



**TAYLOR WIMPEY WEST
MIDLANDS**

**CONISTON CRESCENT
STOURPORT-ON-SEVERN**

SITE INVESTIGATION REPORT

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CONTENTS

1.0 INTRODUCTION	1 - 2
2.0 BACKGROUND	3 - 4
3.0 PRELIMINARY CONCEPTUAL SITE MODEL AND RISK ASSESSMENT	5 - 8
4.0 SITE INVESTIGATIONS	9 - 14
5.0 CONTAMINATION ASSESSMENT	15 - 18
6.0 CONCLUSIONS AND RECOMMENDATIONS	19 - 24

APPENDICES

- Appendix 1 – Sources of Information
- Appendix 2 – Site Photographs
- Appendix 3 – Conceptual Site Model and Qualitative Risk Assessment
- Appendix 4 – Borehole Logs
- Appendix 5 – Trial Pit Logs
- Appendix 6 – Laboratory Geotechnical Test Results
- Appendix 7 – Laboratory Geochemical Test Results
- Appendix 8 – Soakaway Calculations and Graphs
- Appendix 9 – Ground Gas and Groundwater Monitoring Results
- Appendix 10 – TRL DCP Results

DRAWINGS

Drawing No.	Drawing Title	Scale
20088-GE01	Site Investigation Location Plan	1:1,000
20088-GE02	Site Features Plan	1:1,000

1. INTRODUCTION

1.1 Introduction

- 1.1.1 This report has been compiled in accordance with instructions received from Mr James Watton on behalf of Taylor Wimpey West Midlands.
- 1.1.2 This report has been prepared to provide an assessment of ground conditions and identify potential development constraints in respect of a proposed residential development at Coniston Crescent, Stourport-On-Severn. It is understood that development proposals for the site comprise traditional two to three storey housing and apartments with associated gardens, landscaping and infrastructure.
- 1.1.3 This report is intended to provide an indication of the ground conditions to assist the client with identifying the potential abnormal construction costs associated with the geo-environmental issues identified. This report summarises the results of Phase One Site Investigation Report by Ecus Ltd dated 27 April 2017 and details the results of our subsequent Phase II intrusive site investigations.
- 1.1.4 The information contained within this report summarises the historical, geological and environmental setting of the site and immediate area. A list of the information sources used in the preparation of this report is included in Appendix 1.
- 1.1.5 The recent phase of site investigation implemented by TBGE was undertaken between 1 October 2020 and 13 October 2020. The investigations comprised of nine machine excavated trial pits, six dynamic sample boreholes, four TRL-DCP and four in-situ soakaway tests. The works were completed by St Clements Plant Ltd, Exploration Ltd, and Triple H Contracts respectively. The investigations were undertaken under the direct supervision of TBGE. The exploratory hole and soakaway test locations are illustrated on Drawing No. 20088-GE01
- 1.1.6 This investigation has generally been carried out in accordance with the guidance provided in the Investigation of Potentially Contaminated Sites – Code of Practice (BS10175 2011) and Code of Practice for Site Investigations (2015).
- 1.1.7 This report has been prepared for the sole internal use and reliance of Taylor Wimpey West Midlands. This report shall not be relied upon or transferred to other parties without the written authorisation of TBGE.
- 1.1.8 The findings of this report have been based on information provided from a number of different sources, TBGE have carried out all reasonable care in examining and interpreting this information to confirm its reliability, however, we cannot guarantee the authenticity of this information.
- 1.1.9 The findings of this report are based on the ground conditions identified at the individual exploratory hole locations and associated laboratory testing. TBGE have used best skill and diligence in interpreting the conditions between the exploratory hole locations, however, we do not accept any liability for conditions that are not revealed by the exploratory holes or test data. Our recommendations on the ground conditions between or beneath exploratory hole locations are therefore for general guidance only and should be confirmed at or prior to construction.

2. BACKGROUND

2.1 Site Description

- 2.1.1 The proposed development site, is approximately 3.6 Ha in area is currently occupied by rough grassland which formed the old playing fields to the former Stourport Sixth Form College. The main school buildings used to occupy the southern part of the site. The site is approximately centred at National Grid reference 380982, 272626. A selection of photographs obtained during the recent site investigation works are included as Appendix 2.
- 2.1.2 The site area is bound to the south by Coniston Crescent beyond which has established residential housing adjacent. The site is bound by allotments to the north east, and school grounds to the east. To the north and west, the site is surrounded by Burlish Top Nature Reserve.
- 2.1.3 The former Sixth Form buildings and associated playground areas were located in the south of the site, the former buildings have been demolished and hardstanding areas grubbed out, leaving long grass over the majority of the site. The only remaining buildings are a two storey former school caretaker property located next to the entrance of the site on the southern boundary and a single garage next to the caretaker property. Mature trees are present on the southern boundary and more localised trees on the western and northern boundary. There is also a strip of trees at the centre of the site. Fencing is present around all boundaries of the site with several gates / pedestrian access points.
- 2.1.4 The site is accessed via a gate on Coniston Crescent or via a small opening on Coniston Crescent, at the eastern boundary.
- 2.1.5 A topographic survey has been provided which indicates the site is relatively flat lying with a high point of approximately 42.5m AOD in the eastern site area to a low point of 41.3m in the west.

2.2 Site History

- 2.2.1 The earliest historical mapping in 1884 indicates that the general area is a 'Sewage Farm'. A number of sluices are identified in the subject area, however, the main treatment areas such the filter beds, sewage tanks are shown to be off site to the north.
- 2.2.2 The sluices are not shown on plans dating from 1952, from this time allotment gardens are identified in the south east of the site. The first major development of the site is the construction of the Burlish Middle School and caretaker's house in the late 1960's early 1970's. Burlish Middle School was renamed and reoccupied to form Stourport Sixth Form in 2007. The buildings and playgrounds were restricted to southern site area with playing fields occupying the remainder of the development area.
- 2.2.3 In May 2018, the Sixth Form building caught fire and was subsequently demolished. The area is now overlain with long grass.

2.3 Recorded Geology

- 2.3.1 Reference to the British Geological Survey (BGS) online Geo-Index has been undertaken to establish the recorded geological setting of the site and the surrounding area.
- 2.3.2 There is potential for made ground materials from the old sewage works and former Sixth Form building.

- 2.3.3 The geological mapping for the area indicates that the site is recorded to be overlain by river terrace deposits of the Holt Heath Sand and Gravel Member. These are recorded to compromise horizons of gravelly sands interbedded with clay bands and lenses of sandy gravels.
- 2.3.4 The natural superficial deposits are recorded to be underlain by argillaceous sandstones of the Wildmoor Sandstone Member of Triassic age.

2.4 Hydrogeology

- 2.4.1 The Holt Heath Sand and Gravel Member is designated as a Secondary A aquifer. The underlying Wildmoor Sandstone Member is a Principal Aquifer. The site is within Zone 3 of an Environment Agency Groundwater Source Protection Zone.

2.5 Radon

- 2.5.1 The Building Research Establishment (BRE) 'Guidance on Protective Measures for New Buildings' (BR 211) published in 2015 has been consulted. The report identifies areas of the country that are at risk from radon and may require radon protection. The BRE guidance document indicates that the site is located within an area that does not require radon protective measures.

2.6 Mining

- 2.6.1 Based on the geological mapping for the site and immediate area it is considered that there is unlikely to be a coal mining issue associated with the site. The Coal Authority's online interactive map viewer has been consulted which indicates that the Coniston Crescent site is not located within an area that requires a Coal Authority Mining Report.

2.7 Environmental Setting

- 2.7.1 The following information has been obtained from the Ecus Ltd Phase 1 Site Investigation Report and associated Groundsure information. Information from the Environment Agency (EA) is presented within the Groundsure report, dated April 2017.

Abstraction Licenses

- 2.7.2 There are two recorded groundwater abstraction licenses within 1km of the site. One is situated 488m west and is used for process water for Morgan Advanced Ceramics Ltd, the other lies 914m north-east and is used for process water for Brinton's Carpets Ltd. In addition, there are three surface water abstraction licenses within 1.5km of the site. The closest one is 1239m south-east and is used for General Washing for Severn Trent Water.

Discharge Consents

- 2.7.3 There are no licensed discharge consents within 500m of the site.

Pollution Incidents to Controlled Waters

- 2.7.4 There have been two pollution incidents recorded within 500m of the site boundary. The closest incident was a Category 3 (i.e. Minor Incident) on its land impact and occurred approximately 390m to the south west of the site in July 2002, involving household waste. The other incident was situated 412m north east of the site and involved the release of smoke. This occurred in July 2002 and resulted in a Category 3 land and air impact.
- 2.7.5 In addition to the recorded pollution incidents there is anecdotal evidence of a fire at the former Sixth Form building.

TAYLOR WIMPEY WEST MIDLANDS
CONISTON CRESCENT, STOURPORT-ON-SEVERN
SITE INVESTIGATION REPORT



Historical Landfill Sites, Recorded Landfill Sites and Registered Landfill Sites

- 2.7.6 There is a single landfill site 227m to the northeast of the site which is recorded to have accepted household, industrial and commercial waste between 1978 and 1984.

Waste Management Facilities

- 2.7.7 Bonemill Tip lies 481m east of the site, and accepts inert, industrial, commercial and household waste.

Registered Waste Transfer, Treatment or Disposal Sites

- 2.7.8 There is a registered waste facility 458m west of the site, owned by 7 Tek Recycling.

Control of Major Accident Hazard Sites (COMAH)

- 2.7.9 There are no registered Control of Major Accidents Hazard Sites within 500m of the site.

3. PRELIMINARY CONCEPTUAL SITE MODEL AND RISK ASSESSMENT

3.1 Initial Conceptual Site Model

3.1.1 This conceptual site model (CSM) represents the environmental characteristics of the Coniston Crescent site and illustrates the relationships between the identified contaminants, pathways and receptors. The CSM identifies the potential contaminant linkages, which may exist at the site. The aim of the CSM is to provide a qualitative assessment of risk posed to both human health and environmental receptors from possible on and off-site contamination sources and to inform the design of the intrusive site investigation works. In order for a contaminant linkage to exist, each of the three elements need to be present i.e. the source (contaminant), pathway and receptor. These elements are defined as:

- Source - Substance that can cause harm;
- Pathway - A credible pollutant linkage between the source and target;
- Target - A receptor, which could be harmed.

3.2 Sources

- 3.2.1 The initial CSM has been based on the findings of the background information described within Section 2 of this report.
- 3.2.2 Desk study researches has identified the potential for limited sources of contamination to be present on-site. The potential sources of contamination are considered to be from the former use as the previous land use. A summary of potential sources and associated contaminants that may be hazardous to receptors identified in Section 3.4.1 is presented below.

Table 1 – Potential Contamination Sources

	Source	Potential Contaminant
1.	Possible localised made ground associated with infilling hollows, ditches	Metals, metalloids, sulphate, polyaromatic hydrocarbons, asbestos, pH
2.	Possible sludge materials associated with the former sewage works	Metals, metalloids Ground gases: methane, carbon dioxide
3.	Historical pesticides associated with former allotment gardens	Metals, metalloids, etc
4.	Historic landfill sites (227m away from site)	Ground gases: methane and carbon dioxide

3.3 Pathways

- 3.3.1 The list below summarises possible pathways, which could allow potential receptors to be exposed to any contamination present at the site:
- Dermal contact, ingestion or inhalation of soil contaminants by site users;
 - Ingestion of contaminated soil;
 - Inhalation of contaminated dust;
 - Migration of soil borne gases and vapour into new buildings;
 - Migration of contaminants via service routes and foundations;
 - Leaching of contaminants and migration through strata;
 - Groundwater including perched groundwater;

- Surface water run-off;
- Direct contact between contaminated soils and building substructures.

3.4 Targets

3.4.1 Potential receptors to any contamination identified at the site include:

- Humans – during construction phase and subsequent site users;
- Flora and fauna on the site (dependent upon final site design);
- Secondary A aquifer underlying the site (river terrace deposits) over a Principal Aquifer and Zone 3 Groundwater Protection Zone;
- Local water courses (closest 670m to the south east – River Stour);
- Buildings and buildings sub-structures;
- Adjacent sites.

3.5 Preliminary Risk Assessment

- 3.5.1 The methodology used in this assessment is broadly analogous with that presented in the EA/NHBC document R&D Publication 66 "Guidance for the Safe Development of Housing on Land Affected by Contamination" (2008) and has been used to evaluate a level of risk for each contaminant linkage identified in the conceptual model. This is a qualitative approach based upon the classification of the probability of occurrence and the potential consequence (severity).
- 3.5.2 We have used the risk classification system described in R&D Publication 66 in this appraisal, the degree of risk is based on an assessment of consequence of an event occurring and the probability of a pollutant linkage. Table 2 below is the Categorisation of Risk table from the document, in which the likelihood of each pollutant linkage being realised is compared with the severity of the consequence. This provides a qualitative assessment of potentially unacceptable risks.

Table 2 – Categorisation of Risk

		Consequence			
		Severe	Medium	Mild	Minor
Probability of Pollutant Linkage	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate to Low Risk
	Likely	High Risk	Moderate Risk	Moderate to Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate to Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate to Low Risk	Low Risk	Very Low Risk	Very Low Risk

3.5.3 The definitions of the risk terms used in describing the risk levels in Table 2 above are based on those provided in CIRIA 552, Contaminated Land Risk Assessment, a guide to Good Practice 2001a.

- Very High Risk - There is a probability that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remediation action.
- High Risk - Harm is likely to arise to the designated receptor from an identified hazard at the site without appropriate action.

- Moderate Risk - It is possible that without appropriate remediation action harm could arise to the designated receptor. It is relatively unlikely that such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild.
- Low Risk - It is possible that harm could arise to a designated receptor from an identified hazard. It is likely that, at worst, if any harm were realised, any effects would be mild.
- Very Low Risk - The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.

- 3.5.4 We understand that development proposals for the Coniston Crescent site comprises residential housing, gardens, landscaping, public open space and associated infrastructure.
- 3.5.5 This assessment of the potential harm to either human health or the local environment is based on our experience and judgement.

3.6 Pollution Linkages

- 3.6.1 On the basis of the sources, pathways and targets described previously we have summarised the identified pollutant linkages within our Conceptual Site Model and Qualitative Risk Assessment included within Appendix 3.
- 3.6.2 Based on the proposed end use, the site is generally considered to represent a low to medium risk to human health. This risk has been investigated by means of site investigation works detailed within Section 6 of this report. The locations of the exploratory trial pits are shown on Drawing No. 20088-GE01.

3.7 Groundwater

- 3.7.1 Based on the previous land use of the site and the identified pollutant linkages it is considered that the site represents a low risk to controlled waters.

3.8 Contaminants of Concern

- 3.8.1 Based on the identified potential contamination sources and development proposals the following contaminants of concern have been identified:
- metals and metalloids including arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc;
 - pH;
 - sulphate (total and water soluble), sulphide and sulphur;
 - speciated polycyclic aromatic hydrocarbons;
 - asbestos.

- 3.8.2 The main risk of contamination identified in this preliminary risk assessment is associated with previous cuttings on the site and pesticides/insecticides from potential former land use as a farmed field.

3.9 Site Investigation Strategy

- 3.9.1 Against the background of the CSM and preliminary risk assessment, a site investigation has been designed and implemented. Table 3 (below) summarises the site investigation strategy for the site.

Exploratory holes have been positioned to provide a general coverage of the site to obtain geochemical and geotechnical data and to target areas of potential contamination.

Table 3 – Site Investigation Strategy

Exploratory Hole	Objective
Machine excavated trial pits	To determine ground and groundwater conditions across the site, including: <ul style="list-style-type: none">- nature and depth of any made ground;- nature and depth of superficial deposits;- obtain soil samples for laboratory chemical and geotechnical testing;- assess suitability for foundation design.
Dynamic sampling boreholes	To determine ground and groundwater conditions across the site, including: <ul style="list-style-type: none">- nature and depth of any made ground;- nature and depth of superficial deposits;- obtain soil samples for laboratory chemical and geotechnical testing;- obtain SPT values;- assess suitability for foundation design.
Laboratory Testing - Contamination	Analysis of soil samples to provide data for human health risk assessments.
Laboratory Testing - Geotechnical	Analysis of soil samples to assist with foundation assessment.

4.0 SITE INVESTIGATION WORKS

4.1 Site Works

- 4.1.1 Intrusive site investigation works were carried out by Travis Baker Geo-Environmental Ltd between 1 and 13 October 2020. The works were undertaken by Exploration Ltd (dynamic sample boreholes and TRL- DCP), St. Clements Plant Ltd (trial pits) and Triple H Contracts (in-situ soakaway tests). The site investigations were supervised by Travis Baker Geo-Environmental Ltd. Gas and groundwater monitoring wells were installed within selected boreholes to allow for monitoring to be undertaken across the site. The locations of the exploratory holes are shown on Drawing No. 20088-GE01.
- 4.1.2 The exploratory holes were positioned to provide a general site coverage to characterise the ground conditions. The investigation was as far as possible undertaken in accordance with BS10175:2011 + A2:2017 Investigation of Potentially Contaminated Sites; BS5930 (2015+A1:2020) Code of Practice for Site Investigation and BS EN ISO 14688-2:2018 – Geotechnical Investigation and Testing.
- 4.1.3 Representative soil samples of each soil type encountered were obtained from the trial pits and boreholes. Soil samples were collected for contamination testing and placed into appropriate sampling containers (plastic tubs or amber jars, as appropriate). The samples were then placed in cool boxes. The samples were collected and tested by an approved / accredited laboratory, i2 Analytical Ltd (i2).
- 4.1.4 Soil samples were obtained to determine the contamination status of the site and to assess the potential aggressiveness of the underlying soils in terms of possible sulphate attack on future concrete foundations. Geotechnical testing was also undertaken on selected samples to identify the engineering properties of the near surface materials.
- 4.1.5 The site investigation comprised the following works:
- Six dynamic sample boreholes – DS01 to DS06;
 - Four TRL-DCP boreholes – TRL1 to TRL4;
 - Nine machine excavated trial pits – TP01 to TP09;
 - In-situ standard penetration tests at 1m intervals within selected boreholes;
 - Four in-situ soakaway tests SA1, SA2, SA3 and SA4;
 - Laboratory geotechnical testing of soil samples;
 - Laboratory geochemical analysis of soil samples.
- 4.1.6 Dynamic sampling borehole logs are included as Appendix 4. The trial pit and soakaway test pit logs are included within Appendix 5 and Appendix 8 respectively.
- Instrumentation and Monitoring*
- 4.1.7 A total of five 50mm diameter gas / groundwater monitoring standpipes were installed within selected boreholes (i.e. DS01, DS02, DS04, DS05, DS06) in order to monitor the groundwater levels and concentrations of soil-borne gases. Installation details are shown on the exploratory hole logs included in Appendix 4. The standpipes have been monitored on four occasions between 9 October 2020 and 29 October 2020. The results of the monitoring visits are included as Appendix 9. Concentrations of oxygen, methane and carbon dioxide, together with groundwater levels, barometric pressure and gas flow rates have been recorded within each of the installations.

Laboratory Testing

- 4.1.8 A programme of geotechnical laboratory testing was undertaken in accordance with BS1377:1990. The testing included six plasticity index tests at a UKAS accredited laboratory, i2 Analytical.
- 4.1.9 Twenty-nine samples taken from the window sample boreholes and trial pits and were tested for a range of potential contaminants, as identified in the CSM and summarised in Table 4.

Table 4 – Geochemical Testing Summary – Soil Samples

Test	Topsoil	Made Ground	Superficial Deposits
Travis Baker Greenfield Suite ♦	11	7	11
Speciated Polycyclic Aromatic Hydrocarbons (USEPA 16 PAH) #	11	7	8
Asbestos	5	7	2
Total Organic Carbon	9	-	4

♦: Travis Baker Greenfield Suite includes:- arsenic, boron, cadmium, total chromium, copper, lead, mercury, nickel, selenium, zinc, sulphate (soluble), pH

#: USEPA16 PAH includes:- naphthalene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(123-cd)pyrene, benzo(ghi)perylene and dibenzo(a,h)anthracene.

4.2 Ground Conditions

Topsoil

- 4.2.1 Topsoil was encountered across the majority of the proposed development area. These materials typically comprise of brown slightly gravelly, occasionally slightly silty sand with quartzite and rare metal. Topsoil was encountered to a maximum depth of 0.5m below ground level (bgl) at SA3. Topsoil depths were generally in the order of 0.2m to 0.4m.

Made Ground

- 4.2.2 Shallow made ground was encountered at six of the exploratory hole locations across the proposed development site, either at ground surface level or directly below topsoil materials. The deepest the made ground material extends to is 0.95m. The made ground materials are typically orange brown or grey black, slightly gravelly to gravelly sand. Gravel compromises of either one or a selection of quartzite, siltstone, concrete, clinker, limestone, brick fragments, or rare plastic fragments. At TP01 solid concrete was found at 0 – 0.55m, this was the existing floor slab to the garage building at the rear of the caretaker's house. At SA2 cobble sized fragments of quartzite were found and at TP04 a whole brick was found within the made ground.
- 4.2.3 Trial pits TP2, TP3, TP4, SA2 and DS01 were all undertaken within the former footprint of the main school building. There was no evidence on any remaining buried structures such as foundations, etc. The depth of made ground beneath the building was a maximum of 0.95m.
- 4.2.4 Trial pits TP6, TP7, TP8 and TP9 and dynamic sampling boreholes DS04, DS05 and DS06 were carried out within the area historically referred to as a 'sewage farm'. There was no evidence of any former sludge beds, filter wastes, organic rich fills, etc identified.

River Terrace Deposits

- 4.2.5 Directly underlying the top soil and localised made ground the boreholes and trial pits generally identified a medium dense orange brown, slightly gravelly to gravelly fine to coarse sand. The

gravel mostly compromises of sub-rounded and sub-angular quartzite and occasional fragments of sandstone. In exploratory locations DS03, DS04, TP06, TP07, the quantity of gravel is similar to the sand or the material can be described as a sandy gravel. These materials are considered to represent river terrace deposits of the Holt Heath Sand and Gravel Member.

- 4.2.6 The superficial materials encountered extended to the base of the boreholes / trial pits at depths of between 0.28m bgl (DS05) and 5.44mbgl (DS02). These materials are considered to represent superficial river terrace deposits.

Solid Geology

- 4.2.7 Bedrock was not encountered at any of the exploratory hole locations.

4.3 In-Situ Testing

Standard Penetration Tests (SPTs)

- 4.3.1 Standard penetration tests (SPTs) were completed in each of the dynamic sample boreholes at 1m intervals to the base of each borehole. All tests were carried out in the undisturbed river terrace deposits, with the majority being sand, otherwise sandy gravel. The superficial materials recorded SPT 'N' values of 2 to 50, i.e. very loose to very dense sand with majority of SPT 'N' values identifying a medium dense relatively density.
- 4.3.2 The SPT results are included on individual borehole logs. For ease of reference the results of the SPT's are summarised within Table 5.

Table 5 – Summary of 2020 SPT 'N' Values

Borehole Ref.	SPT 'N' Value				
	1m	2m	3m	4m	5m
DS01	16	13	4	6	>50
DS02	10	19	13	9	>50
DS03	11	10	14	50	-
DS04	2	12	20	>50	-
DS05	8	>50	-	-	-
DS06	15	>50	-	-	-

TRL DCP Tests

- 4.3.3 Dynamic Cone Penetrometer testing was undertaken at four locations across the site within areas of proposed highways. Tests were performed to depths of up to 1m below original ground level to provide continuous CBR equivalent values down the soil profile. The results of the DCP testing indicated approximate CBR values to range between 0.68% and 2.2%. A summary of the TRL DCP results is included as Appendix 10. It should be noted that The TRL DCP probe only provided approximate CBR values particularly in sands and gravels, given the granular nature of the soils it is recommended that plate CBR test is undertaken to confirm the design CBR values.

4.4 Groundwater

- 4.4.1 At the time of the recent site works, groundwater was not encountered within any of exploratory locations, however, 'damp' sands were identified at the following locations:
- DS02 – materials recovered damp from 4.5m;

- DS04 – materials recovered damp from 1.4m;
- DS05 – materials recovered damp from 1.7m.

- 4.4.2 Monitoring standpipes were installed within DS01, DS02, DS04, DS05 and DS06 for future monitoring purposes. Groundwater levels have been recorded on four occasions to date between 9 October 2020 and 29 October 2020. Each of the standpipes has remained dry on all monitoring visits.
- 4.4.3 It should be noted that groundwater levels fluctuate throughout the year and between years due to the dynamic balance between groundwater recharge, storage and discharge. Factors affecting groundwater levels include seasonal / climatic variation and groundwater abstraction.

4.5 Excavation Stability

- 4.5.1 The trial pits observations generally identified unstable excavations throughout the soil profile. In the majority of excavations some spalling of side walls was noted. Additionally, the excavation side walls were noted to collapse when extended beyond 1m. It is anticipated that the majority of open excavations will be unstable in the short and long term.
- 4.5.2 It is likely that the majority of excavations extending beyond, say 1m deep will require some form of support or battering back to a safe angle to prevent collapse.

4.6 Laboratory Geotechnical Testing

Particle Size Distribution

- 4.6.1 Six particle size distribution tests were completed at a selection of trial pits and one dynamic sample borehole location in the sands and gravels on site. Table 6 below indicates the results of the testing.

Table 6 – Summary of Results of Particle Size Distribution Tests

Exploratory Hole Location	Depth (m)	Soil Description
DS02	1.1	Brown slightly clayey SAND
TP02	2.3	Brown slightly gravelly slightly clayey SAND
TP05	1.8	Brown slightly clayey gravelly SAND
TP06	1.6	Brown gravelly clayey SAND
TP07	1.5	Brown slightly clayey GRAVEL and SAND
TP08	1.0	Brown slightly gravelly clayey SAND

- 4.6.2 There were no clay deposits identified within any of the exploratory holes, plasticity index testing was therefore not undertaken.

4.7 Concrete Classification

- 4.7.1 Water soluble sulphate and pH analysis has been undertaken on ten samples of the river terrace deposits obtained from across the proposed development area. Water soluble sulphate results range from 0.0081g/l to 0.32g/l with pH values of 5.1 to 8.8.
- 4.7.2 The results of the chemical analysis have been compared to BRE Special Digest 1 (Concrete in Aggressive Ground). Based on the results of the chemical testing the Design Sulphate Class for the site has been determined as DS-1 and the Aggressive Chemical Environment for Concrete Class is AC-1s.

4.8 Soakaway Potential

- 4.8.1 In-situ soakaway testing was undertaken at four locations (SA1, SA2, SA3 and SA4) as shown on Drawing No. 20088-GE01, across the area of the site between 12 and 13 October 2020.
- 4.8.2 The soakaway test locations were excavated to the desired depth of the proposed infiltration feature (2.2m to 2.5m below ground level). The soakaway trial pit logs are included in Appendix 8. The basal zones of SA1, SA2, SA3 and SA4 were filled with approximately 500-1000mm of gravel respectively to maintain the stability of the pit during testing; however, all soakaway pits exhibited slight spalling of walls during testing due to the loose granular material. During soakaway testing monitoring and water input pipes were installed into the gravel layer and the remainder of the excavation was backfilled with arisings. Water was provided to each test pit from a tank provided and carried out by Triple H Contracts.
- 4.8.3 To calculate the soil infiltration rate in accordance with BRE Digest 365, it is necessary to monitor the time taken for the water level to reduce from 25% to 75% of the effective depth of the test pit. To fully assess the permeability of the soils, the pit should be allowed to drain three times on the same or consecutive days.
- 4.8.4 To provide an approximation of the soil infiltration rate for the natural materials for each location we have plotted the results of the soakaway tests graphically to determine the times that the water levels reached 25% and 75% of the effective depth. In accordance with BRE 365, we have used the following formula to determine the approximate permeability rate:

$$f = \frac{vp75-25}{ap50 \times tp75-25} \text{ ms}^{-1}$$

Where:

f = soil infiltration rate

vp75-25 = effective storage volume of water in the trial pit between 75% and 25% effective depth

ap50 = the internal surface area of the trial pit up to 50% effective depth including the base area

tp75-25 = time for the water level to fall from 75% to 25% effective depth (in seconds)

- 4.8.5 The results of the four soakaway tests undertaken at each location, calculation summary sheets and associated graphs are included as Appendix 8. For ease of reference, a summary of calculated soil infiltration rates is presented within Table 7 overleaf.
- 4.8.6 BRE 365 indicates that the lowest soil infiltration rate should be used to assess the suitability of the soils, these are identified in bold in Table 7. Based on the soakaway tests undertaken at the location of the proposed infiltration feature location, the calculated soil infiltration rates indicate the materials tested to exhibit a medium permeability.

Table 7 – Summary of 2020 Infiltration Rates

Test Location	Test Number	Approximate Infiltration Rate	Permeability
SA1	1	5.84 x10 ⁻⁵	Medium Permeability
	2	3.51 x10⁻⁵	Medium Permeability
	3	3.88 x10 ⁻⁵	Medium Permeability
SA2	1	7.46 x10 ⁻⁵	Medium Permeability
	2	6.81 x10⁻⁵	Medium Permeability

Test Location	Test Number	Approximate Infiltration Rate	Permeability
SA3	3	9.12 x10 ⁻⁵	Medium Permeability
	1	1.52 x10 ⁻⁴	Medium Permeability
	2	5.80 x10 ⁻⁵	Medium Permeability
	3	4.73 x10⁻⁵	Medium Permeability
SA4	1	4.34 x10 ⁻⁵	Medium Permeability
	2	2.72 x10⁻⁵	Medium Permeability
	3	2.81 x10 ⁻⁵	Medium Permeability

4.9 Hard Strata

- 4.9.1 Bedrock was not encountered at any exploratory hole locations. Boreholes and trial pits extended to a maximum depth of 5.4m. SPT 'N' values of >50 were typically recorded at depths of 4m to 5m still within dense river terrace sand and gravel deposits.
- 4.9.2 It is considered that the future shallow excavations will generally be completed within the sands and gravels of the river terrace deposits and therefore should be achievable with standard construction works plant and equipment.

4.10 Founding Horizon

- 4.10.1 Localised shallow made ground and/or topsoil was encountered across the site to a maximum depth of 0.95m bgl; these materials are predominantly less than 0.8m thick across the site. Due to the variable nature of the made ground identified at the site, these materials will not form an appropriate horizon for direct founding. The underlying natural superficial glacial sands display very loose to very dense strength consistencies, however, the majority of test results are typical of a medium dense relative density. On this basis it is considered that the undisturbed river terrace deposits will generally form a suitable founding horizon for strip and trench fill foundations at a minimum depth of 0.75m. Foundation options are discussed in further detail within Section 6 of this report.

4.11 Ground Gases

- 4.11.1 Due to the potential for ground gases to be generated from the nearby landfill site located to the northeast of the site and localised shallow made ground identified at the site, five monitoring wells were installed within boreholes DS01, DS02, DS04, DS05 and DS06. The standpipes have been monitored on four occasions between 9 October 2020 and 29 October 2020. The results of the monitoring visits are included as Appendix 9.
- 4.11.2 Methane concentrations across all boreholes were low, ranging from 0.0% to 0.3%. Concentrations of carbon dioxide were generally <5% and ranged from 0.1% to 10%. A single elevated concentration of carbon dioxide of 10% was encountered on one visit at DS06, which is located at the north of the site. Detectable flow rates were recorded to vary between -0.1l/hr and 0.1l/hr.

5. CONTAMINATION ASSESSMENT

5.1 Background

- 5.1.1 Data obtained from the site investigation has been used to assess the contamination status of the site. We have utilised the current technical guidance published by the Environment Agency (EA) i.e. their Contaminated Land Exposure Assessment (CLEA) model. The Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM) published updated Suitable for Use Levels (S4ULs) in January 2015 for a number of potential contaminants of concern (COC). These include those with previously published soil guidance values (SGVs) available from the EA. The published S4ULs are designed to be used as generic screening values. The S4ULs have been produced to incorporate updates to toxicological data, where available, together with adaptations to the exposure modelling originally proposed by Defra in the production of Category 4 Screening Levels (C4SL). However, unlike the C4SLs, the S4ULs are still based on the concept of minimal risk and are considered appropriate for use in generic quantitative risk assessment (GQRA). The S4UL have been used in accordance with following: -

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- 5.1.2 Where available, Generic Assessment Criteria (GAC) values published by the Environmental Industry Commission (EIC) have been used for substances with no published S4UL. There are a number of additional potential Contaminants of Concern (COC) where there is currently no available guidance based on minimal risk and/or it is not considered appropriate to derive in-house GAC values using the CLEA model. The initial screening of geochemical results for these contaminants has therefore been undertaken in accordance with the following principles.
- 5.1.3 With regard to lead the former SGV for residential land uses of 450mg/kg (now withdrawn) was formally recognised guidance in the UK as representing a level of minimal risk. However, review of toxicological research has indicated that lead may affect IQ in children even at low exposures; the value of 450mg/kg is therefore not considered suitably protective. The Category 4 Screening Level (C4SL) for lead, published by Defra in March 2014, related to the revised Part 2A statutory guidance based on a low level of toxicological concern (opposed to minimal risk) is 200mg/kg for the standard residential with homegrown produce land use. This level is considered conservative and appropriate as an initial screening value for the site.
- 5.1.4 It is understood that development proposals for Coniston Crescent site are for a residential housing development. For the purposes of this assessment published screening criteria for a 'residential with plant uptake' land use has therefore been used.
- 5.1.5 Assessment criteria for organic contaminants vary dependent on the soil organic matter (SOM) content of the material. A conservative value of 1.0% SOM has been applied to all soils for the purposes of this assessment.
- 5.1.6 In accordance with current best practice outlined within 'guidance on Comparing Soil Contamination Data with a Critical Concentration' (May 2008) published by CL:AIRE we have reviewed the borehole, soakaway and trial pit logs to determine any differences within the soil types encountered at the site. Three material types have been identified i.e. topsoil, made ground and natural superficial deposits as described in the following text.
- 5.1.7 The following contamination testing has been undertaken on selected soil samples as part of the site investigation.

Table 8 – 2020 Laboratory Testing Summary

Test	Topsoil	Made Ground	Superficial Deposits
Travis Baker Greenfield Suite ♦	11	7	11
Speciated Polycyclic Aromatic Hydrocarbons (USEPA 16 PAH) #	11	7	8
Asbestos	5	7	2
Total Organic Carbon	9	-	4

♦: Travis Baker Greenfield Suite includes:- arsenic, boron, cadmium, total chromium, copper, lead, mercury, nickel, selenium, zinc, sulphate (soluble), pH

#: USEPA16 PAH includes:- naphthalene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(123-cd)pyrene, benzo(ghi)perylene and dibenzo(a,h)anthracene.

- 5.1.8 Due to the low levels of potential contaminants identified across the site; we have undertaken a direct comparison of the contamination test results with the adopted guidance values for a residential end use. A copy of the laboratory test reports and associated assessment table are included as Appendix 7 together with a list of the guideline values used for this initial assessment. A summary of each material tested and associated assessment is presented within the following text.

5.2 Human Health Risk Assessment

Made Ground

- 5.2.1 As part of the investigation, seven samples of made ground were tested for a suite of contaminants commonly found on UK greenfield sites. Seven samples were also tested for a suite (USEPA16) of polycyclic aromatic hydrocarbons (PAHs) and asbestos.
- 5.2.2 When compared with the adopted guidance values it was shown that the majority of the made ground samples tested had contaminant concentrations below the target values for typical residential gardens. However, at single location (DS03 - 0.2m to 0.3m) the concentrations of lead (530mg/kg), copper (6,400mg/kg) and zinc (11,000mg/kg) each exceeded their corresponding target values for a residential end use (i.e. 200mg/kg, 2,400mg/kg and 410mg/kg respectively). This sample was taken from a thin black gravelly sand with fragments of clinker and limestone. The layer was just 0.1m in thickness. Samples of made ground from below this horizon were tested and shown to be below the guidance values for the same determinants. DS03 was undertaken within the former tarmac car park / playground area, the made ground is likely to be associated with sub-base materials to the former hardstanding. Similarly, contaminated materials are therefore expected below the whole of this area (see Drawing No. 20088-GE02).
- 5.2.3 The levels of lead, copper and zinc within DS03 – 0.2m to 0.3m are potentially hazardous to human health of future users. Some form of remedial works will be required to protect future users of the site.

Topsoil

- 5.2.4 Eleven samples of topsoil have been tested for a suite of contaminants commonly found on UK greenfield sites (including heavy metals, metalloids etc.); eleven samples for polycyclic aromatic hydrocarbons (PAH), five samples were tested for asbestos and nine samples tested for total organic carbon.
- 5.2.5 When compared with the adopted guidance values it was shown that the majority of the top soil samples tested had contaminant concentrations below the target values for typical residential

gardens. However, the levels of arsenic were shown to marginally exceed the target value of 37mg/kg at three locations i.e. at DS04-0.15m (42mg/kg), TP05-0.05m (41mg/kg) and TP07-0.1m (40mg/kg).

- 5.2.6 We have carried out statistical analysis on the arsenic data within the topsoil samples. There are a total of 11 top soil samples tested, which is possibly a little low but is considered sufficient to provide an initial assessment of the results. We have initially undertaken an assessment of the arsenic data using the CL:AIRE, CIEH and SAGTA publication 'Guidance on Comparing Soil Contamination Data with Critical Concentration dated 2008. Although this document has subsequently been superseded by a new CL:AIRE publication (Professional Guidance: Comparing Soil Contamination with a Critical Concentration dated 2020), the initial assessment is provided for comparison.
- 5.2.7 The Grubbs Test carried out on the arsenic indicates that there are no statistical outliers with the data set. The calculated 95th percentile value for arsenic is 35mg/kg. This is lower than the critical concentration (target) of 37mg/kg. On this basis the levels of arsenic in the top soil would not have been considered a significant risk to the end users of the site.
- 5.2.8 We have also carried out an initial assessment of the arsenic data within the top soil materials using the recently published CL:AIRE document referenced above. Based on the data we have prepared the histograms of the data and consider the data to be representative of a symmetric data set. We have summarised the statistical analysis results in the following Table 9.

Table 9 – Summary of Statistical Data on Arsenic Top Soil Data

Arsenic – Top Soil	
Number of Samples	11
Maximum Value	42mg/kg
Upper Quartile Value	40mg/kg
Median	29mg/kg
Lower Quartile	23mg/kg
Minimum	9.5mg/kg
Mean	28.8mg/kg
95 th Percentile Value	35mg/kg
Interquartile range	17
Critical Concentration	37mg/kg
Standard Deviation	11
Standard error	3.31
T Value – 80% confidence	1.4
T Value – 95% confidence	2.2
Confidence interval – 80% confidence	24.1 to 33.4mg/kg
Confidence interval – 95% confidence	21.5 to 36.1mg/kg

- 5.2.9 Based on the statistical analysis undertaken the both the 80% and 95% confidence intervals lie outside the arsenic critical concentration of 37mg/kg. On this basis it is considered that there is a fairly high degree of confidence that the true mean of arsenic concentrations will be below the critical concentration.
- 5.2.10 Given that the exceedance of the arsenic concentrations within the top soil is relatively minor and the relatively high degree of confidence that the true mean will be low the value 37mg/kg it is considered that the arsenic concentrations within the top soil will not represent a significant hazard to end users of the site.

- 5.2.11 The source of the slightly elevated arsenic is unlikely to be due to naturally high concentrations in soil as the arsenic concentrations in the underlying river terrace deposits display lower concentrations. It is possible that the source of arsenic is possible former arsenic based pesticides used on the former allotment garden areas and subsequently spread across the playing fields. Alternatively, the slightly elevated arsenic may be a result of the land being associated with a historic sewage farm.

Natural Superficial Deposits

- 5.2.12 Eleven samples of the natural undisturbed materials have been tested for a suite of contaminants commonly found on UK greenfield sites (including heavy metals, metalloids etc.). All determinands tested were below their relevant guidance values.
- 5.2.13 Based on the results of the chemical analysis, the natural materials underlying the site are also considered suitable for re-use within the proposed development.

5.3 Controlled Waters

- 5.3.1 There are no significant surface water features within 250m of the site, the closest water course being the River Stour approximately 670m to the south east of the site. The underlying river terrace deposits are identified as a Secondary A aquifer and the underlying Wildmoor Sandstone Member is classified as a Principal aquifer. The site is within Zone 3 of a Groundwater Source Protection Zone.
- 5.3.2 Given the general low levels of contamination identified in the top soil it is considered that these materials represent a low risk to controlled waters. With regards to thin (0.1 thick) band of black sand and clinker below the former car park / playground area, these soils did contain quite high concentrations of metals (lead, copper and zinc). Given the thickness of these it is unlikely that there will be a risk of the contaminants leaching in sufficient quantities to represent a significant risk to controlled waters, however, given the risk to human health that these soils represent the proposals are for this thin band of soils to be removed. If the preference of the developer is to retain the soils on site is recommended that leachate testing is carried out on the contaminated materials.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Potential Development Constraints

- 6.1.1 Based on the results of the background researches and site investigations it is considered that the following ground related issues and potential development constraints will need to be addressed prior to the proposed development of Coniston Crescent for residential housing;
- The presence two remaining structures (caretaker's house and garage) which will need to be demolished prior to development;
 - The possibility of asbestos containing materials within the building construction;
 - The presence of localised shallow made ground unsuitable as founding horizon without some form of ground improvement;
 - The instability of shallow excavations;
 - The presence of a thin band of localised black sand and clinker below the former playground / carpark which contains elevated concentrations of lead, copper and zinc;
 - The presence of slightly elevated concentrations of arsenic within the top soil;
 - The presence of elevated concentrations of carbon dioxide on a single location on one monitoring visit.

6.2 Demolition / Grubbing out

- 6.2.1 Two small buildings remain on the south western boundary of the site i.e. the caretaker's house and garage buildings. Prior to the onset of any demolition works, a pre-demolition asbestos survey will be required to identify all asbestos containing materials associated with the existing buildings. All asbestos materials will be required to be removed from the buildings to an appropriate facility prior to the dismantling of the buildings. The demolition works should include the grubbing out of any concrete/macadam hardstanding and the removal of redundant services and foundations associated with the existing buildings. Based on the nature of the existing buildings and observed ground conditions it is considered that existing foundations are likely to be relatively shallow.
- 6.2.2 In the unlikely event that any significantly deep underground obstructions are encountered during the demolition / grubbing out works, their size and location should be noted so that appropriate revisions can be made to foundation proposals.
- 6.2.3 Suitable arisings from the grubbing out works etc. could potentially be crushed and graded to allow for future re-use on site, however, this is unlikely to be viable given the limited size of the buildings.

6.3 Foundations

Made Ground

- 6.3.1 Across the majority of the site, the exploratory boreholes and trial pits have identified generally shallow made ground up to 0.95m below ground level (bgl). These made ground materials encountered across the site will not be appropriate for the construction of shallow foundations.
- 6.3.2 Due to the generally shallow depths of made ground across the majority of the proposed development site, it is considered that the minimum foundation depth (0.75m) will be deeper than the depth of made ground for the majority of proposed house plots, with area below the former school buildings being the exception. Slightly deeper foundations will be required locally into ensure the formation level extends a minimum of 200mm below the base of any made ground.

Natural Superficial Deposits

- 6.3.3 Undisturbed natural superficial deposits (i.e. river terrace sand and gravel) were encountered directly below the made ground and/or topsoil across the site. These deposits are typically medium dense orange brown, slightly gravelly to gravelly fine to coarse sand. These materials are considered to represent river terrace deposits of the Holt Heath Sand and Gravel Member. The medium dense to dense sands and gravels are generally considered to be suitable for the construction of traditional strip and trench fill foundations for traditional 2 and 2½ storey houses. A net allowable bearing pressure of 100kN/m² for foundations up to 1m wide is considered appropriate for preliminary design purposes founding in the undisturbed natural superficial deposits (i.e. the river terrace sand and gravels deposits), this will limit total settlements to less than 25mm.
- 6.3.4 The SPT 'N' values within the dynamic sampling boreholes identified a localised area of 'very loose' materials at a depth of 1m at DS04, this was in materials which were described as damp. Should any areas of very loose or loose sands be identified at the proposed founding depth the footing should be extended a minimum of 200mm into the underlying competent natural material. Alternatively, any materials deemed unsuitable for founding should be removed and replaced by lean mix concrete or granular soils compacted in layers.

Solid Geology

- 6.3.5 Solid strata was not identified at any of the exploratory hole locations undertaken at the site.
- 6.3.6 General
Should ground conditions vary across the base of a foundation excavation and result in both sands and clays at the base of the excavation, to address any potential differential settlement it is recommended that either:-
- (i) the excavation be extended to ensure that the whole of the base of the excavation is in weathered siltstone or;
 - (ii) suitable reinforcing be incorporated within the strip or trench fill foundation.
- 6.3.7 Care should be taken when excavating foundations within the former school building area to ensure the foundations extend below any disturbed ground resulting from the grubbing out of foundations, services, sewers etc.
- 6.3.8 Based on the investigations undertaken it is anticipated that relatively shallow foundations will be appropriate for the majority of the site. The unstable nature of the soils should therefore not be too problematic for foundation construction if the foundations are kept shallow. If there are proposals to raise the ground levels consideration should be given to excavating the foundations prior to raising the ground. Should areas of unexpected ground conditions be identified where founding depths of up to 1m are inappropriate for foundation construction and deeper trench fill foundations are required, there are likely to be issues with the stability of trench fill excavations. In such circumstances vibro replacement may be a more economic solution.

- 6.3.9 There were no clay based (cohesive) soils identified at any of the trial pit or borehole locations. The existing trees across the site are therefore unlikely to significantly affect the depth of foundations. Should proposed plots be located over removed trees the foundations should extend below any significant roots.

6.4 Floor Slabs

- 6.4.1 Ground bearing floor slabs are likely to be appropriate for areas of the site where made ground / top soil is less than 0.4m deep and where levels are not being changed significantly. In areas of

the site where the made ground is deeper (i.e. the former school building areas) and where levels are being raised by more than say 0.3m then suspended cast in-situ floor slabs or beam and block will be required.

6.5 Concrete Conditions

- 6.5.1 An assessment of the characteristic pH and soluble sulphate laboratory test results from the two phases of site investigation has been undertaken in accordance with BRE Special Digest 1 (Concrete in Aggressive Ground). The Design Sulphate Class for the site has been determined as DS-1 and the Aggressive Chemical Environment for Concrete Class is AC-1s.

6.6 Hard Strata / Obstructions

- 6.6.1 Bedrock was not encountered at any exploratory hole locations. Boreholes and trial pits extended to a maximum depth of 5.4m. SPT 'N' values of >50 were typically recorded at depths of 4m to 5m still within dense river terrace sand and gravel deposits. It is considered that the future shallow excavations will generally be completed within the sands and gravels of the river terrace deposits and therefore should be achievable with standard construction works plant and equipment
- 6.6.2 A series of trial pits and boreholes were undertaken beneath the footprint of the former school building. The foundations and floor slab associated with the former building appear to have been grubbed out.
- 6.6.3 The caretaker's house and garage are still present, it is likely that the foundations associated with these structures will be relatively shallow and limited in extent.

6.7 Excavation Stability

- 6.7.1 The trial pits observations generally identified unstable excavations throughout the soil profile. In the majority of excavations some spalling of side walls was noted. Additionally, the excavation side walls were noted to collapse when extended beyond 1m. It is anticipated that the majority of open excavations will be unstable in the short and long term.
- 6.7.2 It is likely that the majority of excavations extending beyond, say 1m deep will require some form of support or battering back to a safe angle to prevent collapse. Appropriate allowances for support will need to be made when constructing sewers or any other deep sewer.

6.8 Groundwater

- 6.8.1 Materials were recovered damp at several exploratory hole locations however, standing ground water was not observed within the boreholes or trial pits. Standpipes were installed to depths of between 2.4m and 5.4m, each of the standpipes remained dry over the monitoring period.
- 6.8.2 It should be noted that groundwater levels fluctuate throughout the year and between years due to the dynamic balance between groundwater recharge, storage and discharge. Factors affecting groundwater levels include seasonal / climatic variation and groundwater abstraction. Although the groundwater currently appears to be below the depth of the investigation holes to date (5.4m) there is the possibility that groundwater will be encountered above his depth a different times of the year.

6.9 Contamination

- 6.9.1 Representative samples of made ground, topsoil and natural superficial materials obtained from across the proposed development area have been analysed to determine the contamination status

of the site. The laboratory chemical test results for the aforementioned material types have been compared to adopted guidance values for use in residential development incorporating garden areas where plants might be grown.

Made Ground

- 6.9.2 As part of the investigation, seven samples of made ground were tested for a suite of contaminants commonly found on UK greenfield sites. Seven samples were also tested for a suite (USEPA16) of polyaromatic hydrocarbons (PAHs) and asbestos.
- 6.9.3 When compared with the adopted guidance values it was shown that the majority of the made ground samples tested had contaminant concentrations below the target values for typical residential gardens. However, at single location (DS03 - 0.2m to 0.3m) the concentrations of lead (530mg/kg), copper (6,400mg/kg) and zinc (11,000mg/kg) each exceeded their corresponding target values for a residential end use (i.e. 200mg/kg, 2,400mg/kg and 410mg/kg respectively). This sample was taken from a thin black gravelly sand with fragments of clinker and limestone. The layer was just 0.1m in thickness. Samples of made ground from below this horizon were tested and shown to be below the guidance values for the same determinants. DS03 was undertaken within the former tarmac car park / playground area, the made ground is likely to be associated with sub-base materials to the former hardstanding. Similarly, contaminated materials are therefore expected below the whole of this area (see Drawing 20088-GE02).
- 6.9.4 The levels of lead, copper and zinc within DS03 – 0.2m to 0.3m are potentially hazardous to human health of future users therefore some form of remedial works will be required to protect future users of the site. There are two options which would generally be appropriate i.e. either:-
- (i) excavate and remove to landfill or potentially less sensitive areas of the site, or:
 - (ii) provide clean cover (likely to be 600mm with hard to dig layer)

- 6.9.5 The contaminated made ground has been identified in as a thin band (0.1m in thickness) of black sand and clinker in one location below the car park / playground. It is possible that the layer extends across the whole of this former hardstanding area or is present just within a localised area. It is recommended that the area of contaminated soils is delineated in order that the volume of soils can be estimated. It would also be prudent to carry out WAC testing on the soils to be able to obtain disposal costs.

Topsoil

- 6.9.6 Eleven samples of topsoil have been tested for a suite of contaminants commonly found on UK greenfield sites (including heavy metals, metalloids etc.); eleven samples for polyaromatic hydrocarbons (PAH), five samples were tested for asbestos and nine samples tested for total organic carbon.
- 6.9.7 When compared with the adopted guidance values it was shown that the majority of the top soil samples tested had contaminant concentrations below the target values for typical residential gardens. However, the levels of arsenic were shown to marginally exceed the target value of 37mg/kg at three locations i.e. at DS04-0.15m (42mg/kg), TP05-0.05m (41mg/kg) and TP07-0.1m (40mg/kg).
- 6.9.8 We have carried out statistical analysis on the arsenic data within the topsoil samples as described in Section 5. We have prepared the histograms of the data and consider the data to be representative of a symmetric data set. Based on subsequent statistical analysis undertaken both the 80% and 95% confidence intervals lie outside the arsenic critical concentration of 37mg/kg. On this basis it is considered that there is a fairly high degree of confidence that the true mean of arsenic concentrations will be below the critical concentration.

- 6.9.9 Given that the exceedance of the arsenic concentrations within the top soil is relatively minor and the relatively high degree of confidence that the true mean will be low the value 37mg/kg it is considered that the arsenic concentrations within the top soil will not represent a significant hazard to end users of the site.
- 6.9.10 The source of the slightly elevated arsenic is unlikely to be due to naturally high concentrations in soil as the arsenic concentrations in the underlying river terrace deposits display lower concentrations. It is possible that the source of arsenic is possible former arsenic based pesticides used on the former allotment garden areas and subsequently spread across the playing fields. Alternatively, the slightly elevated arsenic may be a result of the land being associated with a historic sewage farm.
- 6.9.11 As indicated in Section 5 the guidance on comparing chemical data with guidance has only recently changed and there is likely to be an initial period of uncertainty as consultants and regulators get used to new methodology. It is therefore recommended that our report is forwarded to the NHBC and Local Authority with respect to these initial conclusions.

Natural Superficial Deposits

- 6.9.12 Eleven samples of the natural undisturbed materials have been tested for a suite of contaminants commonly found on UK greenfield sites (including heavy metals, metalloids etc.). All determinants tested were below their relevant guidance values. The natural materials underlying the site are therefore considered suitable for re-use within the proposed development.

6.10 Soakaway Drainage

- 6.10.1 A total of five in-situ soakaway tests were completed within the proposed development area. The tests were completed within the river terrace sands and gravels which were identified across the site. Three soakaway tests were completed at each location.
- 6.10.2 The lowest infiltration rates from each soakaway location generally ranged from $2.72 \times 10^{-5} \text{ ms}^{-1}$ to $6.81 \times 10^{-5} \text{ ms}^{-1}$.
- 6.10.3 The current groundwater levels are considered to be at depths of greater than say 4m. It is considered that a suitably designed soakaway drainage system could be appropriate for the granular sands and gravels tested across the site.

6.11 Ground Gases

Carbon Dioxide / Methane

- 6.11.1 Potential sources of ground gas identified via researches and investigations undertaken to date include localised shallow made ground associated with the 'sewage farm' and nearby landfill site to the north east of the site. To evaluate the ground gas regime at the site monitoring standpipes were installed within five of the dynamic sampling boreholes (DS01, DS02, DS04 DS05 and DS06). The site has been monitored on four occasions between 9 October 2020 and 29 October 2020.
- 6.11.2 The maximum methane and carbon dioxide concentrations recorded during the monitoring programme are 0.3% and 10.0% respectively. The methane concentrations of up to 0.3% are considered to represent general background concentrations within soils and are not considered to represent a hazard. The elevated level of carbon dioxide was recorded at DS06 on one monitoring visit only. All subsequent monitoring visits at this location and remaining standpipes recorded carbon dioxide concentrations were less 5%. Flow rates within the standpipes have generally remained low within the majority of the monitoring wells. However, recorded flow rates have ranged between -0.1 l/hr and +0.1 l/hr locally across the site.

- 6.11.3 Based on the results of the gas monitoring, we have assessed the requirement for gas precaution measures within the proposed residential development in accordance with CIRIA Document C665: Assessing Risks Posed by Hazardous Ground Gases to Buildings, 2007. Conservative gas screening values (GSV) has been calculated based on the maximum positive flow rate and highest methane and carbon dioxide concentration recorded on-site (i.e. worst-case scenario).
- 6.11.4 The worst case GSV's for methane and carbon dioxide have been calculated based on the maximum concentrations of 0.3% (methane) and 10% (carbon dioxide) and the worst-case flow rate recorded of +0.1l/hr. The calculated GSV for methane is 0.001l/hr and 0.01l/hr for carbon dioxide. Based on the GSV's the site would be classified as 'Characteristic Situation 1' in accordance with the Modified Wilson and Card Classification or 'green' in accordance with the NHBC Traffic Light System. On this basis specific gas precautions would be not required for the proposed development. However, due to the identification of carbon dioxide at concentrations exceeding the typical maximum concentration of 5% respectively, CIRIA Document C665 states that consideration should be given to increasing the site classification to Characteristic Situation 2 / Amber 1.
- 6.11.5 Given that elevated carbon dioxide has only been detected on a single occasion we have given some consideration to the possible source. DS06 which recorded the single elevated concentrations of carbon dioxide is within the northern part of the site. We have checked the borehole log for this location and there is no evidence of organic rich soils or putrescible materials which could be the potential carbon dioxide source. There is however, a recorded small landfill site 227m to the northeast of the site which is recorded to have accepted household, industrial and commercial waste between 1978 and 1984. Given the distance, limited size and significant age of the landfill and the granular nature of soils across the area, it is difficult to envisage a process that would result in carbon dioxide migrating from the landfill to the site. There would have to be a significant flow of gas and therefore active gas generation to 'push' ground gases horizontally over such distances. It is therefore considered more likely that the boreholes at DS06 has encountered a small pocket of carbon dioxide which has not 'recharged' following the initial visit due to the very low flow rates.
- 6.11.6 There have been four gas monitoring visits to date, it recommended that gas monitoring is continued across the site to confirm whether the carbon dioxide concentrations and flow rates continue at the current levels. In the meantime, it may be prudent to allow for ground gas protection measures for Characteristic Situation 2 / Amber 1 for plots in the northern part of the site (within the vicinity of DS06) until additional monitoring data is available. Gas protection measures are not considered necessary for the remainder of the site.
- 6.11.7 The Characteristic Situation 2 / Amber 1 gas precaution measures would typically include a fully lapped and sealed 2000 gauge proprietary gas membrane and ventilated sub floor void. Verification that all gas measures have been installed appropriately would also be required.
- 6.11.8 The Building Research Establishment (BRE) 'Guidance on Protective Measures for New Buildings' (BR 211) published in 2015 has been consulted. The proposed development site is recorded to be within an area that does not require radon protective measures.
- 6.11.9 It is recommended that the findings of this report are provided to the Local Authority for their comment in this regard.

APPENDICES

APPENDIX 1
List of Information Sources

APPENDIX 1

LIST OF INFORMATION SOURCES – CONINSTON CRESCENT, STOURPORT ON SEVERN

The following principal sources of information have been consulted in the preparation of this report:

- Coal Authority on-line data base;
- Environment Agency – Online data base;
- Ordnance Survey County Series and National Grid Mapping;
- British Geological Survey – Online data base & Interactive mapping;
- BS5930 Code of Practice for Site Investigation (2015+A1:2020);
- BS10175:2011 + A2:2017 British Standards Institution (2011) Investigation of Potentially Contaminated Sites;
- BS1377-2:1990 Methods of test for soils for civil engineering purposes
- BS EN ISO 14688-2:2018 – Geotechnical Investigation and Testing. Principles for Classification.
- EA R&D Publication 66 : 2008 Guidance for the Safe Development of Housing on Land Affected by Contamination Volume 1 and 2
- CIRIA publications including C665 Assessing risks posed by hazardous ground gases to Building;
- Contaminated Land Risk Management (LCRM) Guidance on www.gov.uk/government/publications dated October 2020 – Environment Agency
- Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM) S4ULs for Human Health Risk Assessment (2015) – Publication Number S4UL3689
- Environmental Protection Act 1990, Part 2A, Section 78 (as amended by Environment Act 1995);
- Contaminated Land Statutory Guidance (April 2012), DEFRA
- Environment Agency (2000) Technical Aspects of Guidance of Site Investigation (2 volumes) R&D Technical Report P5-065;
- Environment Agency (2000) Secondary Model Procedures for the development of Appropriate Soil Sampling Strategies for Land Contamination, R&D Technical Report P5-066;
- BRE (2005) Concrete in aggressive ground, Special Digest 1;
- BRE (2015) Radon Guidance on protective measures for new buildings, BR 211;
- BRE (2004) Clean Cover Systems for Land Regeneration Thickness Design of Cover Systems for Contaminated Land.
- Groundsure Report Reference GS-3779159 and GS-3779159 dated 4 April 2017.
- Phase One Site Investigation Report by Ecus Ltd dated 27 April 2017

APPENDIX 2
Selection of Site Photographs

APPENDIX 2 – SELECTION OF SITE PHOTOGRAPHS

CONINSTON CRESCENT



Site Entrance



Looking south east from site entrance



Looking to a line of trees which lie at the centre of the site



Looking beyond the line of trees to the north east of the site towards the allotments



Looking along the northern boundary towards Burlish Top Nature Reserve



Looking at the western corner with a pedestrian walkway entrance



Looking from the western corner of the site, with a path runs down the northern boundary



Turnstile which lies on the northern boundary which separates the site with Burlish Top Nature Reserve



TP09 pit



TP05 material



Soakaway Testing

APPENDIX 3

Conceptual Site Model and Qualitative Risk Assessment

Appendix 3- Conceptual Site Model and Qualitative Risk Assessment
Coniston Crescent, Stourport-on-Severn

Conceptual Model			Qualitative Risk		
Source	Pathway	Target	Consequence	Probability	Risk
Localised made ground materials present across the site – including possible former sewage sludge	Dermal contact	Residents of site and public	Severe	Low	Moderate
		Construction worker	Mild	Low	Low
	Ingestion of soil	Residents of site and public	Medium	Low	Moderate / Low
		Construction worker	Mild	Unlikely	Very Low
	Inhalation of wind borne dust (asbestos)	Residents of site and public	Severe	Low	Moderate
		Construction worker	Severe	Low	Moderate
	Direct contact	Drinking water pipes	Medium	Low	Moderate / Low
	Ingestion via home grown vegetables	Residents of site	Severe	Low	Moderate
	Uptake via flora and fauna	Plants and pets	Minor	Unlikely	Very Low
	Migration of contaminants via groundwater	Controlled waters	Minor	Low	Very Low
	Direct contact	Foundations and other buried structures	Minor	Low	Very Low
Use of part of site as a former allotment gardens (use of pesticides)	Dermal contact	Residents of site and public	Severe	Low	Moderate
		Construction worker	Mild	Low	Low
	Ingestion of soil	Residents of site and public	Medium	Low	Moderate / Low
		Construction worker	Mild	Unlikely	Very Low
	Inhalation of wind borne dust (asbestos)	Residents of site and public	Severe	Low	Moderate
		Construction worker	Severe	Low	Moderate
	Direct contact	Drinking water pipes	Medium	Low	Moderate / Low
	Ingestion via home grown vegetables	Residents of site	Severe	Low	Moderate
	Uptake via flora and fauna	Plants and pets	Minor	Unlikely	Very Low
	Migration of contaminants via groundwater	Controlled waters	Minor	Low	Very Low
	Direct contact	Foundations and other buried structures	Minor	Low	Very Low

Appendix 3- Conceptual Site Model and Qualitative Risk Assessment
Coniston Crescent, Stourport-on-Severn

Conceptual Model			Qualitative Risk		
Source	Pathway	Target	Consequence	Probability	Risk
Made Ground (including putrescible / organic rich soils – leading to production of carbon dioxide and methane)	Inhalation of noxious gases	Residents of site	Severe	Low	Moderate
		Construction worker	Severe	Low	Moderate
	Migration and collection of methane in confined spaces	Residents of site	Severe	Low	Moderate
		Construction worker	Severe	Low	Moderate
Nearby landfill to the northeast (including putrescible / organic rich soils – leading to production of carbon dioxide and methane)	Inhalation of noxious gases	Residents of site	Severe	Low	Moderate
		Construction worker	Severe	Low	Moderate
	Migration and collection of methane in confined spaces	Residents of site	Severe	Low	Moderate
		Construction worker	Severe	Low	Moderate

APPENDIX 4
Borehole Logs



Travis Baker Geo-Environmental Ltd

**Number
DS01**

Excavation Method					Site			
Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Former Stourport 6th Form School, Coniston Crescent, Stourport		
Location		Dates		Client		Job Number 20088		
REFER TO PLAN		01/10/2020		Travis Baker Geo-Environmental Ltd		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1				(0.20) 0.20 (0.20) 0.40	Brown sand. Reworked TOPSOIL/MADE GROUND Orange medium grained sand with much fragments of angular limestone. MADE GROUND.		
0.70	D2					Medium dense to loose orange medium to coarse grained SAND.		
1.00-1.45	SPT N=16		3,4/3,4,4,5					
1.80	D3				(2.80)			
2.00-2.45	SPT N=13		3,3/3,3,3,4					
3.00-3.45	SPT N=4		2,1/1,1,1,1		3.20 (0.80)	Loose brown slightly gravelly coarse grained SAND. Gravel is fine to medium sub rounded gravel.		
4.00-4.45	SPT N=6		2,2/2,2,1,1		4.00 (0.70)	Loose orange coarse grained SAND.		
5.00-5.14	SPT 25*/75 50/60		25/50		4.70 (0.44) 5.14	Brown very gravelly SAND. Gravel is fine to medium subrounded gravel of mixed lithology Complete at 5.14m		
Remarks Borehole dry							Scale (approx)	Logged By
							1:50	C CASEY
							Figure No. 20088.DS01	



Travis Baker Geo-Environmental Ltd

Excavation Method						Site	Number
Drive-in Windowless Sampler						Former Stourport 6th Form School, Coniston Crescent, Stourport	DS02
Dimensions						Client	Job Number
REFER TO PLAN						Taylor Wimpey West Midlands	20088
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.10	D1				(0.30) 0.30	Brown slightly gravelly slightly silty TOPSOIL with fine rootlets	
1.00-1.45 1.10 1.10-2.00	SPT N=10 D2 B1		1,2/2,3,2,3		(0.60) 0.90	Dark brown slightly gravelly slightly silty with fine to medium grained SAND. Gravel is medium to coarse. Subrounded gravel of mixed lithology.	
2.00-2.45	SPT N=19		6,5/5,5,4,5		(1.10) 2.00	Medium dense orange medium grained SAND	
3.00-3.45	SPT N=13		4,3/3,3,3,4			Loose to v dense orange slightly gravelly fine to medium grained SAND. Gravel is fine medium subrounded gravel of quartzite.	
4.00-4.45	SPT N=9		2,2/2,2,2,3				
5.00-5.44	SPT 50/290		4,4/4,5,17,24			Complete at 5.44m	
Remarks Damp from 4.5m						Scale (approx)	Logged By
						1:50	C CASEY
						Figure No.	
						20088.DS02	



Travis Baker Geo-Environmental Ltd

Excavation Method						Site	Number
Drive-in Windowless Sampler						Former Stourport 6th Form School, Coniston Crescent, Stourport	DS03
Dimensions						Client	Job Number
REFER TO PLAN						Taylor Wimpey West Midlands	20088
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.25 0.40 0.55	D1 D2 D3				(0.20) 0.20 0.30 (0.20) 0.50 0.60	Brown slightly gravelly sand TOPSOIL. Black gravelly sand. Gravel is sub angular. Gravel is clinker and limestone. MADE GROUND Light grey coarse sub angular gravel of limestone with clay matrix. MADE GROUND Black fine grained sand. POSSIBLE MADE GROUND.	
0.90 1.00-1.45	D4 SPT N=11		3,3/2,3,3,3		(1.00)	Medium dense orange slightly gravelly medium grained SAND. Gravel is subrounded gravel of mixed lithology predominantly sandstone and quartzite.	
1.60-2.60 1.80	B1 D5				1.60	Medium dense orange with pockets of stained black fine to medium grained sandy GRAVEL. Gravel is fine to medium subrounded gravel of mixed lithology.	
2.00-2.45	SPT N=10		2,2/3,2,2,3		(1.80)		
3.00-3.45	SPT N=14		3,3/3,3,4,4		3.40 (0.55)	Medium dense orange coarse SAND.	
4.00-4.45	SPT N=50		8,10/12,13,12,13		3.95 (0.50) 4.45	Very dense orange gravelly SAND. Gravel is coarse subrounded gravel of predominantly quartzite. Complete at 4.45m	
Remarks Borehole dry						Scale (approx)	Logged By
						1:50	C CASEY
						Figure No. 20088.DS03	



Travis Baker Geo-Environmental Ltd

Excavation Method						Site	Number
Drive-in Windowless Sampler						Former Stourport 6th Form School, Coniston Crescent, Stourport	DS04
Dimensions						Client	Job Number
REFER TO PLAN						Taylor Wimpey West Midlands	20088
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.15	D1				(0.30) 0.30 (0.25) 0.55	Dark brown slightly gravelly sand TOPSOIL Orange gravelly SAND. Gravel is fine to coarse subrounded gravel of mixed lithology	
0.70	D2				(1.45)	V loose brown gravelly slightly cobbly SAND. Gravel and cobbles subrounded of mixed lithology. Gravel is fine to coarse.	
1.00-1.45	SPT N=2	1,0/1,0,0,1			2.00 (0.50)	Medium dense brown fine to medium sandy GRAVEL.	
1.40	D3				2.50 (0.60)	Medium dense orange slightly gravelly medium to coarse SAND. Gravel is fine to medium subrounded gravel of mixed lithology including sandstone quartzite	
2.00-2.45	SPT N=12	2,2/3,3,3,3			3.10 (1.24)	Medium dense to v dense brown fine to medium sandy GRAVEL. Gravel is subrounded gravel of mixed lithology	
3.00-3.45	SPT N=20	5,5/4,6,5,5			4.34	Complete at 4.34m	
4.00-4.34	SPT 50/190	11,11/14,17,19					
Remarks Material damp from 1.2m - 1.4m Material wet from 1.6m - 2.0m						Scale (approx)	Logged By
						1:50	C CASEY
						Figure No. 20088.DS04	



Travis Baker Geo-Environmental Ltd

Excavation Method Drive-in Windowless Sampler					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Number DS05			
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088			
Location REFER TO PLAN		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.20	D1				(0.28) 0.28 (0.37) 0.65 (0.25) 0.90	Dark brown slightly silty TOPSOIL with fine rootlets Dark brown slightly silty slightly gravelly fine grained SAND. Gravel is fine to medium subrounded gravel of mixed lithology Orange medium grained SAND Loose orange very gravelly SAND. Gravel is fine to coarse subrounded gravel of mixed lithology.				
0.60	D2				(0.80) 1.70 (0.15) 1.85	Orange-red coarse grained SAND				
1.00-1.45	SPT N=8	1,1/2,2,2,2			(0.59) 2.44	V dense orange-red very gravelly SAND. Gravel is subrounded fine to medium grained of mixed lithology. Complete at 2.44m				
1.40	D3									
2.00-2.44	SPT 50/285	12,12/13,14,13,10								
Remarks Damp at 1.7m Refused at 2m							Scale (approx) 1:50	Logged By C CASEY		
							Figure No. 20088.DS05			



Travis Baker Geo-Environmental Ltd

Excavation Method						Site		Number								
Dimensions						Former Stourport 6th Form School, Coniston Crescent, Stourport		DS06								
Excavation Method		Dimensions		Ground Level (mOD)		Client		Job Number								
Drive-in Windowless Sampler		Location		Dates		Taylor Wimpey West Midlands		20088								
Depth (m)		Sample / Tests		Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description								
0.20	D1	SPT N=15	3,3/3,4,3,5				(0.35) 0.35 (1.15) 1.50 (0.91) 2.41	Dark brown slightly silty slightly gravelly sand TOPSOIL. Gravel is medium rounded gravel of quartzite.								
								Medium dense orange-red gravelly coarse SAND. Gravel is fine-medium subrounded gravel of mixed lithology								
								V dense orange-red very gravelly SAND. Gravel is fine to coarse subrounded gravel of mixed lithology including sandstone mudstone and quartzite								
								Complete at 2.41m								
Remarks Refused at 2m Borehole dry								Scale (approx)	Logged By							
								1:50	C CASEY							
								Figure No. 20088.DS06								

APPENDIX 5
Trial Pit Logs



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number TP01			
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088			
Location (Handheld GPS) See Exploratory Hole Location Plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend		
					(0.55) 0.55 (0.30) 0.85	MADE GROUND: Concrete. Orange brown slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded quartzite. Complete at 0.85m		 		
Plan					Remarks Trial pit undertaken adjacent to building to investigate existing foundations. Dry and stable.					
					Scale (approx) 1:50	Logged By LG	Figure No. 20088.TP01			



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number TP02		
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088		
Location (Handheld GPS) See Exploratory Hole Location Plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend Water		
0.10	D1				(0.40)	TOPSOIL: Grass onto brown gravelly sand with rootlets and rare metal.			
0.60	D2				0.40 (0.30)	MADE GROUND: Reworked orange brown gravelly sand. Gravel is fine to occasionally coarse subangular to subrounded quartzite. Rare brick fragment.			
					0.70 (1.40)	(Medium dense) orange brown gravelly medium and coarse grained SAND. Gravel is fine to occasionally coarse subangular to subrounded quartzite.			
2.30	B1				2.10 (0.90)	Orange brown slightly gravelly medium to coarse grained SAND. Gravel is fine to occasionally coarse sandstone.			
					3.00	Complete at 3.00m			
Plan					Remarks Spalling of side walls leading to partial collapse at depth. Dry.				
					Scale (approx)	Logged By	Figure No.		
					1:50	LG	20088.TP02		



Travis Baker Geo-Environmental Ltd

Machine : JCB £CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number TP03		
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088		
Location (Handheld GPS) See exploratory hole location plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend Water		
0.05	D1				(0.15)	Grass onto gravelly sand. Topsoil.			
0.20	D2				(0.15) (0.30) (0.45) (0.35) 0.80	MADE GROUND: Gravel of angular concrete, siltstone in a black, brown and yellow brown sand.			
0.90	D3				(2.00)	MADE GROUND: Reworked orange brown gravelly sand with occasional pockets of dark orange brown, brown and rare black sand. (Medium dense) orange brown slightly gravelly medium dense SAND. Gravel is fine to coarse subangular to subrounded quartzite. Locally slightly clayey.			
					2.80	Complete at 2.80m			
Plan					Remarks Spalling on side of wall below approx. 1m leading to collapse. Dry.				
					Scale (approx) 1:50	Logged By LG	Figure No. 20088.TP03		



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number TP04			
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088			
Location (Handheld GPS) See exploratory hole location plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.10	D1				(0.30) 0.30	Grass and vegetation onto slightly gravelly sand. Topsoil.				
0.70	D2				(0.65) 0.95	MADE GROUND: Reworked orange brown slightly gravelly sand with rare plastic and whole brick.				
2.70	D3				(2.15) 3.10	(Medium dense) orange brown slightly gravelly medium grained SAND. Gravel is fine to occasionally coarse subangular to subrounded quartzite. Complete at 3.10m				
Plan					Remarks Dry. Terminated due to collapse.					
					Scale (approx) 1:50	Logged By LG	Figure No. 20088.TP04			



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number TP05		
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088		
Location (Handheld GPS) See exploratory hole location plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend		
0.05	D1				(0.40)	Grass onto dry brown slightly gravelly sand with rootlets. TOPSOIL.			
0.50	D2				0.40 (0.40)	(Medium dense) orange brown slightly gravelly, locally gravelly, medium to coarse grained SAND. Gravel is fine to occasionally coarse subangular to subrounded quartzite.			
1.80	B1				0.80 (0.60) 1.40 (1.90)	Recovered as orange brown slightly gravelly medium to coarse grained SAND. Gravel is fine to medium subangular to subrounded quartzite.			
					3.30	Recovered as orange brown gravelly medium to coarse grained SAND. Gravel is fine to medium subangular to subrounded quartzite. Complete at 3.30m			
Plan					Remarks Significant spalling of side walls below 1m leading to collapse. Dry				
					Scale (approx) 1:50	Logged By LG	Figure No. 20088.TP05		



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport	Trial Pit Number TP06
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands		Job Number 20088
Location (Handheld GPS) See exploratory hole location plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.10	D1				(0.35) 0.35	Grass onto dry brown slightly gravelly sand with rootlets. TOPSOIL.
1.60	B1				(1.95) 2.30 (0.40) 2.70 (0.70) 3.40	(Medium dense) orange brown slightly gravelly medium grained SAND. Gravel is fine to medium subangular to subrounded quartzite.
						Recovered as orange brown gravelly medium grained SAND. Gravel is fine to medium subangular to subrounded quartzite.
						Dark orange brown SAND and GRAVEL of subangular to subrounded quartzite. Rare cobble of quartzite.
						Complete at 3.40m
Plan					Remarks Dry Slight spalling below approx. 3m leading to partial collapse between 3m and 3.4m.	
					Scale (approx) 1:50	Logged By LG
					Figure No. 20088.TP06	



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport	Trial Pit Number TP07
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands		Job Number 20088
Location (Handheld GPS) See exploratory hole location plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.10	D1				(0.45)	Grass onto dry brown slightly gravelly sand with rootlets. TOPSOIL.
0.60	D2				(0.45) (0.60) (0.20) 0.80	(Medium dense) orange brown slightly gravelly medium grained SAND. Gravel is fine to medium subangular to subrounded quartzite.
1.50	B1 D3				(2.20)	Recovered as orange brown gravelly medium grained SAND. Gravel is fine to medium subangular to subrounded quartzite.
					3.00	Recovered as orange brown SAND and GRAVEL of fine to medium subangular to subrounded quartzite.
						Complete at 3.00m
Plan					Remarks Dry Some spalling below 2m.	
					Scale (approx) 1:50	Logged By LG
					Figure No. 20088.TP07	



Travis Baker Geo-Environmental Ltd

Site						Trial Pit Number	
Former Stourport 6th Form School, Coniston Crescent, Stourport						TP08	
Machine : JCB 3CX		Dimensions		Ground Level (mOD)		Client	Job Number
Method : Trial Pit		Location (Handheld GPS)		Dates 01/10/2020		Taylor Wimpey West Midlands	20088
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend Water
0.10	D1				(0.30) 0.30	Grass onto dry brown slightly gravelly fine sand with rootlets. TOPSOIL.	
0.55	D2				(1.50)	(Medium dense) orange brown slightly gravelly medium grained SAND. Gravel is fine to medium subangular to subrounded quartzite.	
1.00	B1				1.80 (0.90)	Orange brown gravelly medium grained SAND. Gravel is fine to medium, occasionally coarse, subangular to subrounded quartzite.	
					2.70 (0.60)	Orange brown medium and coarse grained SAND and GRAVEL of subangular to subrounded quartzite. Gravel is fine to medium subangular to subrounded quartzite.	
					3.30	Complete at 3.30m	
Plan				Remarks			
				Spalling of side walls from 1m leading to significant collapse below 2m. Dry			
				Scale (approx)	Logged By	Figure No.	
				1:50	LG	20088.TP08	



Travis Baker Geo-Environmental Ltd

Machine : JCB 3CX Method : Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number TP09			
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088			
Location (Handheld GPS) See exploratory hole location plan		Dates 01/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description				
1.20	D1				(0.30) 0.30	Brown slightly gravelly sand with rootlets. TOPSOIL.				
					(2.70)	(Medium dense) orange brown gravelly medium grained SAND. Gravel is fine to coarse subangular to subrounded quartzite. Occasional cobble of quartzite with depth.				
					3.00 (0.20) 3.20	Recovered as orange brown gravelly medium grained SAND. Gravel is fine to medium subangular to subrounded quartzite. Complete at 3.20m				
Plan					Remarks Spalling below 1m leading to small partial collapses. Dry					
					Scale (approx)	Logged By	Figure No.			
					1:50	LG	20088.TP09			

APPENDIX 6
Geotechnical Test Results



4041

TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: Travis Baker Geo-Environmental Limited
Client Address: Trinity Point, New Road,
Halesowen, West Midlands,
B63 3HY
Contact: Lindsey Geddes
Site Address: Coniston Crescent, Stourport

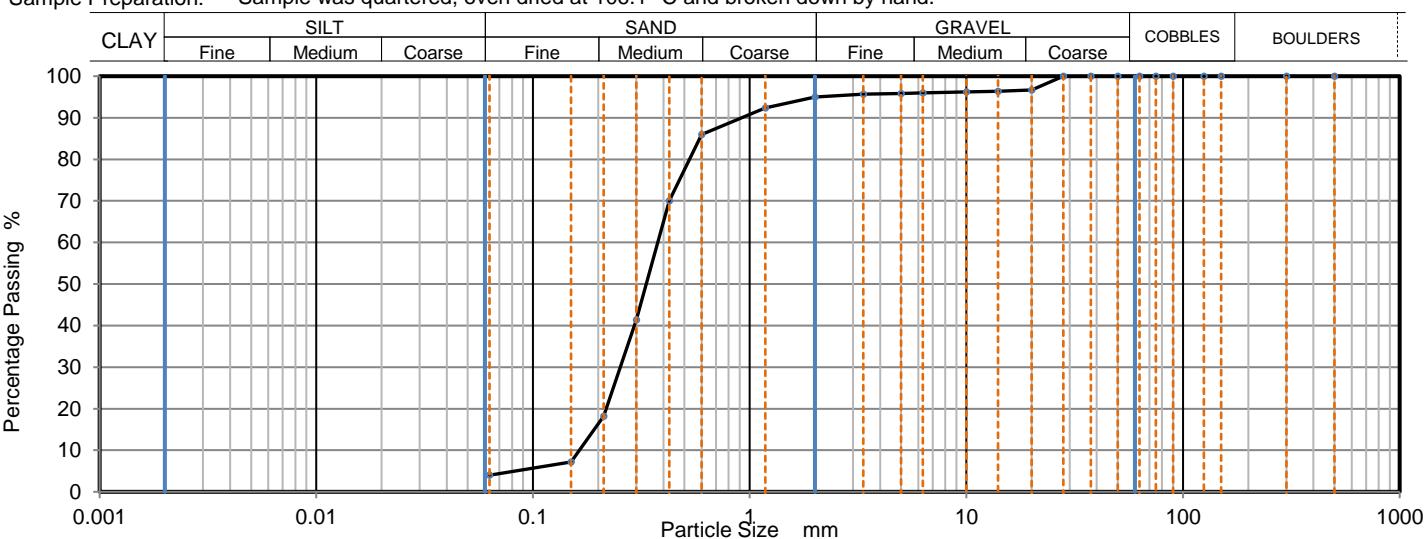
Client Reference: 20088
Job Number: 20-34307
Date Sampled: 01/10/2020
Date Received: 02/10/2020
Date Tested: 14/10/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland

Test Results:

Laboratory Reference: 1643215
Hole No.: TP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 2.30
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	96		
10	96		
6.3	96		
5	96		
3.35	96		
2	95		
1.18	92		
0.6	86		
0.425	70		
0.3	41		
0.212	18		
0.15	7		
0.063	4		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	5.00
Sand	91.00
Fines <0.063mm	4.00

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	2.3
Curvature Coefficient	1

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



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Particle Size Distribution

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Client Address: Trinity Point, New Road,
Halesowen, West Midlands,
B63 3HY
Contact: Lindsey Geddes
Site Address: Coniston Crescent, Stourport

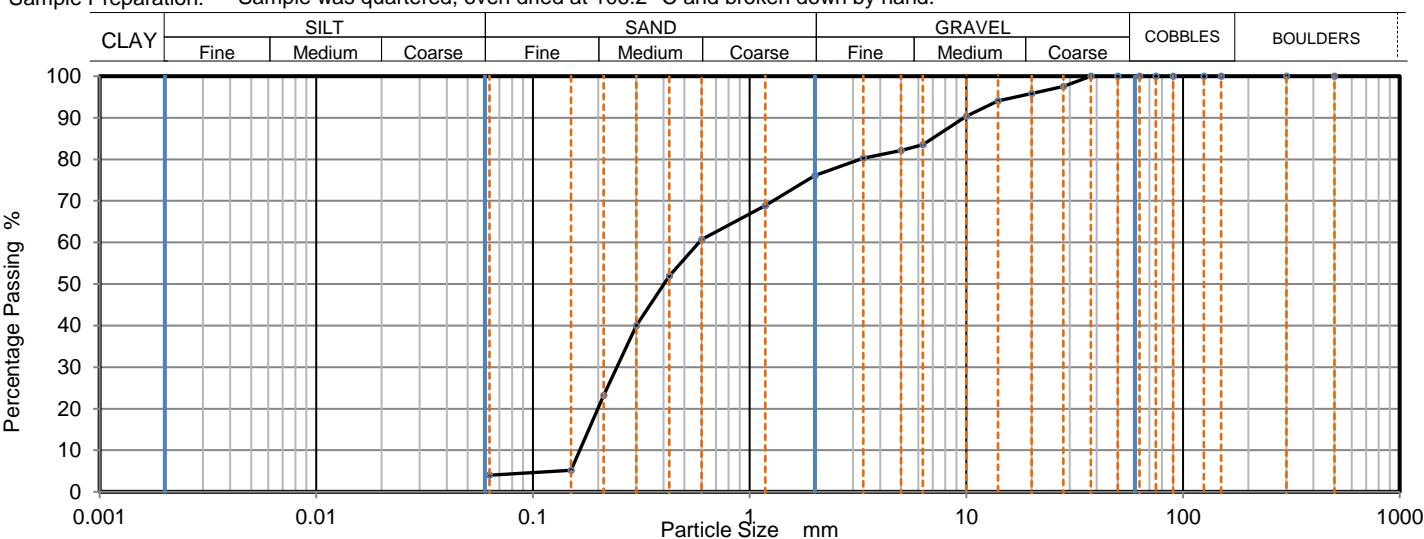
Client Reference: 20088
Job Number: 20-34307
Date Sampled: 01/10/2020
Date Received: 02/10/2020
Date Tested: 14/10/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland

Test Results:

Laboratory Reference: 1643216
Hole No.: TP05
Sample Reference: Not Given
Sample Description: Brown slightly clayey gravelly SAND
Sample Preparation: Sample was quartered, oven dried at 106.2 °C and broken down by hand.

Depth Top [m]: 1.80
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	96		
14	94		
10	90		
6.3	84		
5	82		
3.35	80		
2	76		
1.18	69		
0.6	61		
0.425	52		
0.3	40		
0.212	23		
0.15	5		
0.063	5		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	23.90
Sand	71.50
Fines <0.063mm	4.60

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	3.6
Curvature Coefficient	0.62

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: Travis Baker Geo-Environmental Limited
Client Address: Trinity Point, New Road,
Halesowen, West Midlands,
B63 3HY
Contact: Lindsey Geddes
Site Address: Coniston Crescent, Stourport

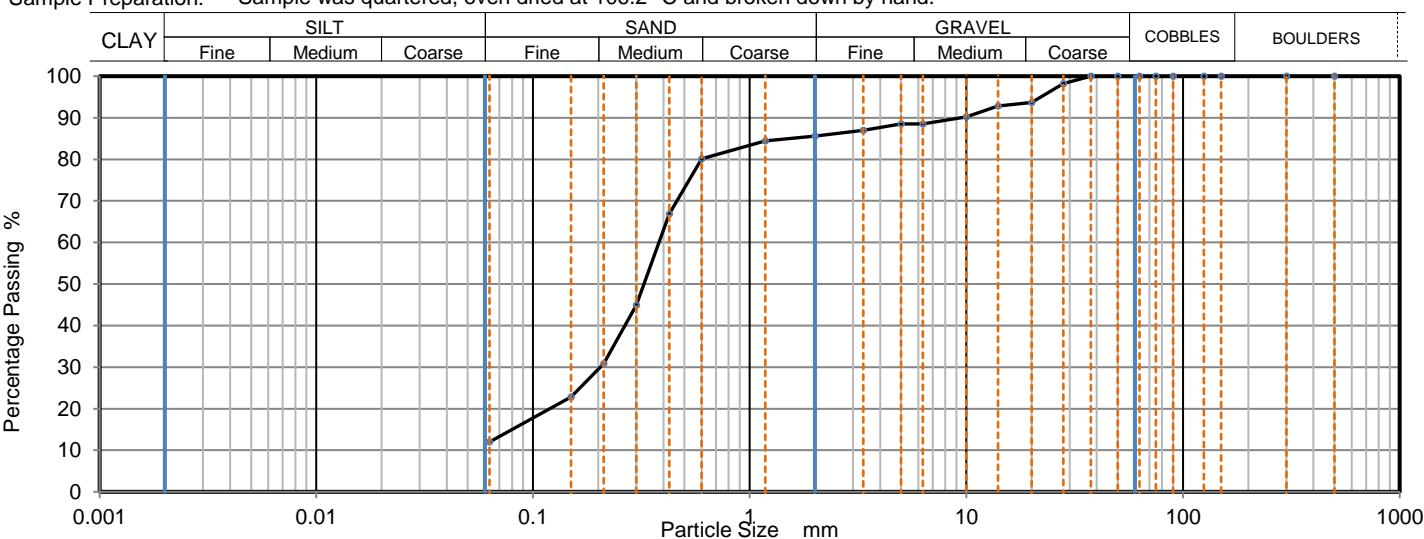
Client Reference: 20088
Job Number: 20-34307
Date Sampled: 01/10/2020
Date Received: 02/10/2020
Date Tested: 14/10/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland

Test Results:

Laboratory Reference: 1643217
Hole No.: TP6
Sample Reference: Not Given
Sample Description: Brown gravelly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.2 °C and broken down by hand.

Depth Top [m]: 1.60
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	94		
14	93		
10	90		
6.3	89		
5	89		
3.35	87		
2	86		
1.18	84		
0.6	80		
0.425	67		
0.3	45		
0.212	31		
0.15	23		
0.063	13		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	14.40
Sand	73.00
Fines <0.063mm	12.60

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 6
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
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Particle Size Distribution

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B63 3HY
Contact: Lindsey Geddes
Site Address: Coniston Crescent, Stourport

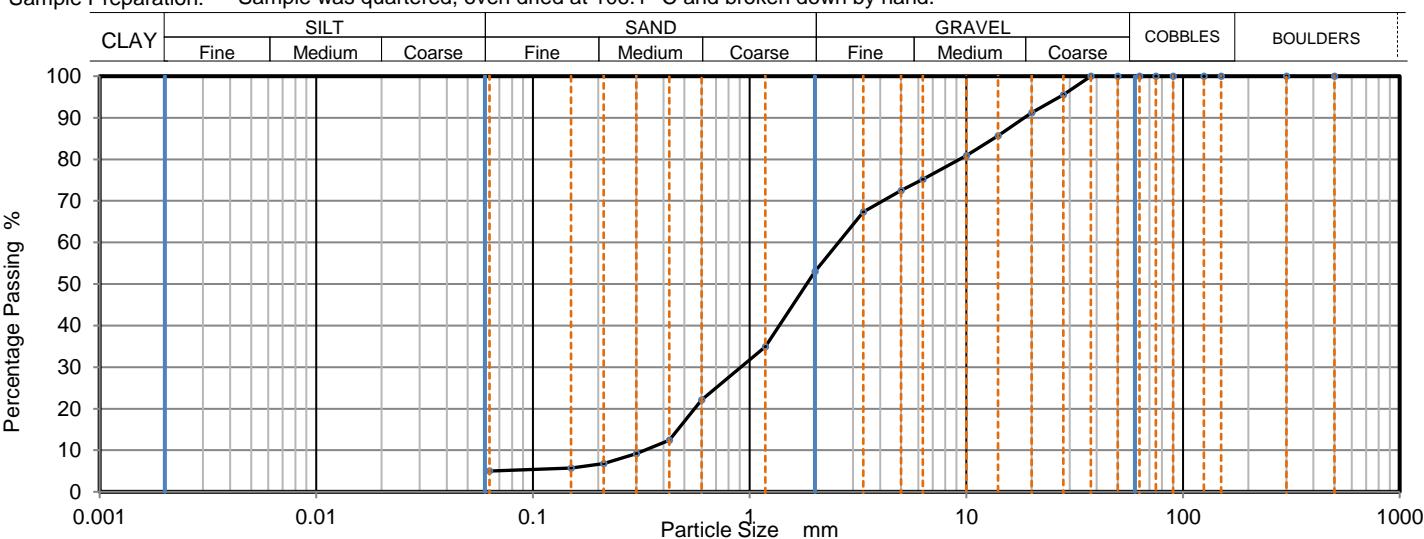
Client Reference: 20088
Job Number: 20-34307
Date Sampled: 01/10/2020
Date Received: 02/10/2020
Date Tested: 14/10/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland

Test Results:

Laboratory Reference: 1643218
Hole No.: TP07
Sample Reference: Not Given
Sample Description: Brown slightly clayey GRAVEL and SAND
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	91		
14	86		
10	81		
6.3	75		
5	73		
3.35	67		
2	53		
1.18	35		
0.6	22		
0.425	12		
0.3	9		
0.212	7		
0.15	6		
0.063	5		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	47.00
Sand	47.60
Fines <0.063mm	5.40

Grading Analysis		
D100	mm	37.5
D60	mm	2.57
D30	mm	0.91
D10	mm	0.326
Uniformity Coefficient		7.9
Curvature Coefficient		0.99

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



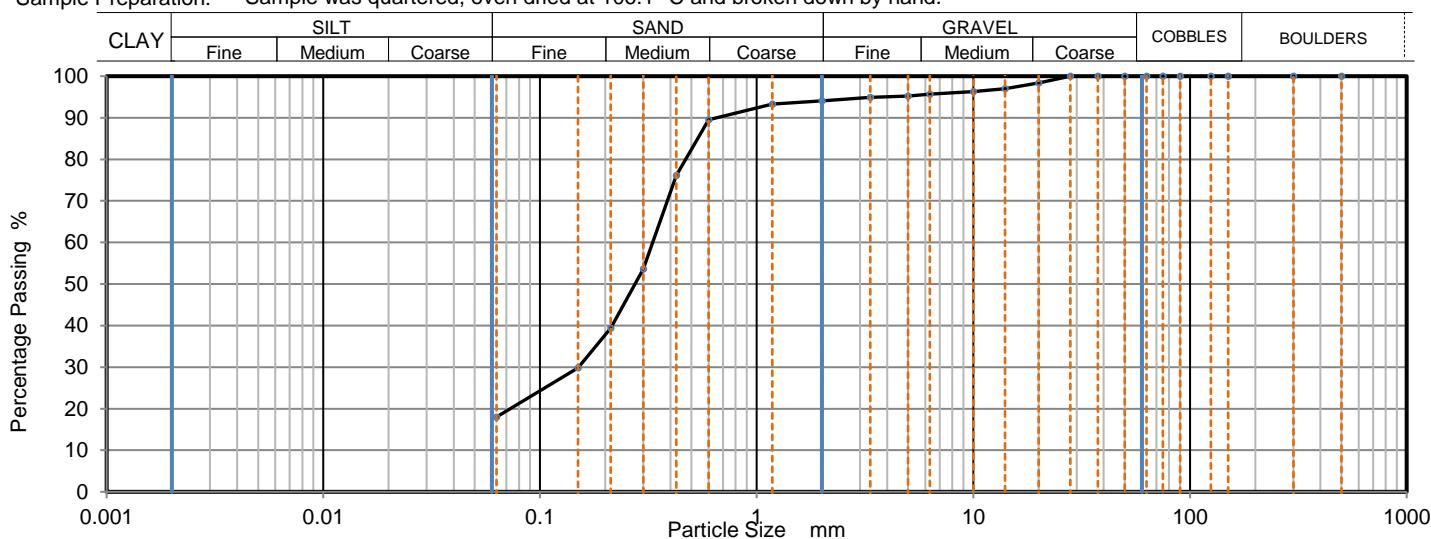
Client: Travis Baker Geo-Environmental Limited
Client Address: Trinity Point, New Road,
Halesowen, West Midlands,
B63 3HY
Contact: Lindsey Geddes
Site Address: Coniston Crescent, Stourport

Client Reference: 20088
Job Number: 20-34307
Date Sampled: 01/10/2020
Date Received: 02/10/2020
Date Tested: 14/10/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland

Test Results:

Laboratory Reference: 1643219
Hole No.: TP08
Sample Reference: Not Given
Sample Description: Brown slightly gravelly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	97		
10	96		
6.3	96		
5	95		
3.35	95		
2	94		
1.18	93		
0.6	90		
0.425	76		
0.3	54		
0.212	39		
0.15	30		
0.063	18		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	5.90
Sand	76.10
Fines <0.063mm	18.00

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 5.3
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Signed:

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PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd



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Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: Travis Baker Geo-Environmental Limited
Client Address: Trinity Point, New Road,
Halesowen, West Midlands,
B63 3HY
Contact: Lindsey Geddes
Site Address: Coniston Crescent, Stourport

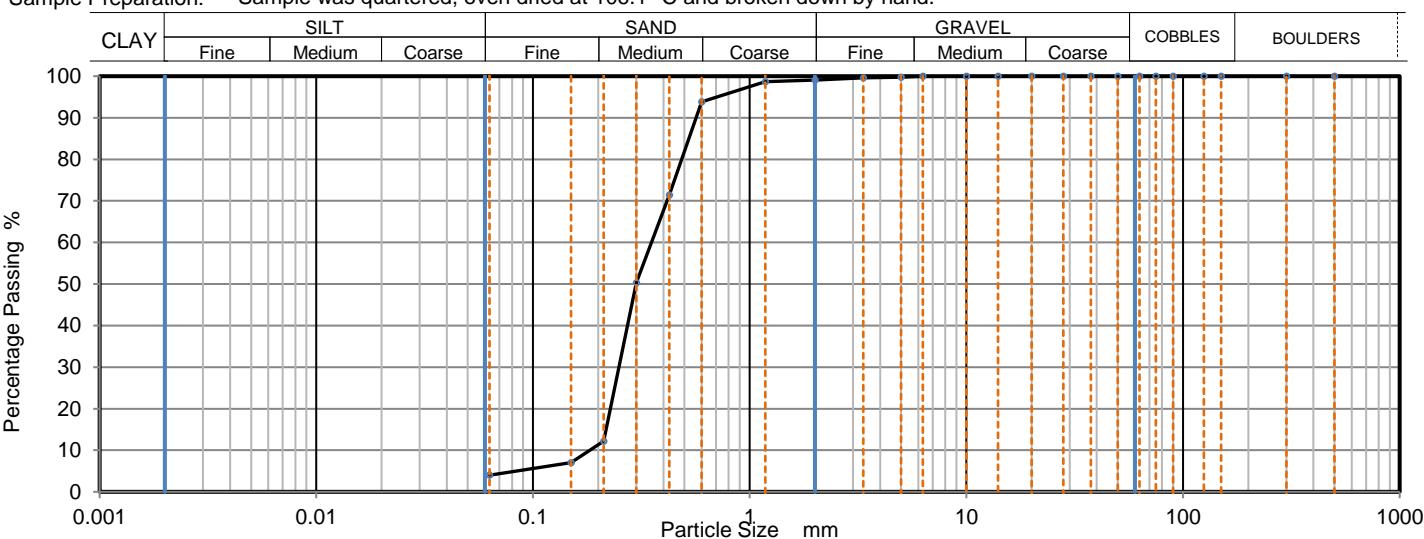
Client Reference: 20088
Job Number: 20-34307
Date Sampled: 01/10/2020
Date Received: 02/10/2020
Date Tested: 14/10/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland

Test Results:

Laboratory Reference: 1643220
Hole No.: DS02
Sample Reference: Not Given
Sample Description: Brown slightly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 1.10
Depth Base [m]: 2.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	94		
0.425	71		
0.3	50		
0.212	12		
0.15	7		
0.063	4		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.90
Sand	95.00
Fines <0.063mm	4.10

Grading Analysis		
D100	mm	6.3
D60	mm	0.352
D30	mm	0.249
D10	mm	0.183
Uniformity Coefficient		1.9
Curvature Coefficient		0.96

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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APPENDIX 7
Laboratory Geochemical Test Results

APPENDIX 7 – CHEMICAL SUMMARY TABLE

Coniston Crescent, Stourport-on-Severn

Substance	Target Residential 1% SOM		All Materials - Travis Baker Investigations		
	Value (mg/kg)	Source	No. of Samples	Range (mg/kg)	No. Samples Above Guidance
Mercury	1.2	S4UL [◊]	29	0.4 - 1.9	0
Selenium	250	S4UL [◊]	29	1.1 - 1.9	0
Arsenic	37	S4UL [◊]	29	5 - 42	2
Nickel	180	S4UL [◊]	29	7.3 - 66	0
Cadmium	11	S4UL [◊]	29	0.2 - 3.6	0
Boron (water-soluble)	290	S4UL [◊]	29	0.2 - 4.1	0
Chromium	910	S4UL [◊]	29	9.9 - 260	0
Copper	2,400	S4UL [◊]	29	12 - 6400	1
Lead	200	C4SL	29	7.4 - 530	1
Zinc	3,700	S4UL [◊]	29	34 - 11000	1
Asbestos Bulk ID	0.001	In House	14	Not Detected	0
Acenaphthene	210	S4UL [◊]	26	<0.05	0
Acenaphthylene	170	S4UL [◊]	26	<0.05	0
Anthracene	2,400	S4UL [◊]	26	<0.05 - 0.51	0
Benzo(a)anthracene	7.2	S4UL [◊]	26	<0.05 - 1.8	0
Benzo(a)pyrene	2.2	S4UL [◊]	26	<0.05 - 2.0	0
Benzo(b)fluoranthene	2.6	S4UL [◊]	26	<0.05 - 2.3	0
Benzo(k)fluoranthene	77	S4UL [◊]	26	<0.05 - 0.95	0
Benzo(ghi)perylene	320	S4UL [◊]	26	<0.05 - 1.1	0
Chrysene	15	S4UL [◊]	26	<0.05 - 1.6	0
Dibenzo(a,h)anthracene	0.24	S4UL [◊]	26	<0.05	0
Fluoranthene	280	S4UL [◊]	26	<0.05 - 4.0	0
Fluorene	170	S4UL [◊]	26	<0.05	0
Indeno(123-cd)pyrene	27	S4UL [◊]	26	<0.05 - 1.0	0
Naphthalene	2.3	S4UL [◊]	26	<0.05	0
Phenanthrene	95	S4UL [◊]	26	<0.05 - 2.0	0
Pyrene	620	S4UL [◊]	26	<0.05 - 3.6	0

Notes

- EA CLEA - Soil Guidance Value (SGV) published by the EA calculated using Contaminated Land Exposure Assessment (CLEA) model (version 1.07)
- CIEH/LQM[◊] - Suitable for Use Level (S4UL) published by the Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM) dated January 2015
- C4SL - Category 4 Screening Levels published by DEFRA in 2014
- ◊ - "Copyright Land Quality Management Ltd reproduced with permission; Publication number S4UL3689. All rights reserved".

All target values based on a residential with rear garden end use



4041

**Lindsey Geddes**

Travis Baker Geo-Environmental Limited
Trinity Point
New Road
Halesowen
West Midlands
B63 3HY

e: lindsey.geddes@travisbaker.co.uk



i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-34342

Project / Site name:	Consiston Crescent, Stourport	Samples received on:	02/10/2020
Your job number:	20088	Samples instructed on / Analysis started on:	07/10/2020
Your order number:	1850G	Analysis completed by:	14/10/2020
Report Issue Number:	1	Report issued on:	14/10/2020
Samples Analysed:		R Bradley Signed: _____	

R Bradley
Signed: _____
Rachel Bradley
Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1643386	1643387	1643388	1643389
Sample Reference		DS02	DS02	DS05	DS05
Sample Number		None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)		0.10	1.10	0.20	0.60
Date Sampled		01/10/2020	01/10/2020	01/10/2020	01/10/2020
Time Taken		None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	on detecti on	limit of detecti on	Accred itation status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.5	3.2	5.3	7.1
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.3	6.3	6	6.5
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0095	0.011	0.012	0.011
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.9	-	-	0.8

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80
-----------------------------	-------	-----	--------	--------	--------	--------	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	29	5.5	29	26
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	< 0.2	0.3	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	160	21	180	160
Copper (aqua regia extractable)	mg/kg	1	MCERTS	70	13	91	74
Lead (aqua regia extractable)	mg/kg	1	MCERTS	78	10	87	57
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1	< 0.3	0.8	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	7.3	10	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	42	120	140

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1643390	1643391	1643392	1643393
Sample Reference		DS06	DS06	DS04	DS04
Sample Number		None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)		0.20	0.50	0.15	0.70
Date Sampled		01/10/2020	01/10/2020	01/10/2020	01/10/2020
Time Taken		None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	on detecti on	limit of detecti on	Accred itation status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.7	4.4	4.2	6.6
Total mass of sample received	kg	0.001	NONE	0.6	0.6	1.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.2	6.7	6	6.4
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.012	0.0095	0.0081
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.6	0.5	3.2	0.9

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.5	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.78	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.8	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.47	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.69	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.41	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.46	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	7	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	16	42	18
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2	0.4	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	140	42	260	120
Copper (aqua regia extractable)	mg/kg	1	MCERTS	65	34	190	80
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	21	170	34
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3	1.8	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	19	16	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	66	200	120

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1643394	1643395	1643396	1643397
Sample Reference		DS04	DS03	DS03	DS03
Sample Number		None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)		1.40	0.20-0.30	0.40	0.55
Date Sampled		01/10/2020	01/10/2020	01/10/2020	01/10/2020
Time Taken		None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	on detection	limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	2.8	3.1	6
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.8	5.9	7.4	7.4
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.32	0.058	0.034
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	25	5.5	13
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	4.1	0.4	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	3.6	0.6	0.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	170	27	18	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	130	6400	21	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	530	26	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.5	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	66	20	9.1
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.9	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220	11000	110	58

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1643398	1644351	1644352	1644353
Sample Reference	DS01	TP02	TP02	TP03	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	0.30	0.10	0.60	0.05	
Date Sampled	01/10/2020	01/10/2020	01/10/2020	01/10/2020	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	on detecti on	limit of detecti on	Accred itation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.6	8.1	6.3	4.5
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	8.3	8.4	8.2
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.063	0.053	0.028	0.014
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	1.2	-	1.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	2	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.51	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	4	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	3.6	< 0.05	< 0.05
Benz(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.8	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.6	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.3	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.95	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	2	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.1	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	20.7	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	26	12	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.4	< 0.2	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	97	27	46
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	61	22	41
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	71	16	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	0.6	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	15	11	12
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.1	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	100	66	88

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1644354	1644355	1644356	1644357
Sample Reference		TP03	TP03	TP04	TP04
Sample Number		None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)		0.20	0.90	0.10	0.70
Date Sampled		01/10/2020	01/10/2020	01/10/2020	01/10/2020
Time Taken		None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	on detecti on	limit of detecti on	Accred itation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.7	4.9	5.2	4.8
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	7.9	8	8.3
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.21	0.095	0.015	0.015
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	1.5	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.73	< 0.05	< 0.05	0.23
Anthracene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	0.69
Pyrene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	0.65
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.79	< 0.05	< 0.05	0.44
Chrysene	mg/kg	0.05	MCERTS	0.62	< 0.05	< 0.05	0.4
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.99	< 0.05	< 0.05	0.57
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.39	< 0.05	< 0.05	0.28
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.78	< 0.05	< 0.05	0.44
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.46	< 0.05	< 0.05	0.28
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.52	< 0.05	< 0.05	0.33

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.89	< 0.80	< 0.80	4.31
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	7.2	9.5	7.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	< 0.2	0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	13	36	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	81	12	24	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	54	11	36	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	10	12	8.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.7	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	46	77	52

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1644358	1644359	1644360	1644361
Sample Reference	TP04	TP05	TP06	TP07	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	2.70	0.05	0.10	0.10	
Date Sampled	01/10/2020	01/10/2020	01/10/2020	01/10/2020	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accredited Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.8	5	4.1	7.5
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	8.7	6.8	6.8
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.013	0.012	0.013
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	2.3	1.3	1.8

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5	41	30	40
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.2	0.2	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	9.9	240	140	230
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	110	70	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.4	130	76	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.9	1	1.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.6	11	9.9	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	140	130	160

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number: 20-34342

Project / Site name: Consiston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number		1644362	1644363	1644364	1644365
Sample Reference	TP07	TP07	TP08	TP08	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	0.60	1.50	0.10	0.55	
Date Sampled	01/10/2020	01/10/2020	01/10/2020	01/10/2020	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	on detecti on limit of detecti on	Accred itation status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.7	5.2	6.9	6.6
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6	0.6

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.2	6.1	5.1	5.7
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.025	0.015	0.01
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	3.2	0.5

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	13	36	15
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2	0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	56	33	210	59
Copper (aqua regia extractable)	mg/kg	1	MCERTS	54	25	110	55
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	19	120	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	1.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	16	11	8.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	76	150	72

U/S = Unsuitable Sample I/S = Insufficient Sample



4041

**Analytical Report Number : 20-34342****Project / Site name: Consiston Crescent, Stourport**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation.
The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1643386	DS02	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
1643387	DS02	None Supplied	1.1	Brown sand with gravel and vegetation.
1643388	DS05	None Supplied	0.2	Brown sandy loam with gravel and vegetation.
1643389	DS05	None Supplied	0.6	Brown sandy loam with gravel and vegetation.
1643390	DS06	None Supplied	0.2	Brown sandy loam with gravel and vegetation.
1643391	DS06	None Supplied	0.5	Brown sandy loam with gravel and vegetation.
1643392	DS04	None Supplied	0.15	Brown sandy loam with gravel and vegetation.
1643393	DS04	None Supplied	0.7	Brown sandy loam with gravel and vegetation.
1643394	DS04	None Supplied	1.4	Brown sandy loam with gravel and vegetation.
1643395	DS03	None Supplied	0.20-0.30	Brown sandy loam with gravel and vegetation.
1643396	DS03	None Supplied	0.4	Grey sandy clay with gravel.
1643397	DS03	None Supplied	0.55	Brown sandy loam with gravel.
1643398	DS01	None Supplied	0.3	Brown sandy loam with gravel.
1644351	TP02	None Supplied	0.1	Brown sandy loam with vegetation and gravel
1644352	TP02	None Supplied	0.6	Brown sand with gravel.
1644353	TP03	None Supplied	0.05	Brown sandy loam with vegetation and gravel
1644354	TP03	None Supplied	0.2	Brown sandy loam with gravel and brick.
1644355	TP03	None Supplied	0.9	Brown sand with gravel.
1644356	TP04	None Supplied	0.1	Brown sandy loam with vegetation and gravel
1644357	TP04	None Supplied	0.7	Brown sand with gravel.
1644358	TP04	None Supplied	2.7	Brown sand with gravel.
1644359	TP05	None Supplied	0.05	Brown sandy loam with vegetation and gravel
1644360	TP06	None Supplied	0.1	Brown sandy loam with gravel and vegetation.
1644361	TP07	None Supplied	0.1	Brown sandy loam with vegetation and gravel
1644362	TP07	None Supplied	0.6	Brown sand with gravel and brick.
1644363	TP07	None Supplied	1.5	Brown sand with gravel and vegetation.
1644364	TP08	None Supplied	0.1	Brown sandy loam with vegetation and gravel
1644365	TP08	None Supplied	0.55	Brown sand with vegetation and gravel



4041

**Analytical Report Number : 20-34342****Project / Site name: Consiston Crescent, Stourport****Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.****Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



4041

Sample Deviation Report



Analytical Report Number : 20-34342

Project / Site name: Consiston Crescent, Stourport

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP07	None Supplied	S	1644363	b	Speciated EPA-16 PAHs in soil	L064-PL	b

**Lindsey Geddes**

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Analytical Report Number : 20-34704

Project / Site name:	Coniston Crescent, Stourport	Samples received on:	02/10/2020
Your job number:	20088	Samples instructed on/ Analysis started on:	12/10/2020
Your order number:	1850G	Analysis completed by:	16/10/2020
Report Issue Number:	1	Report issued on:	16/10/2020
Samples Analysed:	1 soil sample		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-34704

Project / Site name: Coniston Crescent, Stourport

Your Order No: 1850G

Lab Sample Number	1645651		
Sample Reference	TP06		
Sample Number	None Supplied		
Depth (m)	0.50		
Date Sampled	01/10/2020		
Time Taken	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status
Stone Content	%	0.1	NONE
Moisture Content	%	N/A	NONE
Total mass of sample received	kg	0.001	NONE
			0.6

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	73
Copper (aqua regia extractable)	mg/kg	1	MCERTS	62
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	97

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-34704

Project / Site name: Coniston Crescent, Stourport

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1645651	TP06	None Supplied	0.5	Light brown sand with gravel and vegetation.



Analytical Report Number : 20-34704

Project / Site name: Coniston Crescent, Stourport

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX 8
Soakaway Calculations and Graphs



Travis Baker Geo-Environmental Ltd

Excavation Method					Site		Trial Pit Number
Trial Pit		Dimensions		Ground Level (mOD)		Client	SA1
		Location (Observed measurements) REFER TO PLAN		Dates	12/10/2020	Engineer	Job Number 20088
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
					(0.45) 0.45 (0.40) 0.85 (0.65) 1.50 (1.00) 2.50	Grassed over dark brown slightly gravelly sand. Gravel is fine to coarse subrounded quartzite with rootlets. TOPSOIL. Light brown slightly gravelly fine to coarse grained SAND. Gravel is fine to coarse subrounded quartzite. Red - brown gravelly fine to coarse grained SAND. Gravel is fine to coarse subangular to subrounded quartzite. Light orange - brown slightly gravelly fine to coarse grained SAND. Gravel is fine to coarse subrounded and subrounded quartzite. Complete at 2.50m	
Plan					Remarks		
					Slight spalling of trial pit walls due to loose granular material Trial pit was dry during excavation		
					Scale (approx)	Logged By	Figure No.
					1:50	R ALLEN	20088.SA1



Travis Baker Geo-Environmental Ltd

Excavation Method Trial Pit					Site Former Stourport 6th Form School, Coniston Crescent, Stourport		Trial Pit Number SA2		
Dimensions		Ground Level (mOD)		Client Taylor Wimpey West Midlands			Job Number 20088		
Location REFER TO PLAN		Dates 12/10/2020		Engineer Travis Baker Geo-Environmental Ltd			Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend		
					(0.20) 0.20 (0.50) 0.70 (0.30) 1.00 (1.33) 2.33	<p>Grassed over dark brown slightly gravelly sand. Gravel is fine to medium subrounded quartzite with rootlets. TOPSOIL.</p> <p>Grey black very gravelly cobbly fine to coarse grained sand. Gravel is fine to coarse subrounded quartzite. Cobbles are quartzite and brick. MADE GROUND</p> <p>Orange - brown gravelly fine to coarse grained SAND. Gravel is fine to coarse subangular to subrounded quartzite.</p> <p>Orange - brown slightly gravelly fine grained SAND. Gravel is fine to coarse subrounded quartzite.</p> <p>Complete at 2.33m</p>	Water		
Plan					Remarks Slight spalling of trial pit walls due to loose granular material. Trial pit was dry during excavation				
					Scale (approx) 1:50	Logged By R ALLEN	Figure No. 20088.SA2		



Travis Baker Geo-Environmental Ltd

Trial Pit
Number
SA3

Excavation Method				Dimensions		Ground Level (mOD)		Site		Trial Pit Number	
Trial Pit								Former Stourport 6th Form School, Coniston Crescent, Stourport		SA3	
		Location		Dates				Client		Job Number	
		REFER TO PLAN		12/10/2020		Engineer		Travis Baker Geo-Environmental Ltd		Sheet	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water	
					(0.50)	Grassed over dark brown slightly gravelly sand. Gravel is fine to coarse subrounded quartzite with rootlets. TOPSOIL.					
					0.50	Red brown gravelly fine to coarse grained SAND. Gravel is fine to coarse subrounded quartzite.					
					(0.80)						
					1.30 (0.30)	Light brown slightly cobbly gravelly fine to coarse grained SAND. Gravel is fine to coarse subangular to subrounded quartzite. Cobbles of subrounded quartzite.					
					1.60 (0.15) 1.75 (0.45)	Brown gravelly fine to coarse grained SAND with pockets of black organic material. Gravel is fine to coarse subrounded quartzite.					
					2.20	Light brown slightly cobbly gravelly fine to coarse grained SAND. Gravel is fine to coarse subrounded quartzite. Cobbles of subrounded quartzite.					
						Complete at 2.20m					
Plan						Remarks					
						Slight spalling of trial pit walls due to loose granular material. Trial pit was dry during excavation					
						Scale (approx)		Logged By		Figure No.	
						1:50		R ALLEN		20088.SA3	



Travis Baker Geo-Environmental Ltd

Trial Pit
Number
SA4

Excavation Method				Dimensions		Ground Level (mOD)		Site			
Trial Pit		Location		Dates		Client		Job Number		Sheet	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water	
					(0.40) 0.40 (0.45) 0.85 (1.05) 1.90 (0.30) 2.20	Grassed over dark brown slightly gravelly sand. Gravel is fine to medium subrounded quartzite with rootlets. TOPSOIL.	Orange brown slightly gravelly fine to coarse grained SAND. Gravel is fine to coarse subrounded quartzite.	Orange brown very gravelly fine to coarse grained SAND. Gravel is fine to coarse subrounded quartzite.	Orange brown slightly gravelly fine-grained SAND. Gravel is fine to coarse subrounded quartzite.	Complete at 2.20m	
Plan						Remarks					
						Spalling of trial pit walls due to loose granular material Trial pit was dry during excavation					
						Scale (approx)		Logged By		Figure No.	
						1:50		R ALLEN		20088.SA4	

Soakaway 1 test 1	
Width (m):	0.70
Length (m):	2.80
Depth (m):	2.50
Natural depth (m):	0.00
Depth (m) of Water at T = 0	1.45
Effective depth (m)	1.05
Vp25 (m)	0.263
Depth (mbgl) at Vp25	2.238
Vp75 (m)	0.788
Depth (mbgl) at Vp75	1.713
Vp50 (m)	0.53
Vp75/Vp25 (m^3)	1.029
Vp75/Vp25 (m^3) * 0.3	0.207
a50 (m^2)	5.64
t between vp75 to vp25(secs)	630
Soil Infiltration (m/s)	5.84E-05

Soakaway 1 test 2	
Width (m):	0.70
Length (m):	2.80
Depth (m):	2.50
Natural depth (m):	0.00
Depth (m) of Water at T = 0	1.46
Effective depth (m)	1.04
Vp25 (m)	0.260
Depth (mbgl) at Vp25	2.240
Vp75 (m)	0.780
Depth (mbgl) at Vp75	1.720
Vp50 (m)	0.52
Vp75/Vp25 (m^3)	1.019
Vp75/Vp25 (m^3) * 0.3	0.236
a50 (m^2)	5.60
t between vp75 to vp25(secs)	1200
Soil Infiltration (m/s)	3.51E-05

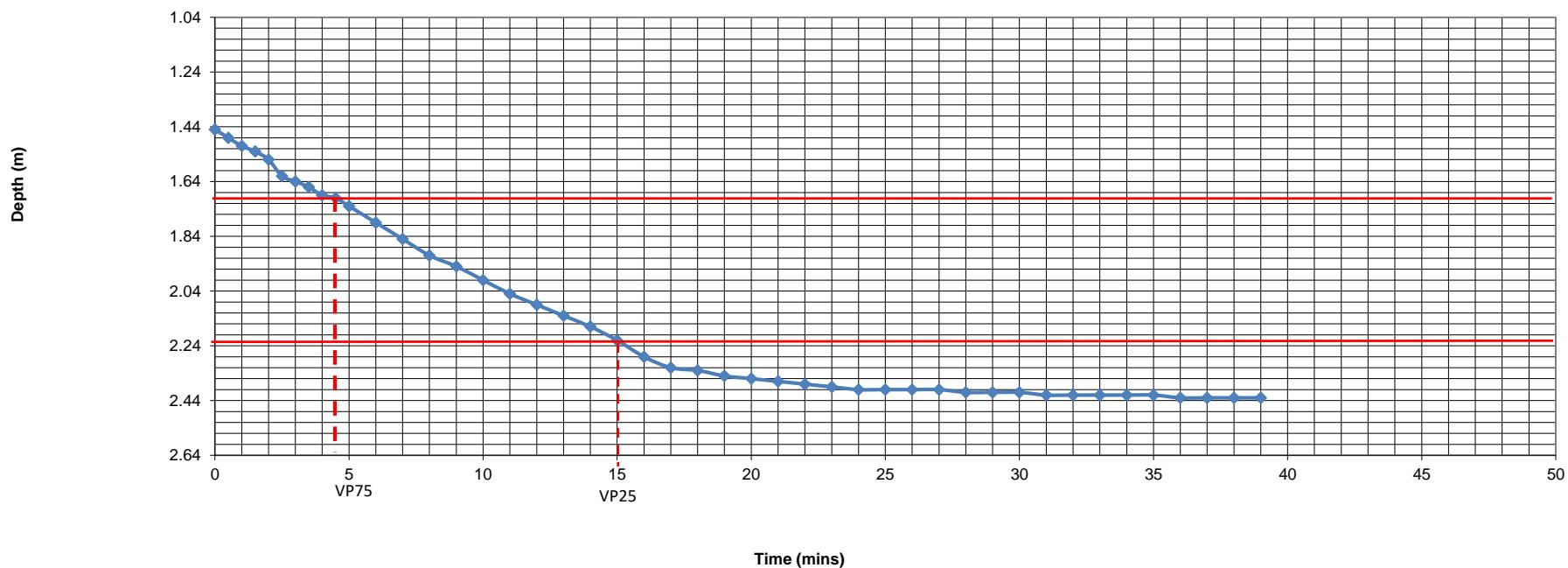
Soakaway 1 test 3	
Width (m):	0.70
Length (m):	2.80
Depth (m):	2.50
Natural depth (m):	0.00
Depth (m) of Water at T = 0	1.45
Effective depth (m)	1.05
Vp25 (m)	0.263
Depth (mbgl) at Vp25	2.238
Vp75 (m)	0.788
Depth (mbgl) at Vp75	1.713
Vp50 (m)	0.53
Vp75/Vp25 (m^3)	1.029
Vp75/Vp25 (m^3) * 0.3	0.289
a50 (m^2)	5.64
t between vp75 to vp25(secs)	1320
Soil Infiltration (m/s)	3.88E-05

Trial 1		
Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.45
0.5	30	1.48
1	60	1.51
1.5	90	1.53
2	120	1.56
2.5	150	1.62
3	180	1.64
3.5	210	1.66
4	240	1.69
4.5	270	1.7
5	300	1.73
6	360	1.79
7	420	1.85
8	480	1.91
9	540	1.95
10	600	2
11	660	2.05
12	720	2.09
13	780	2.13
14	840	2.17
15	900	2.22
16	960	2.28
17	1020	2.32
18	1080	2.33
19	1140	2.35
20	1200	2.36
21	1260	2.37
22	1320	2.38
23	1380	2.39
24	1440	2.4
25	1500	2.4

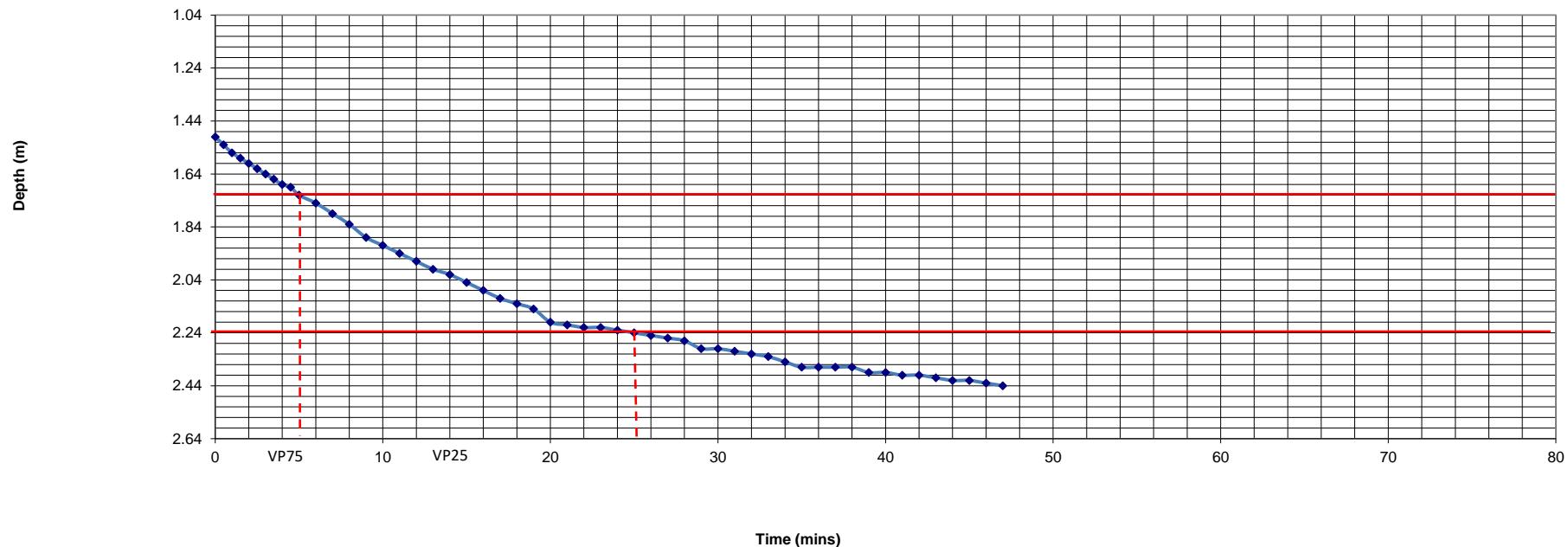
Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.45
0.5	30	1.48
1	60	1.51
1.5	90	1.53
2	120	1.56
2.5	150	1.6
3	180	1.62
3.5	210	1.64
4	240	1.66
4.5	270	1.68
5	300	1.69
6	360	1.72
7	420	1.75
8	480	1.79
9	540	1.83
10	600	1.88
11	660	1.91
12	720	1.94
13	780	1.97
14	840	2
15	900	2.02
16	960	2.05
17	1020	2.08
18	1080	2.11
19	1140	2.13
20	1200	2.15
21	1260	2.2
22	1320	2.21
23	1380	2.22
24	1440	2.22
25	1500	2.23

Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.45
0.5	30	1.48
1	60	1.5
1.5	90	1.52
2	120	1.54
2.5	150	1.56
3	180	1.58
3.5	210	1.6
4	240	1.61
4.5	270	1.63
5	300	1.64
6	360	1.68
7	420	1.7
8	480	1.73
9	540	1.76
10	600	1.79
11	660	1.82
12	720	1.86
13	780	1.88
14	840	1.91
15	900	1.93
16	960	1.96
17	1020	1.99
18	1080	2.03
19	1140	2.05
20	1200	2.07
21	1260	2.08
22	1320	2.11
23	1380	2.13
24	1440	2.14
25	1500	2.16

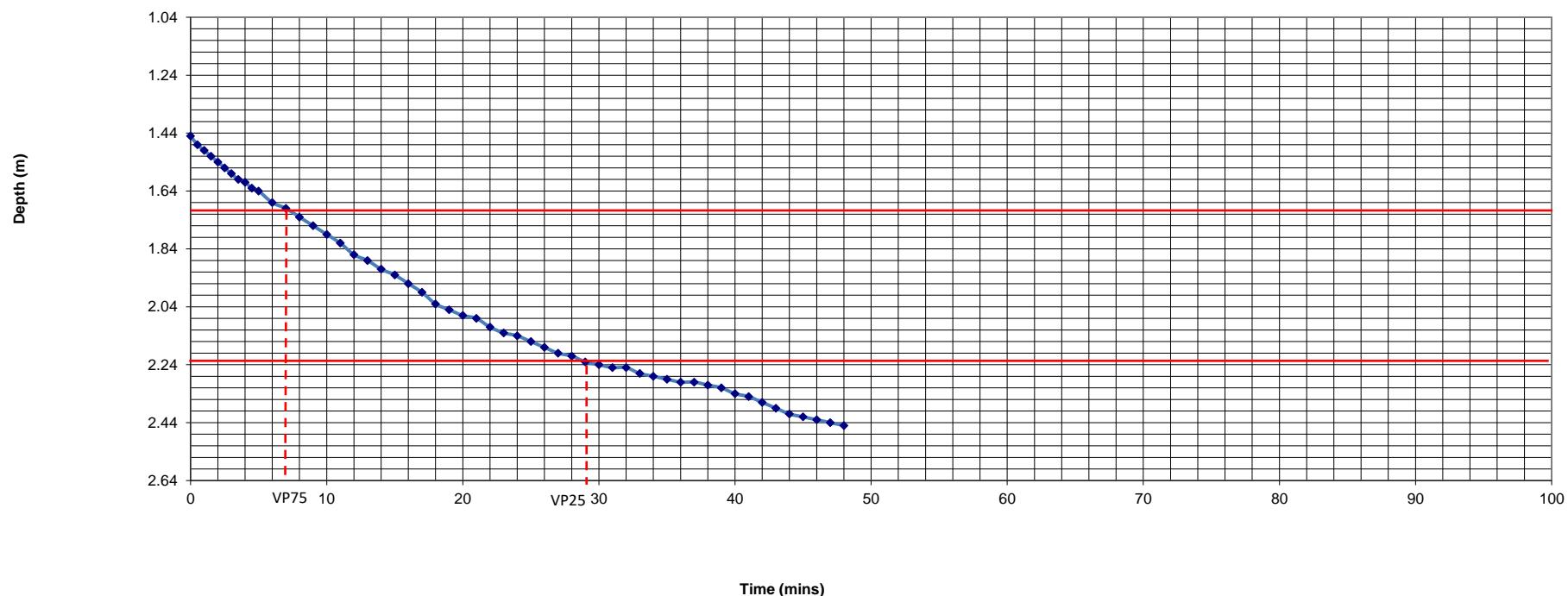
Coniston Crescent, Stourport - SA1 - Test 1



Coniston Crescent, Stourport - Soakaway 1 Test 2



Coniston Crescent, Stourport - Soakaway 1 Test 3



Soakaway 2 test 1
Width (m): 1.50
Length (m): 2.60
Depth (m): 2.33
Natural depth (m): 0.00
Depth (m) of Water at T = 0 1.30

Effective depth (m) 1.03
Vp25 (m) 0.258
Depth (mbgl) at Vp25 2.073
Vp75 (m) 0.773
Depth (mbgl) at Vp75 1.558
Vp50 (m) 0.52
Vp75/Vp25 (m^3) 2.009
Vp75/Vp25 (m^3) $^{0.3}$ 0.207
 $a_{50} (m^3)$ 8.12
t between vp75 to vp25(secs) 342
Soil infiltration (m/s) **7.46E-05**

Soakaway 2 test 2
Width (m): 1.50
Length (m): 2.60
Depth (m): 2.33
Natural depth (m): 0.00
Depth (m) of Water at T = 0 1.30

Effective depth (m) 1.03
Vp25 (m) 0.258
Depth (mbgl) at Vp25 2.073
Vp75 (m) 0.773
Depth (mbgl) at Vp75 1.558
Vp50 (m) 0.52
Vp75/Vp25 (m^3) 2.009
Vp75/Vp25 (m^3) $^{0.3}$ 0.236
 $a_{50} (m^3)$ 8.12
t between vp75 to vp25(secs) 426
Soil infiltration (m/s) **6.81E-05**

Soakaway 2 test 3
Width (m): 1.50
Length (m): 2.60
Depth (m): 2.33
Natural depth (m): 0.00
Depth (m) of Water at T = 0 1.30

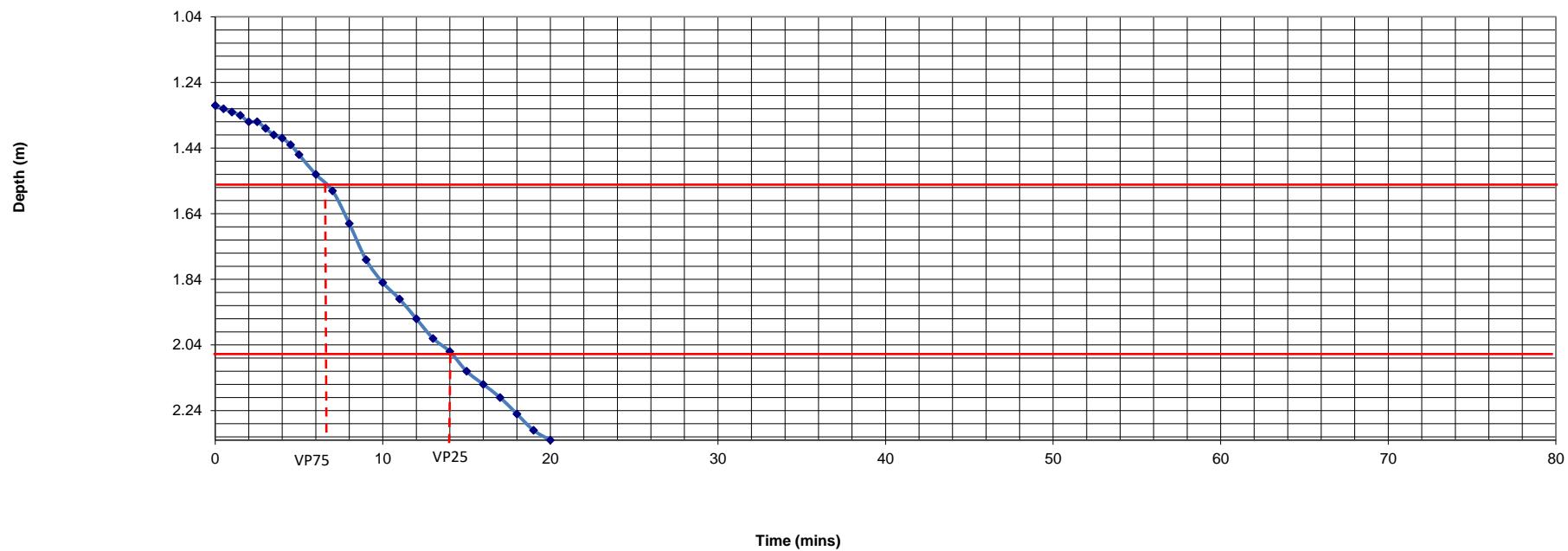
Effective depth (m) 1.03
Vp25 (m) 0.258
Depth (mbgl) at Vp25 2.073
Vp75 (m) 0.773
Depth (mbgl) at Vp75 1.558
Vp50 (m) 0.52
Vp75/Vp25 (m^3) 2.009
Vp75/Vp25 (m^3) $^{0.3}$ 0.289
 $a_{50} (m^3)$ 8.12
t between vp75 to vp25(secs) 390
Soil infiltration (m/s) **9.12E-05**

Trial 1		
Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.3
0.5	30	1.32
1	60	1.35
1.5	90	1.34
2	120	1.36
2.5	150	1.38
3	180	1.4
3.5	210	1.43
4	240	1.45
4.5	270	1.48
5	300	1.5
6	360	1.57
7	420	1.67
8	480	1.78
9	540	1.89
10	600	1.98
11	660	2.05
12	720	2.1
13	780	2.16
14	840	2.21
15	900	2.25
16	960	2.33

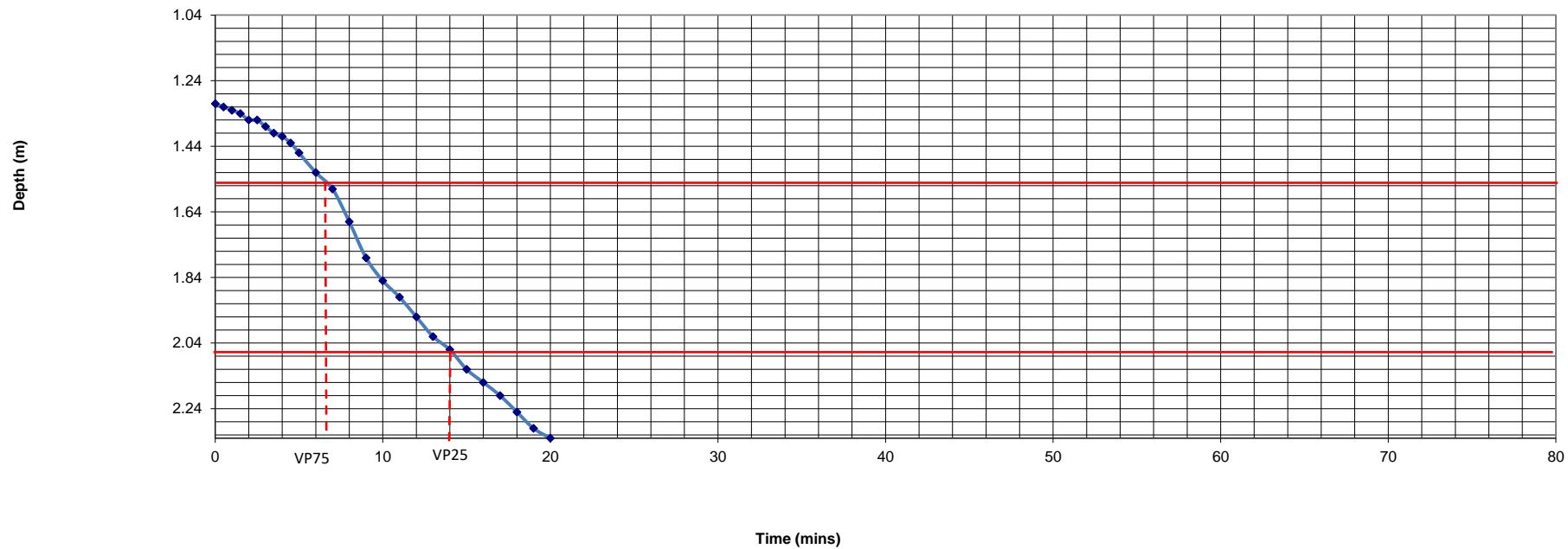
Trial 1		
Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.3
0.5	30	1.31
1	60	1.32
1.5	90	1.33
2	120	1.34
2.5	150	1.36
3	180	1.36
3.5	210	1.38
4	240	1.4
4.5	270	1.41
5	300	1.43
6	360	1.46
7	420	1.52
8	480	1.57
9	540	1.67
10	600	1.78
11	660	1.85
12	720	1.9
13	780	1.96
14	840	2.02
15	900	2.06
16	960	2.12
17	1020	2.16
18	1080	2.2
19	1140	2.25
20	1200	2.3
21	1260	2.33

Trial 1		
Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.3
0.5	30	1.31
1	60	1.32
1.5	90	1.33
2	120	1.35
2.5	150	1.35
3	180	1.36
3.5	210	1.37
4	240	1.37
4.5	270	1.36
5	300	1.4
6	360	1.43
7	420	1.47
8	480	1.56
9	540	1.66
10	600	1.74
11	660	1.81
12	720	1.86
13	780	1.92
14	840	1.97
15	900	2.02
16	960	2.07
17	1020	2.11
18	1080	2.15
19	1140	2.18
20	1200	2.22
21	1260	2.25
22	1320	2.27
23	1380	2.29
24	1440	2.31
25	1500	2.33

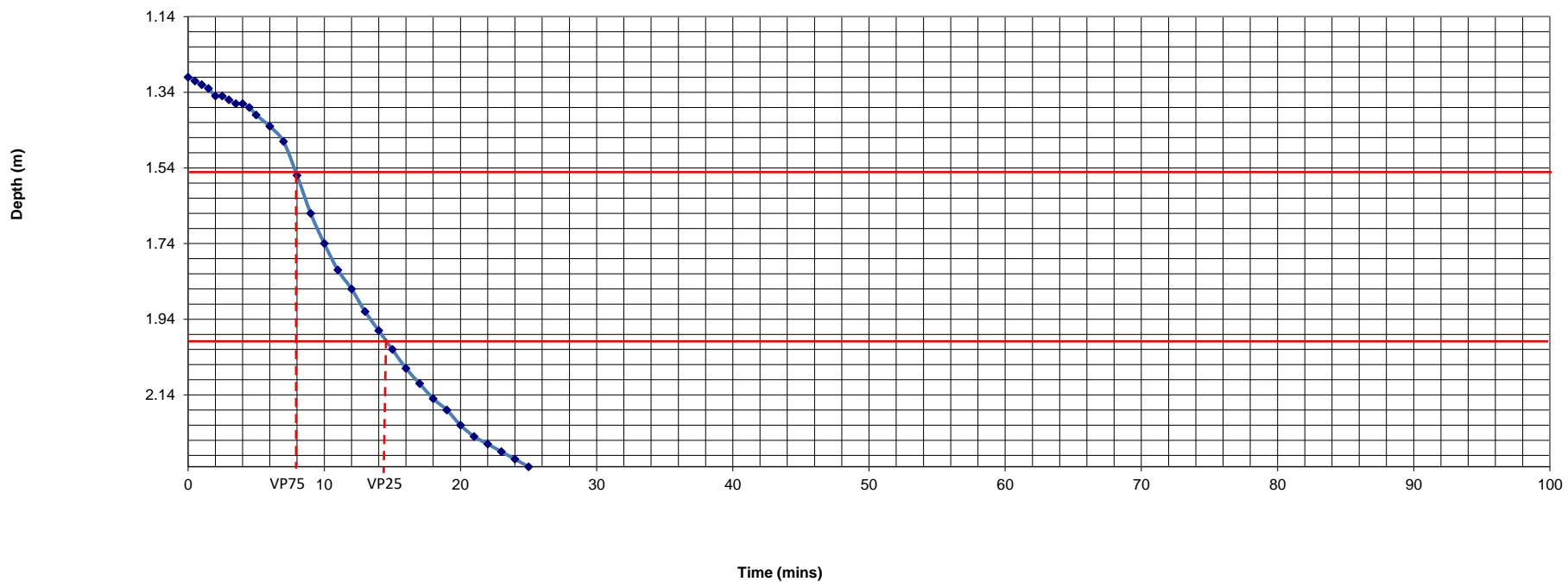
Coniston Crescent, Stourport - Soakaway 2 Test 2



Coniston Crescent, Stourport - Soakaway 2 Test 2



Coniston Crescent, Stourport - Soakaway 2 Test 3



Soakaway 3 test 1
Width (m): 0.65
Length (m): 2.50
Depth (m): 2.00
Natural depth (m): 0.00
Depth (m) of Water at T = 0 1.31

Effective depth (m) 0.69
Vp25 (m) 0.173
Depth (mbgl) at Vp25 1.828
Vp75 (m) 0.518
Depth (mbgl) at Vp75 1.483
Vp50 (m) 0.35
Vp75/Vp25 (m^3) 0.561
Vp75/Vp25 (m^3) $\times 0.3$ 0.207
 $a50 (m^3)$ 3.80
 t between vp75 to vp25(secs) 360
Soil infiltration (m/s) 1.52E-04

Soakaway 3 test 2
Width (m): 0.65
Length (m): 2.50
Depth (m): 2.00
Natural depth (m): 0.00
Depth (m) of Water at T = 0 0.91

Effective depth (m) 1.09
Vp25 (m) 0.273
Depth (mbgl) at Vp25 1.728
Vp75 (m) 0.818
Depth (mbgl) at Vp75 1.183
Vp50 (m) 0.55
Vp75/Vp25 (m^3) 0.886
Vp75/Vp25 (m^3) $\times 0.3$ 0.236
 $a50 (m^3)$ 5.06
 t between vp75 to vp25(secs) 804
Soil infiltration (m/s) 5.80E-05

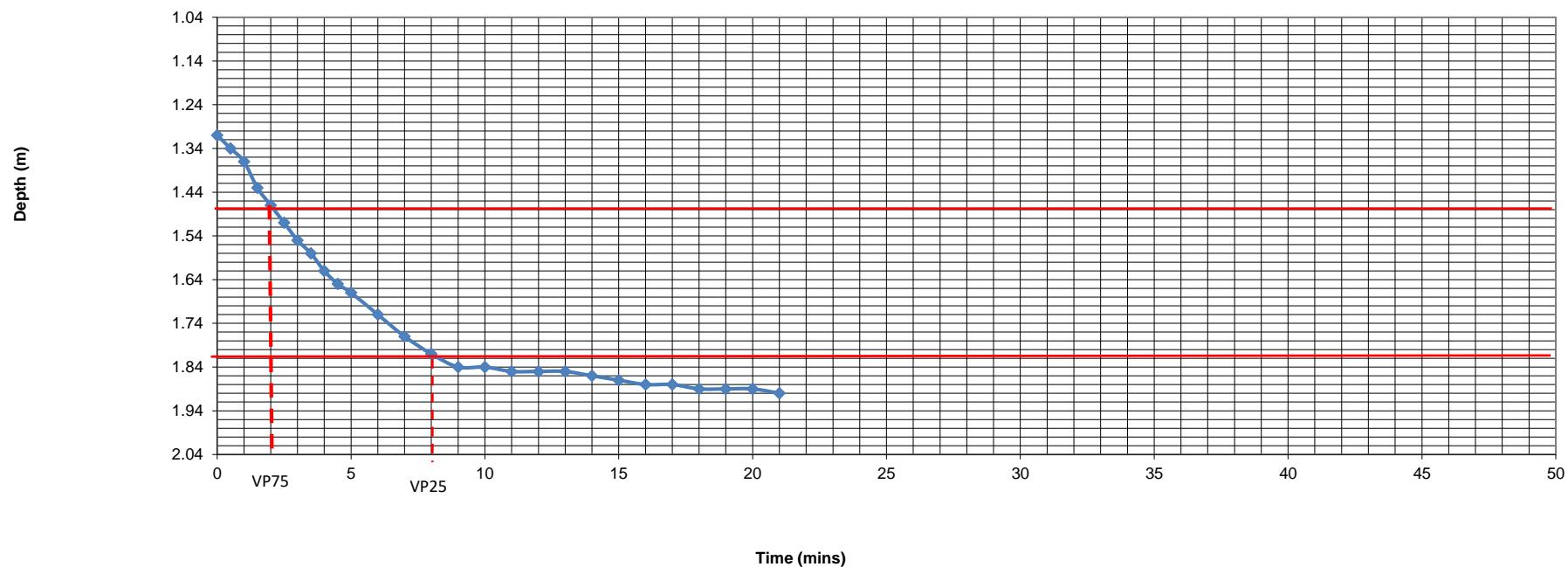
Soakaway 3 test 3
Width (m): 0.65
Length (m): 2.50
Depth (m): 2.00
Natural depth (m): 0.00
Depth (m) of Water at T = 0 0.90

Effective depth (m) 1.10
Vp25 (m) 0.275
Depth (mbgl) at Vp25 1.725
Vp75 (m) 0.825
Depth (mbgl) at Vp75 1.175
Vp50 (m) 0.55
Vp75/Vp25 (m^3) 0.894
Vp75/Vp25 (m^3) $\times 0.3$ 0.289
 $a50 (m^3)$ 5.09
 t between vp75 to vp25(secs) 1200
Soil infiltration (m/s) 4.73E-05

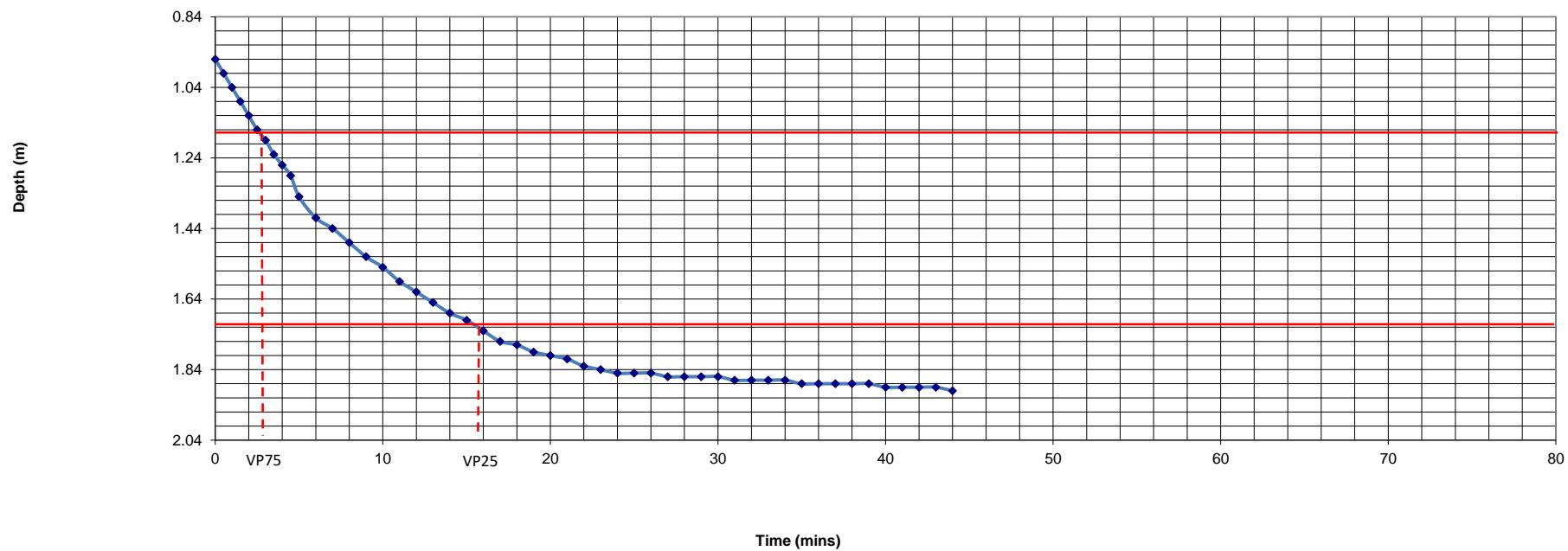
Trial 1

Time (mins)	Time (secs)	Depth (mbgl)	Trial 1	Time (mins)	Depth (mbgl)	Trial 1	Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.31	0	0	0.91	0	0	0.9	
0.5	30	1.34	0.5	30	0.96	0.5	30	0.94	
1	60	1.37	1	60	1	1	60	0.98	
1.5	90	1.43	1.5	90	1.04	1.5	90	1	
2	120	1.47	2	120	1.08	2	120	1.03	
2.5	150	1.51	2.5	150	1.12	2.5	150	1.06	
3	180	1.55	3	180	1.16	3	180	1.08	
3.5	210	1.58	3.5	210	1.19	3.5	210	1.1	
4	240	1.62	4	240	1.23	4	240	1.13	
4.5	270	1.65	4.5	270	1.26	4.5	270	1.16	
5	300	1.67	5	300	1.29	5	300	1.19	
6	360	1.72	6	360	1.35	6	360	1.23	
7	420	1.77	7	420	1.41	7	420	1.28	
8	480	1.81	8	480	1.44	8	480	1.33	
9	540	1.84	9	540	1.48	9	540	1.36	
10	600	1.84	10	600	1.52	10	600	1.39	
11	660	1.85	11	660	1.55	11	660	1.42	
12	720	1.85	12	720	1.59	12	720	1.46	
13	780	1.85	13	780	1.62	13	780	1.46	
14	840	1.86	14	840	1.65	14	840	1.51	
15	900	1.87	15	900	1.68	15	900	1.54	
16	960	1.88	16	960	1.7	16	960	1.57	
17	1020	1.88	17	1020	1.73	17	1020	1.59	
18	1080	1.89	18	1080	1.76	18	1080	1.62	
19	1140	1.89	19	1140	1.77	19	1140	1.65	
20	1200	1.89	20	1200	1.79	20	1200	1.64	
21	1260	1.9	21	1260	1.8	21	1260	1.65	
	22		22	1320	1.81	22	1320	1.66	
	23		23	1380	1.83	23	1380	1.68	
	24		24	1440	1.84	24	1440	1.7	
	25		25	1500	1.85	25	1500	1.72	
	26		26	1560	1.85	26	1560	1.73	
	27		27	1620	1.85	27	1620	1.74	
	28		28	1680	1.86	28	1680	1.76	
	29		29	1740	1.86	29	1740	1.78	
	30		30	1800	1.86	30	1800	1.8	
	31		31	1860	1.86	31	1860	1.8	
	32		32	1920	1.87	32	1920	1.81	
	33		33	1980	1.87	33	1980	1.82	
	34		34	2040	1.87	34	2040	1.82	
	35		35	2100	1.87	35	2100	1.83	
	36		36	2160	1.88	36	2160	1.83	
	37		37	2220	1.88	37	2220	1.84	
	38		38	2280	1.88	38	2280	1.84	
	39		39	2340	1.88	39	2340	1.84	
	40		40	2400	1.88	40	2400	1.85	
	41		41	2460	1.89	41	2460	1.85	
	42		42	2520	1.89	42	2520	1.85	
	43		43	2580	1.89	43	2580	1.86	
	44		44	2640	1.89	44	2640	1.86	
	45		45	2700	1.9	45	2700	1.87	
	46		46	2760		46	2760	1.87	
	47		47	2820		47	2820	1.87	
	48		48	2880		48	2880	1.87	
	49		49	2940		49	2940	1.87	
	50		50	3000		50	3000	1.88	
	51		51	3060		51	3060	1.88	
	52		52	3120		52	3120	1.89	
	53		53	3180		53	3180	1.89	
	54		54	3240		54	3240	1.89	
	55		55	3300		55	3300	1.9	

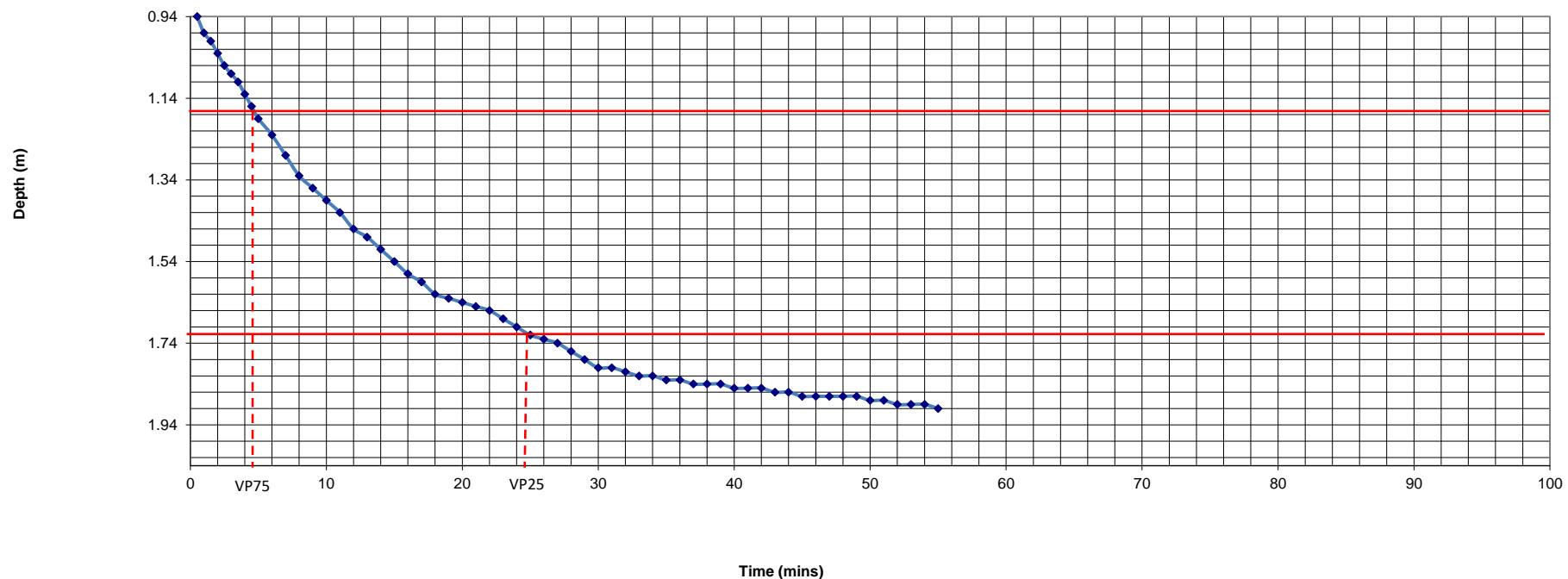
Coniston Crescent, Stourport - SA3 - Test 1



Coniston Crescent, Stourport - Soakaway 3 Test 2



Coniston Crescent, Stourport - Soakaway 3 Test 3



Soakaway 4 test 1

Width (m):	0.70
Length (m):	2.10
Depth (m):	2.04
Natural depth (m):	0.00
Depth (m) of Water at T = 0	1.10

Effective depth (m)	0.94
Vp25 (m)	0.235
Depth (mbgl) at Vp25	1.805
Vp75 (m)	0.705
Depth (mbgl) at Vp75	1.335
Vp50 (m)	0.47
Vp75/Vp25 (m^3)	0.691
Vp75/Vp25 (m^3) ^{0.3}	0.207
a50 (m^3)	4.10
t between vp75 to vp25(secs)	1164
Soil infiltration (m/s)	4.34E-05

Soakaway 4 test 2

Width (m):	0.70
Length (m):	2.10
Depth (m):	2.04
Natural depth (m):	0.00
Depth (m) of Water at T = 0	0.97

Effective depth (m)	1.07
Vp25 (m)	0.268
Depth (mbgl) at Vp25	1.773
Vp75 (m)	0.803
Depth (mbgl) at Vp75	1.238
Vp50 (m)	0.54
Vp75/Vp25 (m^3)	0.786
Vp75/Vp25 (m^3) ^{0.3}	0.236
a50 (m^3)	4.47
t between vp75 to vp25(secs)	938
Soil infiltration (m/s)	2.72E-05

Soakaway 4 test 3

Width (m):	0.70
Length (m):	2.10
Depth (m):	2.04
Natural depth (m):	0.00
Depth (m) of Water at T = 0	1.01

Effective depth (m)	1.03
Vp25 (m)	0.258
Depth (mbgl) at Vp25	1.783
Vp75 (m)	0.773
Depth (mbgl) at Vp75	1.268
Vp50 (m)	0.52
Vp75/Vp25 (m^3)	0.757
Vp75/Vp25 (m^3) ^{0.3}	0.289
a50 (m^3)	4.35
t between vp75 to vp25(secs)	2388
Soil infiltration (m/s)	2.81E-05

Trial 1

Time (mins)	Time (secs)	Depth (mbgl)
0	0	1.1
0.5	30	1.12
1	60	1.14
1.5	90	1.17
2	120	1.2
2.5	150	1.24
3	180	1.26
3.5	210	1.28
4	240	1.3
4.5	270	1.3
5	300	1.345
6	360	1.39
7	420	1.43
8	480	1.47
9	540	1.5
10	600	1.52
11	660	1.565
12	720	1.58
13	780	1.59
14	840	1.63
15	900	1.65
16	960	1.68
17	1020	1.695
18	1080	1.71
19	1140	1.725
20	1200	1.74
21	1260	1.75
22	1320	1.77
23	1380	1.785
24	1440	1.8
25	1500	1.82
26	1560	1.84
27	1620	1.85
28	1680	1.86
29	1740	1.88
30	1800	1.9
32	1920	1.92
34	2040	1.94
36	2160	1.96
38	2280	1.98
40	2400	1.99
41	2460	2.01
42	2520	2.02
43	2580	2.03
44,46	2667.6	2.04

Trial 1

Time (mins)

Time (secs)

Depth (mbgl)

Trial 1

Time (mins)

Time (secs)

Depth (mbgl)

Trial 1

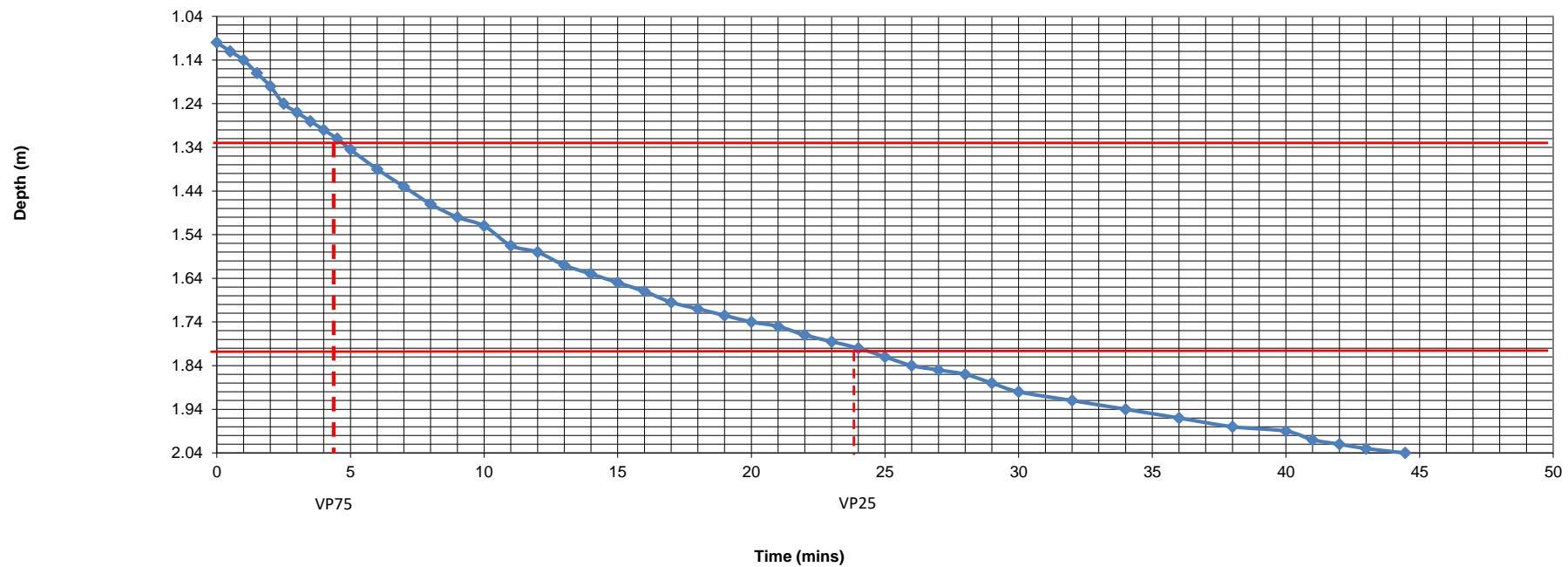
Time (mins)

Time (secs)

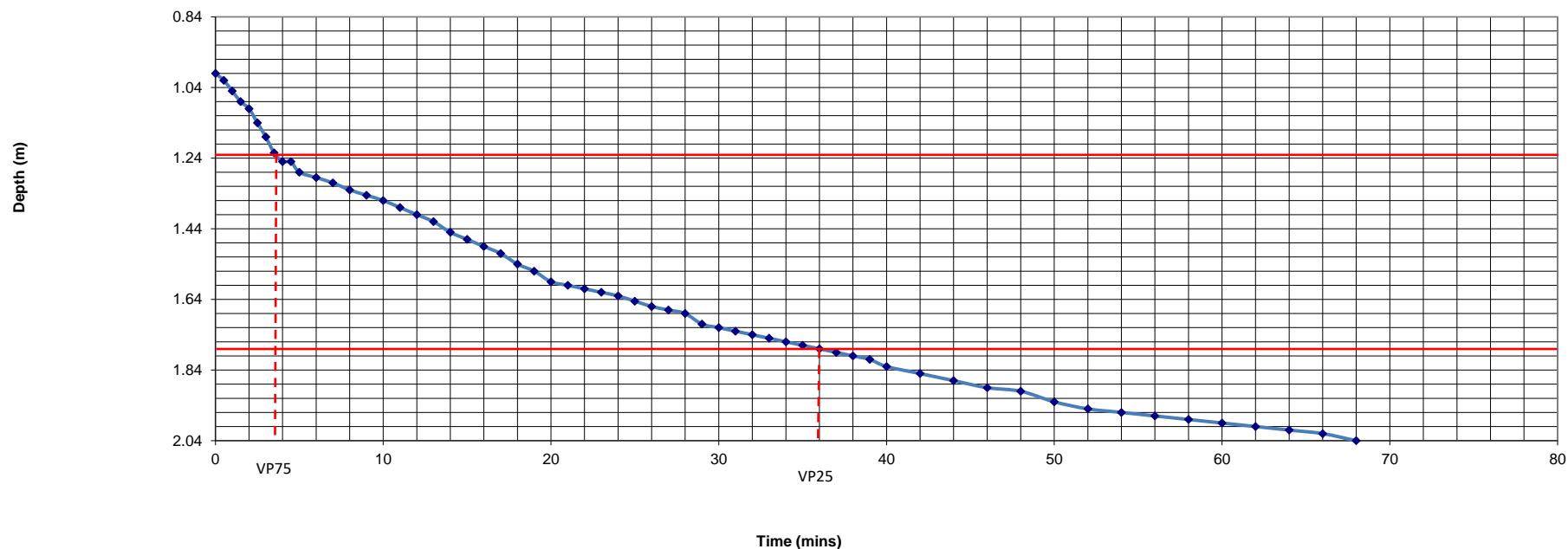
Depth (mbgl)

Time (mins)	Time (secs)	Depth (mbgl)	Time (mins)	Time (secs)	Depth (mbgl)
0	0	0.97	0	0	1.01
0.5	30	1	0.5	30	1.03
1	60	1.02	1	60	1.06
1.5	90	1.05	1.5	90	1.08
2	120	1.08	2	120	1.09
2.5	150	1.1	2.5	150	1.11
3	180	1.14	3	180	1.13
3.5	210	1.18	3.5	210	1.15
4	240	1.225	4	240	1.17
4.5	270	1.25	4.5	270	1.16
5	300	1.25	5	300	1.2
6	360	1.28	6	360	1.23
7	420	1.295	7	420	1.25
8	480	1.31	8	480	1.27
9	540	1.33	9	540	1.295
10	600	1.345	10	600	1.32
11	660	1.36	11	660	1.35
12	720	1.38	12	720	1.37
13	780	1.39	13	780	1.39
14	840	1.42	14	840	1.41
15	900	1.45	15	900	1.43
16	960	1.47	16	960	1.45
17	1020	1.49	17	1020	1.47
18	1080	1.51	18	1080	1.49
19	1140	1.54	19	1140	1.525
20	1200	1.56	20	1200	1.52
21	1260	1.59	21	1260	1.53
22	1320	1.6	22	1320	1.55
23	1380	1.61	23	1380	1.56
24	1440	1.62	24	1440	1.575
25	1500	1.63	25	1500	1.59
26	1560	1.645	26	1560	1.6
27	1620	1.66	27	1620	1.61
28	1680	1.67	28	1680	1.62
29	1740	1.68	29	1740	1.63
30	1800	1.71	30	1800	1.64
32	1920	1.72	31	1860	1.65
34	2040	1.73	32	1920	1.66
36	2160	1.74	33	1980	1.67
38	2280	1.75	34	2040	1.675
40	2400	1.76	35	2100	1.68
41	2460	1.77	36	2160	1.69
42	2520	1.78	37	2220	1.7
43	2580	1.79	38	2280	1.71
44,46	2667.6	1.8	39	2340	1.72
40	2400	1.81	40	2400	1.73
42	2520	1.83	41	2460	1.74
44	2640	1.85	42	2520	1.75
46	2760	1.87	43	2580	1.76
48	2880	1.89	44	2640	1.765
50	3000	1.9	45	2700	1.77
52	3120	1.93	46	2760	1.775
54	3240	1.95	47	2820	1.78
56	3360	1.96	48	2880	1.79
58	3480	1.97	49	2940	1.795
60	3600	1.98	50	3000	1.8
62	3720	1.99	51	3060	1.805
64	3840	2	52	3120	1.81
66	3960	2.01	53	3180	1.81
68	4080	2.02	54	3240	1.815
70,24	4214.4	2.04	55	3300	1.82
56	3600	1.99	56	3360	1.825
57	3420	1.98	57	3420	1.83
58	3480	1.98	58	3540	1.845
59	3540	1.98	59	3600	1.85
60	3600	1.98	60	3720	1.86
64	3840	1.97	64	3840	1.87
66	3960	1.96	66	3960	1.86
68	4080	1.95	68	4080	1.89
70	4200	1.94	70	4200	1.9
72	4320	1.92	72	4320	1.92
74	4440	1.94	74	4440	1.94
76	4560	1.95	76	4560	1.95
78	4680	1.96	78	4680	1.96
80	4800	1.98	80	4800	1.98
82	4920	2	82	4920	2
84	5040	2.01	84	5040	2.01
86	5160	2.03	86	5160	2.03
87,56	5253.6	2.04	87,56	5253.6	2.04

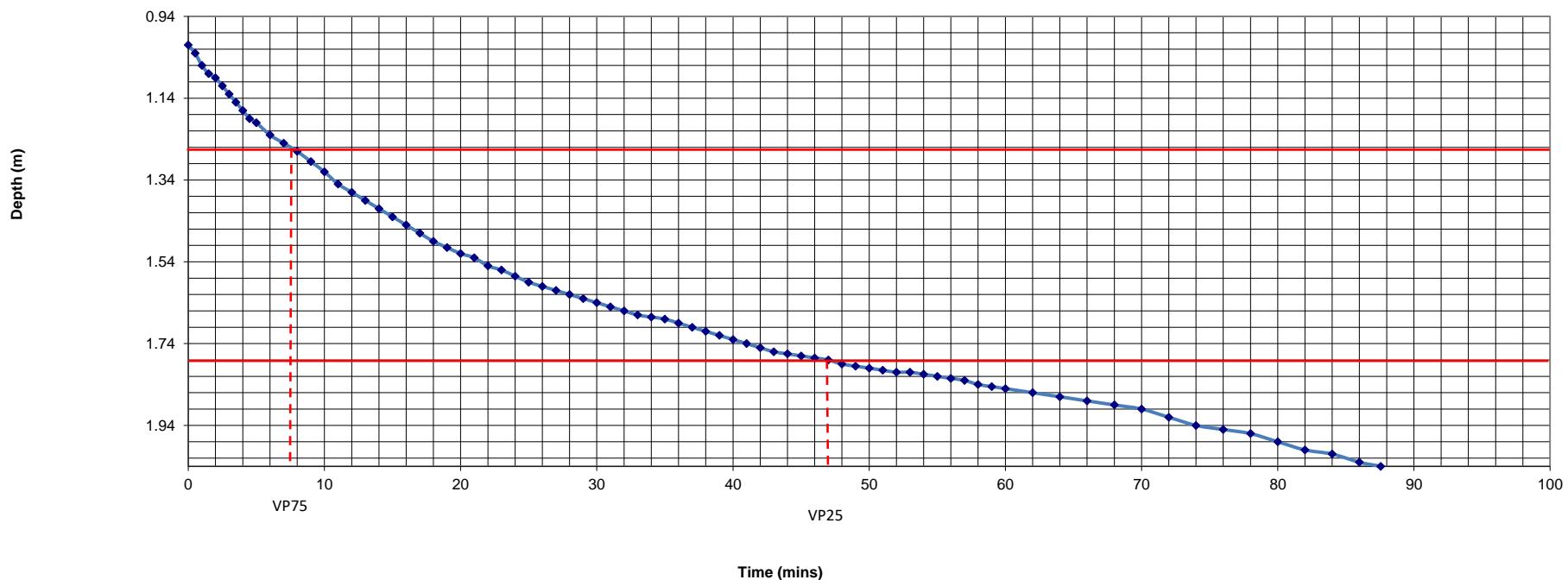
Coniston Crescent, Stourport - SA4 - Test 1



Coniston Crescent, Stourport - Soakaway 4 Test 2



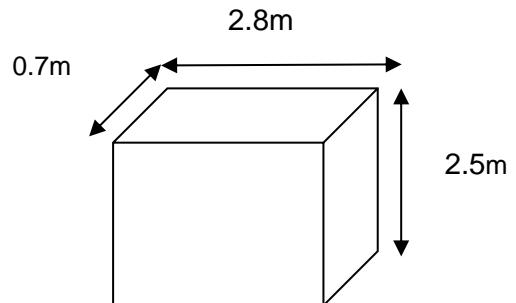
Coniston Crescent- Soakaway Test - S3



In-situ Soakaway Test Record – Test No: SA1 – Test 1

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit	NOTES: Light showers/overcast weather conditions Spalling of trial pit walls Pit was dry during excavation		
Width of pit:	0.7m			
Length of pit:	2.8m			
Depth of pit:	2.5m			
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	1.45m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.45	Topsoil.
0.45 – 0.85	Light brown slightly gravelly SAND.
0.85 – 1.5	Red- brown gravelly SAND.
1.50 – 2.50	Light orange- brown slightly gravelly SAND



Water Level Records

Time (mins)	Depth to Water (mbgl)
0	1.45
0.5	1.48
1	1.51
1.5	1.53
2	1.56
2.5	1.62
3	1.64
3.5	1.66
4	1.69
4.5	1.7
5	1.73
6	1.79
7	1.85
8	1.91
9	1.95
10	2
11	2.05
12	2.09
13	2.13
14	2.17
15	2.22

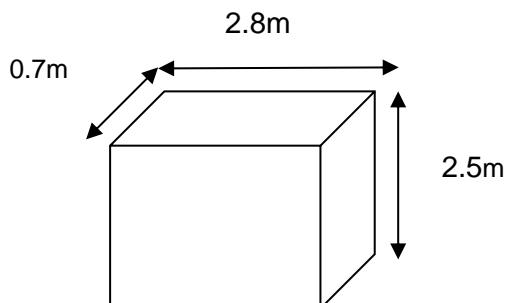
Time (mins)	Depth to Water (mbgl)
16	2.28
17	2.32
18	2.33
19	2.35
20	2.36
21	2.37
22	2.38
23	2.39
24	2.4
25	2.4
26	2.4
27	2.4
28	2.41
29	2.41
30	2.41
31	2.42
32	2.42
33	2.42
34	2.42
35	2.42
36	2.43

Time (mins)	Depth to Water (mbgl)
37	2.43
38	2.43
39	2.43
40	2.43
41	2.43
42	2.43
43	2.43
44	2.43
45	2.44

In-situ Soakaway Test Record – Test No: SA1 – Test 2

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
	Type of Test:	Pit	NOTES:	
	Width of pit:	0.7m	Light showers/overcast weather conditions	
	Length of pit:	2.8m	Spalling of trial pit walls	
	Depth of pit:	2.5m	Pit was dry during excavation	
	Standing Water Level Prior to Test:	None		
	Depth of Water at T = 0 (below ground level):	1.46m		
	Infilled with gravel? (Y/N)	Y		

Depth (mbgl)	Strata
0 – 0.45	Topsoil.
0.45 – 0.85	Light brown slightly gravelly SAND.
0.85 – 1.5	Red- brown gravelly SAND.
1.50 – 2.50	Light orange- brown slightly gravelly SAND



Water Level Records

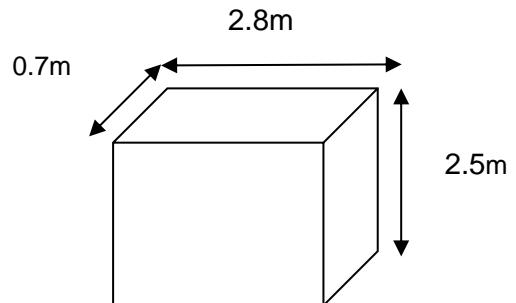
Time (mins)	Depth to Water (mbgl)
0	1.46
0.5	1.5
1	1.53
1.5	1.56
2	1.58
2.5	1.6
3	1.62
3.5	1.64
4	1.66
4.5	1.68
5	1.69
6	1.72
7	1.75
8	1.79
9	1.83
10	1.88
11	1.91
12	1.94
13	1.97
14	2
15	2.02

Time (mins)	Depth to Water (mbgl)
16	2.05
17	2.08
18	2.11
19	2.13
20	2.15
21	2.2
22	2.21
23	2.22
24	2.22
25	2.23
26	2.24
27	2.25
28	2.26
29	2.27
30	2.3
31	2.3
32	2.31
33	2.32
34	2.33
35	2.35
36	2.37

In-situ Soakaway Test Record – Test No: SA1 – Test 3

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit	NOTES: Light showers/overcast weather conditions Spalling of trial pit walls Pit was dry during excavation		
Width of pit:	0.7m			
Length of pit:	2.8m			
Depth of pit:	2.5m			
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	1.45m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.45	Topsoil.
0.45 – 0.85	Light brown slightly gravelly SAND.
0.85 – 1.5	Red- brown gravelly SAND.
1.50 – 2.50	Light orange- brown slightly gravelly SAND



Water Level Records

Time (mins)	Depth to Water (mbgl)
0	1.45
0.5	1.48
1	1.5
1.5	1.52
2	1.54
2.5	1.56
3	1.58
3.5	1.6
4	1.61
4.5	1.63
5	1.64
6	1.68
7	1.7
8	1.73
9	1.76
10	1.79
11	1.82
12	1.86
13	1.88
14	1.91
15	1.93

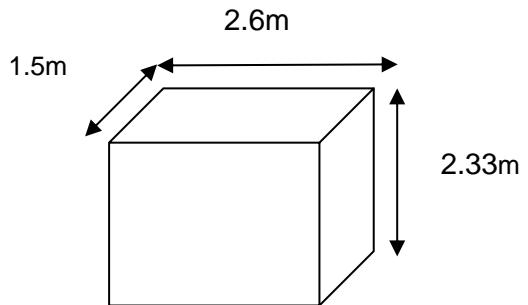
Time (mins)	Depth to Water (mbgl)
16	1.96
17	1.99
18	2.03
19	2.05
20	2.07
21	2.08
22	2.11
23	2.13
24	2.14
25	2.16
26	2.18
27	2.2
28	2.21
29	2.23
30	2.24
31	2.25
32	2.25
33	2.27
34	2.28
35	2.29
36	2.30

Time (mins)	Depth to Water (mbgl)
37	2.30
38	2.31
39	2.32
40	2.34
41	2.35
42	2.37
43	2.39
44	2.41
45	2.42
46	2.43
47	2.44
48	2.45

In-situ Soakaway Test Record – Test No: SA2 – Test 1

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit	NOTES:		
Width of pit:	1.5m	Light showers/overcast weather conditions		
Length of pit:	2.60m	Spalling of trial pit walls		
Depth of pit:	2.33m	Pit was dry during excavation		
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	1.3m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.2	Topsoil.
0.5 – 0.7	Made Ground.
0.7 – 1.00	Orange- brown gravelly SAND.
1.00 – 2.30	Orange- brown slightly gravelly SAND



Water Level Records

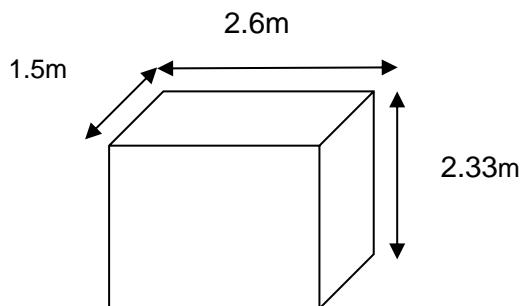
Time (mins)	Depth to Water (mbgl)
0	1.3
0.5	1.32
1	1.33
1.5	1.34
2	1.36
2.5	1.38
3	1.40
3.5	1.43
4	1.45
4.5	1.48
5	1.50
6	1.57
7	1.67
8	1.78
9	1.89
10	1.98
11	2.05
12	2.10
13	2.16
14	2.21
15	2.25

Time (mins)	Depth to Water (mbgl)
16	2.33
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
32	
34	
36	
38	
40	
41	

In-situ Soakaway Test Record – Test No: SA2 – Test 2

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test: Pit Width of pit: 1.5m Length of pit: 2.60m Depth of pit: 2.33m Standing Water Level Prior to Test: None Depth of Water at T = 0 (below ground level): 1.3m Infilled with gravel? (Y/N) Y		NOTES: Light showers/overcast weather conditions Spalling of trial pit walls Pit was dry during excavation		

Depth (mbgl)	Strata
0 – 0.2	Topsoil.
0.5 – 0.7	Made Ground.
0.7 – 1.00	Orange- brown gravelly SAND.
1.00 – 2.30	Orange- brown slightly gravelly SAND



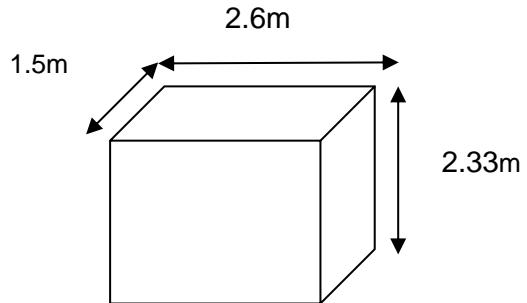
Water Level Records

Time (mins)	Depth to Water (mbgl)
0	1.30
0.5	1.31
1	1.32
1.5	1.33
2	1.34
2.5	1.36
3	1.36
3.5	1.38
4	1.40
4.5	1.41
5	1.43
6	1.46
7	1.52
8	1.57
9	1.67
10	1.78
11	1.85
12	1.90
13	1.96
14	2.02
15	2.06

In-situ Soakaway Test Record – Test No: SA2 – Test 3

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test: Pit Width of pit: 1.5m Length of pit: 2.60m Depth of pit: 2.33m Standing Water Level Prior to Test: Depth of Water at T = 0 (below ground level): Infilled with gravel? (Y/N)		NOTES: Light showers/overcast weather conditions Spalling of trial pit walls Pit was dry during excavation		

Depth (mbgl)	Strata
0 – 0.2	Topsoil.
0.5 – 0.7	Made Ground.
0.7 – 1.00	Orange- brown gravelly SAND.
1.00 – 2.30	Orange- brown slightly gravelly SAND



Water Level Records

Time (mins)	Depth to Water (mbgl)
0	1.30
0.5	1.31
1	1.32
1.5	1.33
2	1.35
2.5	1.35
3	1.36
3.5	1.37
4	1.37
4.5	1.38
5	1.40
6	1.43
7	1.47
8	1.56
9	1.66
10	1.74
11	1.81
12	1.86
13	1.92
14	1.97
15	2.02

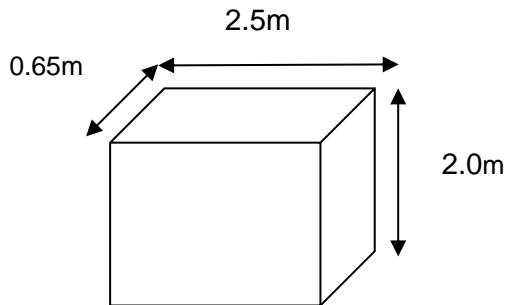
Time (mins)	Depth to Water (mbgl)
16	2.07
17	2.11
18	2.15
19	2.18
20	2.22
21	2.25
22	2.27
23	2.29
24	2.31
25	2.33

Time (mins)	Depth to Water (mbgl)
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In-situ Soakaway Test Record – Test No: SA3 – Test 1

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit	NOTES:		
Width of pit:	0.65m	Light showers/overcast weather conditions		
Length of pit:	2.50m	Spalling of trial pit walls		
Depth of pit:	1.91m	Pit was dry during excavation		
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	0.90m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.5	Topsoil.
0.5 – 1.3	Red brown gravelly SAND.
1.3 – 2.0	Light brown slightly cobbly gravelly SAND.



Water Level Records

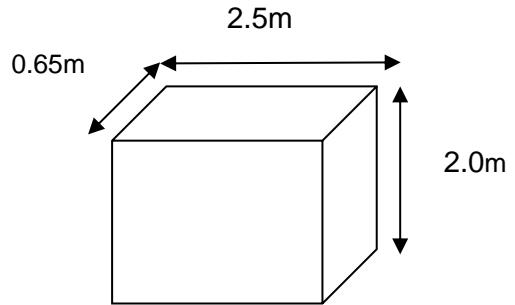
Time (mins)	Depth to Water (mbgl)
0	1.31
0.5	1.34
1	1.37
1.5	1.43
2	1.47
2.5	1.51
3	1.55
3.5	1.58
4	1.62
4.5	1.65
5	1.67
6	1.72
7	1.77
8	1.81
9	1.84
10	1.84
11	1.85
12	1.85
13	1.85
14	1.86
15	1.87

Time (mins)	Depth to Water (mbgl)
16	1.88
17	1.88
18	1.89
19	1.89
20	1.89
21	1.90
22	
23	
24	
25	
26	
27	
28	
29	
30	
32	
34	
36	
38	
40	
41	

In-situ Soakaway Test Record – Test No: SA3 – Test 2

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit		NOTES: Light showers/overcast weather conditions Spalling of trial pit walls Pit was dry during excavation	
Width of pit:	0.65m			
Length of pit:	2.50m			
Depth of pit:	1.91m			
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	0.90m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.5	Topsoil.
0.5 – 1.3	Red brown gravelly SAND.
1.3 – 2.0	Light brown slightly cobbly gravelly SAND.



Water Level Records

Time (mins)	Depth to Water (mbgl)
0	0.91
0.5	0.96
1	1.00
1.5	1.04
2	1.08
2.5	1.12
3	1.16
3.5	1.19
4	1.23
4.5	1.26
5	1.29
6	1.35
7	1.41
8	1.44
9	1.48
10	1.52
11	1.55
12	1.59
13	1.62
14	1.65
15	1.68

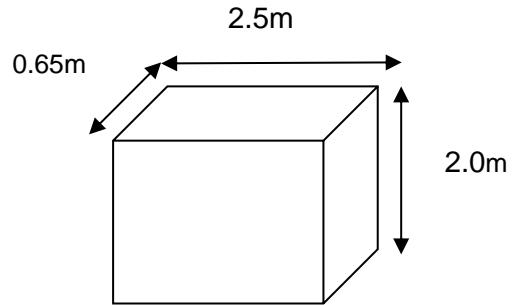
Time (mins)	Depth to Water (mbgl)
16	1.70
17	1.73
18	1.76
19	1.77
20	1.79
21	1.80
22	1.81
23	1.83
24	1.84
25	1.85
26	1.85
27	1.85
28	1.86
29	1.86
30	1.86
31	1.86
32	1.87
33	1.87
34	1.87
35	1.87
36	1.88

Time (mins)	Depth to Water (mbgl)
37	1.88
38	1.88
39	1.88
40	1.88
41	1.89
42	1.89
43	1.89
44	1.89
45	1.90

In-situ Soakaway Test Record – Test No: SA3 – Test 3

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit	NOTES: Light showers/overcast weather conditions Spalling of trial pit walls Pit was dry during excavation		
Width of pit:	0.65m			
Length of pit:	2.50m			
Depth of pit:	1.91m			
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	0.90m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.5	Topsoil.
0.5 – 1.3	Red brown gravelly SAND.
1.3 – 2.0	Light brown slightly cobbly gravelly SAND.



Water Level Records

Time (mins)	Depth to Water (mbgl)
0	0.9
0.5	0.94
1	0.98
1.5	1.00
2	1.03
2.5	1.06
3	1.08
3.5	1.10
4	1.13
4.5	1.16
5	1.19
6	1.23
7	1.28
8	1.33
9	1.36
10	1.39
11	1.42
12	1.46
13	1.48
14	1.51
15	1.54

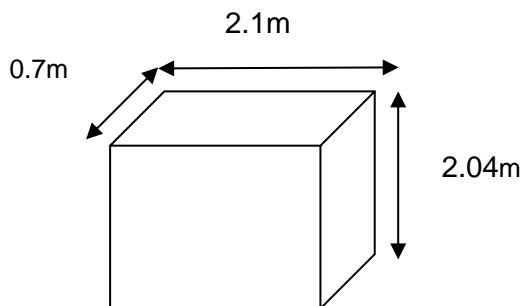
Time (mins)	Depth to Water (mbgl)
16	1.57
17	1.59
18	1.62
19	1.63
20	1.64
21	1.65
22	1.66
23	1.68
24	1.70
25	1.72
26	1.73
27	1.74
28	1.76
29	1.78
30	1.80
31	1.80
32	1.81
33	1.82
34	1.82
35	1.83
36	1.83

Time (mins)	Depth to Water (mbgl)
37	1.84
38	1.84
39	1.84
40	1.85
41	1.85
42	1.85
43	1.86
44	1.86
45	1.87
46	1.87
47	1.87
48	1.87
49	1.87
50	1.88
51	1.88
52	1.89
53	1.89
54	1.89
55	1.90

In-situ Soakaway Test Record – Test No: SA4 – Test 1

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test:	Pit	NOTES:		
Width of pit:	0.7m	Light showers/overcast weather conditions		
Length of pit:	2.1m	Slight spalling of trial pit walls		
Depth of pit:	2.04m	Pit was dry during excavation		
Standing Water Level Prior to Test:	None			
Depth of Water at T = 0 (below ground level):	1.10m			
Infilled with gravel? (Y/N)	Y			

Depth (mbgl)	Strata
0 – 0.4	Topsoil.
0.4 – 2.04	Orange brown gravelly SAND.



Water Level Records

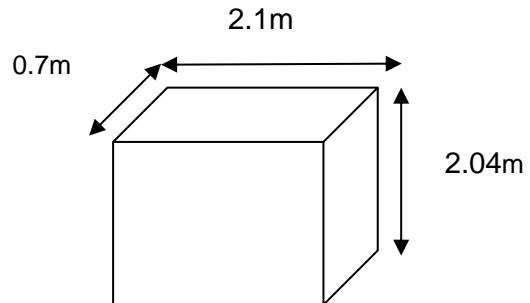
Time (mins)	Depth to Water (mbgl)
0	1.10
0.5	1.12
1	1.14
1.5	1.17
2	1.20
2.5	1.24
3	1.26
3.5	1.28
4	1.30
4.5	1.32
5	1.345
6	1.39
7	1.43
8	1.47
9	1.50
10	1.52
11	1.565
12	1.58
13	1.61
14	1.63
15	1.65

Time (mins)	Depth to Water (mbgl)
16	1.68
17	1.695
18	1.71
19	1.725
20	1.74
21	1.75
22	1.77
23	1.785
24	1.80
25	1.82
26	1.84
27	1.85
28	1.86
29	1.88
30	1.90
32	1.92
34	1.94
36	1.96
38	1.98
40	1.99
41	2.01

In-situ Soakaway Test Record – Test No: SA4 – Test 2

SITE	Coniston Crescent, Stourport		DATE	12/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test: Width of pit: Length of pit: Depth of pit: Standing Water Level Prior to Test: Depth of Water at T = 0 (below ground level): Infilled with gravel? (Y/N)	Pit 0.7m 2.1m 2.04m None 0.97m Y	NOTES: Light showers/overcast weather conditions Slight spalling of trial pit walls Pit was dry during excavation		

Depth (mbgl)	Strata
0 – 0.4	Topsoil.
0.4 – 2.04	Orange brown gravelly SAND.



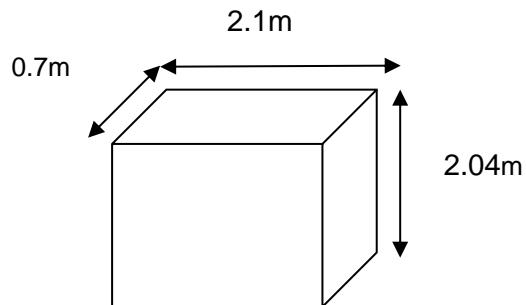
Water Level Records

Time (mins)	Depth to Water (mbgl)	Time (mins)	Depth to Water (mbgl)	Time (mins)	Depth to Water (mbgl)
0	0.97	16	1.49	37	1.78
0.5	1.00	17	1.51	38	1.79
1	1.02	18	1.54	39	1.80
1.5	1.05	19	1.56	40	1.81
2	1.08	20	1.59	42	1.83
2.5	1.10	21	1.60	44	1.85
3	1.14	22	1.61	46	1.87
3.5	1.18	23	1.62	48	1.89
4	1.225	24	1.63	50	1.90
4.5	1.25	25	1.645	52	1.93
5	1.28	26	1.66	54	1.95
6	1.295	27	1.67	56	1.96
7	1.31	28	1.68	58	1.97
8	1.33	29	1.69	60	1.98
9	1.345	30	1.71	62	1.99
10	1.36	31	1.72	64	2.00
11	1.38	32	1.73	66	2.01
12	1.40	33	1.74	68	2.02
13	1.42	34	1.75	70.24	2.04
14	1.45	35	1.76		
15	1.47	36	1.77		

In-situ Soakaway Test Record – Test No: SA4 – Test 3

SITE	Coniston Crescent, Stourport		DATE	13/10/2020
CLIENT	Taylor Wimpey West Midlands		JOB NO.	20088
Type of Test: Width of pit: Length of pit: Depth of pit: Standing Water Level Prior to Test: Depth of Water at T = 0 (below ground level): Infilled with gravel? (Y/N)	Pit 0.7m 2.1m 2.04m None 1.01m Y	NOTES: Light showers/overcast weather conditions Slight spalling of trial pit walls Pit was dry during excavation		

Depth (mbgl)	Strata
0 – 0.4	Topsoil.
0.4 – 2.04	Orange brown gravelly SAND.



Water Level Records

Time (mins)	Depth to Water (mbgl)						
0	1.01	16	1.45	37	1.70	58	1.84
0.5	1.03	17	1.47	38	1.71	59	1.845
1	1.06	18	1.49	39	1.72	60	1.85
1.5	1.08	19	1.505	40	1.73	62	1.86
2	1.09	20	1.52	41	1.74	64	1.87
2.5	1.11	21	1.53	42	1.75	66	1.88
3	1.13	22	1.55	43	1.76	68	1.89
3.5	1.15	23	1.56	44	1.765	70	1.90
4	1.17	24	1.575	45	1.77	72	1.92
4.5	1.19	25	1.59	46	1.775	74	1.94
5	1.20	26	1.60	47	1.78	76	1.95
6	1.23	27	1.61	48	1.79	78	1.96
7	1.25	28	1.62	49	1.795	80	1.98
8	1.27	29	1.63	50	1.80	82	2.00
9	1.295	30	1.64	51	1.805	84	2.01
10	1.32	31	1.65	52	1.81	86	2.03
11	1.35	32	1.66	53	1.81	87.56	2.04
12	1.37	33	1.67	54	1.815		
13	1.39	34	1.675	55	1.82		
14	1.41	35	1.68	56	1.825		
15	1.43	36	1.69	57	1.83		

APPENDIX 9
Ground Gas and Groundwater Monitoring Results

RECORD OF MEASUREMENTS FOR GAS MONITORING BOREHOLES

Client Name: Taylor Wimpey West Midlands

Date of Sampling: 9/10/2020

Site Name: Stourport Sixth Form, Stourport

Job Number: 20088

Borehole Reference	Borehole Flow (l/hr)	Methane	Carbon Dioxide	Oxygen (% by volume)	Balance (% by volume)	Sample Type	Borehole Pressure (mb)	Depth (m bgl)	
		(% by volume)	(% by volume)					Borehole	Water
DS02	-0.0	0.0	1.6	19.5	78.8	Accumulated	0.02	5.44	DRY
DS05	-0.0	0.0	1.0	19.9	79.1	Accumulated	-0.03	2.44	
DS06	0.0	0.1	10	20.2	78.8	Accumulated	0.07	2.41	DRY
DS04	-0.0	0.1	0.9	20.4	78.6	Accumulated	-0.12	4.34	DRY
DS01	0.0	0.3	0.1	21.4	78.4	Accumulated	0.0	5.14	DRY
Atmospheric Pressure: 1001		Instrument Type: GA5000				Notes: DS05 unable to access, bung trapped.			
Pressure Trend:		Sample Type: As indicated above							
Weather: light rain, cloud		Operator: R Allen							

RECORD OF MEASUREMENTS FOR GAS MONITORING BOREHOLES

Client Name: Taylor Wimpey West Midlands

Date of Sampling: 16/10/2020

Site Name: Stourport Sixth Form, Stourport

Job Number: 20088

Borehole Reference	Borehole Flow (l/hr)	Methane	Carbon Dioxide	Oxygen (% by volume)	Balance (% by volume)	Sample Type	Borehole Pressure (mb)	Depth (m bgl)	
		(% by volume)	(% by volume)					Borehole	Water
DS02	0.0	0.0	1.1	20.3	78.5	Accumulated	0.05	5.44	DRY
DS05	0.1	0.0	0.9	20.9	78.1	Accumulated	0.05	2.44	DRY
DS06	-0.0	0.1	0.3	21.8	77.8	Accumulated	-0.02	2.41	DRY
DS04	0.0	0.0	0.9	20.1	79.0	Accumulated	-0.12	4.34	DRY
DS01	-0.0	0.0	1.5	19.5	79.0	Accumulated	0.07	5.14	DRY
Atmospheric Pressure: 1023mb				Instrument Type: GA5000				Notes:	
Pressure Trend: Decreasing				Sample Type: As indicated above					
Weather: cloud				Operator: R Allen					

RECORD OF MEASUREMENTS FOR GAS MONITORING BOREHOLES

Client Name: Taylor Wimpey West Midlands

Date of Sampling: 26/10/2020

Site Name: Stourport Sixth Form, Stourport

Job Number: 20088

Borehole Reference	Borehole Flow (l/hr)	Methane	Carbon Dioxide	Oxygen (% by volume)	Balance (% by volume)	Sample Type	Borehole Pressure (mb)	Depth (m bgl)	
		(% by volume)	(% by volume)					Borehole	Water
DS02	-0.0	0.1	0.4	20.8	78.7	Accumulated	0.0	5.44	DRY
DS05	-0.0	0.0	0.5	20.6	78.8	Accumulated	0.03	2.44	DRY
DS06	0.0	0.0	0.6	20.7	78.1	Accumulated	0.02	2.41	DRY
DS04	-0.1	0.0	0.3	21.1	78.6	Accumulated	0.07	4.34	DRY
DS01	-0.1	0.0	0.4	21.0	78.5	Accumulated	6.58	5.14	DRY
Atmospheric Pressure: 991mb				Instrument Type: GA5000				Notes:	
Pressure Trend: Fluctuating				Sample Type: As indicated above					
Weather: Light rain, Sun				Operator: R Allen					

RECORD OF MEASUREMENTS FOR GAS MONITORING BOREHOLES

Client Name: Taylor Wimpey West Midlands

Date of Sampling: 29/10/2020

Site Name: Stourport Sixth Form, Stourport

Job Number: 20088

Borehole Reference	Borehole Flow (l/hr)	Methane	Carbon Dioxide	Oxygen (% by volume)	Balance (% by volume)	Sample Type	Borehole Pressure (mb)	Depth (m bgl)	
		(% by volume)	(% by volume)					Borehole	Water
DS02	-0.1	0.1	0.2	20.3	78.9	Accumulated	0.0	5.44	DRY
DS05	0.0	0.1	0.2	20.5	79.3	Accumulated	0.0	2.44	DRY
DS06	-0.0	0.1	0.4	20.3	79.3	Accumulated	-0.05	2.41	DRY
DS04	-0.0	0.1	0.4	20.4	79.1	Accumulated	0.02	4.34	DRY
DS01	-0.1	0.1	1.6	19.3	79.0	Accumulated	0.17	5.14	DRY
Atmospheric Pressure: 991mb			Instrument Type: GA5000 Sample Type: As indicated above Operator: R Allen				Notes:		
Pressure Trend: Fluctuating									
Weather: Light rain, Sun									

APPENDIX 10
TRL DCP Results and CBR Equivalents

Appendix 10 - TRL Summary
Coniston Crescent, Stourport-on-Severn

TRL 1

Blows	Depth (mm/bgl)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
7	100	7	100	14.3	1.26
25	200	32	100	3.1	1.96

TRL 1a

Blows	Depth (mm/bgl)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
11	100	11	100	9.1	1.47
25	200	36	100	2.8	2.01

TRL 2

Blows	Depth (mm/bgl)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
6	100	6	100	16.7	1.19
25	200	31	100	3.2	1.94

TRL 2a

Blows	Depth (mm/bgl)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
8	100	8	100	12.5	1.32
25	200	33	100	3.0	1.97

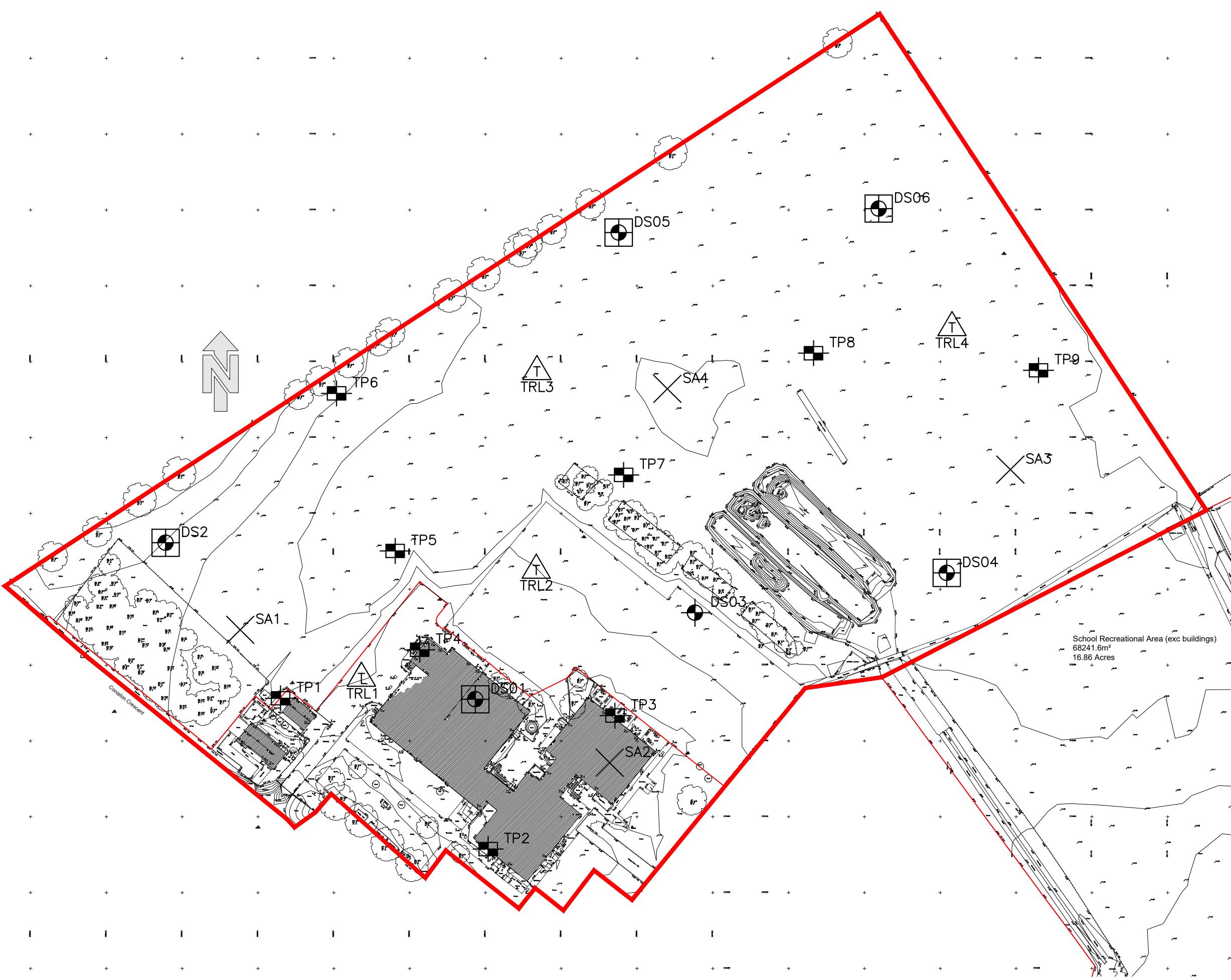
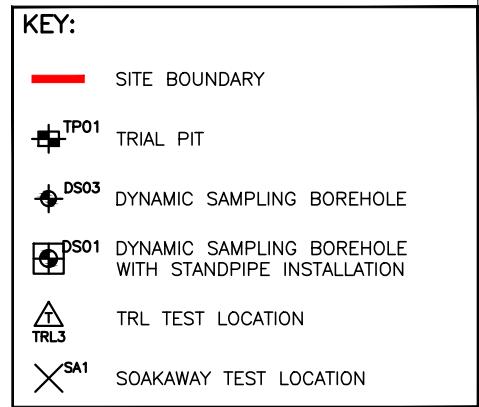
TRL 3

Blows	Depth (mm/bgl)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
2	100	2	100	50.0	0.68
4	200	6	100	16.7	1.19
3	300	9	100	11.1	1.37
6	400	15	100	6.7	1.61
5	500	20	100	5.0	1.74
5	600	25	100	4.0	1.84
4	700	29	100	3.4	1.91
5	800	34	100	2.9	1.98
5	900	39	100	2.6	2.05
5	1000	44	100	2.3	2.10

TRL 4

Blows	Depth (mm/bgl)	Total Blows	Depth of Penetration (mm)	mm/blow	CBR%
1	100	1	100	100.0	0.37
6	200	7	100	14.3	1.26
5	300	12	100	8.3	1.51
5	400	17	100	5.9	1.67
6	500	23	100	4.3	1.81
5	600	28	100	3.6	1.90
5	700	33	100	3.0	1.97
3	800	36	100	2.8	2.01
8	900	44	100	2.3	2.10
10	1000	54	100	1.9	2.20

DRAWINGS



REV	DESCRIPTION	DATE	BY	AUTH

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CLIENT
TAYLOR WIMPEY WEST MIDLANDS

PROJECT
STOURPORT SIXTH FORM COLLEGE, STOURPORT

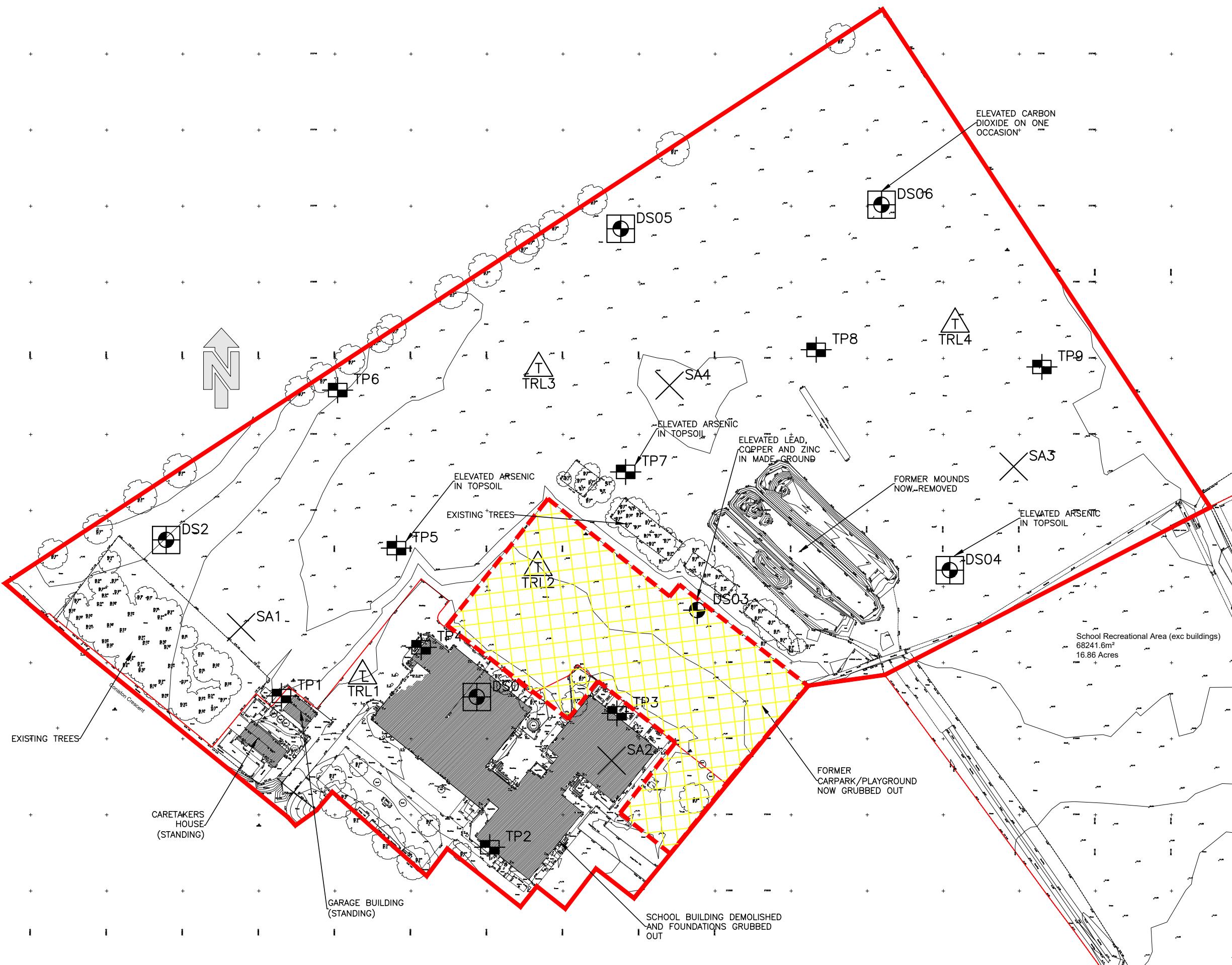
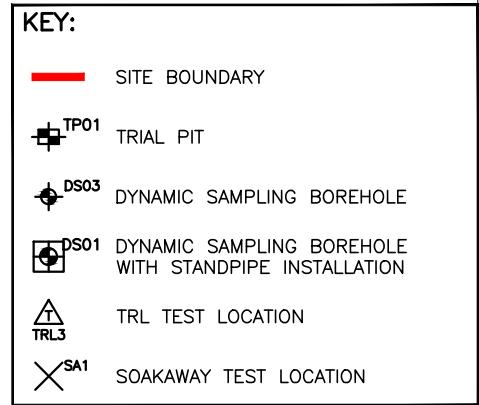
TITLE
SITE INVESTIGATION LOCATION PLAN

DRAWN	AUTHORISED	SCALE	DATE
BC	JD	1:1000@A3	04/11/20

PROJECT NO.	DRAWING NO.	REV
20088	GE01	-

STATUS:	-
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REV	DESCRIPTION	DATE	BY	AUTH



CLIENT
TAYLOR WIMPEY WEST MIDLANDS

PROJECT
STOURPORT SIXTH FORM COLLEGE, STOURPORT

TITLE
SITE FEATURES PLAN

DRAWN	AUTHORISED	SCALE	DATE
BC	JD	1:1000@A3	13/11/20

PROJECT NO.	DRAWING NO.	REV
20088	GE02	-

STATUS:	-
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