1007

All monitoring results together with the temporal conditions are contained within Appendix H and discussed in Section 6.2.2.

5 GROUND CONDITIONS

The results of the intrusive investigation and subsequent laboratory analysis are detailed below. The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater, in situ testing and details of monitoring well installations are included on the exploratory hole records presented in Appendix D.

5.1 Soil

The exploratory holes reveal the site is generally underlain by a relatively thin layer of granular made ground, generally ranging from 0.3m (JTP02) to 1.6m (JBH01), with locally thicker deposits associated with below ground historic features and structures in the north and west of the site (1.95m in JTP30 and 3.4m in JTP31A). Made ground was found to be underlain by Glaciofluvial deposits, generally comprising gravelly sand to depths of between 0.65m (JTP05) to 5.4m (JBH04). Sandstone bedrock was encountered below the Glaciofluvial deposits at depths of between 0.45m and 5.4m bgl to a maximum (unproven) depth of 16.2m bgl (JBH02).

The ground conditions are summarised in Table 3 and the strata discussed in subsequent subsections.

Table 3: General succession of strata encountered

Strata	Exploratory holes encountered	Depth to base of stratum m bgl	Elevation of base of stratum (m AOD)
Made ground	All exploratory holes	0.3 (JTP02) to 1.6 (JTP21) Locally deep deposits at JTP30 (1.95m) and JTP31A (3.4m) due to historic features	29.01 (JTP20) to 23.81 (JTP31A)
Glaciofluvial deposits	All exploratory holes with the exceptions of JTP20-JTP22, JTP30 and JTP31A	0.65 (JTP05) to 5.4 (JBH04)	25.49 (JTP25) to 22.63 (JBH02)
Weathered Sandstone (Chester Formation)	JBH01 to JBH04, JTP02, JTP07, JTP10A, JTP11, JTP13, JTP24, JTP25, JTP30, JTP31A	2.5 (JBH01) to 5.7 (JBH02)	23.93 (JBH01) to 21.73 (JBH02)
Sandstone (Chester Formation)	JBH01 to JBH04, JTP02, JTP07, JTP11, JTP13, JTP24, JTP25, JTP30, JTP31A	2.5 (JBH01) to 5.7 (JBH02)	23.93 (JBH01) to 21.73 (JBH02)

5.1.1 Surface coverings

A variety of surface coverings were encountered across the site.

Made ground described as greyish brown gravelly sand was encountered from the ground surface in several locations; JBH01, JBH02, JTP30 and JTP31 to depths of around 0.2m bgl.

Cobble setts set with bituminous tar, were encountered at the ground surface to depths of between 0.15m and 0.2m bgl at JBH03, JBH04, JTP20, JTP21, JTP22, JTP23 and JTP24 (all located in the external courtyard and below the entrance archways).

Asphalt tile with woven geotextile and bituminous binding was encountered at the ground surface in JTP01, JTP03, JTP04 (all located in Mill 1) and JTP14 (located in Mill 2).

Wooden floorboards (MDF/PLY) attached to wooden floor joists were encountered from the ground surface in JTP02, JTP06, JTP07 and JTP13. The Wooden floor was suspended above a void measuring approximately 0.25-0.53m thick.

Concrete was encountered from the ground surface in JTP05, JTP25 and JTP31A to depths of between 0.1m and 0.15m bgl.

Yorkstone flags were encountered from the ground surface in JTP10, JTP10A, JTP11, JTP12, JTP32 and JTP33 (all located in Mill 2) measuring 0.08m thick.

5.1.2 Made ground

Made ground was encountered in every exploratory hole location below surface coverings to depths ranging between 0.3m (JTP02) to 1.6m bgl (JTP21). Locally, made ground deposits were found to extend deeper in areas of historic features. In JTP30, located in the northwest of the site (the location of a suspected culvert, made ground was encountered to a depth of 1.95m bgl. In JTP31A, located in the north of the site and targeting a historic chimney, made ground was encountered to a depth of 3.4m bgl.

Shallow made ground deposits were encountered within the existing mill buildings. In Mill 1 the depth to the base of the made ground ranged between 0.3m and 0.75m bgl (25.42m AOD and 25.86m AOD). In Mill 2, the depth to made ground ranged between 0.53m and 0.7m bgl (25.44m AOD to 25.65m AOD).

A multicoloured crystallised gravel with a hard outer shell of yellow was encountered in JTP14 at depths of 0.19m to 0.27m bgl. The unknown material had a sweet perfumery odour. RSK is unsure of the provenance and composition of this material but assume it is a by-product of a previous industrial process present on site.

Made ground deposits generally comprised blackish to greyish brown gravelly, slightly clayey fine to coarse sand with brick, concrete, glass, ash, clinker, bituminous fragments and ceramic pipe fragments.

A dry clay pipe was encountered within made ground deposits in JTP20 and JTP21 (running along the western site boundary through the main archway into the site) at a depth of 0.4m bgl. The pipe appeared to be dipping away from the site (i.e. taking water out of the site to Ellesmere Road).

An SPT at 1.2m bgl was undertaken within 0.1m of the base of the made ground in JBH01 and JBH02. SPT ‘N’-values of 46 and >50 (refusal) were calculated. The made ground was noted to contain angular gravel and cobbles of brick and mudstone with the next

barrel run terminating due to a cobble. It is likely that the high SPT value and refusal are due to cobble obstructions within the made ground.

A summary of the in-situ test and laboratory results in this stratum is presented in Table 4 below.

Table 4: Summary of in-situ and laboratory test results for the made ground

Soil parameters	Range	Reference
Water soluble sulphate (WSO_4) (mg/l)	<10 - 1340	Appendices E and F
Chloride (mg/l)	38 - 123	
pH value	6.87 – 7.99	

5.1.3 Superficial deposits (glaciofluvial)

Glaciofluvial deposits were encountered beneath made ground deposits in all exploratory holes with the exceptions of JTP11, JTP20 – JTP22, JTP30 and JTP31A (where the holes were terminated either within made ground deposits or made ground was underlain directly by sandstone bedrock). The base of the glaciofluvial stratum was measured to be between 0.65m (JTP05) and 5.4m bgl (JBH04). In terms of elevation data, the base of the glaciofluvial deposits was found to be between 22.63m AOD in JBH02 (north of the site) and 28.93m AOD (in south of the site).

Generally, the glaciofluvial deposits were described as yellowish brown and reddish brown slightly clayey, slightly gravelly sand with gravel of mudstone and sandstone. However, in JTP06, firm to stiff slightly sandy slightly gravelly clay was encountered below granular glaciofluvial deposits at 0.8m bgl.

SPT tests undertaken in the glaciofluvial deposits resulted in refusals (>50) in most tests. Only two SPT tests resulted in <50 blows; JBH04 resulted in N-values of 15 and 30 indicating medium dense soils. In JBH02 there was poor recovery of the superficial deposits, likely due to the granular nature of the soils.

A summary of the in-situ test and laboratory results in this stratum is presented in Table 5.

Table 5: Summary of in-situ and laboratory test results for the glaciofluvial deposits

Soil parameters	Range		Reference
Moisture content (%)	23[1]		Appendix F
Liquid limit (%)	36[1]		
Plasticity limit (%)	20[1]		
Plasticity index (%)	16[1]		
Plasticity term	Intermediate[1]		
Grading (%)	Gravel	2 to 72	
	Sand	25 to 86	
	Silt/clay	3 to 12	
SPT ‘N’ values	15 to >50		Appendix D; Fig 3

Soil parameters	Range	Reference
Density term	Medium Dense to Very Dense	Appendix D
Laboratory CBR Test (%)	16 to 27 (100)	Appendix F
Water soluble sulphate (WSO_4) (mg/l)	<10 to 247	Appendices E and F
Chloride (mg/l)	<7 to 104	Appendices E and F
pH value	7.13 to 8.50	Appendices E and F
Notes: [1]Testing from localised clay layer in JTP06		

5.1.4 Weathered sandstone

Weathered sandstone, described as orangish red gravelly coarse sand with gravel of weak coarse sandstone, was encountered below superficial deposits is JBH01, JBH04, JTP02, JTP07, JTP10A, JTP24, JTP25 and JTP31 at depths of between 1.0m and 3.0m bgl. In JTP11, JTP30 and JTP31A weathered sandstone was encountered directly below made ground deposits at depths of 1.95m and 3.4m bgl respectively. In JBH02 there was poor recovery noted in the core liner from 1.2 to 4.2m bgl however, the engineer noted the presence of weak sandstone gravels and cobbles, assumed to be weathered sandstone.

In JBH01 and JBH04 where sandstone bedrock was encountered beneath the weathered zone, the weathered sandstone was found to measure between 0.7m and 2.4m thick. Trial pits JTP12 and JTP13 terminated before reaching the base of the foundation due to difficult digging with hand dug tools. JTP02, JTP10, JTP10A and JTP11 found the base of the foundation and terminated due to difficult digging with hand tools at the bottom of the foundation level. In trial pits JTP30, JTP31 and JTP31A, the excavations were terminated due to scraping on rock at the base by the excavator, assumed to be the top of the bedrock. The thickness of the weathered zone in these excavations was measured between 0.1m and 1.1m.

A summary of the in-situ test and laboratory results in this stratum is presented in Table 6.

Table 6: Summary of in-situ and laboratory test results for the weathered sandstone

Soil parameters	Range		Reference
Grading (%)	Gravel	5	Appendix F
	Sand	89	
	Silt/clay	6	
SPT ‘N’ values	46 to >50		Appendix D, Fig 4
Unconfined Compressive Strength (MPa) inferred from SPT N value	0.46 to 1.57		Fig 5
Strength term	Dense / Extremely weak to Very Weak		Appendix D
Water soluble sulphate (WSO_4) (mg/l)	<10 to 60		Appendix F
Chloride (mg/l)	<7 - 12		Appendix F

pH value	7.48 to 8.67	Appendix F

5.1.5 Bedrock (Sandstone of Chester Formation)

Sandstone of the Chester Formation was encountered in the boreholes directly beneath either superficial deposits (in JBH03) or beneath weathered sandstone (in JBH01, JBH02 and JBH04). The stratum was encountered at depths ranging between 2.5m bgl (JBH01) and 5.7m bgl (JBH02). In terms of an elevation, the sandstone bedrock was encountered at levels between 23.93m AOD in JBH01 (located in the northwest of the site) and 21.73m AOD in JTP02 (located in the east of the site). From the elevation data, it can be inferred that bedrock is dipping down towards the northeast.

In the rotary cores, the sandstone has been described as very weak to weak thinly bedded reddish brown fine to coarse grained sandstone. Bedding fractures are sub-horizontal and shallowly dipping very closely to closely spaced.

A summary of the in-situ test and laboratory results in this stratum is presented in Table 7.

Table 7: Summary of in-situ and laboratory test results for the sandstone

Soil parameters	Range	Reference
Moisture content (%)	3.8 to 12	Appendix F
Bulk Density (Mg/m^3)	1.97 to 2.11	Appendix F
Unconfined compressive strength (MPa)	3.3 to 11.0	Appendix F
Point Load Strength Is_{50} (MPa)	0.07 (0.01*) to 0.49	Appendix F
Unconfined Compressive Strength (MPa) inferred from Is_{50}	1.15 to 7.58	Appendix F, Fig 5
Strength term	Very weak to Weak	Appendix D
Water soluble sulphate (WSO_4) (mg/l)	<10 to 40	Appendix F
Chloride (mg/l)	<7	Appendix F
pH value	7.51 to 8.15	Appendix F
Notes: *Considered uncharacteristically low possibly due to sample disturbance		

5.1.6 Groundwater

Groundwater was encountered during the investigation as detailed in Table 8 below.

Table 8: Groundwater results during investigation

BH/TP	Stratum	Strike in m b (conditions after 20 minutes))	Strike elevation (m AOD)
JBH01	Sandstone	6.2 (rising to 4.1)	20.23
JBH02	Sandstone	7.2 (rising to 5.7)	20.23
JBH03	Sandstone	5.7 (rising to 3.2)	21.14
JBH04	Sandstone	6.0 (rising to 5.1)	22.95

BH/TP	Stratum	Strike in m b (conditions after 20 minutes))	Strike elevation (m AOD)
JTP30	Weathered sandstone	2.1	23.86

A slight groundwater seepage was encountered within the upper weathered zone of the sandstone bedrock in JTP31A at 3.50m.

The results of the first groundwater monitoring visit are summarised in Table 9 below.

Table 9: Groundwater monitoring data (23 May 2018)

Monitoring well	Depth to product (m bgl)	Depth to water (m bgl)	Depth to water elevation (m AOD)
JBH01	N/D	2.17	24.26
JBH02	ND	3.10	24.33
JBH03	ND	2.57	24.27
JBH04	ND	4.75	24.20

5.1.7 Visual/olfactory evidence of soil and groundwater contamination

Evidence of olfactory or visible contamination on soil or groundwater was not noted during the site investigation.

5.2 Ground gas regime

The results of the ground gas monitoring and testing carried out are given in Appendix H. The minimum and maximum results are recorded in Table 10.

Table 10: Summary of ground gas monitoring results

Borehole	Response zone/strata	Number of monitoring visits	Methane (%)	Carbon dioxide (%)	Oxygen (%)	Flow rate (l/hr)
JBH01	SST	6	<0.1	0.9	19.3	0.1
JBH02	SST	6	<0.1	0.9	20.3	0.1
JBH03	SST	6	<0.1	<0.1	20.7	0.1
JBH04	SST	6	<0.1	1.0	19.4	0.1
Note: *SST - sandstone* *Maximum (minimum for oxygen) steady state gas concentrations and flows are presented in this table.*						

5.3 Investigation of the canal wall (JTP30)

A single trial pit was excavated perpendicular to the wall of the Bridgewater Canal, located on the western site boundary. The aim of this trial pit was to investigate the wall arrangement and a suspected culvert which engineers anticipated to run parallel to the canal. A GPR survey was undertaken in the area thought to be the location of the culvert and a positive signal was picked up on the equipment. During excavation, evidence of a culvert was not observed, however a brick feature and void could be the source of the signal induced by the GPR equipment.

As part of the trial pit excavation process at JTP30, the wall of the canal was inspected. This process was extremely difficult due to the presence of dense vegetation and bricks making up the wall being extremely fragile. As shown on trial pit log JTP30 Face C, made ground was encountered to 0.5m bgl with a layer of concrete flags encountered between 0.2m and 0.3m bgl. The made ground sat on top of a brick wall measuring 5 brick courses or 0.3m deep (base of brick wall at 0.8m bgl). The brick wall in turn was sat directly on sandstone bedrock.

During the investigation of JTP30 the water level in the canal arm was surveyed and measured to be at an elevation of 25.29m AOD. Relating this back to ground level at JTP30, there is a difference between the site level and the water level in the canal of 1.07m. This would put the water level within the canal at a level that is within the weathered sandstone however, there was no water ingress observed at this level during the excavation of the trial pit. A groundwater strike was observed at 2.10m bgl (24.26m AOD) but this is at 1.03m below the canal water level.

5.4 Refinement of the initial conceptual site model

The initial conceptual model presented in the PRA, highlighted the existence of the bedrock at shallow depth beneath the site, classified as a principal aquifer. In this respect, the contaminant linkage between contaminated soils, shallow groundwater and the groundwater in the underlying sandstone was identified as being potentially complete.

Exploratory hole logs report that the site is underlain by a relatively thin layer of granular made ground (to depths of between 0.3m bgl and 1.6m bgl) with locally thicker deposits in areas associated with historic site features, such as buildings and chimneys (to a maximum depth of 3.4m bgl in JTP31A). The made ground is underlain by glaciofluvial deposits, generally described as a gravelly sand, to varying depths of between 0.65mgl (JTP05) to 5.4 m bgl (JBH04). These granular superficial deposits are underlain by sandstone of the Chester Formation, designated as a Principal Aquifer. Localised downward migration of potentially contaminated groundwater and soil leachate to the principal aquifer cannot be ruled out. Therefore, groundwater monitoring wells were installed in the sandstone aquifer at depth to allow groundwater level gauging and groundwater samples to be collected.

In line with current guidance, namely BS8576 (2013), the ground gas generation potential for the site was anticipated to be ‘very low’ based on limited deposits of made ground being present with low degradable organic content. This was confirmed during the site investigation whereby made ground thicknesses at the borehole location were limited to 1.0m to 1.3m in thickness and no evidence of degradable or putrescible materials were identified. Given the ‘very low’ gas generation potential, gas monitoring is not necessarily

required in line with the decision matrix in Figure 6 of BS8576. Due to the observations made on site, the response zones of the monitoring wells were installed within the sandstone to target groundwater, but gas monitoring was undertaken as a precautionary measure. The conceptual model, therefore, does not consider the risk of ground gas a complete linkage, however, the results are discussed in section 6.2.2 for completeness.

The initial conceptual model presented in the PRA, highlighted the existence of a potentially complete contaminant linkage between lateral migration of shallow groundwater from the site, and the adjacent surface water body (arm of the Bridgewater Canal). Canal water sampling has been undertaken to assess this potential linkage and the results are discussed in section 6.2.5 for completeness.

6 QUANTITATIVE RISK ASSESSMENT

In line with CLR11 (EA, 2014), there are two stages of quantitative risk assessment, generic and detailed. The GQRA comprises the comparison of soil, groundwater, soil gas and ground gas results with generic assessment criteria (GAC) that are appropriate to the linkage being assessed. This comparison can be undertaken directly against the laboratory results or following statistical analysis depending upon the sampling procedure that was adopted.

6.1 Linkages for assessment

Section 5.4 presents the refined conceptual model, which identified the linkages that required assessment after the findings of the site investigation had been considered. These linkages together with the method of assessment are presented in Table 11.

Table 11: Linkages for generic quantitative risk assessment

Potentially relevant pollutant linkage	Assessment method
1. direct contact via dermal contact, ingestion and inhalation of dust and asbestos fibres by future site residents in landscaped areas from shallow soil impact due to historic site activities and/or made ground.	Human health GAC in Appendix J for a proposed residential end use without home grown produce since proposed the end use includes a landscaped area in the centre of the site. Qualitative assessment based on the asbestos minerals present, their form, concentration, location and the nature of the proposed development.
2. migration of hazardous gases including methane and carbon dioxide into future residential buildings on site via granular strata and service channels with subsequent inhalation by residents and potential accumulation, creating an explosive atmosphere.	Gas screening values (GSV) have been calculated using maximum methane and carbon dioxide concentrations with maximum flow rates recorded at the site. The GSV have been compared with the generic Traffic Lights, as presented within the NHBC ground gases guide (Boyle and Witherington, 2007) and the CIRIA report C665 referred to previously, owing to the development comprising low-rise housing with suspended floors. In addition, the gas regime is considered within the context of a conceptual model as required by both previously referred to guidance documents and BS8576.
3. leaching of contaminants in shallow soil due to historic site activities to groundwater	Comparison of leachate data to lowest of those recorded in Table 1 of Appendix K for principal and secondary aquifers owing to linkages identified to both a Principal aquifer and a river upon which the GAC for Secondary aquifers are based.
4. lateral and vertical migration on impacted shallow groundwater to the underlying principal aquifer.	Comparison of groundwater data to lowest of those recorded in Appendix K for drinking water.

Potentially relevant pollutant linkage	Assessment method
5. lateral migration of contaminants to the adjacent arm of the Bridgewater Canal.	Comparison of groundwater data and upstream/downstream canal water samples to lowest of those recorded in Appendix K for Secondary aquifers/surface water.
6. contaminants associated with historic site uses permeating potable water supply pipes.	Comparison of shallow soil data to GAC in Appendix L for plastic water supply pipes using UKWIR (2010) guidance.
7. risk to building infrastructure from chemical attack via sulphate impacted soil and groundwater.	Qualitative assessment of sulphate, chloride and pH data in the geotechnical section of the report (section 7).

6.2 Methodology and results

The methodology and results of the GQRA are presented for each relevant pollutant linkage in turn.

6.2.1 Direct contact with impacted soil by future residents

Soil results were compared to the GAC for residential without home grown produce (presented in Appendix J). The results of the screening are presented in Appendix M.

Six shallow soil samples were analysed for some or all the contaminants specified in section 4.1.3. The soil samples were taken from the made ground and shallow superficial deposits located in the external courtyard of the site to the north of the existing mill buildings, as this is likely to be the location of proposed landscaping.

A deep sample of made ground was obtained from the base of the chimney structure in JTP31A at 3.0-3.2m bgl. Exceedances of arsenic and lead were reported in this sample; concentrations of 1130 mg/kg of arsenic (against the GAC of 40 mg/kg) and 746 mg/kg for lead (against the GAC of 310 mg/kg). Levels of chromium and mercury were reported to be above the T1 threshold set but did not exceed the GAC. Soils at the base of the chimney were described as black and likely to contain by-products of the chimney flue which have been deposited over time. The depth of this material is deep enough to not pose a risk to future users; however, this may pose a different risk if classified as a waste, which is discussed in section 8.

Out of five samples analysed for metals, two samples of made ground exceeded the generic acceptance criteria (GAC) of 310 mg/kg for lead. Concentrations of 490 mg/kg and 430 mg/kg were reported in JBH02 (0.0-0.1m bgl) and JTP25 (0.15-0.25m bgl) respectively.

None of the TPH aromatic or aliphatic bands exceeded the specified GAC values and all the samples analysed for BTEX were noted to be below the limit of detections (LOD) of <0.01mg/kg.

Exceedances of several PAH compounds were reported, largely in one sample (out of three analysed) as shown in Table 12.

Table 12: PAH exceedance summary table

PAH Compound	No. of exceedance	GAC (mg/kg)	Location / depth (mbgl) of maximum exceedance	Reported concentration (mg/kg)
Benzo(a)anthracene	1	15	JBH04 / 0.3-0.9mbgl	15.7
Benzo(a)pyrene	1	5.3	JBH04 / 0.3-0.9mbgl	12
Benzo(b)fluoranthene	1	4.1	JBH04 / 0.3-0.9mbgl	14.2
Dibenzo(ah)anthracene	2	0.32	JBH04 / 0.3-0.9mbgl JTP25 / 0.15-0.25mbgl	1.22 0.41

The made ground of JBH04 was reported to contain bituminous macadam and is likely the source of the elevated PAHs.

A total of five samples of made ground have been analysed for the presence of asbestos in soil. No asbestos has been identified in the samples tested. Additionally, visible asbestos was not noted in any of the exploratory holes during the investigation.

Given the presence of made ground across the site and the varied site history it is possible that localised contaminants are present in shallow soils, in areas not covered as part of this investigation. To mitigate direct contact linkages to future site residents it is recommended that either a cover layer of clean material (or hardstanding surface) is used within landscaped areas or the made ground at JBH04 and JTP25 is excavated to break the contact pathway. If a clean cover system is to be adopted, it is advised that cover soils of 450mm thickness comprising a suitable topsoil and subsoil, should be installed. Underneath the cover soils a geotextile membrane (or similar) should be installed, which remains insitu to prevent soils at depth (below 450mm) from mixing with shallower soils that form the cover system.

Although asbestos has not been found to be present in soils at the site, it is likely that asbestos will be found in the mill buildings. During the Phase 2 investigation, an asbestos removal company, employed directly by the Client, was carrying out a survey and removal of asbestos within Mill 1. Access to several areas of the ground floor and upper floors of Mill 1 were restricted due to the presence of temporary, air-tight sheeted rooms. The asbestos removal company was onsite for four days during the five day RSK investigation and performed asbestos in air monitoring during and after asbestos removal. RSK did not enter Mill 1 during the asbestos removal work.

6.2.2 Migration of hazardous ground gases

As part of the intrusive investigation carried out by RSK, four monitoring wells were installed in the underlying sandstone.

In line with current guidance, namely BS8576 (2013), the ground gas generation potential for the site was anticipated to be ‘very low’ based on limited deposits of made ground being present with low degradable organic content. This was confirmed during the site investigation whereby made ground thicknesses at the borehole location were limited to 1.0m to 1.3m in thickness and no evidence of degradable or putrescible materials were identified. Given the ‘very low’ gas generation potential of the made ground, gas

monitoring is not necessarily required in line with the decision matrix in Figure 6 of BS8576. Due to the observations made on site, the response zones of the monitoring wells were installed within the sandstone to target groundwater, but gas monitoring was undertaken as a precautionary measure. Six rounds of gas monitoring were undertaken over a three-month period, to characterise the ground gas regime over a range of atmospheric conditions. An assessment of the data is reported below.

6.2.2.1 Method of assessment

The results of the monitoring have been assessed in accordance with the guidance provided in BS8576 and *CIRIA Report C665*. In the assessment of risks and selection of appropriate mitigation measures, both reports highlight the importance of the conceptual model in characterising the gas regime.

CIRIA C665 identifies two types of development, termed Situation A (modified Wilson and Card method), appropriate to all development excluding traditional low-rise construction, and Situation B (National House-Building Council, NHBC) only appropriate to traditional low-rise construction with ventilated sub-floor voids.

Both methods are based on calculations of the limiting borehole gas volume flow for methane and carbon dioxide, renamed as the gas screening value (GSV). The GSV (litres of gas per hour) is calculated by multiplying borehole flow rate (litres per hour) and gas concentration (percent by volume).

In both situations, it is important to note that the GSV thresholds are guideline values and not absolute. The GSV thresholds may be exceeded in certain circumstances, if the site conceptual model indicates it is safe to do so. Similarly, consideration of additional factors such as very high concentrations of methane, should lead to consideration of the need to adopt a higher risk classification than the GSV threshold indicates.

The site is to be redeveloped with a residential apartment block and therefore falls under Situation A.

Situation A relates to all development types except low-rise housing and, by combining the qualitative assessment of risk (see refined conceptual model in Section 5.4) with the gas monitoring results, provides a semi-quantitative estimate of risk for a site. The method uses both gas concentrations and borehole flow rates to define a characteristic situation for a site based on the limiting borehole gas volume flows for methane and carbon dioxide. Having calculated the worst case GSVs for methane and carbon dioxide, the Characteristic Situation is then determined from Table 8.5 of CIRIA C665.

6.2.2.2 Results of gas assessment

The maximum carbon dioxide concentration of 1.2% was measured in JBH01 and methane concentrations were measured as <0.1% in all boreholes during all monitoring rounds. Gas flows ranged from 0.0 to <0.1 l/hr in all boreholes.

A maximum carbon monoxide (CO) concentration of 114ppm was measured during the first monitoring visit in JBH03. During the following five monitoring visits the concentration of carbon monoxide reduced significantly to concentrations of 38ppm (during visit 2) and 3ppm (during visit 6).

6.2.2.3 *Data assessment*

The maximum calculated GSV for carbon dioxide is 0.001l/hr and given the methane concentration has been measured to be <0.1%v/v in all boreholes, no GSV can be calculated. Based on this information, the site is characterised as Green, indicating that gas protection measures relating to carbon dioxide and methane are not required for the development.

Carbon monoxide is a colourless, odourless, and tasteless gas that arises from both natural and anthropogenic (human-made) sources. It is produced as a primary pollutant during the incomplete combustion of fossil fuels and biomass, including internal combustion engines, wildfires, and controlled burns. Carbon monoxide is also produced indirectly from the photochemical oxidation and vegetation can emit carbon monoxide into the atmosphere as a metabolic by-product. The elevated CO concentration was measured in JBH03. The ground conditions encountered during the site investigation and the historic usage of this part of the site do not identify a specific source of carbon monoxide as there was no documented fossil fuel combustion in this area of the site and the ground conditions do not indicate significant organic content within the soils. The elevated CO concentration was measured during the first visit and reduces significantly over time. It is therefore, considered likely that the cause of the elevated CO is the action of drilling the borehole and introduction of oxygen into the ground from the drilling process, leading to partial oxidation of carbon-containing compounds. Given that the CO concentration reduces significantly over time and recorded flow rates are negligible, RSK does not consider it necessary to install protective measures specifically for carbon monoxide.

6.2.3 Leaching of contaminants in shallow soil due to historic site activities to groundwater

Two shallow made ground samples located within the proposed landscaped area were analysed for leachable metals. None of the concentrations exceed the GAC set for groundwater. However, soil samples were not analysed for leachable PAH or TPH. The concentrations of PAH in made ground (as discussed in section 6.2.1) and in a sample of groundwater taken from JBH03, which indicates a slight exceedance of benzo(a)pyrene at a concentration of 0.04µ/l compared to a GAC of 0.01µ/l, indicate that leaching to groundwater could be a relevant pollutant linkage.

The site is currently covered with a mixture of concrete, cobble setts and gravelly sand, allowing for leaching to occur in areas of permeable ground cover. Since the proposed development includes a minimal landscaped area in the centre of the residential apartment blocks, there will be a proportion of permeable ground cover post development. It is recommended that either contaminated made ground is removed or a clean cover system is installed above made ground in areas of soft landscaping therefore, the potential for leaching of contaminants in shallow soils to the underlying groundwater is likely to decrease and is not considered to pose a significant risk.

6.2.4 Vertical and lateral migration of contaminants to the underlying principal aquifer

Groundwater concentrations were compared to the drinking water GAC for principal aquifers presented in Appendix K.

Contaminant concentrations reported in groundwater are generally low, with no indication of non-aqueous phase liquid (NAPL).

PH levels in groundwater from the sandstone aquifer measured between 6.98 and 7.59, and sulphate levels were measured to be relatively low (between 23mg/l and 165mg/l).

The only exceedance of the DWS in the sandstone aquifer, reported in JBH03 in the south of the site, installed within the sandstone at 5 to 8m bgl was for benzo(a)pyrene, with a measured concentration of 0.04µg/l against a GAC of 0.01µg/l. The benzo(a)pyrene detected could potentially have leached from the made ground, through the granular superficial deposits to the underlying sandstone, however, given the relatively low level of exceedance and the distance to the drinking water abstraction, >1km from the site, it is considered unlikely that these concentrations pose a potential risk to the abstraction.

6.2.5 Migration of contaminants to surface water in Bridgewater Canal

Appendix K presents the comparison of groundwater results compared to the GAC for freshwaters.

Three groundwater samples have been analysed for a suite of contaminants and the results exceeding the GAC are summarised in Table 13.

Table 13: Summary of groundwater results with respect to freshwater EQS

Determinant	GAC (µg/l)	Exceedances (max concentration µg/l)
Copper	1	3 (2 µg/l)
Chromium	8.1	2 (14 µg/l)
Lead	1.2	1 (3 µg/l)
Nickel	4	1 (5 µg/l)
Zinc	10.9	2 (14 µg/l)
Benzo(a)pyrene	0.00017	1 (0.04 µg/l)
Benzo(b)fluoranthene		1 (0.04 µg/l)
Benzo(ghi)perylene		1 (0.02 µg/l)
Benzo(k)fluoranthene		1 (0.02 µg/l)
Indeno(123-cd)pyrene		1 (0.02 µg/l)
Fluoranthene	0.0063	2 (0.09 µg/l)

There are several exceedances of inorganic and organic contaminants within the three groundwater samples taken from the sandstone aquifer, however these exceedances are considered to be minor with all exceedances calculated to be of the same order of magnitude as the relevant EQS value.

The greatest exceedance is for chromium in JBH03; a concentration of 14µg/l was detected against an EQS value of 8.1µg/l which is considered to be a minor exceedance.

In terms of the PAHs, the EQS value of 0.00017µg/l is set at a value below the limit of detection (LOD) of <0.01 µg/l for several compounds. The compounds which exceed the EQS are only slightly above the LOD; concentrations ranging between 0.02µg/l and 0.09µg/l compared to the LOD of <0.01µg/l.

The receiving water is an arm of the Bridgewater Canal, a well-established water course flowing through the historically heavily industrialised city of Manchester. It is highly likely that the chemical quality of the water contained within the Bridgewater Canal is significantly worse given the industrial nature of the land uses along its length.

As part of the Phase 2 investigation two samples of canal water were taken to assess the quality of the water both upstream and downstream of the site. Given the location of Talbot Mill it was not possible to take an upstream water sample, as the length of the arm of the Bridgewater Canal runs only the length of the building. As such, a sample was taken from along the length of the mill building (Canal 1) to indicate a worst case scenario if contamination was migrating from the site to the canal. The downstream water sample (Canal 2) was taken from within the Bridgewater Canal itself and to the north, and downstream of Talbot Mill. The table below compares the canal water results with the EQS and the maximum concentration encountered within groundwater in the boreholes at the site.

Table 14: Summary of Bridgewater Canal results with respect to freshwater EQS

Determinant	GAC (µg/l)	Upstream (Canal 1)	Downstream (Canal 2)	Maximum concentration in onsite groundwater
Copper	1	9	10	2
Chromium	8.1	<1	5	14
Lead	1.2	3	2	3
Nickel	4	2	2	5
Zinc	10.9	10	28	14
Benzo(a)pyrene	0.00017	<0.01	<0.01	0.04
Benzo(b)fluoranthene		<0.01	<0.01	0.04
Benzo(ghi)perylene		<0.01	<0.01	0.02
Benzo(k)fluoranthene		<0.01	<0.01	0.02
Indeno(123-cd)pyrene		<0.01	<0.01	0.02
Fluoranthene	0.0063	0.03	0.02	0.09

In the case of the majority of determinants, the concentrations within groundwater beneath the site are marginally greater than the concentration in the canal water samples. This indicates that despite there being a greater level of contamination within the site boundary, this contamination is not having a significant impact on the canal, either in the arm of the canal directly adjacent to the site, or down gradient of the site. It should be noted that with the exception of chromium and nickel, all concentrations within the canal water samples exceed the EQS values. This indicates that in its current state, the canal is already in a poor condition, likely due to its location within a historically heavily industrialised city.

Generally, it is considered that the groundwater within the site is not having a significantly negative impact on the Bridgewater Canal.

During the excavation of JTP30 the water level in the Bridgewater Canal was surveyed and measured to be at an elevation of 25.29m AOD. Relating this back to ground level at JTP30, there is a difference between the site level and the water level in the canal of 1.07m. This would put the water level within the canal at a level that is within the sandstone bedrock however, there was no water ingress observed at this level during the excavation of the trial pit. A groundwater strike was observed at 2.10m bgl (or 24.26m AOD) but this is at 1.03m below the canal water level.

Taking in account the above evidence, it is considered that the contaminant linkage is potentially incomplete given that only slight exceedances of the EQS values have been detected and that dilution during migration to the canal and within the canal will result in significant reductions in compound concentrations.

6.2.6 Impact of organic contaminants on potable water supply pipes

For initial assessment purposes, the shallow soil (<1.5m bgl) results from the investigation have been compared with the GAC presented in Appendix L for this linkage, which are reproduced from *UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (UKWIR, 2010).

The results indicate that a relevant linkage may exist associated with organic contaminants PAH and TPH in the made ground and therefore pollutant polyethylene (PE) and/or polyvinyl chloride (PVC) water supply pipes are expected to be unsuitable for use on the development unless remedial measures are implemented that mitigate the risk.

As such RSK recommend the use of barrier pipes at the site. It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required later once the routes of the supply pipes are known to mitigate the use of barrier pipes if required. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

6.3 Environmental assessment conclusions

The results of the GQRA are presented in Table 15 below.

Table 15: Summary of GQRA results

Relevant Contaminant Linkage	Linkage status
1. direct contact via dermal contact, ingestion and inhalation of dust and asbestos fibres by future site residents in landscaped areas from shallow soil impact due to historic site activities and/or made ground.	Out of five samples analysed for metals, two samples of made ground exceeded the generic acceptance criteria (GAC) of 310 mg/kg for lead. None of the TPH aromatic or aliphatic bands exceeded the specified GAC values. Exceedances of several PAH compounds were reported, largely in one sample (JBH04 at 0.3-0.9mbgl). Asbestos

Relevant Contaminant Linkage	Linkage status
	has not been identified in the samples tested and no visible asbestos was noted during the investigation. To mitigate direct contact linkages to future site residents it is recommended that either a cover layer of clean material is used within landscaped areas or the made ground at JBH04 and JTP25 is excavated to break the contact pathway.
2. migration of hazardous gases including methane and carbon dioxide into future residential buildings on site via granular strata and service channels with subsequent inhalation by residents and potential accumulation, creating an explosive atmosphere.	Gas assessment gave a classification of Green, indicating that gas protection measures are not required.
3. leaching of contaminants in shallow soil due to historic site activities to groundwater	Incomplete – The concentrations of PAH in made ground (as discussed in section 6.2.1) and in a sample of groundwater taken from JBH03, which indicates a slight exceedance of benzo(a)pyrene at a concentration of 0.04 µ/l compared to a GAC of 0.01 µ/l, indicate that leaching to groundwater could be a relevant pollutant linkage. The site is currently covered with a mixture of concrete, cobble setts and gravelly sand, allowing for leaching to occur in areas of permeable ground cover. Since the proposed development includes a minimal landscaped area in the centre of the residential apartment blocks, there will be a proportion of permeable ground cover post development. It is recommended that either contaminated made ground is removed or a clean cover system is installed above made ground in areas of soft landscaping therefore, the potential for leaching of contaminants in shallow soils to the underlying groundwater is likely to decrease and is not considered to pose a significant risk.
4. lateral and vertical migration on impacted shallow groundwater to the underlying principal aquifer.	Incomplete - Contaminant concentrations reported in groundwater are generally low, with no indication of non-aqueous phase liquid (NAPL). The only exceedance of the DWS in the sandstone aquifer, reported in JBH03 in the south of the site, installed within the sandstone at 5 to 8m bgl was for benzo(a)pyrene, with a measured concentration of 0.04µg/l against a GAC of 0.01µg/l. It is considered unlikely that these concentrations pose a potential risk to the abstraction.
5. lateral migration of contaminants to the adjacent arm of the Bridgewater Canal.	Incomplete - slight exceedances of the EQS values have been detected in groundwater beneath the site with similar, if not reduced, concentrations in two

Relevant Contaminant Linkage	Linkage status
	samples taken from the Bridgewater Canal. Given that further dilution during migration to the canal and within the canal will result in significant reductions in compound concentrations, it is considered that the groundwater beneath the site is not having a significant negative impact on the canal.
6. contaminants associated with historic site uses permeating potable water supply pipes.	Potentially complete – use of barrier pipes recommended. Targeted investigation to be undertaken once the proposed pipeline route is known to mitigate against the use of barrier pipes.

7 GEOTECHNICAL SITE ASSESSMENT

7.1 Engineering considerations

The current proposals comprise the residential refurbishment of the mill buildings (Mill 1 and Mill 2) and demolition of the courtyard buildings to create new landscaping for the residents. Mill 1 is to be extensively rebuilt to the rear with a new steel frame and an additional storey. Mill 2 is to have its roof removed and the building increased by 2 storeys. A new 10 storey framed building is also to be constructed in the northern part of the site parallel to Worsley Street. The proposed development is shown on Figure 2.

Existing and proposed loading information has been provided by Joule Consulting as presented in Appendix N. This information indicates that it is proposed to reuse the existing foundations to the mill buildings with local underpinning where required. The preferred foundation solution for the new building is a combination of pad and strip foundations bearing on the sandstone.

7.2 Geotechnical hazards

A summary of commonly occurring geotechnical hazards is given in Table 16 together with an assessment of whether the site may be affected by each of the stated hazards.

Table 16: Summary of main potential geotechnical hazards that may affect site

Hazard category (excluding contamination issues)	Hazard status based on investigation findings and proposed development			Engineering considerations if hazard affects site
	Found to be present on site	Could be present but not found	Unlikely to be present and/or affect site	
Sudden lateral changes in ground conditions	✓	Presence of Glaciofluvial deposits laterally variable and sandstone surface vertically variable		Likely to affect ground engineering and foundation design and construction
Shrinkable clay soils			✓	Design to NHBC Standards Chapter 4 or similar
Highly compressible and low bearing capacity soils, (including peat and soft clay)			✓	Likely to affect ground engineering and foundation design and construction
Silt-rich soils susceptible to loss of strength in wet conditions			✓	Likely to affect ground engineering and foundation design and construction

Hazard category (excluding contamination issues)	Hazard status based on investigation findings and proposed development			Engineering considerations if hazard affects site
	Found to be present on site	Could be present but not found	Unlikely to be present and/or affect site	
Running sand at and below water table	✓	Should be anticipated in open excavations in the sand/gravel deposits where groundwater is encountered		Likely to affect ground engineering and foundation design and construction
Karstic dissolution features (including 'swallow holes' in Chalk terrain)			✓	May affect ground engineering and foundation design and construction.
Evaporite dissolution features and/or subsidence			✓	May affect ground engineering and foundation design and construction
Ground subject to or at risk from landslides			✓	Likely to require special stabilisation measures
Ground subject to peri-glacial valley cambering with gulls possibly present			✓	Likely to affect ground engineering and foundation design and construction
Ground subject to or at risk from coastal or river erosion			✓	Likely to require special protection/stabilisation measures
High groundwater table (including waterlogged ground)	✓	Groundwater level ~24.00mAOD locally below sandstone surface		May affect temporary and permanent works
Rising groundwater table due to diminishing abstraction in urban area			✓	May affect deep foundations, basements and tunnels
Underground mining		✓		Likely to require special stabilisation measures
Existing sub-structures (e.g. tunnels, foundations, basements, and adjacent sub-structures)	✓	Existing foundations & former sub-structures, i.e. former chimney		Likely to affect ground engineering and foundation design and construction
Filled and made ground (including embankments, infilled ponds and quarries)	✓	Made ground locally present in area of the new building to depths of up to 3.40m		Likely to affect ground engineering and foundation design and construction

Hazard category (excluding contamination issues)	Hazard status based on investigation findings and proposed development			Engineering considerations if hazard affects site
	Found to be present on site	Could be present but not found	Unlikely to be present and/or affect site	
Adverse ground chemistry (including expansive slags and weathering of sulphides to sulphates)	✓	See section 6.2.1		May affect ground engineering and foundation design and construction
Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.				

7.3 Ground model and characteristic values

The preliminary ground model summarised in Table 17 has been adopted for the preliminary foundation design recommendations.

Table 17: Ground model derived from ground investigation

Stratum	Elevation at top of stratum	Thickness (m)
Made ground	27.00	1.00 / 3.40
Glaciofluvial Deposits	26.00 / Absent	1.00 / -
Weathered Sandstone	25.00 / 23.60	1.50 / 0.60
Sandstone	24.50 / 23.00	Proven to 16.20mbgl / 11.23[1]
Notes: 1) 1st values indicate depths considered for spread foundation design / 2nd values for piled foundations 2) base of stratum not proven		

Groundwater has been recorded within the installations at elevations ranging between 24.28m and 23.71m AOD.

The geotechnical design parameters presented in Table 18 below are based on the results of the fieldwork, in-situ and laboratory testing, and reflect RSK's understanding of the proposed construction at the time this report was written. The designer should assess the applicability of the characteristic values provided below for the design situation under consideration and to ensure that it is a cautious estimate of the value affecting the occurrence of the relevant limit state(s).

Table 18: Summary of characteristic geotechnical design parameters

Design parameter	Stratum			
	Made Ground	Glaciofluvial Deposits	Weathered Sandstone	Sandstone
Unit weight - $\gamma_{,k}$ (kN/m^3)	18.0[1]	19.0[1] (Dry) 20.0[1] (Sat.)	19.0[1] (Dry) 20.0[1] (Sat.)	20.0
Effective Angle of Friction - $\varphi'_{,k}$ (°)	28[2]	34[3]	38[4]	-
Unconfined compressive strength - UCS'$_{,k}$ (MPa)	-	-	-	1 - 5

Notes:
[1]Estimated from soil descriptions using Figure 1 & 2 of BS 8002:2015
[2]Assumed empirical values in the absence of testing
[3]Estimated using equation 4 for coarse soils from BS 8002:2015
[4]Presumed value for non-intact sandstone

7.4 Existing foundations

7.4.1 General

This section discusses the implications of the load changes to the existing foundations in the mill buildings associated with refurbishment, change of use and extensions. The Engineer has provided a detailed breakdown of the existing and proposed loads/bearing pressures for specific column/wall locations where investigations have been completed to establish the foundation geometry. Foundation widths to the walls are taken as per the assumed widths provided by the Engineer. Based on the foundation geometries assumed from the investigations this indicates typical existing bearing pressures in the range of 84 to 437kN/m^2, locally 1263 kN/m^2 at JTP11, and the proposed bearing pressures in the range of 80 to 435kN/m^2, locally 1208 kN/m^2 at JTP11.

The findings of the trial pitting completed generally indicate that the existing mill buildings are supported on a combination of pad and strip footings constructed of sandstone blocks and masonry founded within the sand/gravel of the Glaciofluvial deposits and locally underlying weathered sandstone, i.e. JTP11.

Where exposed the existing foundation depths range from 0.53m to 1.58m below the existing floor levels with the corresponding elevations to the underside of foundation estimated to range from approximately 25.64m AOD to 24.59m AOD. The pad widths across the foundations investigated are estimated to range from approximately 0.90m to 1.23m and strips indicated to range in width from 0.92m to 1.24m.

The general ground profile beneath the footings comprises medium dense to very dense gravelly sand/sand & gravel (Glaciofluvial deposits) or weathered weak sandstone bedrock over sandstone bedrock.

The principle exception to the above being JTP11 where a very weak sandstone layer was encountered at the foundation level. Due to the limited exposure in the hand excavated trial pit it was not possible to determine the lateral or vertical extent of the sandstone and whether this comprises competent bedrock. The bearing resistance at this location has therefore been assessed using conventional bearing capacity equations for a granular soil in the case of a non-intact weathered sandstone and with reference to presumed bearing resistances

for rock given in EN 1997-1:2004 Fig G.1 for the case of competent sandstone bedrock, proportioned for the approximately 1m wide foundation for 15mm settlement.

7.4.2 Bearing resistance

The bearing capacity of selected existing foundations for which load take down information has been supplied has been assessed to Eurocode 7 (BS EN 1997-1).

Based on the ground model above, the ultimate limit state (ULS) design resistances (DA1-2) have been calculated for the estimated foundation geometries and compared with the associated design pressures to determine the degree of utilisation. The detailed bearing capacity calculations and summary are presented in Appendix O.

The Eurocode 7 assessment (BS EN 1997-1) considers Design Approach 1 – Combination 1 (DA1-C1) and Combination 2 (DA1-C2) partial factors. It has been determined that DA1-C2 is the more conservative approach and the results summarised in Table 19.

Table 19: Comparison of ULS design resistance, design pressures and utilisation

Estimated Foundation Dimensions				DA1-C2 Design Resistance (kN/m²)	DA1-C2 Design Pressure (kN/m²)	Utilisation
Ref.	Width (m)	Length (m)	Depth (m)			
E2/JTP01	1.10	1.10	0.85	477	182	38%
E8/JTP02	1.14	1.18	1.30	652	460	70%
GL4/JTP05	0.93	1.00	0.53	326	323	99%
GL9a/JTP06/07	1.00	1.00	0.72	411	82	20%
GL11	1.00	1.00	0.53	398	328	83%
GLG/JTP07	1.24	1.00	1.04	547	220	40%
JTP10	1.40	1.43	1.50+	754	374	50%
JTP10A	1.54	1.59	1.63	796	442	55%
JTP11 (1)	0.91	0.93	0.73	662	1277	193%
JTP11 (2)	0.91	0.93	0.73	1500	1277	85%
JTP13	1.16	1.00	1.42	691	297	43%
JTP14	1.12	1.00	1.88	865	314	36%
JTP23	0.92	1.00	0.70	398	375	94%
JTP24	0.92	1.00	0.70	398	375	94%

Notes: Utilisation >100% unacceptable
(1) Weathered non-intact sandstaone
(2) Sandstone bedrock

From the table above, it can be seen that the design resistances obtained for the selected foundations generally have a satisfactory degree of utilisation.

GL 4/JTP05 is indicated to be essentially fully utilised (99 utilised), but it is noted that it still maintains working stress factors of safety above 2.0 under the proposals.

The footing exposed at JTP11 is assessed as having a degree of utilisation of 193% or 85% and working stress factors of safety of 1.29 or 1.49 depending on whether its founded on non-intact weathered sandstone or intact sandstone bedrock.

It is recommended that further work is undertaken at this location to confirm the presence of sandstone bedrock or otherwise and in turn if an acceptable utilisation is achievable.

It is also necessary to check the serviceability limit state (SLS) under the proposed load increases and the results of this analysis are detailed in the following section.

7.4.3 Serviceability limit state analysis

Serviceability limit state analysis (SLS) analysis has been carried out to estimate the likely magnitude of settlement beneath the selected foundations.

The settlement calculations have been carried out using the Burland and Burbridge approach for the granular soils and linear elastic approach for sandstone bedrock. Given that settlements under the existing bearing pressures will have long since ceased and the SLS analysis only considers the settlement due to the proposed changes in pressure.

It should be appreciated, however, that the strains resulting from settlement under the existing loads may be locked into the existing structures to some degree and therefore an estimate of the original settlements is also outlined in the table to assess the likely overall total settlement.

The results of the settlement analysis are presented in Table 20.

Table 20: Results of settlement analysis

Ref.	New applied pressure (kN/m^2)	Change in applied Pressure (kN/m^2)	Estimated settlement under change (mm)	Original design pressure (kN/m^2)	Estimated original settlement (mm)	Estimated total settlement (new+old) (mm)
E2	176	-198	0	374	19	19
E8	435	51	4	384	20	24
GL 4	315	57	5	258	18	23
GL 9a	80	-4	0	84	6	6
GL 11	324	22	2	302	21	23
GL G	215	19	2	197	15	17
TP10	510	-23	0	370	25	25
JTP10A	417	-19	0	437	27	27
JTP11 (1)	1208	-56	0	1263	15	15
JTP11 (2)	1208	-56	0	1263	8	8

Ref.	New applied pressure (kN/m^2)	Change in applied Pressure (kN/m^2)	Estimated settlement under change (mm)	Original design pressure (kN/m^2)	Estimated original settlement (mm)	Estimated total settlement (new+old) (mm)
JTP13	287	9	1	278	21	22
JTP14	309	28	1	281	20	21
TP23/24	362	11	1	351	24	25
Notes:						

The results of the analysis indicate that the predicted total settlements under the new applied bearing pressures (un-factored) are in the range of 0 to 5mm and the total settlements under the original and new applied pressures are generally below or equal 25mm except for the foundations at JTP10A where settlement under the original load is estimated to be in the order of 27mm. However, it is noted that the proposals result in a reduction in applied pressure on the foundation JTP10A and therefore no additional settlement would be expected at these locations providing the foundations have fully experienced the loads indicated.

In addition to the above, the settlement estimated from the proposed increases in dead load have also been assessed and the results are provided on the summary sheet in Appendix O.

7.5 New foundations

7.5.1 General

The loading information provided by the Engineer indicates pad and strip footings associated with the new ten-storey building in the order of 1980kN and 383kN/m, respectively.

Given the presence of competent sandstone at estimated depths of 1.90 to 2.70m bgl, locally 3.50m+ at JTP31A, it is considered that spread footings would be suitable for supporting the new building. The depth of such foundations may vary considerably where former foundations/sub-structures are encountered and the new foundations need to be extended beneath these into the underlying competent sandstone strata, the depth to which is also likely to vary across the building. Deep excavations will require support and may require dewatering. Alternatively, pile foundations taken to the underlying competent sandstone would provide a suitable alternative.

Recommendations for spread foundations and piled foundations for the new building are provided in the following sections.

7.5.2 Spread foundations

The recommendations for the design and construction of spread foundations in relation to the ground conditions are set out in Table 21.

Table 21: Design and construction of spread foundations

Design/construction considerations	Design/construction recommendations
Founding stratum	Sand / Gravel - Medium dense to dense Sandstone – Very weak to weak
Depth	Foundations for underpinning existing foundations to the Mill buildings should be taken at least 0.2m into the founding stratum below any overlying made ground or clay layers. Foundations for the new multi-storey building should be taken to a minimum depth of 2.00m below finished ground level and at least 0.2m into the competent sandstone founding stratum below any overlying made ground or unconsolidated superficial sand/gravel deposits.
Presumed Bearing Resistance for Glacial Sand/Gravel and highly weathered sandstone	Spread foundations with a width of up to 1.7m and constructed on the sand/gravel at a minimum depth of 1.00m below finished ground level may be designed using a presumed bearing resistance of 350 kN/m$^{2.}$ Settlement for the presumed bearing pressure should not exceed 25mm.
Presumed Bearing Resistance for Competent Sandstone	Spread foundations with a width of up to 2.50m and constructed on the sandstone at a minimum depth of 2.00m below finished ground level may be designed using a presumed bearing resistance of 500 kN/m$^{2.}$ Settlement for the presumed bearing pressure should not exceed 15mm.
Stability of excavations	The trial pits were locally unstable during excavation. It is therefore recommended that excavation sides are battered back to a safe angle where space permits or support systems are made available during the groundwork stage of the development. No man entry should be allowed within excavations without battering back to a safe angle or appropriate temporary support in place.
Dewatering	Groundwater was encountered at a highest level of 24.2mAOD, which is generally below the sandstone surface. However, where excavations have to be deepened groundwater may be encountered and allowance should be made for localised dewatering of excavations as required.
Construction considerations	All foundation excavations should be inspected, and any made ground and soft, organic or otherwise unsuitable materials removed and replaced with mass concrete.

7.5.3 Piled foundations

Recommendations for the design and construction of pile foundations in relation to the ground conditions are set out in Table 22.

Table 22: Design and construction of piled foundations

Design/construction considerations	Design/construction recommendations
Pile type	The construction of both conventional rotary bored and CFA piles is considered technically feasible at this site.

Design/construction considerations	Design/construction recommendations	
Possible constraints on choice of pile type	Driven piles will not be suitable due to presence of hard strata at shallow depths. CFA piles may not be able to achieve sufficient penetration into the sandstone and there may be a risk of flighting within any overlying unconsolidated Glaciofluvial deposits with uncased CFA piles because of slow penetration rates in the underlying sandstone. However, it is recommended that the advice of a piling specialist is sort in respect to this.	
Temporary casing	The presence of perched groundwater has been recorded and the made ground/Glaciofluvial deposits are non-self-supporting therefore bored piles will require temporary casing. Alternatively, the use of continuous-flight-auger (CFA) injected bored piles usually overcomes this issue, subject to possibility of flighting as mentioned above.	
Made ground / Alluvium	For assessing preliminary pile capacities, the made ground has been presumed not to contribute to the load-carrying capacity for the piles.	
Man-made obstructions	The presence of buried sub-structures or other obstructions within made ground may lead to some difficulty during piling. It is recommended that once the proposed pile layout has been determined, pre-pile probing be carried out at each of the pile positions. Where buried obstructions are encountered, it will be necessary to either relocate the pile(s) or make allowance for removing the obstruction.	
Hard strata	An allowance should be made for forming rock sockets in the sandstone.	
Pile design parameters for Glaciofluvial Deposits/ Weathered Sandstone	Shaft Friction Factor (k_s.tan δ)	0.22
	Average limiting shaft friction (kN/m^2)	110
Pile design parameters for Unweathered Sandstone	Ultimate Shaft Resistance q_s (kN/m^2)	200
	Ultimate Base Resistance q_b (kN/m^2)	6,000
	Model factor (γ_{Rd})	1.4
Special precautions relating to bored pile shafts and bases	Bored pile concrete should be cast as soon after completion of boring as possible and in any event the same day as boring. Prior to casting the base of the pile bore should be clean, otherwise a reduced safe working load will be required. Similarly, if the pile bore is left open the shaft walls may relax/soften, leading to a reduced safe working load.	

The design resistance has been calculated in accordance with BS EN 1997-1 and the UK National Annex, using partial resistance factors for bored/CFA piles, given in Table 23.

Table 23: Partial resistance factors (γ_R)

Resistance	Set	
	DA1 C1	DA1 C2[1)]
Base - γ_b	1.0	2.0
Shaft (compression) - γ_s	1.0	1.6
Total (compression) - γ_t	1.0	2.0

[1)] no serviceability verification

The design procedure for piles varies considerably, depending on the proposed type of pile. However, for illustrative purposes Table 24 gives likely working pile loads for traditional bored/CFA, cast-in-situ concrete piles of various diameters and lengths, based on the design parameters given in Table 19.

Table 24: Typical pile design resistances for bored/CFA piles - compression

Typical Design resistance for DA1 – Combinations C1 & C2 (kN)						
Depth of Pile toe below Level - 27.00mOD	Pile diameter					
	300mm		450mm		600mm	
	C1	C2	C1	C2	C1	C2
8.00	846	491	1497	850	2299	1285
9.00	981	575	1699	976	2568	1454
10.00	1116	659	1901	1103	2838	1622
11.00	1250	743	2103	1229	3107	1790
12.00	1385	827	2305	1355	3376	1958

When dimensioning a pile, the design load must be multiplied by the appropriate partial factor, γ_G.

It should be stressed that the above capacities do not take into consideration limiting concrete stress (to be verified by a separate load case as defined in EC2) nor pile group effects, the latter of which is more pronounced for many closely spaced piles.

Notwithstanding the above, it is recommended that a specialist piling contractor should be contacted at an early stage for their advice on the most suitable pile type and capacity for the strata encountered at this site. The piling specialist will need to confirm the ability of their equipment to form of rock sockets within the bedrock and depth of penetration practically achievable based on their previous experience in the local area.

7.6 Floor slabs

Lightly loaded ground floor slabs are envisaged for the new building, i.e. not exceeding a maximum design loading of 5kN/m^2.

The exploratory holes excavated in the northern part of the site typically indicate a moderate thickness (0.75m to 1.95m), locally up to 3.40m at JTP31. Based on the exploratory records, these materials appear to be predominately granular in nature and in a variable state of compaction with buried sub-structures also encountered.

It is common practice to suspend ground floor slabs where existing made ground is of significant thickness and variable state of compaction due to the risk of excessive settlement. However, lightly loaded ground bearing slabs may be suitable providing that suitable measures are taken to minimise the risk of settlement. Such measures should include removal of a suitable thickness of existing made ground, say 1.00m or so, careful examination and rolling of the formation, replacement of exceptionally hard (i.e. old structures) and soft material at the formation level with well compacted suitable granular fill, engineering back in the granular made ground materials (oversize or otherwise unsuitable material removed), placement of a suitable blanket of well-compacted imported granular fill and provision of some light reinforcing. It may also be prudent to ensure that ground floor slabs are suitably disconnected from the main structure.

Alternatively, suspended ground floor slabs should be adopted for the new buildings, particularly where floor slabs are required to support any heavy or sensitive equipment.

7.7 Roads and hardstanding

In the 1.0m to 1.5m below the proposed finished ground level the exploratory holes have revealed a soil profile comprising moderate thickness of variable made ground over gravelly sand or sand and gravel.

In pavement design terms, the groundwater conditions are anticipated to comprise a low water table, i.e. at least 1 m below the pavement formation level.

The recommended sub-grade soil CBR value for preliminary road pavement design is therefore less than 2% for the existing made ground. It is recommended that in situ plate bearing tests are conducted at final formation level following treatment/compaction to confirm the final design CBR values.

During construction the formation level should be carefully compacted, and any soft spots removed and replaced with well-compacted granular fill.

The sub-grade soils can be regarded as non-frost-susceptible, based upon the criteria given in Appendix 1 of TRRL (1970) Report Road Note 29.

7.8 Chemical attack on buried concrete

This assessment of the potential for chemical attack on buried concrete is based on current BRE guidance. The available information for the site indicates that for the purposes of this assessment of the aggressive chemical environment, the site should be considered as a brownfield development unlikely to contain pyrite. An appropriate suite of chemical analyses for this site classification was carried out on soil samples by RSK.

Based on testing results, Table 25 gives the characteristic pH and water-soluble sulphate content values soil for each of the geological units encountered on site.

Table 25: Characteristic water-soluble sulphate values for soils and groundwater beneath the site

Soil type	Characteristic pH	Characteristic $WS0_4$ (mg/l)
Made ground	7.69	382
Glaciofluvial Deposits	8.14	54.6
Sandstone	7.87	17.6
Groundwater	7.16	107.7

Based on the results above and following the steps outlined in the BRE guidance, the Design Sulphate Classes and Aggressive Chemical Environment for Concrete classifications are summarised in Table 26, based on water soluble sulphate contents.

Table 26: DS and ACEC Class – based on water soluble sulphate

Soil type	Design Sulphate (DS) Class	Aggressive Chemical Environment for Concrete (ACEC) Class
Made ground	DS2	AC-2
Glaciofluvial Deposits	DS1	AC-1
Sandstone	DS1	AC-1
Groundwater	DS-1	AC-1

The recommended ACEC Classification is therefore AC-2 with a Design Sulphate Class of DS-2.

7.9 Natural drainage system

Infiltration testing was not undertaken as part of the investigation. Notwithstanding this, natural superficial deposits beneath the site, generally comprising sands and gravels, are not considered to impede the natural percolation of water. The proposed design includes the use of permeable paving in external courtyard areas. This form of surface covering will offer a diffuse form of recharge, and coupled with the largely granular superficial deposits, is considered to be a suitable form of drainage system. It should be noted that section 6.2.3 recommends that either contaminated made ground be removed or a clean cover system is installed above made ground in areas of soft landscaping therefore, the potential for leaching of contaminants in shallow soils to the underlying groundwater is likely to decrease and is not considered to pose a significant risk.

8 REUSE OF MATERIALS AND WASTE

8.1 Reuse of suitable materials

Under the Waste Framework Directive, naturally occurring soils are not considered waste if reused on the site of origin for the purposes of development.

In accordance with the definition provided in the Waste Framework Directive, materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Thus, soils that are not of clean and natural origin, i.e. made ground (whether contaminated or not) and other materials such as recycled aggregate, do not become waste until the criteria are met.

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current reuse scenarios covered by the CoP comprise

- reuse on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed soil treatment facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not permitted currently under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on sites undergoing development, four factors are of relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

The MMP establishes whether specific materials are classified as waste and how excavated materials will be treated and/or reused in line with the CoP. The MMP is likely to form part of the site waste management plan.

The site has been developed previously and the investigation has confirmed the presence of made ground generally to depths of between 0.3m bgl and 1.6m bgl with locally deeper

deposits associated with historic site features (to 1.95m bgl associated with mill building and to 3.4m bgl associated with chimney).

Detailed designs for the proposed development have not been provided to RSK. It is understood that a ten-storey apartment building will be developed in the north of the site. There is no basement, but the lowest level will be roughly level with the basement of the mills and level access will be provided to the courtyard. Given that piled foundations are the likely foundation solution, it is anticipated that some degree of soil (likely to be made ground but also natural superficial deposits) will be removed from this area and generally at shallow depths across the site to allow for site reprofiling and the implementation of landscaped areas in the centre of the site.

It should be noted that before any excavation works begin on-site, an MMP will need to be prepared, reviewed by a QP; and a Declaration lodged with the EA.

As noted above, under the Waste Framework Directive naturally occurring soils are not considered waste and therefore arisings of clean natural soils, e.g. from foundation and drainage excavations, may be reused on the site. However, it is important that these soils should be stockpiled separately and not become cross-contaminated with made ground / contaminated soils or construction wastes.

If it were proposed to import clean and naturally occurring soils direct from another site, the receiving site's MMP would need to be updated in advance of importation.

8.2 Treatment to meet suitable-for-use criteria

Where materials do not meet the suitable for use criteria, it may be possible to treat them under an environmental permit (mobile treatment licence) to enable them to be reused on-site.

To enable the treatment options to be determined, an options appraisal and a remediation strategy document will be necessary to support discussion of the issues with regulators and third parties.

8.3 Reuse of waste materials

If material is discarded as waste, then its reuse on site may still be possible. Waste soils and recycled aggregate can be reused on site under a standard rules environmental permit or a U1 waste exemption from the Environmental Permitting (England and Wales) Regulations 2010 if they are suitable for the proposed use, i.e. not cause harm to human health or the environment. However, it should be noted that these have strict limits on the quantity of material that can be reused.

8.4 Wastes for landfill disposal

Wastes require pre-treatment prior to disposal at landfill. Pre-treatment must be a physical, thermal, chemical or biological process (including sorting) that changes the characteristics of the waste to reduce its volume, reduce its hazardous nature, facilitate its handling and enhance its recovery.

The latest edition of the EA's 'Technical Guidance WM3' (2015), Guidance on the classification and assessment of waste, requires that within a mixed waste the separately

identifiable wastes are assessed separately. Mixing of different types of hazardous waste and hazardous waste with other waste substances is prohibited under the Waste Framework Directive. Wastes that have been mixed must be separated whenever possible.

It is best practice to provide your waste carrier (or the disposal site) with details of how the waste has been treated. Your waste carrier may provide a pre-treatment confirmation form or space on the waste transfer note to detail the pre-treatment.

The classification of waste soil is a two-stage process, the first being an assessment of whether the soil is considered hazardous or not following the guidance within Technical Guidance WM3. For off-site disposal to landfill the results of Waste Acceptance Criteria (WAC) testing must then be reviewed to establish if the soil is acceptable at the relevant class of landfill or requires pre-treatment to reduce specific hazardous properties.

8.4.1 Waste acceptance criteria

All inert, stable non-reactive hazardous and hazardous wastes have limit values (waste acceptance criteria) set out in legislation that must be met before that class of landfill can accept the waste. Currently, no WAC are in place for non-hazardous waste.

Soil and other materials that are found not to be hazardous may be classified as either non-hazardous or inert. To determine whether they can be classed as inert the soil must be tested and found to be below the inert waste acceptance criteria.

8.4.2 Waste sampling plan

Technical Guidance WM3 sets out requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. At this stage, RSK consider that the level of soil sampling is/is not sufficient to categorise the material robustly/fully.

RSK recommends that a Sampling Plan be prepared to support any waste classifications and hazardous waste assessments, prior to development.

8.4.3 Preliminary waste assessment

Given the level of data obtained and the scale of the development, the following assessment should be considered indicative and further assessment should be undertaken following the preparation of a waste sampling plan.

Envirolab, an RSK company, has developed a waste soils characterisation assessment tool (HASWASTE), which follows the guidance within Technical Guidance WM3. The analytical results have been divided into three categories based on their depth and soil type:

- shallow made ground (between ground level and 1.1m bgl)
- deep made ground (associated with historic chimney at 3.0-3.2m bgl)
- natural superficial deposits.

Eight samples of shallow made ground, taken at depths of between 0.0m and 1.1m bgl, have been analysed for a suite of contaminants and the results have been assessed using the Envirolab HasWaste tool. None of the samples were classified as hazardous waste.

Therefore, to determine whether waste might be classified as inert or non-hazardous WAC testing will need to be undertaken.

Three samples of natural superficial deposits taken at depths ranging between 0.8m bgl and 1.4m bgl have been analysed for a suite of contaminants and the results have been assed using the Envirolab HasWaste tool. None of the samples were classified as hazardous waste. Therefore, to determine whether waste might be classified as inert or non-hazardous WAC testing will need to be undertaken.

A single sample of deep made ground was taken at a depth of 3.0m bgl. This sample is associated with the historic chimney and is located within the outline of the proposed development. Results have been assed using the Envirolab HasWaste tool and indicate an exceedance of the Carcinogenic HP7 threshold of 0.1% with a value of 0.14916, likely associated with elevated arsenic and lead concentrations. Based on this

The HasWaste sheet is presented in Appendix P.

8.5 Landfill tax

Waste producers disposing of material to landfill are required to pay landfill tax by HM Revenue and Customs.

The tax is chargeable by weight (tonnage) and two rates apply, either standard or lower rate. The lower rate only applies to those less polluting wastes as set out in the Landfill Tax (Qualifying Material) Order 2011, which include naturally occurring rock and soil, concrete, some minerals, some furnace slags and ash, and some low-activity organic compounds. Evidence confirming that the waste qualifies for the lower rate will be required, and standard rate tax will apply for the whole waste load for any loads of mixed waste.

Currently (since 1 April 2018), standard rate landfill tax is £88.95 per tonne.

The lower rate of landfill tax applicable to less polluting wastes (i.e. 'inert' wastes) remains at £2.80 per tonne.

Material disposed of at a soil treatment centre will not be subject to landfill tax.

8.6 Groundwater

When there is an intention to discard groundwater, chemical test results will indicate the appropriate disposal options. This could include disposal to treatment facility, via consent (issued by the water authority) to foul sewer or via consent (issued by the EA) to a watercourse or land.

8.7 Recommendations

RSK recommends that consideration as to how potentially waste soils will be dealt with as part of this development/remediation is given as early in the project planning process as possible. Such planning can lead to cost savings where potentially waste soils are viewed as a resource and retained on-site as part of the development. We also recommend, where off-site disposal is being considered, that appropriate facilities are

identified, and discussions initiated to confirm suitability of the facility to take the material. Potentially, these may include soil treatment facilities as well as landfills.

RSK can provide specialist advice to assist in this process, which can be complex and subject to regular regulatory change.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Environmental

A deep sample of made ground was obtained from the base of the chimney structure in JTP31A at 3.0-3.2m bgl. Exceedances of arsenic and lead were reported in this sample; concentrations of 1130mg/kg of arsenic (against the GAC of 40mg/kg) and 746mg/kg for lead (against the GAC of 310mg/kg). It is considered that materials at this depth are unlikely to pose a risk to future users.

Two of five samples of made ground analysed for metals, exceeded the generic acceptance criteria (GAC) of 310 mg/kg for lead. Concentrations of 490mg/kg and 430mg/kg were reported in JBH02 (0.0-0.1m bgl) and JTP25 (0.15-0.25m bgl) respectively.

Given the presence of made ground across the site and the varied site history it is possible that localised contaminants are present in shallow soils, in areas not covered as part of this investigation. To mitigate direct contact linkages to future site residents it is recommended that either a cover layer of clean material is used within landscaped areas or the made ground at JBH04 and JTP25 is excavated to break the contact pathway. If a clean cover system is to be adopted, it is advised that cover soils of 450mm thickness comprising a suitable topsoil and subsoil, should be installed. Underneath the cover soils a geotextile membrane (or similar) should be installed, which remains insitu to prevent soils at depth (below 450mm) from mixing with shallower soils that form the cover system.

The concentrations of PAH in made ground and in a sample of groundwater taken from JBH03, which indicates a slight exceedance of the DWS for benzo(a)pyrene, indicate that leaching of contaminants to groundwater could be a relevant pollutant linkage. Since the proposed development includes a minimal landscaped area in the centre of the residential apartment blocks, there will be a proportion of permeable ground cover post development. It is recommended that either contaminated made ground is removed or a clean cover system is installed above made ground in areas of soft landscaping therefore, the potential for leaching of contaminants in shallow soils to the underlying groundwater is likely to decrease and is not considered to pose a significant risk.

The slightly elevated concentration of benzo(a)pyrene above the DWS is considered to be a minor exceedance and given the distance to the drinking water abstraction is >1km from the site, it is considered unlikely that these concentrations pose a potential risk to the underlying aquifer and abstraction.

There are several exceedances of inorganic and organic contaminants within the three groundwater samples taken from the sandstone aquifer when compared against the EQS values protective of a surface water body (the adjacent Bridgewater Canal), however these exceedances are considered to be minor with all exceedances calculated to be of the same order of magnitude as the relevant EQS value. In addition, dilution during migration to the canal and within the canal will result in significant reductions in compound concentrations.

Two samples of canal water (upstream and downstream) have been analysed for a suite of contaminants and indicate, for the majority of determinants, lower concentrations compared to those in the groundwater beneath the site. This indicates that concentrations

from within the site are not having a significantly negative impact on the canal. It is therefore unlikely that the groundwater between the site and the canal is in continuity, and if it is, the dilution during migration and within the canal is reducing the levels of contamination.

During the Phase 2 investigation, an asbestos removal company, employed directly by the Client, was carrying out a survey and removal of asbestos within Mill 1. Access to several areas of the ground floor and upper floors of Mill 1 were restricted due to the presence of temporary, air-tight sheeted rooms. The asbestos removal company were onsite for four days during the five-day RSK investigation and performed asbestos in air monitoring during and after asbestos removal. RSK did not enter Mill 1 during the asbestos removal work. The linkage of permeation of plastic utilities was found to be potentially complete, with numerous exceedances of the GAC for shallow soil. It is recommended that this linkage is assessed in more detail once the route of the planned water supply is known.

Ground gas assessment has characterised the site as Green, meaning that gas protection measures will not be required.

9.2 Geotechnical

The investigation findings confirm that the existing Mill buildings are supported off sandstone/masonry pad and strip footings founded within the sand/gravel of the Glaciofluvial Deposits. The existing foundation depths were found to range from 0.53m to 1.58m below the existing floor levels with pad widths estimated to range from approximately 0.90m to 1.23m and strips indicated to range in width from 0.92m to 1.24m.

The design resistances obtained for the selected existing foundations generally show a satisfactory degree of utilisation under the proposals. GL 4/JTP05 appears to be essentially fully utilised (99 utilised), but it is noted that it still maintains working stress factors of safety above 2.0 under the proposals. JTP11 is assessed as having a degree of utilisation of 193% or 85% depending on whether its founded on weathered non-intact sandstone or intact sandstone bedrock.

The results of the analysis indicate that the predicted total settlements under the new applied bearing pressures (un-factored) are in the range of 0 to 5mm and the total settlements under the original and new applied pressures are generally below or equal 25mm. A principal exception being the foundation at JTP10A where settlement under the original load is estimated to be in the order of 27mm, although the proposals result in a reduction in applied pressure on the foundation JTP10A and therefore no additional settlement would be expected at this location providing the foundations have fully experienced the loads indicated.

It is recommended that further work is undertaken at JTP11 to confirm the founding stratum and available bearing resistance in order to confirm the available degree of utilisation. Plate testing would normally provide the most suitable means of assessing the load – settlement performance of weathered rocks but is not practical in this instance due to the site constraints. Therefore, the recommended scope of work comprises the following:

- 3no. additional hand excavated trial pits to expose the opposing corner of JTP11 and two adjacent foundations to check the lateral persistence. If the trial pits confirm a consistent bedrock level in this area:
- sink a rotary borehole with a specialist low headroom rig to a minimum depth of 3m to investigate the vertical persistence discontinuity spacing and recover core samples for unconfined compressive strength testing
- alternatively, enlarge a trial pit and attempt to recover a core sample with diamond coring techniques and use a breaker to progress the excavation below rock head to recover intact pieces for sub-sampling.

Given the presence of competent sandstone at estimated depths of 1.90 to 2.70m bgl, locally 3.50m+ at JTP31A, it is considered that spread footings would be suitable for supporting the new building. The depth of such foundations may vary considerably where former foundations/sub-structures are encountered and the new foundations need to be extended beneath these into the underlying competent sandstone strata, the depth to which is also likely to vary across the building. Deep excavations will require support and may require dewatering. Alternatively, pile foundations taken to the underlying competent sandstone would provide a suitable alternative.

Ground bearing slabs may be suitable within the existing buildings or for the new building, providing that suitable measures are taken to minimise the risk of settlement. Alternatively, suspended ground floor slabs should be adopted for the new buildings.

The recommended sub-grade soil CBR value for preliminary road pavement design is just less than 2% for the existing made ground. It is recommended that in situ plate bearing tests are conducted at final formation level following treatment/compaction to confirm the final design CBR values.

9.3 Re-use of materials and waste

The results of analysis for soil samples collected during the recent investigation have been assessed to allow characterisation in the event the material is planned to be removed from site for disposal to landfill.

Envirolab (an RSK company) has developed a waste soils characterisation assessment tool (HASWASTE), which follows the guidance within Technical Guidance WM3. The analytical results have been assessed using this tool for potential off-site disposal of materials in the future. The assessment identifies if the material would be classified as hazardous (or not) if it was decided to dispose of the material to landfill. The analysis does not determine if the material is inert. Inert wastes can only be identified through WAC analysis.

The HASWASTE assessment used data from eight samples of shallow made ground, taken at depths of between 0.0m and 1.1m bgl, and three samples of natural superficial deposits taken at depths ranging between 0.8m bgl and 1.4m bgl. None of the samples were classified as hazardous waste. A single sample of deep made ground, taken at a depth of 3.0m bgl, resulted in an exceedance of the Carcinogenic HP7 due to elevated arsenic and lead concentrations. This deep made ground associated with the historic chimney is classified as hazardous.

Further WAC testing of soils requiring offsite disposal is recommended to determine whether waste might be classified as inert or non-hazardous.

10 OUTLINE REMEDIATION STRATEGY

10.1 Remedial actions

The general principles underpinning the outline remediation strategy are presented in the following sections. It should be noted that the outline strategy is based on the current level of knowledge and may be subject to change when the full remedial strategy for the site is developed.

A remedial strategy and implementation plan will be developed once the final approach to remediation of the site has been developed. At this stage of development of the remedial strategy, the following sections set out a general approach to the remediation which is anticipated. It is likely to require refinement to identify planned remedial works in areas known to require remediation and contingency for managing previously unidentified or unanticipated potential sources.

10.1.1 Primary source removal

Primary sources of contamination (e.g. buried tanks, chemical drums, etc.) have not been identified in the shallow ground underlying the site. However, should any be encountered during redevelopment earthworks the source should be removed and disposed from site by an appropriate method and, if required, by a suitably qualified contractor. An environmental specialist is recommended to undertake assessment of the chemical status of the surrounding soils.

10.1.2 Secondary source mitigation

In principal, and based on findings to date, the identified risks to human health receptors may be managed by incorporation of engineered measures into the built development, which may preclude the need to remove and/or treat hotspots of contamination. However, removal and/or treatment of contaminated soils may be required should:

- risks to controlled waters from soil contamination be identified
- the presence of significant contamination (e.g. phase separated ‘free’ hydrocarbons) be encountered during the redevelopment.

Should source removal be required it is currently envisaged this would be carried out by excavation.

Engineered measures to isolate site users and maintenance workers from direct contact with potentially contaminated made ground on the site comprises use of building ground slabs, hard surfaced roads, car parking and footway areas, and providing a simple soil cover for areas of landscaping underlain by made ground.

In general, any made ground currently on site should not be present within 450mm of the surface of any landscaping areas. It is advised that cover soils of 450mm thickness comprising a suitable topsoil and subsoil, should be installed. Underneath the cover soils a geotextile membrane (or similar) should be installed, which remains insitu to prevent soils at depth (below 450mm) from mixing with shallower soils that form the cover system.

10.1.3 Watching brief demolition and site clearance

There is currently a building located in the centre of the site, known as the Time Keepers Cottage, which has been previously used as a garage. It is understood this building is to be removed as part of the development phase. It is recommended that a general 'overdig' of the made ground (if present) underlying the concrete slab of this building is undertaken to assess for the presence of any buried features (tanks or foundations). In addition, there is a concrete slab in the north of the site to be removed to allow the construction of the new apartment block. Inspection should be maintained during its removal for signs of unexpected contamination or buried obstructions or features.

Given the historic features in this part of the site (deep made ground relating to the mill building and chimney) an environmental specialist should be in attendance during the removal of any ground bearing slabs and below ground foundations to assess the condition of the underlying soils and provide documented evidence of the work.

10.1.4 Non-remedial general excavation/soft strip

Detailed designs for the proposed development have not been provided to RSK. It is understood that a ten-storey apartment building will be developed in the north of the site and the design does not include for a basement.

It is anticipated that some soil (likely made ground but also natural superficial deposits) will be removed from the site in addition to any planned remedial excavation carried out for source removal. This includes:

- carry out a soft strip of soils below existing hard cover to re-grade the site to form the development platform
- excavations for removal of old foundations / obstructions and other hard sub-surface structures to remove constraints to development
- pile foundation arisings
- excavations to remove shallow drainage, and redundant services, if required.

These additional excavations also provide an opportunity to observe ground conditions and if necessary obtain chemical analyses under the verification plan.

10.1.5 Re-use of materials

It is unlikely excavated soils will be re-used given existing ground levels across the site. Any excavated soils including materials excavated for redevelopment purposes will require excavation and disposal to a suitably licensed off-site facility.

Materials may be generated from break out of concrete slabs and old foundations and processed to provide a suitable granular fill, which can be re-used on site. Such recycled material would first require verification to confirm its suitability.

Waste soils and recycled aggregate can be reused on site under a standard rules environmental permit or a U1 waste exemption from the Environmental Permitting (England and Wales) Regulations 2010 if they are suitable for the proposed use, i.e. not cause harm to human health or the environment. However, it should be noted that these have strict limits on the quantity of material that can be reused.

10.1.6 Water supply and drainage

Due to the potential risk from residual organic contamination within the made ground it is considered the risk from contaminants permeating plastic water supply pipes to be potentially complete. As a consequence, water supply pipes may be required to be hydrocarbon-resistant “barrier pipe” materials.

The local water company will require a risk assessment for installation of water supply pipes and this will manage and control water supply installation.

10.2 Requirements for remediation verification/validation

10.2.1 Frequency and records

The remedial strategy will set out detailed provisions for verification of the remedial works, these being provided in a verification plan.

It is envisaged at this stage that verification/validation of the remediation will require:

- analytical testing at the limits of remedial excavations at appropriate frequencies which will be set out within an agreed remedial verification plan
- analytical testing of soils excavated from general excavations and stockpiled for re-use or in situ soils to be used to form cover systems
- for imported materials, certification and/or chemical testing depending on the source of the material to be carried out at agreed frequencies set out in the verification plan
- confirmation of suitability of materials intended for any cover system
- confirmation any soil cover system has been correctly installed at an agreed frequency set out in the verification plan
- a remedial verification report.

10.2.2 Chemical criteria

Appropriate criteria for chemical compliance will be developed and agreed within the remedial strategy document. These are likely to be based on the results of risk assessments, but taking into account other factors such as sustainability, practicality, and reasonableness. It is inappropriate to consider actual values at this stage until the remedial strategy is fully developed and all relevant contaminant linkages which require mitigation have been defined, this is particularly relevant to assessment of the potential for risk to controlled waters.

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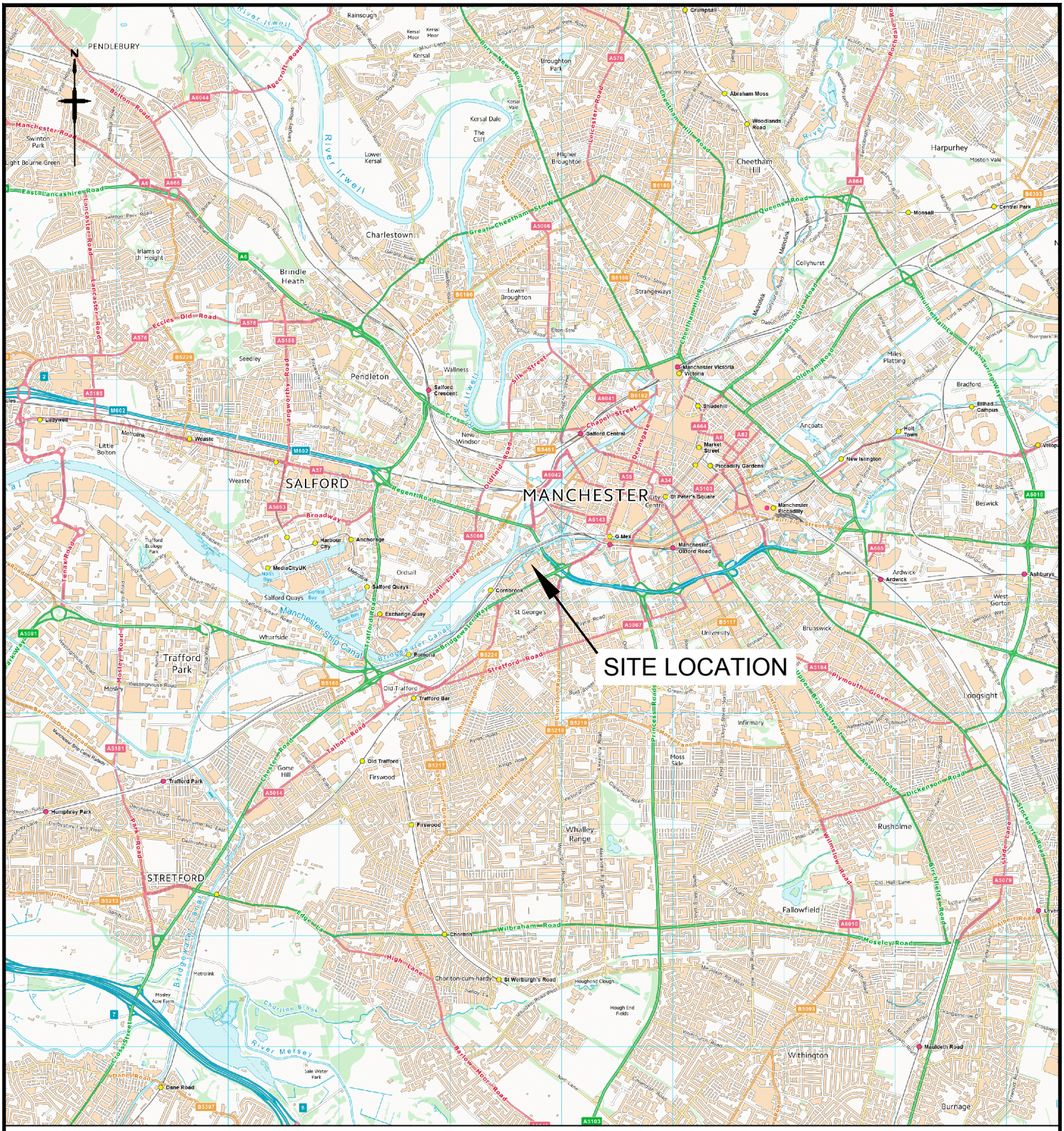
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FIGURES



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Client
JOULE CONSTRUCTING ENGINEERS LTD

Project Title
TALBOT MILL, MANCHESTER

Drawing Title
SITE LOCATION PLAN

Drawn	Date	Checked	Date	Approved	Date	Project No.	Drawing File
AP	24.07.18	EH	24.07.18	EH	24.07.18	11264	11264-R01(00)D001A

Scale	Orig Size	Dimensions	Drawing No.	Rev.
1:50000	A4	—	FIGURE 1	A



LEGEND:

- Phase 1 boreholes and trial pits
- Phase 2 trial pits

N

Notes

Base plan from Joule Consulting Engineers Ltd, Drawing 251-02 SL 40, Revision A, Dated 19.01.18

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
A	14.01.19	FIRST ISSUE	AP	EH	EH

Dimensions	Projection	Scale	Orig Size
m		1:300	A3

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CLIENT
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PROJECT
TALBOT MILL, MANCHESTER

TITLE
EXPLORATORY HOLE LOCATION PLAN

JOB No.:	DRAWING FILE:
11264	11264-R01(04)D002A

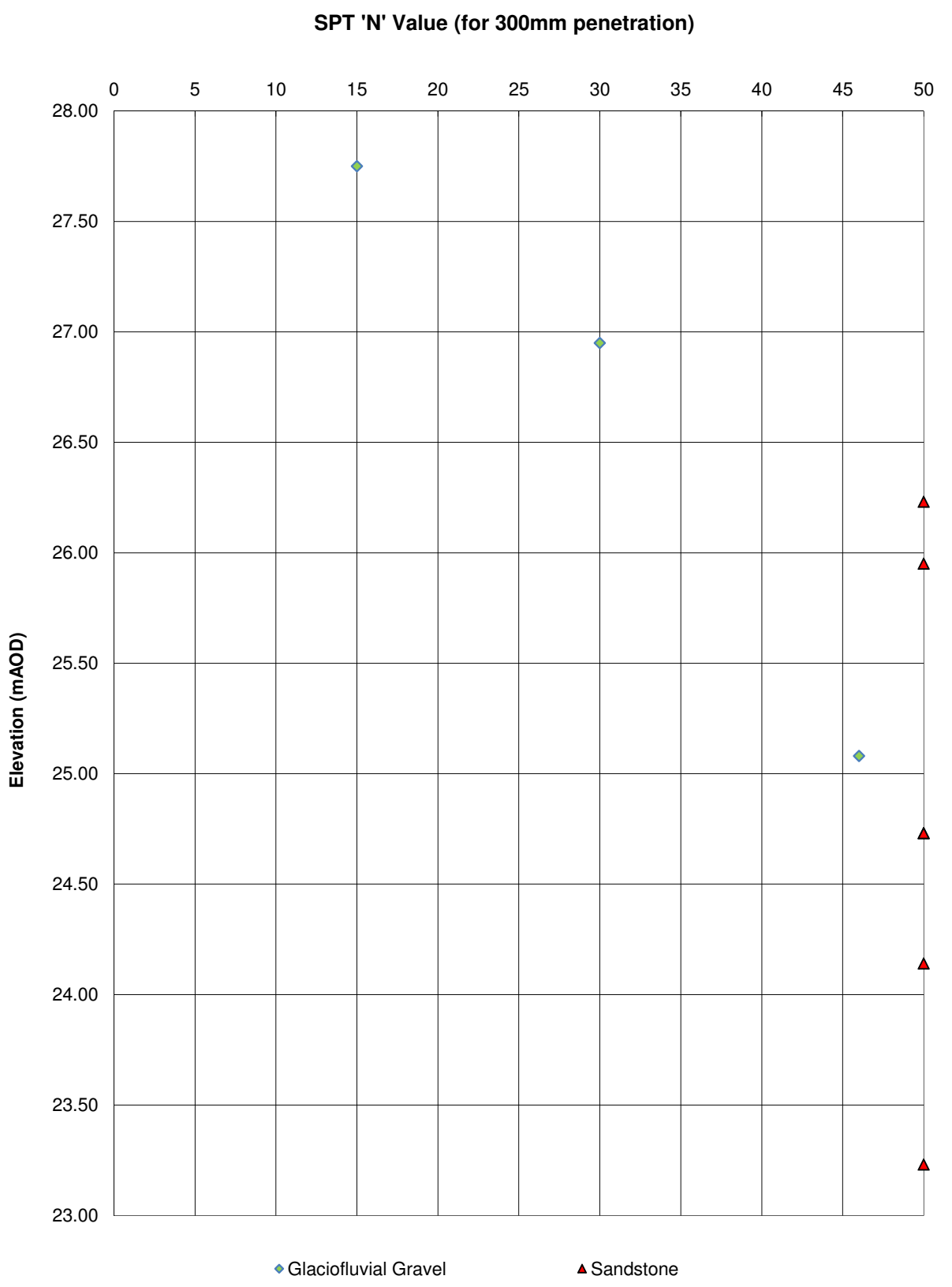
BY:	DATE:	CONTRACT NO.		REV:
AP	14.01.19		FIGURE 2	A

Scale 1:300

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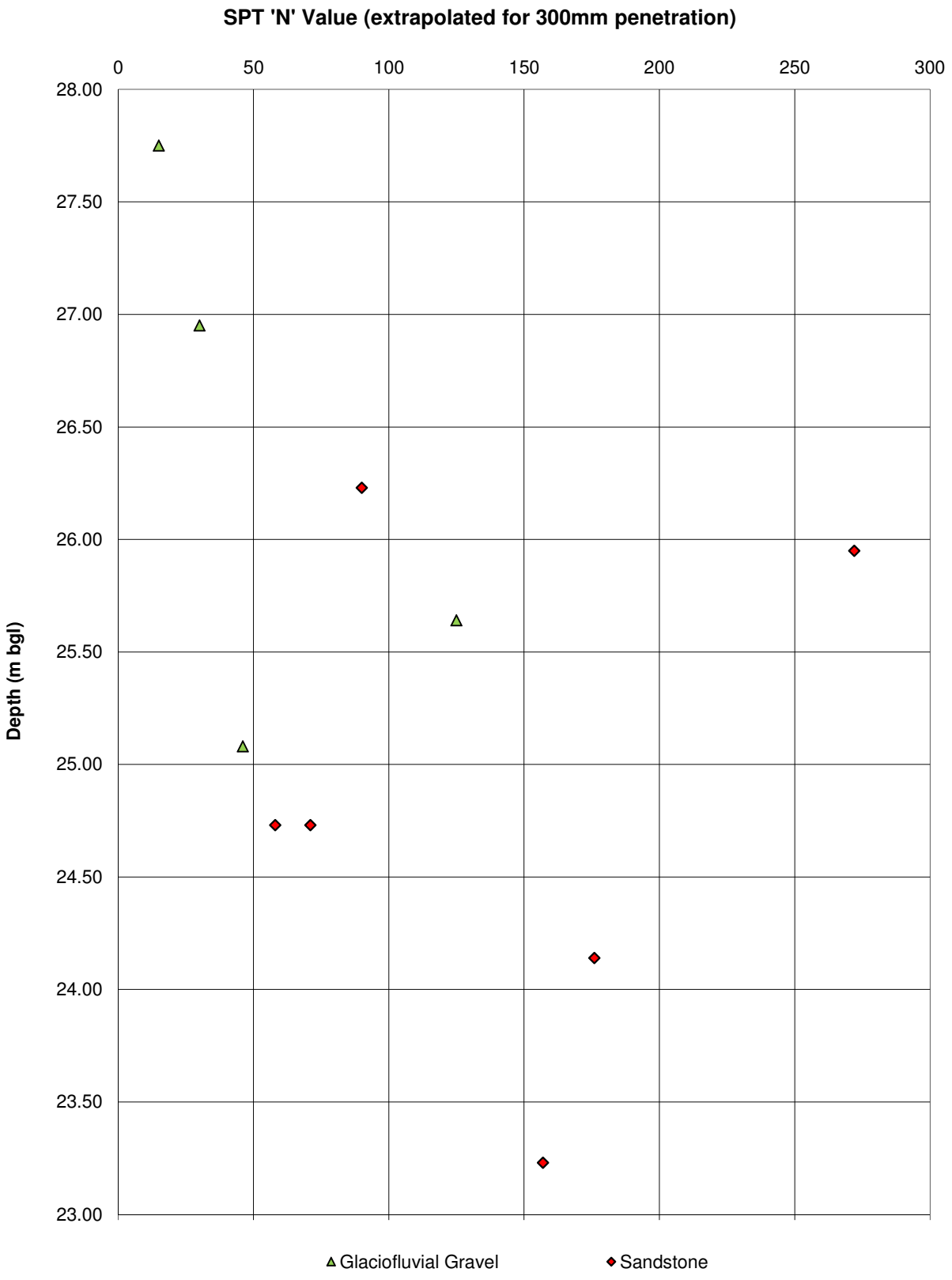
SPT 'N' VALUES vs ELEVATION

Site:	Client:	Job Number:	11264
Talbot Mill	Capital & Centric (Adored) Limited	Figure:	3



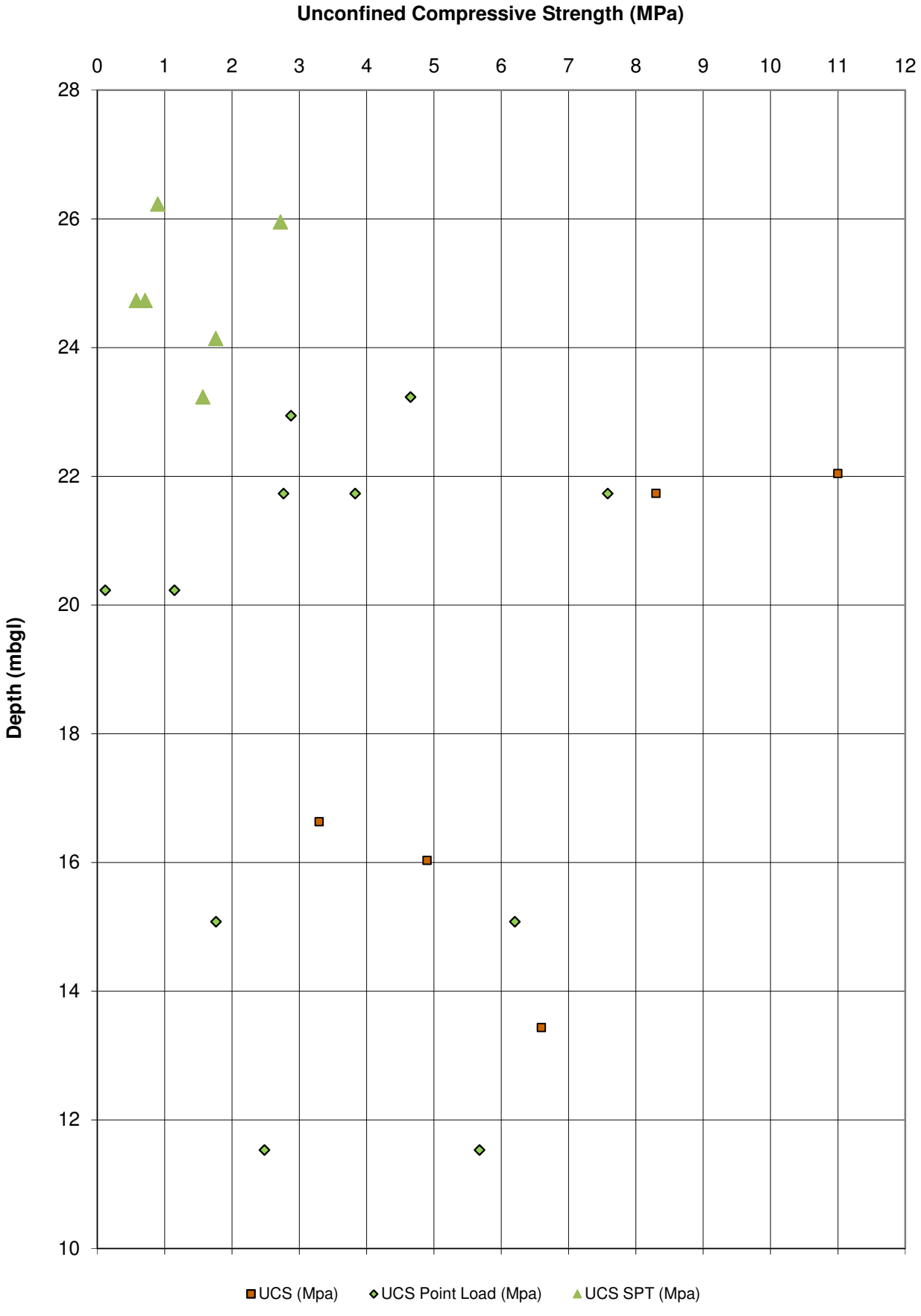
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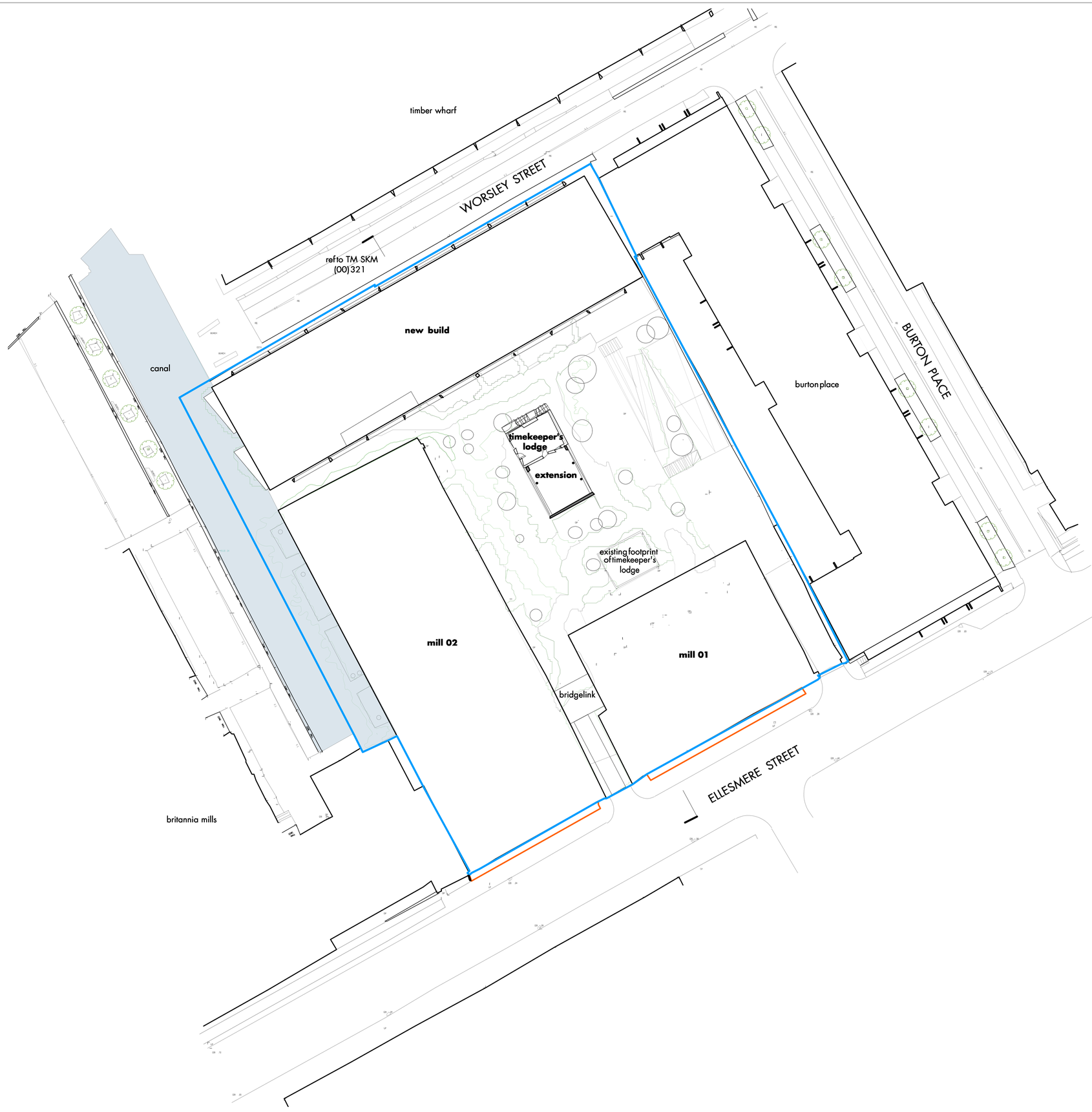
Site:	Client:	Job Number:	11264
Talbot Mill	Capital & Centric (Adored) Limited	Figure:	4



UCS vs ELEVATION

Site:	Client:	Job Number:	11264
Talbot Mill	Capital & Centric (Adored) Limited	Figure:	5







for proposed floor plans refer to drawing series TM SKM (00)140 - 170

for landscape refer to drawings by exterior architecture

site ownership boundary

lightwell boundary

rev	description	issued • drawn • checked
d	• tender issue- general update	2706 18 • ek • cy
c	• noteabout timekeeper lodge updated	0905 18 • cy • mdj
b	• lightwell added to ownership line	1304 18 • ek • cy
a	• ownership line added	0512 17 • sj • cy
-	• draft issue	0911 17 • cy • ek

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+44(0)207 2538881

project	talbot mill
client	capital & centric
drawing number	TM SKM (00) 021 **d**
scale	1:250 @ a1
status	**stage 04**

proposed site plan

do not scale from this drawing • all dimensions are to be set out and checked on site prior to starting construction • any discrepancy found between information given on this drawing and that given elsewhere or recorded on site shall be brought to the attention of the projectarchitect immediately

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Capital and Centric (Adored) Ltd (the "client") in accordance with the terms of a contract between RSK and the "client". The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.

2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**

4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.

6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B
SUMMARY OF LEGISLATION AND POLICY RELATING TO CONTAMINATED LAND

Part IIA of the Environmental Protection Act 1990 (EPA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA of the EPA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2010 provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2010 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Planning Policy

Contaminated land is often dealt with through planning because of land redevelopment. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF).

The new framework has only limited guidance on contaminated land, as follows:

- *"planning policies and decisions should also ensure that:*
    - *the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;*
    - *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*

- *adequate site investigation information, prepared by a competent person, is presented".*

APPENDIX C
RISK ASSESSMENT METHODOLOGY

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. Under CLR11, three stages of risk assessment exist: preliminary, generic quantitative and detailed quantitative. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) pollutant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in ‘significant harm’ as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in ‘Draft Circular on Contaminated Land’, DETR 2000)
- medium: chronic damage to human health (‘significant harm’ as defined in ‘Draft Circular on Contaminated Land’, DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services (‘significant harm’ as defined in ‘Draft Circular on Contaminated Land’, DETR 2000). Damage to sensitive buildings, structures or the environment

- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- Very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required.
- High: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term.
- Moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term.
- Low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild.
- Very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

APPENDIX D
EXPLORATORY HOLE RECORDS

BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH01**

Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.43**	**E:382661.6 N:397306.8**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
										MADE GROUND: Greyish brown gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse brick and limestone.	0.20	
0.30-1.00	1	ES	T, V, J							MADE GROUND: Blackish brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse brick and clinker.	(0.90) 1.10	
1.15-1.25	2	ES	T, V, J							MADE GROUND: Dark brown gravelly fine to coarse SAND. Gravel is angular to subrounded brick and mudstone. Poor recovery.	1.30	
1.20-1.65	1	SPT	N=46							. . . 1.20m to 1.70m refused in core barrel at 1.70m.	(0.50) 1.80	
1.40-1.70	3	B										
1.40-1.70	4	ES	T, V, J									
1.70-3.20												
1.70-2.11	2	SPT	6,11/11,10,18,11 for 30mm							Medium dense to dense brown slightly gravelly medium to coarse SAND. Gravel is subrounded to rounded fine to coarse mudstone. (GLACIOFLUVIAL DEPOSITS)		
1.70-3.20	5	C		53	37	15					(1.40) 3.20	
3.20-4.70										Weak thinly bedded reddish brown fine to medium grained SANDSTONE. Bedding fractures are closely to very closely spaced underlying rough.		
3.20-4.70	6	C								. . . 1.80m to 2.50m poor recovery.		
				81	14	14				Extremely weak red brown SANDSTONE. Recovered as sand.	(1.50) 4.70	
										. . . 4.10m to 4.40m, sub vertical joint.		
4.70-6.20										Weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Bedding fractures are closely spaced underlying rough partly open to open.		
4.70-6.20	7	C		100	99	63				. . . 4.90m to 5.03m sub vertical fracture.		
6.20-7.70												
6.20-7.70	8	C		88	88	75				. . . 6.15m to 6.18m, non intact (recovered as fine to coarse gravel of sandstone and siltstone).		
7.70-9.20												
7.70-9.20	9	C		97	96	90					(7.50)	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
		1.70	1.70	N/R	
		3.20	3.20	N/R	
		6.00	6.00	N/R	
		6.20	None	N/R	6.20
			None	N/R	4.00
		6.20	3.20	N/R	6.20

General Remarks

1. Scanned with GPR and CAT and Genny prior to excavation.
2. Encountered metal grate in first hand dug pit. Moved 0.50m and hand dug pit to 1.20m depth.
3. Rotary coring from 1.70m to 12.20m.
4. Water strike at at 6.20m depth, rising to 4.10m after 20 minutes.
5. Installation: Backfilled with bentonite 12.20m to 8.00m; 50mm slotted pipe 8.00m to 3.00m; 50mm plain pipe 3.00m to ground level.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**EHobbs + JEvans**	EH AGS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH01**

Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.43**	**E:382661.6 N:397306.8**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instru-mentation	Water	Description of Strata	Depth (Thick ness)	Material Graphic Legend
9.20-10.70 9.20-10.70	10	C		97 100	96 95	90 92				Weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Bedding fractures are closely spaced underlying rough partly open to open. *(stratum copied from 4.70m from previous sheet)*		
10.70-12.20 10.70-12.20	11	C		95	95	73					12.20	
										Borehole terminated at 12.20m depth.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**EHobbs + JEvans**	EH AGS

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH01**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.43**	**E:382661.6 N:397306.8**	**3** of **4**





Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**EHobbs + JEvans**	Checked By:	EH

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH01**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.43**	**E:382661.6 N:397306.8**	**4** of **4**





Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**EHobbs + JEvans**	Checked By:	EH

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BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH02**

Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**27.43**	**E:382704.6 N:397314.1**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
0.00-1.10	1	ES	T, V, J							MADE GROUND: Brown gravelly fine to coarse SAND with a low cobbles content. Gravel is angular to subrounded fine to coarse brick , mudstone, slate and sandstone. Cobbles are angular brick and slate and subrounded mudstone. With occasional pieces of timber and plastic.	(1.20)	
0.00-1.10	3	B									1.20	
1.20-2.70										No recovery in core (no description can be made)		
1.20-1.52	1	SPT	6,8/8,12,30 for 15mm							. . . 1.20m to 2.70m, poor recovery. Recovered as cobbles of sandstone.		
1.20-2.70	2	D		0	0	0						
2.70-4.20										. . . 2.70m to 4.20m, no recovery.	(3.60)	
2.70-3.06	2	SPT	10,10/15,18,17 for 60mm	0	0	0			1			
4.20-5.70										. . . 4.20m to 5.70m, poor recovery.		
4.20-4.34	3	SPT(c)	25/36,14 for 20mm								4.80	
4.80-5.70	4	B		50	40	30	NI 80 110			Very weak to weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Bedding fractures are shallowly dipping very closely to closely spaced underlying rough. Partly open to open.		
5.70-7.20				50	30	20						
6.70-7.20	5	B							1			
7.20-8.70										. . . 7.20m to 7.60m, no recovery.	(5.40)	
				67	65	9				. . . 7.60m to 7.90m, non intact. Recovered as angular to subangular medium to coarse gravel.		
8.70-10.20				79	79	66				. . . 8.70m to 8.85m, with occasional thin black laminations.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
15/05/18		1.20	1.20	N/R	
		2.70	2.70	N/R	
		4.20	4.20	N/R	
		5.70	5.70	N/R	
		7.20	None	N/R	7.20
			None	N/R	5.70

General Remarks

1. Scanned with GPR and CAT and Genny prior to excavation.
2. Rotary coring from 2.70m to 16.20m.
3. Water strike at 7.20m depth, rise to 3.80m below ground level after 20 minutes and 5.70m below ground level at end of borehole.
4. Installation: Backfilled with bentonite 16.20m to 8.00m; 50mm slotted pipe 8.00m to 3.00m; 50mm plain pipe 3.00m to ground level.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**JEvans + JTee**	EH AGS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH02**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**15.05.18** End: **15.05.18**	**27.43**	**E:382704.6 N:397314.1**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
				79	79	66				Very weak to weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Bedding fractures are shallowly dipping very closely to closely spaced underlying rough. Partly open to open. *(stratum copied from 4.80m from previous sheet)* . . . 9.93m to 10.20m, no recovery. Recovered fine to coarse gravel.	10.20	
10.20-11.70				100	99	90	NI 260 440			Weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Bedding fractures are shallowly dipping closely to medium spaced underlying rough partly open. . . . 10.30m to 10.42m, non intact. Recovered as fine to coarse sand and gravel. . . . 10.63m to 10.70m, non intact. Recovered as fine to coarse sand and gravel. . . . 10.70m to 10.75m, non intact. Recovered as fine to coarse sand and gravel.	(3.72)	
11.70-13.20				95	85	85						
13.20-14.70				100	95	73				. . . 13.82m to 13.93m, area of non intact. Recovered as fine to medium grained sandstone and angular to subangular gravel.	13.92	
										Weak thinly bedded reddish brown fine to medium grained SANDSTONE. Bedding fractures are shallowly dipping closely to very closely spaced underlying rough partly open to open. . . . 14.47m to 14.59m, area of non intact. Recovered as fine to medium grained sandstone and angular to subangular gravel. . . . 14.70m to 15.30m, no recovery. . . . 15.50m to 15.62m, non intact. Recovered as angular to subangular fine to medium gravel. . . . 15.70m to 15.85m, with occasional yellow grey laminations.	(2.28)	
14.70-16.20				56	39	8	NI 70 120				16.20	
										Borehole terminated at 16.20m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**JEvans + JTee**	EH AGS

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH02**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**27.43**	**E:382704.6 N:397314.1**	**3** of **4**





Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**JEvans + JTee**	Checked By:	EH

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH02**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**27.43**	**E:382704.6 N:397314.1**	**4** of **4**



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Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**JEvans + JTee**	Checked By:	EH AGS

BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH03**

Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.84**	**E:382699.6 N:397274.6**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instru-mentation	Water	Description of Strata	Depth (Thick ness)	Material Graphic Legend
										MADE GROUND: Cobble setts.	0.10	
0.30-0.50	1	ES	T, J, V							MADE GROUND: Greyish brown black slightly clayey gravelly fine to coarse SAND with a medium cobble content of sandstone. Gravel is angular to subrounded fine to coarse of brick, glass, clinker and ceramic tiles.	(0.95)	
											1.05	
1.10-1.30	2	ES	T, J, V							Very dense reddish brown slightly clayey SAND AND GRAVEL. Sand is medium to coarse. Gravel is subrounded to rounded fine to coarse mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)		
1.10-1.30	3	D										
1.20-1.47	1	SPT	6,6/22,28 for 45mm				NI 60 110				(1.65)	
											2.70	
2.70-4.20										Weak medium strong reddish brown medium to coarse grained SANDSTONE with well rounded quartz gravel. Subhorizontal bedding fractures.		
2.70-2.88	2	SPT(c)	13,12/35,15 for 10mm	45	45	7			1			
4.20-5.70				96	96	47			1	. . . 4.85m to 4.95m, slight colour change to light brown with medium to coarse graining.		
5.70-7.20				91	91	68	NI 230 320			. . . 6.90m, approximately 32 degree fracture.		
7.20-8.70				99	98	75				. . . 7.10m to 7.27m, non intact.	(10.50)	
8.70-10.20				96	87	78				. . . 8.76m to 8.83m, non intact.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
		1.20	1.20	N/R	
		2.70	2.70	N/R	
		4.20	4.20	N/R	
		5.70	4.20	N/R	5.70
			3.40	N/R	

General Remarks

1. Scanned with GPR and CAT and Genny prior to excavation.
2. Evidence at 2.70m of fall in from above casing. Scrubbing on top of core.
3. Installation: Backfilled with bentonite 13.20m to 8.00m; 50mm slotted pipe 8.00m to 3.00m; 50mm plain pipe 3.00m to ground level.
4. Rotary coring between 2.70m amd 13.20m.
5. Groudnwater strike at 5.70m, rose to 3.10m after 20 minutes.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**EHobbs + JEvans**	EH AGS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH03**

Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.84**	**E:382699.6 N:397274.6**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
				96	87	78	NI 230 320			Weak medium strong reddish brown medium to coarse grained SANDSTONE with well rounded quartz gravel. Subhorizontal bedding fractures. *(stratum copied from 2.70m from previous sheet)* . . . 9.34m to 9.43m, drilling subvertical fracture. . . . 9.80m to 10.00m, subvertical fracture.		
10.20-11.70				95	92	77				. . . 10.20m to 13.20m, fracture orientation changes direction. Rounded quartz and mudstone gravel. Medium strong to weak. . . . 10.75m, non intact. . . . 10.85m to 11.70m, non intact.		
11.70-13.20				97	97	90	NI 170 280			. . . 11.76m, non intact. Recovered as fine to medium gravel and coarse sand.	13.20	
										Borehole terminated at 13.20m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**EHobbs + JEvans**	EH AGS

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH03**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.84**	**E:382699.6 N:397274.6**	**3** of **4**





Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**EHobbs + JEvans**	Checked By:	EH

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH03**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.84**	**E:382699.6 N:397274.6**	**4** of **4**



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BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH04**

Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**28.95**	**E:382720.1 N:397285.9**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
										MADE GROUND: Greyish brown gravelly COBBLES of concrete setts. Gravel is angular to subangular fine to coarse bituminous macadam.	0.20	
0.30-0.90	1	ES	T,V,J							MADE GROUND: Blackish brown gravelly slightly clayey fine to coarse SAND. Gravel is angular to subrounded fine to coarse of brick, bituminous macadam and concrete. With occasional pieces of ceramic.	(0.80) 1.00	
1.20-1.65	1	SPT	N=15							Medium dense to dense yellowish brown gravelly silty fine to coarse SAND. Gravel is subangular to rounded fine to coarse sandstone, limestone and mudstone. With rare cobbles of rounded sandstone and,limestone. (GLACIOFLUVIAL DEPOSITS)		
1.20-1.50	2	ES	T,V,J									
1.50-2.00	3	B									(2.00)	
2.00-2.45	2	SPT	N=30									
2.00-3.00	4	B								. . . 1.20m to 2.00m, poor recovery.		
										. . . 2.00m to 3.00m, poor recovery.	3.00	
3.00-4.50										Cobbles (possibly weathered SANDSTONE)		
3.00-3.14	3	SPT	22,3/50 for 55mm							. . . 3.00m to 5.40m, poor recovery. Recovered as a few sandstone cobbles.		
				10	0	0						
4.50-6.00											(2.40)	
				50	40	10			1			
5.40-6.00	5	D								Very weak to weak red brown fine to coarse grained SANDSTONE. Bedding fractures are closely to very closely spaced horizontal to subhorizontal shallowly dipping (0 degrees to 0.5 degrees) tight partly open underlying rough.	5.40	
6.00-7.50										. . . 6.00m to 6.12m, non intact. Recovered as fine to coarse sand with angular to subrounded gravel.		
				95	82	47				. . . 6.46m to 6.62m, vertical fracture.		
										. . . 6.90m to 7.00m, non intact. Recovered as fine to coarse sand with angular to subrounded gravel.		
7.50-9.00							NI 120 220				(5.10)	
				96	93	71				. . . 8.06m to 8.46m, discolouration.		
										. . . 8.64m, inclusion of angular gravel (30mm).		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
		3.00	3.00	N/R	
		4.50	4.50	N/R	
		6.00	6.00	N/R	
		6.00	4.50	N/R	6.00
			None	N/R	5.10

General Remarks

1. Scanned with GPR and CAT and Genny prior to excavation.
2. Rotary coring from 3.00m to 15.00m.
3. Water strike at 6.00m depth, rise to 5.20m below ground level after 20 minutes and 5.10m below ground level at end of borehole.
4. Installation: Backfilled with bentonite 15.00m to 8.00m; 50mm slotted pipe 8.00m to 3.00m; 50mm plain pipe 3.00m to ground level.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**JEvans + JTee**	EH AGS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JBH04**

Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**28.95**	**E:382720.1 N:397285.9**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill & Instru-mentation	Water	Description of Strata	Depth (Thick ness)	Material Graphic Legend
9.00-10.50				90	81	30				Very weak to weak red brown fine to coarse grained SANDSTONE. Bedding fractures are closely to very closely spaced horizontal to subhorizontal shallowly dipping (0 degrees to 0.5 degrees) tight partly open underlying rough. *(stratum copied from 5.40m from previous sheet)* . . . 9.34m, inclusion of subrounded gravel. . . . 9.50m to 9.64m, non intact. Recovered as fine to coarse sand with angular to subrounded gravel.	10.50	
10.50-12.00				97	55	23	NI 110 150			Weak thinly bedded reddish brown medium to coarse grained SANDSTONE with rare subangular to subrounded inclusions up to 12.00mm of quartz. Bedding fractures are closely spaced underlying rough. . . . 10.56m to 10.60m, non intact. Recovered as fine to coarse sand and gravel. Gravel is angular to subrounded fine to coarse. . . . . 11.50m to 12.00m, non intact possibly drilling induced. recovered as medium to coarse grained SAND AND GRAVEL. Gravel is angular to subangular. Bedding fractures still clear. Evidence of scrubbing carries on to next box with core that looks to have been re-drilled. . . . 12.00m to 12.10m, rounded cobble sized pieces of SANDSTONE. . . . 12.40m to 13.30m, area of moderately strong SANDSTONE. . . . 13.36m, 35 degree fracture. . . . 13.60m to 13.76m, non intact. Recovered as fine to coarse sand and gravel. Gravel is angular to subrounded.	(4.50)	
12.00-13.50				85	81	36						
13.50-15.00				93	77	51	NI 100 210			. . . 14.50m to 14.72m subvertical fracture.	15.00	
										Borehole terminated at 15.00m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Trial Pit/trench + Rotary Cored	**Hand tools + Comacchio GEO 205**	**Lee Gidman**	**JEvans + JTee**	EH AGS

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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH04**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**28.95**	**E:382720.1 N:397285.9**	**3** of **4**





Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**JEvans + JTee**	Checked By:	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log COMPOSITE LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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BOREHOLE LOG

Contract:		Client:		Borehole:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JBH04**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**28.95**	**E:382720.1 N:397285.9**	**4** of **4**



GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log COMPOSITE LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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Method Used:	**Trial Pit/trench + Rotary Cored**	Plant Used:	**Hand tools + Comacchio GEO 205**	Drilled By:	**Lee Gidman**	Logged By:	**JEvans + JTee**	Checked By:	EH

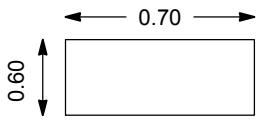
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP01**

Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.22**	**E:382709.4 N:397262.5**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Asphalt tile with woven geotextile and bituminous binding. Tar odour when breaking ground.	0.05	
0.10-0.30	1	ES	T, V, J			MADE GROUND: Blackish brown gravelly ashy SAND. Gravel is angular to subangular fine to coarse asphalt,brick and slate. Sand is ashy.	(0.30)	
						MADE GROUND: One course of brick.	0.35 0.45	
0.50-1.00 0.50-1.00	2 3	ES D	T, V, J			Brown gravelly medium to coarse SAND. Gravel is angular to rounded fine to coarse mudstone and sandstone with rare whole shells. With occasional pockets of silty clay. (GLACIOFLUVIAL DEPOSITS)	(0.55)	
						Trial pit terminated at 1.00m depth.	1.00	

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

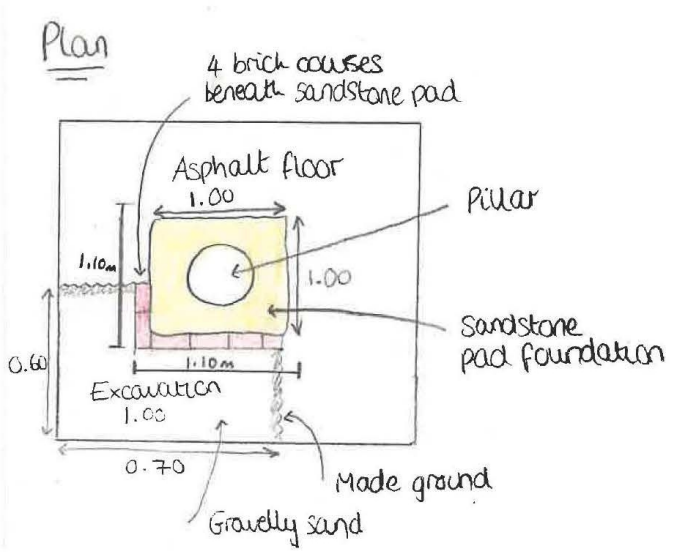
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

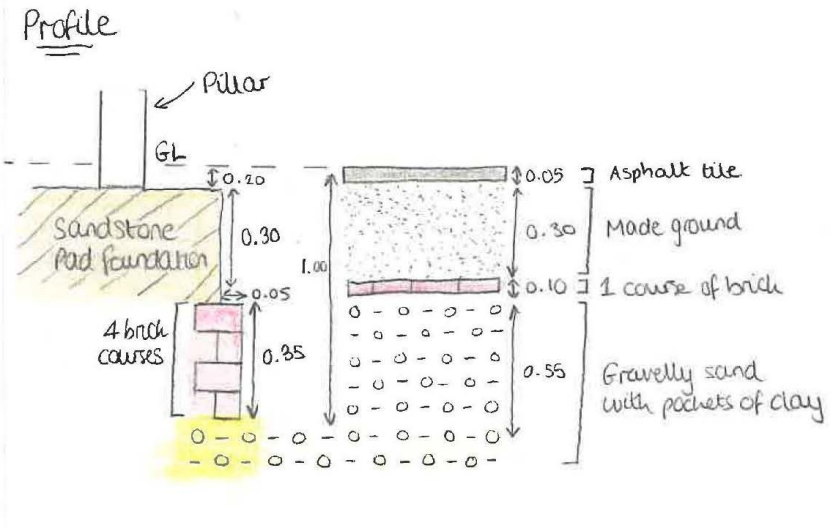
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP01**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.22**	**E:382709.4 N:397262.5**	**2** of **3**

Trial Pit JTP01 Sketch of Plan and Profile





Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP01**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.22**	**E:382709.4 N:397262.5**	**3** of **3**

Trial Pit JTP01 - Photo 1





Trial Pit JTP02 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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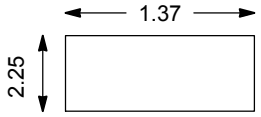
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP02**

Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.16**	**E:382721.4 N:397270.7**	**1** of **5**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Wood floorboard (MDF / Ply)	0.05	
						VOID	(0.25)	VOID
							0.30	
						Light brown yellowish grey slightly silty SAND and subrounded to subangular fine to coarse GRAVEL with a low to medium cobble content of angular sandstone cobbles. (GLACIOFLUVIAL DEPOSITS)	(1.00)	
0.90-1.10	1	ES						
0.90-1.10	2	D						
							1.30	
						Orangish red silty SAND. (Recovered as weathered sandstone)	1.33	
						Trial pit terminated at 1.33m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings to 0.70m and replaced wooden floorboard.

All dimensions in metres | Scale: **1:21**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

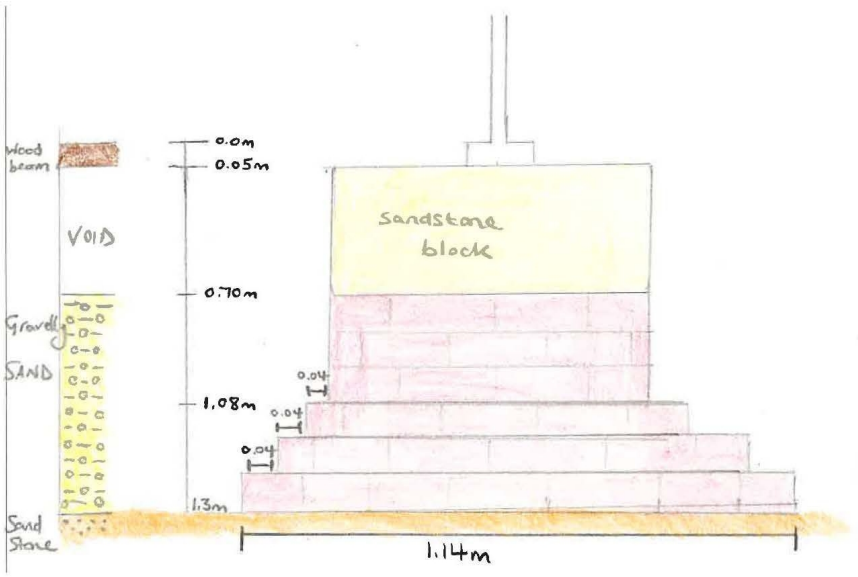
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP02**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.16**	**E:382721.4 N:397270.7**	**2** of **5**

Trial Pit JTP02 Sketch of Profile



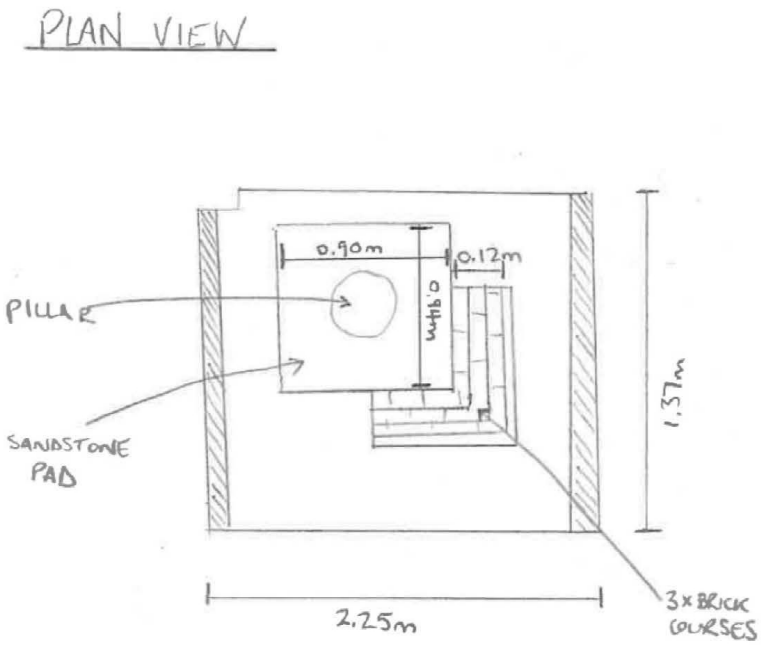
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP02**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.16**	**E:382721.4 N:397270.7**	**3** of **5**

Trial Pit JTP02 Sketch of Plan



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP02**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.16**	**E:382721.4 N:397270.7**	**4** of **5**

Trial Pit JPT02 - Photo 1



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP02**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.16**	**E:382721.4 N:397270.7**	**5** of **5**

Trial Pit JTP02 - Photo 2





Trial Pit JTP02 - Photo 3

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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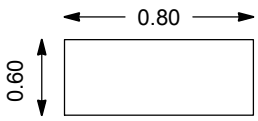
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP03**

Contract Ref:	Start: **18.05.18** End: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**26.19**	**E:382703.8 N:397262.9**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.30	1	ES	T,V,J			MADE GROUND: Asphalt tile with woven geotextile and bituminous binding. Tar odour when breaking ground.	0.05	
						MADE GROUND: Blackish brown gravelly ashy SAND. Gravel is angular to subangular fine to coarse asphalt,brick and slate.	(0.30)	
							0.35	
						MADE GROUND: One course of brick.	0.45	
0.50-1.00	2	ES	T,V,J			Brown gravelly medium to coarse SAND. Gravel is angular to rounded fine to coarse mudstone and sandstone with rare whole shells. With occasional pockets of silty clay. (GLACIOFLUVIAL DEPOSITS)	(0.65)	
0.50-1.00	3	D						
							1.10	
						Trial pit terminated at 1.10m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 1.10m bgl.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

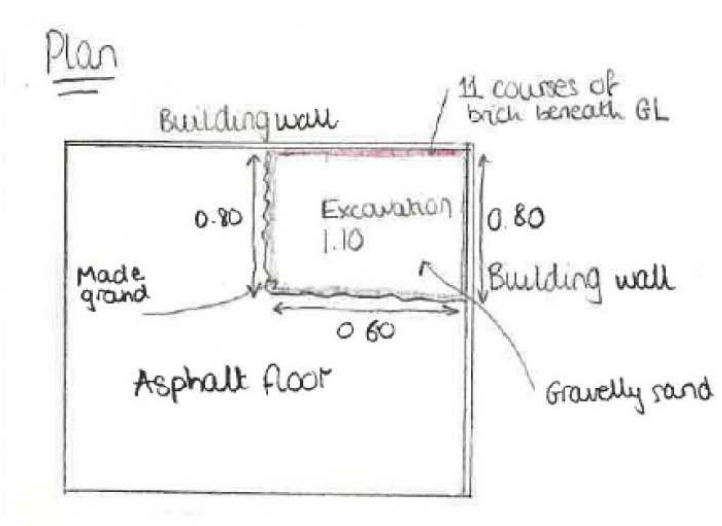
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP03**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.19**	**E:382703.8 N:397262.9**	**2** of **4**

Trial Pit JTP03 - Sketch of Plan



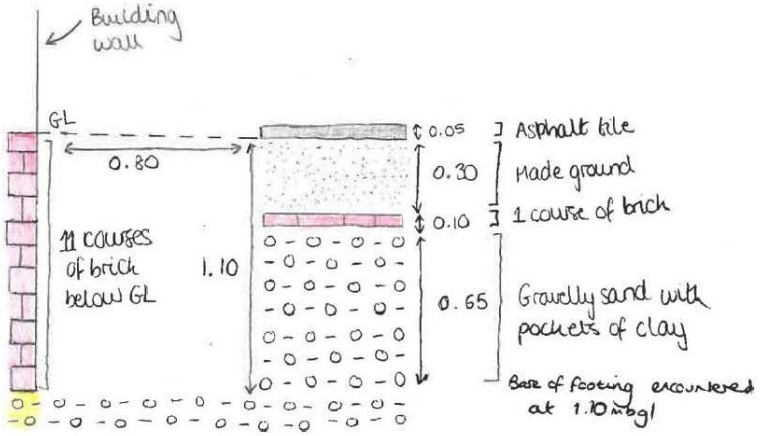
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Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP03**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.19**	**E:382703.8 N:397262.9**	**3** of **4**

Trial Pit JTP03 - Sketch of Face



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP03**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.19**	**E:382703.8 N:397262.9**	**4** of **4**

Trial Pit JTP03 - Photo 1





Trial Pit JTP03 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:40 | JS12 |

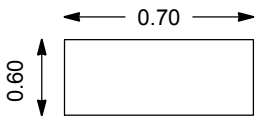
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP04**

Contract Ref:	Start: **18.05.18** End: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**26.16**	**E:382715.9 N:397260.1**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.35	1	ES	T,V,J			MADE GROUND: Asphalt tile with woven geotextile and bituminous binding. Tar odour when breaking ground.	0.05	
						MADE GROUND: Blackish brown gravelly ashy SAND. Gravel is angular to subangular fine to coarse asphalt,brick and slate.	(0.35) 0.40	
0.45-0.80	2	ES	T,V,J			Brown gravelly medium to coarse SAND. Gravel is angular to rounded fine to coarse mudstone and sandstone with rare whole shells. With occasional pockets of silty clay. (GLACIOFLUVIAL DEPOSITS)	(0.40) 0.80	
0.45-0.80	3	D						
						Trial pit terminated at 0.80m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

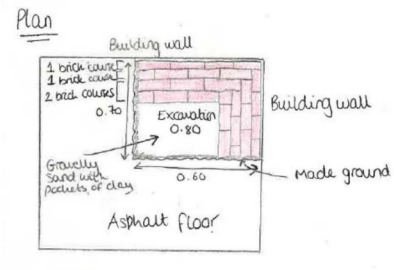
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

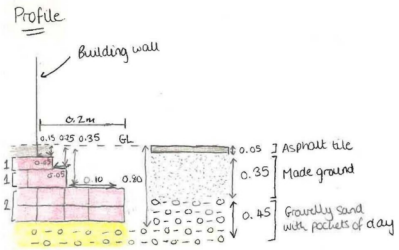
GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP04**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.16**	**E:382715.9 N:397260.1**	**2** of **3**

Trial Pit JTP04 Sketch of Plan





Trial Pit JTP04 Sketch of Profile

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP04**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.16**	**E:382715.9 N:397260.1**	**3** of **3**

Trial Pit JTP04 - Photo 1





Trial Pit JTP04 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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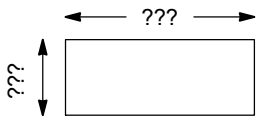
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP05**

Contract Ref:	Start: **18.05.18** End: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**26.17**	**E:382713.6 N:397267.6**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Concrete (unreinforced).	0.10	
						MADE GROUND: Greyish brown ashy silty SAND and subangular to angular fine to coarse GRAVEL of concrete, brick and sandstone with occasional glass and ceramic.	(0.40)	
0.50 0.50	1 2	ES D	T, V, J				0.50	
						Light brown yellowish grey slightly silty gravelly fine to medium SAND with a low cobble content of sandstone. Gravel is subrounded to rounded fine to coarse of sandstone and quartzite. (GLACIOFLUVIAL DEPOSITS)	0.68	
						Trial pit terminated at 0.68m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate to difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

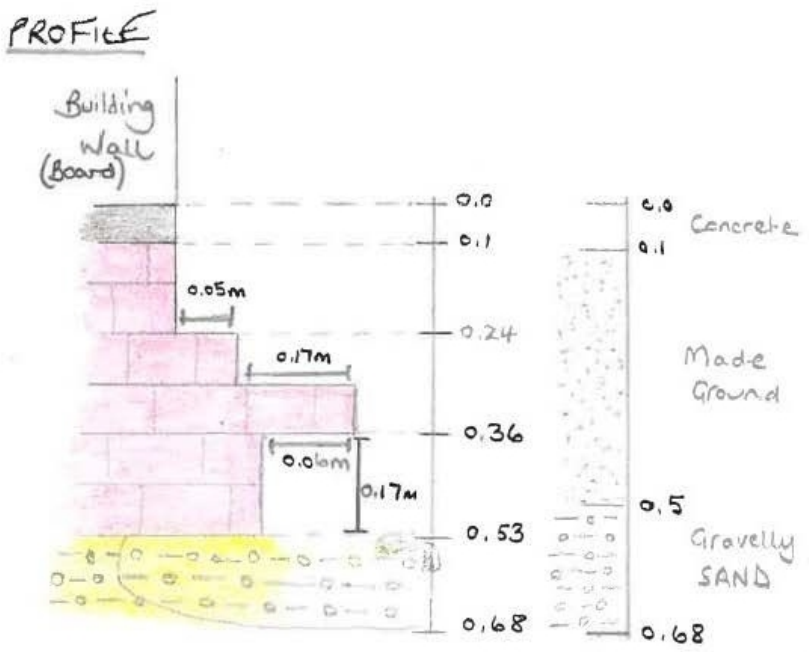
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP05**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.17**	**E:382713.6 N:397267.6**	**2** of **3**

Trial Pit JTP05 - Sketch of Profile



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP05**
Contract Ref:	Start: **18.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **18.05.18**	**26.17**	**E:382713.6 N:397267.6**	**3** of **3**

Trial Pit JTP05 - Photo 1





Trial Pit JTP05 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

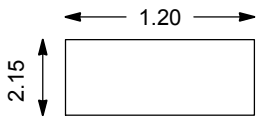
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP06**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**15.05.18** End: **15.05.18**	**26.15**	**E:382725.6 N:397274.4**	**1** of **5**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Wooden floor board.	0.05	
						MADE GROUND: Wooden beam.	0.11	
						VOID	(0.34)	VOID
							0.45	
						MADE GROUND: Reddish brown slightly clayey gravelly SAND with a medium cobble content of wood, brick and sandstone. Gravel is fine to coarse of brick, glass and wood fragments.	(0.27)	
							0.72	
0.80-0.95	1	ES	T,V,J			Yellowish-greyish brown slightly clayey silty gravelly fine to medium SAND with a medium cobble content of sandstone. Gravel is subrounded to rounded fine to coarse of sandstone. (GLACIOFLUVIAL DEPOSITS)	0.80	
0.80-0.95	2	D						
0.80		V	c_u=34				0.95	
						Firm to stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium of mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)		
						Trial pit terminated at 0.95m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

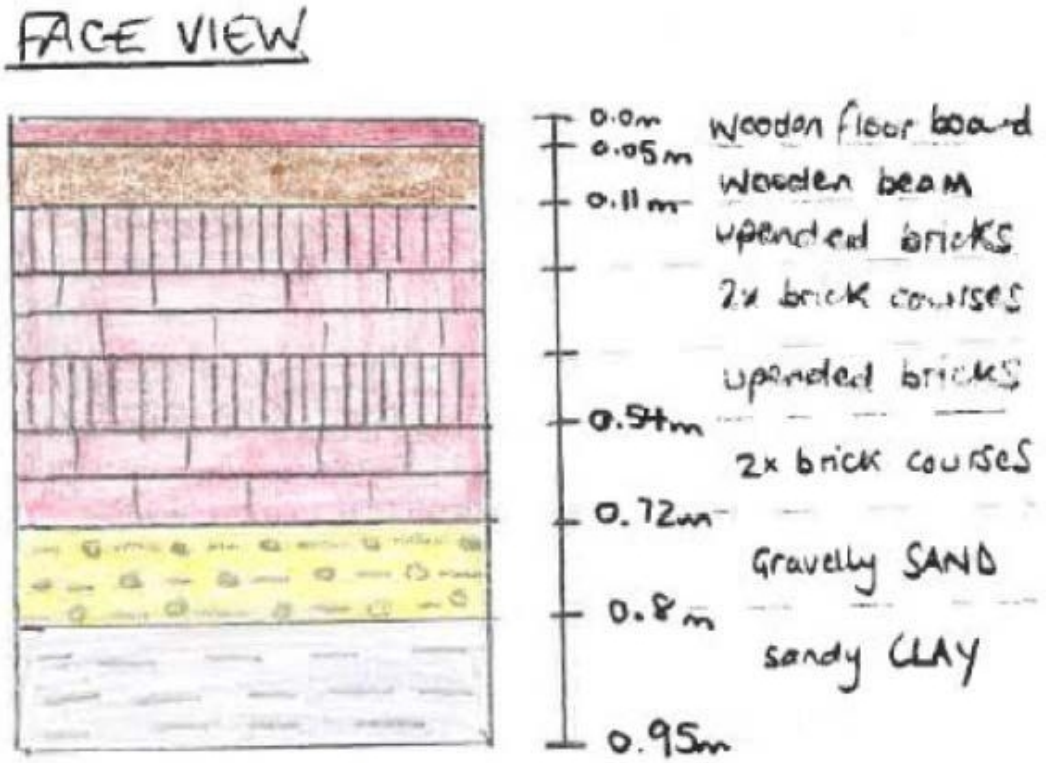
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP06**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**26.15**	**E:382725.6 N:397274.4**	**2** of **5**

Trial Pit JTP06 Sketch of Face View



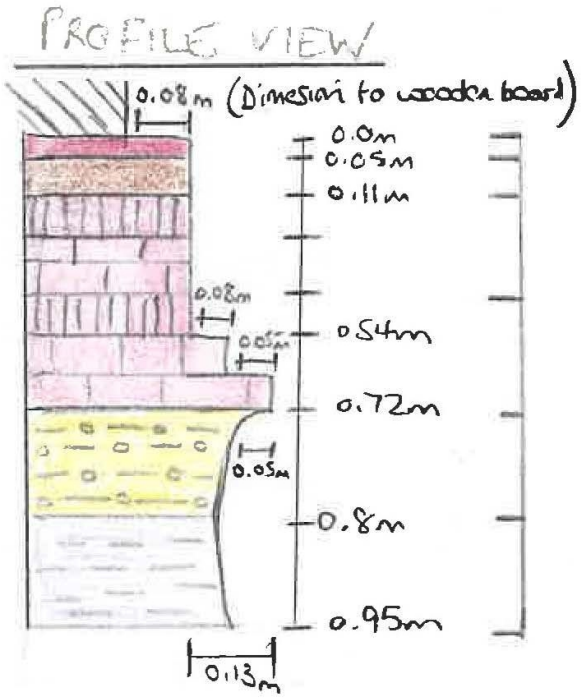
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP06**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**26.15**	**E:382725.6 N:397274.4**	**3** of **5**

Trial Pit JTP06 - Sketch of Pofile



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP06**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**26.15**	**E:382725.6 N:397274.4**	**4** of **5**

Trial Pit JTP06 - Photo 1





Trial Pit JTP06 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP06**

Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**26.15**	**E:382725.6 N:397274.4**	**5** of **5**

Trial Pit JTP06 - Photo 23



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

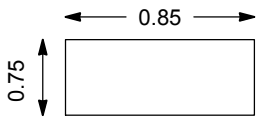
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP07**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**17.05.18** End: **17.05.18**	**26.17**	**E:382729.3 N:397268.0**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Wooden floorboard (MDF/ Ply).	0.03	
						MADE GROUND: Wooden beam / joist.	0.11	
						VOID	(0.53)	VOID
							0.64	
						MADE GROUND: Blackish grey ashy gravelly ashySAND with a low cobble content of brick. Gravel is angular to subangular fine to coarse of brick and glass with frequent pieces of wood, plastic and rare glass.	0.75	
0.80-1.00	1	ES				Light yellowish reddish brown slightly silty SAND and subrounded to subangular fine to coarse GRAVEL of frequent rounded sandstone. (GLACIOFLUVIAL DEPOSITS)	(0.50)	
0.80-1.00	2	D					1.25	
						Orangish red silty SAND. (Recovered weathered sandstone)	1.30	
						Trial pit terminated at 1.30m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings to 0.65m and replaced wooden floorboard.

All dimensions in metres | Scale: **1:21**

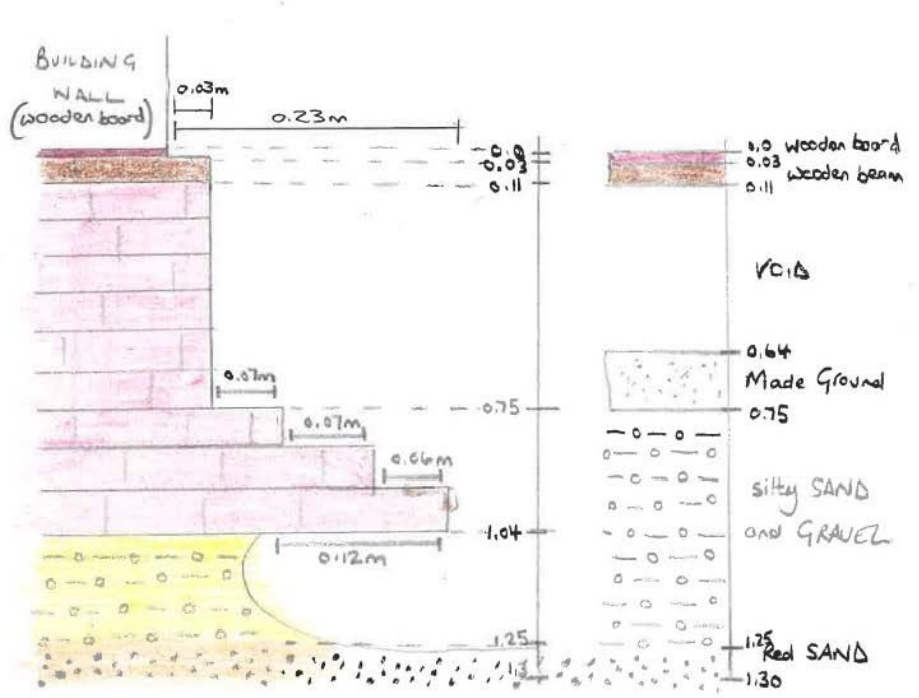
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP07**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382729.3 N:397268.0**	**2** of **4**

Trial Pit JTP07 - Sketch of Profile



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP07**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382729.3 N:397268.0**	**3** of **4**





JTP07 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP07**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382729.3 N:397268.0**	**4** of **4**

JTP07 - Photo 3



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

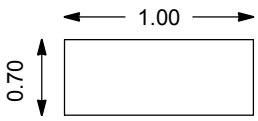
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP10**

Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382688.0 N:397268.5**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Yorkstone flags.	0.08	
0.10-0.40	1	ES	T,V,J			MADE GROUND: Brown gravelly SAND. Gravel is angular to subrounded fine to coarse mudstone and brick.	(0.45)	
							0.53	
0.60-1.20	2	ES	T,V,J			Light brown gravelly medium to coarse SAND. Gravel is subrounded to rounded fine to coarse of mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)		
0.80-1.50	3	D					(0.97)	
							1.50	
						Trial pit terminated at 1.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and flagstones reinstated with post mix concrete.

All dimensions in metres | Scale: **1:21**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

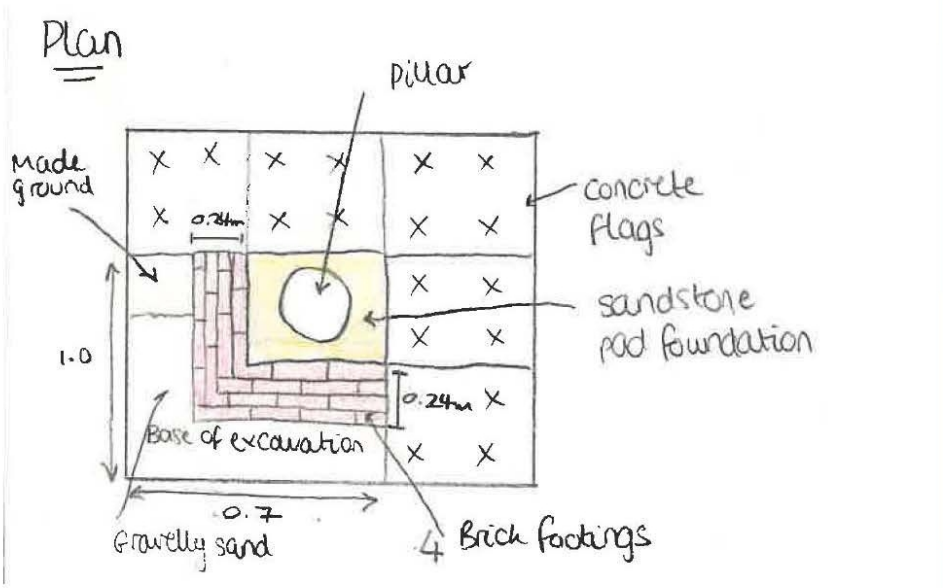
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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382688.0 N:397268.5**	**2** of **4**

Trial Pit JTP010 Sketch of Plan



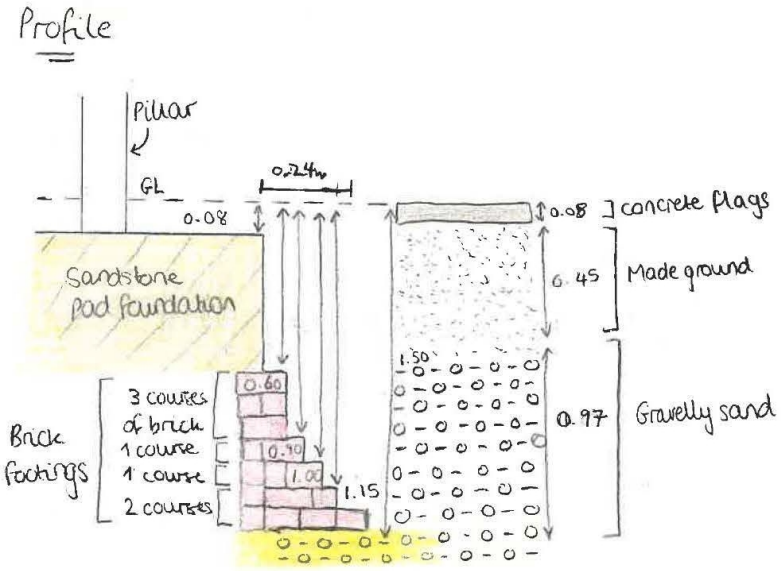
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382688.0 N:397268.5**	**3** of **4**

Trial Pit JTP10 - Sketch of Profile



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.17**	**E:382688.0 N:397268.5**	**4** of **4**

Trial Pit JTP10 - Photo 1





Trial Pit JTP10 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

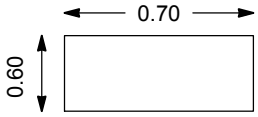
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP10A**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**17.05.18** End: **17.05.18**	**26.18**	**E:382686.0 N:397257.5**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Yorkstone flags.	0.08	
0.10-0.40	1	ES	T,V,J			MADE GROUND: Greyish brown gravelly ashy SAND. Gravel is angular to subrounded fine to coarse of brick and sandstone.	(0.45)	
							0.53	
0.50-0.70	2	ES	T,V,J			Light brown gravelly SAND. Gravel is subrounded to rounded fine to coarse mudstone and sandstone with occasional pockets of sandy silty clay. (GLACIOFLUVIAL DEPOSITS)		
0.50-0.80	4	ES	T,V,J					
0.50-0.80	5	D						
0.50		V	c_u=34				(1.05)	
							1.58	
						Trial pit terminated at 1.58m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. On completion, trial pit backfilled with arisings and flagstones finished with postmix concrete.
6. Trial pit terminated at 1.58m bgl.

All dimensions in metres | Scale: **1:21**

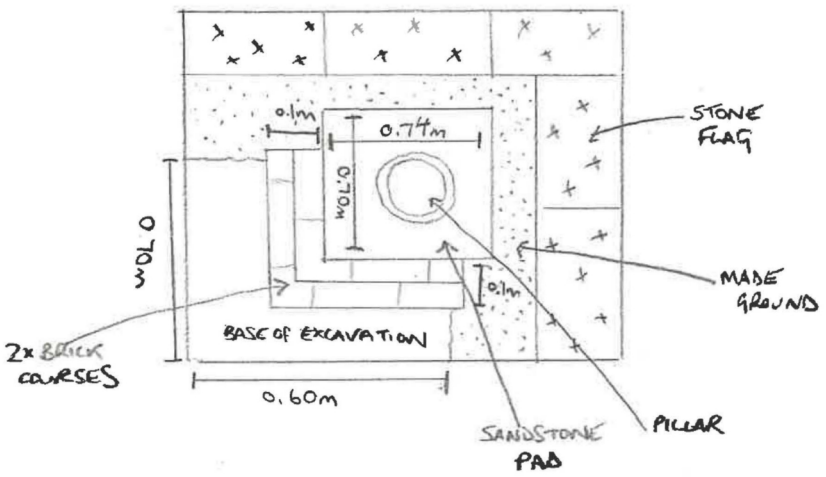
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10A**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.18**	**E:382686.0 N:397257.5**	**2** of **4**

Trial Pit JTP10A Sketch of Plan



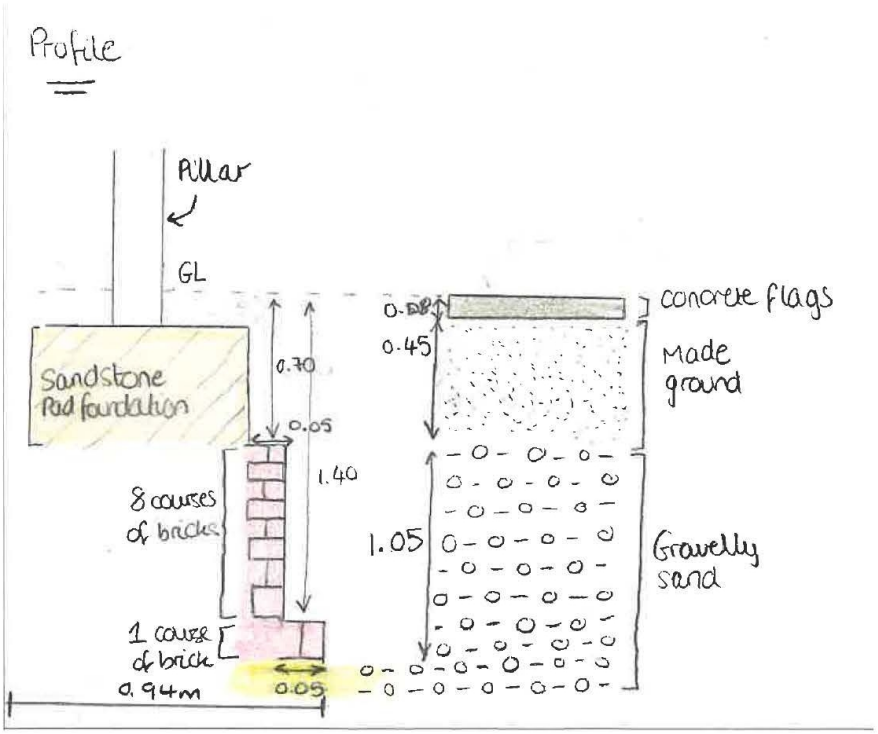
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10A**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.18**	**E:382686.0 N:397257.5**	**3** of **4**

Trial Pit JTP10A Sketch of Profile



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10A**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.18**	**E:382686.0 N:397257.5**	**4** of **4**

Trial Pit JTP10A - Photo 1





Trial Pit JTP10A - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

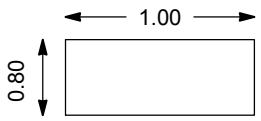
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP12**

Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.14**	**E:382676.0 N:397266.5**	**1** of **5**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Yorkstone flags.	0.08	
0.20-0.60	1	ES	T, V, J			MADE GROUND: Dark brown gravelly SAND. Gravel is angular to subrounded fine to coarse brick and sandstone with occasional half brick.	(0.62) 0.70	
0.80-1.20 0.80-1.20	2 3	ES D	T, V, J			Light brown gravelly SAND. Gravel is subrounded to rounded fine to coarse mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)	(0.60) 1.30	
						Trial pit terminated at 1.30m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 1.30m bgl.
6. On completion, trial pit backfilled with arisings and flagstone reinstated with post mix concrete.

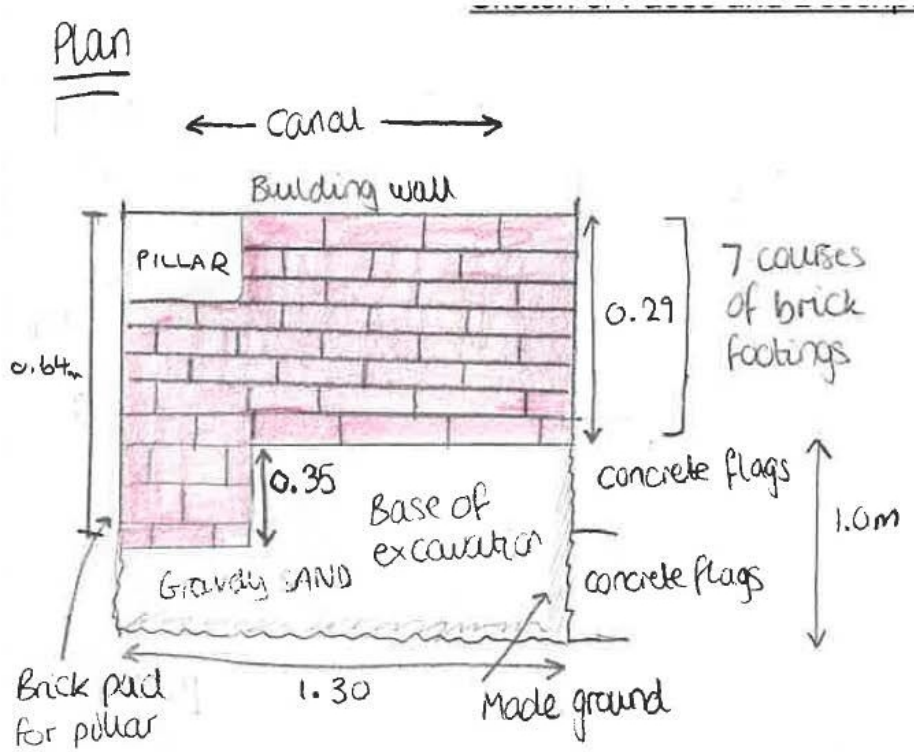
All dimensions in metres | Scale: **1:21**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP12**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.14**	**E:382676.0 N:397266.5**	**2** of **5**

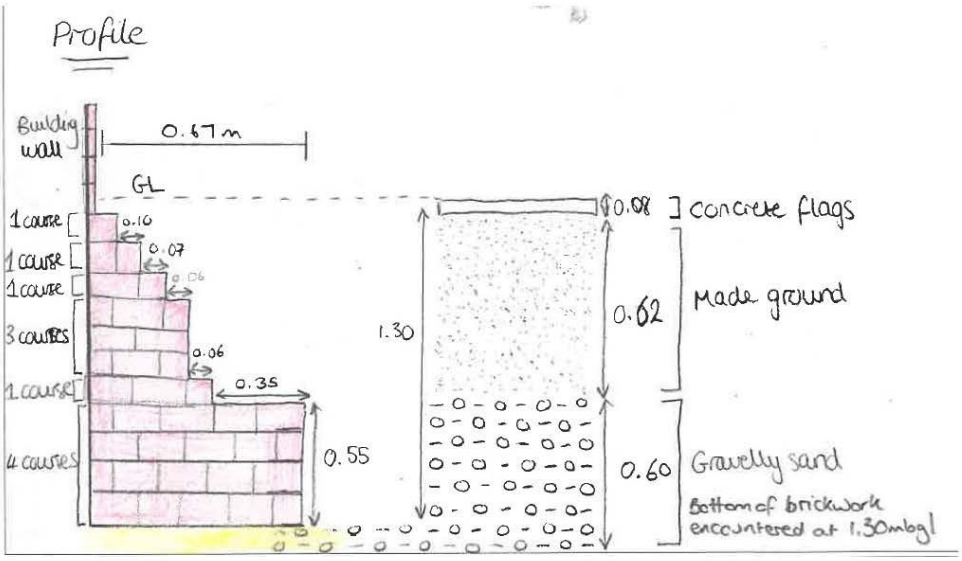


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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP12**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.14**	**E:382676.0 N:397266.5**	**3** of **5**



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP12**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.14**	**E:382676.0 N:397266.5**	**4** of **5**

Trial Pit JTP12 - Photo 1





Trial Pit JTP12 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP12**
Contract Ref:	Start: **17.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **17.05.18**	**26.14**	**E:382676.0 N:397266.5**	**5** of **5**

Trial Pit JTP12 - Photo 3



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:41 | JS12 |

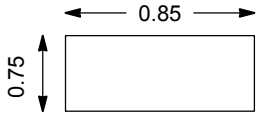
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP20**

Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.49**	**E:382732.5 N:397271.3**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Cobble setts with bituminous tar surround.	0.15	
0.20-0.40 0.20-0.40	1 2	ES D	T,V,J			MADE GROUND: Greyish brown slightly silty gravelly medium to coarse SAND with a medium cobble content of sandstone and brick. Gravel is angular to subangular fine to coarse of sandstone, bituminous macadam, coal, slate, tile and brick.	(0.33) 0.48	
						Trial pit terminated at 0.48m depth due to ceramic pipe.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: digging easy, but difficult to remove cobbles setts.
3. No groundwater encountered.
4. Ceramic pipe encountered at 0.45m.
5. Trial pit remained dry and stable during excavation.
6. Trial pit terminated at 0.48m bgl.
7. On completion, trial pit backfilled with arisings and cobbles reinstated with post mix concrete.

All dimensions in metres | Scale: **1:21**

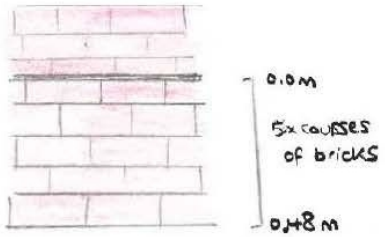
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

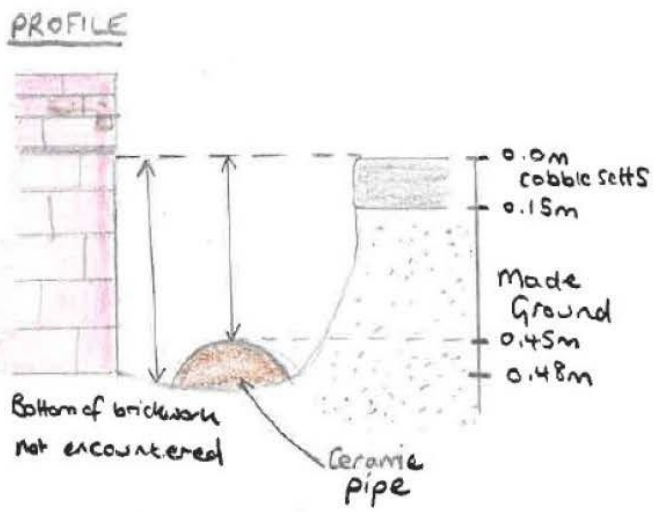
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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP20**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.49**	**E:382732.5 N:397271.3**	**2** of **3**

Trial Pit JTP20 - Sketch of Profiles





Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP20**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.49**	**E:382732.5 N:397271.3**	**3** of **3**

Trial Pit JTP20 - Photo 1





Trial Pit JTP20 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

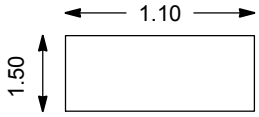
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP21**

Contract Ref:	Start: **16.05.18** End: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**29.16**	**E:382726.8 N:397281.4**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Cobbles setts with bituminous tar surround.	0.15	
						MADE GROUND: Greyish brown with reddish brown slightly clayey gravelly medium to coarse SAND with a medium cobble content of sandstone and concrete. Gravel is angular to subangular fine to coarse of brick, sandstone, clinker slate and rare ceramic. . . . 0.35m - 0.40m, empty / dry clay pipe.	(1.45) 1.60	
						Trial pit terminated at 1.60m depth due to maximum depth for a hand dug pit being reached.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: digging moderate, but difficult to remove cobble setts.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at maximum depth possible by hand digging.
6. On completion, trial pit backfilled with arisings and cobbles reinstated with post mix concrete.

All dimensions in metres | Scale: **1:21**

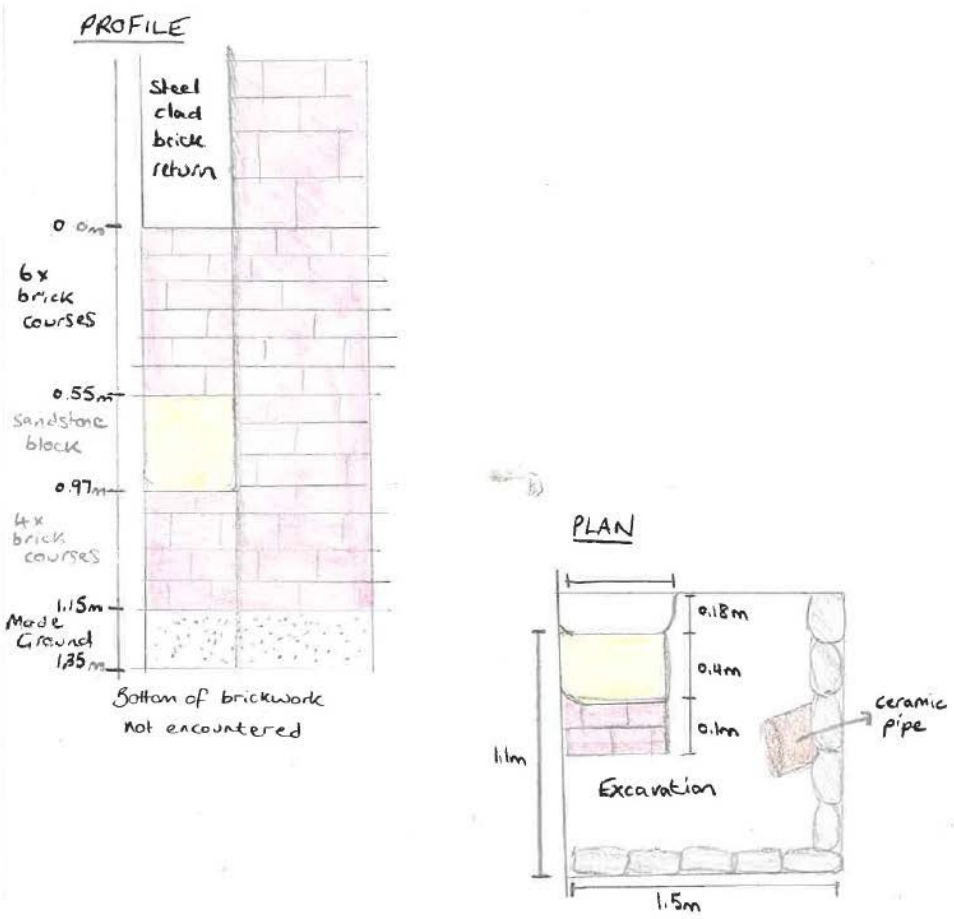
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP21**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.16**	**E:382726.8 N:397281.4**	**2** of **4**

Trial Pit JTP21 - Sketch of Profile and Plan



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP21**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.16**	**E:382726.8 N:397281.4**	**3** of **4**

JTP21 - Photo 1





JTP21 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP21**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.16**	**E:382726.8 N:397281.4**	**4** of **4**

JTP21 - Photo 3





Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

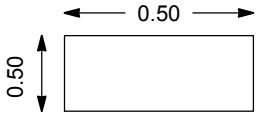
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP22**

Contract Ref:	Start: **16.05.18** End: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**29.46**	**E:382706.0 N:397253.9**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Concrete hardstanding.	0.08	
						MADE GROUND: Cobble setts with bituminous binding.	0.30	
						MADE GROUND: Blackish brown gravelly ashy SAND. Gravel is angular to subangular fine to coarse brick and clinker.	0.40	
0.45	1	ES	T,V,J			MADE GROUND: Brown gravelly clayey medium to coarse SAND. Gravel is angular to subrounded fine to coarse of mudstone and brick.	0.50	
0.50	2	ES	T,V,J			Trial pit terminated at 0.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

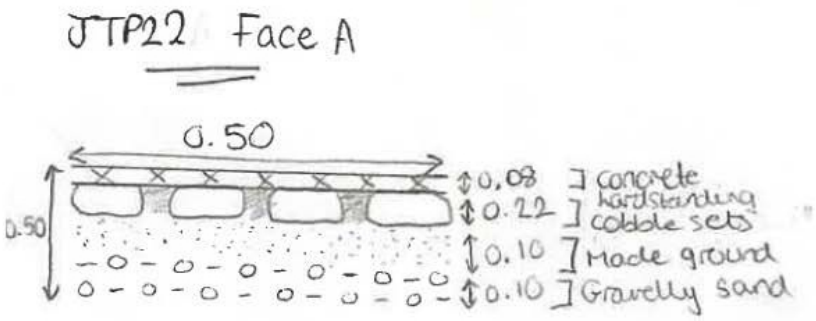
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

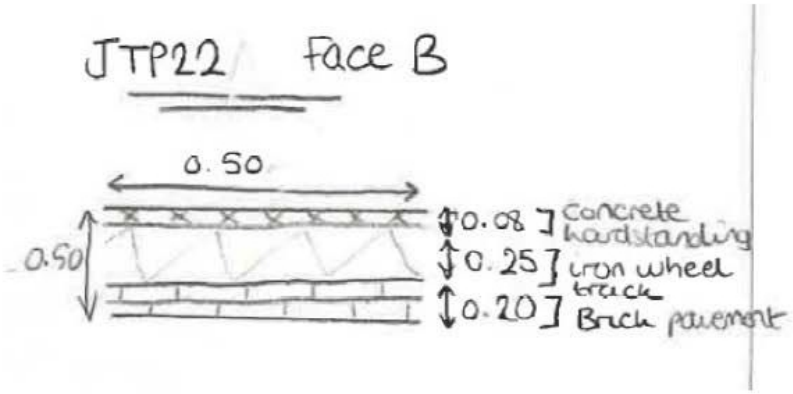
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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP22**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.46**	**E:382706.0 N:397253.9**	**2** of **3**

Trial Pit JTP22 - Sketch of Faces A and B





Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP22**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.46**	**E:382706.0 N:397253.9**	**3** of **3**

JTP22 - Photo 1





JTP22 - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

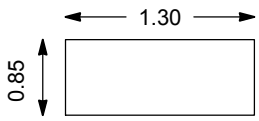
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP22A**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**16.05.18** End: **16.05.18**	**29.53**	**E:382706.5 N:397254.8**	**1** of **2**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Concrete hardstanding.	0.08	
						MADE GROUND: Sandstone pad foundation.	(0.35)	
							0.43	
						MADE GROUND: Brick footing.	0.53	
						Brown gravelly clayey medium to coarse SAND. Gravel is angular to subrounded fine to coarse of mudstone. (GLACIOFLUVIAL DEPOSITS)	(1.02)	
							1.55	
						Trial pit terminated at 1.55m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

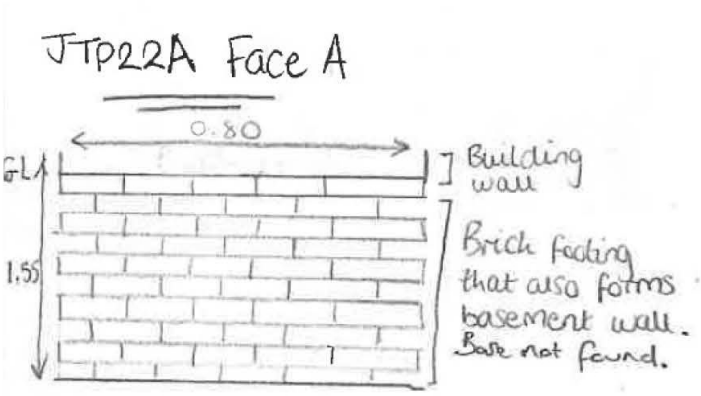
Method Used:	Plant Used:	Logged By:	Checked By:
Hand and machine dug	**Tracked excavator**	**JTee**	EH

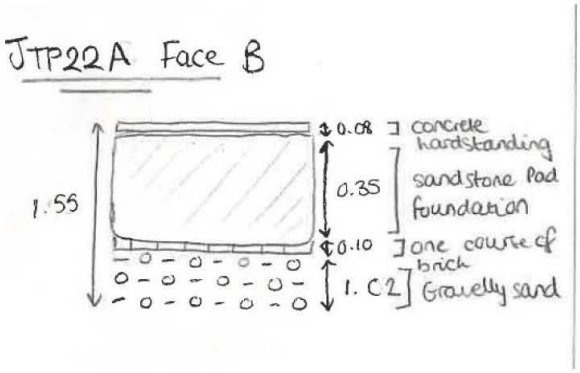
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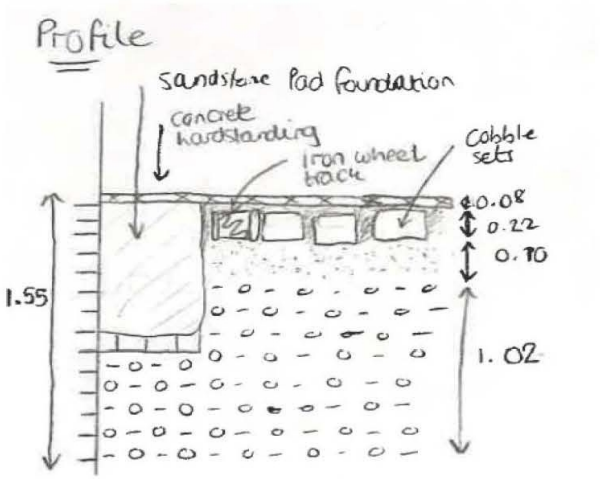
TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP22A**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**29.53**	**E:382706.5 N:397254.8**	**2** of **2**

Trial Pit JTP22A - Sketch of Faces A and B and Profile







Method Used:	**Hand and machine dug**	Plant Used:	**Tracked excavator**	Logged By:	**JTee**	Checked By:	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

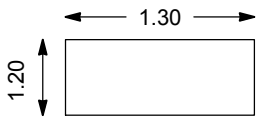
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP23**

Contract Ref:	Start: **16.05.18** End: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**26.27**	**E:382694.1 N:397273.7**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Cobbles setts with bituminous binding.	0.20	
0.25-0.35	1	ES				MADE GROUND: Brown gravelly SAND. Gravel is angular to subrounded fine to coarse brick, clinker and sandstone.	0.35	
0.40-0.60	2	ES				Light brown gravelly clayey medium to coarse SAND. Gravel is subrounded to rounded fine to coarse of mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)	(0.50)	
0.40-0.60	3	D					0.85	
						Trial pit terminated at 0.85m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: hand digging difficult, made use of excavator.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation, slight spalling of gravelly sand.
5. On completion, trial pit backfilled with arisings and cobbles reinstated with postmix concrete.

All dimensions in metres | Scale: **1:21**

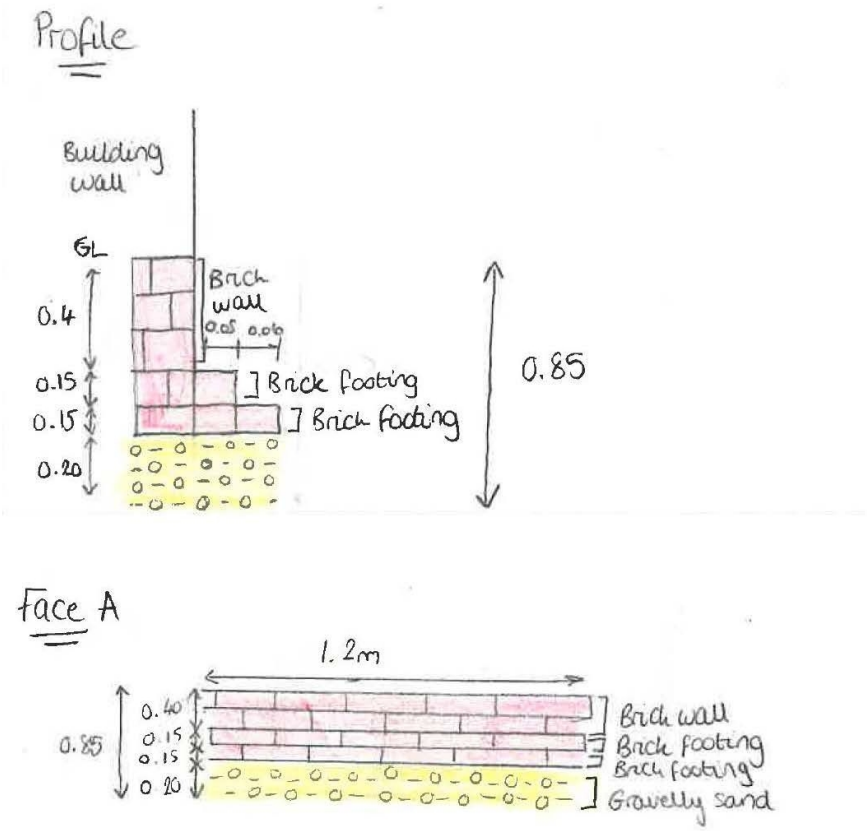
Method Used:	Plant Used:	Logged By:	Checked By:
Hand and machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP23**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.27**	**E:382694.1 N:397273.7**	**2** of **3**

Trial Pit JTP23 - Sketch of Profile and Face A



Method Used:	Plant Used:	Logged By:	Checked By:
Hand and machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP23**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.27**	**E:382694.1 N:397273.7**	**3** of **3**

Trial Pit JTP23 - Photo 1



Method Used:	Plant Used:	Logged By:	Checked By:
Hand and machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

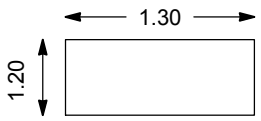
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP24**

Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.34**	**E:382688.6 N:397284.1**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Cobble setts with bituminous binding.	0.20	
0.30-0.60	1	ES	T,V,J			MADE GROUND: Blackish brown gravelly SAND. Gravel is angular to rounded fine to coarse brick and clinker.	(0.50)	
							0.70	
0.80-1.00	2	ES	T,V,J			Light brown gravelly medium to coarse SAND. Gravel is angular to rounded fine to coarse mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)	(0.40)	
0.80-1.00	3	D					1.10	
						Reddish brown silty medium to coarse grained SAND. (Recovered as weathered sandstone)	1.15	
						Trial pit terminated at 1.15m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and cobbles reinstated with postmix concrete.

All dimensions in metres | Scale: **1:21**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

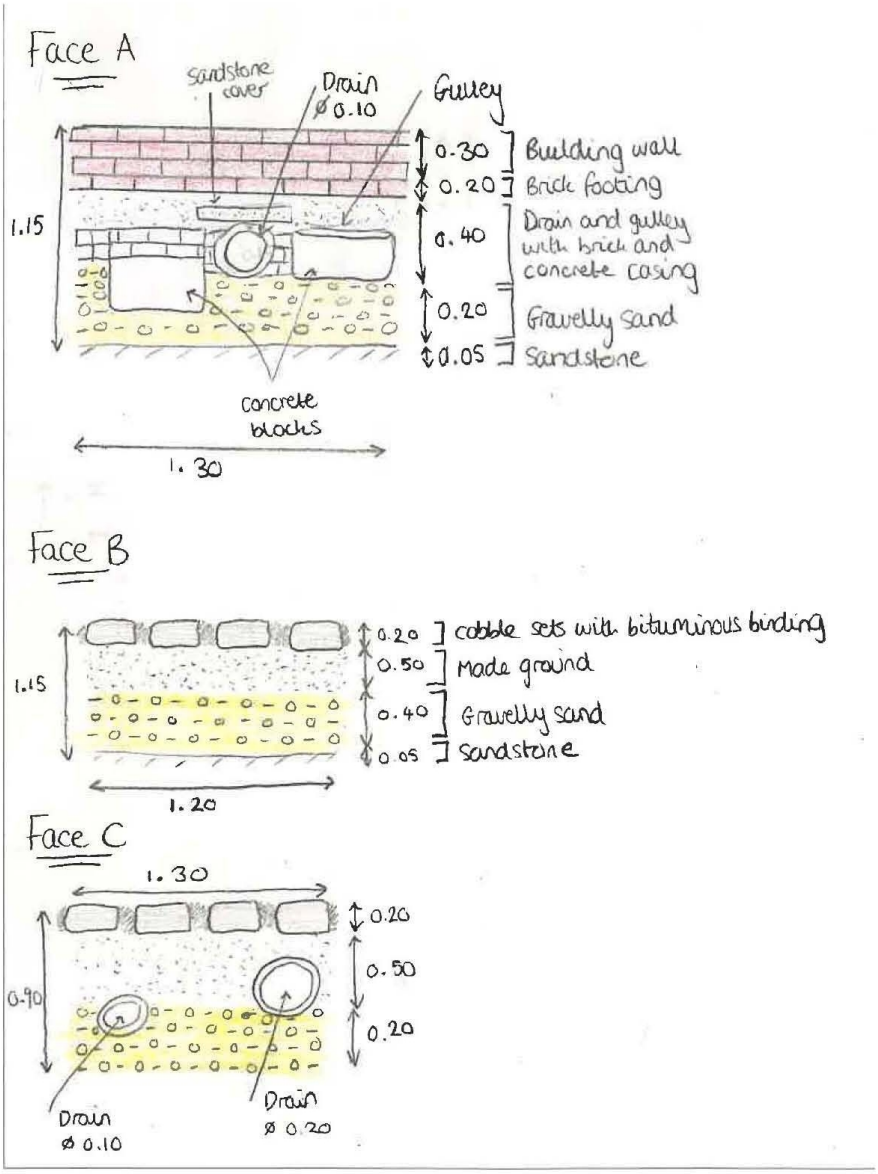
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP24**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.34**	**E:382688.6 N:397284.1**	**2** of **3**

Trial Pit JTP24 - Sketch of Faces



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP24**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.34**	**E:382688.6 N:397284.1**	**3** of **3**

Trial Pit JTP24 - Photo Face A





Trial Pit JTP24 - Photo Face C

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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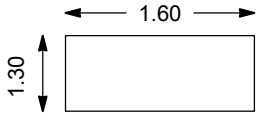
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP25**

Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.49**	**E:382702.8 N:397281.4**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Concrete hardstanding.	0.10	
0.15-0.25	1	ES	T,V,J			MADE GROUND: Blackish brown gravelly SAND. Gravel is angular to subangular fine to coarse brick and clinker.	0.30	
						MADE GROUND: Brick courses.	0.50	
0.40-0.50	2	ES	T,V,J			Light brown gravelly medium to coarse SAND. Gravel is subrounded to rounded fine to coarse mudstone and sandstone. (GLACIOFLUVIAL DEPOSITS)	(0.50)	
0.40-0.50	3	D					1.00	
						Reddish brown silty medium to coarse grained SAND. (Recovered as weathered sandstone)	1.05	
						Trial pit terminated at 1.05m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at base of foundations.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand auger**	**JTee**	EH

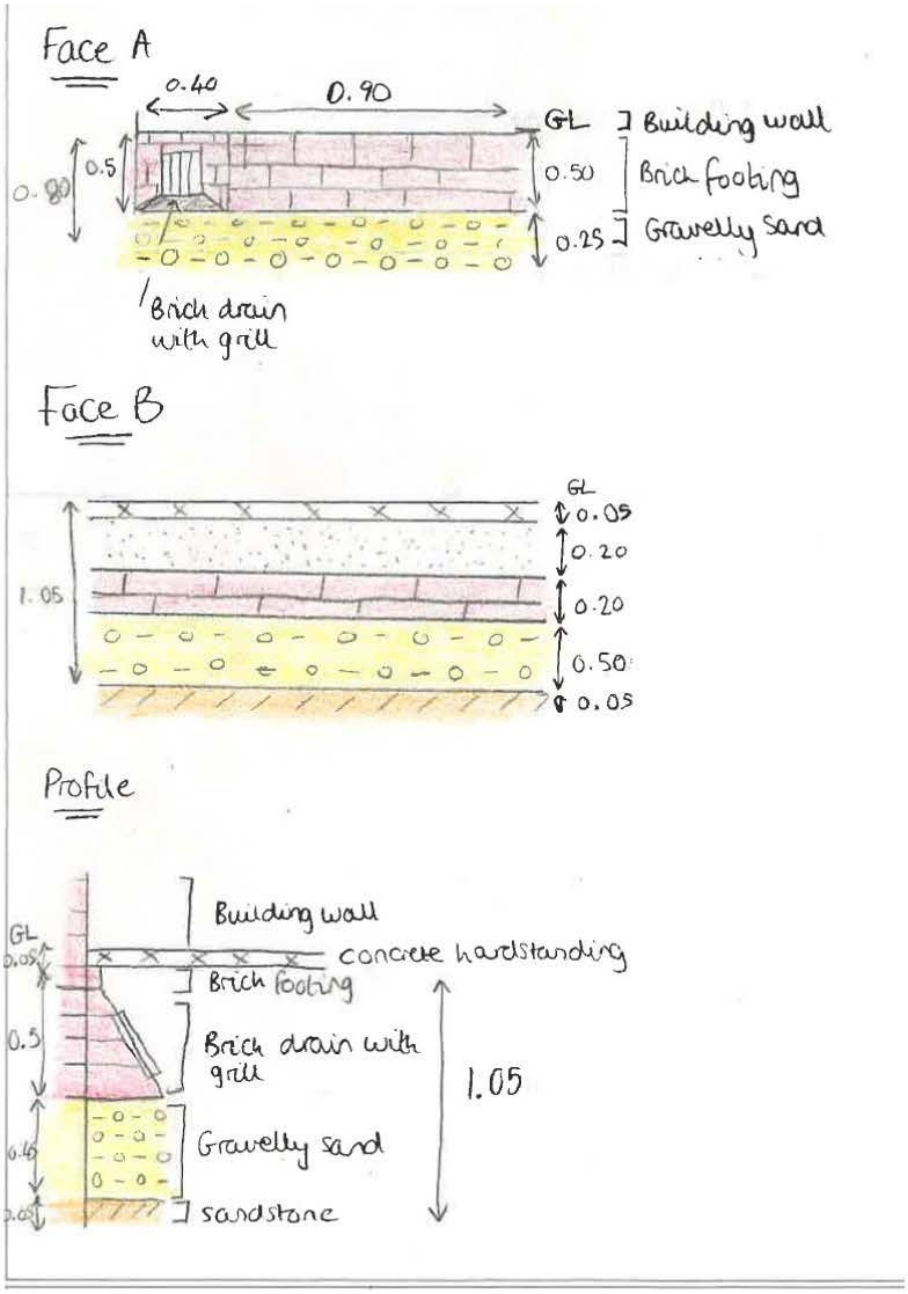
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GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP25**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.49**	**E:382702.8 N:397281.4**	**2** of **4**

Trial Pit JTP25 - Sketches of Faces A & B and Profile



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand auger**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP25**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.49**	**E:382702.8 N:397281.4**	**3** of **4**

Trial Pit JTP25 - Photo Face A





Trial Pit JTP25 Photo Face B

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand auger**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP25**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.49**	**E:382702.8 N:397281.4**	**4** of **4**

Trial Pit JTP25 Photo Base



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand auger**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

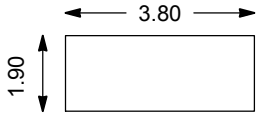
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP30 Face A**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**15.05.18** End: **15.05.18**	**26.36**	**E:382660.7 N:397301.9**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.10	1	ES	T,V,J			MADE GROUND: Greyish brown gravelly SAND. Gravel is subangular to subrounded fine to coarse limestone and brick with occasional glass, metal and timber.	0.20	
						MADE GROUND: Concrete flags.	0.30	
0.35-0.40	2	ES	T,V,J			MADE GROUND: Blackish grey slightly gravelly ashy SAND. Gravel is angular to subangular brick, clinker and sandstone.	0.45	
0.40-1.90	6	ES	T,V,J			MADE GROUND: Brick course.	0.55	
0.60-0.70	3	ES	T,V,J			MADE GROUND: Blackish grey slightly gravelly SAND. Gravel is angular to subangular brick, clinker and sandstone.	0.75	
0.80-1.50	4	ES	T,V,J	1		Reddish brown silty medium to coarse grained SAND. (Recovered as weathered sandstone)	(1.75)	
0.80-1.50	5	B					2.50	
						Trial pit terminated at 2.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. Groundwater strike at 2.10m.
4. Trial pit remained stable during excavation.
5. Trial pit terminated due to difficult digging (scraping)
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

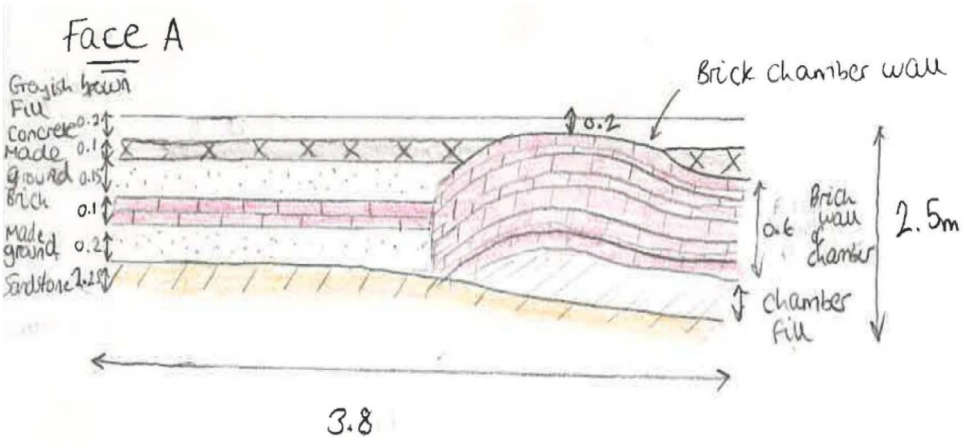
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face A**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**26.36**	**E:382660.7 N:397301.9**	**2** of **3**

Trial Pit JTP30 - Sketch Face A



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face A**
Contract Ref:	Start: **15.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **15.05.18**	**26.36**	**E:382660.7 N:397301.9**	**3** of **3**

Trial Pit JTP30 - Photo



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

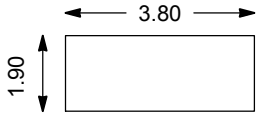
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP30 Face B**

Contract Ref:	Start: **16.05.18** End: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264		**26.36**	**E:382660.7 N:397301.9**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Greyish brown gravelly SAND. Gravel if angular to subrounded fine to coarse limestone, brick and slate. With occasional glass, metal and timber.	(0.35) 0.35	
						MADE GROUND: Brick wall of chamber infilled with blackish brown sandy angular to subangular fine to coarse GRAVEL of ash and clinker.	(1.60) 1.95	
				1		Reddish brown silty medium to coarse grained SAND. (Recovered as weathered sandstone)	(0.55) 2.50	
						Trial pit terminated at 2.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. Groundwater strike at 2.10m.
4. Trial pit remained stable during excavation.
5. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

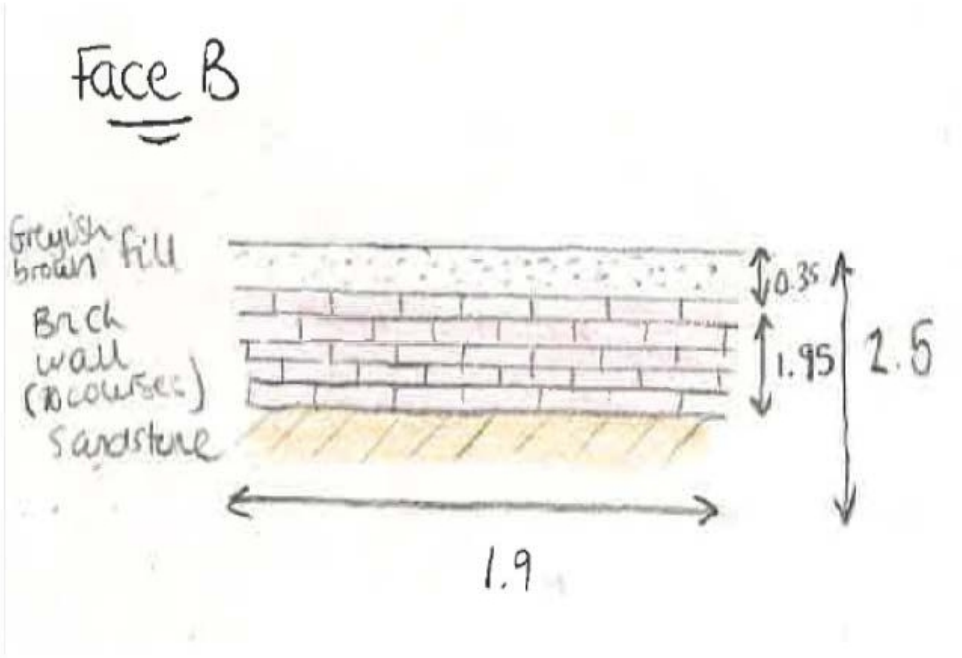
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face B**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.36**	**E:382660.7 N:397301.9**	**2** of **3**

Trial Pit JTP30 - Sketch Face B



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face B**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.36**	**E:382660.7 N:397301.9**	**3** of **3**

Trial Pit JTP30 - Photo 1





Trial Pit JTP JTP30 Face B Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:42 | JS12 |

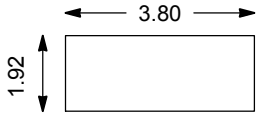
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP30 Face C**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**16.05.18** End: **16.05.18**	**26.36**	**E:382660.7 N:397301.9**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Greyish brown gravelly SAND. Gravel is angular to subrounded fine to coarse limestone, brick and slate. With occasional glass, metal and timber.	0.20	
						MADE GROUND: Concrete flags.	0.30	
						MADE GROUND: Blackish grey slightly gravely ashy SAND. Gravel is angular to subangular fine to coarse brick, clinker and sandstone.	0.50	
						MADE GROUND: Brick wall.	(0.30) 0.80	
				1		Reddish brown silty medium to coarse grained SAND. (Recovered as weathered sandstone)	(1.70) 2.50	
						Trial pit terminated at 2.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. Groundwater strike at 2.10m.
4. Trial pit remained stable during excavation.
5. Trial pit terminated due to difficult digging (scraping)
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

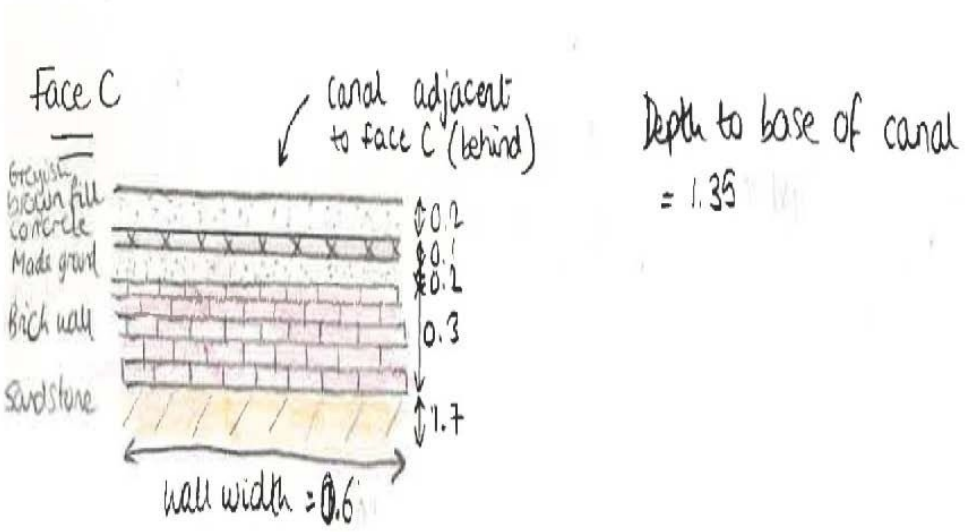
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face C**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.36**	**E:382660.7 N:397301.9**	**2** of **4**

Trial Pit JTP30 - Sketch -Face C



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face C**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.36**	**E:382660.7 N:397301.9**	**3** of **4**

Trial Pit JTP30 Face C - Photo 1





Trial Pit JTP30 Face C - Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30 Face C**
Contract Ref:	Start: **16.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **16.05.18**	**26.36**	**E:382660.7 N:397301.9**	**4** of **4**

Trial Pit JTP30 Face C - Photo 3



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**JTee**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

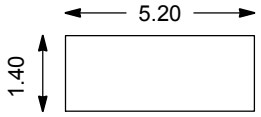
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP31 Face A**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**14.05.18** End: **14.05.18**	**26.88**	**E:382691.1 N:397311.6**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Greyish brown slightly clayey gravelly medium to coarse SAND with a medium cobble content. Gravel is subrounded to subangular fine to coarse of brick, sandstone and concrete with rare metal and rootlets.	(0.25) 0.25	
						MADE GROUND: Six courses of 73m red brick.	(0.40) 0.65	
0.60-0.80	1	D						
0.60-0.80	2	ES	T,V,J			MADE GROUND: Brown and greyish red silty gravelly SAND with a medium cobble content of sandstone (250mm to 170mm). Gravel is subrounded to subangular fine to coarse of brick, sandstone, glass and quartzite.	0.80	
0.80-1.10	3	ES	T,V,J			Yellowish greyish brown slightly silty slightly gravelly coarse SAND with a low to medium cobble content of sandstone. Gravel is subrounded to rounded fine to coarse sandstone. (GLACIOFLUVIAL DEPOSITS)	(0.60) 1.40	
1.50-1.80	2	D				Orangish red slightly silty gravelly coarse SAND with a low cobble content. Gravel is subangular to subrounded of weak coarse sandstone. (Weathered sandstone).	(0.50) 1.90	
1.50-1.80	3	B						
1.50-1.80	4	B						
						Trial pit terminated at 1.90m depth due to difficulty digging.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit sides unstable during excavation.
5. Brick wall very fragile.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

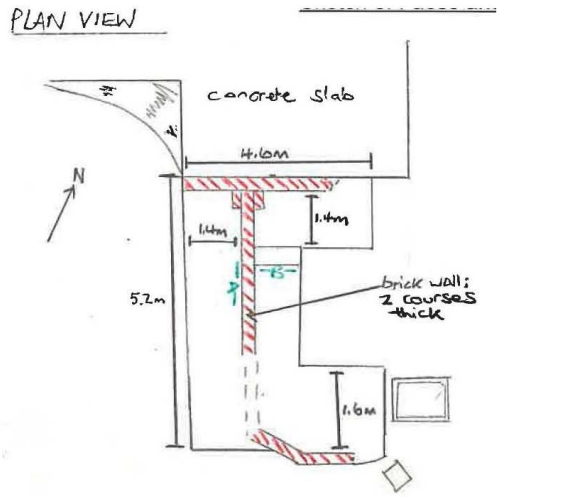
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

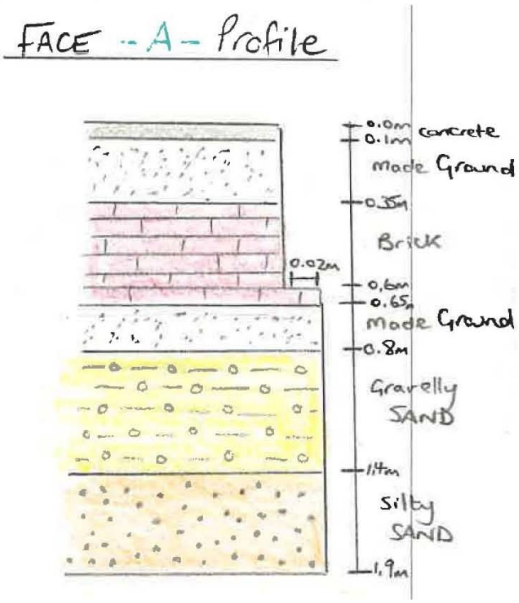
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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP31 Face A**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **14.05.18**	**26.88**	**E:382691.1 N:397311.6**	**2** of **3**

Trial Pit JTP31 Face A - Sketch of plan and profile





Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP31 Face A**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **14.05.18**	**26.88**	**E:382691.1 N:397311.6**	**3** of **3**

Trial Pit JP31 Face A Photo 1





Trial Pit JP31 Face A Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

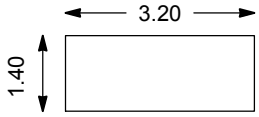
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP31 Face B**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**14.05.18** End: **14.05.18**	**26.88**	**E:382691.1 N:397311.6**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Un-reinforced concrete.	0.05	
						MADE GROUND: Greyish brown slightly clayey gravelly medium to coarse SAND with a low to medium cobble content of brick and concrete. Gravel is subrounded to subangular fine to coarse with frequent angular brick, sandstone and concrete with rare metal and glass.	(0.25)	
							0.30	
						MADE GROUND: Yorkstone paving slab.	0.35	
0.40-0.60	1	ES	T,V,J			MADE GROUND: Brown and greyish red silty gravelly SAND with a medium cobble content of sandstone. Gravel is subrounded to subangular fine to coarse of brick, sandstone and glass with occasional rare paper and metal pipe.	(0.50)	
						. . . 0.50m, corroded metal pipe.	0.85	
						Yellowish greyish brown slightly silty slightly gravelly coarse SAND with a low to medium cobble content of sandstone. Gravel is subrounded to rounded fine to coarse of sandstone and quartzite. (GLACIOFLUVIAL DEPOSITS)	0.95	
						Trial pit terminated at 0.95m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained stable during excavation.
5. Corroded metal pipe at 0.50m.
6. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

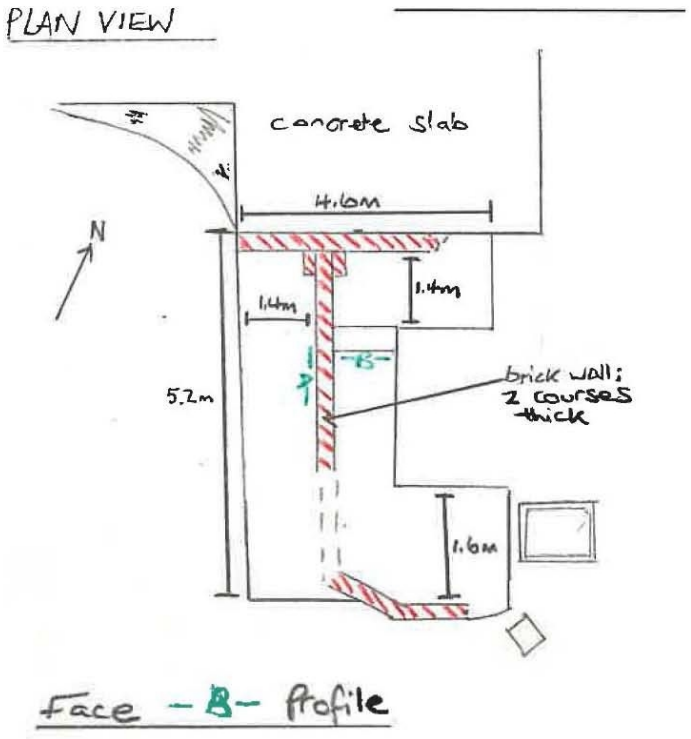
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

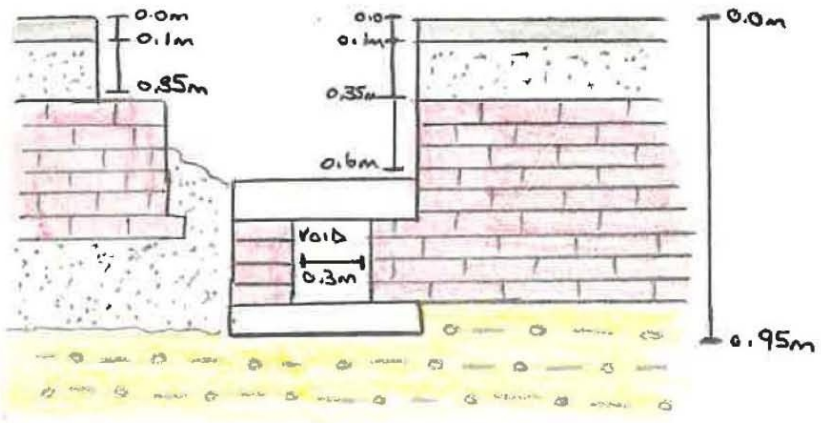
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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP31 Face B**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **14.05.18**	**26.88**	**E:382691.1 N:397311.6**	**2** of **3**

Trial Pit JTP31 Face B - Sketch of plan and profile





Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP31 Face B**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **14.05.18**	**26.88**	**E:382691.1 N:397311.6**	**3** of **3**

Trial Pit JP31 Face B Photo 1



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

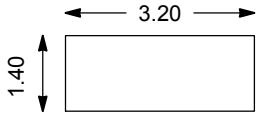
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP31A**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**14.05.18** End: **14.05.18**	**27.21**	**E:382701.8 N:397308.6**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Un-reinforced concrete.	0.15	
0.50-0.80	1	ES	T,V,J			MADE GROUND: Reddish brown very gravelly SAND with abundant bricks (whole and fragmented) and occasional sandstone, metal pieces and glass. (Brick Fill)	(2.45)	
							2.60	
3.00-3.20	2	ES	T,V,J			MADE GROUND: Greyish brown and black slightly silty gravelly medium to coarse SAND with a high cobble content of sandstone blocks and flagstones. Gravel is brick and sandstone. (Sandstone blocks are 350mm x 200mm x 400mm)	(0.80)	
							3.40	
3.40-3.50	3	ES	T,V,J	≈		Orangish purplish red gravelly coarse SAND. Gravel is fine to carse weak coarse sandstone. (Weathered sandstone recovered as SAND).	3.50	
						Trial pit terminated at 3.50m depth due to collapsing sides.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. Slight groundwater seepage at 3.50m.
4. Trial pit sides very unstable during excavation.
5. On completion, trial pit backfilled with arisings and finished with concrete.

All dimensions in metres | Scale: **1:21**

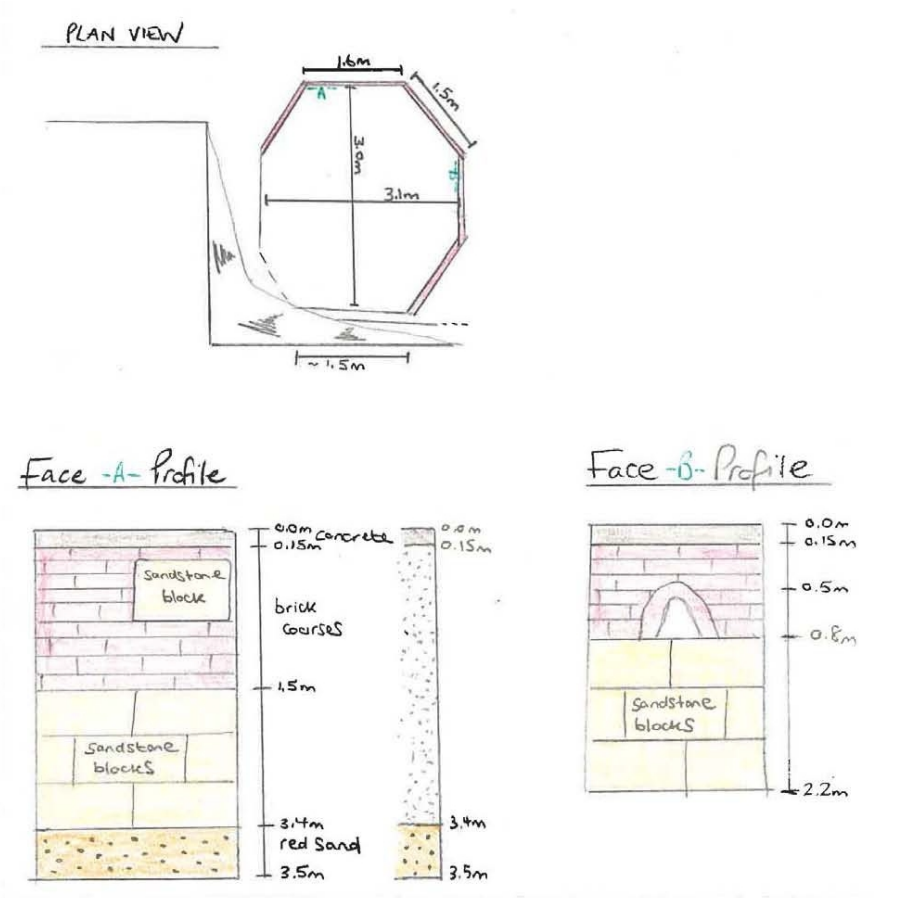
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP31A**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **14.05.18**	**27.21**	**E:382701.8 N:397308.6**	**2** of **3**

Trial Pit JP31A - Sketch of plan and profiles



Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP31A**
Contract Ref:	Start: **14.05.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **14.05.18**	**27.21**	**E:382701.8 N:397308.6**	**3** of **3**

Trial Pit JP31A Photo 1





Trial Pit JP31A Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Tracked excavator**	**EHobbs**	EH

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 02/10/18 - 14:43 | JS12 |

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP10A rev**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**28.11.18** End: **29.11.18**	**26.18**	**E:382686.0 N:397257.5**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Yorkstone flags.	0.08	
						MADE GROUND: Greyish brown gravelly ashy SAND. Gravel is angular to subrounded fine to coarse of brick and sandstone.	(0.45)	
							0.53	
						Light brown gravelly SAND. Gravel is subrounded to rounded fine to coarse mudstone and sandstone. With occasional pockets of sandy silty clay. (GLACIOFLUVIAL DEPOSITS)	(0.32)	
							0.85	
						Firm slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mixed lithologies. (GLACIOFLUVIAL DEPOSITS)	(0.70)	
							1.55	
						Weak red sandstone recovered as silty SAND. (WEATHERED SANDSTONE)	1.63	
						Trial pit terminated at 1.63m depth.		

General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 1.63m bgl.
6. On completion, trial pit backfilled with arisings and flagstones replaced.

All dimensions in metres | Scale: **1:11**

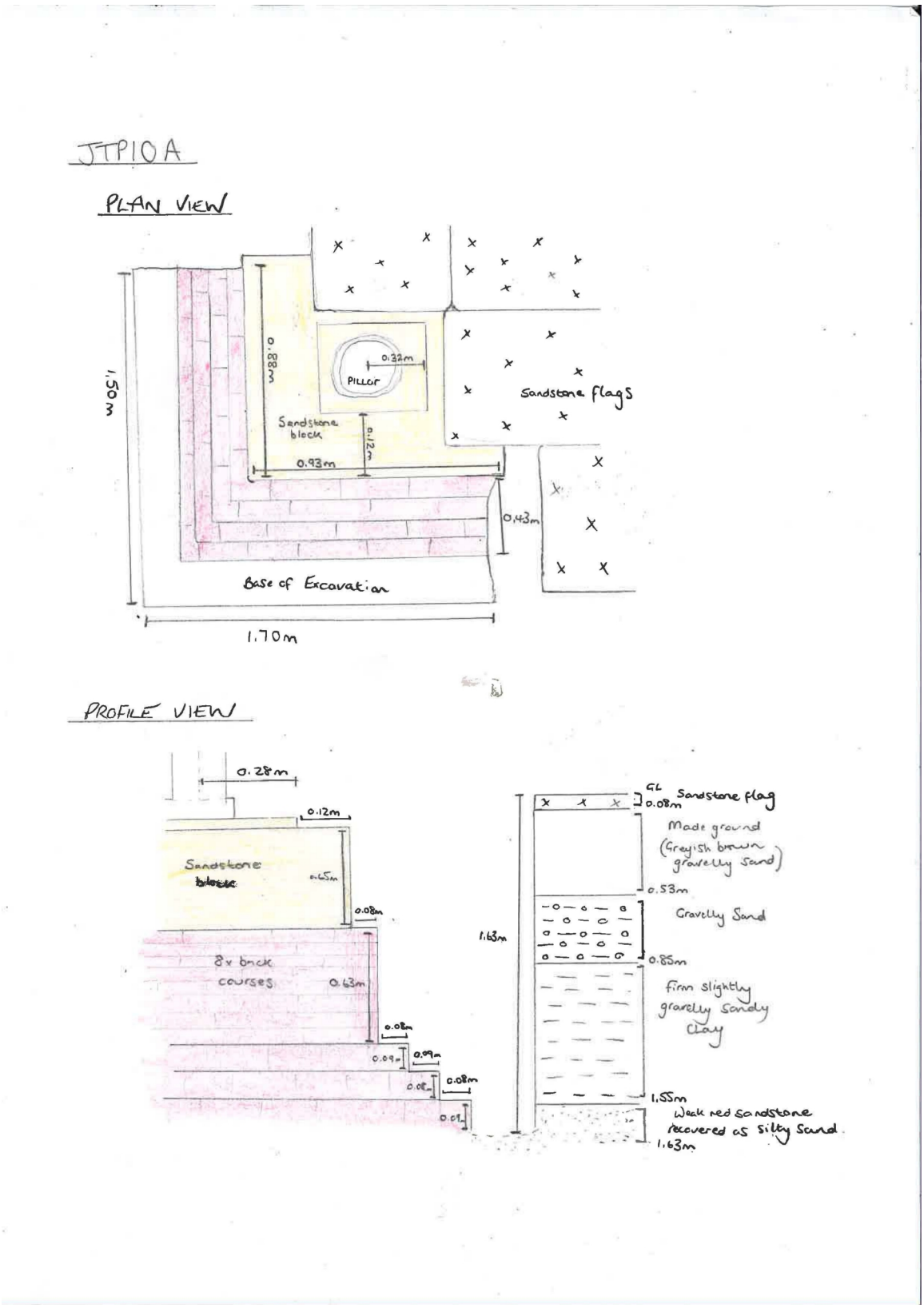
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10A rev**
Contract Ref:	Start: **28.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **29.11.18**	**26.18**	**E:382686.0 N:397257.5**	**2** of **4**

JTP10A Revised Plan and Profile View



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10A rev**
Contract Ref:	Start: **28.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **29.11.18**	**26.18**	**E:382686.0 N:397257.5**	**3** of **4**

JTP10A revised Photo 1





JTP10A revised Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:17 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP10A rev**
Contract Ref:	Start: **28.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **29.11.18**	**26.18**	**E:382686.0 N:397257.5**	**4** of **4**

JTP10A revised Photo 3



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:17 | JS12 |

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP11**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**27.11.18**	**---**	**---**	**1** of **3**
	End: **28.11.18**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Yorkstone flag.	0.050	
						MADE GROUND: reddish brown slightly gravelly silty SAND. Gravel is subangular to subrounded fine to coarse of sandstone and brick. With occasional pieces of porcelain, tiles and plastic fragments.	(0.400)	
							0.450	
						Red and grey slightly silty SAND. (WEATHERED SANDSTONE)	(0.300)	
							0.750	
						Weak red SANDSTONE	0.770	
						Trial pit terminated at 0.77m depth due to difficult digging insolid rock formation.		

General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate to difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 0.77m bgl.
6. On completion, trial pit backfilled with arisings and replaced yorkstone flags.

All dimensions in metres | Scale: **1:11**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

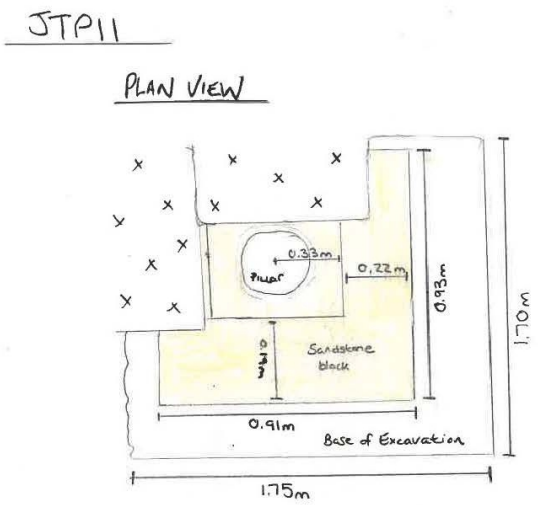
AGS

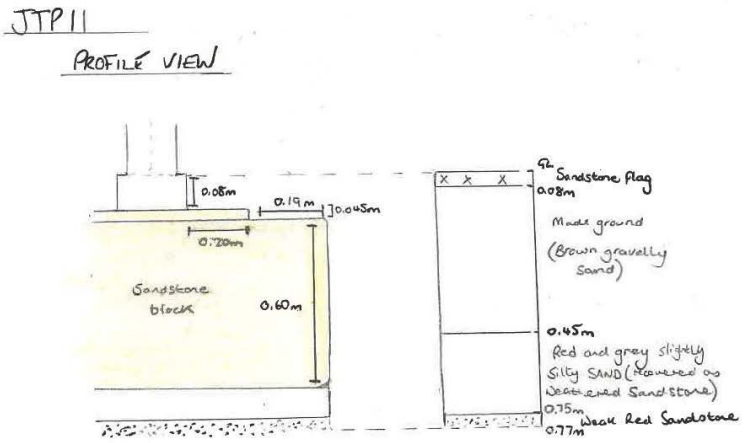
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP11**
Contract Ref:	Start: **27.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **28.11.18**	**---**	**---**	**2** of **3**

JTP11 Plan and Profile Views





Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP11**
Contract Ref:	Start: **27.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **28.11.18**	**---**	**---**	**3** of **3**

JTP11 Photo 1





JTP11 Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP13**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**26.11.18** End: **27.11.18**	**---**	**---**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Chipboard / MDF	0.005	
						MADE GROUND: Wooden beam.	0.025	
						MADE GROUND: Reddish grey slightly gravelly fine to medium SAND. Gravel is subrounded fine of slate and concrete (screed).	0.100	
0.150	1	ES	J, T, V			MADE GROUND: Sandstone flag.	0.150	
						MADE GROUND: Brown gravelly fine to medium SAND. Gravel is subrounded to subangular fine to medium of brick, coal, concrete, slate and sandstone.	(0.500)	
0.500	2	ES	J, T, V			. . . 0.50m, becoming more clayey.		
0.600	3	D					0.650	
						MADE GROUND: Reddish brown gravelly SAND. Gravel is subrounded to subangular fine to coarse of brick and concrete.	0.700	
						MADE GROUND: Dark brown clayey gravelly SAND. Gravel is subrounded to subangular fine to coarse of brick and concrete.	(0.200)	
							0.900	
						Reddish brown gravelly slightly silty SAND with a low to medium cobble content of sandstone, quartzite and mudstone. With frequent clayey pockets. (WEATHERED SANDSTONE)	(0.520)	
							1.420	
						Base of foundation not found. Trial pit terminated at 1.42m depth due to unsafe working area.		

General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate to difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 1.42m bgl.
6. On completion, trial pit backfilled with arisings and chipboard/MDF replaced.

All dimensions in metres | Scale: **1:11**

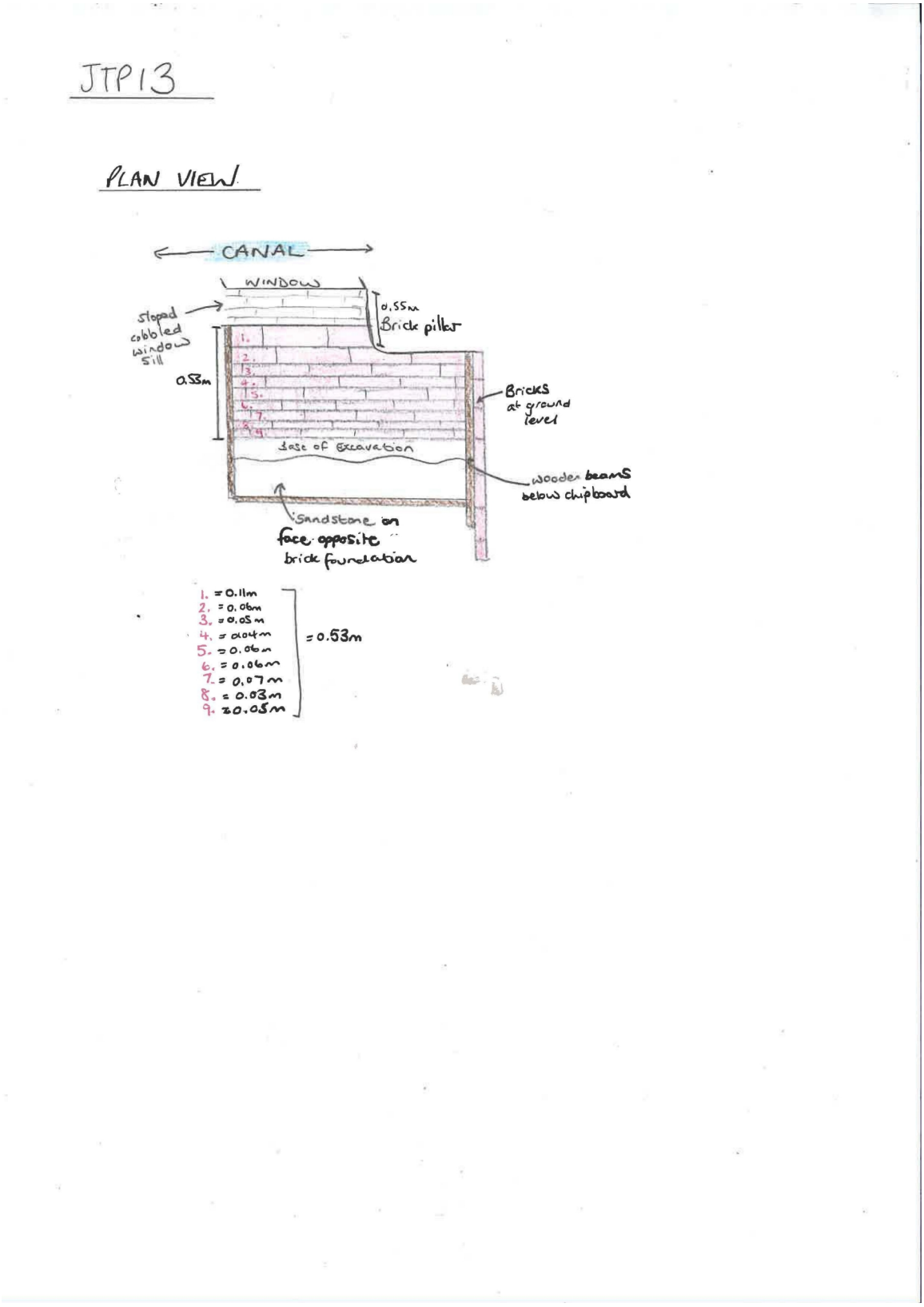
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP13**
Contract Ref:	Start: **26.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **27.11.18**	**---**	**---**	**2** of **4**

JTP13 Plan View



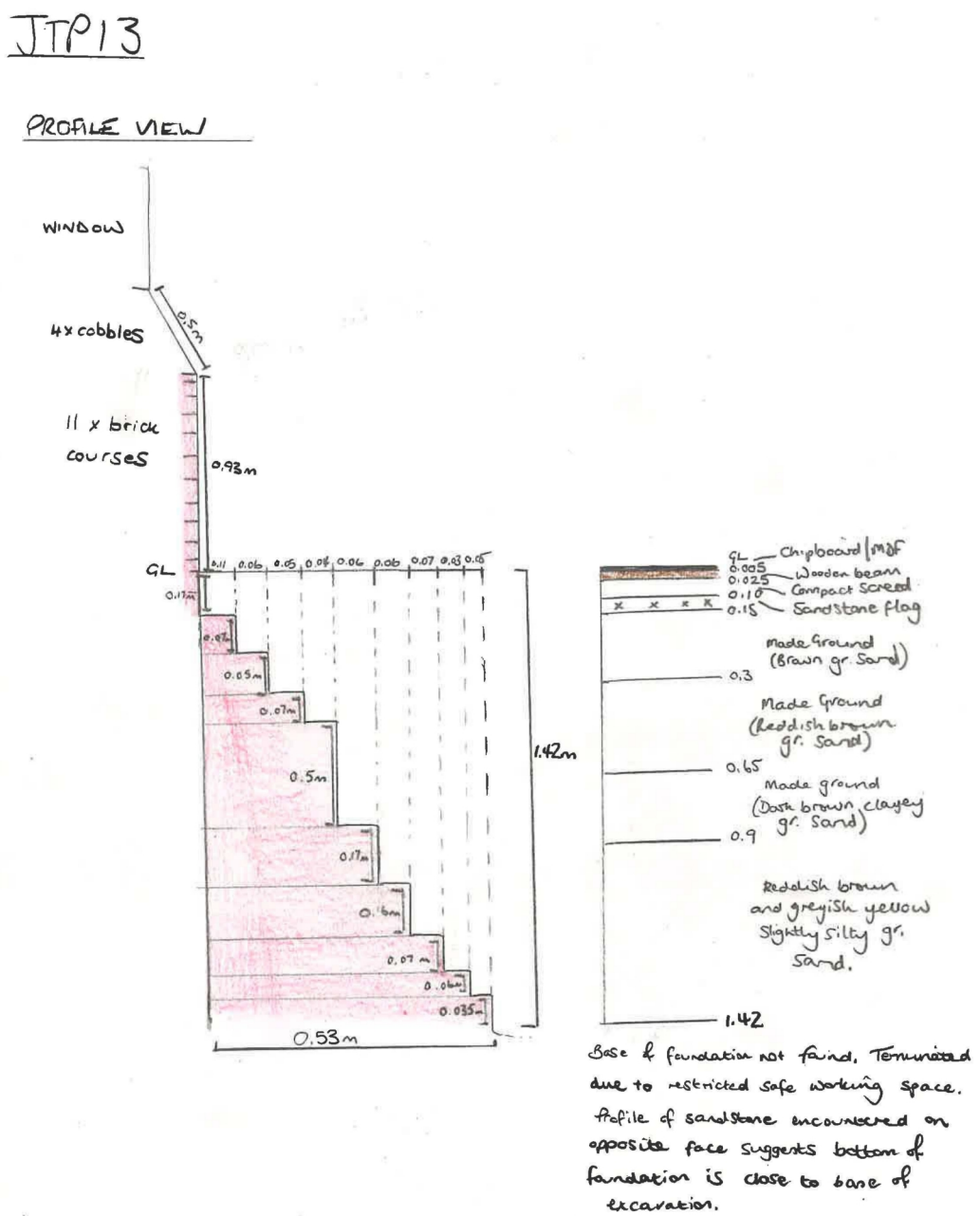
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP13**
Contract Ref:	Start: **26.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **27.11.18**	**---**	**---**	**3** of **4**

JTP13 Profile View



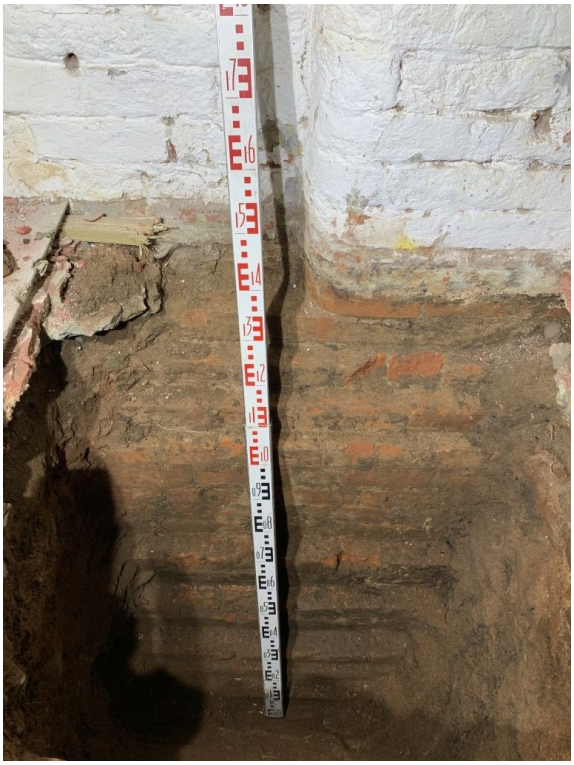
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP13**
Contract Ref:	Start: **26.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **27.11.18**	**---**	**---**	**4** of **4**

JTP13 Photo 1





JTP13 Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
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TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP14**

Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**---**	**---**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Vinyl tile and concrete screed.	0.085	
						MADE GROUND: Sandstone flag.	0.190	
0.190-0.270	2	ES	J, V			MADE GROUND: Multicoloured (black, orange and yellow) slightly clayey crystalised GRAVEL with a hard shell of lighter yellow. With occasional fine sand pockets and a sweet perfumey odour.	0.270	
0.300-0.350	1	ES	T, V, J			MADE GROUND: Dark brown ashy gravelly medium SAND with frequent cobbles. Gravel is subrounded to subangular fine to coarse of brick, sandstone and concrete. Cobbles are subangular to subrounded of brick.	0.350	
0.500-0.700	3	ES	T, V, J			Brown and reddish brown gravelly medium SAND with frequent cobbles. With occasional pockets of soft to firm sandy clay. Gravel is subrounded to rounded medium to coarse of mixed lithologies. Cobbles are subrounded to rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)	(1.450)	
						Base of foundation not found. Trial pit terminated at 1.80m depth due to restricted safe working area..	1.800	

General Remarks

1. Scanned with CAT and Genny prior to excavation.
2. Ease of trial pit excavation: moderate to difficult.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 1.80m bgl.
6. On completion, trial pit backfilled with arisings and flagstone reinstated.

All dimensions in metres | Scale: **1:11**

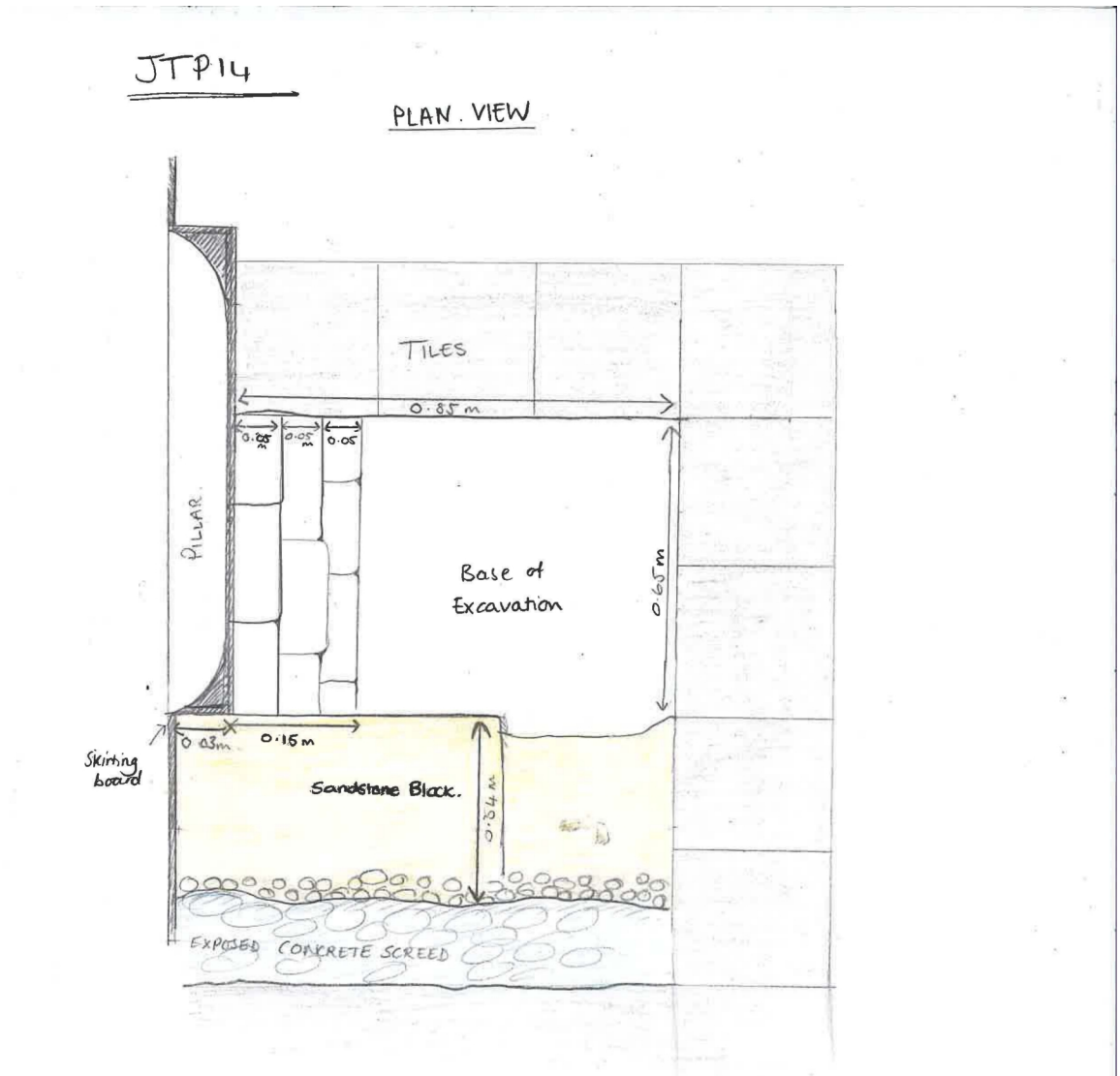
Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP14**
Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**---**	**---**	**2** of **4**

JTP14 Plan View



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

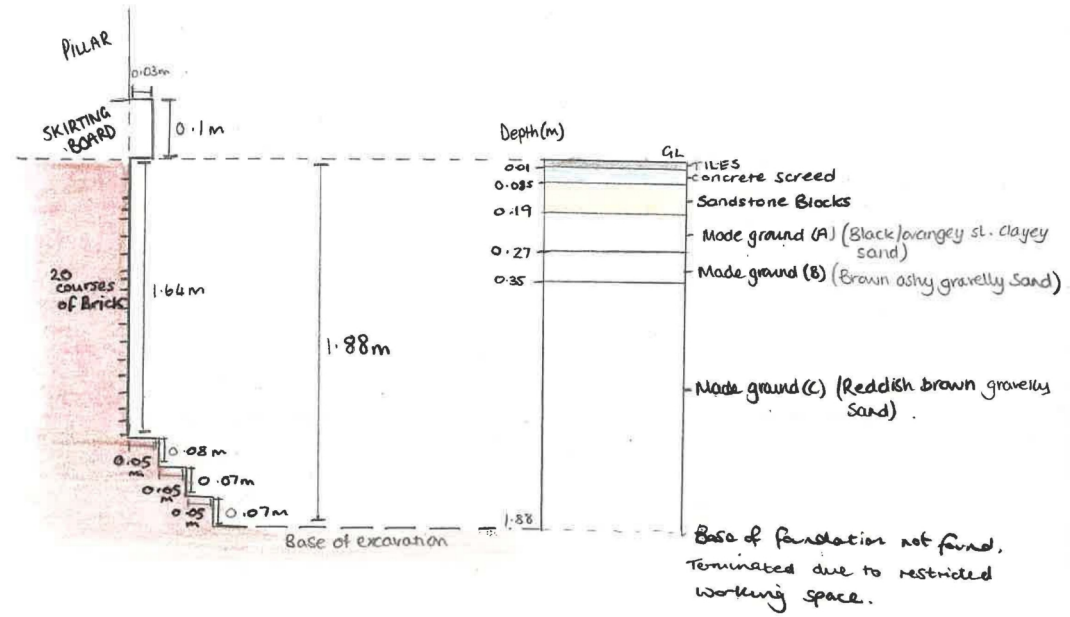
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RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP14**

Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**---**	**---**	**3** of **4**

JTP14 Profile View



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP14**
Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**---**	**---**	**4** of **4**

JTP14 Photo 1



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP30A**

Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**26.36**	**E:382660.7 N:397301.9**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Sandstone flag.	0.110	
						MADE GROUND: Dark brown gravelly medium to coarse SAND with frequent cobbles. Gravel is subrounded to subangular of brick. Cobbles are subrounded to subangular of brick and concrete.	0.170	
						MADE GROUND: Reddish brown medium coarse SAND with frequent cobbles. Cobbles are subangular to angular of brick and concrete.	(0.180)	
							0.350	
						Reddish brown gravelly medium to coarse SAND with occasional lenses of orangish yellow sandy clay. Gravel is subrounded to subangular fine to medium of sandstone and quartzite. (GLACIOFLUVIAL DEPOSITS)	(0.950)	
							1.300	
						Trial pit terminated at 1.30m depth.		

General Remarks

1. Position re-dug at request of client.
2. Ease of trial pit excavation: moderate.
3. No groundwater encountered.
4. Trial pit remained dry and stable during excavation.
5. Trial pit terminated at 1.30m bgl.
6. On completion, trial pit backfilled with arisings.

All dimensions in metres | Scale: **1:11**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

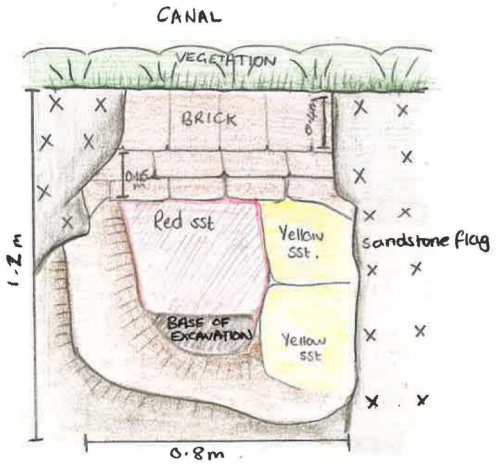
TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30A**
Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**26.36**	**E:382660.7 N:397301.9**	**2** of **3**

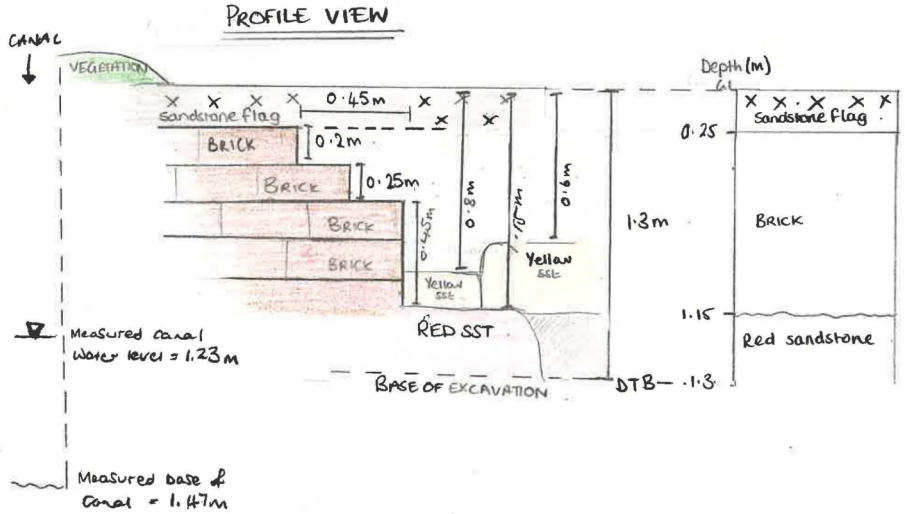
JTP30a (re-dig) Plan and Profile Views

JTP30 (Re-dig)

PLAN VIEW



PROFILE VIEW



GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP30A**
Contract Ref:	Start: **30.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **30.11.18**	**26.36**	**E:382660.7 N:397301.9**	**3** of **3**

JTP30a (re-dig) Photo 1



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**DParekh**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP32**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**27.11.18** End: **28.11.18**	**---**	**---**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND: Sandstone flag.	0.070	
						VOID	(1.480)	VOID
						MADE GROUND: Greyish brown gravelly fine to medium SAND with a high cobble content. Gravel is subrounded to subangular fine to coarse of brick, concrete and sandstone. Cobbles are angular whole and fragment brick and concrete. With occasional pieces of glass, tiles, plastic and pieces of carpet.	1.550 (0.350)	
						Base of foundation not found. Trial pit terminated terminated at 1.90m depth due to unsafe working area.	1.900	

General Remarks

1. Trial pit located in a raised area of the mill (approximately 1.10m above ground level).
2. Position scanned with CAT & Genny prior to excavation.
3. Removal of Yorkstone flag and clear out debris from void using hand tools.
4. Ease of trial pit excavation: moderate-difficult.
5. No groundwater encountered.
6. Trial pit remained dry and stable during excavation.
7. Trial pit terminated at 1.90m bgl.
8. On completion, sandstone flagstone reinstated.

All dimensions in metres | Scale: **1:11**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

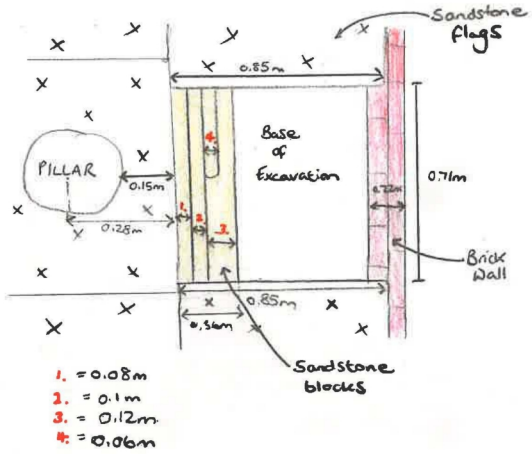
TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP32**
Contract Ref:	Start: **27.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **28.11.18**	**---**	**---**	**2** of **3**

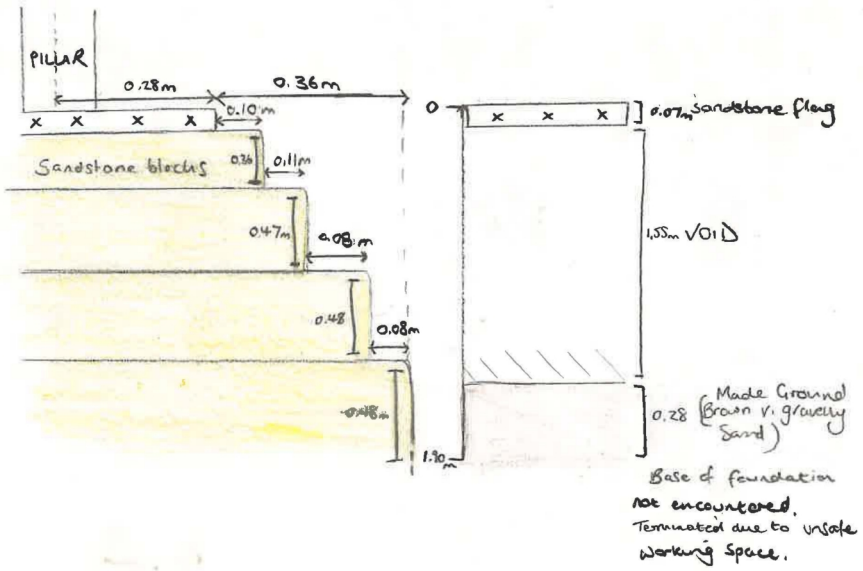
JTP32 Plan and Profile View

JTP32

PLAN VIEW



PROFILE VIEW



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP32**
Contract Ref:	Start: **27.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **28.11.18**	**---**	**---**	**3** of **3**

JTP32 Photo 1





JTP32 Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

TRIAL PIT LOG

(1.070)

Contract:	Client:	Trial Pit:
Talbot Mill	**Capital & Centric (Adored) Ltd**	**JTP33**

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	**26.11.18** End: **27.11.18**	**---**	**---**	**1** of **3**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
							0.070	
						MADE GROUND: Reinforced steel joint.	(0.230)	
							0.300	
						VOID.	(0.950)	VOID
							1.250	
						MADE GROUND: Greyish brown gravelly fine to medium SAND with a high cobble content. Gravel is subrounded to subangular fine to coarse of brick, concrete and sandstone. Cobbles are angular whole and fragmented bricks. With pieces of glass, tiles, plastic and pieces of carpet.	(0.550)	
							1.800	
						Base of foundation not found. Trial pit terminated at 1.80m depth due to resticted and unsafe working area..		

General Remarks

1. Trial pit located in a raised area of the mill (approximately 1.10m above ground level).
2. Position scanned with CAT & Genny prior to excavation.
3. No surface covering. Void are already present (cleared out debris, digging using hand tools).
4. Ease of trial pit excavation: moderate.
5. No groundwater encountered.
6. Trial pit remained dry and stable during excavation.
7. Trial pit terminated at 1.80m bgl.
8. On completion, trial pit backfilled with arisings and left open as found.

All dimensions in metres | Scale: **1:11**

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:18 | JS12 |

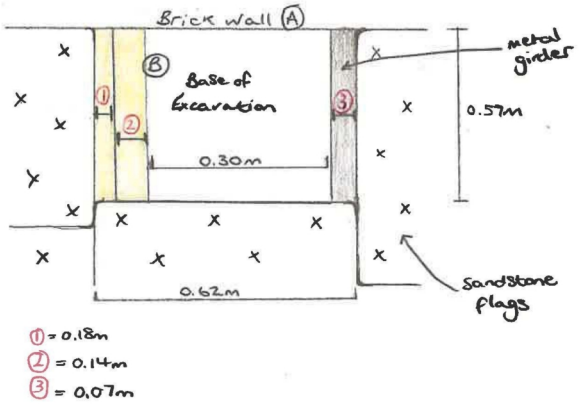
TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP33**
Contract Ref:	Start: **26.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **27.11.18**	**---**	**---**	**2** of **3**

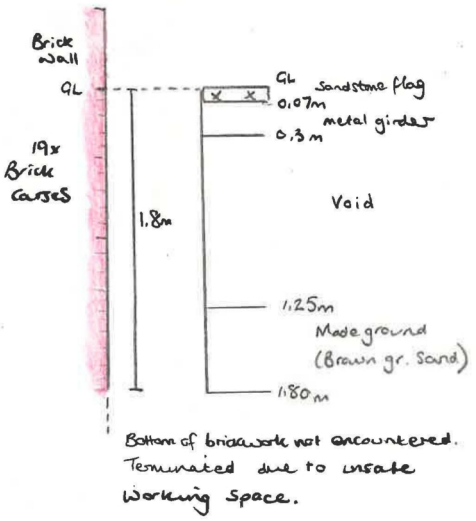
JTP33 Plan and Profile View

JTP33

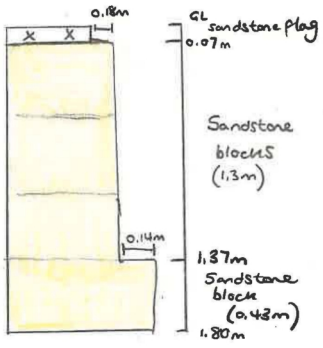
PLAN VIEW



PROFILE VIEW (A)



PROFILE VIEW (B)



Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:19 | JS12 |

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Talbot Mill		**Capital & Centric (Adored) Ltd**		**JTP33**
Contract Ref:	Start: **26.11.18**	Ground Level:	National Grid Co-ordinate:	Sheet:
11264	End: **27.11.18**	**---**	**---**	**3** of **3**

JTP33 Photo 1





JTP33 Photo 2

Method Used:	Plant Used:	Logged By:	Checked By:
Hand dug	**Hand tools**	**EHobbs**	KF

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Logs - 002 | Log TRIAL PIT LOG - NO PLAN - A4P | 11264 TALBOT MILL.GPJ - v8_06.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk. | 16/01/19 - 12:19 | JS12 |

APPENDIX E
LABORATORY CERTIFICATES FOR SOIL ANALYSIS

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/04126
Issue Number: 1 **Date:** 11 June, 2018

Client:
RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Emma Hobbs/Gavin Saddington/Joshua Tee
Project Name: Talbot Mill
Project Ref: 11264
Order No: N/A
Date Samples Received: 18/05/18
Date Instructions Received: 25/05/18
Date Analysis Completed: 09/06/18

Prepared by:



Richard Wong
Client Manager

Approved by:



Danielle Bescoby
Quality Manager

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30		
Depth to Top	1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60		
Depth To Bottom	1.70	1.00	1.30	0.90	1.10	3.20	0.40	0.70		
Date Sampled	16-May-18	15-May-18	17-May-18	15-May-18	14-May-18	14-May-18	15-May-18	15-May-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	1A	4AB	4A	4A	1	4B	4A	4AB		
% Stones >10mm$_A$	1.7	29.2	15.0	4.1	<0.1	11.7	8.4	20.9	% w/w	A-T-044
pH$_D^{M\#}$	8.50	7.99	8.29	7.46	7.66	6.87	7.86	-	pH	A-T-031s
Sulphate (water sol 2:1)$_D^{M\#}$	<0.01	0.04	<0.01	-	0.06	1.34	<0.01	-	g/l	A-T-026s
Sulphate (acid soluble)$_D^{M\#}$	<200	700	<200	-	<200	26000	870	-	mg/kg	A-T-028s
Cyanide (free)$_A^{M\#}$	-	<1	-	-	<1	<1	-	<1	mg/kg	A-T-042sFCN
Cyanide (total)$_A^{M\#}$	-	<1	-	-	<1	<1	-	<1	mg/kg	A-T-042sTCN
Total Organic Carbon$_D^{M\#}$	0.22	-	2.16	12	0.07	-	16.2	-	% w/w	A-T-032s
Arsenic$_D^{M\#}$	5	10	6	23	3	1130	27	-	mg/kg	A-T-024s
Cadmium$_D^{M\#}$	<0.5	1.0	0.6	1.4	<0.5	1.9	2.1	-	mg/kg	A-T-024s
Copper$_D^{M\#}$	6	52	30	321	6	540	159	-	mg/kg	A-T-024s
Chromium$_D^{M\#}$	8	18	9	23	8	48	27	-	mg/kg	A-T-024s
Chromium (hexavalent)$_D$	-	-	-	<1	<1	-	<1	-	mg/kg	A-T-040s
Lead$_D^{M\#}$	18	490	37	231	9	746	226	-	mg/kg	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	0.84	<0.17	8.31	0.36	-	mg/kg	A-T-024s
Nickel$_D^{M\#}$	9	21	16	49	11	80	84	-	mg/kg	A-T-024s
Selenium$_D^{M\#}$	<1	1	<1	2	<1	65	3	-	mg/kg	A-T-024s
Zinc$_D^{M\#}$	45	125	38	180	27	268	411	-	mg/kg	A-T-024s
Leachate Prep BS EN 12457-1 (2:1) (1 no)$_A$	-	-	-	*	-	-	-	-		A-T-001
Arsenic (leachable)$_A^{\#}$	-	-	-	3	-	-	-	-	µg/l	A-T-025w
Cadmium (leachable)$_A^{\#}$	-	-	-	<1	-	-	-	-	µg/l	A-T-025w
Copper (leachable)$_A^{\#}$	-	-	-	4	-	-	-	-	µg/l	A-T-025w
Chromium (leachable)$_A^{\#}$	-	-	-	<1	-	-	-	-	µg/l	A-T-025w
Lead (leachable)$_A^{\#}$	-	-	-	<1	-	-	-	-	µg/l	A-T-025w
Mercury (leachable)$_A^{\#}$	-	-	-	<0.1	-	-	-	-	µg/l	A-T-025w
Nickel (leachable)$_A^{\#}$	-	-	-	7	-	-	-	-	µg/l	A-T-025w
Selenium (leachable)$_A^{\#}$	-	-	-	<1	-	-	-	-	µg/l	A-T-025w
Zinc (leachable)$_A^{\#}$	-	-	-	48	-	-	-	-	µg/l	A-T-025w

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30		
Depth to Top	1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60		
Depth To Bottom	1.70	1.00	1.30	0.90	1.10	3.20	0.40	0.70		
Date Sampled	16-May-18	15-May-18	17-May-18	15-May-18	14-May-18	14-May-18	15-May-18	15-May-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	1A	4AB	4A	4A	1	4B	4A	4AB		
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	-	NAD	-	NAD	-	NAD	NAD	-		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	-	N/A	-	N/A	-	N/A	N/A	-		

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30		
Depth to Top	1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60		
Depth To Bottom	1.70	1.00	1.30	0.90	1.10	3.20	0.40	0.70		
Date Sampled	16-May-18	15-May-18	17-May-18	15-May-18	14-May-18	14-May-18	15-May-18	15-May-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	1A	4AB	4A	4A	1	4B	4A	4AB		
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	-	-	13.5	<0.01	<0.01	-	0.06	mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	-	-	0.16	<0.01	0.04	-	<0.01	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	-	-	8.00	<0.02	0.28	-	0.09	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	-	-	15.7	<0.04	0.23	-	0.24	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	-	-	12	<0.04	0.09	-	0.23	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	-	-	14.2	<0.05	1.21	-	0.29	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	-	-	4.53	<0.05	0.23	-	0.18	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	-	-	4.84	<0.07	0.27	-	0.11	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	<0.06	-	-	17.6	<0.06	0.40	-	0.34	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	-	-	1.22	<0.04	<0.04	-	<0.04	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	-	-	34.8	<0.08	0.16	-	0.50	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	-	-	10.2	<0.01	<0.01	-	0.05	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	-	-	4.89	<0.03	0.33	-	0.17	mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	-	-	17.2	<0.03	<0.03	-	0.10	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	-	-	51	<0.03	0.06	-	0.53	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.07	-	-	34.8	<0.07	0.16	-	0.54	mg/kg	A-T-019s
Total PAH-16MS$_A^{M\#}$	<0.08	-	-	245	<0.08	3.46	-	3.43	mg/kg	A-T-019s

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30		
Depth to Top	1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60		
Depth To Bottom	1.70	1.00	1.30	0.90	1.10	3.20	0.40	0.70		
Date Sampled	16-May-18	15-May-18	17-May-18	15-May-18	14-May-18	14-May-18	15-May-18	15-May-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	1A	4AB	4A	4A	1	4B	4A	4AB		
TPH CWG										
Ali >C5-C6$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
Ali >C8-C10$_A^{M\#}$	<1	-	-	<1	<1	<1	-	2	mg/kg	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1	-	-	1	<1	<1	-	2	mg/kg	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1	-	-	4	<1	<1	-	5	mg/kg	A-T-055s
Ali >C16-C21$_A^{M\#}$	<1	-	-	4	<1	2	-	7	mg/kg	A-T-055s
Ali >C21-C35$_A^{M\#}$	<1	-	-	4	<1	9	-	18	mg/kg	A-T-055s
Total Aliphatics >C5-C35$_A^{\#}$	<1	-	-	13	<1	12	-	33	mg/kg	A-T-055s
Aro >C5-C7$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
Aro >C8-C10$_A^{M\#}$	<1	-	-	4	<1	2	-	6	mg/kg	A-T-055s
Aro >C10-C12$_A^{M\#}$	<1	-	-	39	<1	2	-	6	mg/kg	A-T-055s
Aro >C12-C16$_A^{M\#}$	<1	-	-	153	<1	5	-	17	mg/kg	A-T-055s
Aro >C16-C21$_A^{M\#}$	<1	-	-	282	<1	13	-	24	mg/kg	A-T-055s
Aro >C21-C35$_A^{M\#}$	<1	-	-	379	<1	75	-	239	mg/kg	A-T-055s
Total Aromatics >C5-C35$_A^{\#}$	<1	-	-	857	<1	95	-	292	mg/kg	A-T-055s
TPH (Ali & Aro >C5-C35)$_A^{\#}$	<1	-	-	870	<1	108	-	325	mg/kg	A-T-055s
BTEX - Benzene$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s
MTBE$_A^{\#}$	<0.01	-	-	<0.01	<0.01	<0.01	-	<0.01	mg/kg	A-T-022s

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/24	18/04126/27							Units	Method ref
Client Sample No										
Client Sample ID	JTP25	JTP24								
Depth to Top	0.15	0.80								
Depth To Bottom	0.25	1.00								
Date Sampled	16-May-18	16-May-18								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4A	4A								
% Stones >10mm$_A$	13.5	15.6							% w/w	A-T-044
pH$_D^{M\#}$	7.81	8.00							pH	A-T-031s
Sulphate (water sol 2:1)$_D^{M\#}$	<0.01	<0.01							g/l	A-T-026s
Sulphate (acid soluble)$_D^{M\#}$	390	210							mg/kg	A-T-028s
Total Organic Carbon$_D^{M\#}$	-	3.85							% w/w	A-T-032s
Arsenic$_D^{M\#}$	20	-							mg/kg	A-T-024s
Cadmium$_D^{M\#}$	1.7	-							mg/kg	A-T-024s
Copper$_D^{M\#}$	241	-							mg/kg	A-T-024s
Chromium$_D^{M\#}$	20	-							mg/kg	A-T-024s
Chromium (hexavalent)$_D$	<1	-							mg/kg	A-T-040s
Lead$_D^{M\#}$	430	-							mg/kg	A-T-024s
Mercury$_D$	0.68	-							mg/kg	A-T-024s
Nickel$_D^{M\#}$	35	-							mg/kg	A-T-024s
Selenium$_D^{M\#}$	<1	-							mg/kg	A-T-024s
Zinc$_D^{M\#}$	425	-							mg/kg	A-T-024s
Leachate Prep BS EN 12457-1 (2:1) (1 no)$_A$	-	*								A-T-001
Arsenic (leachable)$_A^{\#}$	-	1							µg/l	A-T-025w
Cadmium (leachable)$_A^{\#}$	-	<1							µg/l	A-T-025w
Copper (leachable)$_A^{\#}$	-	5							µg/l	A-T-025w
Chromium (leachable)$_A^{\#}$	-	11							µg/l	A-T-025w
Lead (leachable)$_A^{\#}$	-	8							µg/l	A-T-025w
Mercury (leachable)$_A^{\#}$	-	<0.1							µg/l	A-T-025w
Nickel (leachable)$_A^{\#}$	-	<1							µg/l	A-T-025w
Selenium (leachable)$_A^{\#}$	-	<1							µg/l	A-T-025w
Zinc (leachable)$_A^{\#}$	-	12							µg/l	A-T-025w

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/24	18/04126/27							Units	Method ref
Client Sample No										
Client Sample ID	JTP25	JTP24								
Depth to Top	0.15	0.80								
Depth To Bottom	0.25	1.00								
Date Sampled	16-May-18	16-May-18								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4A	4A								
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	NAD	NAD								A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	N/A								

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/24	18/04126/27							Units	Method ref
Client Sample No										
Client Sample ID	JTP25	JTP24								
Depth to Top	0.15	0.80								
Depth To Bottom	0.25	1.00								
Date Sampled	16-May-18	16-May-18								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4A	4A								
PAH-16MS										
Acenaphthene$_A^{M\#}$	0.68	-							mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	0.08	-							mg/kg	A-T-019s
Anthracene$_A^{M\#}$	1.07	-							mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	3.93	-							mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	3.29	-							mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	4.06	-							mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	1.50	-							mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	1.46	-							mg/kg	A-T-019s
Chrysene$_A^{M\#}$	4.38	-							mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	0.41	-							mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	8.07	-							mg/kg	A-T-019s
Fluorene$_A^{M\#}$	0.43	-							mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	1.61	-							mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	0.04	-							mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	6.94	-							mg/kg	A-T-019s
Pyrene$_A^{M\#}$	8.16	-							mg/kg	A-T-019s
Total PAH-16MS$_A^{M\#}$	46.1	-							mg/kg	A-T-019s

Envirolab Job Number: 18/04126

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04126/24	18/04126/27							Units	Method ref
Client Sample No										
Client Sample ID	JTP25	JTP24								
Depth to Top	0.15	0.80								
Depth To Bottom	0.25	1.00								
Date Sampled	16-May-18	16-May-18								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4A	4A								
TPH CWG										
Ali >C5-C6$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
Ali >C8-C10$_A^{M\#}$	<1	-							mg/kg	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1	-							mg/kg	A-T-055s
Ali >C12-C16$_A^{M\#}$	1	-							mg/kg	A-T-055s
Ali >C16-C21$_A^{M\#}$	2	-							mg/kg	A-T-055s
Ali >C21-C35$_A^{M\#}$	4	-							mg/kg	A-T-055s
Total Aliphatics >C5-C35$_A^{\#}$	7	-							mg/kg	A-T-055s
Aro >C5-C7$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
Aro >C8-C10$_A^{M\#}$	2	-							mg/kg	A-T-055s
Aro >C10-C12$_A^{M\#}$	2	-							mg/kg	A-T-055s
Aro >C12-C16$_A^{M\#}$	16	-							mg/kg	A-T-055s
Aro >C16-C21$_A^{M\#}$	65	-							mg/kg	A-T-055s
Aro >C21-C35$_A^{M\#}$	157	-							mg/kg	A-T-055s
Total Aromatics >C5-C35$_A^{\#}$	242	-							mg/kg	A-T-055s
TPH (Ali & Aro >C5-C35)$_A^{\#}$	248	-							mg/kg	A-T-055s
BTEX - Benzene$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	-							mg/kg	A-T-022s
MTBE$_A^{\#}$	<0.01	-							mg/kg	A-T-022s

REPORT NOTES

General:
This report shall not be reproduced, except in full, without written approval from Envirolab.
All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure and there is insufficient sample to repeat the analysis. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/10434
Issue Number: 1 **Date:** 17 December, 2018

Client:
RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Emma Hobbs
Project Name: Talbot Mill
Project Ref: 11264
Order No: N/A
Date Samples Received: 30/11/18
Date Instructions Received: 11/12/18
Date Analysis Completed: 17/12/18

Prepared by:
Melanie Marshall
Laboratory Coordinator

Approved by:
Iain Haslock
Analytical Consultant

Envirolab Job Number: 18/10434

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/10434/1	18/10434/2	18/10434/3	18/10434/5	18/10434/6				Units	Method ref
Client Sample No										
Client Sample ID	JTP11	JTP11	JTP13	JTP14	JTP14					
Depth to Top	0.50	0.10	0.50	0.30	0.50					
Depth To Bottom	0.60	0.25	0.60	0.35	0.70					
Date Sampled	28-Nov-18	28-Nov-18	27-Nov-18	30-Nov-18	30-Nov-18					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	1A	4A	4A	4A	5A					
% Stones >10mm$_A$	10.0	5.0	10.7	22.5	40.1				% w/w	A-T-044
pH$_D^{M\#}$	7.48	7.65	7.95	7.57	7.99				pH	A-T-031s
Chloride (water sol 2:1)$_D^{M\#}$	12	-	66	38	<10				mg/kg	A-T-026s
Sulphate (water sol 2:1)$_D^{M\#}$	0.06	-	0.03	1.12	0.04				g/l	A-T-026s
Sulphur (total)$_D$	75	-	112	2290	96				mg/kg	A-T-024s
Cyanide (total)$_A^{M\#}$	-	-	-	2	-				mg/kg	A-T-042sTCN
Total Organic Carbon$_D^{M\#}$	-	0.61	-	-	-				% w/w	A-T-032s
Arsenic$_D^{M\#}$	-	<1	-	5	-				mg/kg	A-T-024s
Cadmium$_D^{M\#}$	-	0.9	-	1.4	-				mg/kg	A-T-024s
Copper$_D^{M\#}$	-	13	-	65	-				mg/kg	A-T-024s
Chromium$_D^{M\#}$	-	10	-	18	-				mg/kg	A-T-024s
Chromium (hexavalent)$_D$	-	-	-	<1	-				mg/kg	A-T-040s
Lead$_D^{M\#}$	-	44	-	175	-				mg/kg	A-T-024s
Mercury$_D$	-	<0.17	-	<0.17	-				mg/kg	A-T-024s
Nickel$_D^{M\#}$	-	10	-	13	-				mg/kg	A-T-024s
Selenium$_D^{\#}$	-	<1	-	<1	-				mg/kg	A-T-024s
Zinc$_D^{M\#}$	-	30	-	264	-				mg/kg	A-T-024s

Envirolab Job Number: 18/10434

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/10434/1	18/10434/2	18/10434/3	18/10434/5	18/10434/6				Units	Method ref
Client Sample No										
Client Sample ID	JTP11	JTP11	JTP13	JTP14	JTP14					
Depth to Top	0.50	0.10	0.50	0.30	0.50					
Depth To Bottom	0.60	0.25	0.60	0.35	0.70					
Date Sampled	28-Nov-18	28-Nov-18	27-Nov-18	30-Nov-18	30-Nov-18					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	1A	4A	4A	4A	5A					
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	-	NAD	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	-	N/A	-	-	-					

Envirolab Job Number: 18/10434

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/10434/1	18/10434/2	18/10434/3	18/10434/5	18/10434/6				Units	Method ref
Client Sample No										
Client Sample ID	JTP11	JTP11	JTP13	JTP14	JTP14					
Depth to Top	0.50	0.10	0.50	0.30	0.50					
Depth To Bottom	0.60	0.25	0.60	0.35	0.70					
Date Sampled	28-Nov-18	28-Nov-18	27-Nov-18	30-Nov-18	30-Nov-18					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	1A	4A	4A	4A	5A					
PAH-16MS										
Acenaphthene$_{A}^{M\#}$	-	0.11	-	1.73	-				mg/kg	A-T-019s
Acenaphthylene$_{A}^{M\#}$	-	0.03	-	0.47	-				mg/kg	A-T-019s
Anthracene$_{A}^{M\#}$	-	0.21	-	5.98	-				mg/kg	A-T-019s
Benzo(a)anthracene$_{A}^{M\#}$	-	0.40	-	5.08	-				mg/kg	A-T-019s
Benzo(a)pyrene$_{A}^{M\#}$	-	0.37	-	3.29	-				mg/kg	A-T-019s
Benzo(b)fluoranthene$_{A}^{M\#}$	-	0.42	-	3.42	-				mg/kg	A-T-019s
Benzo(ghi)perylene$_{A}^{M\#}$	-	0.25	-	1.36	-				mg/kg	A-T-019s
Benzo(k)fluoranthene$_{A}^{M\#}$	-	0.15	-	1.26	-				mg/kg	A-T-019s
Chrysene$_{A}^{M\#}$	-	0.40	-	4.20	-				mg/kg	A-T-019s
Dibenzo(ah)anthracene$_{A}^{M\#}$	-	0.05	-	0.37	-				mg/kg	A-T-019s
Fluoranthene$_{A}^{M\#}$	-	1.00	-	14.9	-				mg/kg	A-T-019s
Fluorene$_{A}^{M\#}$	-	0.14	-	5.28	-				mg/kg	A-T-019s
Indeno(123-cd)pyrene$_{A}^{M\#}$	-	0.28	-	1.77	-				mg/kg	A-T-019s
Naphthalene$_{A}^{M\#}$	-	0.07	-	5.82	-				mg/kg	A-T-019s
Phenanthrene$_{A}^{M\#}$	-	0.82	-	26.9	-				mg/kg	A-T-019s
Pyrene$_{A}^{M\#}$	-	0.83	-	13.7	-				mg/kg	A-T-019s
Total PAH-16MS$_{A}^{M\#}$	-	5.53	-	95.5	-				mg/kg	A-T-019s

Envirolab Job Number: 18/10434

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/10434/1	18/10434/2	18/10434/3	18/10434/5	18/10434/6				Units	Method ref
Client Sample No										
Client Sample ID	JTP11	JTP11	JTP13	JTP14	JTP14					
Depth to Top	0.50	0.10	0.50	0.30	0.50					
Depth To Bottom	0.60	0.25	0.60	0.35	0.70					
Date Sampled	28-Nov-18	28-Nov-18	27-Nov-18	30-Nov-18	30-Nov-18					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	1A	4A	4A	4A	5A					
TPH CWG										
Ali >C5-C6$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
Ali >C6-C8$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
Ali >C8-C10$_A^{M\#}$	-	<1	-	-	-				mg/kg	A-T-055s
Ali >C10-C12$_A^{M\#}$	-	<1	-	-	-				mg/kg	A-T-055s
Ali >C12-C16$_A^{M\#}$	-	<1	-	-	-				mg/kg	A-T-055s
Ali >C16-C21$_A^{M\#}$	-	<1	-	-	-				mg/kg	A-T-055s
Ali >C21-C35$_A$	-	18	-	-	-				mg/kg	A-T-055s
Total Aliphatics$_A$	-	18	-	-	-				mg/kg	A-T-055s
Aro >C5-C7$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
Aro >C7-C8$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
Aro >C8-C10$_A^{M\#}$	-	2	-	-	-				mg/kg	A-T-055s
Aro >C10-C12$_A^{M\#}$	-	<1	-	-	-				mg/kg	A-T-055s
Aro >C12-C16$_A$	-	2	-	-	-				mg/kg	A-T-055s
Aro >C16-C21$_A^{M\#}$	-	6	-	-	-				mg/kg	A-T-055s
Aro >C21-C35$_A^{M\#}$	-	59	-	-	-				mg/kg	A-T-055s
Total Aromatics$_A$	-	68	-	-	-				mg/kg	A-T-055s
TPH (Ali & Aro >C5-C35)$_A$	-	86	-	-	-				mg/kg	A-T-055s
BTEX - Benzene$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
BTEX - Toluene$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
BTEX - o Xylene$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s
MTBE$_A^{\#}$	-	<0.01	-	-	-				mg/kg	A-T-022s

REPORT NOTES

General:
This report shall not be reproduced, except in full, without written approval from Envirolab.
All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

APPENDIX F
CERTIFICATES OF GEOTECHNICAL ANALYSIS

STRUCTURAL SOILS LTD

TEST REPORT

Report No. 783202 R1 1774

Date Contract Talbot Mill

Client RSK Environment Ltd
Address Spring Lodge
172 Chester Road
Helsby
Cheshire WA6 0AR

For the Attention of Emma Hobbs

Samples submitted by client	06/06/2018	Client Reference	11264
Testing Started	13/06/2018	Client Order No.	
Testing Completed	16/07/2018	Instruction Type	Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

Ukas Accredited Tests Underatken

Moisture Content (oven drying method) BS1377:Part 2:1990,clause 3.2 (superseded)**
Water content in accordance with BS EN ISO 17892-1:2014
Liquid Limit (one point method) BS1377:Part 2:1990,clause 4.4
Plastic Limit BS1377:Part 2:1990,clause 5.3
Plasticity Index Derivation BS1377:Part 2:1990,clause 5.4
Particle Size Distribution wet sieve method BS1377:Part 2:1990,clause 9.2
California Bearing Ratio BS1377:Part 4:1990,clause 7.4

Ukas Accredited Tests Underatken

Point Load Index ISRM:2007
Unconfined Compressive Strength - load controlled method ISRM:2007

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail mark.athorne@soils.co.uk

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
JBH01	1	B	1.40	13					Red brown clayey slightly gravelly SAND
JBH02	2	B	4.80	13					Red brown slightly silty slightly gravelly SAND
JBH04	1	B	1.20	5.9					Brown slightly silty very gravelly SAND
JBH04	2	B	2.00	21					Brown clayey very sandy GRAVEL
JTP06	1	D	0.80	23	36	20	16	88	Grey brown slightly sandy slightly gravelly CLAY
JTP31	1	B	1.50	8.1					Orange brown silty gravelly SAND

STRUCTURAL SOILS LTD

Contract:

Talbot Mill

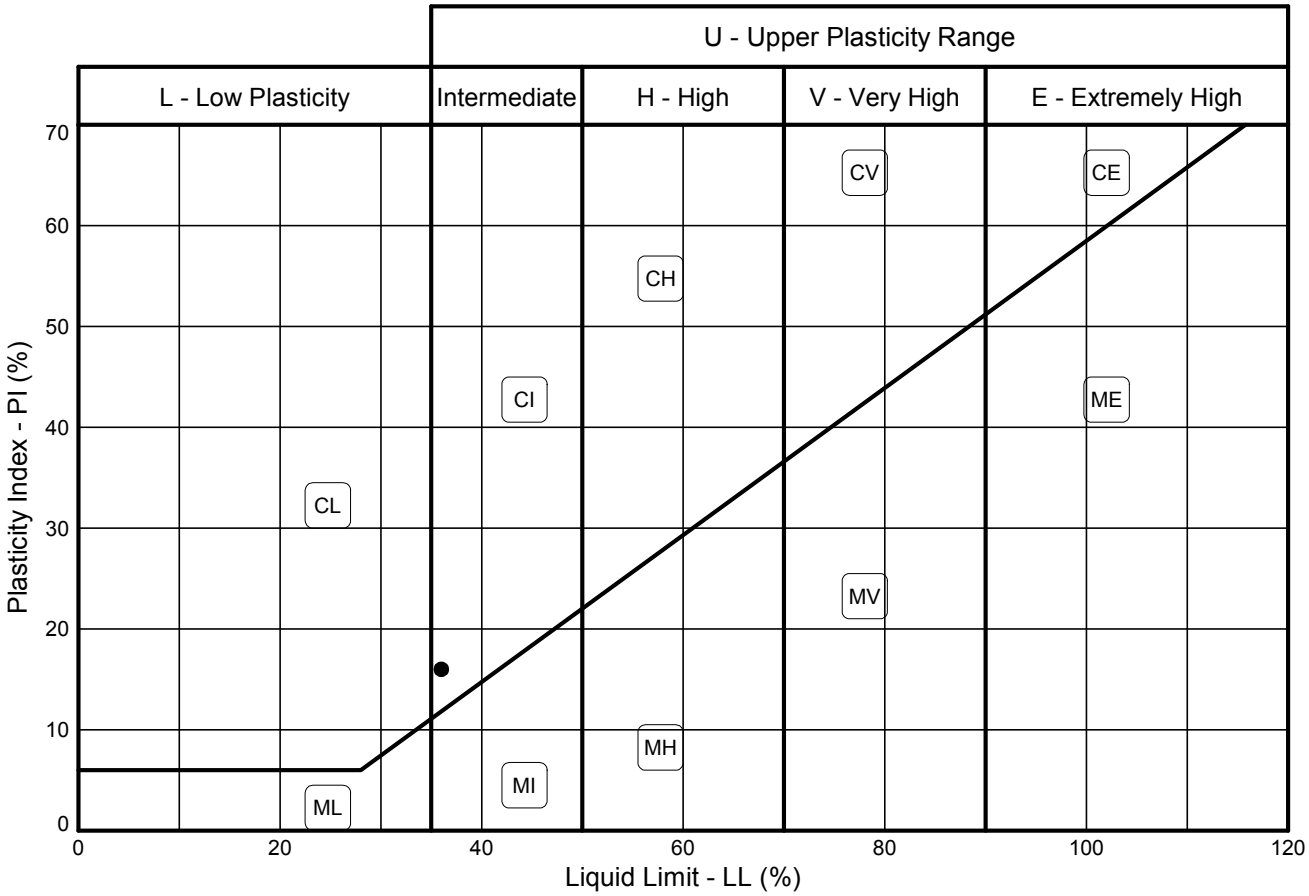
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PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %	Lab location	
	Exploratory Position ID	Sample	Depth (m)									
●	JTP06	1D	0.80	3.2/4.4/5.3/5.4	4.2.4	23	36	20	16	88	C	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Fisher.	**MAUREEN FISHER**	**16/07/18**

Contract	Contract Ref:
Talbot Mill	**783202**

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SUMMARY OF WATER CONTENT TESTS

In accordance with BS EN ISO 17892-1 : 2014

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content (%)	Drying Temperature (degC)	Description	Lab location
JBH02	1	D	1.20	1.0	105	Red brown GRAVEL	C
JBH02	3	D	6.70	12.1	105	Red brown SANDSTONE	C
JBH03	1	D	1.10	6.9	105	Dark brown slightly silty SAND and GRAVEL	C
JBH04	8	D	5.40	11.1	105	Red brown SANDSTONE	C
JTP10	1	D	0.80	13.4	105	Brown very sandy slightly gravelly CLAY	C
JTP21	1	D	0.40	12.0	105	Dark grey very silty slightly gravelly SAND	C
JTP25	1	D	0.40	9.5	105	Brown slightly clayey slightly gravelly SAND	C

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

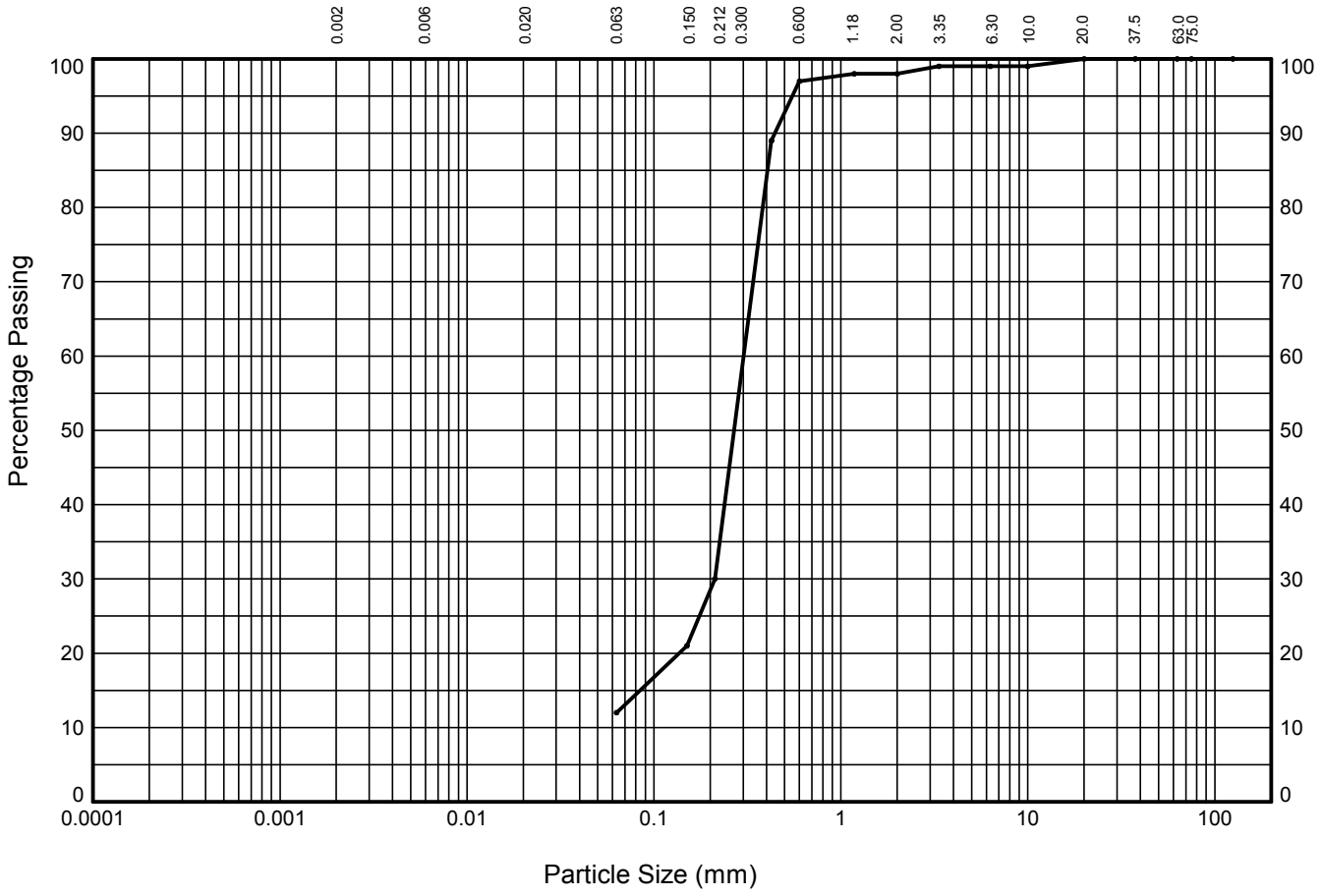
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Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date	Contract Ref:
M. Fisher.	**MAUREEN FISHER**	**16.07.18**	**783202**
Contract: **Talbot Mill**			

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2 of BS1377:Part 2:1990

Position ID: **JBH01** Sample Ref: **1** Sample Type: **B** Depth (m): **1.40**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**99**
6.30	**99**
3.35	**99**
2.00	**98**
1.18	**98**
0.600	**97**
0.425	**89**
0.212	**30**
0.150	**21**
0.063	**12**

Particle Diameter (mm)	Percent Passing (%)

Sedimentation sample was not pre-treated

Soil Fraction	Sieve Percentage (%)
GRAVEL	**2**
SAND	**86**
SILT/CLAY	**12**

Soil Description:

Red brown clayey slightly gravelly SAND

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W. Yorkshire WF10 1NJ

Compiled By	Date
SARAH MUNDY	16/07/18

Contract	Contract Ref:
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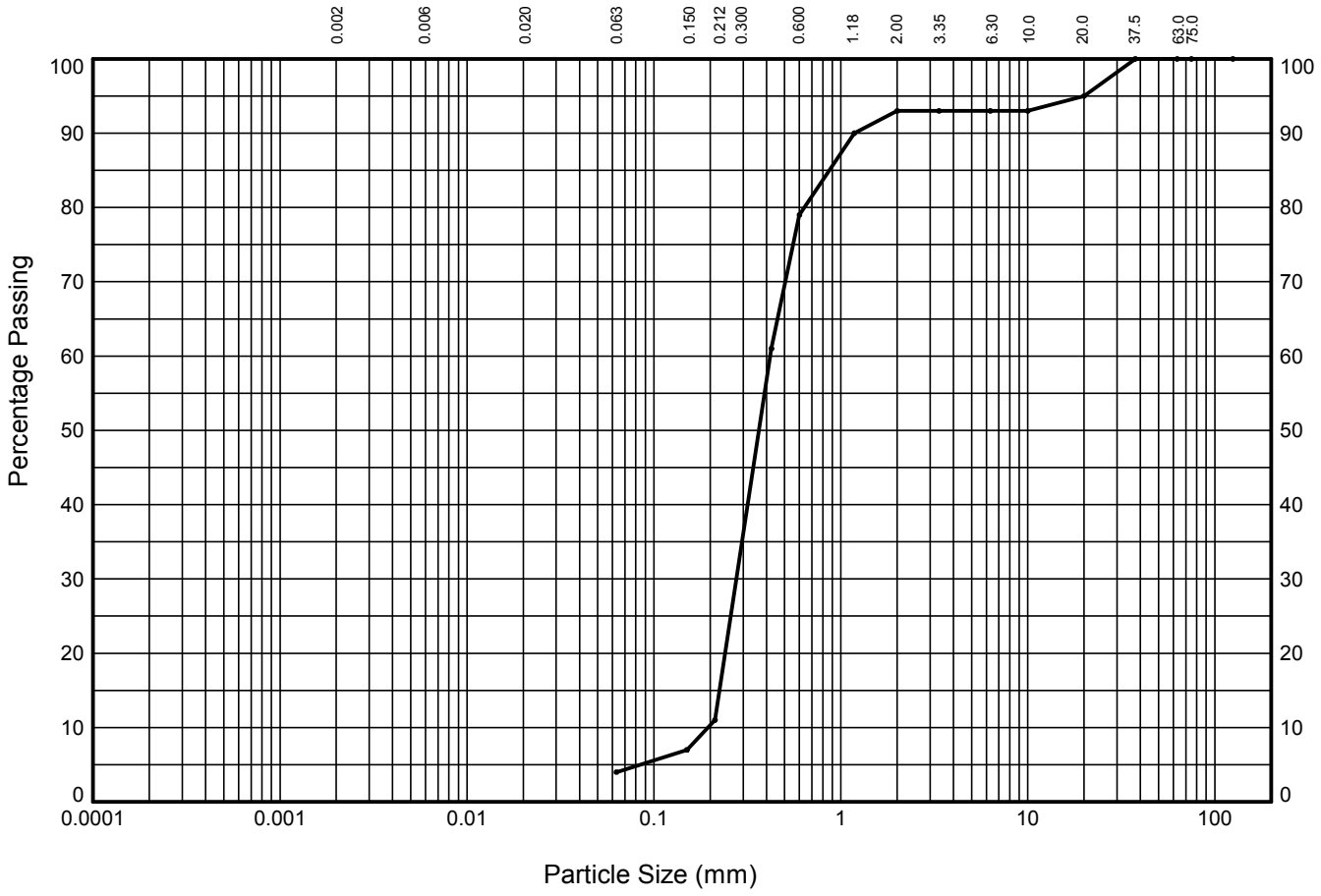
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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2 of BS1377:Part 2:1990

Position ID: **JBH02** Sample Ref: **2** Sample Type: **B** Depth (m): **4.80**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**95**
10.0	**93**
6.30	**93**
3.35	**93**
2.00	**93**
1.18	**90**
0.600	**79**
0.425	**61**
0.212	**11**
0.150	**7**
0.063	**4**

Particle Diameter (mm)	Percent Passing (%)

Sedimentation sample was not pre-treated

Soil Fraction	Sieve Percentage (%)
GRAVEL	**7**
SAND	**89**
SILT/CLAY	**4**

Soil Description:

Red brown slightly silty slightly gravelly SAND

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Pottery Street
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Compiled By		Date
Sarah Mundy	**SARAH MUNDY**	**16/07/18**

Contract	Contract Ref:
Talbot Mill	**783202**

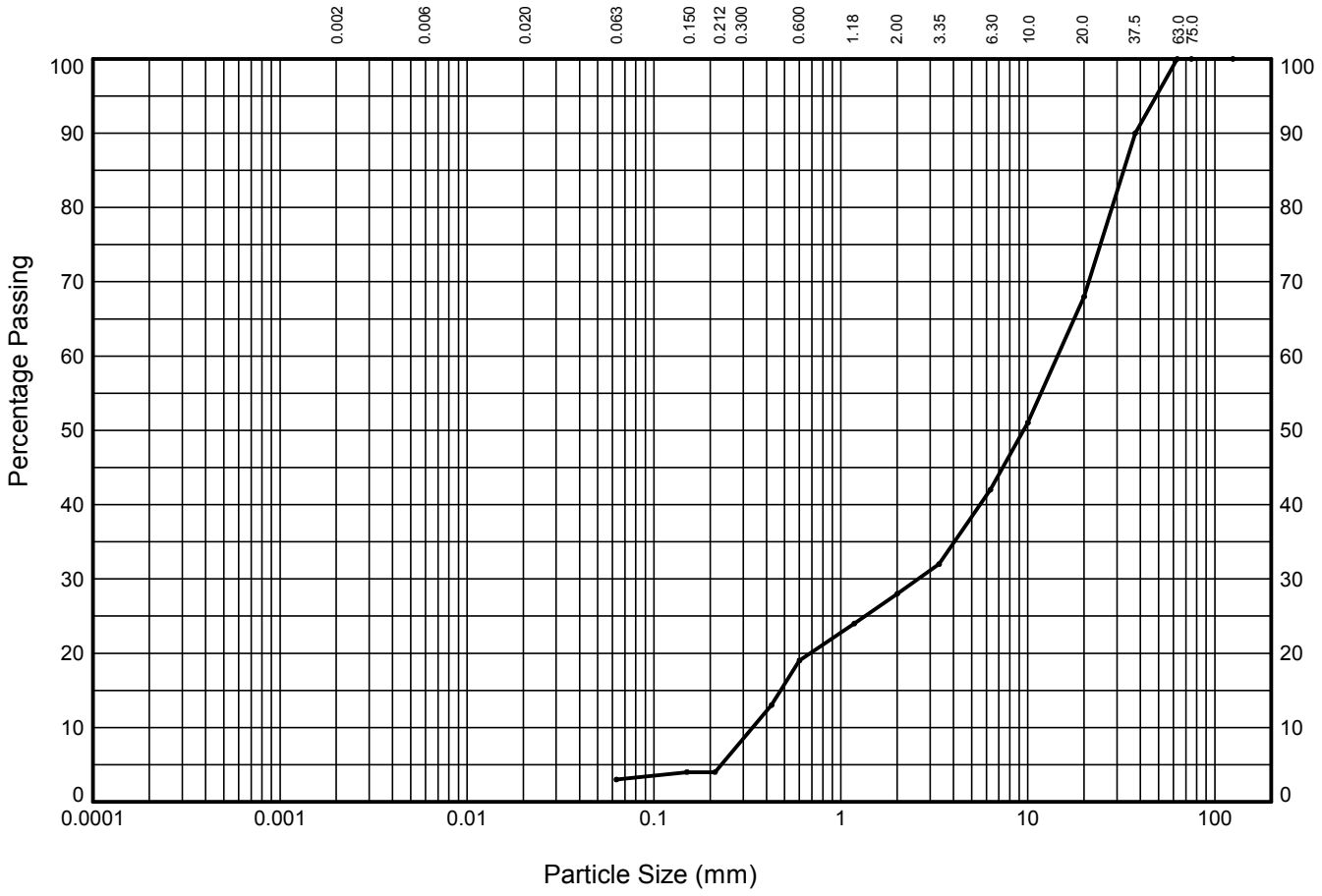
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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2 of BS1377:Part 2:1990

Position ID: **JBH04** Sample Ref: **1** Sample Type: **B** Depth (m): **1.20**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**90**
20.0	**68**
10.0	**51**
6.30	**42**
3.35	**32**
2.00	**28**
1.18	**24**
0.600	**19**
0.425	**13**
0.212	**4**
0.150	**4**
0.063	**3**

Particle Diameter (mm)	Percent Passing (%)

Sedimentation sample was not pre-treated

Soil Fraction	Sieve Percentage (%)
GRAVEL	**72**
SAND	**25**
SILT/CLAY	**3**

Soil Description:

Brown slightly silty very gravelly SAND

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The Potteries
Pottery Street
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Compiled By		Date
Sarah Mundy	**SARAH MUNDY**	**16/07/18**

Contract	Contract Ref:
Talbot Mill	**783202**

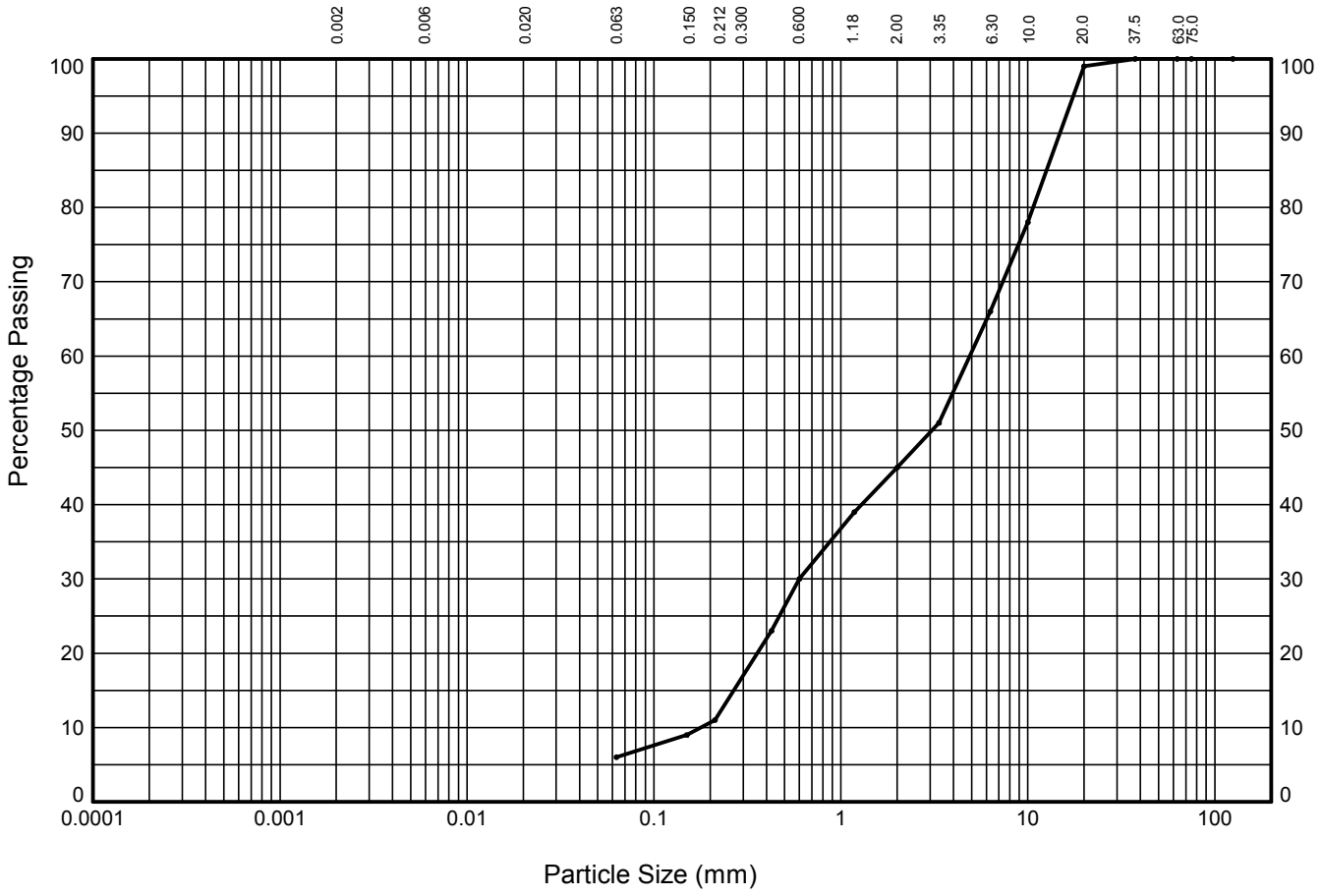
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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2 of BS1377:Part 2:1990

Position ID: **JBH04** Sample Ref: **2** Sample Type: **B** Depth (m): **2.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**99**
10.0	**78**
6.30	**66**
3.35	**51**
2.00	**45**
1.18	**39**
0.600	**30**
0.425	**23**
0.212	**11**
0.150	**9**
0.063	**6**

Particle Diameter (mm)	Percent Passing (%)

Sedimentation sample was not pre-treated

Soil Fraction	Sieve Percentage (%)
GRAVEL	**55**
SAND	**39**
SILT/CLAY	**6**

Soil Description:

Brown clayey very sandy GRAVEL

STRUCTURAL SOILS
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Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Fisher	**MAUREEN FISHER**	**16/07/18**

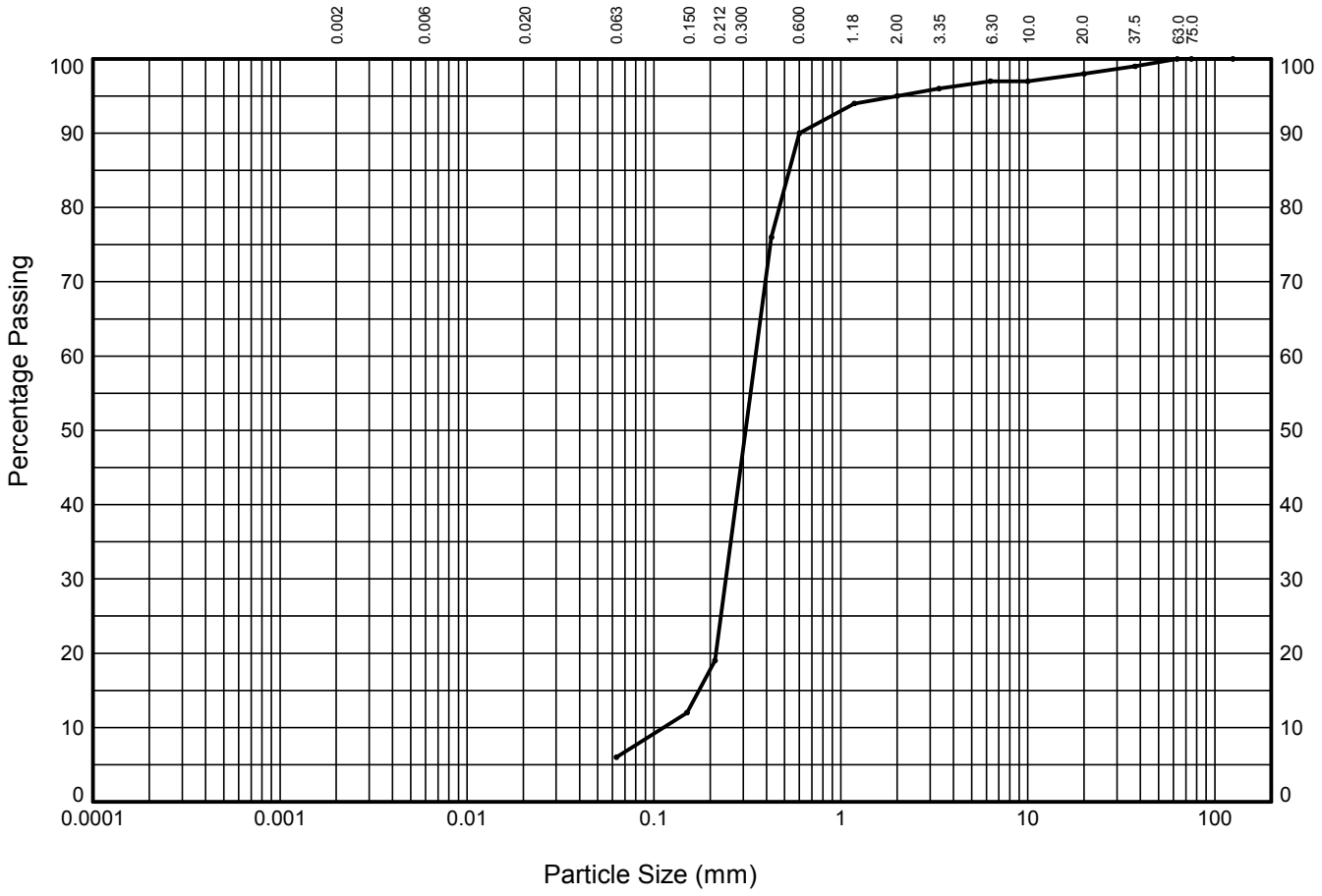
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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2 of BS1377:Part 2:1990

Position ID: **JTP30** Sample Ref: **1** Sample Type: **B** Depth (m): **0.80**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**99**
20.0	**98**
10.0	**97**
6.30	**97**
3.35	**96**
2.00	**95**
1.18	**94**
0.600	**90**
0.425	**76**
0.212	**19**
0.150	**12**
0.063	**6**

Particle Diameter (mm)	Percent Passing (%)

Sedimentation sample was not pre-treated

Soil Fraction	Sieve Percentage (%)
GRAVEL	**5**
SAND	**89**
SILT/CLAY	**6**

Soil Description:

Red brown slightly clayey slightly gravelly SAND

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Compiled By		Date
Sarah Mundy.	**SARAH MUNDY**	**16/07/18**

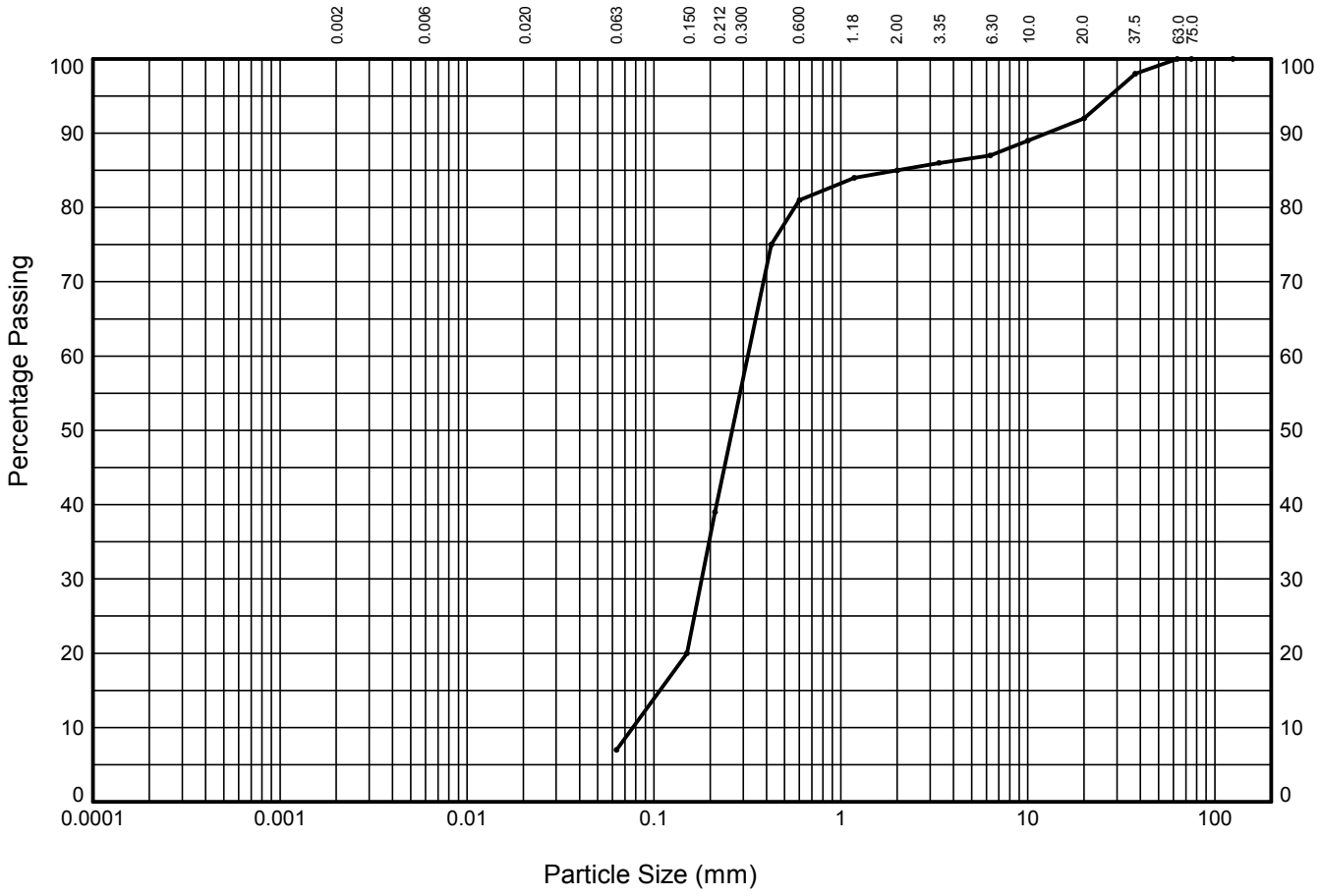
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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2 of BS1377:Part 2:1990

Position ID: **JTP31** Sample Ref: **1** Sample Type: **B** Depth (m): **1.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**98**
20.0	**92**
10.0	**89**
6.30	**87**
3.35	**86**
2.00	**85**
1.18	**84**
0.600	**81**
0.425	**75**
0.212	**39**
0.150	**20**
0.063	**7**

Particle Diameter (mm)	Percent Passing (%)

Sedimentation sample was not pre-treated

Soil Fraction	Sieve Percentage (%)
GRAVEL	**15**
SAND	**78**
SILT/CLAY	**7**

Soil Description:

Orange brown silty gravelly SAND

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Compiled By		Date
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Contract	Contract Ref:
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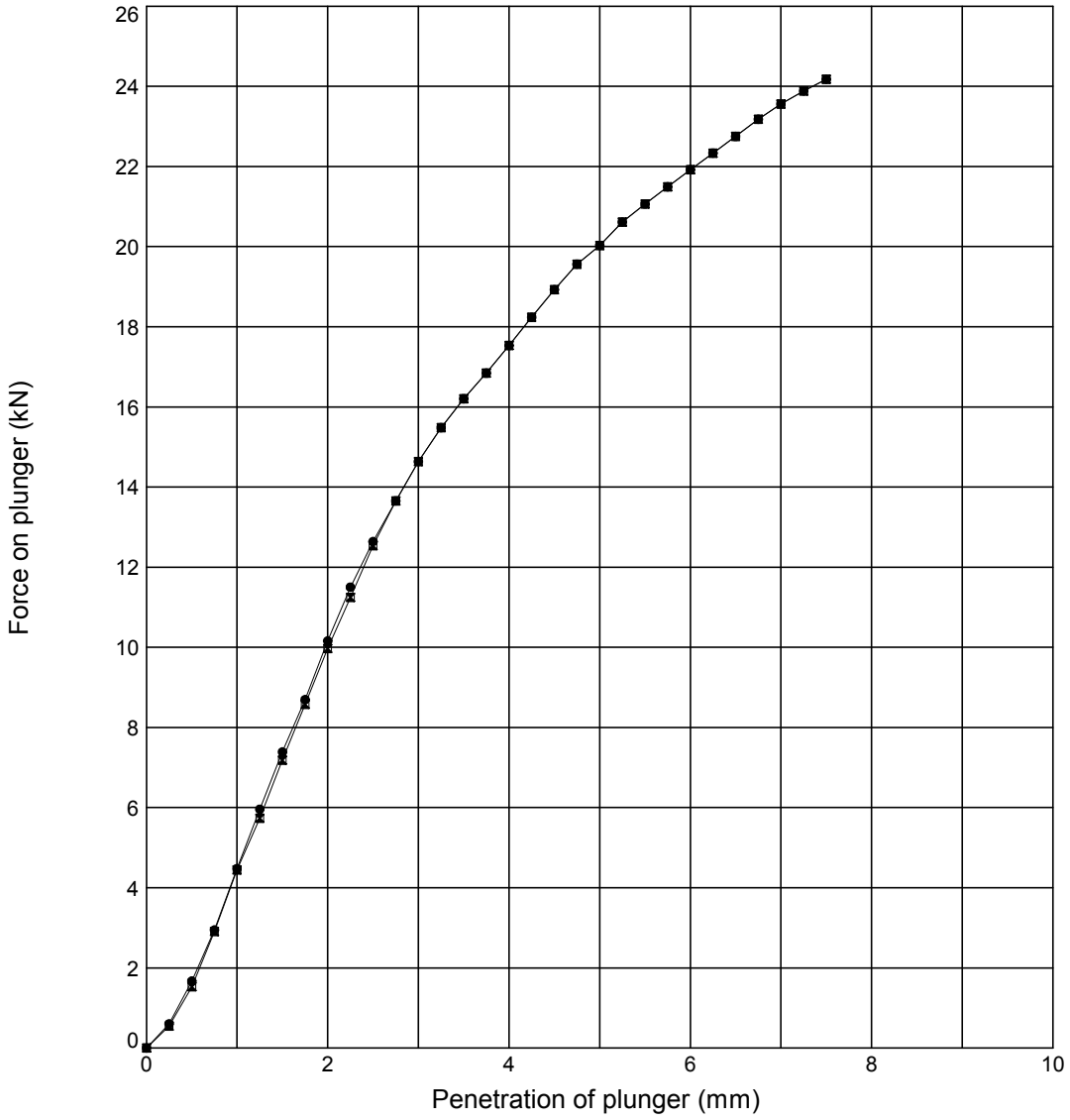
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LABORATORY CALIFORNIA BEARING RATIO TEST

In accordance with clause 7 of BS1377:Part 4:1990

Position ID: **JBH04** Sample Ref: **2** Sample Type: **B** Depth (m): **2.00**



Initial Sample Conditions			Test Details			Test Results	Top	Base
Initial Moisture Content (%)	:	**8.4**	Compaction Type	:	**2.5 kg Dynamic**	Moisture Content (%)	**8.4**	**8.4**
Initial Bulk Density (Mg/m^3)	:	**2.35**	Surcharge (kg)	:	**4.0**	CBR value (%)	**100**	**100**
Initial Dry Density (Mg/m^3)	:	**2.17**	Soaking Time (hrs)	:	**-**	Remarks: **None**		
% retained on 20mm sieve	:	**0**	Swelling (mm)	:	**-**			

Sample Description	Key
Brown clayey very sandy GRAVEL	● **Top** ⧓ **Base**

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Contract	Contract Ref:
Talbot Mill	**783202**

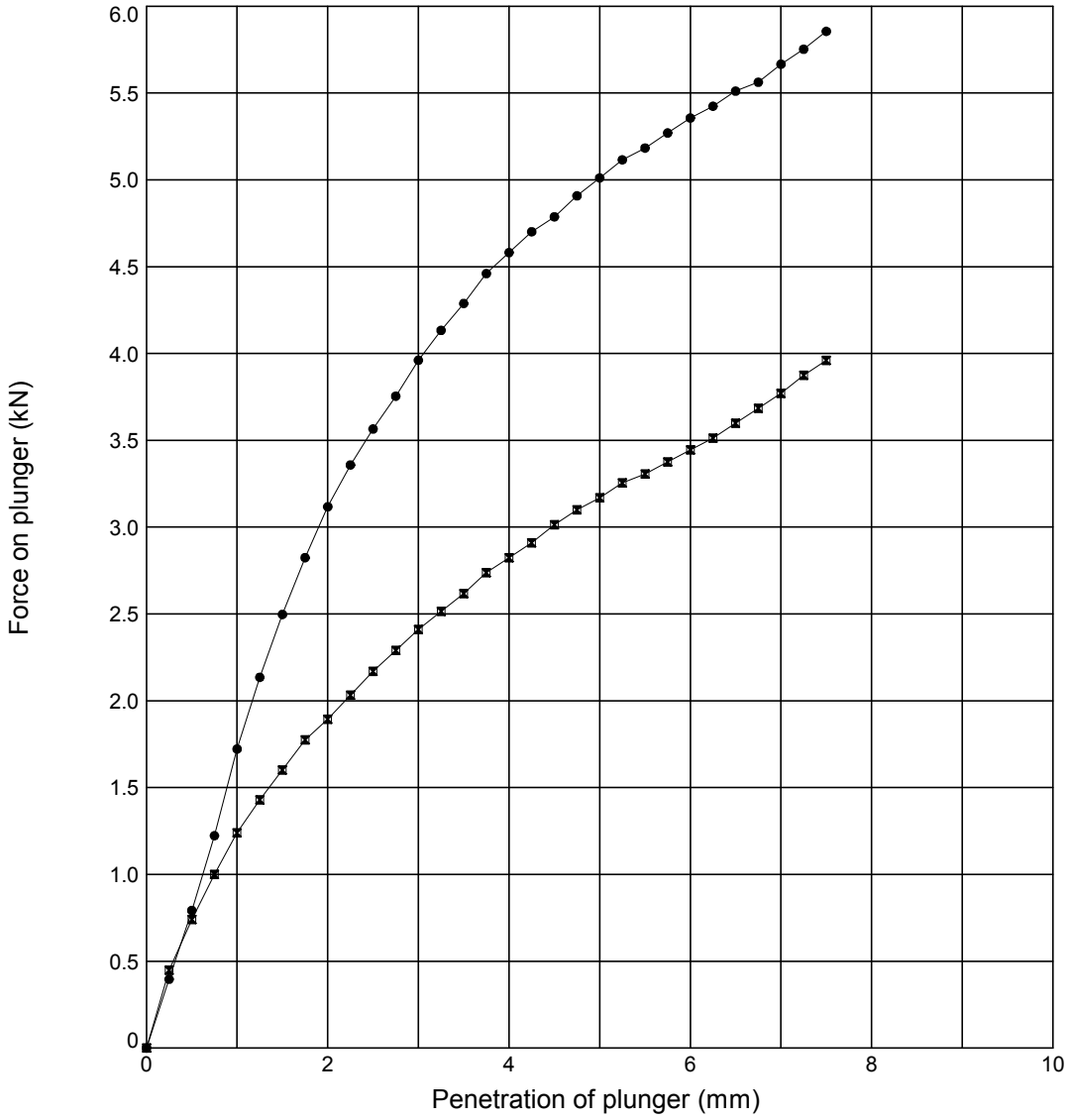
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LABORATORY CALIFORNIA BEARING RATIO TEST

In accordance with clause 7 of BS1377:Part 4:1990

Position ID: **JTP31** Sample Ref: **1** Sample Type: **B** Depth (m): **1.50**



Initial Sample Conditions			Test Details			Test Results	Top	Base
Initial Moisture Content (%)	:	**10**	Compaction Type	:	**Vibrating Hammer**	Moisture Content (%)	**10**	**10**
Initial Bulk Density (Mg/m^3)	:	**1.87**	Surcharge (kg)	:	**4.0**	CBR value (%)	**27**	**16**
Initial Dry Density (Mg/m^3)	:	**1.70**	Soaking Time (hrs)	:	**-**	Remarks: **None**		
% retained on 20mm sieve	:	**3**	Swelling (mm)	:	**-**			

Sample Description	Key
Orange brown silty gravelly SAND	● **Top** ⧓ **Base**

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Contract	Contract Ref:
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DETERMINATION OF POINT LOAD STRENGTH

RT03 Point Load Testing (in accordance with ISRM 2007)

Exploratory Position ID	Sample Ref	Depth (m)	Type of Test	Width or Length (W or L) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MN/m^2)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MN/m^2)	Water Content (%)	Rock Type	Lab location
JBH01	2	3.20	A	113.81	102.27	3.006	122	0.20	1.49	0.30 (✓)	1.4	SANDSTONE	**C**

Results

$I_s(50)$ Mean Axial tests = **0.3** MN/m^2
Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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M. Fisher.	**MAUREEN FISHER**	**16.07.18**	**783202**
Contract: **Talbot Mill**			

DETERMINATION OF POINT LOAD STRENGTH

RT03 Point Load Testing (in accordance with ISRM 2007)

Exploratory Position ID	Sample Ref	Depth (m)	Type of Test	Width or Length (W or L) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MN/m^2)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MN/m^2)	Water Content (%)	Rock Type	Lab location
JBH01	3	4.70	D	79.095	79.52	0.081	80	0.01	1.23	0.02 (✓)	7.1	SANDSTONE	**C**
JBH01	3	4.70	D	52.025	77.09	1.083	77	0.18	1.22	0.22 (✓)	7.1	SANDSTONE	**C**
JBH01	3	4.70	A	85.48	46.06	2.114	71	0.42	1.17	0.49 (✓)	7.1	SANDSTONE	**C**

Results

$I_s(50)$ Mean Axial tests = **0.49** MN/m^2
$I_s(50)$ Mean Diametral tests = **0.12** MN/m^2
$I_a(50)$ Strength Anisotropy Index = **4.16** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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M. Fisher.	**MAUREEN FISHER**	**16.07.18**	**783202**
Contract: **Talbot Mill**			

DETERMINATION OF POINT LOAD STRENGTH

RT03 Point Load Testing (in accordance with ISRM 2007)

Exploratory Position ID	Sample Ref	Depth (m)	Type of Test	Width or Length (W or L) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MN/m^2)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MN/m^2)	Water Content (%)	Rock Type	Lab location
JBH01	4	11.35	D	90.205	85.09	0.825	85	0.11	1.27	0.14 (✓)	9.1	SANDSTONE	**C**
JBH01	4	11.35	A	86.11	84.23	2.777	96	0.30	1.34	0.40 (✓)	9.1	SANDSTONE	**C**

Results

$I_s(50)$ Mean Axial tests = **0.4** MN/m^2
$I_s(50)$ Mean Diametral tests = **0.14** MN/m^2
$I_a(50)$ Strength Anisotropy Index = **2.79** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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M. Fisher.	**MAUREEN FISHER**	**16.07.18**	**783202**
Contract: **Talbot Mill**			

DETERMINATION OF POINT LOAD STRENGTH

RT03 Point Load Testing (in accordance with ISRM 2007)

Exploratory Position ID	Sample Ref	Depth (m)	Type of Test	Width or Length (W or L) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MN/m^2)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MN/m^2)	Water Content (%)	Rock Type	Lab location
JBH02	4	7.20	D	65.23	77.53	0.040	78	0.01	1.22	0.01 (✓)	2.6	SANDSTONE	**C**
JBH02	4	7.20	A	86.22	53.61	0.362	77	0.06	1.21	0.07 (✓)	2.6	SANDSTONE	**C**

Results

$I_s(50)$ Mean Axial tests = **0.07** MN/m^2
$I_s(50)$ Mean Diametral tests = **0.01** MN/m^2
$I_a(50)$ Strength Anisotropy Index = **9.2** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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M. Fisher.	**MAUREEN FISHER**	**16.07.18**	**783202**
Contract: **Talbot Mill**			

DETERMINATION OF POINT LOAD STRENGTH

RT03 Point Load Testing (in accordance with ISRM 2007)

Exploratory Position ID	Sample Ref	Depth (m)	Type of Test	Width or Length (W or L) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MN/m^2)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MN/m^2)	Water Content (%)	Rock Type	Lab location
JBH02	7	15.90	D	59.06	81.42	0.808	81	0.12	1.25	0.15 (✓)	5.8	SANDSTONE	**C**
JBH02	7	15.90	A	86.43	51.75	1.747	75	0.31	1.20	0.37 (✓)	5.8	SANDSTONE	**C**

Results

$I_s(50)$ Mean Axial tests = **0.37** MN/m^2
$I_s(50)$ Mean Diametral tests = **0.15** MN/m^2
$I_a(50)$ Strength Anisotropy Index = **2.43** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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Contract: **Talbot Mill**			

DETERMINATION OF POINT LOAD STRENGTH

RT03 Point Load Testing (in accordance with ISRM 2007)

Exploratory Position ID	Sample Ref	Depth (m)	Type of Test	Width or Length (W or L) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MN/m^2)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MN/m^2)	Water Content (%)	Rock Type	Lab location
JBH03	2	3.90	A	102.52	96.69	1.641	112	0.13	1.44	0.19 (✓)	5.3	SANDSTONE	**C**

Results

$I_s(50)$ Mean Axial tests = **0.19** MN/m^2
Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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Compiled By		Date	Contract Ref:
M. Fisher.	**MAUREEN FISHER**	**16.07.18**	**783202**
Contract: **Talbot Mill**			

UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **JBH01** Sample Ref: **3** Sample Type: **C** Depth (m): **4.70**

Bulk Density (Mg/m^3): **2.11** Dry Density (Mg/m^3): **1.92** Moisture Content (%): **10**
Length (mm): **151.20** Diameter (mm): **86.18** Length/Diameter Ratio: **1.75**
Test Duration (mins:secs): **8** Stress Rate (kN/min): **4.2** Load at Failure (kN): **48.3**
UCS (MPa): **8.3** Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**
Description: **Brown/red SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.
Non-standard notes: **Non Standard Test Ratio 1.75:1**



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076

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UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **JBH01** Sample Ref: **5** Sample Type: **C** Depth (m): **10.40**

Bulk Density (Mg/m^3): **1.98** Dry Density (Mg/m^3): **1.82** Moisture Content (%): **8.9**
Length (mm): **201.83** Diameter (mm): **86.70** Length/Diameter Ratio: **2.33**
Test Duration (mins:secs): **6** Stress Rate (kN/min): **4.2** Load at Failure (kN): **29.2**
UCS (MPa): **4.9** Failure Type: **Explosive**

Note: **Axis of loading parallel to core axis**
Description: **Brown/red SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076

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Compiled By		Date
M. Fisher	**MAUREEN FISHER**	**16/07/18**
Contract: **Talbot Mill**	Job No: **783202**	

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UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

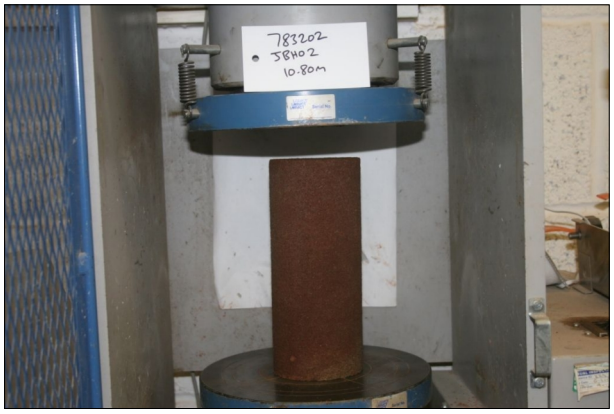
Borehole: **JBH02** Sample Ref: **4** Sample Type: **C** Depth (m): **10.80**

Bulk Density (Mg/m^3): **1.97** Dry Density (Mg/m^3): **1.76** Moisture Content (%): **12**
Length (mm): **202.73** Diameter (mm): **86.32** Length/Diameter Ratio: **2.35**
Test Duration (mins:secs): **3** Stress Rate (kN/min): **5.4** Load at Failure (kN): **19.3**
UCS (MPa): **3.3** Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**
Description: **Brown.red SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076

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Compiled By		Date
M. Fisher	**MAUREEN FISHER**	**16/07/18**

Contract	Job No
Talbot Mill	**783202**

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Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 16/07/18 - 14:57 | MF1 |

UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

Borehole: **JBH02** Sample Ref: **6** Sample Type: **C** Depth (m): **14.00**

Bulk Density (Mg/m^3): **2.00** Dry Density (Mg/m^3): **1.85** Moisture Content (%): **8.1**
Length (mm): **172.60** Diameter (mm): **85.84** Length/Diameter Ratio: **2.01**
Test Duration (mins:secs): **11** Stress Rate (kN/min): **2.4** Load at Failure (kN): **38.3**
UCS (MPa): **6.6** Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**
Description: **Brown/red SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Fisher	**MAUREEN FISHER**	**16/07/18**
Contract: **Talbot Mill**	Job No: **783202**	

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Geotech Lab-Castleford - 009 | GrfcText L - UCS STRESS CONTROL - A4P | 783202 - TALBOT MILL.GPJ - v8_06.
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UNIAXIAL COMPRESSIVE STRENGTH

RT05 UCS of Rock-Sample Preparation (In-house method based on ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)
RT06 UCS of Rock (In-house method based on ISRM 2007, ASTM D4543-08 and Eurocode 7 Part 2 W.1.1)

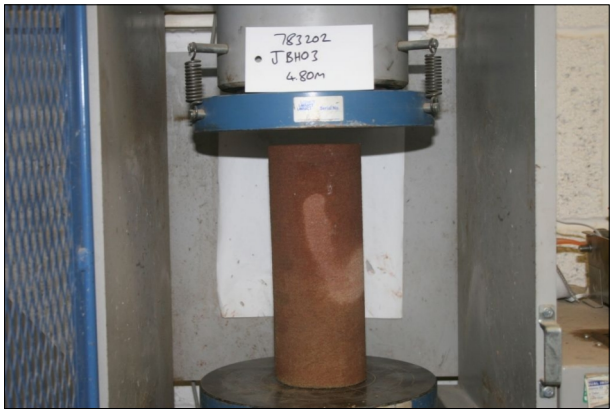
Borehole: **JBH03** Sample Ref: **3** Sample Type: **C** Depth (m): **4.80**

Bulk Density (Mg/m^3): **2.02** Dry Density (Mg/m^3): **1.95** Moisture Content (%): **3.8**
Length (mm): **218.43** Diameter (mm): **85.66** Length/Diameter Ratio: **2.55**
Test Duration (mins:secs): **18** Stress Rate (kN/min): **2.4** Load at Failure (kN): **63.3**
UCS (MPa): **11.0** Failure Type: **Shear**

Note: **Axis of loading parallel to core axis**
Description: **Red/brown SANDSTONE**
Specimen Preparation: **Specimen was not recored.**
Sample tolerance checks: Straightness: **PASS**. Flatness: **PASS**. Perpendicularity: **PASS**.



Front view (pre-test)



Rear view (pre-test)



Front view (post-test)



Rear view (post-test)

Samples delivered from site to storage facility. Samples are stored in a frost free environment, at temperatures >4°C
Compression machine: Impact CT340 2000kN Auto Compression Machine Serial No. CT340-22. SSL No. 011076

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Fisher	**MAUREEN FISHER**	**16/07/18**

Contract	Job No
Talbot Mill	**783202**

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TESTING VERIFICATION CERTIFICATE

UKAS TESTING
1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **16/07/2018 15:26:08**.

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Mark Athorne (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU

STRUCTURAL SOILS LTD	Contract: **Talbot Mill**	Job No: **783202**

AGS

GINT_LIBRARY_V8_06.GLB LibVersion: v8_06_018 PrjVersion: v8_06 - Core+Geotech Lab-Castleford - 009 | GrfcText L - LAB VERIFICATION REPORT - V02 - A4P | 783202 - TALBOT MILL.GPJ - v8_06.
Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 16/07/18 - 15:26 | MAA1 |

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/04796
Issue Number: 1 **Date:** 22 June, 2018

Client:
Structural Soils Limited (Castleford Lab)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Mark Athorne
Project Name: Talbot Mill
Project Ref: 783202
Order No: N/A
Date Samples Received: 14/06/18
Date Instructions Received: 18/06/18
Date Analysis Completed: 22/06/18

Prepared by:



Holly Neary-King
Sales Executive

Approved by:



Georgia King
Admin & Client Services Supervisor

Envirolab Job Number: 18/04796

Client Project Name: Talbot Mill

Client Project Ref: 783202

Lab Sample ID	18/04796/1	18/04796/2	18/04796/3	18/04796/4	18/04796/5	18/04796/6	18/04796/7	18/04796/8	Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH01	JBH01	JBH02	JBH02	JBH02	JBH03	JBH04		
Depth to Top	1.60	1.70	6.20	4.80	6.70	11.70	1.20	2.00		
Depth To Bottom	1.70	3.20	7.70	5.70	7.20	13.20	1.70			
Date Sampled	16-May-18			15-May-18			17-May-18	15-May-18		
Sample Type	Soil - D	Soil	Soil	Soil - D	Soil	Soil	Solid	Soil - D		
Sample Matrix Code	1	1A	1A	1A	1A	1A	7	4A		
% Stones >10mm$_A$	<0.1	<0.1	<0.1	<0.1	<0.1	3.2	<0.1	23.2	% w/w	A-T-044
pH BRE$_D^{M\#}$	8.25	8.13	7.51	7.64	7.60	7.70	8.37	8.02	pH	A-T-031s
Chloride BRE, SO4 equiv. (water sol 2:1)$_D^{M\#}$	<7	<7	<7	<7	<7	<7	<7	<7	mg/l	A-T-026s
Sulphate BRE (water sol 2:1)$_D^{M\#}$	13	16	40	<10	<10	<10	<10	22	mg/l	A-T-026s

Envirolab Job Number: 18/04796

Client Project Name: Talbot Mill

Client Project Ref: 783202

Lab Sample ID	18/04796/9	18/04796/10	18/04796/11	18/04796/12	18/04796/13	18/04796/14	18/04796/15	18/04796/16	Units	Method ref
Client Sample No			1				2			
Client Sample ID	JTP05	JTP10A	JTP20	JTP23	JTP24	JTP30	JTP31	JBH02		
Depth to Top	0.50	0.50	0.20	0.40	0.90	0.80	1.50	1.20		
Depth To Bottom	0.65	0.80	0.40	0.60	1.00	1.50	1.80			
Date Sampled	17-May-18	17-May-18	15-May-18	16-May-18	16-May-18	15-May-18	14-May-18			
Sample Type	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Solid		
Sample Matrix Code	4A	4A	4A	4A	4	1	4A	7		
% Stones >10mm$_A$	29.0	29.9	25.5	37.9	12.1	<0.1	10.1	<0.1	% w/w	A-T-044
pH BRE$_D^{M\#}$	8.03	8.04	7.64	8.22	8.23	8.67	7.71	8.34	pH	A-T-031s
Chloride BRE, SO4 equiv. (water sol 2:1)$_D^{M\#}$	<7	<7	123	<7	<7	<7	<7	<7	mg/l	A-T-026s
Sulphate BRE (water sol 2:1)$_D^{M\#}$	89	247	1150	<10	<10	<10	64	23	mg/l	A-T-026s

Envirolab Job Number: 18/04796

Client Project Name: Talbot Mill

Client Project Ref: 783202

Lab Sample ID	18/04796/17	18/04796/18							Units	Method ref
Client Sample No		1								
Client Sample ID	JBH01	JTP06								
Depth to Top	4.70	0.75								
Depth To Bottom	6.20	0.95								
Date Sampled		15-May-18								
Sample Type	Soil - D	Soil - D								
Sample Matrix Code	1A	6A								
% Stones >10mm$_A$	<0.1	17.0							% w/w	A-T-044
pH BRE$_D^{M\#}$	8.15	7.13							pH	A-T-031s
Chloride BRE, SO4 equiv. (water sol 2:1)$_D^{M\#}$	<7	104							mg/l	A-T-026s
Sulphate BRE (water sol 2:1)$_D^{M\#}$	14	214							mg/l	A-T-026s

REPORT NOTES

General:
This report shall not be reproduced, except in full, without written approval from Envirolab.
All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure and there is insufficient sample to repeat the analysis. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

APPENDIX G
LABORATORY CERTIFICATES FOR GROUNDWATER

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/04274
Issue Number: 1 **Date:** 13 June, 2018

Client:
RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Emma Hobbs
Project Name: Talbot Mill
Project Ref: 11264
Order No: N/A
Date Samples Received: 30/05/18
Date Instructions Received: 31/05/18
Date Analysis Completed: 13/06/18

Prepared by:
Melanie Marshall
Laboratory Coordinator

Approved by:
John Gustafson
Managing Director

UKAS TESTING
1247

Envirolab Job Number: 18/04274

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04274/1	18/04274/2	18/04274/3						Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03							
Depth to Top	7.00	6.50	5.00							
Depth To Bottom										
Date Sampled	29-May-18	29-May-18	29-May-18							
Sample Type	Water - EW	Water - EW	Water - EW							
Sample Matrix Code	N/A	N/A	N/A							
pH (w)$_A^{\#}$	6.95	6.95	7.59						pH	A-T-031w
Hardness Total$_A^{\#}$	265	460	248						mg/l Ca CO3	A-T-049w
Chloride (w)$_A^{\#}$	29	103	31						mg/l	A-T-026w
Sulphate (w)$_A^{\#}$	135	165	23						mg/l	A-T-026w
DOC (w)$_A^{\#}$	2.7	2.2	1.3						mg/l	A-T-032w
Arsenic (dissolved)$_A^{\#}$	1	<1	1						µg/l	A-T-025w
Cadmium (dissolved)$_A^{\#}$	<0.2	<0.2	<0.2						µg/l	A-T-025w
Copper (dissolved)$_A^{\#}$	2	2	2						µg/l	A-T-025w
Chromium (dissolved)$_A^{\#}$	9	7	14						µg/l	A-T-025w
Lead (dissolved)$_A^{\#}$	3	1	<1						µg/l	A-T-025w
Magnesium (dissolved)$_A^{\#}$	18	16	18						mg/l	A-T-049w
Mercury (dissolved)$_A^{\#}$	<0.1	<0.1	<0.1						µg/l	A-T-025w
Nickel (dissolved)$_A^{\#}$	2	5	1						µg/l	A-T-025w
Selenium (dissolved)$_A^{\#}$	1	<1	<1						µg/l	A-T-025w
Zinc (dissolved)$_A^{\#}$	14	13	2						µg/l	A-T-025w

Envirolab Job Number: 18/04274

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04274/1	18/04274/2	18/04274/3						Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03							
Depth to Top	7.00	6.50	5.00							
Depth To Bottom										
Date Sampled	29-May-18	29-May-18	29-May-18							
Sample Type	Water - EW	Water - EW	Water - EW							
Sample Matrix Code	N/A	N/A	N/A							
PAH 16MS (w)										
Acenaphthene $(w)_A^{\#}$	<0.01	<0.01	0.03						µg/l	A-T-019w
Acenaphthylene $(w)_A^{\#}$	<0.01	<0.01	<0.01						µg/l	A-T-019w
Anthracene $(w)_A^{\#}$	<0.01	<0.01	0.01						µg/l	A-T-019w
Benzo(a)anthracene $(w)_A^{\#}$	<0.01	<0.01	0.04						µg/l	A-T-019w
Benzo(a)pyrene $(w)_A^{\#}$	<0.01	<0.01	0.04						µg/l	A-T-019w
Benzo(b)fluoranthene $(w)_A^{\#}$	<0.01	<0.01	0.04						µg/l	A-T-019w
Benzo(ghi)perylene $(w)_A^{\#}$	<0.01	<0.01	0.02						µg/l	A-T-019w
Benzo(k)fluoranthene $(w)_A^{\#}$	<0.01	<0.01	0.02						µg/l	A-T-019w
Chrysene $(w)_A^{\#}$	<0.01	<0.01	0.06						µg/l	A-T-019w
Dibenzo(ah)anthracene $(w)_A^{\#}$	<0.01	<0.01	<0.01						µg/l	A-T-019w
Fluoranthene $(w)_A^{\#}$	<0.01	0.02	0.09						µg/l	A-T-019w
Fluorene $(w)_A^{\#}$	<0.01	<0.01	0.01						µg/l	A-T-019w
Indeno(123-cd)pyrene $(w)_A^{\#}$	<0.01	<0.01	0.02						µg/l	A-T-019w
Naphthalene $(w)_A^{\#}$	<0.01	<0.01	<0.01						µg/l	A-T-019w
Phenanthrene $(w)_A^{\#}$	<0.01	0.01	0.08						µg/l	A-T-019w
Pyrene $(w)_A^{\#}$	0.09	0.02	0.10						µg/l	A-T-019w
Total PAH 16MS $(w)_A^{\#}$	0.09	0.05	0.56						µg/l	A-T-019w

Envirolab Job Number: 18/04274

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/04274/1	18/04274/2	18/04274/3						Units	Method ref
Client Sample No										
Client Sample ID	JBH01	JBH02	JBH03							
Depth to Top	7.00	6.50	5.00							
Depth To Bottom										
Date Sampled	29-May-18	29-May-18	29-May-18							
Sample Type	Water - EW	Water - EW	Water - EW							
Sample Matrix Code	N/A	N/A	N/A							
TPH CWG										
Ali >C5-C6 $(w)_A^{\#}$	<1	<1	3						µg/l	A-T-022w
Ali >C6-C8 $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
Ali >C8-C10 $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
Ali >C10-C12 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Ali >C12-C16 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Ali >C16-C21 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Ali >C21-C35 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Total Aliphatics $(w)_A$	<5	<5	<5						µg/l	A-T-022+23w
Aro >C5-C7 $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
Aro >C7-C8 $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
Aro >C8-C9 $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
Aro >C9-C10 $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
Aro >C10-C12 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Aro >C12-C16 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Aro >C16-C21 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Aro >C21-C35 $(w)_A^{\#}$	<5	<5	<5						µg/l	A-T-023w
Total Aromatics $(w)_A$	<5	<5	<5						µg/l	A-T-022+23w
TPH (Ali & Aro) $(w)_A$	<5	<5	<5						µg/l	A-T-022+23w
BTEX - Benzene $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
BTEX - Toluene $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
BTEX - Ethyl Benzene $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
BTEX - m & p Xylene $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
BTEX - o Xylene $(w)_A^{\#}$	<1	<1	<1						µg/l	A-T-022w
MTBE $(w)_A^{\#}$	<1	<1	3						µg/l	A-T-022w

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All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

APPENDIX H
GROUND GAS MONITORING DATA SHEETS

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks
Round 1	-	-	1023	-	GA2000 + Weather: Clear + Ground: Dry + Wind: Light + Air Temp: 13DegC
Round 2	-	-	1016	-	GA2000 + YSI556 SN-07L100518 + Peristaltic pump SN-25083312 + Weather: Clear + Ground: Dry + Wind: Light + Air Temp: 18DegC
Round 3	Falling	-	-	-	GA2000 + Weather: Cloudy and windy + Ground: Dry + Wind: Strong + Air Temp: 17DegC
Round 4	-	-	1009	-	GA2000 SN-GA10789 + Weather: Cloudy with gusty winds + Ground: Dry + Wind: Medium + Air Temp: 21DegC
Round 5	-	-	1008	-	GA2000 SN-GA10789 + Weather: Sunny + Ground: Dry + Wind: None + Air Temp: 22DegC
Round 6	-	-	1374	-	GA2000 SN-GA10789 + Weather: Dry and sunny + Ground: Dry + Wind: None + Air Temp: 24DegC

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH01	1	50	1	8.00	7.92	3.00 to 8.00	23/05/2018 08:30:00	1023	1023	$0.0_{(I)}$	2.82	0.2	0.0	20.8	-	0.8	3	0
JBH01	1	50	1		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.2	0.0	20.1	-	-	6	0
JBH01	1	50	1		---	3.00 to 8.00	30 secs	-	-	-	-	0.5	0.0	20.0	-	-	5	0
JBH01	1	50	1		---	3.00 to 8.00	60 secs	-	-	-	-	0.5	0.0	19.9	-	-	5	0
JBH01	1	50	1		---	3.00 to 8.00	90 secs	-	-	-	-	0.5	0.0	19.9	-	-	5	0
JBH01	1	50	1		---	3.00 to 8.00	120 secs	-	-	-	-	0.5	0.0	19.9	-	-	4	0
JBH01	1	50	1		---	3.00 to 8.00	180 secs	-	-	-	-	0.5	0.0	19.9	-	-	5	0
JBH01	1	50	1		---	3.00 to 8.00	240 secs	-	-	-	-	0.5	0.0	19.9	-	-	4	0
JBH01	1	50	1		---	3.00 to 8.00	300 secs	-	-	-	-	0.5	0.0	19.9	-	-	4	0
JBH01	1	50	1		---	3.00 to 8.00	360 secs	-	-	-	-	0.5	0.0	19.9	-	-	4	0
JBH01	1	50	1		---	3.00 to 8.00	420 secs	-	-	-	-	0.5	0.0	19.9	-	-	4	0
JBH01	1	50	2	8.00	7.94	3.00 to 8.00	29/05/2018 10:05:00	1016	1016	$0.4_{(I)}$	2.27	0.0	0.0	20.8	-	1.1	0	0
JBH01	1	50	2		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.4	0.0	20.3	-	-	2	0
JBH01	1	50	2		---	3.00 to 8.00	30 secs	-	-	-	-	0.4	0.0	20.0	-	-	4	0
JBH01	1	50	2		---	3.00 to 8.00	60 secs	-	-	-	-	0.4	0.0	20.0	-	-	4	0
JBH01	1	50	2		---	3.00 to 8.00	90 secs	-	-	-	-	0.4	0.0	20.0	-	-	3	0
JBH01	1	50	2		---	3.00 to 8.00	120 secs	-	-	-	-	0.4	0.0	20.0	-	-	3	0
JBH01	1	50	2		---	3.00 to 8.00	180 secs	-	-	-	-	0.4	0.0	20.0	-	-	3	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	10/08/18	11264

Contract: **Talbot Mill**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH01	1	50	2		---	3.00 to 8.00	240 secs	-	-	-	-	0.4	0.0	20.0	-	-	3	0
JBH01	1	50	2		---	3.00 to 8.00	300 secs	-	-	-	-	0.4	0.0	20.0	-	-	3	0
JBH01	1	50	3	8.00	7.84	3.00 to 8.00	14/06/2018 08:20:00	996	997	$0.0_{(I)}$	2.15	0.2	0.0	21.0	0.0	-	0	0
JBH01	1	50	3		---	3.00 to 8.00	15 secs	-	-	$0.1_{(SS)}$	-	0.9	0.0	19.5	0.0	-	1	0
JBH01	1	50	3		---	3.00 to 8.00	30 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	4	0
JBH01	1	50	3		---	3.00 to 8.00	60 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	3	0
JBH01	1	50	3		---	3.00 to 8.00	90 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	4	0
JBH01	1	50	3		---	3.00 to 8.00	120 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	3	0
JBH01	1	50	3		---	3.00 to 8.00	180 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	3	0
JBH01	1	50	3		---	3.00 to 8.00	240 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	3	0
JBH01	1	50	3		---	3.00 to 8.00	300 secs	-	-	-	-	0.9	0.0	19.3	0.0	-	3	0
JBH01	1	50	4	8.00	7.83	3.00 to 8.00	20/06/2018 10:48:00	1009	1009	$-0.1_{(I)}$	2.29	1.2	0.0	20.1	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	15 secs	-	-	$0.1_{(SS)}$	-	1.3	0.0	19.1	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	30 secs	-	-	-	-	1.3	0.0	19.2	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	60 secs	-	-	-	-	1.2	0.0	19.2	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	90 secs	-	-	-	-	1.2	0.0	19.2	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	120 secs	-	-	-	-	1.2	0.0	19.3	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	180 secs	-	-	-	-	1.1	0.0	19.4	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	240 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	300 secs	-	-	-	-	0.9	0.0	19.6	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	360 secs	-	-	-	-	0.9	0.0	19.7	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	420 secs	-	-	-	-	0.9	0.0	19.7	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	480 secs	-	-	-	-	0.8	0.0	19.7	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	540 secs	-	-	-	-	0.8	0.0	19.7	0.0	-	1	0
JBH01	1	50	4		---	3.00 to 8.00	600 secs	-	-	-	-	0.8	0.0	19.7	0.0	-	1	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	10/08/18	11264

Contract: **Talbot Mill**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH01	1	50	5	8.00	7.82	3.00 to 8.00	05/07/2018 11:23:00	1007	1008	$-0.4_{(I)}$	2.39	0.0	0.0	20.3	0.0	-	0	0
JBH01	1	50	5		---	3.00 to 8.00	15 secs	-	-	$-0.4_{(SS)}$	-	1.5	0.0	18.1	0.0	-	4	0
JBH01	1	50	5		---	3.00 to 8.00	30 secs	-	-	-	-	1.3	0.0	18.0	0.0	-	4	0
JBH01	1	50	5		---	3.00 to 8.00	60 secs	-	-	-	-	1.4	0.0	17.9	0.0	-	4	0
JBH01	1	50	5		---	3.00 to 8.00	90 secs	-	-	-	-	1.4	0.0	17.9	0.0	-	4	0
JBH01	1	50	5		---	3.00 to 8.00	120 secs	-	-	-	-	1.4	0.0	17.9	0.0	-	4	0
JBH01	1	50	5		---	3.00 to 8.00	180 secs	-	-	-	-	1.4	0.0	17.9	0.0	-	4	0
JBH01	1	50	5		---	3.00 to 8.00	240 secs	-	-	-	-	1.4	0.0	17.9	0.0	-	5	0
JBH01	1	50	5		---	3.00 to 8.00	300 secs	-	-	-	-	1.4	0.0	17.9	0.0	-	4	0
JBH01	1	50	6	8.00	7.80	3.00 to 8.00	16/07/2018 14:31:00	988	1374	$0.4_{(I)}$	2.34	0.0	0.0	20.5	0.0	0.0	0	0
JBH01	1	50	6		---	3.00 to 8.00	15 secs	-	-	$0.4_{(SS)}$	-	1.6	0.0	18.4	0.0	-	1	0
JBH01	1	50	6		---	3.00 to 8.00	30 secs	-	-	-	-	1.5	0.1	17.9	1.0	-	2	0
JBH01	1	50	6		---	3.00 to 8.00	60 secs	-	-	-	-	1.5	0.1	17.9	1.0	-	2	0
JBH01	1	50	6		---	3.00 to 8.00	90 secs	-	-	-	-	1.5	0.1	17.8	1.0	-	2	0
JBH01	1	50	6		---	3.00 to 8.00	120 secs	-	-	-	-	1.5	0.1	17.8	1.0	-	2	0
JBH01	1	50	6		---	3.00 to 8.00	180 secs	-	-	-	-	1.5	0.1	17.8	1.0	-	2	0
JBH01	1	50	6		---	3.00 to 8.00	240 secs	-	-	-	-	1.5	0.1	17.8	1.0	-	2	0
JBH01	1	50	6		---	3.00 to 8.00	300 secs	-	-	-	-	1.5	0.1	17.8	1.0	-	2	0
JBH02	1	50	1	8.00	7.64	3.00 to 8.00	23/05/2018 10:50:00	1024	1024	$0.0_{(I)}$	3.18	0.0	0.0	21.1	-	0.5	1	0
JBH02	1	50	1		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.4	0.0	20.9	-	-	1	0
JBH02	1	50	1		---	3.00 to 8.00	30 secs	-	-	-	-	0.4	0.0	20.7	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	60 secs	-	-	-	-	0.4	0.0	20.7	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	90 secs	-	-	-	-	0.4	0.0	20.6	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	120 secs	-	-	-	-	0.4	0.0	20.6	-	-	0	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	10/08/18	11264

Contract: **Talbot Mill**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH02	1	50	1		---	3.00 to 8.00	180 secs	-	-	-	-	0.4	0.0	20.6	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	240 secs	-	-	-	-	0.4	0.0	20.5	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	300 secs	-	-	-	-	0.4	0.0	20.4	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	360 secs	-	-	-	-	0.4	0.0	20.4	-	-	0	0
JBH02	1	50	1		---	3.00 to 8.00	420 secs	-	-	-	-	0.4	0.0	20.4	-	-	0	0
JBH02	1	50	2	8.00	7.61	3.00 to 8.00	29/05/2018 10:55:00	1015	1016	$0.0_{(I)}$	3.17	0.1	0.0	21.0	-	-	0	0
JBH02	1	50	2		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.5	0.0	20.8	-	-	0	0
JBH02	1	50	2		---	3.00 to 8.00	30 secs	-	-	-	-	0.5	0.0	20.7	-	-	0	0
JBH02	1	50	2		---	3.00 to 8.00	60 secs	-	-	-	-	0.5	0.0	20.7	-	-	0	0
JBH02	1	50	2		---	3.00 to 8.00	90 secs	-	-	-	-	0.5	0.0	20.7	-	-	1	0
JBH02	1	50	2		---	3.00 to 8.00	120 secs	-	-	-	-	0.5	0.0	20.7	-	-	1	0
JBH02	1	50	2		---	3.00 to 8.00	180 secs	-	-	-	-	0.5	0.0	20.7	-	-	1	0
JBH02	1	50	2		---	3.00 to 8.00	240 secs	-	-	-	-	0.5	0.0	20.7	-	-	1	0
JBH02	1	50	2		---	3.00 to 8.00	300 secs	-	-	-	-	0.5	0.0	20.7	-	-	1	0
JBH02	1	50	3	8.00	---	3.00 to 8.00	14/06/2018 08:10:00	996	998	$0.1_{(I)}$	-	0.7	0.0	20.4	0.0	-	0	0
	Remarks: Could not remove bug. No cone over borehole and gas taps. too high to properly close cover. Unable to take depth readings.																	
JBH02	1	50	3		---	3.00 to 8.00	15 secs	-	-	$0.1_{(SS)}$	-	0.8	0.0	20.4	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	30 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	60 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	90 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	120 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	180 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	240 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	3		---	3.00 to 8.00	300 secs	-	-	-	-	0.7	0.0	20.3	0.0	-	0	0
JBH02	1	50	4	8.00	7.83	3.00 to 8.00	20/06/2018 10:21:00	1009	1009	$0.1_{(I)}$	2.29	0.9	0.0	20.2	0.0	-	0	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	10/08/18	11264

Contract: **Talbot Mill**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH02	1	50	4		---	3.00 to 8.00	15 secs	1009	1009	$0.1_{(SS)}$	-	0.8	0.0	20.2	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	30 secs	-	-	-	-	0.8	0.0	20.2	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	60 secs	-	-	-	-	0.8	0.0	20.2	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	90 secs	-	-	-	-	0.8	0.0	20.2	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	120 secs	-	-	-	-	0.8	0.0	20.3	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	180 secs	-	-	-	-	0.9	0.0	20.3	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	240 secs	-	-	-	-	0.9	0.0	20.3	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	300 secs	-	-	-	-	0.9	0.0	20.3	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	360 secs	-	-	-	-	0.9	0.0	20.3	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	420 secs	-	-	-	-	0.9	0.0	20.3	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	480 secs	-	-	-	-	0.9	0.0	20.4	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	540 secs	-	-	-	-	0.9	0.0	20.4	0.0	-	0	0
JBH02	1	50	4		---	3.00 to 8.00	600 secs	-	-	-	-	0.9	0.0	20.4	0.0	-	0	0
JBH02	1	50	5	8.00	---	3.00 to 8.00	05/07/2018 11:10:00	1007	1008	$-0.1_{(I)}$	-	0.0	0.0	20.7	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	15 secs	-	-	$-0.1_{(SS)}$	-	0.9	0.0	20.0	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	30 secs	-	-	-	-	0.9	0.0	20.0	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	60 secs	-	-	-	-	0.9	0.0	20.0	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	90 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	120 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	180 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	240 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	5		---	3.00 to 8.00	300 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	6	8.00	---	3.00 to 8.00	16/07/2018 14:15:00	1004	1004	$0.6_{(I)}$	-	0.0	0.0	20.6	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	15 secs	-	-	$0.5_{(SS)}$	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	30 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	10/08/18	11264

Contract: **Talbot Mill**

AGS

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH02	1	50	6		---	3.00 to 8.00	60 secs	-	-	-	-	0.9	0.0	19.9	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	90 secs	-	-	-	-	1.0	0.0	19.8	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	120 secs	-	-	-	-	1.0	0.0	19.8	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	180 secs	-	-	-	-	1.0	0.0	19.8	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	240 secs	-	-	-	-	1.0	0.0	19.8	0.0	-	0	0
JBH02	1	50	6		---	3.00 to 8.00	300 secs	-	-	-	-	1.0	0.0	19.8	0.0	-	0	0
JBH03	1	50	1	8.00	5.83	3.00 to 8.00	23/05/2018 09:44:00	1022	1022	-0.1$_{(I)}$	2.68	0.0	0.0	21.4	-	0.5	114	0
JBH03	1	50	1		---	3.00 to 8.00	15 secs	-	-	0.0$_{(SS)}$	-	0.0	0.0	21.4	-	-	113	0
JBH03	1	50	1		---	3.00 to 8.00	30 secs	-	-	-	-	0.0	0.0	21.3	-	-	102	0
JBH03	1	50	1		---	3.00 to 8.00	60 secs	-	-	-	-	0.0	0.0	21.3	-	-	98	0
JBH03	1	50	1		---	3.00 to 8.00	90 secs	-	-	-	-	0.0	0.0	21.3	-	-	96	0
JBH03	1	50	1		---	3.00 to 8.00	120 secs	-	-	-	-	0.0	0.0	21.3	-	-	95	0
JBH03	1	50	1		---	3.00 to 8.00	180 secs	-	-	-	-	0.0	0.0	21.3	-	-	91	0
JBH03	1	50	1		---	3.00 to 8.00	240 secs	-	-	-	-	0.0	0.0	21.3	-	-	88	0
JBH03	1	50	1		---	3.00 to 8.00	300 secs	-	-	-	-	0.0	0.0	21.3	-	-	86	0
JBH03	1	50	1		---	3.00 to 8.00	360 secs	-	-	-	-	0.0	0.0	21.3	-	-	85	0
JBH03	1	50	1		---	3.00 to 8.00	420 secs	-	-	-	-	0.0	0.0	21.3	-	-	85	0
JBH03	1	50	2	8.00	5.83	3.00 to 8.00	29/05/2018 10:20:00	1016	1016	0.0$_{(I)}$	2.69	0.2	0.0	20.2	-	-	10	0
JBH03	1	50	2		---	3.00 to 8.00	15 secs	-	-	0.0$_{(SS)}$	-	0.0	0.0	20.5	-	-	37	0
JBH03	1	50	2		---	3.00 to 8.00	30 secs	-	-	-	-	0.0	0.0	20.5	-	-	38	0
JBH03	1	50	2		---	3.00 to 8.00	60 secs	-	-	-	-	0.0	0.0	20.6	-	-	36	0
JBH03	1	50	2		---	3.00 to 8.00	90 secs	-	-	-	-	0.0	0.0	20.6	-	-	34	0
JBH03	1	50	2		---	3.00 to 8.00	120 secs	-	-	-	-	0.0	0.0	20.6	-	-	33	0
JBH03	1	50	2		---	3.00 to 8.00	180 secs	-	-	-	-	0.0	0.0	20.6	-	-	31	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	**10/08/18**	**11264**

Contract: **Talbot Mill**

AGS

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH03	1	50	2		---	3.00 to 8.00	240 secs	-	-	-	-	0.0	0.0	20.7	-	-	30	0
JBH03	1	50	2		---	3.00 to 8.00	300 secs	-	-	-	-	0.0	0.0	20.7	-	-	29	0
JBH03	1	50	3	8.00	5.87	3.00 to 8.00	14/06/2018 08:00:00	997	998	$0.1_{(I)}$	2.68	0.0	0.0	21.0	0.0	-	0	0
JBH03	1	50	3		---	3.00 to 8.00	15 secs	-	-	$0.1_{(SS)}$	-	0.0	0.0	20.9	0.0	-	1	0
JBH03	1	50	3		---	3.00 to 8.00	30 secs	-	-	-	-	0.0	0.0	20.9	0.0	-	2	0
JBH03	1	50	3		---	3.00 to 8.00	60 secs	-	-	-	-	0.0	0.0	20.9	0.0	-	2	0
JBH03	1	50	3		---	3.00 to 8.00	90 secs	-	-	-	-	0.0	0.0	20.9	0.0	-	2	0
JBH03	1	50	3		---	3.00 to 8.00	120 secs	-	-	-	-	0.0	0.0	21.0	0.0	-	0	0
JBH03	1	50	3		---	3.00 to 8.00	180 secs	-	-	-	-	0.0	0.0	21.0	0.0	-	0	0
JBH03	1	50	4	8.00	---	3.00 to 8.00	20/06/2018 10:35:00	-	-	-	-	-	-	-	-	-	-	-
	Remarks: Unable to find well position as cars parked in the area.																	
JBH03	1	50	5	8.00	5.73	3.00 to 8.00	05/07/2018 10:32:00	1006	1008	$0.0_{(I)}$	2.79	0.0	0.0	20.8	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.0	0.0	20.7	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	30 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	1	0
JBH03	1	50	5		---	3.00 to 8.00	60 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	90 secs	-	-	-	DRY	0.0	0.0	20.8	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	120 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	180 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	240 secs	-	-	-	-	0.0	0.0	20.9	0.0	-	0	0
JBH03	1	50	5		---	3.00 to 8.00	300 secs	-	-	-	-	0.0	0.0	20.9	0.0	-	0	0
JBH03	1	50	6	8.00	5.73	3.00 to 8.00	16/07/2018 14:10:00	1005	1004	$0.3_{(I)}$	2.74	0.0	0.0	20.6	0.0	0.0	0	0
JBH03	1	50	6		---	3.00 to 8.00	15 secs	-	-	$0.3_{(SS)}$	-	0.1	0.0	20.1	0.0	-	0	0
JBH03	1	50	6		---	3.00 to 8.00	30 secs	-	-	-	-	0.1	0.0	20.3	0.0	-	3	0
JBH03	1	50	6		---	3.00 to 8.00	60 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	3	0
JBH03	1	50	6		---	3.00 to 8.00	90 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	3	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
JSaddington	10/08/18	IMWilson	10/08/18	11264

Contract: **Talbot Mill**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH03	1	50	6		---	3.00 to 8.00	120 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	3	0
JBH03	1	50	6		---	3.00 to 8.00	180 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	3	0
JBH03	1	50	6		---	3.00 to 8.00	240 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	3	0
JBH03	1	50	6		---	3.00 to 8.00	300 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	3	0
JBH04	1	50	1	8.00	6.55	3.00 to 8.00	23/05/2018 11:30:00	1021	1021	$0.0_{(I)}$	5.65	0.6	0.0	20.5	-	0.9	7	0
JBH04	1	50	1		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.6	0.0	20.2	-	-	11	0
JBH04	1	50	1		---	3.00 to 8.00	30 secs	-	-	-	-	0.6	0.0	20.2	-	-	11	0
JBH04	1	50	1		---	3.00 to 8.00	60 secs	-	-	-	-	0.6	0.0	20.2	-	-	10	0
JBH04	1	50	1		---	3.00 to 8.00	90 secs	-	-	-	-	0.6	0.0	20.2	-	-	10	0
JBH04	1	50	1		---	3.00 to 8.00	120 secs	-	-	-	-	0.6	0.0	20.2	-	-	10	0
JBH04	1	50	1		---	3.00 to 8.00	180 secs	-	-	-	-	0.6	0.0	20.2	-	-	10	0
JBH04	1	50	1		---	3.00 to 8.00	240 secs	-	-	-	-	0.6	0.0	20.2	-	-	10	0
JBH04	1	50	1		---	3.00 to 8.00	300 secs	-	-	-	-	0.6	0.0	20.3	-	-	9	0
JBH04	1	50	1		---	3.00 to 8.00	360 secs	-	-	-	-	0.6	0.0	20.3	-	-	9	0
JBH04	1	50	1		---	3.00 to 8.00	420 secs	-	-	-	-	0.6	0.0	20.3	-	-	9	0
JBH04	1	50	2	8.00	5.57	3.00 to 8.00	29/05/2018 11:15:00	1016	1016	$0.0_{(I)}$	4.86	0.3	0.0	20.5	-	0.7	1	0
JBH04	1	50	2		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	0.3	0.0	20.2	-	-	0	0
JBH04	1	50	2		---	3.00 to 8.00	30 secs	-	-	-	-	0.4	0.0	20.1	-	-	0	0
JBH04	1	50	2		---	3.00 to 8.00	60 secs	-	-	-	-	0.4	0.0	20.1	-	-	0	0
JBH04	1	50	2		---	3.00 to 8.00	90 secs	-	-	-	-	0.4	0.0	20.1	-	-	1	0
JBH04	1	50	2		---	3.00 to 8.00	120 secs	-	-	-	-	0.4	0.0	20.1	-	-	1	0
JBH04	1	50	2		---	3.00 to 8.00	180 secs	-	-	-	-	0.4	0.0	20.1	-	-	1	0
JBH04	1	50	2		---	3.00 to 8.00	240 secs	-	-	-	-	0.4	0.0	20.1	-	-	1	0
JBH04	1	50	2		---	3.00 to 8.00	300 secs	-	-	-	-	0.4	0.0	20.1	-	-	1	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	**10/08/18**	**11264**

Contract: **Talbot Mill**

GINT_LIBRARY_V8_06.GLB : E - GAS MON - STANDARD - 7A - A4L : 11264 TALBOT MILL.GPJ : 10/08/18 12:00 : JS12 :

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH04	1	50	3	8.00	5.55	3.00 to 8.00	14/06/2018 08:30:00	996	998	$0.0_{(I)}$	4.83	0.0	0.0	21.0	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	15 secs	-	-	$0.1_{(SS)}$	-	0.9	0.0	20.0	0.0	-	1	0
JBH04	1	50	3		---	3.00 to 8.00	30 secs	-	-	-	-	0.9	0.0	19.5	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	60 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	90 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	120 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	180 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	240 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0	0
JBH04	1	50	3		---	3.00 to 8.00	300 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0	0
JBH04	1	50	4	8.00	5.57	3.00 to 8.00	20/06/2018 11:04:00	1008	1008	$0.1_{(I)}$	4.86	0.7	0.0	19.9	0.0	-	0	0
	Remarks: Very soft well base red clay on meter tip.																	
JBH04	1	50	4		---	3.00 to 8.00	15 secs	-	-	$0.1_{(SS)}$	-	1.0	0.0	19.3	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	30 secs	-	-	-	-	1.0	0.0	19.2	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	60 secs	-	-	-	-	1.0	0.0	19.2	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	90 secs	-	-	-	-	1.0	0.0	19.2	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	120 secs	-	-	-	-	1.0	0.0	19.2	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	180 secs	-	-	-	-	1.0	0.0	19.3	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	240 secs	-	-	-	-	1.0	0.0	19.3	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	300 secs	-	-	-	-	1.0	0.0	19.3	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	360 secs	-	-	-	-	1.0	0.0	19.4	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	420 secs	-	-	-	-	1.0	0.0	19.4	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	480 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	540 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	0	0
JBH04	1	50	4		---	3.00 to 8.00	600 secs	-	-	-	-	1.0	0.0	19.6	0.0	-	0	0
JBH04	1	50	5	8.00	5.48	3.00 to 8.00	05/07/2018 10:50:00	1008	1009	$0.0_{(I)}$	4.90	0.0	0.0	21.0	0.0	-	0	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Fourways House
57 Hilton Street
Piccadilly
Manchester M1 2EJ

Compiled By	Date	Checked By	Date	Contract Ref:
	10/08/18	IMWilson	**10/08/18**	**11264**

Contract: **Talbot Mill**

Page: **9** of **10**

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
JBH04	1	50	5		---	3.00 to 8.00	15 secs	-	-	$0.0_{(SS)}$	-	1.2	0.0	19.4	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	30 secs	-	-	-	-	1.2	0.0	19.3	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	60 secs	-	-	-	-	1.2	0.0	19.3	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	90 secs	-	-	-	-	1.2	0.0	19.3	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	120 secs	-	-	-	-	1.2	0.0	19.3	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	180 secs	-	-	-	-	1.2	0.0	19.3	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	240 secs	-	-	-	-	1.2	0.0	19.4	0.0	-	0	0
JBH04	1	50	5		---	3.00 to 8.00	300 secs	-	-	-	-	1.2	0.0	19.4	0.0	-	0	0
JBH04	1	50	6	8.00	5.48	3.00 to 8.00	16/07/2018 13:50:00	1004	1007	$0.7_{(I)}$	4.87	0.0	0.0	20.9	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	15 secs	-	-	$0.6_{(SS)}$	-	0.0	0.0	18.9	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	30 secs	-	-	-	-	1.1	0.0	18.9	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	60 secs	-	-	-	-	1.1	0.0	18.8	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	90 secs	-	-	-	-	1.1	0.0	18.8	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	120 secs	-	-	-	-	1.2	0.0	18.8	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	180 secs	-	-	-	-	1.2	0.0	18.8	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	240 secs	-	-	-	-	1.2	0.0	18.8	0.0	-	0	0
JBH04	1	50	6		---	3.00 to 8.00	300 secs	-	-	-	-	1.2	0.0	18.8	0.0	-	0	0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Contract: **Talbot Mill**

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APPENDIX I
GROUNDWATER QUALITY MONITORING RECORDS

IN-SITU WATER MONITORING RESULTS

	Weather	Ground Conditions	Wind Conditions	Air Temperature (°C)	Equipment Used & Remarks
Round 2	Clear	Dry	Light	18	GA2000 + YSI556 SN-07L100518 + Peristaltic pump SN-25083312

Exploratory Position ID	Pipe Ref	Pipe Diameter	Monitoring Round / Test Number	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring	Water Depth (mbgl)	pH	Redox (mV)	Conduc-tivity (uS/cm)	Temp-erature (°C)	Dissolved Oxygen (mg/l)	Remarks
JBH01	1	50	2 / 1	8.00	7.94	3.00 to 8.00	29/05/2018 13:16	2.29	7.21	335	905	12.6	5.9	
JBH01	1	50	2 / 1				29/05/2018 13:19	2.18	7.26	323	886	13.1	3.4	
JBH01	1	50	2 / 1				29/05/2018 13:22	2.18	7.27	302	874	13.1	2.2	
JBH01	1	50	2 / 1				29/05/2018 13:25	2.18	7.28	302	862	13.2	1.4	
JBH01	1	50	2 / 1				29/05/2018 13:28	2.18	7.28	293	852	13.1	1.0	
JBH01	1	50	2 / 1				29/05/2018 13:31	2.18	7.29	287	849	13.1	0.9	
JBH01	1	50	2 / 1				29/05/2018 13:34	2.18	7.29	284	847	13.1	0.8	
JBH02	1	50	2 / 1	8.00	7.62	3.00 to 8.00	29/05/2018 15:14	3.19	7.23	272	1034	13.3	7.9	
JBH02	1	50	2 / 1				29/05/2018 15:17	3.10	7.14	267	1037	13.2	7.9	
JBH02	1	50	2 / 1				29/05/2018 15:20	3.10	7.13	265	1036	13.3	7.9	
JBH02	1	50	2 / 1				29/05/2018 15:23	3.10	7.13	263	1032	13.2	8.0	
JBH02	1	50	2 / 1				29/05/2018 15:26	3.10	7.13	261	1034	13.3	8.1	
JBH03	1	50	2 / 1	8.00	5.83	3.00 to 8.00	29/05/2018 14:17	2.73	7.80	261	544	11.3	7.6	
JBH03	1	50	2 / 1				29/05/2018 14:20	2.63	7.67	264	526	11.3	7.2	
JBH03	1	50	2 / 1				29/05/2018 14:23	2.63	7.64	265	525	11.1	7.4	
JBH03	1	50	2 / 1				29/05/2018 14:26	2.63	7.65	266	528	11.0	7.5	

Key: NDA denotes 'no data available'.

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AGS

IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe Diameter	Monitoring Round / Test Number	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring	Water Depth (mbgl)	pH	Redox (mV)	Conduc-tivity (uS/cm)	Temp-erature (°C)	Dissolved Oxygen (mg/l)	Remarks
JBH03	1	50	2 / 1				29/05/2018 14:29	2.63	7.65	267	527	11.1	7.6	

Key: NDA denotes 'no data available'.

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APPENDIX J
HUMAN HEALTH GENERIC ASSESSMENT CRITERIA

Generic assessment criteria for human health: residential scenario without home-grown produce

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009[1]. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009[2]. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)[3,4], as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)[5] used in the generation of SGVs.

C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010[3]). Where a C4SL has been published, the RSK GAC duplicates the C4SL published values using all input parameters within the SP1010 final project report[3] and associated appendices[6], and adopts them as GAC for these six substances.

For all other substances the C4SL exposure modifications relevant for residential without home-grown produce end use have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) and reducing exposure frequency for dermal contact outdoors.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015[7] or by the USEPA[14], where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the Contaminated Land Exposure Assessment (CLEA) tool v1.071, supporting EA guidance[5,8,9] and revised exposure scenarios published for the C4SL[3]. The SAC are also termed GAC.

Conceptual model

In accordance with SR3[5], the residential without home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance with Box 3.1 of SR3[5], the pathways considered for production of the SAC in the residential without home-grown produce scenario are

- direct soil and dust ingestion in areas of soft landscaping
- dermal contact with soil and indoor dust

- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

In line with guidance in the EA SGV report for cadmium[1], the RSK GAC for cadmium has been derived based on estimates representative of lifetime exposure. Although young children are generally more likely to have higher exposures to soil contaminants, the renal toxicity of cadmium, and the derivation of the TDI_{oral} and TDI_{inh}, are based on considerations of the kidney burden accumulated over 50 years or so. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase[9]. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached[9]. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required[9]:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook[9], this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook[9], which explains how to calculate an effective assessment criterion manually.

SR3[5] states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the

polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7[10], the EA TOX[1] reports, the C4SL SP1010 project report and associated appendices[3,6], the 2015 LQM/CIEH report[7] or the USEPA IRIS database[14]. Where a C4SL has been published, the RSK GAC have duplicated the C4SL published values using all input parameters within the SP1010 final project report[3] and associated appendices[6], and has adopted them as GAC for these six substances. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene and methyl tertiary-butyl ether (MTBE) were obtained from the CL:AIRE Soil Generic Assessment Criteria report[11].

For TPH, aromatic hydrocarbons C_5–C_8 were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the residential without home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. SR3[5] notes this residential building type to be the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3[3], with a dust loading factor detailed in Section 9.3 of SR3[5]. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3[5]. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3[5] input parameters for residential without home-grown produce

In summary, the RSK GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3[5]. Modifications to the default SR3[5] exposure scenarios based on the C4SL exposure scenarios[3] are presented in Table 2 below.

The final selected GAC are presented by pathway in Table 3 and the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA residential scenario without home-grown produce

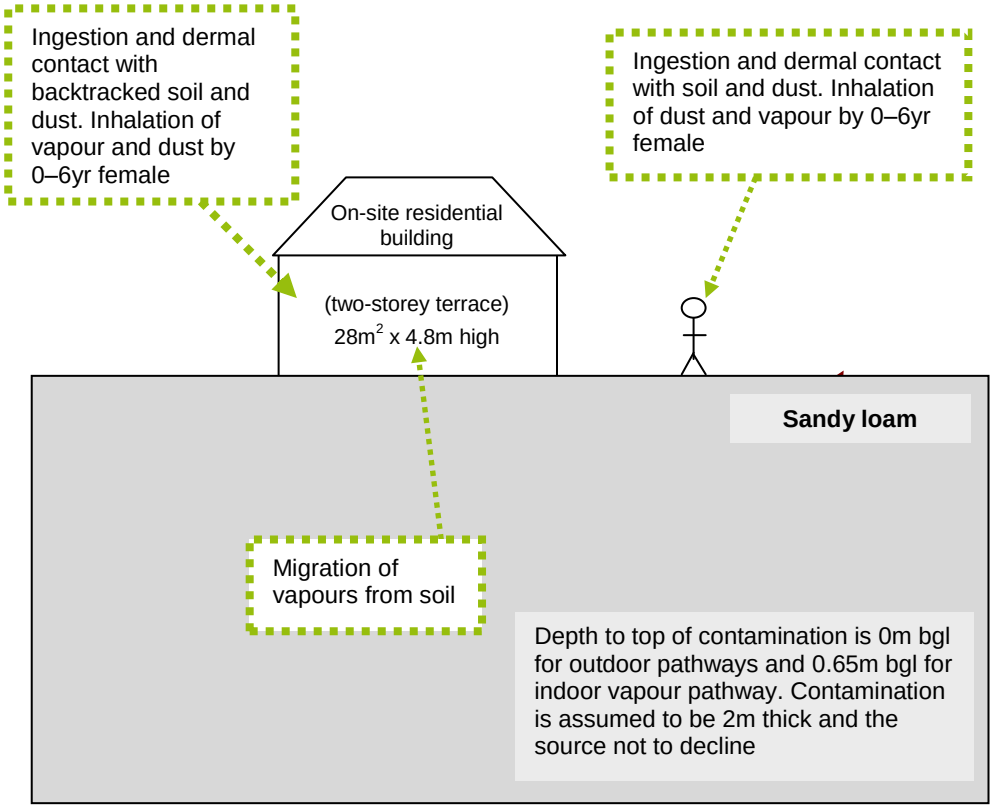


Table 1: Exposure assessment parameters for residential scenario without home-grown produce – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential without home-grown produce	Chosen land use
Receptor	Female child	Key generic assumption given in Box 3.1, SR3[5]
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3[5]. Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3)[5]
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3)[5]
Start age class (AC)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3[5]
End AC	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[13]
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Residential without home-grown produce – modified receptor data

Parameter	Unit	Age class					
		1	2	3	4	5	6
Soil to skin adherence factor – (outdoor)	mg soil/cm^2 skin	0.1	0.1	0.1	0.1	0.1	0.1
Justification		Table 3.5, SP1010[3]					
Inhalation rate	m^3 day^{-1}	5.4	8.0	8.9	10.1	10.1	10.1
Justification		Mean value USEPA, 2011[12]; Table 3.2, SP1010[3]					
Notes: For **cadmium**, the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI_{oral} and TDI_{inh} are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3[1], Science Report SC050021/Cadmium SGV[1] and the project report SP1010[3] for more information.							

References

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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITHOUT HOME-GROWN PRODUCE

Table 3

Human Health Generic Assessment Criteria by Pathway for Residential Scenario Without Home-Grown Produce

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	3.99E+01	5.26E+02	NR	NR	3.99E+01	5.26E+02	NR	NR	3.99E+01	5.26E+02	NR	NR
Cadmium	(a)	1.95E+02	4.88E+02	1.49E+02	NR	1.95E+02	4.88E+02	1.49E+02	NR	1.95E+02	4.88E+02	1.49E+02	NR
Chromium (III) - trivalent	(c)	1.98E+04	9.07E+02	NR	NR	1.98E+04	9.07E+02	NR	NR	1.98E+04	9.07E+02	NR	NR
Chromium (VI) - hexavalent	(a,d)	5.91E+01	2.06E+01	NR	NR	5.91E+01	2.06E+01	NR	NR	5.91E+01	2.06E+01	NR	NR
Copper		1.08E+04	1.41E+04	7.13E+03	NR	1.08E+04	1.41E+04	7.13E+03	NR	1.08E+04	1.41E+04	7.13E+03	NR
Lead	(a)	3.14E+02	NR	NR	NR	3.14E+02	NR	NR	NR	3.14E+02	NR	NR	NR
Elemental Mercury (Hg^0)	(d)	NR	2.41E-01	NR	4.31E+00	NR	5.74E-01	NR	1.07E+01	NR	1.25E+00	NR	2.58E+01
Inorganic Mercury (Hg^{2+})		5.71E+01	3.63E+03	5.62E+01	NR	5.71E+01	3.63E+03	5.62E+01	NR	5.71E+01	3.63E+03	5.62E+01	NR
Methyl Mercury (Hg^{4+})		1.80E+01	1.87E+01	9.16E+00	7.33E+01	1.80E+01	3.62E+01	1.20E+01	1.42E+02	1.80E+01	7.68E+01	1.46E+01	3.04E+02
Nickel	(d)	1.88E+02	1.81E+02	NR	NR	1.88E+02	1.81E+02	NR	NR	1.88E+02	1.81E+02	NR	NR
Selenium	(b)	4.31E+02	NR	NR	NR	4.31E+02	NR	NR	NR	4.31E+02	NR	NR	NR
Zinc	(b)	4.05E+04	3.63E+07	NR	NR	4.05E+04	3.63E+07	NR	NR	4.05E+04	3.63E+07	NR	NR
Cyanide (free)		4.03E+01	1.37E+04	4.02E+01	NR	4.03E+01	1.37E+04	4.02E+01	NR	4.03E+01	1.37E+04	4.02E+01	NR
Volatile Organic Compounds													
Benzene	(a)	7.36E+01	9.01E-01	8.90E-01	1.22E+03	7.36E+01	1.68E+00	1.64E+00	2.26E+03	7.36E+01	3.48E+00	3.33E+00	4.71E+03
Toluene		2.87E+04	9.08E+02	8.80E+02	8.69E+02	2.87E+04	2.00E+03	1.87E+03	1.92E+03	2.87E+04	4.55E+03	3.93E+03	4.36E+03
Ethylbenzene		1.29E+04	8.34E+01	8.29E+01	5.18E+02	1.29E+04	1.96E+02	1.93E+02	1.22E+03	1.29E+04	4.58E+02	4.42E+02	2.84E+03
Xylene - m		2.32E+04	8.25E+01	8.22E+01	6.25E+02	2.32E+04	1.95E+02	1.93E+02	1.47E+03	2.32E+04	4.56E+02	4.47E+02	3.46E+03
Xylene - o		2.32E+04	8.87E+01	8.83E+01	4.78E+02	2.32E+04	2.08E+02	2.06E+02	1.12E+03	2.32E+04	4.86E+02	4.76E+02	2.62E+03
Xylene - p		2.32E+04	7.93E+01	7.90E+01	5.76E+02	2.32E+04	1.86E+02	1.85E+02	1.35E+03	2.32E+04	4.36E+02	4.28E+02	3.17E+03
Total xylene		2.32E+04	7.93E+01	7.90E+01	6.25E+02	2.32E+04	1.86E+02	1.85E+02	1.47E+03	2.32E+04	4.36E+02	4.28E+02	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		3.87E+04	1.04E+02	1.04E+02	2.04E+04	3.87E+04	1.69E+02	1.69E+02	3.31E+04	3.87E+04	3.21E+02	3.19E+02	6.27E+04
Trichloroethene		6.45E+01	1.72E-02	1.72E-02	1.54E+03	6.45E+01	3.59E-02	3.59E-02	3.22E+03	6.45E+01	7.98E-02	7.97E-02	7.14E+03
Tetrachloroethene		7.13E+02	1.79E-01	1.79E-01	4.24E+02	7.13E+02	4.02E-01	4.02E-01	9.51E+02	7.13E+02	9.21E-01	9.20E-01	2.18E+03
1,1,1-Trichloroethane		7.74E+04	9.01E+00	9.01E+00	1.43E+03	7.74E+04	1.84E+01	1.84E+01	2.92E+03	7.74E+04	4.04E+01	4.04E+01	6.39E+03
1,1,1,2 Tetrachloroethane		7.34E+02	1.54E+00	1.53E+00	2.60E+03	7.34E+02	3.56E+00	3.55E+00	6.02E+03	7.34E+02	8.29E+00	8.20E+00	1.40E+04
1,1,2,2-Tetrachloroethane		7.34E+02	3.92E+00	3.90E+00	2.67E+03	7.34E+02	8.04E+00	7.95E+00	5.46E+03	7.34E+02	1.76E+01	1.72E+01	1.20E+04
Carbon Tetrachloride		5.15E+02	2.58E-02	2.58E-02	1.52E+03	5.15E+02	5.65E-02	5.64E-02	3.32E+03	5.15E+02	1.28E-01	1.28E-01	7.54E+03
1,2-Dichloroethane		1.55E+01	9.20E-03	9.20E-03	3.41E+03	1.55E+01	1.33E-02	1.33E-02	4.91E+03	1.55E+01	2.28E-02	2.27E-02	8.43E+03
Vinyl Chloride		1.81E+00	7.73E-04	7.73E-04	1.36E+03	1.81E+00	1.00E-03	9.99E-04	1.76E+03	1.81E+00	1.53E-03	1.53E-03	2.69E+03
1,2,4-Trimethylbenzene		NR	5.58E+00	NR	4.74E+02	NR	1.29E+01	NR	1.16E+03	NR	2.69E+01	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
Semi-Volatile Organic Compounds													
Acenaphthene		7.64E+03	4.86E+04	6.60E+03	5.70E+01	7.64E+03	1.18E+05	7.17E+03	1.41E+02	7.64E+03	2.68E+05	7.43E+03	3.36E+02
Acenaphthylene		7.65E+03	4.59E+04	6.55E+03	8.61E+01	7.65E+03	1.11E+05	7.15E+03	2.12E+02	7.65E+03	2.53E+05	7.42E+03	5.06E+02
Anthracene		3.82E+04	1.53E+05	3.06E+04	1.17E+00	3.82E+04	3.77E+05	3.47E+04	2.91E+00	3.82E+04	8.76E+05	3.66E+04	6.96E+00
Benzo(a)anthracene		1.98E+01	2.47E+01	1.10E+01	1.71E+00	1.98E+01	4.37E+01	1.36E+01	4.28E+00	1.98E+01	6.26E+01	1.50E+01	1.03E+01
Benzo(a)pyrene	(a)	5.34E+00	3.51E+01	NR	9.11E-01	5.34E+00	3.77E+01	NR	2.28E+00	5.34E+00	3.89E+01	NR	5.46E+00
Benzo(b)fluoranthene		4.97E+00	1.93E+01	3.95E+00	1.22E+00	4.97E+00	2.13E+01	4.03E+00	3.04E+00	4.97E+00	2.22E+01	4.06E+00	7.29E+00
Benzo(g,h,i)perylene		4.38E+02	1.87E+03	3.55E+02	1.54E-02	4.38E+02	1.94E+03	3.58E+02	3.85E-02	4.38E+02	1.97E+03	3.59E+02	9.23E-02
Benzo(k)fluoranthene		1.31E+02	5.41E+02	1.06E+02	6.87E-01	1.31E+02	5.76E+02	1.07E+02	1.72E+00	1.31E+02	5.91E+02	1.07E+02	4.12E+00
Chrysene		3.95E+01	1.19E+02	2.97E+01	4.40E-01	3.95E+01	1.49E+02	3.12E+01	1.10E+00	3.95E+01	1.66E+02	3.19E+01	2.64E+00
Dibenzo(a,h)anthracene		3.95E-01	1.45E+00	3.10E-01	3.93E-03	3.95E-01	1.64E+00	3.18E-01	9.82E-03	3.95E-01	1.74E+00	3.22E-01	2.36E-02
Fluoranthene		1.59E+03	3.83E+04	1.53E+03	1.89E+01	1.59E+03	8.87E+04	1.56E+03	4.73E+01	1.59E+03	1.83E+05	1.58E+03	1.13E+02
Fluorene		5.09E+03	6.20E+03	2.80E+03	3.09E+01	5.09E+03	1.53E+04	3.82E+03	7.65E+01	5.09E+03	3.62E+04	4.47E+03	1.83E+02
Indeno(1,2,3-cd)pyrene		5.65E+01	2.12E+02	4.46E+01	6.13E-02	5.65E+01	2.38E+02	4.56E+01	1.53E-01	5.65E+01	2.50E+02	4.60E+01	3.68E-01

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITHOUT HOME-GROWN PRODUCE

Table 3

Human Health Generic Assessment Criteria by Pathway for Residential Scenario Without Home-Grown Produce

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Naphthalene		2.50E+03	2.33E+01	2.31E+01	7.64E+01	2.50E+03	5.58E+01	5.46E+01	1.83E+02	2.50E+03	1.31E+02	1.25E+02	4.32E+02
Phenanthrene		1.58E+03	7.17E+03	1.30E+03	3.60E+01	1.58E+03	1.76E+04	1.45E+03	8.96E+01	1.58E+03	4.07E+04	1.52E+03	2.14E+02
Pyrene		3.82E+03	8.79E+04	3.66E+03	2.20E+00	3.82E+03	2.04E+05	3.75E+03	5.49E+00	3.82E+03	4.23E+05	3.79E+03	1.32E+01
Phenol		6.48E+04	4.58E+02	4.55E+02	2.42E+04	6.48E+04	6.95E+02	6.88E+02	3.81E+04	6.48E+04	1.19E+03	1.17E+03	7.03E+04
Total Petroleum Hydrocarbons													
Aliphatic hydrocarbons EC_5-EC_6		3.23E+05	4.24E+01	4.24E+01	3.04E+02	3.23E+05	7.79E+01	7.79E+01	5.58E+02	3.23E+05	1.61E+02	1.61E+02	1.15E+03
Aliphatic hydrocarbons >EC_6-EC_8		3.23E+05	1.04E+02	1.04E+02	1.44E+02	3.23E+05	2.31E+02	2.31E+02	3.22E+02	3.23E+05	5.29E+02	5.29E+02	7.36E+02
Aliphatic hydrocarbons >EC_8-EC_{10}		6.45E+03	2.68E+01	2.68E+01	7.77E+01	6.45E+03	6.55E+01	6.53E+01	1.90E+02	6.45E+03	1.56E+02	1.55E+02	4.51E+02
Aliphatic hydrocarbons >EC_{10}-EC_{12}		6.45E+03	1.33E+02	1.32E+02	4.75E+01	6.45E+03	3.31E+02	3.27E+02	1.18E+02	6.45E+03	7.93E+02	7.67E+02	2.83E+02
Aliphatic hydrocarbons >EC_{12}-EC_{16}		6.45E+03	1.11E+03	1.06E+03	2.37E+01	6.45E+03	2.78E+03	2.42E+03	5.91E+01	6.45E+03	6.67E+03	4.37E+03	1.42E+02
Aliphatic hydrocarbons >EC_{16}-EC_{35}	(b)	6.50E+04	NR	NR	8.48E+00	9.25E+04	NR	NR	2.12E+01	1.11E+05	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC_{35}-EC_{44}	(b)	6.50E+04	NR	NR	8.48E+00	9.25E+04	NR	NR	2.12E+01	1.11E+05	NR	NR	5.09E+01
Aromatic hydrocarbons >EC_8-EC_{10}		2.58E+03	4.74E+01	4.72E+01	6.13E+02	2.58E+03	1.16E+02	1.15E+02	1.50E+03	2.58E+03	2.77E+02	2.69E+02	3.58E+03
Aromatic hydrocarbons >EC_{10}-EC_{12}		2.58E+03	2.58E+02	2.52E+02	3.64E+02	2.58E+03	6.39E+02	5.94E+02	8.99E+02	2.58E+03	1.52E+03	1.24E+03	2.15E+03
Aromatic hydrocarbons >EC_{12}-EC_{16}		2.58E+03	2.85E+03	1.80E+03	1.69E+02	2.58E+03	7.07E+03	2.30E+03	4.19E+02	2.58E+03	1.68E+04	2.48E+03	1.00E+03
Aromatic hydrocarbons >EC_{16}-EC_{21}	(b)	1.86E+03	NR	NR	5.37E+01	1.90E+03	NR	NR	1.34E+02	1.92E+03	NR	NR	3.21E+02
Aromatic hydrocarbons >EC_{21}-EC_{35}	(b)	1.93E+03	NR	NR	4.83E+00	1.93E+03	NR	NR	1.21E+01	1.93E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC_{35}-EC_{44}	(b)	1.93E+03	NR	NR	4.83E+00	1.93E+03	NR	NR	1.21E+01	1.93E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.

Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

Table 4
Human health generic assessment criteria for residential without home-grown produce

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	40	40	40
Cadmium	149	149	149
Chromium (III) - trivalent	910	910	910
Chromium (VI) - hexavalent	21	21	21
Copper	7,100	7,100	7,100
Lead	310	310	310
Elemental Mercury (Hg^0)	0.2	0.6	1.2
Inorganic Mercury (Hg^{2+})	56	56	56
Methyl Mercury (Hg^{4+})	9	12	15
Nickel	180	180	180
Selenium	430	430	430
Zinc	40,000	40,000	40,000
Cyanide (free)	40	40	40
Volatile Organic Compounds			
Benzene	0.9	1.6	3.3
Toluene	900 (869)	1,900	3,900
Ethylbenzene	80	190	440
Xylene - m	80	190	450
Xylene - o	90	210	480
Xylene - p	80	180	430
Total xylene	80	180	430
Methyl tertiary-Butyl ether (MTBE)	100	170	320
Trichloroethene	0.02	0.04	0.08
Tetrachloroethene	0.2	0.4	0.9
1,1,1-Trichloroethane	9.0	18.4	40.4
1,1,1,2 Tetrachloroethane	1.5	3.5	8.2
1,1,2,2-Tetrachloroethane	3.9	8.0	17.2
Carbon Tetrachloride	0.026	0.056	0.128
1,2-Dichloroethane	0.009	0.013	0.023
Vinyl Chloride	0.0008	0.0010	0.0015
1,2,4-Trimethylbenzene	5.6	12.9	26.9
1,3,5-Trimethylbenzene	NR	NR	NR
Semi-Volatile Organic Compounds			
Acenaphthene	6,600 (57)	7,200	7,400
Acenaphthylene	6,600 (86)	7,200	7,400
Anthracene	31,000 (1.17)	35,000	37,000
Benzo(a)anthracene	11.0	13.6	15.0
Benzo(a)pyrene	5.3	5.3	5.3
Benzo(b)fluoranthene	4.0	4.0	4.1
Benzo(g,h,i)perylene	355	358	359
Benzo(k)fluoranthene	106	107	107
Chrysene	30	31	32
Dibenzo(a,h)anthracene	0.31	0.32	0.32
Fluoranthene	1,500	1,600	1,600
Fluorene	2,800 (31)	3,800 (77)	4,500 (183)
Indeno(1,2,3-cd)pyrene	45	46	46
Naphthalene	23	55	125
Phenanthrene	1,300 (36)	1,450	1,520
Pyrene	3,700	3,800	3,800
Phenol	440*	688	1,170
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC_5-EC_6	42	78	161
Aliphatic hydrocarbons >EC_6-EC_8	100	230	530
Aliphatic hydrocarbons >EC_8-EC_{10}	27	65	155
Aliphatic hydrocarbons >EC_{10}-EC_{12}	130 (48)	330 (118)	770 (283)
Aliphatic hydrocarbons >EC_{12}-EC_{16}	1,100 (24)	2,400 (59)	4,400 (142)
Aliphatic hydrocarbons >EC_{16}-EC_{35}	65,000 (8)	92,000 (21)	111,000
Aliphatic hydrocarbons >EC_{35}-EC_{44}	65,000 (8)	92,000 (21)	111,000
Aromatic hydrocarbons >EC_8-EC_{10}	47	115	269
Aromatic hydrocarbons >EC_{10}-EC_{12}	300	600	1,200
Aromatic hydrocarbons >EC_{12}-EC_{16}	1,800 (169)	2,300 (419)	2,500
Aromatic hydrocarbons >EC_{16}-EC_{21}	1,900	1,900	1,900
Aromatic hydrocarbons >EC_{21}-EC_{35}	1,900	1,900	1,900
Aromatic hydrocarbons >EC_{35}-EC_{44}	1,900	1,900	1,900
Minerals			
Asbestos	No asbestos detected with ID or <0.001% dry weight[1]		

Notes:
'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used
EC - equivalent carbon. SAC - soil assessment criteria.
[1] LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

(VALUE IN BRACKETS)
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.

APPENDIX K
GENERIC ASSESSMENT CRITERIA FOR CONTROLLED WATERS

GENERIC ASSESSMENT CRITERIA FOR CONTROLLED WATERS

Protection of the water environment

The water environment in the United Kingdom is protected under a number of regulatory regimes. The relevant environmental regulator is consulted where there may be a risk that pollution of 'controlled waters' may occur or may have occurred in the past.

The term 'controlled waters' refers to coastal waters, inland freshwaters and groundwater. The EU Water Framework Directive (WFD) (2000/60/EC) is implemented via domestic regulations and guidance, covering aspects of groundwater and surface water protection as well as drinking water supply policy. Domestic legislation and guidance will vary across the United Kingdom. Therefore, the relevant legislation for England, Wales, Northern Ireland and Scotland should be reviewed, alongside guidance provided by the Environment Agency (EA), Natural Resource Wales (NRW), the Scottish Environmental Protection Agency (SEPA) or the Northern Ireland Environment Agency (NIEA), as appropriate.

The main objectives of the protection and remediation of groundwater under threat from land contamination are set out within "The Environment Agency's approach to groundwater protection", version 1.0 (March 2017)[(1)] and the associated guidance "Land contamination groundwater compliance points: quantitative risk assessments (March 2017)[(1a)] that have replaced the previous guidance document "Groundwater Principles and Practice (GP3)". When assessing risks to groundwater, the following need to be considered:

- Where pollutants have not yet entered groundwater, all necessary and reasonable measures must be taken to:
    - ***prevent*** *the input of* ***hazardous*** *substances into groundwater (see description of hazardous substances below)*
    - ***limit*** *the entry of other (non-hazardous) pollutants into groundwater to avoid pollution, deterioration in the status of groundwater bodies and to prevent sustained, upward trends in pollutant concentrations in groundwater.*
- Where pollutants have already entered groundwater, the priority is to take all necessary and reasonable measures to:
    - ***minimise*** *further entry of "contaminants" where there is a defined source*
    - ***limit the pollution*** *of groundwater or any effect on the status of the groundwater body from the future expansion of the 'plume', if necessary, by actively reducing its extent.*

Within the context of groundwater risk assessments on sites affected by land contamination, "reasonable" means feasible without involving disproportionate costs. What costs are "disproportionate" depends on site-specific circumstances, which may include:

- Considerations of technical feasibility such as identified by the remedial options appraisal, this may be due to the distribution or nature of the contamination and the available remedial methods to treat the identified contamination;
- Sustainability considerations.

DEFINITIONS AND SUBSTANCE CLASSIFICATIONS

Risks to surface waters:

When assessing risks to surface waters, the following list of definitions should be understood:

Priority substances (PS) are harmful substances originally identified under the Water Framework Directive (WFD) 2000/60/EC as substances 'presenting a significant risk to or via the aquatic environment' at a European level. Member States are required to incorporate the identified **PS** into their country-wide monitoring programmes. There are currently 33 **PS** defined within the Priority Substances Directive (2013/39/EU; Annex 1), with a further 12 additional substances due to come into force from 22 December 2018. Directive 2013/39/EU has been transposed into domestic legislation for England and Wales by The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Under the umbrella of **PS**, there is a sub-set of substances identified as being "hazardous", and these are referred to as **Priority hazardous substances (PHS).** The list of **PHS** is defined at EU level within the Priority Substances Directive (2013/39/EU). The WFD defines hazardous substances as 'substances (or groups of substances) that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances that give rise to an equivalent level of concern.' There are currently 15 **PHS**, with a further 6 additional substances due to come into force from 22 December 2018.

There is also another group of substances defined at EU level and which are referred to as **other pollutants (OP)** in Directive 2013/39/EU**.** These are additional substances which although not **priority substances**, have EQS which are identical to those laid down in the legislation which applied prior to 13 January 2009 (Directive 2008/105/EU). The **OP** are listed along with the **priority substance (PS)** within the Priority Substances Directive (2013/39/EU),and their associated EQS are also listed therein. There are 6 **OP** defined within the Priority Substances Directive (2013/39/EU).

In addition to the EU level substances, there are also a group of pollutants defined at a Member State level, referred to as **Specific pollutants (SP)**. These substances are pollutants which are released in significant quantities into water bodies in each of the individual European Member States. Under the WFD, Member States are required to set their own EQS for these substances. An indicative list of **SP** is given in Annex VIII of the WFD. Many of the substances categorised as **SP** in the UK were formerly List 2 substances under the old Groundwater Directive (80/68/EEC). The **SP** are defined within Part 2 (Table 1) of The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Risks to groundwater:

When assessing risks to groundwater, the following definitions should be understood:

Under the requirements of the Groundwater Daughter Directive (2006/118/EU), the UK has published a list of substances it considers to be **hazardous substances** with respect to groundwater. In their advisory capacity to the government, this list has been derived by the UK Joint Agencies Groundwater Directive Advisory Group (JAGDAG), of which the Environment Agency is a member. The JAGDAG list of **hazardous substances** was published in January 2017 and the Environment Agency will use the updated list of hazardous substances from this date for all new activities that may lead to the discharge of hazardous substances to groundwater. The list is extensive and can be found in full at:

https://www.wfduk.org/stakeholders/jagdag

Selecting the appropriate assessment criteria

When assessing the risks to controlled waters, various assessment criteria apply, depending on the nature of the assessment and the conceptual site model.

Where a surface water body is involved, then Environmental Quality Standards (EQS) are the relevant assessment criteria as they are designed to be protective of surface water ecology.

Where a public water supply or a Principal aquifer is involved, then the standards defined in The Water Supply (Water Quality) Regulations[(2)] are the primary source of assessment criteria. The Private Water Supplies Regulations[(3)] may also be applicable in some cases. For instances where there are no UK assessment criteria, then the World Health Organisation (WHO) drinking water guidelines[(4)] may be used.

This appendix presents the generic assessment criteria (GAC) that RSK considers suitable for assessing risks to controlled waters for our most commonly encountered determinants. A full list of EQS for England and Wales are included in The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

The RSK GAC for controlled waters are presented in **Table 1** and **Table 2**. In line with the Environment Agency's Remedial Targets Methodology, the GAC for controlled waters are termed 'target concentrations'.

The appropriate target concentrations should be selected with consideration to:

- the site conceptual model (i.e. the receptor at potential risk);
- whether the substance is already present in groundwater at the site;
- whether or not the substance is classified as a priority hazardous substance under the Priority Substances Directive (2013/39/EC) (see above), or as a hazardous substance according to the current list of JAGDAG determinations[(5)]; and
- background concentrations in the aquifer (if applicable).

It is important to remember that the WFD and Environment Agency guidance[(1 & 1a)] support a sustainable, risk-based approach be applied to groundwater contamination. Exceedance of any target concentration does not necessarily imply that an unacceptable risk exists or that remediation is inevitably required.

Target concentrations shaded in green are statutory values	Target concentrations shaded in orange are non-statutory values

Note: Units µg/l throughout (unless otherwise stated)

Table 1: Target concentrations for controlled waters (excluding TPH CWG fractions)

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Metals & other inorganics						
Hazardous substance	Specific pollutant	Arsenic	-	10[2]	50[6a]	25[6a]
Non-hazardous pollutant	Priority substance	Cadmium	0.1[7]	5[2]	≤0.08, 0.08, 0.09, 0.15, 0.25 [6b]	0.2[6a]
(Not determined)	-	Chromium (total)	-	50[2]	Sum values for chromium III and VI	
(None	Specific pollutant	Chromium (III)	-	Use value for total chromium	4.7[6a]	-
Hazardous substance	Specific pollutant	Chromium (VI)			3.4[6a]	0.6[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
(Not determined)	Specific pollutant	Copper	-	2,000[2]	1 bioavailable[6a]	3.76 dissolved, where DOC ≤1mg/l[6a] 3.76µg/l + (2.677µg/l x ((DOC/2) – 0.5µg/l)) dissolved, where DOC >1mg/l[6a]
Hazardous substance	Priority substance	Lead	-	10[2]	1.2 bioavailable[6a]	1.3[6a]
Hazardous substance	**Priority hazardous substance**	Mercury	0.01[7]	1[2]	0.07[6c]	0.07[6c]
Non-hazardous pollutant	Priority substance	Nickel	-	20[2]	4.0 bioavailable[6a]	8.6[6a]
Non-hazardous pollutant	-	Selenium	-	10[2]	-	-
Non-hazardous pollutant	Specific pollutant	Zinc	-	3,000[8]	10.9 bioavailable[6a]	6.8 dissolved [6a]
None	Specific pollutant	Iron	-	200[2]	1000[6a]*1	1000[6a])*1
None	Specific pollutant	Manganese	-	50[2] (0.05mg/l)	123 bioavailable[6a] (0.123mg/l)	-
(Not determined)	-	Aluminium	-	200[2]	-	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	**Priority hazardous substance**	Tributyltin compounds (Tributyltin-cation)	0.001[7]	-	0.0002[6a]	0.0002[6a]
(Not determined)	-	Sodium	-	200,000[2] (200 mg/l)	-	-
Non-hazardous pollutant	Specific pollutant	Cyanide (Hydrogen cyanide)	-	50[2] (0.05 mg/l)	1[6a] (0.001 mg/l)	1[6a] (0.001 mg/l)
Non-hazardous pollutant	-	Total ammonia[$] (ammonium (as NH_4^+) plus ammonia (NH_3)	-	500[2] (0.5 mg/l)	300[6f] (0.3 mg/l)	-
Non-hazardous pollutant	Specific pollutant	Ammonia un-ionised (NH_3)	-	-	-	21[6a] (0.021 mg/l)
Non-hazardous pollutant	Specific pollutant	Chlorine	-	-	2[6a] (0.002 mg/l)	10[6d] (0.01 mg/l)
(Not determined)	-	Chloride	-	250,000[2] (250 mg/l)	-	-
(Not determined)	-	Sulphate	-	250,000[2] (250 mg/l)	-	-
(Not determined)	-	Nitrate (as NO_3)	-	50,000[2] (50 mg/l)	-	-
(Not determined)	-	Nitrite (as NO_2)	-	500[2] (0.5 mg/l)	10[9] (0.01 mg/l)	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Volatile organic compounds (VOC)						
Non-hazardous pollutant	Other pollutant	Tetrachloroethene (tetrachloroethylene; PCE)	0.1[7]	10[2] sum of TCE and PCE	10[6a]	10[6a]
Hazardous substance	Other pollutant	Trichloroethene (trichloroethylene; TCE)	0.1[7]		10[6a]	10[6a]
None	Specific pollutant	Tetrachloroethane	-	-	140[6a]	-
Hazardous substance	Other pollutant	Carbon tetrachloride (tetrachloromethane)	0.1[7]	3.0[2]	12[6a]	12[6a]
Non-hazardous pollutant	Priority substance	1,2-Dichloroethane	1.0[7]	3.0[2]	10[6a]	10[6a]
Non-hazardous pollutant	-	1.2-Dichloroethene (DCE)	-	50.0[4]	-	-
Hazardous substance	-	Vinyl chloride (chloroethene)	-	0.5[2]	-	-
Non-hazardous pollutant	Priority substance	Dichloromethane	-	20[4]	20[6a]	20[6a]
Non-hazardous pollutant	Priority substance	Trichlorobenzenes	0.01[7]	-	0.4[6a]	0.4[(6a)]
(Not determined)	-	Trihalomethanes	-	100[2a]	-	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	Priority substance	Trichloromethane (Chloroform)	0.1[7]	(see "Trihalomethanes" above)	2.5[6a]	2.5[6a]
Non-hazardous pollutant	**Priority hazardous substance**	Di(2-ethylhexyl) phthalate (bis(2-ethylhexyl) phthalate, DEHP)	-	8[4]	1.3[6a]	1.3[6a]
None	Specific pollutant	Benzyl butyl phthalate	-	-	7.5[6a]	0.75[6e]
Hazardous substance	**Priority hazardous substance**	Hexachlorobutadiene	0.005[7]	0.6[4]	0.6[6c]	0.6[6c]
Semi-volatile organic compounds (SVOC)						
(Not determined)	-	Acenaphthylene (C12-C16)	-	-	5.8[10]	
Hazardous substance	**Priority hazardous substance**	Anthracene (C16-C21)	-	-	0.1[6a]	0.1[6a]
Non-hazardous pollutant	Priority substance	Naphthalene (C10-C12)	-	-	2[6a]	2[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
			Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
Groundwater receptors[5]	Surface water receptors[6]				Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	Priority substance	Fluoranthene (C21-C35)	-	-	0.0063[6a]	0.0063[6a]
Hazardous substance(s)	**Priority hazardous substance(s)**	Benzo(a)pyrene (C21-C35)	-	0.01[2]	0.00017[6a]	0.00017[6a]
		Benzo(b)fluoranthene (C21-C35)	-	0.1[2] sum of the concentration of the four specified compounds	No EQS for these substances. B(a)P should be used as the indicator compound instead.	
		Benzo(k)fluoranthene (C21-C35)	-			
		Benzo(g,h,i)perylene (C21-C35)	-			
		Indeno(1,2,3-cd) pyrene (C21-C35)	-			
Non-hazardous pollutant	Specific pollutant	Phenol		-	7.7[6a]	7.7[6a]
Hazardous substance	Specific pollutant	2,4-Dichlorophenol	0.1[7]	-	4.2[6a]	0.42[6a]
Hazardous substance	Priority substance	Pentachloro-phenol (PCP)	0.1[7]	9[4]	0.4[6a]	0.4[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
			Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
Groundwater receptors[5]	Surface water receptors[6]				Freshwater	Transitional (estuaries) and coastal waters
Petroleum hydrocarbons						
Hazardous substance	-	Total petroleum hydrocarbons	-	See Table 2 for individual (non-statutory) TPH CWG fractions with respect to drinking water receptors	See individual risk driving compounds (i.e. BTEX and PAH) for specific EQS	
Hazardous substance	Priority substance	Benzene (C5-C7)	1[7]	1[2]	10[6a]	8[6a]
Hazardous substance	Specific pollutant	Toluene (C7-C8)	4[7]	700[4]	74[6a]	74[6a]
Hazardous substance	-	Ethylbenzene (C8-C9)	-	300[4]	-	-
(Not determined)	-	Xylenes (C8-C10)	3[7]	500[4]	30[11]	-
Non-hazardous pollutant	-	Methyl tertiary butyl ether (MTBE)	-	15[12]	-	
Pesticides, fungicides, insecticides and herbicides						
Hazardous substance(s)	Other pollutant (Cyclodiene	Aldrin	0.003[7]	0.03[2]	0.01[6a] (sum of all four)	0.005[6a] (sum of all four)
		Dieldrin	0.003[7]	0.03[2]		

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
	pesticides)	Endrin	0.003[7]	0.1[2b]		
		Isodrin*[2]	0.003[7]	0.1[2b]		
Hazardous substance	Other pollutant	DDT (total)	0.002[7]	1[4]	0.025[6a]	0.025[6a]
(Not determined) – assume to be Hazardous Substance	-	Total pesticides	-	0.5[2]	-	-
(Not determined) - assume to be Hazardous Substance	-	Other individual pesticides	-	0.1[2]		
Hazardous substance	Specific pollutant	Carbendazim	-	-	0.15[6a]	-
Hazardous substance	Specific pollutant	Chlorothalonil	-	-	0.035[6a]	-
Hazardous substance	Specific pollutant (until 22/12/18, after which it becomes a Priority substance)	Cypermethrin	-	-	0.0001[6a] From 22/12/18: 8.0E-5[6a]	0.0001[6a] From 22/12/18: 8.0E-6[6a]
Hazardous substance	Specific pollutant	Dimethoate	0.01[7]	-	0.48[6a]	0.48[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
(Not determined)	Specific pollutant	Glyphosate	-	-	196[6a]	196[6a]
Hazardous substance	Specific pollutant	Linuron		-	0.5[6a]	0.5[6a]
Non-hazardous pollutant	Specific pollutant	Mecoprop	0.04[7]	-	18[6a]	18[6a]
Non-hazardous pollutant	Specific pollutant	Methiocarb	-	-	0.01[6a]	-
Non-hazardous pollutant	Specific pollutant	Pendimethalin	-	20[4]	0.3[6a]	-
Hazardous substance	Specific pollutant	Permethrin	0.001[7]	-	0.001[6a]	0.0002[6a]
Hazardous substance	Priority substance	Alachlor	-	20[4]	0.3[6a]	0.3[6a]
Hazardous substance	Priority substance	Atrazine	0.03[7]	100[4]	0.6[6a]	0.6[6a]
Hazardous substance	Priority substance	Diuron	-	-	0.2[6a]	0.2[6a]
Hazardous substance	**Priority hazardous substance**	Endosulphan	0.005[7]	-	0.005[6a]	0.0005[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Non-hazardous pollutant	Priority substance	Isoproturon	-	9[4]	0.3[6a]	0.3[6a]
Hazardous substance	Priority substance	Simazine	0.03[7]	2[4]	1[6a]	1 [6a]
Hazardous substance	**Priority hazardous substance**	Trifluralin	0.01[7]	20[4]	0.03[6a]	0.03[6a]
(Not determined)	From 22/12/18: Priority substance	Dichlorovos	-	-	From 22/12/18: 6.0E-4[6a]	From 22/12/18: 6.0E-5[6a]
Hazardous substance	From 22/12/18: Priority substance	Heptachlor and heptachlor epoxide	-	0.03[2]	From 22/12/18: 2.0E-7[6a]	From 22/12/18: 1.0E-08[6a]
Miscellaneous						
None	Specific pollutant	Triclosan (antibacterial agent)	-	-	0.1[6a]	0.1[6a]
Hazardous substance	**From 22/12/18: Priority hazardous substance**	Perfluoro-octane sulfonic acid (and its derivatives) (PFOS)	-	-	From 22/12/18: 6.5E-4[6a]	From 22/12/18: 1.3E-4[6a]
Hazardous substance	**From 22/12/18: Priority hazardous substance**	Hexabromo cyclododecane (HBCDD)	-	-	From 22/12/18: 0.0016[6a]	From 22/12/18: 0.0008[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters

Notes:

'-' A target concentration is not available.

$Please note that total ammonia (NH_4^+ and NH_3) is equivalent to ammoniacal nitrogen in laboratory reports

*1 Please note that although iron is listed in the 2015 Direction as 1.000 µg/l, the EQS remains at 1mg/l in Scotland and it is assumed this is an error and should read either 1,000 or 1000µg/l.

*2 Please note that although Isodrin is not listed in name within the group of "Cyclodiene pesticides" in Table 1 of Schedule 3 Part 3 of the 2015 Direction[6], the CAS number for Isodrin (465-73-6) **is** listed and therefore it is assumed that it has been missed off the named list of substances.

*3 Total petroleum hydrocarbons is used for consistency, but is an analytical method-defined measurement for a mixture of hydrocarbons subject to environmental analysis[11].

"Bioavailable" in relation to copper, zinc, nickel and manganese (but not lead) is the generic EQSbioavailable[6a] derived from the Metal Bioavailability Assessment Tool (M-BAT) developed by the Water Framework Directive UK Technical Advisory Group (WFDTAG). Exceedance of this value should prompt a site-specific assessment using the M-BAT with pH, DOC and Ca to derive a site-specific EQS termed the $PNEC_{dissolved}$. http://www.wfduk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat.

For zinc, if there is an exceedance of the EQSbioavailable in an initial GQRA, Tier 2 required that the EQS for zinc should also have the ambient background concentration of zinc added as well

Table 2: World Health Organization (WHO) guide values for TPH CWG fractions in drinking water[13] (as referenced in CL:AIRE, 2017[11])

TPH CWG fraction	WHO guide value for drinking water[13] (µg/l)
Aliphatic fractions:	
Aliphatic EC5-EC6	15,000
Aliphatic >EC6-EC8	15,000
Aliphatic >EC8-EC10	300
Aliphatic >EC10-EC12	300
Aliphatic >EC12-EC16	300
Aliphatic >EC16-EC21	-
Aliphatic >EC21-EC35	-
Aromatic fractions:	
Aromatic EC5-EC6	10 (benzene)
Aromatic >EC6-EC8	700 (toluene)
Aromatic >EC8-EC10	300 (ethyl benzene) 500 (xylenes)
Aromatic >EC10-EC12	90
Aromatic >EC12-EC16	90
Aromatic >EC16-EC21	90
Aromatic >EC21-EC35	90
Reference: World Health Organisation (WHO), 2008. Petroleum products in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/05.08/123. World Health Organisation, Geneva[13].	

References

1. Environment Agency (2017), 'The Environment Agency's approach to groundwater protection', version 1.0, March 2017 (formerly contained within GP3) [accessed 29 March 2017]. https://www.gov.uk/government/collections/groundwater-protection

1a. Environment Agency (2017), 'Land contamination groundwater compliance points: quantitative risk assessments', March 2017 (formerly contained within GP3) [accessed 29 March 2017]. https://www.gov.uk/government/collections/groundwater-protection

2. The Water Supply (Water Quality) Regulations 2016 (SI 2016/619)
    - 2a. Sum of chloroform, bromoform, dibromochloromethane and bromodichloromethane
    - 2b. Standard applies to individual pesticides except aldrin, dieldrin, heptachlor and heptachlor epoxide, for which a separate standard is defined.
3. The Private Water Supplies (England) Regulations 2016. SI 2016 / 618
4. WHO (2011), *Guidelines for drinking-water quality*, 4th edn
5. JAGDAG hazard substance determinations: This list contains substances that are determined to be hazardous substances or non-hazardous pollutants for the purposes of the groundwater directive 2006/118/EC. The absence of an assessment or substance from the list means an assessment has not been done yet and is presented as 'Not yet determined'; if a substance has been assessed but does not fall into either category it is presented as 'None'. For further details on how substances are assessed, see the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) 'Methodology for the determination of hazardous substances in groundwater for the purposes of the groundwater directive 2006/118/EC' which is available from the JAGDAG website. The methodology is a UK –wide framework that sets criteria for how to assess whether a substance is a hazardous substances in groundwater. The list of substances can be found at:

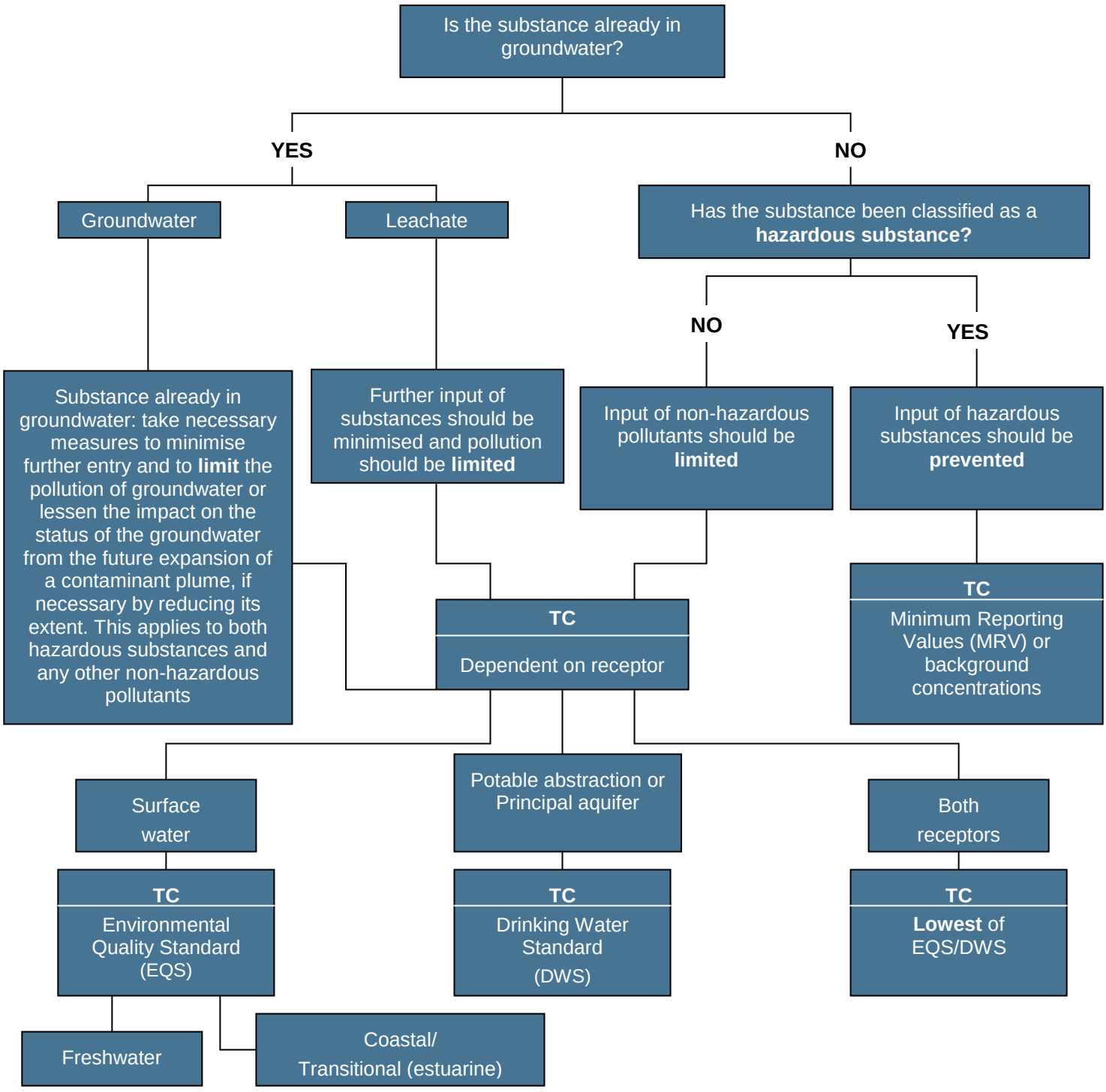
   https://www.wfduk.org/stakeholders/jagdag

6. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
    - 6a. The EQS for these substances are based on a "long term mean" or an "annual average (AA)" EQS.
    - 6b. For cadmium and its compounds the EQS values vary depending on the hardness of the water as specified in five class categories (Class 1: < 40 mg CaCO3/l, Class 2: 40 to < 50 mg CaCO3/l, Class 3: 50 to < 100 mg CaCO3/l, Class 4: 100 to < 200 mg CaCO3/l and Class 5: ≥ 200 mg CaCO3/l).
    - 6c. The EQS for Mercury and hexachlorobutadiene are based on a "maximum acceptable concentration (MAC)" EQS in absence of an "annual average (AA)" EQS.
    - 6d. The EQS for chlorine in saltwater is based on the 95th percentile concentration of total residual oxidant, which refers to the sum of all oxidising agents existing in water, expressed as available chlorine.
    - 6e. The recommended saltwater standard is derived using a safety factor of 100. Where the standard is failed, it is recommended that supporting evidence of ecological damage should be obtained before committing to expensive action.
    - 6f. EQS for total ammonia is as per Schedule 3, Part 1, Table 7 of of the above directions. EQS applies to river types 1, 2 and 4 and 6 (namely upland and low alkalinity). The EQS for a lowland and high alkalinity rivers (types 3, 5 and 7) is 600µg/l (0.6mg/l).

Additional information on the Metal Bioavailability Assessment Tool (M-BAT) is available at http://www.wfduk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat

7. Minimum reporting values listed at https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values (updated 13 January 2017; accessed 29 March 2017). Note target concentration for xylenes is 3 μg/l each for o-xylene and m/p xylene as it may not be possible to separate m- and p-xylene; 135 tcb, 124 tcb, 123 tcb each to 0.01 μg/l)
8. The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 (as amended). SI 1996 / 3001
9. Council Directive on the Quality of Fresh Waters Needing Protection or Improvement in Order to Support Fish Life (Freshwater Fish Directive) (78/659/EEC)
10. WRc plc (2002), R&D Technical Report P45.
11. CL:AIRE, 2017. Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies. V1.1.
12. Drinking Water Inspectorate (London, UK). Environmental Information Request on MTBE in drinking water. Ref. DWI 1/10/18; dated 28 November 2006. Value is based on the odour threshold for MTBE, which is lower than a health-based guideline value
13. World Health Organisation (WHO), 2008. Petroleum products in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/05.08/123. World Health Organisation, Geneva. [accessed 29 March 2017] http://www.who.int/water_sanitation_health/dwq/chemicals/petroleumproducts_2add_june2008.pdf

FLOW CHART TO ASSIST WITH SELECTION OF TARGET CONCENTRATIONS



TC = Target concentration

When leachate is being assessed the 'compliance point' is the groundwater body. Therefore dilution within the groundwater body may be applied with caution before comparing with the TC.

When directly assessing a receptor, e.g., a river, the appropriate TC should be selected.

APPENDIX L
GENERIC ASSESSMENT CRITERIA FOR POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75m below finished ground levels, sample results from depths between 0.5m and 1.5m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5m below the proposed depth of the pipe.

It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table A3: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	**PE**	**PVC**
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	• BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C_5–C_{10}) (Not including compounds within group 2e and 2f)	2	1.4
2e	• Phenols	2	0.4
2f	• Cresols and chlorinated phenols	2	0.04
3	Mineral oil C_{11}–C_{20}	10	Suitable
4	Mineral oil C_{21}–C_{40}	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			

APPENDIX M
COMPARISON OF SOIL AND WATER LABORATORY DATA TO HUMAN HEALTH GAC

Project name	Talbot Mill, Manchester
Project code	11264
Client name	Capital & Centric
Address	Ellesmere Street Manchester
NGR	
Land use	Residential without home-grown produce
SOM	6%
GAC version	2018_00

Notes: Both Phase 1 and Phase 2 data for residential without plant uptake scenario

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects														
Lab sample ID									18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/10434/1	18/10434/2	18/10434/3	18/10434/5	18/10434/6	18/04126/27	18/04126/24	18/04126/16	18/04126/17	18/04126/10	18/04126/13
Client sample ID									JBH01	JBH02	JBH03	JBH04	JTP11	JTP11	JTP13	JTP14	JTP14	JTP24	JTP25	JTP30	JTP30	JTP31	JTP31A
Depth to top									1.4	0	1.1	0.3	0.5	0.1	0.5	0.3	0.5	0.8	0.15	0.35	0.6	0.8	3
Depth to bottom									1.7	1	1.3	0.9	0.6	0.25	0.6	0.35	0.7	1	0.25	0.4	0.7	1.1	3.2
Date sampled									16/05/18	15/05/18	17/05/18	15/05/18	28/11/18	28/11/18	27/11/18	30/11/18	30/11/18	16/05/18	16/05/18	15/05/18	15/05/18	14/05/18	14/05/18
Metals and Inorganics																							
Arsenic	mg/kg	40		1130	<1	10	9	1	5	10	6	23		<1		5			20	27		3	1130
Cadmium	mg/kg	149		2.1	<0.5	10	8	2	<0.5	1	0.6	1.4		0.9		1.4			1.7	2.1		<0.5	1.9
Chromium	mg/kg	910	21	48	8	10	10	0	8	18	9	23		10		18			20	27		8	48
Chromium (hexavalent)	mg/kg	21			<1	5	0	5				<1				<1			<1	<1		<1	
Copper	mg/kg	7100		540	6	10	10	0	6	52	30	321		13		65			241	159		6	540
Lead	mg/kg	310		746	9	10	10	0	18	490	37	231		44		175			430	226		9	746
Mercury	mg/kg	56	1.2	8.31	<0.17	10	4	6	<0.17	<0.17	<0.17	0.84		<0.17		<0.17			0.68	0.36		<0.17	8.31
Nickel	mg/kg	180		84	9	10	10	0	9	21	16	49		10		13			35	84		11	80
Selenium	mg/kg	430		65	<1	10	4	6	<1	1	<1	2		<1		<1			<1	3		<1	65
Zinc	mg/kg	40000		425	27	10	10	0	45	125	38	180		30		264			425	411		27	268
Cyanide (free)	mg/kg	40			<1	4	0	4		<1											<1	<1	<1
Cyanide (total)	mg/kg		40	2	<1	5	1	4		<1						2					<1	<1	<1
Asbestos																							
Asbestos in soil						7	0	7		NAD		NAD		NAD				NAD	NAD	NAD			NAD
Petroleum Hydrocarbons																							
Ali >C5-C6	mg/kg	161			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
Ali >C6-C8	mg/kg	530			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
Ali >C8-C10	mg/kg	155		2	<1	7	1	6	<1			<1		<1					<1		2	<1	<1
Ali >C10-C12	mg/kg	770	283	2	<1	7	2	5	<1			1		<1					<1		2	<1	<1
Ali >C12-C16	mg/kg	4400	142	5	<1	7	3	4	<1			4		<1					1		5	<1	<1
Ali >C16-C21	mg/kg			7	<1	7	4	3	<1			4		<1					2		7	<1	2
Ali >C21-C35	mg/kg			18	<1	7	5	2	<1			4		18					4		18	<1	9
Ali >C16-C35 calculated	mg/kg	111000		25	<1	7	5	2	<1			8		18					6		25	<1	11
Total Aliphatics	mg/kg			33	<1	7	5	2	<1			13		18					7		33	<1	12
Aro >C5-C7	mg/kg				<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
Aro >C7-C8	mg/kg				<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
Aro >C8-C10	mg/kg	269		6	<1	7	5	2	<1			4		2					2		6	<1	2
Aro >C10-C12	mg/kg	1200		39	<1	7	4	3	<1			39		<1					2		6	<1	2
Aro >C12-C16	mg/kg	2500		153	<1	7	5	2	<1			153		2					16		17	<1	5
Aro >C16-C21	mg/kg	1900		282	<1	7	5	2	<1			282		6					65		24	<1	13
Aro >C21-C35	mg/kg	1900		379	<1	7	5	2	<1			379		59					157		239	<1	75
Total Aromatics	mg/kg			857	<1	7	5	2	<1			857		68					242		292	<1	95
TPH (Ali & Aro)	mg/kg			870	<1	7	5	2	<1			870		86					248		325	<1	108
BTEX - Benzene	mg/kg	3.3			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
BTEX - Toluene	mg/kg	3900			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
BTEX - Ethyl Benzene	mg/kg	440			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
BTEX - o Xylene	mg/kg	480			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
BTEX - m & p Xylene	mg/kg	430			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
MTBE	mg/kg	320			<0.01	7	0	7	<0.01			<0.01		<0.01					<0.01		<0.01	<0.01	<0.01
Polycyclic aromatic hydrocarbons																							
Acenaphthene	mg/kg	7400		13.5	<0.01	8	5	3	<0.01			13.5		0.11		1.73			0.68		0.06	<0.01	<0.01
Acenaphthylene	mg/kg	7400		0.47	<0.01	8	5	3	<0.01			0.16		0.03		0.47			0.08		<0.01	<0.01	0.04
Anthracene	mg/kg	37000		8	<0.02	8	6	2	<0.02			8		0.21		5.98			1.07		0.09	<0.02	0.28
Benzo(a)anthracene	mg/kg	15		15.7	<0.04	8	6	2	<0.04			15.7		0.4		5.08			3.93		0.24	<0.04	0.23
Benzo(a)pyrene	mg/kg	5.3		12	<0.04	8	6	2	<0.04			12		0.37		3.29			3.29		0.23	<0.04	0.09
Benzo(b)fluoranthene	mg/kg	4.1		14.2	<0.05	8	6	2	<0.05			14.2		0.42		3.42			4.06		0.29	<0.05	1.21
Benzo(ghi)perylene	mg/kg	359		4.53	<0.05	8	6	2	<0.05			4.53		0.25		1.36			1.5		0.18	<0.05	0.23
Benzo(k)fluoranthene	mg/kg	107		4.84	<0.07	8	6	2	<0.07			4.84		0.15		1.26			1.46		0.11	<0.07	0.27
Chrysene	mg/kg	32		17.6	<0.06	8	6	2	<0.06			17.6		0.4		4.2			4.38		0.34	<0.06	0.4
Dibenzo(ah)anthracene	mg/kg	0.32		1.22	<0.04	8	4	4	<0.04			1.22		0.05		0.37			0.41		<0.04	<0.04	<0.04
Fluoranthene	mg/kg	1600		34.8	<0.08	8	6	2	<0.08			34.8		1		14.9			8.07		0.5	<0.08	0.16
Fluorene	mg/kg	4500	183	10.2	<0.01	8	5	3	<0.01			10.2		0.14		5.28			0.43		0.05	<0.01	<0.01
Indeno(123-cd)pyrene	mg/kg	46		4.89	<0.03	8	6	2	<0.03			4.89		0.28		1.77			1.61		0.17	<0.03	0.33
Naphthalene	mg/kg	125		17.2	<0.03	8	5	3	<0.03			17.2		0.07		5.82			0.04		0.1	<0.03	<0.03
Phenanthrene	mg/kg	1520		51	<0.03	8	6	2	<0.03			51		0.82		26.9			6.94		0.53	<0.03	0.06
Pyrene	mg/kg	3800		34.8	<0.07	8	6	2	<0.07			34.8		0.83		13.7			8.16		0.54	<0.07	0.16
Total PAH-16MS	mg/kg			245	<0.08	8	6	2	<0.08			245		5.53		95.5			46.1		3.43	<0.08	3.46
Other analytes																							
% Stones >10mm	% w/w			40.1	<0.1	15	14	1	1.7	29.2	15	4.1	10	5	10.7	22.5	40.1	15.6	13.5	8.4	20.9	<0.1	11.7
Chloride (water sol 2:1)	mg/kg			66	<10	4	3	1					12		66	38	<10						
pH	pH			8.5	6.87	14	14	0	8.5	7.99	8.29	7.46	7.48	7.65	7.95	7.57	7.99	8	7.81	7.86		7.66	6.87
Sulphate (acid soluble)	mg/kg			26000	<200	8	5	3	<200	700	<200							210	390	870		<200	26000
Sulphate (water sol 2:1)	g/l			1.34	<0.01	12	7	5	<0.01	0.04	<0.01		0.06		0.03	1.12	0.04	<0.01	<0.01	<0.01		0.06	1.34
Sulphur (total)	mg/kg			2290	75	4	4	0					75		112	2290	96						
Total Organic Carbon	% w/w			16.2	0.07	7	7	0	0.22		2.16	12		0.61				3.85		16.2		0.07	
Converted to SOM (x / 0.58)	% w/w			27.93103	0.12069	7	7	0	0.37931034		3.72413793	20.6896552		1.05172414				6.63793103		27.9310345		0.12068966	

APPENDIX N
EXISTING AND PROPOSED LOADING INFORMATION PROVIDED BY JOULE CONSULTING

RSK	Site:	Client:	Job Number:
	Talbot Mill	Capital & Centric	11264

Summary of Loadings and Re-use Factors

Ref.	Ground Level (mAOD)	Foundation Width Bf (m)	Foundation Length Lf (m)	Foundation Base Depth Bf (m)	Foundation Base Elevation (mAOD)	Existing Load Take Down (kN)			Existing Applied Pressure (kN/m^2)	New Loads (kN)			New Applied Pressure (kN/m^2)	Increase in Applied Pressure (kN/m^2)	% Increase	ULS Bearing Resistance (kN/m2)		Design Bearing Pressure (kN/m2)		Utilisation		Re-use Fator of Safety (Ultimate Resistance / New Pressure)	Estimated Settlement under Pressure Increase (mm)
						DL	LL	Total	Total	DL	LL	Total	Total			DA1-C1	DA1-C2	DA1-C1	DA1-C2	DA1-C1	DA1-C2		
E2/JTP01	26.220	1.100	1.100	0.850	25.370	261	192	453	374	189	24	213	176	-198	-53%	1022	477	241	182	24%	38%	5.81	0
E8/JTP02	26.160	1.140	1.180	1.300	24.860	313	203	516	384	473	112	585	435	51	13%	1370	652	600	460	44%	70%	3.15	3-5
GL4/JTP05	26.170	0.930	1.000	0.530	25.640	195	45	240	258	268	25	293	315	57	22%	707	326	429	323	61%	99%	2.24	6-9
GL9a/JTP06&07	26.150	1.000	1.000	0.720	25.430	69	15	84	84	75	5	80	80	-4	-5%	883	411	109	82	12%	20%	11.04	0
GL11	26.150	1.000	1.000	0.530	25.620	285	17	302	302	310	14	324	324	22	7%	717	398	440	328	61%	83%	2.21	1-2
GL G/JTP07	26.170	1.240	1.000	1.040	25.130	215	29	244	197	249	18	267	215	19	9%	1158	547	293	220	25%	40%	5.38	1-2
JTP10	26.170	1.700	1.700	1.500	24.670	682	387	1069	370	825	197	1022	354	-16	-4%	1584	754	488	374	31%	50%	4.48	0
JTP10A	26.170	1.540	1.590	1.630	24.540	682	387	1069	437	825	197	1022	417	-19	-4%	1664	796	576	442	35%	55%	3.99	0
JTP11	26.170	0.910	0.930	0.600	25.570	682	387	1069	1263	825	197	1022	1208	-56	-4%	758	352	1665	1277	220%	363%	0.63	0
JTP13	26.170	1.160	1.000	1.420	24.750	255	68	323	278	293	40	333	287	9	3%	1443	691	393	297	27%	43%	5.03	<1
JTP14	26.170	1.120	1.000	1.880	24.290	275	40	315	281	327	19	346	309	28	10%	1786	865	420	314	23%	36%	5.78	1-2
JTP23	26.270	0.920	1.000	0.700	25.570	255	68	323	351	293	40	333	362	11	3%	853	398	495	375	58%	94%	2.36	1-2
JTP 24	26.340	0.920	1.000	0.700	25.640	255	68	323	351	293	40	333	362	11	3%	853	398	495	375	58%	94%	2.36	1-2

Notes: E2 - Reduced load on existing foundation due to some of the load being directed into new foundations
GL4, GL9a, GL11, GL, GL G, JTP23 & JTP24 highlighted lengths indicate unit length, whereas minimum length of 20.00m assumed for derivation of shape factors for bearing capacity calculations
GL11 blue highlighted indicate all levels and dimensions assumed in the absence of specific investigation data and location
Green highlighted cells indicate strip widths provided by the Engineer

APPENDIX O
DETAILED BEARING CAPACITY CALCULATIONS AND SUMMARY

Site:	Client:	Job Number:
Talbot Mill	Capital & Centric	11264

Summary of Loadings and Re-use Factors

Ref.	Ground Level (mAOD)	Foundation Width Bf (m)	Foundation Length Lf (m)	Foundation Base Depth Bf (m)	Foundation Base Elevation (mAOD)	Existing Load Take Down (kN)			Existing Applied Pressure (kN/m^2)	New Loads (kN)			New Applied Pressure (kN/m^2)	Increase in Applied Pressure (kN/m^2)	% Increase	Increase in Applied Pressure due to DL (kN/m^2)	% Increase DL	ULS Bearing Resistance (kN/m2)		Design Bearing Pressure (kN/m2)		Utilisation		Re-use Fator of Safety (Ultimate Resistance / New Pressure)	Estimated Settlement under Pressure Increase (mm)	Estimated Settlement under Pressure Increase in DL (mm)
						DL	LL	Total	Total	DL	LL	Total	Total					DA1-C1	DA1-C2	DA1-C1	DA1-C2	DA1-C1	DA1-C2			
E2/JTP01	26.220	1.100	1.100	0.850	25.370	261	192	453	374	189	24	213	176	-198	-53%	-60	-28%	1022	477	241	182	24%	38%	5.81	0	0
E8/JTP02	26.160	1.140	1.180	1.300	24.860	313	203	516	384	473	112	585	435	51	13%	119	51%	1370	652	600	460	44%	70%	3.15	3-4	6-8
GL4/JTP05	26.170	0.930	1.000	0.530	25.640	195	45	240	258	268	25	293	315	57	22%	78	37%	707	326	429	323	61%	99%	2.24	4-5	5-7
GL9a/JTP06&07	26.150	1.000	1.000	0.720	25.430	69	15	84	84	75	5	80	80	-4	-5%	6	9%	883	411	109	82	12%	20%	11.04	0	1
GL11	26.150	1.000	1.000	0.530	25.620	285	17	302	302	310	14	324	324	22	7%	25	9%	717	398	440	328	61%	83%	2.21	1-2	1-2
GL G/JTP07	26.170	1.240	1.000	1.040	25.130	215	29	244	197	249	18	267	215	19	9%	27	16%	1158	547	293	220	25%	40%	5.38	1-2	1-2
JTP10	26.170	1.700	1.700	1.500	24.670	682	387	1069	370	825	197	1022	354	-16	-4%	49	21%	1584	754	488	374	31%	50%	4.48	0	2-3
JTP10A	26.170	1.540	1.590	1.630	24.540	682	387	1069	437	825	197	1022	417	-19	-4%	58	21%	1664	796	576	442	35%	55%	3.99	0	3-4
JTP11 (1)	26.170	0.910	0.930	0.730	25.440	682	387	1069	1263	825	197	1022	1208	-56	-4%	169	21%	1554	662	1665	1277	107%	193%	1.29	0	2-3
JTP11 (2)	26.170	0.910	0.930	0.730	25.440	682	387	1069	1263	825	197	1022	1208	-56	-4%	169	21%	1800	1500	1665	1277	93%	85%	1.49	0	1-2
JTP13	26.170	1.160	1.000	1.420	24.750	255	68	323	278	293	40	333	287	9	3%	33	15%	1443	691	393	297	27%	43%	5.03	1	1-2
JTP14	26.170	1.120	1.000	1.880	24.290	275	40	315	281	327	19	346	309	28	10%	46	19%	1786	865	420	314	23%	36%	5.78	1	2-3
JTP23	26.270	0.920	1.000	0.700	25.570	255	68	323	351	293	40	333	362	11	3%	41	15%	853	398	495	375	58%	94%	2.36	1	2-3
JTP 24	26.340	0.920	1.000	0.700	25.640	255	68	323	351	293	40	333	362	11	3%	41	15%	853	398	495	375	58%	94%	2.36	1	2-3

Notes:
E2 - Reduced load on existing foundation due to some of the load being directed into new foundations
GL4, GL9a, GL11, GL, GL G, JTP23 & JTP24 highlighted lengths indicate unit length, whereas minimum length of 20.00m assumed for derivation of shape factors for bearing capacity calculations
GL11 blue highlighted indicate all levels and dimensions assumed in the absence of specific investigation data and location
Green highlighted cells indicate strip widths provided by the Engineer
JTP11 (1) considers non intact/weathered Sandstone treated as a granular soil with phi'=38 and SPT N = 50 for settlement assessment
JTP11 (2) considers intact very weak well cemented sandstone qu ≥ 2MPa, minimum joint spacing ~100-200mm giving presumed bearing resistance of ~500 - 600kN/m^2 from EN 1997-1:2004 Fig G.1 proportioned for 1m wide footing for 25mm settlement

APPENDIX P
HASWASTE SHEET

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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

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TP/WS/BH		JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30	JTP25	JTP24				
Depth (m)		1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60	0.15	0.80				
Envirolab reference		18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27				
% Moisture	%														
pH (soil)		8.50	7.99	8.29	7.46	7.66	6.87	7.86		7.81	8.00				
pH (leachate)															
Arsenic	mg/kg	5	10	6	23	3	1,130	27		20					
Cadmium	mg/kg	<0.5	1.0	0.6	1.4	<0.5	1.9	2.1		1.7					
Copper	mg/kg	6	52	30	321	6	540	159		241					
CrVI or Chromium	mg/kg	8	18	9	23	8	48	27		20					
Lead	mg/kg	18	490	37	231	9	746	226		430					
Mercury	mg/kg	<0.17	<0.17	<0.17	0.84	<0.17	8.31	0.36		0.68					
Nickel	mg/kg	9	21	16	49	11	80	84		35					
Selenium	mg/kg	<1	1	<1	2	<1	65	3		<1					
Zinc	mg/kg	45	125	38	180	27	268	411		425					
Barium	mg/kg														
Beryllium	mg/kg														
Vanadium	mg/kg														
Cobalt	mg/kg														
Manganese	mg/kg														
Molybdenum	mg/kg														
Antimony	mg/kg														
Aluminium	mg/kg														
Bismuth	mg/kg														
CrIII	mg/kg														
Iron	mg/kg														
Strontium	mg/kg														
Tellurium	mg/kg														
Thallium	mg/kg														
Titanium	mg/kg														
Tungsten	mg/kg														
Ammoniacal N	mg/kg														
ws Boron	mg/kg														
PAH (Input Total PAH **OR** individual PAH results)															
Acenaphthene	mg/kg														
Acenaphthylene	mg/kg														
Anthracene	mg/kg														
Benzo(a)anthracene	mg/kg														
Benzo(a)pyrene	mg/kg														
Benzo(b)fluoranthene	mg/kg														
Benzo(ghi)perylene	mg/kg														
Benzo(k)fluoranthene	mg/kg														
Chrysene	mg/kg														
Dibenzo(ah)anthracene	mg/kg														
Fluoranthene	mg/kg														
Fluorene	mg/kg														
Indeno(123cd)pyrene	mg/kg														
Naphthalene	mg/kg														
Phenanthrene	mg/kg														
Pyrene	mg/kg														
Coronene	mg/kg														
Total PAHs (16 or 17)	mg/kg	<0.08			245.00	<0.08	3.46		3.43	46.10					
TPH															
Petrol	mg/kg														
Diesel	mg/kg														
Lube Oil	mg/kg														
Crude Oil	mg/kg														
White Spirit / Kerosene	mg/kg														
Creosote	mg/kg														

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TP/WS/BH		JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30	JTP25	JTP24				
Depth (m)		1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60	0.15	0.80				
Envirolab reference		18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27				
Unknown TPH with ID	mg/kg														
Unknown TPHCWG	mg/kg	<1			870.0	<1	108.0		325.0	248.0					
Total Sulphide	mg/kg														
Complex Cyanide	mg/kg														
Free (or Total) Cyanide	mg/kg														
Thiocyanate	mg/kg														
Elemental/Free Sulphur	mg/kg														
Phenols Input Total Phenols HPLC **OR** individual Phenol results.															
Phenol	mg/kg														
Cresols	mg/kg														
Xylenols	mg/kg														
Resourcinol	mg/kg														
Phenols Total by HPLC	mg/kg														
BTEX Input Total BTEX **OR** individual BTEX results.															
Benzene	mg/kg	<0.01			<0.01	<0.01	<0.01		<0.01	<0.01					
Toluene	mg/kg	<0.01			<0.01	<0.01	<0.01		<0.01	<0.01					
Ethylbenzene	mg/kg	<0.01			<0.01	<0.01	<0.01		<0.01	<0.01					
Xylenes	mg/kg	<0.01			<0.01	<0.01	<0.01		<0.01	<0.01					
Total BTEX	mg/kg	<0.01			<0.01	<0.01	<0.01		<0.01	<0.01					
PCBs (POPs)															
PCBs Total (eg EC7/WHO12)	mg/kg														
PBBs (POPs)															
Hexabromobiphenyl (Total or PBB153; 2,2',4,4',5,5'- if only available)	mg/kg														

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TP/WS/BH		JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30	JTP25	JTP24			
Depth (m)		1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60	0.15	0.80			
Envirolab reference		18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27			
POPs Dioxins and Furans Input Total Dioxins and Furans **OR** individual Dioxin and Furan results.														
2,3,7,8-TeCDD	mg/kg													
1,2,3,7,8-PeCDD	mg/kg													
1,2,3,4,7,8-HxCDD	mg/kg													
1,2,3,6,7,8-HxCDD	mg/kg													
1,2,3,7,8,9-HxCDD	mg/kg													
1,2,3,4,6,7,8-HpCDD	mg/kg													
OCDD	mg/kg													
2,3,7,8-TeCDF	mg/kg													
1,2,3,7,8-PeCDF	mg/kg													
2,3,4,7,8-PeCDF	mg/kg													
1,2,3,4,7,8-HxCDF	mg/kg													
1,2,3,6,7,8-HxCDF	mg/kg													
2,3,4,6,7,8-HxCDF	mg/kg													
1,2,3,7,8,9-HxCDF	mg/kg													
1,2,3,4,6,7,8-HpCDF	mg/kg													
1,2,3,4,7,8,9-HpCDF	mg/kg													
OCDF	mg/kg													
Total Dioxins and Furans	mg/kg													
Some Pesticides (POPs unless otherwise stated)														
Aldrin	mg/kg													
α Hexachlorocyclohexane (alpha-HCH) *(leave empty if total HCH results used)*	mg/kg													
β Hexachlorocyclohexane (beta-HCH) *(leave empty if total HCH results used)*	mg/kg													
α Cis-Chlordane (alpha) ***OR*** *Total Chlordane*	mg/kg													
δ Hexachlorocyclohexane (delta-HCH) *(leave empty if total HCH results used)*	mg/kg													
Dieldrin	mg/kg													
Endrin	mg/kg													
χ Hexachlorocyclohexane (gamma-HCH) (lindane) ***OR*** *Total HCH*	mg/kg													
Heptachlor	mg/kg													
Hexachlorobenzene	mg/kg													
o,p'-DDT *(leave empty if total DDT results used)*	mg/kg													
p,p'-DDT ***OR*** *Total DDT*	mg/kg													
χ Trans-Chlordane (gamma) *(leave empty if total Chlordane results used)*	mg/kg													
Chlordecone (kepone)	mg/kg													
Pentachlorobenzene	mg/kg													
Mirex	mg/kg													
Toxaphene (camphechlor)	mg/kg													
Tin														

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Talbot Mill, Manchester 11264

TP/WS/BH		JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30	JTP25	JTP24			
Depth (m)		1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60	0.15	0.80			
Envirolab reference		18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27			
Tin *(leave empty if Organotin and Tin excl Organotin results used)*	mg/kg													
Organotin														
Dibutyltin; DiBT	mg/kg													
Tributyltin; TriBT	mg/kg													
Triphenyltin; TriPT	mg/kg													
Tetrabutyltin; TeBT	mg/kg													
Tin excluding Organotin														
Tin excl Organotin	mg/kg													

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Talbot Mill, Manchester 11264

TP/WS/BH		JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30	JTP25	JTP24				
Depth (m)		1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60	0.15	0.80				
Envirolab reference		18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27				
Asbestos in Soil	Thresholds														
Asbestos detected in Soil (enter Y or N)	Y		N		N		N	N		N	N				
		If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7												If Asbestos in Soil above is "Y", the soil is Hazard	
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Carc HP7 % Asbestos in Soil (Fibres)" below	%													
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces) *Please be advised, if the calculation cell is "0.00000" DOES NOT MEAN asbestos testing has been undertaken and the result is zero.*	≥0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.										If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only u Asbestos % results when visual identifiable			
Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y														
		If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.										If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Iden			
		Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.										Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie			
		All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.										All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % (			
Hazardous Property	Thresholds	Cut Off Value	**If cells below turn yellow and the text turns red, the samples should be classified as Hazardous Waste.**										**If cells below turn yellow and the text turns red, the samples s**		
Corrosive HP8	≥5%	<1%	0.00220	0.00478	0.00252	0.00745	0.00193	0.15838	0.00875	0.00000	0.00648	0.00000	0.00000	0.00000	0.00000	0.00000
Irritant HP4	≥10%	<1%	0.00134	0.00720	0.00418	0.03931	0.00107	0.21018	0.02153	0.00000	0.02987	0.00000	0.00000	0.00000	0.00000	0.00000
Irritant HP4	≥20%	<1%	#VALUE!	0.01012	0.00662	#VALUE!	#VALUE!	#VALUE!	0.03494	#VALUE!	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥20%		0.00000	0.00000	0.00000	0.02450	0.00000	0.00035	0.00000	0.00034	0.00461	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥1%		0.00182	0.00424	0.00323	0.00990	0.00222	0.01616	0.01697	0.00000	0.00707	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥10%		#VALUE!	0.04900	#VALUE!	0.08700	#VALUE!	0.07460	0.02260	0.03250	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Aspiration Toxicity HP5	≥10%		#VALUE!	0.00000	0.00000	#VALUE!	#VALUE!	#VALUE!	0.00000	#VALUE!	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	#VALUE!	#VALUE!	#VALUE!	0.00312	#VALUE!	0.14999	0.00360	0.00000	0.00271	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥5%	<0.1%	#VALUE!	0.00360	#VALUE!	0.00470	#VALUE!	0.01838	0.00561	0.00000	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥25%	<1%	#VALUE!	0.05922	0.01038	0.09391	#VALUE!	0.15232	0.05775	0.00034	0.08208	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	#VALUE!	#VALUE!	#VALUE!	0.00008	#VALUE!	0.00083	0.00004	0.00000	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥2.5%	<0.1%	0.00154	0.00346	0.00173	0.00442	0.00154	0.00922	0.00518	0.00000	0.00384	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥15%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥55%	<1%	#VALUE!	0.00010	0.00006	#VALUE!	#VALUE!	#VALUE!	0.00021	#VALUE!	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.5%	<0.1%	#VALUE!	#VALUE!	#VALUE!	0.00464	#VALUE!	0.01024	0.00543	0.00000	0.00408	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥3.5%	<0.1%	#VALUE!	0.00014	#VALUE!	0.00028	#VALUE!	0.00917	0.00042	0.00000	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥22.5%	<1%	#VALUE!	0.05912	0.01032	#VALUE!	#VALUE!	#VALUE!	0.05754	#VALUE!	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7	≥0.1%		0.00182	0.04900	0.00370	0.08700	0.00222	**0.14916**	0.02260	0.03250	0.04300	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7	≥0.1%		0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000

Table 3 of the CLP, CL Inventory, ATPs, IARC, Concawe, MSDSs, REACH + Pesticide Properties databases. Worst case REACH + MSDS's used for "*" STOT + Acute Toxicity.

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Envirolab reference		18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27				
Carcinogenic HP7	≥1%	0.00000	0.00000	0.00000	0.02450	0.00000	0.00035	0.00000	0.00034	0.00461	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.5	8.50	7.99	8.29	7.46	7.66	6.87	7.86	0.00	7.81	8.00	0.00	0.00	0.00	0.00
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2	8.50	7.99	8.29	7.46	7.66	6.87	7.86	0.00	7.81	8.00	0.00	0.00	0.00	0.00
Toxic for Reproduction HP10	≥0.3%	0.00182	0.04900	0.00370	0.02450	0.00222	0.07460	0.02260	0.00034	0.04300	0.00000	0.00000	0.00000	0.00000	0.00000
Toxic for Reproduction HP10	≥3%	0.00154	0.00346	0.00173	0.08700	0.00154	0.01080	0.00518	0.03250	0.02480	0.00000	0.00000	0.00000	0.00000	0.00000
Mutagenic HP11	≥0.1%	0.00154	0.00346	0.00173	0.08700	0.00154	0.01080	0.00518	0.03250	0.02480	0.00000	0.00000	0.00000	0.00000	0.00000
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Mutagenic HP11	≥1%	0.00182	0.00424	0.00323	0.02450	0.00222	0.01616	0.01697	0.00034	0.00707	0.00000	0.00000	0.00000	0.00000	0.00000
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HP13 Sensitising	≥10%	0.00182	0.00424	0.00323	0.02450	0.00222	0.01616	0.01697	0.00034	0.00707	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14 amended v6	≥25%	<0.1%	#VALUE!	#VALUE!	#VALUE!	0.12423	#VALUE!	0.35419	0.11833	0.00034	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000

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TP/WS/BH			JBH01	JBH02	JBH03	JBH04	JTP31	JTP31A	JTP30	JTP30	JTP25	JTP24				
Depth (m)			1.40	0.00	1.10	0.30	0.80	3.00	0.35	0.60	0.15	0.80				
Envirolab reference			18/04126/3	18/04126/4	18/04126/6	18/04126/7	18/04126/10	18/04126/13	18/04126/16	18/04126/17	18/04126/24	18/04126/27				
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.11833	#VALUE!	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	11.83270	#VALUE!	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0.005%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

If other contaminants need adding to Haswaste, please contact Envirolab.

APPENDIX Q
LABORATORY CERTIFICATES OF SURFACE WATER ANALYSIS

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/10131
Issue Number: 1 **Date:** 14 December, 2018

Client:
RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Emma Hobbs
Project Name: Talbot Mill
Project Ref: 11264
Order No: N/A
Date Samples Received: 30/11/18
Date Instructions Received: 01/12/18
Date Analysis Completed: 14/12/18

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Danielle Brierley
Client Manager

UKAS TESTING
1247

Envirolab Job Number: 18/10131

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/10131/1	18/10131/2							Units	Method ref
Client Sample No	1	2								
Client Sample ID	Canal 1	Canal 2								
Depth to Top	1.23	0.38								
Depth To Bottom										
Date Sampled	30-Nov-18	30-Nov-18								
Sample Type	Water - EW	Water - EW								
Sample Matrix Code	N/A	N/A								
pH (w)$_{A}^{\#}$	7.94	7.95							pH	A-T-031w
BOD (settled, 5 day)$_{A}$	<1	1							mg/l	A-T-048
Alkalinity (total) (w) Colorimetry$_{A}^{\#}$	68	59							mg/l Ca CO3	A-T-038w
Total Suspended Solids (w)$_{A}^{\#}$	<10	<10							mg/l	A-T-036w
Ammonium / Ammoniacal nitrogen as NH4 (w)$_{A}^{\#}$	0.470	0.797							mg/l	A-T-033w
Chloride (w)$_{A}^{\#}$	31	29							mg/l	A-T-026w
Sulphate (w)$_{A}^{\#}$	29	26							mg/l	A-T-026w
DOC (w)$_{A}^{\#}$	4.0	4.1							mg/l	A-T-032w
Arsenic (dissolved)$_{A}^{\#}$	1	1							µg/l	A-T-025w
Cadmium (dissolved)$_{A}^{\#}$	<0.2	<0.2							µg/l	A-T-025w
Copper (dissolved)$_{A}^{\#}$	9	10							µg/l	A-T-025w
Chromium (dissolved)$_{A}^{\#}$	<1	5							µg/l	A-T-025w
Lead (dissolved)$_{A}^{\#}$	3	2							µg/l	A-T-025w
Mercury (dissolved)$_{A}^{\#}$	<0.1	<0.1							µg/l	A-T-025w
Nickel (dissolved)$_{A}^{\#}$	2	2							µg/l	A-T-025w
Selenium (dissolved)$_{A}^{\#}$	<1	<1							µg/l	A-T-025w
Zinc (dissolved)$_{A}^{\#}$	10	28							µg/l	A-T-025w

Envirolab Job Number: 18/10131

Client Project Name: Talbot Mill

Client Project Ref: 11264

Lab Sample ID	18/10131/1	18/10131/2							Units	Method ref
Client Sample No	1	2								
Client Sample ID	Canal 1	Canal 2								
Depth to Top	1.23	0.38								
Depth To Bottom										
Date Sampled	30-Nov-18	30-Nov-18								
Sample Type	Water - EW	Water - EW								
Sample Matrix Code	N/A	N/A								
PAH 16MS (w)										
Acenaphthene (w)$_A^{\#}$	0.03	<0.01							µg/l	A-T-019w
Acenaphthylene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Anthracene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Benzo(a)anthracene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Benzo(a)pyrene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Benzo(b)fluoranthene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Benzo(ghi)perylene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Benzo(k)fluoranthene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Chrysene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Dibenzo(ah)anthracene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Fluoranthene (w)$_A^{\#}$	0.03	0.02							µg/l	A-T-019w
Fluorene (w)$_A^{\#}$	0.02	<0.01							µg/l	A-T-019w
Indeno(123-cd)pyrene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Naphthalene (w)$_A^{\#}$	<0.01	<0.01							µg/l	A-T-019w
Phenanthrene (w)$_A^{\#}$	0.05	<0.01							µg/l	A-T-019w
Pyrene (w)$_A^{\#}$	0.02	0.02							µg/l	A-T-019w
Total PAH 16MS (w)$_A^{\#}$	0.15	0.04							µg/l	A-T-019w
TPH Banded 1 (w)										
>C6-C8 (w)$_A^{\#}$	<10	<10							µg/l	A-T-007w
>C8-C10 (w)$_A^{\#}$	<5	<5							µg/l	A-T-007w
>C10-C12 (w)$_A^{\#}$	<5	<5							µg/l	A-T-007w
>C12-C16 (w)$_A^{\#}$	<10	<10							µg/l	A-T-007w
>C16-C21 (w)$_A^{\#}$	<20	<20							µg/l	A-T-007w
>C21-C40 (w)$_A^{\#}$	<20	<20							µg/l	A-T-007w
Total TPH Banded 1 (w)$_A^{\#}$	<20	<20							µg/l	A-T-007w

REPORT NOTES

General:
This report shall not be reproduced, except in full, without written approval from Envirolab.
All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.