

3.2 Potential Receptors

The potential receptors detailed below take into consideration the most sensitive proposed future land use (residential housing with private gardens) as a precautionary approach. It is considered possible that any potential contamination within the soils could be disturbed during the construction phase, or during gardening or landscaping undertaken by future Site users.

3.2.1 Human Health

- Site Users (residents, visitors, maintenance workers and contractors).

Contamination risks to construction workers are not appraised by chronic (long term) exposure human health risk assessments. There are no appropriate published criteria applicable to assessment of potential risks to construction workers. The potential risks should be addressed by a site-specific construction workers risk assessment and implementation of appropriate health and safety measures, to adequately mitigate any potential risks. All works should be conducted in accordance with the CDM Regulations (2015) [6] or any other relevant guidance. Construction workers are not considered further in this assessment.

3.2.2 Controlled Waters

Groundwater - Secondary A Aquifer underlying the majority of the Site (River Terrace Deposits)

Surface Water - Beck Brook approximately 500m east of the Site, several surface water drains across the Site, Ponds on eastern boundary.

3.2.3 Buildings

- Underground building structures/services (water pipes, concrete).
- Proposed buildings and foundations.

3.3 Potential Pathways

Potential pathways are the routes that link the receptor to the contamination. The potential pathways for this site are summarised in the table below.

Table 3.2 Potential Pathways

Potential Pathway	Receptor
Accidental ingestion of contaminants within soil, water and dust	Human Health – residents, uptake of plants, visitors, maintenance workers and contractors
Inhalation of dust, vapours and ground gases	
Dermal contact with contaminants within soil, water and dust	

Potential Pathway	Receptor
<p>Accidental ingestion of contaminated vegetables/ crops or contaminated soil adhered to vegetables</p>	
<p>Leaching of potential contaminants in soil or Made Ground into groundwater.</p> <p>Vertical migration of soluble contaminants through the unsaturated zone into groundwater beneath the Site.</p> <p>Lateral migration of dissolved contaminant via groundwater flow</p> <p>Surface run-off of contaminants into surface water</p> <p>Migration of contaminants via surface water drains/ channels/ preferential pathways</p>	<p>Controlled Waters (groundwater and surface water)</p>
<p>Direct contact of building services or foundations with contaminants in the soil and Made Ground.</p> <p>Gas accumulation in confined and poorly ventilated spaces.</p>	<p>Buildings, services and foundations</p>

4 Intrusive Ground Investigation

4.1 Historic Ground Investigations

Multiple ground investigations have been conducted on the wider Northstowe site, by WSP in 2007 and Arcadis Consulting in 2016, 2017, and 2018, however no previous locations fall within the current Phase 2C redline boundary.

4.2 Arcadis 2022 Ground Investigation

The most recent phase of ground investigation works was carried out between the 15th – 23rd March 2022. The ground investigation scope, which was determined by Arcadis Consulting (UK) Limited, comprised:

- 4 no. cable percussive boreholes with 50mm HDPE installations.
- 8 no. dynamic exploratory holes with 50mm HDPE installations
- 16 no. machine excavated trial pits.
- Geotechnical and contamination sampling.
- 3 rounds of gas and groundwater monitoring from exploratory holes.

5 Ground Conditions

5.1 Introduction

The anticipated ground conditions identified within Chapter 2.3 identified the potential for Made Ground across the site overlying Kimmeridge Clay bedrock. Superficial deposits were not anticipated during the investigation based upon the geological mapping.

The following ground model is based upon information relating to ground conditions encountered on site during the ground investigation works.

Full engineering logs are included within the Factual Report [1].

Full details of the ground conditions encountered are included in the exploratory logs presented and factual report and are summarised below.

It should be noted that topsoil was not encountered at locations across the site as it has previously been reworked or stripped during prior archaeological investigations and through the use as a stockpiling area for materials. While BGS mapping does not show the presence of superficial deposits underlying the site, the ground investigation encountered both granular and cohesive deposits.

Table 5.1 Ground Conditions Summary

Strata	Maximum Strata Range (m bgl)	Thickness Range (m)	Description	In situ Data SPT N value
Made Ground	GL -1.60	1.60	<u>Cohesive</u> Soft to firm and encountered as dark brown occasional mottled orangish or bluish slightly sandy slightly gravelly to gravelly CLAY.	10 - 12
	GL -0.50	0.40 -0.50	<u>Granular</u> Typically, as fine to coarse GRAVEL with fragments of brick, concrete, chert or plastic, or gravelly SAND. <i>Found in TP2C102 and TP2C103 only.</i>	N/A
Superficial Deposits River Terrace Deposits	GL -1.40	0.40 -1.40	<u>Cohesive</u> Very soft to stiff sandy, gravelly CLAY or silty gravelly CLAY. Occasional rootlets and pockets of sand.	8->50
	0.30 -4.90	0.20 -4.60	<u>Granular</u> Typically medium dense clayey sandy fine to coarse GRAVEL or clayey gravelly SAND. <i>Found in BH2C102, BH2C104, TP2C113, TP2C117, TP2C119, WS2C112, and WS2C121 only.</i>	15-33

Strata	Maximum Strata Range (m bgl)	Thickness Range (m)	Description	In situ Data SPT N value
Bedrock (Kimmeridge Clay)	0.10 -15.45 extent not proven	1.40 -14.30 extent not proven	<u>Cohesive</u> Typically, firm to very stiff bluish grey silty CLAY with occasional shelly fragments and selenite crystals. Frequent bands of extremely weak to weak light grey SILTSTONE.	8->50

5.2 Range of Geotechnical Parameters

The range of laboratory and in situ tests results for ground conditions encountered within the exploratory holes are summarised in Tables 5.2 to 5.8 below. These are based on laboratory test results, in situ test results and published data.

Table 5.2: Summary of Geotechnical Properties for Cohesive Made Ground

Test	No. of results	Min	Max	Recorded Value
SPT N values	2	10	12	-
Natural moisture content (mc - %)	1	-	-	29
Liquid Limit (LL) %	1	-	-	59
Plastic Limit (PL) %	1	-	-	26
Plasticity Index (PI) %	1	-	-	33
*Modified Plasticity Index (MPI) %	1	-	-	31.02

* Modified Plasticity Index (NHBC)

Table 5.3: Summary of Geotechnical Properties for Cohesive River Terrace Deposits

Test	No. of results	Min	Max	Recorded Value
SPT N values	1	-	-	15
Natural moisture content (mc - %)	7	17	33	-
Liquid Limit (LL) %	7	30	80	-
Plastic Limit (PL) %	7	16	28	-
Plasticity Index (PI) %	7	14	55	-

Test	No. of results	Min	Max	Recorded Value
***Cu (kPa) from correlations	1	-	-	75
*Modified Plasticity Index (MPI) %	7	12.74	55	-

* Modified Plasticity Index (NHBC)

Table 5.4: Summary of Geotechnical Properties for Granular River Terrace Deposits

Test	No. of results	Min	Max
SPT N values	5	8	>50

* Modified Plasticity Index (NHBC)

Table 5.5: Summary of Geotechnical Properties for Bedrock (Cohesive Kimmeridge Clay Deposits)

Test	No. of results	Min	Max
SPT N values	54	8	50
Natural moisture content (mc - %)	29	16	40
Liquid Limit (LL) %	29	30	94
Plastic Limit (PL) %	29	15	33
Plasticity Index (PI) %	29	10	69
***Cu (kPa) from correlations	54	40	250
*Modified Plasticity Index (MPI) %	29	10	69
**Cu (kPa) (From laboratory testing)	9	26	123
Bulk Density Mg/m ³	12	1.94	2.28
Dry Density Mg/m ³	12	1.45	1.95
Voids Ratio	3	0.64	0.80

Test	No. of results	Min	Max
Cv M2/yr (for applied pressure between 100 and 200 kPa)	3	1.0	1.60
Mv M2/MN (for applied pressure between 90 and 120 kPa)	3	0.21	0.33
pH	14	7.9	8.6
Sulphate as SO ₄ (mg/l)	13	180	2066

* Modified Plasticity Index (NHBC)

** Cu taken from single stage unconsolidated undrained triaxial test with cell pressure of 250 kPa

*** In clay soils, $C_u = f_1 \times \text{SPTN}$. $f_1 = 5.5$ for a Plasticity index of <20% (After Stroud, 1974)

5.3 Standard Penetration Testing

5.3.1 Made Ground

Due to the inconsistent presence, and shallow depth of Made Ground across the Phase 2C site only 2 SPT tests were undertaken within the strata, reporting N value of 10 and 12. However it should be noted that these SPTs penetrated natural strata during the test and are unlikely to be representative of the Made Ground only.

5.3.2 Superficial Deposits

SPT tests were undertaken within all boreholes and window sample holes during the investigation.

The SPT results suggests River Terrace deposits (Granular) are typically medium dense to very dense with recorded SPT N-values of between 8 and >50.

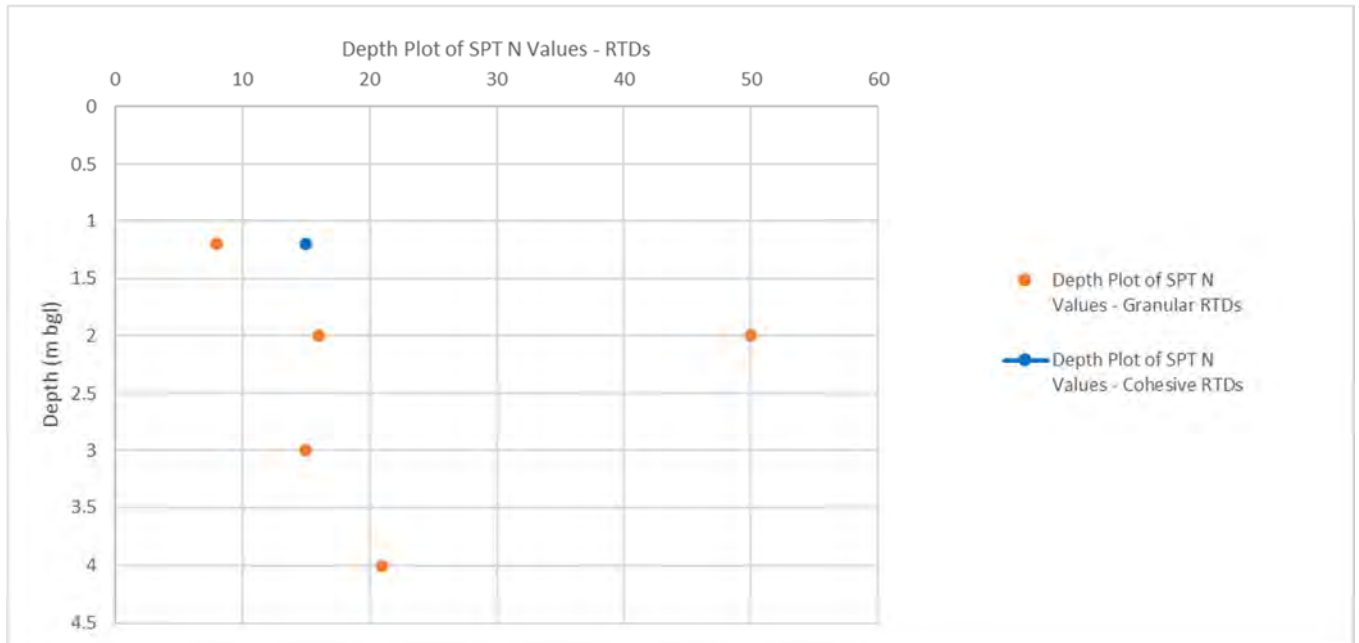
A single SPTN value of >50 can be disregarded as this test penetrated into a siltstone band in the underlying Kimmeridge Clay and is therefore not representative of the RTDs alone.

Cohesive deposits recorded as River Terrace Deposits were encountered sporadically across the site and returned a single SPT N value of 15 at 1.2m bgl within WS2C114.

The SPTs undertaken were noted to generally increased in strength with depth.

Figure 5-1 below displays the relationship between depth and SPT N-value.

Figure 5-1 Depth plot of SPT N Values - RTDs



5.3.3 Kimmeridge Clay Formation

The Kimmeridge Clay was encountered below either Made Ground or the River Terrace Deposits across the Site within all exploratory holes at depths ranging from 0.10 m to 15.45 m bgl.

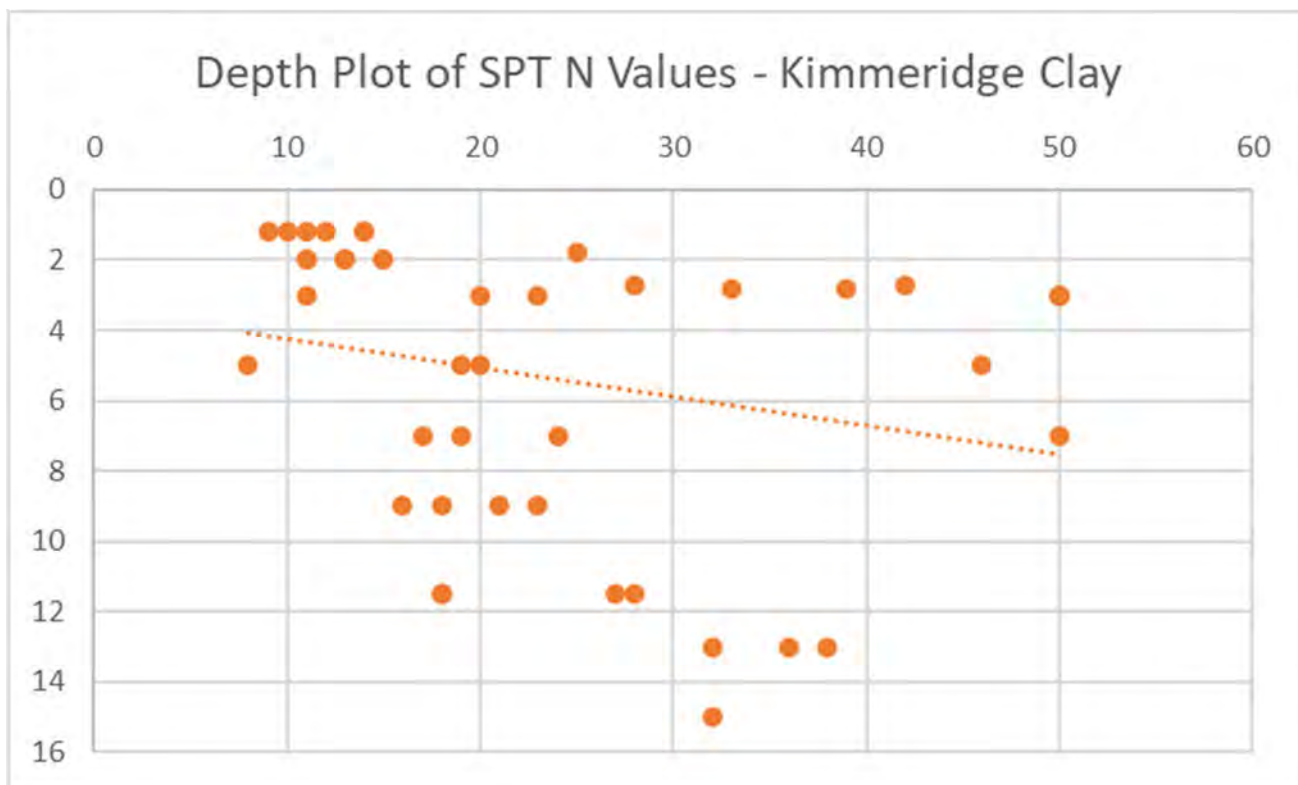
The Kimmeridge Clay typically comprises a firm to stiff dark grey silty Clay with bands of extremely weak and very weak grey siltstone. Occasional selenite crystals, shelly fragments and pockets of sand were noted. Orange mottling was also encountered.

The base of the Kimmeridge Clay was not proven during the ground investigation.

SPT testing undertaken within the Kimmeridge Clay recorded SPT N-values of between 8 and >50, and in general displayed an overall increase in strength with depth.

Figure 5-2 below displays a general trendline and the relationship between depth and the increase in SPT N-value.

Figure 5-2 Depth Plot of SPT N Values vs Depth - Kimmeridge Clay



5.4 Particle Size Distribution Test Results

7no. PSD tests were undertaken within superficial deposits and Bedrock. These comprised 5 within granular River Terrace Deposits, and 2 within the bedrock of the Kimmeridge Clay Formation. The results were obtained by wet sieving soils to achieve a percentage passing for each grain size.

Log descriptions corresponded with the PSD results, with PSD results from the Kimmeridge Clay Formation returning as slightly sandy SILT/CLAY to slightly gravelly, sandy SILT/CLAY and PSD results from the granular River Terrace Deposits returning as clayey/silty, very gravelly SAND to clayey/silty, very sandy GRAVEL with low cobble content.

The results are attached as part of the Factual Report (Appendix C).

5.5 Atterberg Tests

The Atterberg limits indicate the following plasticity for the clay particles encountered within the strata encountered. Calculation of the modified plasticity index has been done in accordance to NHBC Chapter 4.2 guidelines [7].

- Made ground – intermediate to high plasticity with a low to medium volume change potential.
- Cohesive River Terrace Deposits – low to high plasticity with a low to medium volume change potential.
- Bedrock – Kimmeridge Clay – low to high volume change potential.

5.6 Undrained Shear Strength

5.6.1 Correlations

The undrained strength of clay soils recovered from cohesive River Terrace Deposits and Kimmeridge Clay bedrock were also determined from correlation with the Standard Penetration Test (SPT) and have been extrapolated to estimate final N-values (uncorrected for overburden and/or hammer efficiency). Based on the correlations made, the cohesive River Terrace deposits (one STP results) correlates with an undrained shear strength of 75kPa, which would correspond to medium strength soils).

Correlations made within the Kimmeridge clay deposits based upon SPT N values ranged between 40 kPa and 250 kPa this would correspond to medium to very high strength soils.

Geotechnical test results are attached as part of the Factual Report (Appendix C).

5.6.2 Laboratory Testing

Nine single stage unconsolidated undrained triaxial tests were carried out upon soil samples recovered Kimmeridge Clays (bedrock) and tested in accordance with BS1377:1990, Part 7, Section 8 [8]. Analysis of the test data indicates that for a cell pressure of 250 kPa a deviator stress was recorded between 52 kPa and 191 kPa. Undrained shear strength was assessed as between 26 kPa and 123 kPa for this cell pressure. This corresponds to low to high strength soils.

5.7 One Dimensional Consolidation Testing

One dimensional consolidation testing was undertaken on three soil samples recovered Kimmeridge Clays (bedrock) and tested in accordance with BS1377:1990, Part 5, Section 3 [8]. Analysis of the test data indicates that for a stress range of 100 kPa to 200 kPa the coefficient of compressibility (mv) was recorded between 0.21 m²/MN and 0.33 m²/MN.

Geotechnical test results are attached as part of the Factual Report (Appendix C).

5.8 Olfactory/Visual Contamination Evidence

No visual or olfactory contamination was recorded during the ground investigation.

5.9 Groundwater

Groundwater strikes within cable percussive boreholes were noted at depths of between 2.50 mbgl to 13.10 mbgl within the River Terrace Deposits and the Kimmeridge Clay Formation. A number of strikes coincided with the top of the Kimmeridge Clay Formation or bands of siltstone within the Kimmeridge Clay Formation and are potentially an indication of “semi-perched” water condition atop of the predominantly cohesive bedrock unit (lower relative permeability).

Groundwater strikes within trial pits were noted at depths of between 0.50m bgl and 3.00m bgl within the River Terrace Deposits and the Kimmeridge Clay Formation. Groundwater was recorded as seepages, indicative of the relatively low permeability of the Kimmeridge Clay Formation.

Post fieldwork monitoring has been undertaken on three occasions on the following dates;

- 7th April 2022.
- 13th April 2022; and
- 23rd May 2022; and

Groundwater levels recorded during monitoring ranged between 0.497 m bgl and 2.74 m bgl where groundwater was encountered. A number of shallow monitoring wells were recorded as dry during the monitoring period.

It should be appreciated that ground and groundwater conditions may vary between and away from the exploratory hole positions, and that no account can be taken in this report of such variations.

It should also be noted that groundwater levels may be affected by seasonal variations such as rainfall and that no account can be taken of such variations in this report due to the short monitoring period.

Details of groundwater strikes are presented on the exploratory hole logs and within the groundwater monitoring data in the factual reports.

6 Geotechnical Assessment

6.1 Introduction

At the time of writing and with reference to the proposed development plans attached as Appendix A, the proposed development within Phase 2C is to comprise 130 houses with gardens and associated infrastructure as well as a neighbourhood equipped area of play.

The wider Phase 2 Northstowe development scheme comprises the following;

- Development of the main Phase 2 development area into approximately 3,500 dwellings, schools, town centre including employment uses, formal and informal recreation space and landscaped areas, the eastern sports hub, the busway, a primary road to the southern access, construction haul route and engineering and infrastructure works, and;
- Construction of a highway link (Southern Access Road (West) (SARW)) between the proposed new town of Northstowe and the B1050, improvements to the B1050 and associated landscaping and drainage.

It is understood that the housing units will be a minimum of two storeys however these may extend to three or four storeys in some areas.

The proposed loads are currently not known but are anticipated to be moderately loaded. Finished levels are yet to be finalised, but it is expected to be raised across the site in the order of 1m. Therefore, some earthworks will be required. Foundations are likely to need to extend through the new fill to achieve adequate bearing and satisfactory settlement performance, unless special precautions are taken, regarding quality of fill and foundation type. Further comment on options is beyond the scope of this report. Should design plans change it is recommended that this assessment be revisited.

The below assessment is considered preliminary and has been based upon an indicative proposed load in the order of 80 kPa for the preliminary assessment purposes. Should the design loads be more than foundation recommendations should be reviewed.

The following assessment is based upon the information and ground conditions presented within the Factual Report (Appendix C).

With reference to Table 5.1 the ground conditions across the site were found to generally comprise a mixture of granular and cohesive made ground to a maximum depth of 1.60m bgl, overlying superficial deposits described as River Terrace Deposits. These were recovered as a mixture of cohesive and granular material but predominately recorded as soft to firm clays to a maximum depth of 4.90 m bgl and were above the Kimmeridge Clay bedrock, which comprised intermittent siltstone bands.

Groundwater levels recorded during the monitoring phase of works ranged between 0.497m bgl and 2.74m bgl.

6.2 Foundations

6.2.1 Floor Slabs

Current building control regulations require that where the infilled ground is present to depths more than 600mm or where the sub-stratum is variable in terms of the structure and settlement potential or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required. Regarding Table 5.1 the thickest amount of made ground from the ground investigation was 1.60 m bgl, which lies above cohesive River Terrace deposits in areas at variable strength. Therefore, a suspended floor slab would be recommended.

However, site levels are due to be raised by approximately 1m. Therefore, if a suitable type 1 granular fill is to be used and well compacted and proof rolled a ground bearing slab option may become viable.

Where site levels are raised, the quality of this fill will have an influence on house types and ground floor arrangements. Early consultation with Building Control and the homes insurance body (e.g. NHBC) should take place, in advance of site filling if possible, to reach agreement in principle.

6.2.2 Shallow Foundations

Shallow strip footings or pad foundations are likely to be the most appropriate foundation types for the proposed development, founding within either granular River Terrace Deposits or Kimmeridge Clay bedrock at a depth in the order of 1.50 m bgl or a maximum of 2.50 m bgl in areas of significant made ground.

It is recommended that foundations be within consistent strata to avoid the risk of differential settlement.

Alternatively in areas where the River Terrace Deposits are present and deemed viable as a founding stratum, a raft or semi-raft foundation may be preferred to help control and minimise the effects of differential settlements. It is understood that raft foundations have previously been used in the wider Northstowe development. It is recommended that once fixed development plans become available, settlement analysis is undertaken.

Development plans are proposed to raise site levels in the order of 1m. Made ground is not considered to be a suitable founding stratum for the foundations and where fill material is placed over significant quantities for cohesive made ground of variable strength some consolidation is expected.

Deep made ground was found in areas across the site as shown by the following areas;

- BH2C101 – 1.30m bgl
- BH2C102 – 1.40m bgl
- TP2C102 – 1.60m bgl
- TP2C116 – 1.40m bgl.

6.3 Excavations

It is anticipated that the overlying made ground, topsoil and River Terrace Deposits should be readily excavated using a conventional backhoe excavator. However, excavation through any buried construction may require the use of specialist breaking equipment, and the presence of a high groundwater table should be taken into account.

The site should be cleared and any vegetation below areas of proposed development stripped following Series 200 of the Specification for Highway Works [9]. Whilst not extensive, any roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void in-filled with suitable compacted engineered fill; and redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.

All excavations should be carried out following CIRIA Report 97 'Trenching Practice' [10] and BRE 440 Foundations, Basements, and External Works 2002 [11]. Random and sudden falls should be expected from the faces of near vertically sided excavations put down at the site. This situation is likely to be prevalent in the made ground and natural coarse soils and is likely to be exacerbated by water inflows. Never-the-less, the materials in excavations should be exposed for as little time as is practical to minimise the risk of softening any cohesive materials in the excavation.

If excavations are cut at a safe angle of repose or benched, a suitably qualified geotechnical engineer should be present to check for potential signs of instability. Where possible all soils should be kept on-site to reduce disposal costs. Even then, the stability of excavation faces cannot be guaranteed thus temporary support to the excavation faces may become necessary unless the foundations are constructed using trench-fill techniques. In this method, the foundation trenches should be excavated, inspected, and backfilled with concrete as a continuous operation. Under no circumstances should operatives be allowed to enter unsupported excavations. Even where the excavations are supported, a risk assessment of the stability of any open excavation should be undertaken by a competent person and measures adopted to ensure safe working practice in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations [6].

Groundwater monitoring has identified groundwater levels between 0.497m and 2.74m bgl, therefore, shallow excavations open for a short period are likely to be subject to groundwater ingress. Should seepage of groundwater be encountered it is considered that it could be dealt with using a simple form of de-watering. Such a system could include the excavation of sumps from which the water could be pumped.

6.4 Soakaway Performance

BRE 365 Soak Away [12] tests were not conducted across the 2C site due to the limited presence of granular deposits.

If a partial SuDs solution needs to be assessed further, close centred, detailed investigations would be required to locate and zone the limited occurrence of granular River Terrace Deposits. Further assessment of this limited potential should be confirmed through the use of 'full scale' BRE 365 soak away testing, taking into account specific development proposals available for the site and the sites proposed increase in ground levels.

In addition, taking the high groundwater into account, the site has very low feasibility for a typical soakage-based SuDs drainage solution.

6.5 Road Pavements

It is likely that the pavement subgrade exposed at current formation levels would comprise both granular and cohesive River Terrace Deposits, variable Made Ground or cohesive strata of the Kimmeridge Clay Formation. However, the Phase 2C site is to be raised by approximately 1m site wide therefore this imported fill would become the formation material, and the fill specification should set minimum CBR for acceptability.

Pavement and road design should be based upon a suitable (equilibrium) CBR value for such formation soils. It is recommended that new road pavement and road construction design should be based upon a preliminary CBR value within the range 2 to 5%. Areas of soft ground should be excavated when identified during proof rolling. A conservative estimate of equilibrium CBR for the cohesive Kimmeridge Clay and cohesive rich RTDs ranges from 2-3%, while more granular RTDs can be expected to fall within the range of 4-5%.

The design value will need to be reviewed and confirmed by suitable in-situ testing at formation levels following earthwork operations (raising of site levels) and prior to pavement construction.

Notwithstanding this, the formation at all levels should be proof-rolled prior to pavement construction, and any soft zones thus revealed should be excavated out, with the resulting excavation in-filled with appropriately graded engineered granular fill.

It would thus be prudent to adopt a relatively low CBR in the preliminary design and to open discussions with the local authority highways department in order to agree pavement design approaches. This should be done at an early stage, as design traffic, drainage arrangements and thickness/stiffness of a pavement all play a part in achieving a satisfactory performance and an adoptable design.

6.6 Buried Concrete

In accordance with BRE Special Digest 1 2005 Third Edition, "Concrete in Aggressive Ground" [13], and results of BRE BR 279 Chemical Analysis [14], below ground concrete should comply with Table C1 design sulphate class DS-3 and ACEC class AC-3. The BRE testing undertaken was confined to samples within the Kimmeridge Clay. Design/mix of buried concrete should be undertaken in accordance with these classifications.

6.7 Other Development Considerations

6.7.1 Material Management

In the case of managing soil movements or earthworks (e.g. raising of the site level) it is important to also manage the intention to re-use materials, when a genuine need for the materials exists.

This will help avoid unnecessary additional regulation that can sometimes arise from a "waste management" perspective.

Providing materials are suitable for use, both chemically and geotechnically, and that re-use is certain, regulators should be able to agree that such materials do not need to enter the waste regulation system. A good approach to the management of this risk is via development of a Materials Management Plan (MMP) in line with the CL:AIRE Code of Practice, DoWCoP [15].

If certain materials do require regulation as waste exemptions have changed significantly in recent years and there are strict limitations on the quantity of soil that can be used and the thickness to which it can be deposited. The use of a permit could stigmatise the site for future conveyance. It is on this basis that we would recommend the development of the MMP route.

The MMP once drafted would be reviewed together with the approved site investigation and remediation documents by a Qualified Person, with their Declaration being issued to the Environment Agency; ultimately allowing the development to go ahead under a self-regulation approach.

The development of an MMP would require a "Cut and Fill" model and a detailed materials management strategy to identify the sources of and destinations for site-won materials. It is envisaged that site formation levels will need to be raised by approximately 1m, so formation levels should be designed to accommodate the required thickness for construction.

If removal of any localised contamination that might be found was undertaken, such materials would be waste and would require disposal at an appropriately permitted waste facility.

6.7.2 Local Contamination Areas and Excess Arisings

On the basis of the current information, it is likely that if materials became excess to requirements, the majority of the Made Ground and natural soils would classify as "Inert" for landfill disposal.

An appropriate waste classification can only be undertaken on the material due to be disposed of via further chemical testing, which should be completed prior to making disposal arrangements. In all cases where excess soils require off-site disposal, the materials need to be managed under the appropriate waste legislation and consideration given to any remedial techniques that could be used to improve the soil.

For Inert Waste and Hazardous Waste disposal, an allowance will need to be made for adequate Waste Acceptance Criteria (WAC) testing with appropriate consideration of the additional time and cost associated with this.

6.7.3 Health, Safety & Environment

Whilst very few samples tested were found to have contamination at concentrations of regulatory concern, there remains a low potential for more-significantly impacted soils to be encountered; consideration should therefore be given to the level of PPE that should be provided to future site operatives.

A watching brief should be established to check for such as yet undiscovered impact.

All work on site should be conducted in accordance with appropriate Health and Safety guidance, with particular reference to HSG66 [16].

Care should be taken to minimise the risk of potentially contaminative incidents occurring during redevelopment. Good working practices should be adopted during construction works in order to minimise the risk of contamination occurring as a result of spillage or leakage of fuels, oils or chemicals stored or used at the site during re-development. All such materials should be sited on an impervious base within a bund and should be adequately secured. In particular, care should be taken to prevent fuel, oils or other mobile contamination sources from entering any surface water drains at the site.

Throughout all redevelopment works, due regard should be given to potential detrimental effects on the surroundings including noise, vibration, odour and dust.

6.7.4 Potable Water Supply

There are currently no (fully adopted) national Standards for the protection of potable water supply pipes in potentially contaminated ground. However, the UKWIR [17] has published guidance in this respect and site testing should be undertaken with due recognition of this guidance.

On the basis of the ground conditions encountered, it is unlikely that specific protection measures may be required for potable water supply for the development. It is recommended that consultation is undertaken with the local supplier to confirm this, and a Water Pipeline Risk Assessment undertaken.

7 Geo-environmental Assessment - Soil

7.1 Human Health Risk Assessment

7.1.1 Data Used

30 No. soil samples were taken across the site during the 2022 ground investigation undertaken by Arcadis. No previous ground investigations have been completed on the site.

7.1.2 Soil Screening Values (SSVs)

The proposed end use of the site may include mixed use, including areas of residential development. In advance of development specifics, for the purpose of this assessment, all soil samples have been conservatively screened against criteria protective of residential development with gardens / soft landscaping and Public Open Space (POS) Residential. As such an end use of residential with plant uptake has been used for screening purposes.

As an initial screen, all the soil chemical data has been screened against the current LQM/CIEH Suitable for Use Levels (S4ULs) [18] for Human Health Risk Assessment for a residential with plant uptake scenario. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been adopted [19].

For organic contaminants SSVs corresponding to a Soil Organic Matter (SOM) content of 1% has been used as Tier 1 screening values in the assessment. This is based on the average measured concentration of total organic carbon in the samples (0.65%).

7.1.3 Tier 1 Screening Assessment

7.1.3.1 Inorganics

The chemical results were assessed against the SSV for a residential with plant uptake land use. No results from the ground investigations recorded concentrations above the relevant SSVs.

7.1.3.2 Organics

The soil samples were analysed for a suite of organic compounds including PAH compounds, TPH, Phenol and BTEX. The chemical results were assessed against the SSV for a residential with plant uptake land use. No results from the ground investigations recorded concentrations above the relevant SSVs.

7.1.3.3 Asbestos

No asbestos was detected above the laboratory detection in any of the 28 No samples screened.

Tables detailing the results and the screening criteria used as included in Appendix B.

7.2 Risk to Controlled Waters

7.2.1 Data

8 No. water samples were taken from exploratory holes installed across the site during the Arcadis ground investigation.

7.2.2 Water Quality Standards (WQS)

To assess the groundwater in terms of its potential as a source of contamination to Controlled Waters, the contaminant concentrations have been compared against appropriate Water Quality Standards (WQS). Given the location of the site above the Secondary A Aquifer and the close proximity of watercourses and especially Beck Brook, for completeness the results have been compared to both UK Drinking Water Standards (UK DWS) and Environmental Quality Standards for freshwater (EQS).

The EQS values have been taken from the Water Framework Directive (WFD) [20] which provides screening values to be protective to the surface water environment.

For some of the metals, the EQS guideline for copper, zinc, lead and nickel are based on bioavailability. Site specific Predicted No Effect Concentration (PNECs) values were previously calculated. The PNEC values presented below were based on the minimum measured concentration of calcium (104 mg/l), minimum pH of 7.2 pH units and an assumed dissolved organic carbon of 10 mg/l as a conservative (worst case) approach. The approach used is set out in the Water Framework Directive UK Technical Advisory Group guidance, Metal Bioavailability Assessment Tool [20].

Predicted no effect concentrations adopted as WQS in this assessment are:

- Copper: EQS 46 µg/l
- Zinc: 37 µg/l
- Nickel: 26.5 µg/l

7.2.3 Groundwater Assessment

From the monitoring round, 8 groundwater samples from 8 standpipes were analysed for a general suite of metals, non-metals and hydrocarbons (PAH, TPH, BTEX and phenol). Where present, water was sampled, and groundwater levels are detailed on the gas monitoring sheets in the Arcadis Factual report. It is noted that generally the standing level of the water in the deeper wells were very similar to the shallower wells. This would tend to indicate a general continuity of groundwater between shallow and the slightly deeper strata i.e. generally non-confined conditions, however the response zones within deeper wells were long.

If it was important to design of a certain aspect of the project, specific sealed response zones should be installed to provide a better understanding.

7.2.3.1 Inorganics

The table below presents exceedances in the WQS screening values.

Table 5.2.3.1 Exceedances in WQS screening values

Determinand	Range of Concentrations (µg/l)	WQS (EQS/DWS) (µg/l)	Exceedances (Yes/No) (Number)	Location of exceedances
Boron	1100 – 1300	2000 (EQS) and 1000 (DWS)	2 (DWS)	BH2C101 and BH2C102
Cadmium	0.09 – 0.19	0.08 (EQS) and 5 (DWS)	4 (EQS)	BH2C103, BH2C104, WS2C112 and WS2C114
Nickel	6.5 – 43	26.5 (EQS) and 20 (DWS)	2 (DWS) 2 (EQS)	BH2C104 and WS2C112
Selenium	13 – 40	10 (DWS)	4 (DWS)	BH2C102, WS2C108, WS2C112 and WS2C114
Cyanide Total	110	1 (EQS) and 50 (DWS)	1 (EQS/DWS)	WS2C114

Notes: **Bold** locations denote highest recorded exceedance

The exceedances detailed above are generally marginal when compared to the WQS and the results are not considered to be pose a risk to the receptors. An elevated cyanide concentration has been encountered in one sample so this shows it is not wide spread across the area. This is possibly an anomaly. No elevated cyanide soil concentrations were encountered in this area. Exceedances for Selenium, of up to 40ug/l with respect to EQS/DWS threshold of 10ug/l have been recorded within Phase 2C. This is consistent with concentrations detected over the wider Northstowe site. The Contaminated Land Officer has accepted that the presence of selenium is representative of background conditions, and do not indicate a soil source of Selenium, or groundwater contamination of significance at the site.

All other concentrations are below the relevant criteria, and no exceedances were recorded.

7.2.3.2 Organics

The groundwater samples were analysed for organic compounds (TPH – total petroleum hydrocarbons, PAH – Polycyclic Aromatic Hydrocarbons, BTEX – Benzene, Toluene, Ethylbenzene and Xylene and phenol).

A single exceedance of EQS screening value for Phenol (7.7ug/l) was encountered in WS2C114 at a concentration of 950ug/l. No other exceedances were encountered.

Tables detailing the results and the screening criteria used as included in Appendix B.

7.3 Ground Gas Risk Assessment

7.3.1 Introduction

To assess the ground gas regime for the site, the boreholes installations were monitored on three occasions between 7th April 2022 and 23rd May 2022.

There are no recorded potential sources capable of generation of significant volumes of ground gases on site (e.g. no landfill sites or significant thick or organic Made Ground) and therefore the monitoring is included with an expectation to confirm this conceptual model of 'low likelihood'.

The ground gas monitoring was undertaken using an infra-red gas analyser and flow pod. Concentrations of methane (CH₄), carbon dioxide (CO₂) and oxygen (O₂) in %, Hydrogen Sulphide (H₂S) and Carbon Monoxide in ppm and ground gas flow in litres per hour (l/hr) were recorded during each visit.

After the monitoring was undertaken, each well was dipped to record the groundwater level in each location.

7.3.2 Atmospheric Pressure

Atmospheric pressure can impact ground gas flow. According to CIRIA C665 Assessing the risks posed by hazardous ground gases to buildings [21]:

“at falling pressure increased emission rates occur as the gas increases in volume. Rising pressure causes air to flow into the ground, diluting soil gas concentrations. The rate of change in barometric pressure is also important. A swift drop over a small range has the potential to release a greater volume of gas than a gradual drop over a greater pressure range”.

Atmospheric pressure data from the ground gas monitor utilised on site was recorded at each monitoring location. The following atmospheric pressure conditions were noted during the monitoring rounds:

- 7th and 8th April 2022 – **low and rising** pressures from 984 and 1000 millibar
- 13th April 2022 – **high and rising** pressures between 1014 and 1015 millibar
- 23rd May 2022 – **high and steady** pressures between 1003 and 1004 millibar

7.3.3 Gas Monitoring Results

During monitoring visits, it was noted that the response zones were completely flooded in BH2C101, BH2C102, BH2C103 and WS2C112, as well as WS2C121 during the first round due to high groundwater levels. As such only the response zones in BH2C104, WS2C101, WS2C106, WS2C108, WS2C114, WS2C120, WS2C121 and WS2C123 were not completely flooded, and data considered valid to assessment of the ground gas regime.

Below is a summary of the range of ground gas monitoring results recorded during the three monitoring rounds. Full details are provided in the factual report.

Parameter	Range of Results		
	Round 1	Round 2	Round 3
Methane (% v/v)	0.1 – 0.3 (WS2C108)	0.1 – 0.3 (WS2C108)	<0.1 – 0.8 (WS2C108)
Carbon Dioxide (% v/v)	0.2 – 3.2 (BH2C104)	0.1 – 1.6 (BH2C104)	0.1 – 2.5 (BH2C104)
Oxygen (%v/v)	2.6 – 21.6 (BH2C104)	16.4 – 21.6 (BH2C104)	16.2 – 21.4 (BH2C104)
Carbon Monoxide (ppm)	0 – 2 ¹	1 – 2 ²	0 – 4 (WS2C101)
Hydrogen Sulphide (ppm)	0	0 – 1 (BH2C104)	0
Ground Gas Flow (l/h)	<0.1 – 0.1 (BH2C104)	0.1 – 0.3 (WS2C120)	<0.1

Parameter	Range of Results		
	Round 1	Round 2	Round 3
Atmospheric Pressure (mbar)	984 – 1000	1014 – 1015	1003 - 1004

Notes: Location in brackets represents the highest ground gas concentration or lowest Oxygen concentration

1 WS2C101, WS2C114, WS2C120

2 BH2C104, WS2C106, WS2C108, WS2C123

A maximum concentration of 4.0 ppm of Carbon Monoxide (CO) was recorded in WS2C101 during the third round of monitoring. Hydrogen sulphide was found to be generally below the limit of detection with a maximum concentration of 1.0ppm recorded in BH2C104 during the second round of monitoring. The short-term occupation exposure limit (15 minutes) for CO is 200ppm with the long-term exposure limit of 30ppm [22]. The concentrations recorded on site are considerably lower than these limits and therefore not considered to be significant.

7.3.4 Hazardous Ground Gas Assessment

A ground gas risk assessment has been undertaken to evaluate the risk posed to potential receptors of the proposed development. As the proposed development is mainly residential properties, a risk assessment appropriate for this land use has been completed.

BS 8485(2019) + A1 guidance [23] has been used to inform the ground gas assessment.

The Qhg is calculated using the following equation:

Qhg = borehole flow rate (l/h) x gas concentration (%v)/100

The following parameters have been used in the equation:

CH4 (max recorded concentration) = 0.8 % v/v

CO2 (max recorded concentration) = 3.2 % v/v

Flow Rate (max steady flow rate) 0.3 l/hr

Qhg CH4: $0.8/100 \times 0.3 = 0.0024$ – CS1 Very Low risk

Qhg CO2: $3.2/100 \times 0.3 = 0.0096$ – CS1 Very Low Risk

With reference to BS8485 *Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings* the calculated Qhg fall into the CS1 ‘very low risk’ category.

No elevated concentrations of Methane or Carbon Dioxide were recorded at the site above the CS1/CS2 threshold of 1.0%v/v and 5% v/v, respectively.

8 Quantitative Risk Assessment

8.1 Methodology

Geo-environmental assessments are required to consider the significant of potential contamination in terms of plausible contaminant source-pathway-receptor contaminant linkages. As part of this process, it is necessary to develop a conceptual model of these potential contaminant linkages by identifying the potential contamination sources, sensitive receptors and potential exposure pathways. A risk assessment is then undertaken to determine the likelihood and significance of these potential linkages.

Risk assessment involves identifying hazards and determining their potential severity and likelihood, if an impact occurs on identified receptors. Risks are generally managed by changing the receptor, isolating the sensitive receptor by intercepting or interrupting the exposure pathway, or removing the source. If no pollutant linkages are formed, there is no risk. The following risk assessment focuses on the potential contaminants identified on the site and the proposed development of the site.

CIRIA guidance C552 [3] states that the designation of risk is based upon a consideration of both:

- The likelihood of an event (probability); (takes into account both the presence of the hazard and the receptor and the integrity of the pathway).
- The severity of the potential consequence (takes into account both the potential severity of the hazard and the sensitivity of the receptor).

Under such a classification system the following categorisation of risk has been developed and the terminology adopted as follows (Table 6.1):

Table 6.1 Risk Categorisation

Risk Term	Description
Very High Risk	There is a high probability that significant harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
High Risk	Significant Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
Moderate Risk	It is possible that without appropriate remedial action, harm could arise to a designated receptor, but it is relatively unlikely that any such harm would be severe and if any harm were to occur, it is likely that such harm would be relatively mild.
Low Risk	It is possible that significant harm could arise to a designated receptor from an identified hazard, but it is likely that at worst this harm if realised would normally be mild.

Risk Term	Description
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Further risk assessment terminology is included in Appendix B.

8.2 Pollutant Linkages – Conceptual Site Model

As discussed above in Section 6.1, for a pollutant linkage to be present on the site, a source, pathway and receptor must all be present at the site. An updated Conceptual Site Model is presented below:

Table 6.2: Refined conceptual site model

RPL No	Contaminant Source	Sensitive Receptor	Pathway	Hazard (Severity)	Likelihood	Potential Risk	Comments
RPL1	Potential for elevated CoCs in areas not investigated	Human Health	Ingestion / Inhalation / Dermal Contact / Veg uptake	Chronic damage (Medium)	Low. Potential for unidentified contamination remains in areas not investigated. In areas of proposed housing with private gardens, a large proportion of the site would be soft landscaping and therefore it is likely that receptors would come into contact with contaminants if present in the surface soils if no remediation /mitigation is undertaken.	Low to Moderate	No elevated levels of CoC were identified within samples tested across the site but could still be present elsewhere on the site. The level of remediation / mitigation required will depend on the final design of the development. Site proposals include the rising of site levels y approximately 1m which, if appropriately designed, would act a s a “clean” cover protection in soft landscaping areas.
RPL2		Controlled Waters (Groundwater and Surface Water)	Leaching and migration into water environment	Reduction of water quality, although unlikely to be a potable resource.	Unlikely. Only marginal exceedances of WQS have been recorded in the groundwater analysis undertaken. This indicates that contaminants are not typically being mobilised via infiltration. Resolution of RCL1	Low	Only marginal exceedances of WQS have been recorded in the groundwater analysis undertaken.

				(Mild - Medium)	would be required to be protective from local discrete soil sources.		
RPL3		Buildings/Services	Contact of contaminants with buildings and structures (excluding potable water supply pipes)	Damage to structures (Mild)	Low. Contamination is not widespread across the site such that, if appropriate concrete design is used, significant damage to new buildings is unlikely.	Low	No pH concentrations outside the normal range of 6-9 units have been detected.
RPL4	No on-site or off-site source of Ground Gases (methane and carbon dioxide) are present.	Human Health	Inhalation in confined spaces	Asphyxiation (Severe)	Unlikely. Low concentrations and low flow volumes of methane and carbon dioxide were recorded in areas across the site. Based on the current information, the risk to residential end users is considered to be low.	Moderate/Low	No credible source has been identified. The precautionary (limited) ground gas monitoring is consistent with this conceptual model and accords with CIRIA Characteristic Situation 1. No special precautions from ground gases are likely to be required. This finding should be reviewed with the Regulator, early in the development programme, to confirm that additional confirmatory monitoring is not required.
RPL5		Buildings/Services (on-site)	Accumulation in confined spaces	Explosion (Severe)			

RPL6	Elevated inorganic contaminants (selenium, boron, cadmium, nickel, cyanide (total) and phenol)	Controlled Waters (Groundwater and Surface Water)	Leaching and migration into water environment (off-site)	Reduction of water quality (Medium)	Likely. Contaminant concentrations greater than water quality standards have been detected in the groundwater. Groundwater flow is to the northeast towards Beck Brook (500m) and therefore it is considered likely that the groundwater may migrate and discharge into the Brook.	Moderate	Due to the distances involved, the risk to the Brook is deemed low and contaminant concentrations are likely to be representative of background conditions. However, discussions with the EA should be undertaken to determine their position. Monitoring of groundwater may be required during redevelopment to ensure that groundwater quality is not affected during site works.
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6.3 Pollutant Linkages Discussion

Soil

No results from the ground investigations recorded concentrations above the relevant SSVs. No asbestos was encountered.

While the ground investigation did not encounter any contamination within the soil samples tested the ground investigation only covered discreet locations such that unidentified contamination might still be present on the site. Therefore, it would be prudent that a watching brief be undertaken during any excavation works and that, once development plans are known, consideration of clean cover system should be made. A clean cover system in the areas of soft landscaping and private garden areas would work as a pathway break between any unidentified contamination and end users which could be incorporated into the proposed site level rise of approximately 1.0m.

Groundwater

A number of minor Selenium exceedances of the WQS have been recorded within the groundwater samples, however these are in keeping with Selenium concentrations over the wider site and most probably representative of background concentrations. Therefore, the risk to Controlled Water is deemed low.

Marginal exceedances in boron, cadmium, nickel and cyanide (total) have been identified when compared to WQS but are not considered to be pose a substantial impact to the identified receptors.

A single exceedance of phenol was encountered in the groundwater sample taken from WS2C114 which screened the Made Ground. A soil sample tested at the location did not indicate any phenol above the limit of detection. It would be recommended to undertake a second round of groundwater sampling at this location to determine if this was anomalous or representative of this area.

Gas

Gas concentrations and flow rates recorded at the subject site indicate that the site is classified as Characteristic Situation 1. Subject to liaison and regulatory agreement, special measures are unlikely to be required.

9 Conclusions and Recommendations

9.1 Conclusions

The investigation has provided site specific data for the area of Northstowe known as Phase 2C.

The Phase 2C site is approximately 3.6 hectares and generally flat. It is located towards the eastern side of the main Northstowe Phase 2 development. The Northstowe Secondary College is located to the northwest of the Site.

No specific point sources of contamination have been identified on site. Sampling has therefore been undertaken on a spatial coverage basis.

The ground investigation identified Made Ground deposits overlying granular deposits of the River Terrace Deposits and the cohesive Kimmeridge Clay Formation.

While no concentrations above the appropriate SSVs were identified within the Made Ground or underlying natural deposits across the site there is the possibility for isolated and localised areas of contamination, given the site history.

Site redevelopment proposals include the construction of low-rise residential dwellings (up to 3 storeys) with gardens and associated infrastructure and a Neighbourhood Equipped Area of Play (NEAP). Proposals also include increasing site levels by approximately 1.0m which, if appropriately designed, would act as a capping layer in areas of soft landscaping.

No further remedial measures are likely to be required for the proposed development.

Gas concentrations and flow rates recorded indicate that the site is classified as Characteristic Situation 1, very low risk, and as such no special protection measures are likely to be required to protect the proposed structures from hazardous ground gas subject to regulatory liaison.

Minor Selenium exceedances of the WQS have been recorded within the groundwater samples however these are deemed to be minor and are most likely representative of background concentrations.

marginal exceedances in boron, cadmium, nickel and cyanide (total) have been identified when compared to WQS but are not considered to be pose a substantial impact to the identified receptors.

Additionally, a single exceedance of phenol was encountered in groundwater sampled from the Made Ground at WS2C11. No corresponding level of phenol was encountered within the soil at that location. It is recommended a second round of groundwater sampling at this location be undertaken to determine if this was anomalous or representative of this area.

The risk to Controlled Waters is considered to be moderate.

Soak Away testing was not completed at the Phase 2C site as only a limited thickness of granular deposits were encountered within boreholes and no suitable strata were encountered within the trial pits excavated. Adequate soakage potential is unlikely to be present across the site. Irrespective of this, the application of standard designs is likely to have limited potential due to the high groundwater level, and the resultant absence of an adequate unsaturated zone beneath soakaways.

Based on the available data, it is considered likely that groundwater will be encountered in shallow excavations (i.e. <2.0mbgl) at the site, especially during periods of wet weather. Appropriate groundwater control/dewatering provisions are likely to be required in excavations.

9.2 Recommendations

Contaminant sources likely to be of regulatory concern have not been identified on the site. Nonetheless, to satisfy and enable the discharge of the likely future relevant Planning Conditions (including pre-commencement conditions), it is recommended that the findings of this report (with respect to contamination) be formalised in a development-specific Remediation Statement (detailing the chosen remedial option or statement that none is required, as appropriate) and be submitted to the Local Planning Authority for their approval once fixed development plans are available for the site.

While contamination of concern has not been encountered on site during the investigation, during the redevelopment of the site a watching brief approach should be adopted. If any evidence of significant made ground or visual or olfactory evidence of contamination is encountered during excavation works, work in that area should be suspended and analysis should be undertaken to determine if the material can remain on site. Whilst the contractor should be responsible for the watching brief, inspection of any finds and sampling should be undertaken by an experienced Geo Environmental Engineer.

Whilst contamination levels are typically not elevated, it is recommended that construction workers use appropriate PPE during the redevelopment.

A number of foundation solutions are deemed viable, and these will need to respond to the variable geology encountered and the differing development proposals. In general, shallow strip footings or pad foundations are likely to be suitable. In general trench or strip foundations are not generally economical at depth of greater than 2mbgl.

Owing to the requirement for site levels to be raised by up to 1.0m over the site the re-use or importation of materials should be discussed with regulators and controlled under a Material Management Plan. Use of the CL:AIRE CoP or similar good practice is recommended to help secure maximum re-use opportunities for site soils, and minimise risk of materials requiring additional and potentially unnecessary regulation as waste.

Any contaminated materials being excavated for off-site disposal and other materials excess to requirements and requiring disposal will be waste and will require management under appropriate waste regulations.

Early consultation with local authority highways is recommended to help inform selection of design CBR.

It is unlikely that specific protection measures will be required for potable water supply. It is recommended that consultation is undertaken with the local supplier to confirm this, and a Water Pipeline Risk Assessment undertaken.

Whilst adequate bearing to support shallow foundation solutions should be available in the natural soils (for the form of residential development proposed) the design will need to take account of the 1m of fill and the high groundwater table present on site.

Foundation conditions are likely to vary over short distances, in a manner that is difficult to predict, between granular and cohesive, due to the presence of some sand and gravel superficial deposits overlying the solid geology Kimmeridge Clays.

It is recommended that design of the earthworks 1m fill is integrated into assessment of foundation and ground floor slab options, and that a detailed probing/trial pitting exercise is undertaken on a plot by plot basis, to truth out local ground conditions and enable suitable foundation options to be designed.

10 References

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Appendix A

Exploratory Hole Plan



LEGEND

- CABLE PERCUSSIVE BOREHOLE
- MACHINE EXCAVATED TRIAL PIT
- DYNAMIC SAMPLE
- PHASE BOUNDARY

NOTES

SYMBOLS FOR BOREHOLES, TRIAL PITS AND OTHER SPECIFIC FEATURES ARE REPRESENTATIONS OF LOCATION ONLY AND UNLESS OTHERWISE SPECIFIED, DO NOT REPRESENT THE TRUE SIZE OF THE FEATURE.

N

0 3.5 7 14 21 28 35 Metres

TITLE: EXPLORATORY HOLE LOCATION PLAN	
SITE: NORTHSTOWE PHASE 2C	
CLIENT: HOMES ENGLAND	
PROJECT: 10052307	FIGURE 1
DATE: 28/04/22	DRAWN BY: AP
DRG No.: 10052307-AUK-XX-XX-DR-ZZ-0003-P1	
SCALE: 1 1,000	PR NT: A3

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Appendix B

ESDAT Tables

https://arcadis365.sharepoint.com/teams/arcadis365/Shared%20Documents/Project%20Documents/12%20Reports%20and%20Documents/Exist%20Screened%20Data/PC-Chemistry_Output_Table1.xlsx

Table with columns for Analyte, Unit, EQC, LQM SAUL Public, LQM SAUL Residential, and Statistical Summary. Rows include Metals (Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Selenium, Vanadium, Zinc), Asbestos fibres, Inorganics (Ammonia, Cyanide, Sulfate), PAHs (Naphthalene, Acenaphthylene, Fluoranthene, Anthracene, Phenanthrene, Pyrene, Chrysene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzofluoranthene, Benzo[a]pyrene, Dibenz[a,h]anthracene, Indeno[1,2,3-cd]perylene, PAH 16 Total), PCBs, PCBs-C16-C35, PCBs-EC7, PCBs-EC7A, PCBs-EC7B, PCBs-EC7C, PCBs-EC7D, PCBs-EC7E, PCBs-EC7F, PCBs-EC7G, PCBs-EC7H, PCBs-EC7I, PCBs-EC7J, PCBs-EC7K, PCBs-EC7L, PCBs-EC7M, PCBs-EC7N, PCBs-EC7O, PCBs-EC7P, PCBs-EC7Q, PCBs-EC7R, PCBs-EC7S, PCBs-EC7T, PCBs-EC7U, PCBs-EC7V, PCBs-EC7W, PCBs-EC7X, PCBs-EC7Y, PCBs-EC7Z, PCBs-EC7AA, PCBs-EC7AB, PCBs-EC7AC, PCBs-EC7AD, PCBs-EC7AE, PCBs-EC7AF, PCBs-EC7AG, PCBs-EC7AH, PCBs-EC7AI, PCBs-EC7AJ, PCBs-EC7AK, PCBs-EC7AL, PCBs-EC7AM, PCBs-EC7AN, PCBs-EC7AO, PCBs-EC7AP, PCBs-EC7AQ, PCBs-EC7AR, PCBs-EC7AS, PCBs-EC7AT, PCBs-EC7AU, PCBs-EC7AV, PCBs-EC7AW, PCBs-EC7AX, PCBs-EC7AY, PCBs-EC7AZ, PCBs-EC7BA, PCBs-EC7BB, PCBs-EC7BC, PCBs-EC7BD, PCBs-EC7BE, PCBs-EC7BF, PCBs-EC7BG, PCBs-EC7BH, PCBs-EC7BI, PCBs-EC7BJ, PCBs-EC7BK, PCBs-EC7BL, PCBs-EC7BM, PCBs-EC7BN, PCBs-EC7BO, PCBs-EC7BP, PCBs-EC7BQ, PCBs-EC7BR, PCBs-EC7BS, PCBs-EC7BT, PCBs-EC7BU, PCBs-EC7BV, PCBs-EC7BW, PCBs-EC7BX, PCBs-EC7BY, PCBs-EC7BZ, PCBs-EC7CA, PCBs-EC7CB, PCBs-EC7CC, PCBs-EC7CD, PCBs-EC7CE, PCBs-EC7CF, PCBs-EC7CG, PCBs-EC7CH, PCBs-EC7CI, PCBs-EC7CJ, PCBs-EC7CK, PCBs-EC7CL, PCBs-EC7CM, PCBs-EC7CN, PCBs-EC7CO, PCBs-EC7CP, PCBs-EC7CQ, PCBs-EC7CR, PCBs-EC7CS, PCBs-EC7CT, PCBs-EC7CU, PCBs-EC7CV, PCBs-EC7CW, PCBs-EC7CX, PCBs-EC7CY, PCBs-EC7CZ, PCBs-EC7DA, PCBs-EC7DB, PCBs-EC7DC, PCBs-EC7DD, PCBs-EC7DE, PCBs-EC7DF, PCBs-EC7DG, PCBs-EC7DH, PCBs-EC7DI, PCBs-EC7DJ, PCBs-EC7DK, PCBs-EC7DL, PCBs-EC7DM, PCBs-EC7DN, PCBs-EC7DO, PCBs-EC7DP, PCBs-EC7DQ, PCBs-EC7DR, PCBs-EC7DS, PCBs-EC7DT, PCBs-EC7DU, PCBs-EC7DV, PCBs-EC7DW, PCBs-EC7DX, PCBs-EC7DY, PCBs-EC7DZ, PCBs-EC7EA, PCBs-EC7EB, PCBs-EC7EC, PCBs-EC7ED, PCBs-EC7EE, PCBs-EC7EF, PCBs-EC7EG, PCBs-EC7EH, PCBs-EC7EI, PCBs-EC7EJ, PCBs-EC7EK, PCBs-EC7EL, PCBs-EC7EM, PCBs-EC7EN, PCBs-EC7EO, PCBs-EC7EP, PCBs-EC7EQ, PCBs-EC7ER, PCBs-EC7ES, PCBs-EC7ET, PCBs-EC7EU, PCBs-EC7EV, PCBs-EC7EW, PCBs-EC7EX, PCBs-EC7EY, PCBs-EC7EZ, PCBs-EC7FA, PCBs-EC7FB, PCBs-EC7FC, PCBs-EC7FD, PCBs-EC7FE, PCBs-EC7FF, PCBs-EC7FG, PCBs-EC7FH, PCBs-EC7FI, PCBs-EC7FJ, PCBs-EC7FK, PCBs-EC7FL, PCBs-EC7FM, PCBs-EC7FN, PCBs-EC7FO, PCBs-EC7FP, PCBs-EC7FQ, PCBs-EC7FR, PCBs-EC7FS, PCBs-EC7FT, PCBs-EC7FU, PCBs-EC7FV, PCBs-EC7FW, PCBs-EC7FX, PCBs-EC7FY, PCBs-EC7FZ, PCBs-EC7GA, PCBs-EC7GB, PCBs-EC7GC, PCBs-EC7GD, PCBs-EC7GE, PCBs-EC7GF, PCBs-EC7GG, PCBs-EC7GH, PCBs-EC7GI, PCBs-EC7GJ, PCBs-EC7GK, PCBs-EC7GL, PCBs-EC7GM, PCBs-EC7GN, PCBs-EC7GO, PCBs-EC7GP, PCBs-EC7GQ, PCBs-EC7GR, PCBs-EC7GS, PCBs-EC7GT, PCBs-EC7GU, PCBs-EC7GV, PCBs-EC7GW, PCBs-EC7GX, PCBs-EC7GY, PCBs-EC7GZ, PCBs-EC7HA, PCBs-EC7HB, PCBs-EC7HC, PCBs-EC7HD, PCBs-EC7HE, PCBs-EC7HF, PCBs-EC7HG, PCBs-EC7HH, PCBs-EC7HI, PCBs-EC7HJ, PCBs-EC7HK, PCBs-EC7HL, PCBs-EC7HM, PCBs-EC7HN, PCBs-EC7HO, PCBs-EC7HP, PCBs-EC7HQ, PCBs-EC7HR, PCBs-EC7HS, PCBs-EC7HT, PCBs-EC7HU, PCBs-EC7HV, PCBs-EC7HW, PCBs-EC7HX, PCBs-EC7HY, PCBs-EC7HZ, PCBs-EC7IA, PCBs-EC7IB, PCBs-EC7IC, PCBs-EC7ID, PCBs-EC7IE, PCBs-EC7IF, PCBs-EC7IG, PCBs-EC7IH, PCBs-EC7II, PCBs-EC7IJ, PCBs-EC7IK, PCBs-EC7IL, PCBs-EC7IM, PCBs-EC7IN, PCBs-EC7IO, PCBs-EC7IP, PCBs-EC7IQ, PCBs-EC7IR, PCBs-EC7IS, PCBs-EC7IT, PCBs-EC7IU, PCBs-EC7IV, PCBs-EC7IW, PCBs-EC7IX, PCBs-EC7IY, PCBs-EC7IZ, PCBs-EC7JA, PCBs-EC7JB, PCBs-EC7JC, PCBs-EC7JD, PCBs-EC7JE, PCBs-EC7JF, PCBs-EC7JG, PCBs-EC7JH, PCBs-EC7JI, PCBs-EC7JJ, PCBs-EC7JK, PCBs-EC7JL, PCBs-EC7JM, PCBs-EC7JN, PCBs-EC7JO, PCBs-EC7JP, PCBs-EC7JQ, PCBs-EC7JR, PCBs-EC7JS, PCBs-EC7JT, PCBs-EC7JU, PCBs-EC7JV, PCBs-EC7JW, PCBs-EC7JX, PCBs-EC7JY, PCBs-EC7JZ, PCBs-EC7KA, PCBs-EC7KB, PCBs-EC7KC, PCBs-EC7KD, PCBs-EC7KE, PCBs-EC7KF, PCBs-EC7KG, PCBs-EC7KH, PCBs-EC7KI, PCBs-EC7KJ, PCBs-EC7KK, PCBs-EC7KL, PCBs-EC7KM, PCBs-EC7KN, PCBs-EC7KO, PCBs-EC7KP, PCBs-EC7KQ, PCBs-EC7KR, PCBs-EC7KS, PCBs-EC7KT, PCBs-EC7KU, PCBs-EC7KV, PCBs-EC7KW, PCBs-EC7KX, PCBs-EC7KY, PCBs-EC7KZ, PCBs-EC7LA, PCBs-EC7LB, PCBs-EC7LC, PCBs-EC7LD, PCBs-EC7LE, PCBs-EC7LF, PCBs-EC7LG, PCBs-EC7LH, PCBs-EC7LI, PCBs-EC7LJ, PCBs-EC7LK, PCBs-EC7LL, PCBs-EC7LM, PCBs-EC7LN, PCBs-EC7LO, PCBs-EC7LP, PCBs-EC7LQ, PCBs-EC7LR, PCBs-EC7LS, PCBs-EC7LT, PCBs-EC7LU, PCBs-EC7LV, PCBs-EC7LW, PCBs-EC7LX, PCBs-EC7LY, PCBs-EC7LZ, PCBs-EC7MA, PCBs-EC7MB, PCBs-EC7MC, PCBs-EC7MD, PCBs-EC7ME, PCBs-EC7MF, PCBs-EC7MG, PCBs-EC7MH, PCBs-EC7MI, PCBs-EC7MJ, PCBs-EC7MK, PCBs-EC7ML, PCBs-EC7MN, PCBs-EC7MO, PCBs-EC7MP, PCBs-EC7MQ, PCBs-EC7MR, PCBs-EC7MS, PCBs-EC7MT, PCBs-EC7MU, PCBs-EC7MV, PCBs-EC7MW, PCBs-EC7MX, PCBs-EC7MY, PCBs-EC7MZ, PCBs-EC7NA, PCBs-EC7NB, PCBs-EC7NC, PCBs-EC7ND, PCBs-EC7NE, PCBs-EC7NF, PCBs-EC7NG, PCBs-EC7NH, PCBs-EC7NI, PCBs-EC7NJ, PCBs-EC7NK, PCBs-EC7NL, PCBs-EC7NM, PCBs-EC7NO, 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PCBs-EC7QU, PCBs-EC7QV, PCBs-EC7QW, PCBs-EC7QX, PCBs-EC7QY, PCBs-EC7QZ, PCBs-EC7RA, PCBs-EC7RB, PCBs-EC7RC, PCBs-EC7RD, PCBs-EC7RE, PCBs-EC7RF, PCBs-EC7RG, PCBs-EC7RH, PCBs-EC7RI, PCBs-EC7RJ, PCBs-EC7RK, PCBs-EC7RL, PCBs-EC7RM, PCBs-EC7RN, PCBs-EC7RO, PCBs-EC7RP, PCBs-EC7RQ, PCBs-EC7RR, PCBs-EC7RS, PCBs-EC7RT, PCBs-EC7RU, PCBs-EC7RV, PCBs-EC7RW, PCBs-EC7RX, PCBs-EC7RY, PCBs-EC7RZ, PCBs-EC7SA, PCBs-EC7SB, PCBs-EC7SC, PCBs-EC7SD, PCBs-EC7SE, PCBs-EC7SF, PCBs-EC7SG, PCBs-EC7SH, PCBs-EC7SI, PCBs-EC7SJ, PCBs-EC7SK, PCBs-EC7SL, PCBs-EC7SM, PCBs-EC7SN, PCBs-EC7SO, PCBs-EC7SP, PCBs-EC7SQ, PCBs-EC7SR, PCBs-EC7SS, PCBs-EC7ST, PCBs-EC7SU, PCBs-EC7SV, PCBs-EC7SW, PCBs-EC7SX, PCBs-EC7SY, PCBs-EC7SZ, PCBs-EC7TA, PCBs-EC7TB, PCBs-EC7TC, PCBs-EC7TD, PCBs-EC7TE, PCBs-EC7TF, PCBs-EC7TG, PCBs-EC7TH, PCBs-EC7TI, PCBs-EC7TJ, PCBs-EC7TK, PCBs-EC7TL, PCBs-EC7TM, PCBs-EC7TN, PCBs-EC7TO, PCBs-EC7TP, PCBs-EC7TQ, PCBs-EC7TR, PCBs-EC7TS, PCBs-EC7TT, PCBs-EC7TU, PCBs-EC7TV, PCBs-EC7TW, PCBs-EC7TX, PCBs-EC7TY, PCBs-EC7TZ, PCBs-EC7UA, PCBs-EC7UB, PCBs-EC7UC, PCBs-EC7UD, PCBs-EC7UE, PCBs-EC7UF, PCBs-EC7UG, PCBs-EC7UH, PCBs-EC7UI, PCBs-EC7UJ, PCBs-EC7UK, PCBs-EC7UL, PCBs-EC7UM, PCBs-EC7UN, PCBs-EC7UO, PCBs-EC7UP, PCBs-EC7UQ, PCBs-EC7UR, PCBs-EC7US, PCBs-EC7UT, PCBs-EC7UU, PCBs-EC7UV, PCBs-EC7UW, PCBs-EC7UX, PCBs-EC7UY, PCBs-EC7UZ, PCBs-EC7VA, PCBs-EC7VB, PCBs-EC7VC, PCBs-EC7VD, PCBs-EC7VE, PCBs-EC7VF, PCBs-EC7VG, PCBs-EC7VH, PCBs-EC7VI, PCBs-EC7VJ, PCBs-EC7VK, PCBs-EC7VL, PCBs-EC7VM, PCBs-EC7VN, PCBs-EC7VO, PCBs-EC7VP, PCBs-EC7VQ, PCBs-EC7VR, PCBs-EC7VS, PCBs-EC7VT, PCBs-EC7VU, PCBs-EC7VV, PCBs-EC7VW, PCBs-EC7VX, PCBs-EC7VY, PCBs-EC7VZ, PCBs-EC7WA, PCBs-EC7WB, PCBs-EC7WC, PCBs-EC7WD, PCBs-EC7WE, PCBs-EC7WF, PCBs-EC7WG, PCBs-EC7WH, PCBs-EC7WI, PCBs-EC7WJ, PCBs-EC7WK, PCBs-EC7WL, PCBs-EC7WM, PCBs-EC7WN, PCBs-EC7WO, PCBs-EC7WP, PCBs-EC7WQ, PCBs-EC7WR, PCBs-EC7WS, PCBs-EC7WT, PCBs-EC7WU, PCBs-EC7WV, PCBs-EC7WW, PCBs-EC7WX, PCBs-EC7WY, PCBs-EC7WZ, PCBs-EC7XA, PCBs-EC7XB, PCBs-EC7XC, PCBs-EC7XD, PCBs-EC7XE, PCBs-EC7XF, PCBs-EC7XG, PCBs-EC7XH, PCBs-EC7XI, PCBs-EC7XJ, PCBs-EC7XK, PCBs-EC7XL, PCBs-EC7XM, PCBs-EC7XN, PCBs-EC7XO, PCBs-EC7XP, PCBs-EC7XQ, PCBs-EC7XR, PCBs-EC7XS, PCBs-EC7XT, PCBs-EC7XU, PCBs-EC7XV, PCBs-EC7XW, PCBs-EC7XX, PCBs-EC7XY, PCBs-EC7XZ, PCBs-EC7YA, PCBs-EC7YB, PCBs-EC7YC, PCBs-EC7YD, PCBs-EC7YE, PCBs-EC7YF, PCBs-EC7YG, PCBs-EC7YH, PCBs-EC7YI, PCBs-EC7YJ, PCBs-EC7YK, PCBs-EC7YL, PCBs-EC7YM, PCBs-EC7YN, PCBs-EC7YO, PCBs-EC7YP, PCBs-EC7YQ, PCBs-EC7YR, PCBs-EC7YS, PCBs-EC7YT, PCBs-EC7YU, PCBs-EC7YV, PCBs-EC7YW, PCBs-EC7YX, PCBs-EC7YY, PCBs-EC7YZ, PCBs-EC7ZA, PCBs-EC7ZB, PCBs-EC7ZC, PCBs-EC7ZD, PCBs-EC7ZE, PCBs-EC7ZF, PCBs-EC7ZG, PCBs-EC7ZH, PCBs-EC7ZI, PCBs-EC7ZJ, PCBs-EC7ZK, PCBs-EC7ZL, PCBs-EC7ZM, PCBs-EC7ZN, PCBs-EC7ZO, PCBs-EC7ZP, PCBs-EC7ZQ, PCBs-EC7ZR, PCBs-EC7ZS, PCBs-EC7ZT, PCBs-EC7ZU, PCBs-EC7ZV, PCBs-EC7ZW, PCBs-EC7ZX, PCBs-EC7ZY, PCBs-EC7ZZ

Env Sids Description
LQM SAUL Public Open Space (POS) Residential - 1% SOM LQM SAUL 2015. Human health criteria for a public open space (POS) residential end-use (with consumption of homegrown produce).
LQM SAUL Residential (with consumption of homegrown produce) - 1% SOM LQM SAUL 2015. Human health criteria for a residential end-use (with consumption of homegrown produce). For soil at 1% soil organic matter (SOM).

Env Sids Comments
#1 GAC is only presented as speciated chromium. 7.7mg/kg is used for hexavalent. If hexavalent chromium (Cr(VI)) data is available, a value of 1.500mg/kg may be appropriate for the remaining trivalent chromium (Cr(III)).
#2 GAC is only presented as speciated chromium. 8.0mg/kg is used for hexavalent. If hexavalent chromium (Cr(VI)) data is available, a value of 0.100mg/kg may be appropriate for the remaining trivalent chromium (Cr(III)).
#3 CASL for lead adopted
#4 GAC only presented as speciated mercury. 16mg/kg is used for elemental mercury. If the CSM indicates that elemental mercury is not a CoC and mercury is present in an inorganic form, a value of 120mg/kg for inorganic mercury may be appropriate
#5 GAC only presented as speciated mercury. 1.2mg/kg is used for elemental mercury. If the CSM indicates that elemental mercury is not a CoC and mercury is present in an inorganic form, a value of 40mg/kg for inorganic mercury may be appropriate
#6 Updated SAUL for nickel
#7 SAUL exceeds solubility saturation limit
#8 SAUL exceeds vapour saturation limit
#9 Criteria derived for AIB-C16-C35 split between AIB-C16-C1 and AIB-C21-35. Requires summation of fractions to use AIB-C16-C35 criteria.
#10 Criteria presented is for p-xylene. A separate value is presented for o-xylene.

Data Comments
#1 Brown clay and loam with gravel and vegetation.
#2 Brown clay and sand with gravel and vegetation.
#3 Brown loam and clay with gravel and vegetation.
#4 Brown loam and clay with gravel and stones.
#5 Brown clay and loam with gravel and stones.
#6 Brown clay and loam with gravel and chalk.
#7 Light brown clay and sand with gravel.
#8 Light grey clay and sand with gravel.
#9 Brown clay with gravel and chalk.
#10 Brown clay and sand with gravel.
#11 Brown clay and loam with gravel.
#12 Brown loam and clay with gravel.
#13 Grey clay and sand with gravel.
#14 Brown clay with gravel.
#15 Not-detected

https://arcadis0365.sharepoint.com/teams/project-10052307/ProjectDocuments/Ground Investigation/12.Reports and Documents/Esdat Screened Data/Groundwater/2C-Chemistry Output Table 1.xlsm)Chemistry Output Table

Table with columns for Site ID, Field ID, Location, Well, Sampled Date Time, and Analyte. It contains data for various chemical groups including Miscellaneous, Metals, Inorganics, PAH, TPH CWG, BTX and MTBE, SVOC, Phenolics, and Other. Each row lists an analyte, its unit, and its concentration across multiple wells (BH101-BH104, WS108-WS120).

Statistical Summary table with columns: Number of Results, Number of Defects, Minimum Concentration, Minimum Detect, Maximum Concentration, Maximum Detect, Average Concentration, Median Concentration, Standard Deviation, Number of Guideline Exceedances, and Number of Guideline Exceedances (Defects Only).

Env Stds Description
UK Drinking Water Standards: UK Drinking Water Standards - Water Supply (Water Quality) Regulations, 2016 [http://www.legislation.gov.uk/ukdsi/2016/614/pdfs/ukdsi_20160614_en.pdf] plus other key CoC. To be used to assess risk to an aquifer.
UK Freshwater EQS: UK Freshwater EQS Annual Average (AA) [https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit] plus other key CoC. *UK Freshwater EQS - further

Env Stds Comments
#1: Water Supply (Water Quality) Regulations 2016.
#2: Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
#3: Operational Targets and EQS. EA, April 2018.
#4: Water Framework Directive (Standards & Classification) Directions (England & Wales) 2015. Dissolved fraction. Lowest criteria presented (<40mg/l of CaCO3). See 'further assessment' if criteria exceeded and hardness (CaCO3) data available.
#5: Water Framework Directive (Standards & Classification) Directions (England & Wales) 2015. Dissolved fraction.
#6: Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Dissolved Fraction. If hexavalent chromium (CrVI) data is available, a value of 4.7µg/l may be appropriate for the remaining trivalent chromium (CrIII).
#7: Water Framework Directive (Standards & Classification) Directions (England & Wales) 2015. Dissolved & bioavailable (bio) fraction plus background. M-BAT tool to assess: http://wfd.uk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat
#8: Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Dissolved Fraction. MAC adopted in absence of AA value.
#9: Guidelines for Drinking-water Quality, 4th Edition. WHO, 2011. Based on taste rather than a formal guideline.
#10: Water Supply (Water Quality) Regulations 2016. Value of 0.1µg/l for PAH split between four individual PAH. Requires summation of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene to use 0.1µg/l value.
#11: Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Benzo(a)pyrene can be considered as a marker for other PAH for comparison with the corresponding AA-EQS in water.
#12: Guidelines for Drinking-water Quality, 4th Edition. WHO, 2011.
#13: Proposed Environmental Quality Standard, in absence of legislative standard (Ayscough et al., 2002). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291223/sp2-115-t4-e-e.pdf
#14: Guidelines for Drinking-water Quality, 4th Edition. WHO, 2011. Value of 500µg/l for sum xylenes split between isomers. Requires summation of m,p & o isomers to use 500µg/l value.
#15: Operational Targets and EQS. EA, April 2018. Value of 30µg/l for sum xylenes split between isomers. Requires summation of m,p & o isomers to use 30µg/l value.
#16: The taste and odour threshold of 15µg/l is commonly adopted as a guide.
#17: The taste and odour threshold of 15µg/l is commonly adopted as a guide. In situations where there is no risk to a drinking water supply or aquifer, a PNEC value of 2,600µg/l may be used.
#18: US EPA Regional Screening Levels, May 2019. https://www.epa.gov/rsl/regional-screening-levels-rsls-generic-tables
#19: Operational Targets and EQS. EA, April 2018. Maximum Allowable Concentration (MAC) adopted in absence of Annual Average (AA) value.

Appendix C

Phase 2C Factual Report

NORTHSTOWE PHASE 2 - PARCEL 2C

Ground Investigation Factual Report

May 2022



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Report No 10052307-SER-G001

Date May 2022

Version control

Version	Date	Author	Changes
00	May 2022	Reg. 13(1)	Original issue

This report dated May 2022 has been prepared for Homes England (the "Client") in accordance with the terms and conditions of appointment dated February 2022 (the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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1 INTRODUCTION

Homes England propose to undertake the development of residential properties on the 2C parcel of land at Northstowe, Cambridgeshire. This ground investigation was commissioned by Homes England, 'the Client', to inform on the ground conditions at the site.

The scope of the ground investigation was determined by Arcadis Consulting (UK) Ltd, and the work was instructed in February 2022.

This report provides a factual account of the fieldwork undertaken including engineering descriptions of the various strata encountered, results of *in situ* testing, monitoring and the subsequent geotechnical and geo-environmental laboratory testing undertaken on samples obtained.

1.1 Limitations

This report has been prepared for the Client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document, including the electronic format and any AGS data, shall remain the property of Arcadis.

Arcadis do not accept liability for any use of the information presented in this report unless it is signed by the author, checker and approver and marked as final.

It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, seasonal, and climatic variations and those recorded in this report are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

1.2 Proposal

The proposed development is expected to comprise circa 130 houses and a Neighbourhood Equipped Area of Play (NEAP).

1.3 Existing Information

The following information relating to the site and the ground conditions was made available to Arcadis prior to mobilisation to the site:

- a. 10018973-ARC-XX-XX-RP-YY-0004-03-Phase 2B Interpretive Report 2020; Arcadis Consulting (UK) Ltd [1]

2 SITE DETAILS

2.1 Site Location and Description

The site is situated approximately 10km northwest of Cambridge at the approximate national grid reference of TL 402 672. Figure 2-1 below shows the site location.

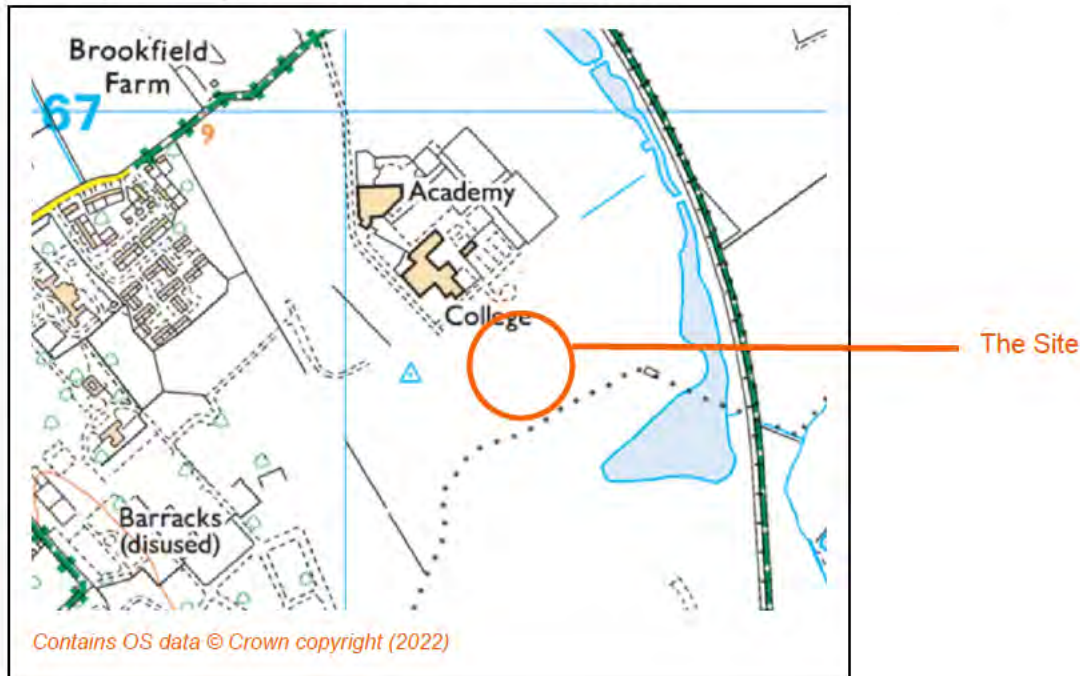


Figure 2-1 Site Location

The site is a defined plot of land, designated 2C, within the wider development of the new town of Northstowe. It currently comprises undeveloped open land which has been stripped of vegetation and is being used for the stockpiling of materials from the wider Northstowe development.

To the north is Northstowe Secondary College, to the northeast is open land (marked to be developed as a Sports Hub) while to the east and southeast is a grassed waterparks area with an associated play area. The site is bound to the south and west by a currently unnamed road.

The site is generally level, however the 2C parcel currently sits approximately 1m below the surrounding ground level of the adjacent roads and footpaths.

2.2 Geology

The published 1:50 000 scale British Geological Survey (BGS) map of the area incorporating the site, Sheet 188 Cambridge [2], and the BGS OnShore GeolIndex [3] indicate the site is underlain by the Kimmeridge Clay Formation. The site is located adjacent to the boundary of the mapped River Terrace Deposits on the southern and eastern side indicating these deposits are unlikely to be laterally extensive across the site. The general distribution of the strata at the site is shown in Figure 2-2 below.

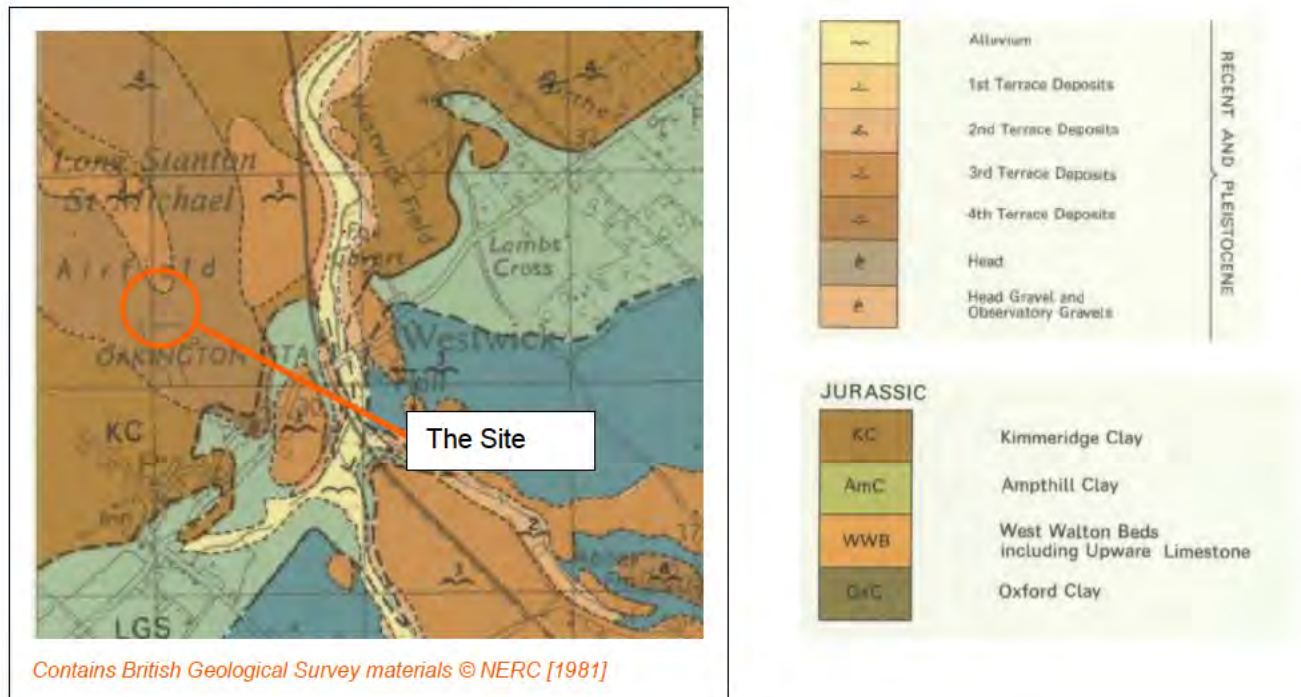


Figure 2-2: Geological Setting

The superficial River Terrace Deposits are described as “sand and gravel, locally with lenses of silt, clay or peat” [3]. These are underlain by the solid geology of the Kimmeridge Clay Formation which is described as “mudstones (calcareous or kerogen-rich or silty or sandy); thin siltstone and cementstone beds; locally sands and silts” [3].

Due to the sites history as an RAF facility and its current development, the likelihood of encountering anthropogenic materials side wide is high.

2.3 Hydrogeology and Hydrology

The superficial deposits on the site are classified as Secondary A aquifer meaning permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers [4].

The Kimmeridge Clay Formation is classified as Unproductive Strata. Unproductive Strata is defined as “rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow” [4].

The site is not situated in a source protection zone.

The closest surface water feature is a newly created waterparks area consisting of soft landscaping and ponds approximately 300m east southeast of the plot. The site is not situated in a flood risk zone.

3 FIELDWORK

3.1 General

Ground investigation works were carried out in a single phase between 15^h and 23rd March 2022. The scope of the ground investigation, including the location, scheduled depth and type of exploratory hole undertaken was determined by Arcadis Consulting (UK) Ltd and is summarised in Table 3-1.

The ground investigation methods were undertaken in general accordance with the principles set out in BS EN 1997-2:2004 [5] and with the general practice described in BS5930:2015+A1:2020 [6]. The geo-environmental aspects of the ground investigation complied with the general requirements of BS 10175+A2:2017 [7].

Table 3-1 Initial ground investigation scope

Location ID	Hole Type	Scheduled Depth (m)	Requirements
BH2C101-BH2C104	CP	15.00	Determine thickness of engineering soils; collect representative samples of strata and undertake <i>in situ</i> tests
TP2C102, TP2C103, TP2C104, TP2C105, TP2C107, TP2C109, TP2C110, TP2C111, TP2C113, TP2C115, TP2C116, TP2C117, TP2C118, TP2C119, TP2C122, TP2C124	TP	3.00	Determine thickness of engineering soils; collect representative samples of strata.
WS2C101, WS2C106, WS2C108, WS2C112, WS2C114, WS2C120, WS2C121, WS2C123	DS	3.00	Determine thickness of engineering soils; collect representative samples of strata and undertake <i>in situ</i> tests

Notes

TP = trial pitting, CP = cable percussive boring, DS = dynamic sampling.

The investigation works were carried out under the supervision of an Arcadis ground engineer who undertook the logging and reporting of the exploratory holes and *in situ* testing.

3.2 Exploratory Holes

3.2.1 Exploratory Hole Locations

The exploratory hole locations were set out using eastings and northings on site by a specialist survey firm and the elevations then established using a Trimble VRS NOW GPRS system.

3.2.2 Investigation Methodology

The following methods and techniques were undertaken to construct the exploratory holes at the site.

Details of the methods of investigation and associated standards adopted and a key to the notation and symbols used on the logs is presented in Appendix B; the exploratory hole records are presented in Appendix C.

3.2.3 Cable Percussive Boring

Cable percussive boring was completed using a trailer mounted Dando 2000 or Dando 2500 boring rig equipped with 200 mm and 150 mm casing and tools to undertake boreholes up to 15.45 m bgl.

Samples of the material recovered from the borehole were taken to enable representative laboratory testing. Generally, small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Standard penetration tests (SPT) were generally undertaken at 1.0 m intervals until 10 m depth and then were taken at 1.50 m intervals until the termination depth of the hole. These were alternated with open drive tube samples, taken using thin-walled sampling apparatus from the relatively undisturbed material at the base of the borehole.

3.2.4 Dynamic Sampling

Dynamic sampling was completed using a track-mounted Competitor Dart sampling rig capable of driving windowless sampling tubes using a mechanical hammer dropped repeatedly from a self-governed height.

Due to the method of investigation, the materials recovered within the sampler apparatus were generally disturbed and were assessed as complying with Class 3 to Class 5 of BS EN 22475-2 [8]. Sub-samples of the material recovered in the liners were taken to enable representative laboratory testing. Generally, small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and small bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Standard penetration tests (SPT) were undertaken using the track mounted rig 1.0 m centres until the termination depth of the hole.

3.2.5 Trial Pitting

Trial pits were undertaken using a tracked mechanical excavator and pits were entirely logged from the surface and arisings.

Samples of the material recovered in the trial pits were taken to enable representative laboratory testing. Generally, small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was assessed as significant.

3.2.6 Completed Works

Drawing 10052307-SER-EHP-0001 presented in Appendix A displays the as-constructed exploratory hole locations while the co-ordinates and elevation of the ground surface at each exploratory hole location are given on the individual logs. The completed scope of investigation is summarised in Table 3.2.

Table 3-2. Summary of completed exploratory holes

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
BH2C101	CP	21/03/2022	21/03/2022	15.00	Terminated on target depth.
BH2C102	CP	17/03/2022	17/03/2022	15.45	Terminated on target depth.
BH2C103	CP	21/03/2022	22/03/2022	15.00	Terminated on target depth.
BH2C104	CP	22/03/2022	23/03/2022	15.00	Terminated on target depth.
TP2C102	TP	16/03/2022	16/03/2022	3.00	Terminated on target depth.
TP2C103	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.

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Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
TP2C104	TP	16/03/2022	16/03/2022	3.00	Terminated on target depth.
TP2C105	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C107	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C109	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C110	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C111	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C113	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C115	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C116	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C117	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C118	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C119	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C122	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C124	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
WS2C101	DS	21/03/2022	21/03/2022	2.25	Terminated on refusal.
WS2C106	DS	21/03/2022	21/03/2022	3.25	Terminated on refusal.
WS2C108	DS	15/03/2022	15/03/2022	3.15	Terminated on target depth.
WS2C112	DS	16/03/2022	16/03/2022	3.15	Terminated on refusal.
WS2C114	DS	16/03/2022	16/03/2022	3.45	Terminated on target depth.
WS2C120	DS	16/03/2022	16/03/2022	3.17	Terminated on refusal.
WS2C121	DS	21/03/2022	21/03/2022	3.45	Terminated on target depth.
WS2C123	DS	21/03/2022	21/03/2022	3.45	Terminated on target depth.

Notes

TP = trial pitting, CP = cable percussive boring, DS = dynamic sampling.

3.3 In situ Testing

3.3.1 Penetration Testing

3.3.1.1 Standard Penetration Tests

Standard penetration tests (SPT) were carried out as required in the investigation scope and in accordance with the methods given in the standard procedures presented within Appendix B. Generally, tests were undertaken at regular intervals throughout the borehole to provide a profile of the soil's resistance with depth and a disturbed soil sample was recovered from the SPT split-spoon tool or a disturbed sample was taken over the range of the test interval.

The N-values as determined in the field are presented on the borehole logs as uncorrected values that do not take into account the energy losses or efficiency of the automatic trip hammer used to drive the test tool into the ground. The calibration certification for the test devices used in the investigation is presented in Appendix D and a summary of the SPT equipment used at each location is presented in Table 3-3.

Table 3-3 Test Hammer Calibrations

Location ID	SPT Hammer Reference No.	Energy Efficiency Ratio, E_r %
BH2C102	AR2521	78.98
BH2C101, 103, 104	AR2411	77.00
WS2C101, WS2C106, WS2C108, WS2C112, WS2C114, WS2C120, WS2C121, WS2C123	DART489	82.00

3.3.2 VOC Head Space Screening

The presence of Volatile Organic Compounds (VOC) within the ground was determined using a photoionization detector (PID) to detect the 'headspace' vapours emitted by the compounds. The method is applicable to a wide range of compounds that have sufficiently high volatility to be effected liberated from the soil or water matrix in normal temperature and pressure ranges.

The headspace test was undertaken on the freshly extracted soil core sample at regular intervals corresponding with environmental sampling by placing a small amount of material into a screw-top glass jar so that the jar was not more than half-full. The jar opening was covered with an aluminium foil sheet and the lid screwed on to form an air-tight seal. The sample and jar were then shaken for about 15 seconds to break-up and disperse the soil before resting the sample for about 5 minutes.

To assess the headspace vapour, the jar lid was removed and the PID probe was inserted through the foil into the headspace area. The PID reading recorded was the highest response observed in the first 10 seconds. The screening results are presented on the relevant exploratory holes logs within Appendix C.

The testing was undertaken using a MiniRAE Lite PID with a 10.6 eV lamp.

The PID instrument was calibrated regularly throughout the day using isobutylene reference gas concentrations.

3.4 Installations and Post-fieldwork Monitoring

3.4.1 Installations

Installations to enable long term monitoring of the site were made in those boreholes selected by Arcadis Consulting (UK) Ltd and the details are summarised in Table 3-4 and are also provided on the relevant borehole logs.

Table 3-4 Summary exploratory hole installations

Location ID	Installation Type	Response Zone Top m bgl	Response Zone Base m bgl
BH2C101	SP50	3.00	15.00
BH2C102	SP50	5.00	15.00
BH2C103	SP50	4.00	15.00
BH2C104	SP50	0.50	4.90
WS2C101	SP50	0.50	1.70
WS2C106	SP50	0.50	1.50
WS2C108	SP50	0.50	2.70
WS2C112	SP50	0.50	1.20
WS2C114	SP50	0.50	1.50
WS2C120	SP50	0.50	2.50
WS2C121	SP50	0.50	1.50
WS2C123	SP50	0.50	1.50

Notes

SP50 = standpipe piezometer

3.4.2 Post-fieldwork Monitoring

Post-field work monitoring was undertaken on three separate visits on 5th – 8th April, 12^h – 13th April, and 23rd May 2022 to record land gas emissions and groundwater levels. During the first monitoring visit, after completion of the land gas emission monitoring, groundwater monitoring and sampling was undertaken. Where installations were purged dry, monitoring and sampling was conducted on groundwater recovered following recharging of groundwater in installations.

The results of the groundwater monitoring are presented within Appendix E.

4 LABORATORY TESTING

4.1 General

Geotechnical and geo-environmental chemical testing was undertaken on selected samples obtained from the exploratory holes. The testing was scheduled by the geo-environmental engineer and the testing was undertaken by an Arcadis approved testing laboratory.

4.2 Geotechnical Laboratory Testing

The geotechnical tests detailed in Table 4.1 were carried out in accordance with either BS1377:1990: Parts 1 to 8 [9]; BS EN ISO 17892: Parts 1 to 12 [10]; BRE SD 1:2005 [11]; or other methods as listed in Table 4.1. The complete results of the geotechnical laboratory testing are presented in Appendix F.

Table 4-1 Summary of geotechnical test data

Test	Method	No of Determinations
Moisture content	BS1377 Pt 2 - 3.2	37
4-point liquid and plastic limit	BS 1377 Pt 2 - 4.3 & 5.3	37
Particle Size Distribution - Wet sieving	BS1377 Pt 2 - 9.2	7
Particle Size Distribution - Sedimentation	BS1377 Pt 2 - 9.4	7
pH, water soluble sulphate; total sulphate, total sulphur, chloride, nitrate, magnesium	BRE SD1 preferred methods	12
One-dimensional Consolidation	BS1377 Pt 5 – 3	1
Quick Undrained Triaxial Compression	BS1377 Pt 7 – 8	9

4.3 Geo-Environmental Laboratory Testing

Geo-environmental tests were undertaken on soil, groundwater and prepared leachate specimens obtained from the samples collected from the site. Testing was carried out for the contaminants detailed in Table 4.1, Table 4.2. Details of the test methodology and results of the chemical laboratory testing are presented in Appendix G.

Table 4-2 Summary of geo-environmental test data – soil matrix

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn)	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	30
pH		30

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Cyanide Free and Total		30
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	Gas Chromatography –Mass Spectrometry (GC-MS)	28
Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG)	Gas Chromatography – Flame Ionisation Detector (GC-FID)	22
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX)	Gas Chromatography –Mass Spectrometry (GC-MS)	22
Total Organic Carbon		2
Phenol (total), Cresol, Chlorinated Phenols		30
Hexavalent Chromium		26

Table 4-3 Summary of geo-environmental test data – groundwater matrix

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn), pH, Cyanide Free & Total	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	8
PAHs	Gas Chromatography –Mass Spectrometry (GC-MS)	8
TPH CWG	Gas Chromatography – Flame Ionisation Detector (GC-FID)	8
SVOCs	Gas Chromatography –Mass Spectrometry (GC-MS)	8

5 REFERENCES

1. Arcadis Consulting (UK) Ltd. 2020. 10018973-ARC-XX-XX-RP-YY-0004-03-Phase 2B Interpretive Report.
2. British Geological Survey. 1982. Cambridge. England and Wales Sheet 188. Bedrock and Drift Deposits. 1:50 000. BGS Keyworth, Nottingham.
3. British Geological Survey, Onshore GeoIndex
<http://www.bgs.ac.uk/data/mapViewers/home.html>
Accessed April 2022.
4. Natural England Magic Map
<http://www.magic.gov.uk/MagicMap.aspx>
Accessed April 2022
5. BS EN 1997-1. 2004.+ A1 2013 *Incorporating corrigendum February 2009*. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution.
6. BS EN 1997-2. 2007. *Incorporating corrigendum June 2010*. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution.
7. BS 5930. 2015+A1:2020. Code of practice for ground investigations. British Standards Institution.
8. BS 10175+A2. 2017. Investigation of potentially contaminated sites – Code of practice. British Standards Institution.
9. BS 1377. 1990 & 2016 as amended. Method of test for soils for civil engineering purposes. Published in 9 Parts. British Standards Institution.
10. BS EN ISO 17892-1: Geotechnical investigation and testing – Laboratory testing of soil – Determination of water content. British Standards Institution.
11. Building Research Establishment. 2005. Concrete in aggressive ground. BRE Special Digest 1. 3rd Edition. BRE, Watford.

APPENDIX A

DRAWINGS

Drawing 10052307-SER-EHP-0001: Exploratory Hole Location
Plan



LEGEND

- CABLE PERCUSSIVE BOREHOLE
- MACHINE EXCAVATED TRIAL PIT
- DYNAMIC SAMPLE
- PHASE BOUNDARY

NOTES

SYMBOLS FOR BOREHOLES, TRIAL PITS AND OTHER SPECIFIC FEATURES ARE REPRESENTATIONS OF LOCATION ONLY AND UNLESS OTHERWISE SPECIFIED, DO NOT REPRESENT THE TRUE SIZE OF THE FEATURE.

N

0 3.5 7 14 21 28 35 Metres

TITLE:
EXPLORATORY HOLE LOCATION PLAN

SITE :
NORTHSTOWE PHASE 2C1

CLIENT :
HOMES AND COMMUNITIES AGENCY

PROJECT : **10052307** **FIGURE 1**

DATE : 28/04/22 DRAWN BY : AP

DRG No. : 10052307-AUK-XX-XX-DR-ZZ-0003-P1

SCALE : 1 1,000 PR NT : A3

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



APPENDIX B

STANDARD PROCEDURES

B0 General Principles

This ground investigation was undertaken in general accordance with the principles of BS EN 1997-1 [1] and BS EN 1997-2 [2] and the advice given in BS5930:2015+A1:2020 [3], which, provides complimentary guidance on the application of the primary standards. Where the requirements of the ground investigation specification differ from these primary standards, the investigation methodology was adapted as required and specific notes regarding methods and techniques employed were made in the appropriate report sections.

B1 Buried Services

Service clearance was undertaken in accordance with Arcadis' *Safety, Health and Environment (SHE) Standard – Avoidance of Sub-Surface Hazards and Structures Standard*. This document details the methods and safe working practices used to undertake excavations safely. Prior to breaking ground, services plans were consulted and the area scanned using a Cable Avoidance Tool (CAT) with detected signals marked on the ground. For all investigation positions, other than for machine excavated trial pits, hand excavated inspection pits are completed to 1.20 m bgl prior to the use of drilling and boring plant.

B2 Sampling requirements

The selection of sample types and sampling techniques has been chosen to take account of the soil fabric, size and quality of sample required based on whether the soils mass properties or the intact material properties of the ground are to be determined in subsequent laboratory tests. BS EN ISO 22475-1[4] describes three generic sample groups that are:

- a. Sampling by drilling. Generally, a disturbed sample recovered from the drilling tool or digging equipment, typically meeting Class 3 to Class 5 requirements, with the recovered material being stored in bulk bags or sealed jar or tub containers.
- b. Sampling by sampler. Typically referred to as open tube or drive sampling in which a tube with a sharp cutting edge is driven into the ground either by static thrust or dynamically driven to give a relatively undisturbed sample of Class 1 or Class 2 but may result in a Class 3 sample.
- c. Block sampling. Cylindrical large diameter samples or cuboid hand-cut samples usually relatively undisturbed Class 1 and Class 2.

The open-tube sampling equipment used on the site was of a type and design that conformed to BS EN ISO 22475-1. For the purpose of this ground investigation block sampling was not required.

Generally, samples were assessed on site and any unexpected deterioration in sample quality was reported to the ground engineer by the lead drilling technician.

Sufficient and representative samples were taken to allow the geo-mechanical properties of the ground to be adequately characterised and to enable the sequence of soil strata to be described by an engineering geologist or geotechnical engineer.

Where samples have been taken for chemical tests the drilling method attempted to adopt dry drilling over the sampling range that generally was achieved by the use of drill casing to separate and isolate the upper soil layers and exclude groundwater. Cross-contamination was further reduced by regular cleaning of sampling tools. Sample integrity was maintained by sealing samples immediately on collection and storing the samples in a temperature controlled cool box. Samples were despatched from the site at the end of the shift on which they were collected or as

required in the project specification. Details of best practice storage, preservation and decontamination measures undertaken are given below:

Task	Soil	Groundwater	Ground Gas
Storage	Glass jars and vials supplied by the laboratory were used for the collection of soil samples to be analysed for volatile compounds. Plastic one-litre tubs were used to collect soil samples for metals analysis.	Glass vials supplied by the laboratory were used for the collection of samples to be analysed for volatile compounds. Samples to be analysed for lower volatility compounds were stored in laboratory prepared glass bottles.	1.4L Canisters supplied by the laboratory.
Preservation	Filling of sample containers as far as practicable to minimise headspace and low storage temperature to minimise the potential for volatilisation and biodegradation of petroleum hydrocarbon compounds prior to analysis.		Not required.
Decontamination	Disposable gloves were worn and changed between sample collection to prevent cross-contamination.	Groundwater samples were collected using dedicated disposable tubing / bailers, that were changed between monitoring well locations in order to prevent cross-contamination.	Disposable gloves were worn and changed between sample collection to prevent cross contamination.
Transport	Samples stored in dedicated sample boxes provided by the laboratory. Sample details and analytical requests were recorded on the laboratory chain of custody form included with samples, prior to dispatching to laboratory for analysis. Samples were dispatched to the laboratory on the day of sampling.		

B3 Sample description

Sample description was undertaken by the Arcadis site geologist in accordance with BS 5930: 2015+A1:2020. The descriptions of the individual samples were used to identify the sequence of strata at the exploratory hole location and from which representative exploratory hole logs were drawn.

B4 *In situ* testing

In situ geotechnical tests were undertaken taking account of the investigation scope and requirement to attain the appropriate parameters required in the geotechnical design. The tests were undertaken in accordance with the requirements of the relevant parts of BS EN ISO 22476 [5, 6, 7] and other methods as follows:

Standard penetration testing

Standard penetration tests were carried out in accordance with BS EN ISO 22476-3, BS EN 1997-2 and the national Annex to BS EN 1997-2. The test records are presented on the borehole logs as blow counts for each increment with the N-value as the total number of blows of the four main test increments.

Where the N-value exceeds a total of 50 blows, the test reports the penetration in millimetres for the last test increment recorded, and the N value is indicated as greater than 50,

e.g. 4,5/12,14,18, 6 for 10 mm

indicates that the seating blows (4 and 5) were completed and that the test terminated in the 4th increment after penetrating 10 mm.

Where the seating blows exceeded 25 blows for less than 150 mm; the test was stopped and the rods remarked after which, the main drive was continued. The test is then reported as the number of blows in each seating drive for the recorded penetration with the results of the main drive given as above,

e.g. 14/11 for 45 mm/12,14,16, 8 for 10 mm.

In certain circumstances where groundwater in-flow may affect the test, particularly in fine sand or silt, low SPT blow counts may be recorded. Where the SPT blow count was very low, N values of 5 or less, the test was, at the discretion of the site engineer, continued for a further 300 mm, recording blows for each 75 mm increment. **This is not** a standard penetration test value, it does however give an indication of potential disturbance to the ground.

B5 Data transfer format

The data collated during the ground investigation has been organised and managed using the “AGS data format” that allows data transfer between different disciplines and organisations in accordance with BS 8574 [10].

B6 References

1. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
2. BS EN 1997-2. 2007. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution, 2010 (revised text).
3. BS 5930: 2015+A1:2020. Code of practice for ground investigation. British Standards Institution.
4. BS EN ISO 22475-1. Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1 Technical principles for execution.
5. BS EN ISO 22476-3 2005. Geotechnical investigation and testing – Field testing – Part 3: Standard penetration test. British Standards Institution
6. BS 1377-9. 1990. Methods of test for soils for civil engineering purposes. Part 9: In-situ tests. British Standards Institution.
7. BS 8574. Code of practice for the management of geotechnical data for ground engineering projects.

B7 Exploratory Hole Key

Key to Exploratory Hole Symbols and Abbreviations

SAMPLE TYPES

B	Bulk disturbed sample	ES	Environmental soil sample	U	Undisturbed sample
C	Core sample	EW	Environmental water sample	UT	Undisturbed thin wall sample
CBR-D	Disturbed sample from CBR test area	G	Gas sample	W	Water sample
CBR-U	Undisturbed sample from CBR test area	L	Liner sample		
D	Small disturbed sample	SPT	SPT split spoon sample		

IN-SITU TESTING

SPTs	Standard Penetration Test (using a split spoon sampler)
SPTc	Standard Penetration Test (using a solid 60 degree cone)
N	Recorded SPT 'N' Value *
-/-	Blows/Penetration (mm) after seating blows totalling 150 mm
MX	Mexi Probe Test (records CBR as %)
HV	Hand Shear Vane Test (undrained shear strength quoted in kPa)
PP	Pocket Penetrometer Test (kg/m ³)
()	Denotes residual test value
PID	Photo Ionisation Detector (ppm) *
Kf/Kr	Permeability Test (f = falling head, r = rising head quoted in ms ⁻¹)
HPD	High Pressure Dilatometer Test (pressure meter)
PKR	Packer / Lugeon Permeability Test
CBR	California Bearing Ratio Test

ROTARY CORE DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation (% of intact core >100 mm)
FI	Fracture Spacing (average fracture spacing; in mm, over indicated length of core) **
NI	Non-Intact Core
AZCL	Assumed Zone of Core Loss

GROUNDWATER

	Groundwater strike
	Standing water level after 20 minutes; 1st, 2nd etc (number denotes level order)

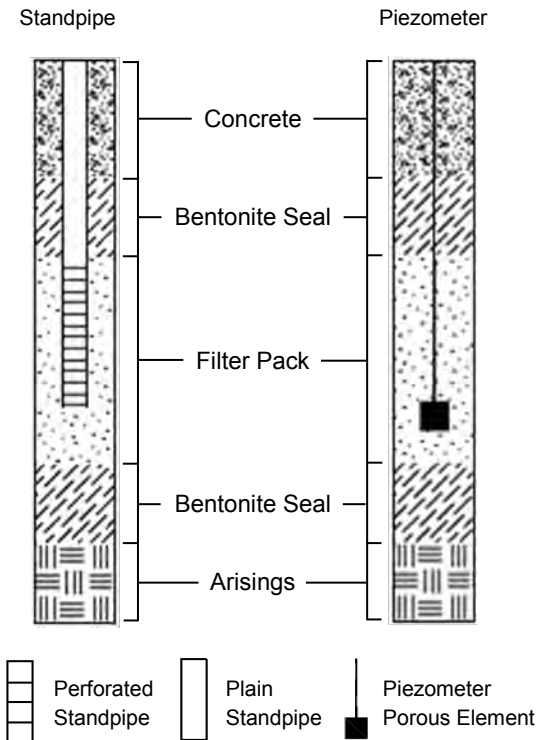
STRATA LEGENDS - Note: Composite strata types are shown by combining symbols

	Made Ground		Silt		Peat		Limestone
	Concrete		Sand		Void		Chalk
	Bituminous Bound Materials		Gravel		Mudstone		Coal
	Topsoil		Cobbles		Siltstone		Metamorphic Rock
	Clay		Boulders		Sandstone		Fine Grained Igneous Rock

* Where a single value is quoted this is the uncorrected 'N' value for a full 300 mm test drive following a seating drive of 150mm. Where the full test drive penetration is not achieved the number of blows is quoted for the penetration below the test total of 300mm, e.g.: 50/75.

** The minimum, average and maximum are shown e.g. 5/45/125.

INSTALLATION & BACKFILL DETAILS



STRATUM BOUNDARIES

	Unit boundary
--	---------------

APPENDIX C

EXPLORATORY HOLE LOGS

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541306.84

Ground Level (mAOD)
11.47
Northing (OS mN)
266608.07

Start Date
21/03/2022
End Date
21/03/2022

Scale
1:50
Sheet 1 of 2

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/ Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(B6) 0.10-0.50 (ES1) 0.20-0.30	PID (1) 0.20	<1ppm		21/03/2022 09:00	0.00 Dry	MADE GROUND: Soft dark brown very gravelly CLAY with occasional rootlets. Gravel is subangular to subrounded fine to coarse of flint, chert, brick. [MADE GROUND]		(1.30)		
(B7) 0.50-1.00 (ES2) 0.50-0.60	PID (2) 0.50	<1ppm								
(B9) 1.20-1.65 (D8) 1.20-1.65 (ES3) 1.30-1.40	SPT(S) 1.20 PID (3) 1.30	N=10 (2,2/2,3,3,2) <1ppm	Dry			Firm to stiff light bluish grey slightly silty CLAY. [KIMMER DGE CLAY FORMATION]		1.30	10.17	
(U10) 2.00 (UT10) 2.00-2.45		U10 59 blows 60%rec. UT10 59 blows 60%rec.	Dry Dry					(1.10)		
(D11) 2.45-2.50						Weak light grey SILTSTONE. [KIMMER DGE CLAY FORMATION]		2.40	9.07	
(B13) 3.00-3.50 (D12) 3.00-3.11 (ES4) 3.00-3.10	SPT(S) 3.00 PID (4) 3.00	N>50 (25 for 25mm/50 for 70mm) <1ppm	Dry			Very stiff dark bluish grey CLAY with occasional claystone bands. [KIMMER DGE CLAY FORMATION]		2.50	8.97	
(UT14) 4.00-4.45		UT14 52 blows 90%rec.	Dry							
(D15) 4.45-4.50										
(B16) 5.00-5.50 (ES5) 5.00-5.10	SPT(C) 5.00 PID (5) 5.00	N=46 (6,13/14,14,9,9) <1ppm	Dry							
(UT17) 6.00-6.45		UT17 42 blows 95%rec.	Dry							
(D18) 6.45-6.50								(9.50)		
(B20) 7.00-7.50 (D19) 7.00-7.45	SPT(S) 7.00	N=19 (3,4/4,5,5,5) <1ppm	Dry			Becoming firm.				
(UT21) 8.00-8.45		UT21 47 blows 100% rec.	Dry							
(D22) 8.45-8.50										
(B24) 9.00-9.50 (D23) 9.00-9.45	SPT(S) 9.00	N=23 (4,6/5,6,6,6) <1ppm	Dry							
(UT25) 10.00-10.45		UT25 58 blows 90%rec.	Dry							

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion										200	15.00	200	3.00			

Remarks
Borehole terminated on Engineer's instruction on achieving target depth.
No groundwater encountered.
No evidence of contamination observed.

Termination Depth:
15.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541306.84

Ground Level (mAOD)
11.47
Northing (OS mN)
266608.07

Start Date
21/03/2022
End Date
21/03/2022

Scale
1:50
Sheet 2 of 2

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(D26) 10.45-10.50						Very stiff dark bluish grey CLAY with occasional claystone bands. [KIMMER DGE CLAY FORMATION]				
(D27) 11.00-11.10										
(B29) 11.50-12.00 (D28) 11.50-11.95	SPT(S) 11.50	N=27 (5,6/6,6,7,8)	Dry							
(D30) 12.00-12.10						Weak light grey SILTSTONE recovered at angular to subrounded fine to coarse gravel. [KIMMER DGE CLAY FORMATION]		12.00	-0.53	
(B31) 13.00-13.50	SPT(C) 13.00	N=36 (5,7/8,8,9,11)	Dry							
(D32) 14.00-14.10						Very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]		12.70	-1.23	
(UT33) 14.50-14.95		UT33 49 blows 100% rec.	Dry							
(D34) 14.95-15.00				21/03/2022 13:00	3.00 Dry					

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion										200	15.00	200	3.00			

Remarks
Borehole terminated on Engineer's instruction on achieving target depth.
No groundwater encountered.
No evidence of contamination observed.

Termination Depth:
15.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541275.46

Ground Level (mAOD)
11.80
Northing (OS mN)
266548.99

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:50
Sheet 1 of 2

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(B1) 0.20-0.40 (ES1) 0.20	PID (1) 0.20	<1ppm		17/03/2022 08:00	0.00 Dry	MADE GROUND: Soft to firm dark brownish grey mottled orangish brown slightly sandy slightly gravelly CLAY. Gravel is very angular to subrounded fine to coarse flint. [MADE GROUND]		(1.40)		
(B2) 0.50-0.70 (ES2) 0.50	PID (2) 0.50	<1ppm								
(B3) 1.00-1.20 (ES3) 1.00	PID (3) 1.00	<1ppm								
(B4) 1.40-1.70 (ES4) 1.40-1.70	SPT(C) 1.20	N=12 (2,4/2,3,2,5)	Dry						10.40	
(B5) 1.70-2.00						Medium dense yellowish brown clayey sandy subangular to subrounded fine to coarse GRAVEL of flint rare pockets of soft bluish grey silty clay. [RIVER TERRACE DEPOSITS]		(0.70)		
(B) 2.10-2.50 (B6) 2.10-2.50 (ES5) 2.10-2.50	SPT(C) 2.00 PID (4) 2.10	N>50 (8,17 for 60mm/38,12 for 10mm) <1ppm	Dry			Very stiff dark bluish grey mottled greyish brown and orangish brown silty slightly sandy CLAY with occasional selenite crystals. [KIMMER DGE CLAY FORMATION]		2.10	9.70	
(D7) 2.50-3.00						Siltstone band.				
(B9) 3.00-3.50 (D8) 3.00-3.45	SPT(S) 3.00	N>50 (3,4/8,24,12,7 for 70mm)	Dry							
(D10) 3.50-4.00						Siltstone band.				
(B13) 4.00-4.50 (UT11) 4.00-4.45		UT11 52 blows 100% rec.	Dry					(3.90)		
(D12) 4.45-4.55 (D14) 4.50-5.00										
(B16) 5.00-5.50 (D15) 5.00-5.45	SPT(S) 5.00	N=20 (4,4/4,5,5,6)	Dry							
(D17) 5.50-6.00						Becoming stiff.				
(B19) 6.00-6.50 (ES6) 6.00-6.50 (UT18) 6.00-6.45		UT18 44 blows 90% rec.	Dry			Firm becoming stiff bluish grey silty CLAY interbedded with extremely weak and weak thickly laminated grey and light grey siltstone. [KIMMER DGE CLAY FORMATION]		6.00	5.80	
(D20) 6.50-7.00										
(B22) 7.00-7.50 (D21) 7.00-7.45	SPT(S) 7.00	N=24 (3,5/5,6,6,7)	Dry							
(D23) 7.50-8.00						Becoming stiff.				
(B26) 8.00-8.50 (UT24) 8.00-8.45		UT24 62 blows 100% rec.	Dry							
(D25) 8.45-8.55 (D27) 8.50-9.00										
(B29) 9.00-9.50 (D28) 9.00-9.45	SPT(S) 9.00	N=21 (3,5/5,4,5,7)	Dry							
(D30) 9.50-10.00										
(B33) 10.00-10.50 (UT31) 10.00-10.45		UT31 70 blows 100% rec.	Dry							

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion	2.10	2.30	00:40	17/03/2022 11:00	2.50	20	2.21	2.00		200	15.45	200	2.30			
			3.30	3.40	00:25									150	4.85			
			12.20	12.50	01:00													

Remarks
 Trial pit terminated on Engineer's Instruction on achieving target depth.
 Groundwater seepage observed at 2.50m.
 No evidence of contamination observed.

Termination Depth:
15.45m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541275.46

Ground Level (mAOD)
11.80
Northing (OS mN)
266548.99

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:50
Sheet 2 of 2

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(D32) 10.45-10.55 (B34) 10.50-11.00						Firm becoming stiff bluish grey silty CLAY interbedded with extremely weak and weak thickly laminated grey and light grey siltstone. [KIMMER DGE CLAY FORMATION]				
(D35) 11.00-11.50										
(B37) 11.50-12.00 (D36) 11.50-11.95	SPT(S) 11.50	N=28 (4,5/5,7,7,9)	Dry							
(D38) 12.00-12.50										
(B39) 12.50-13.00						Siltstone band.				
(B41) 13.00-13.50 (UT40) 13.00-13.45		UT40 110 blows 100% rec.	Dry					(9.45)		
(B42) 13.50-14.00										
(D43) 14.00-14.50										
(B44) 14.50-15.00										
(D45) 15.00-15.45	SPT(S) 15.00	N=32 (4,6/6,8,8,10)	Dry			Becoming very stiff.				
				17/03/2022 17:00	4.65 Dry			15.45	-3.65	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	2.10	2.30	00:40	17/03/2022 11:00	2.50	20	2.21	2.00		200	15.45	200	2.30			
1.20	15.45	Cable Percussion	3.30	3.40	00:25									150	4.65			
			12.20	12.50	01:00													

Remarks
 Trial pit terminated on Engineer's Instruction on achieving target depth.
 Groundwater seepage observed at 2.50m.
 No evidence of contamination observed.

Termination Depth:
15.45m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541432.52

Ground Level (mAOD)
11.30
Northing (OS mN)
266457.44

Start Date
21/03/2022
End Date
22/03/2022

Scale
1:50
Sheet 1 of 2

Samples		Tests		Progress		Strata			Depth (Thickness)	Level	Install/ Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend				
(B7) 0.10-0.30 (ES1) 0.10-0.20	PID (1) 0.10	<1ppm		21/03/2022 15:50	0.00 Dry	MADE GROUND: Soft dark greyish brown slightly sandy gravelly CLAY with occasional organic material. Gravel is angular to subrounded fine to coarse of brick and flint. [MADE GROUND]		(0.35)			
(B8) 0.50-0.70 (ES2) 0.50-0.60	PID (2) 0.50	<1ppm							(0.35)	10.95	
(B9) 1.00-1.20 (ES3) 1.00-1.10 (B10) 1.20-1.65 (D17) 1.20-1.65	SPT(S) 1.20 PID (3) 1.20	N=9 (1,2/2,2,3) <1ppm	Dry	21/03/2022 17:00 22/03/2022 08:00	0.00 Dry 0.00 Dry	MADE GROUND: Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of brick and flint. [MADE GROUND] Firm light grey slightly sandy slightly gravelly CLAY with occasional orange sand and gravel pockets up to 15mm. Gravel is subangular to subrounded fine to coarse of siltstone. [KIMMER DGE CLAY FORMATION]		(0.35)	10.60		
(B35) 2.00-2.50 (ES4) 2.00-2.10	PID (4) 2.00	<1ppm								(2.30)	
(B11) 3.00-3.50 (D18) 3.00-3.13 (ES5) 3.00-3.10	SPT(S) 3.00 PID (5) 3.00	N>50 (25 for 25mm/50 for 70mm) <1ppm	Dry			Very stiff dark bluish grey slightly silty CLAY with occasional coarse subangular gravel of siltstone. [KIMMER DGE CLAY FORMATION]		3.00	8.30		
(UT31) 4.00-4.45	PID (6) 4.00	<1ppm UT31 41 blows 100% rec.	Dry							(0.90)	
(D19) 4.45-4.50						Stiff to very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]		3.90	7.40		
(B12) 5.00-5.50 (ES6) 5.00-5.10	SPT(S) 5.00 PID (7) 5.00	N=19 (3,4/4,5,5,5) <1ppm	Dry								
(UT32) 6.00-6.45		UT32 31 blows 100% rec.	Dry								
(D20) 6.45-6.50											
(B13) 7.00-7.50 (D21) 7.00-7.45	SPT(S) 7.00	N=17 (3,4/4,4,5)	Dry					(11.10)			
(UT33) 8.00-8.45		UT33 43 blows 90% rec.	Dry								
(D22) 8.45-8.50											
(B14) 9.00-9.50 (D23) 9.00-9.45	SPT(S) 9.00	N=18 (3,4/4,4,5)	Dry								
(UT34) 10.00-10.45		UT34 49 blows 100% rec.	Dry								

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion				22/03/2022 13:18	12.70	20	12.55			200	2.50	200	2.50			

Remarks
 Trial pit terminated on Engineer's Instruction on achieving target depth.
 Groundwater seepage observed at 12.70m.
 No evidence of contamination observed.

Termination Depth:
15.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541432.52

Ground Level (mAOD)
11.30
Northing (OS mN)
266457.44

Start Date
21/03/2022
End Date
22/03/2022

Scale
1:50
Sheet 2 of 2

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(D24) 10.45-10.50						Stiff to very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]		15.00	-3.70	
(D25) 11.00-11.10										
(B15) 11.50-12.00 (D26) 11.50-11.95	SPT(S) 11.50	N=18 (4,5/5,5,2,6)	Dry							
(D27) 12.00-12.10										
(B16) 13.00-13.50	SPT(C) 13.00	N=38 (4,7/7,7,11,13)	Dry							
					Siltstone bands.					
(D28) 14.00-14.10										
(UT35) 14.50-14.95		UT35 53 blows 100% rec.	Dry							
(D29) 14.95-15.00				22/03/2022 13:00	2.50 Dry					

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion				22/03/2022 13:18	12.70	20	12.55			200	2.50	200	2.50			

Remarks
 Trial pit terminated on Engineer's Instruction on achieving target depth.
 Groundwater seepage observed at 12.70m.
 No evidence of contamination observed.

Termination Depth:
15.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541402.37

Ground Level (mAOD)
11.60
Northing (OS mN)
266402.29

Start Date
22/03/2022
End Date
23/03/2022

Scale
1:50
Sheet 1 of 2

Samples		Tests		Progress		Strata			Depth (Thickness)	Level	Install/ Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend				
(B1) 0.10-0.30 (ES2) 0.10-0.20	PID (1) 0.10	<1ppm		22/03/2022 14:30	0.00 Dry	MADE GROUND: Firm orangish brown and brown sandy gravelly CLAY Gravel is angular to subrounded fine to coarse flint, brick and chert. [MADE GROUND]		(0.30)	11.30		
(B3) 0.50-1.00 (ES4) 0.50-0.60	PID (2) 0.50	<1ppm				Yellowish brown and orangish brown slightly silty very gravelly SAND Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]					
(B6) 1.20-1.65 (D5) 1.20-1.65 (ES7) 1.20-1.30	SPT(S) 1.20 PID (3) 1.20	N=8 (2,3/2,2,2,2) <1ppm	Dry								
(B9) 2.00-2.50 (D8) 2.00-2.45 (ES10) 2.00-2.10	SPT(S) 2.00	N=16 (3,4/3,4,4,5)	Dry			Becoming medium dense, locally clayey gravelly SAND.		(3.40)			
(B12) 3.00-3.50 (D11) 3.00-3.45 (ES13) 3.00-3.10	SPT(S) 3.00	N=15 (3,3/3,4,4,4)	Dry								
(B14) 3.70 (ES15) 3.70-3.80	PID (4) 3.70	<1ppm				Medium dense dark brownish grey clayey slightly gravelly SAND Gravel is subangular to subrounded fine to coarse flint. [RIVER TERRACE DEPOSITS]		3.70 (0.20)	7.90		
(B16) 4.00-4.50 (ES17) 4.00-4.10	SPT(C) 4.00 PID (5) 4.00	N=21 (4,5/5,5,4,7) <1ppm	3.20	22/03/2022 17:15 23/03/2022 07:30	3.00 3.00	Medium dense yellowish brown silty sandy angular to subrounded fine to coarse GRAVEL of flint with few rounded cobbles. [RIVER TERRACE DEPOSITS]		(1.00)	7.70		
(B19) 5.00-5.50 (D18) 5.00-5.45 (ES22) 5.00-5.10	SPT(S) 5.00 PID (6) 5.00	N=8 (2,3/2,2,2,2) <1ppm	4.90			Firm bluish grey silty CLAY with extremely weak and very weak light grey and grey siltstone bands. [KIMMER DGE CLAY FORMATION]		4.90	6.70		
(UT20) 6.00-6.45		UT20 32 blows 100% rec.	Dry								
(D21) 6.45-6.50											
(B24) 7.00-7.50 (D23) 7.00-7.45	SPT(S) 7.00	N>50 (2,3/4,4,4,5 for 0mm)	Dry			Becoming very stiff.					
(UT25) 8.00-8.45		UT25 46 blows 100% rec.	Dry								
(D26) 8.45-8.50											
(B28) 9.00-9.50 (D27) 9.00-9.45	SPT(S) 9.00	N=16 (3,4/4,4,4,4)	Dry			Becoming stiff.					
(UT29) 10.00-10.45		UT29 47 blows 100% rec.	Dry								

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion				22/03/2022 18:25 23/03/2022 11:00	3.70 13.10	20 20	3.30 12.75	3.00 5.00		150	15.00	200	3.00			

Remarks
 Trial pit terminated on Engineer's Instruction on achieving target depth.
 Groundwater seepages observed at 3.70m and 13.10m.
 No evidence of contamination observed.

Termination Depth:
15.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541402.37

Ground Level (mAOD)
11.60
Northing (OS mN)
266402.29

Start Date
22/03/2022
End Date
23/03/2022

Scale
1:50
Sheet 2 of 2

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(D30) 10.45-10.50						Firm bluish grey silty CLAY with extremely weak and very weak light grey and grey siltstone. bands. [KIMMER DGE CLAY FORMATION]		15.00	-3.40	
(D31) 11.00-11.10										
(D32) 11.50-11.95	SPT(S) 11.50	N=18 (3,4/4,4,5,5)	Dry							
(D33) 12.00-12.10										
(B34) 13.00-13.50	SPT(C) 13.00	N=32 (4,6/7,7,8,10)	Dry		Becoming very stiff. Frequent bands of grey siltstone.					
(D35) 14.00-14.10										
(UT36) 14.50-14.95		UT36 53 blows 100% rec.	12.80							
(D37) 14.95-15.00				23/03/2022 13:00	3.00 Dry					

DRILLING TECHNIQUE			CHISELL NG			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	Hard Strata From	To	Duration	Date & Time	Depth Strike	Time Elapsed (mins)	Rise To	Depth Casing	Depth Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion				22/03/2022 16:25	3.70	20	3.30	3.00		150	15.00	200	3.00			
1.20	15.00					23/03/2022 11:00	13.10	20	12.75	5.00								

Remarks
 Trial pit terminated on Engineer's Instruction on achieving target depth.
 Groundwater seepages observed at 3.70m and 13.10m.
 No evidence of contamination observed.

Termination Depth:
15.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541307.26

Ground Level (mAOD)
13.53
Northing (OS mN)
266579.23

Start Date
16/03/2022
End Date
16/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.40	B1	0.40	PID	<1ppm		MADE GROUND: Light orangish brown slightly clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse of brick and flint. [MADE GROUND]		(0.40)	13.12	
0.00 - 0.40	D1					MADE GROUND: Stiff light grey slightly sandy CLAY with rare sand pockets up to 30mm and low cobble content. Cobbles are angular to subangular of brick. [MADE GROUND]				
0.40 - 1.60	B2	1.60	PID	<1ppm		Stiff dark bluish grey slightly gravelly CLAY with occasional siltstone bands up to 100mm thick. Gravel is angular fine to coarse of siltstone. [KIMMERIDGE CLAY FORMATION]		(1.20)	11.92	
0.40 - 1.60	D2									
0.40 - 1.60	ES1									
0.40 - 1.60	ES2									
1.60 - 3.00	B3	3.00	PID	<1ppm				(1.40)	10.52	
1.60 - 3.00	D3									
1.60 - 3.00	ES3									

PLAN DETAILS 		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.
		Termination Depth: 3.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541341.61

Ground Level (mAOD)
11.46
Northing (OS mN)
266580.53

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.20	B1	0.20	PID	<1ppm	▼	MADE GROUND: Light brown clayey gravelly SAND with rootlets. Gravel is angular fine to medium of brick and flint. [MADE GROUND]		(0.20)	11.26	
0.00 - 0.20	D5					MADE GROUND: Firm light yellowish brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of flint, brick, limestone. [MADE GROUND]		0.20		
0.20 - 0.50	ES9									
0.20 - 0.50	B2 ES10									
0.50 - 1.40	D6	0.50	PID	<1ppm	▼	Firm light grey silty CLAY with silt pockets and fine sand pockets with rootlets. [KIMMERIDGE CLAY FORMATION]		0.50	10.96	
0.50 - 1.40	D7									
0.50 - 1.40	ES11									
0.50 - 1.50	B3									
1.40 - 3.00	4	1.40	PID	<1ppm	▼	Stiff dark bluish grey silty CLAY with frequent pockets of silt and sand and with rootlets. [KIMMERIDGE CLAY FORMATION]		1.40	10.06	
1.40 - 3.00	D8									
1.40 - 3.00	ES12									
		3.00	PID	<1ppm	▼			(0.90)	8.46	

<p>PLAN DETAILS</p>	<p>Remarks</p> <p>Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.</p> <p>Termination Depth: 3.00m</p>
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Project
Northstowe
Client
Homes England

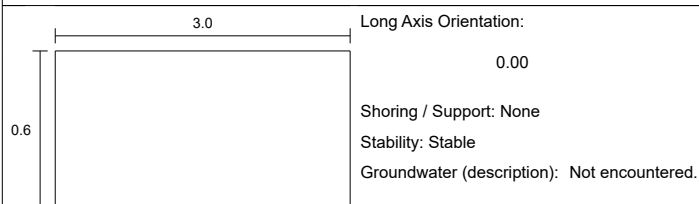
Project No.
10052307
Easting (OS mE)
541251.97

Ground Level (mAOD)
12.13
Northing (OS mN)
266547.04

Start Date
16/03/2022
End Date
16/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.20	B1	0.20	PID	<1ppm		MADE GROUND: Dark brown gravelly CLAY. Gravel is fine to angular to subangular coarse of brick and concrete. [MADE GROUND]	[Cross-hatch pattern]	(0.20)	11.93	[Stratigraphic symbol]
0.00 - 0.20	D1									
0.00 - 0.20	ES1									
0.20 - 0.50	B2									
0.20 - 0.50	D2									
0.20 - 0.50	ES2									
0.50 - 1.50	B3	0.50	PID	<1ppm		Firm to stiff greenish grey sandy gravelly CLAY. Gravel is subangular to rounded fine to medium of siltstone. [KIMMERIDGE CLAY FORMATION]	[Dotted pattern]	(0.50)	11.63	[Stratigraphic symbol]
0.50 - 1.50	D3									
0.50 - 1.50	ES3									
1.50 - 3.00	B4	1.50	PID	<1ppm		Firm becoming very stiff light grey slightly silty CLAY with occasional claystone bands. [KIMMERIDGE CLAY FORMATION]	[Horizontal line pattern]	(1.00)	10.63	[Stratigraphic symbol]
1.50 - 3.00	D4									
1.50 - 3.00	ES4									
		3.00	PID	<1ppm				(1.50)	9.13	

PLAN DETAILS 		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.
		Termination Depth: 3.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541313.25

Ground Level (mAOD)
11.40
Northing (OS mN)
266549.91

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.50 0.00 - 0.50 0.00 - 0.50	B1 D4 ES7					Very soft brownish grey sandy gravelly CLAY with rootlets. [POSS BLE RIVER TERRACE DEPOSITS]		(0.50)		
0.50 - 1.40 0.50 - 1.40 0.50 - 1.40	B2 D5 ES8	0.50	PID	<1ppm		Soft to firm light brownish grey sandy CLAY with pockets of organic rich clay. [POSS BLE RIVER TERRACE DEPOSITS]		0.50 (0.90)	10.90	
1.40 - 3.00 1.40 - 3.00 1.40 - 3.00	B3 D6 ES9	1.40	PID	<1ppm		Firm to stiff bluish grey silty CLAY with occasional silt pockets and pockets of sand. [KIMMERIDGE CLAY FORMATION]		1.40 (1.60)	10.00	
		3.00	PID	<1ppm				3.00	8.40	

<p>PLAN DETAILS</p>	<p>Remarks</p> <p>Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.</p> <p>Termination Depth: 3.00m</p>
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Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541311.16

Ground Level (mAOD)
11.28
Northing (OS mN)
266487.72

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill	
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend				
0.00 - 0.20	B1	0.00	PID	<1ppm	▼	Soft light yellowish brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of claystone and flint. [POSS BLE RIVER TERRACE DEPOSITS]		(0.20)	11.08		
0.00 - 0.20	D4 ES7	0.20	PID	<1ppm		Firm light yellowish grey silty CLAY with local pockets of orangish brown sand and with rootlets. [RIVER TERRACE DEPOSITS]		0.20			
0.20 - 1.10	B2					(0.90)	11.08				
0.20 - 1.10	D5										
0.20 - 1.10	ES8										
1.10 - 3.00	B3	1.10	PID	<1ppm		Stiff dark bluish grey silty CLAY with rootlets, silt pockets and small pockets of orangish brown sand. [KIMMERIDGE CLAY FORMATION]		1.10	10.18		
1.10 - 3.00	D6	1.10	PID	<1ppm					(1.90)		8.28
1.10 - 3.00	ES9										
		3.00									

<p>PLAN DETAILS</p> <p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None</p> <p>Stability: Unstable between 0.90 and 1.10m</p> <p>Groundwater (description): 0.9m seepage.</p>	<p>Remarks</p> <p>Trial pit terminated on Engineer's Instruction on achieving target depth. Groundwater seepage observed at 0.90m. No evidence of contamination observed.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <p>Termination Depth: 3.00m</p> </div>
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Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541313.42

Ground Level (mAOD)
11.47
Northing (OS mN)
266517.34

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill	
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend				
0.00 - 0.20	B1	0.00	PID	<1ppm		MADE GROUND: Firm dark brown gravelly CLAY. Gravel is angular to subrounded fine to coarse of brick and flint. [MADE GROUND]		(0.20)	11.27		
0.00 - 0.20	D5	0.20	PID	<1ppm		Firm bluish grey mottled orange sandy gravelly CLAY with occasional silt pockets and rootlets Gravel is subangular subrounded fine to medium of siltstone. [KIMMERIDGE CLAY FORMATION]		0.20			
0.20 - 0.70	B2					0.70	PID	<1ppm	Firm to stiff light bluish grey sandy CLAY with occasional pockets of orangish brown sand. [KIMMERIDGE CLAY FORMATION]		0.70
0.20 - 0.70	D6								1.70	PID	<1ppm
0.20 - 0.70	ES10	1.70	PID	<1ppm		Stiff dark bluish grey silty CLAY with rootlets and silt pockets [KIMMERIDGE CLAY FORMATION]		(1.30)			
0.70 - 1.70	B3				1.70		PID	<1ppm	Stiff dark bluish grey silty CLAY with rootlets and silt pockets [KIMMERIDGE CLAY FORMATION]		3.00
0.70 - 1.70	D7	1.70	PID	<1ppm		Stiff dark bluish grey silty CLAY with rootlets and silt pockets [KIMMERIDGE CLAY FORMATION]					8.47
0.70 - 1.70	ES11										
1.70 - 3.00	B4	1.70	PID	<1ppm							
1.70 - 3.00	D8										
1.70 - 3.00	ES12										

<p>PLAN DETAILS</p> <p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None</p> <p>Stability: Unstable between 0.40 to 1.70m</p> <p>Groundwater (description): 1.5m seepage.</p>	<p>Remarks</p> <p>Trial pit terminated on Engineer's Instruction on achieving target depth. Groundwater seepage observed at 1.50m. No evidence of contamination observed.</p> <p>Termination Depth: 3.00m</p>
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Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541344.52

Ground Level (mAOD)
11.29
Northing (OS mN)
266519.23

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.50 0.00 - 0.50 0.00 - 0.50	B1 D4 ES7	0.00	PID	<1ppm		MADE GROUND: Soft yellowish brown sandy gravelly CLAY with rootlets. Gravel is angular to subangular fine to medium to coarse of brick. [MADE GROUND]		(0.50)	10.79	
0.50 - 1.90 0.50 - 1.90 0.50 - 1.90	B2 D5 ES8	0.50	PID	<1ppm		Firm light grey sandy CLAY with rootlets and occasional small sand pockets. [KIMMERIDGE CLAY FORMATION]		(1.40)		
1.90 - 3.00 1.90 - 3.00 1.90 - 3.00	B3 D6 ES9	1.90	PID	<1ppm		Firm to Stiff bluish grey silty CLAY with rootlets and occasional silt pockets. [KIMMERIDGE CLAY FORMATION]		(1.10)	9.39	
								3.00	8.29	

<p>PLAN DETAILS</p>	<p>Remarks</p> <p>Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.</p> <p>Termination Depth: 3.00m</p>
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Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541370.89

Ground Level (mAOD)
10.60
Northing (OS mN)
266520.61

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.10	B1	0.00	PID	<1ppm		MADE GROUND; Soft orangish brown very gravelly CLAY with occasional rootlets. Gravel is angular to subangular fine to coarse of brick, flint, and ceramic. [MADE GROUND]		(0.10)	10.50	
0.00 - 0.10	D4	0.10	PID	<1ppm		Firm light yellowish grey sandy gravelly CLAY with sand pockets. Gravel is subangular to subrounded fine and medium of siltstone. [POSS BLE RIVER TERRACE DEPOSITS]		0.10		
0.10 - 1.10	B2	1.10	PID	<1ppm		Stiff dark bluish grey silty CLAY with silt pockets and rootlets. [KIMMERIDGE CLAY FORMATION]		(1.00)		
0.10 - 1.10	D5							1.10		
0.10 - 1.10	ES8							1.10		
1.10 - 3.00	B3							1.10		
1.10 - 3.00	D6							1.10		
1.10 - 3.00	ES9							1.10		
								1.10		
								1.10		
		1.10	9.50							
		1.90								
		3.00	7.60							

<p>PLAN DETAILS</p>		<p>Remarks</p> <p>Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.</p>
		<p>Termination Depth: 3.00m</p>

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541404.64

Ground Level (mAOD)
10.79
Northing (OS mN)
266490.03

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.30 0.00 - 0.30 0.00 - 0.30	B1 D2 ES3	0.00	PID	<1ppm		MADE GROUND: Very soft yellowish light brown sandy gravelly CLAY. [MADE GROUND]		(0.30)	10.49	
0.30 - 1.40 0.30 - 1.40 0.30 - 1.40	B4 D5 ES6	0.30	PID	<1ppm		MADE GROUND: Firm light bluish grey silty CLAY with silt pockets and fragments of ceramic and plastic. [MADE GROUND]				
1.40 - 3.00 1.40 - 3.00 1.40 - 3.00	B7 D8 ES9	1.40	PID	<1ppm		Stiff bluish grey silty CLAY with occasional claystone banding. [KIMMERIDGE CLAY FORMATION]				
					▼			1.40	9.39	
								(1.10)		
								(1.60)		
								3.00	7.79	

PLAN DETAILS	Remarks
<p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None</p> <p>Stability: Stable</p> <p>Groundwater (description): 3.00m seepage.</p>	<p>Trial pit terminated on Engineer's Instruction on achieving target depth.</p> <p>Groundwater seepage at 3.00m bgl.</p> <p>No evidence of contamination observed.</p>
	<p>Termination Depth: 3.00m</p>



Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541434.20

Ground Level (mAOD)
10.64
Northing (OS mN)
266489.84

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20	ES1	0.20	PID	<1ppm		MADE GROUND: Soft bluish grey mottled orangish brown slightly gravelly silty gravelly CLAY. Gravel is subangular to subrounded fine to coarse of flint and brick. [MADE GROUND]		(0.30)	10.34	
0.50	ES2					Orangish brown gravelly very silty SAND. Gravel is subangular to subrounded fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS]		(0.70)		
1.00	ES3	1.00 1.00	PID PID	<1ppm <1ppm		Firm to stiff light greenish grey becoming dark greenish grey silty fissured CLAY with occasional pockets of orangish brown silty clay and occasional fine decaying rootlets. [KIMMERIDGE CLAY FORMATION]		1.00	9.64	
1.40 1.40	B1 D1							(2.00)		
2.80 2.80	B2 D2							3.00	7.64	

PLAN DETAILS <p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None Stability: Sidewall instability between 0.30 and 1.00m Groundwater (description): Not encountered.</p>		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.
		Termination Depth: 3.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541342.17

Ground Level (mAOD)
12.31
Northing (OS mN)
266457.48

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20	ES1	0.20	PID	<1ppm		MADE GROUND: Soft to firm orangish brown and mottled dark brown silty gravelly CLAY with occasional pockets of orangish brown silty sandy gravel. Gravel is subangular to subrounded fine to coarse flint. [MADE GROUND]		(0.40)	11.91	
0.50	ES2	0.50	PID	<1ppm		Firm to stiff light greenish grey silty gravelly CLAY with occasional pockets of orangish brown silty sandy gravel and pockets of orangish brown silty clay. Gravel is subangular to subrounded fine to coarse of flint and quartzite. [RIVER TERRACE DEPOSITS]		(1.00)		
1.00	ES3	1.00	PID	<1ppm						
1.20 1.20	B1 D1									
						Stiff greenish brown silty extremely closely space fissured CLAY with rare pockets of orangish brown silty clay and occasional sand of selenite crystals. [KIMMERIDGE CLAY FORMATION]		1.40	10.91	
								(1.60)		
2.80 2.80	B2 D2									
								3.00	9.31	

PLAN DETAILS <p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None</p> <p>Stability: Stable</p> <p>Groundwater (description): Not encountered.</p>		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.
		Termination Depth: 3.00m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541368.92

Ground Level (mAOD)
12.13
Northing (OS mN)
266458.00

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20	ES1	0.20	PID	<1ppm		MADE GROUND: Soft orangish brown grey silty gravelly CLAY with a low cobble content and occasional pockets of organic clay. Gravel is subangular to subrounded fine to coarse of flint and brick. Cobbles are angular or brick. [MADE GROUND]		(0.50)	11.63	
0.50	ES2	0.50	PID	<1ppm		Firm to stiff light greenish grey silty gravelly CLAY with occasional pockets of orangish brown silty sandy gravel and pockets of orangish brown silty clay. Gravel is subangular to subrounded fine to coarse flint and quartzite. [RIVER TERRACE DEPOSITS]		(0.60)	11.03	
1.00	ES3	1.00	PID	<1ppm		Orangish brown clayey sandy subangular to subrounded fine to coarse GRAVEL of flint and quartzite. [RIVER TERRACE DEPOSITS]		(0.20)	10.83	
1.20 1.20	B1 D1					Stiff greenish brown silty extremely closely spaced fissured CLAY with rare pockets of orangish brown silty clay and occasional sand of selenite crystals. [KIMMERIDGE CLAY FORMATION]		(1.70)		
2.20 2.20	B2 D2									
									3.00	9.13

PLAN DETAILS <p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None</p> <p>Stability: Stable</p> <p>Groundwater (description): Not encountered.</p>		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.
		Termination Depth: 3.00m



Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm),
Thickness (m), Level (mOD).

Equipment Used
CAT 308 GR

Logged By
HS

Checked By
CPr

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541373.77

Ground Level (mAOD)
12.40
Northing (OS mN)
266429.97

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20	ES1	0.20	PID	<1ppm		MADE GROUND: Soft to firm orangish and mottled brown silty gravelly CLAY with occasional pockets of organic clay. Gravel is angular to subangular fine to coarse of brick fragments. [MADE GROUND]		(0.40)	12.00	
0.50	ES2	0.50	PID	<1ppm		Firm light greenish grey and orangish brown silty gravelly CLAY with occasional pockets of orangish brown silty gravelly sand. Gravel is subangular to subrounded fine to coarse of flint. [RIVER TERRACE DEPOSITS]		(0.60)		
0.90 0.90 1.00	B1 D1 ES3	1.00	PID	<1ppm		Stiff greenish grey silty extremely closely spaced fissured CLAY with rare pockets of orangish brown silty clay and occasional sand size selenite crystals. [KIMMERIDGE CLAY FORMATION]		1.00	11.40	
2.00	ES4	2.00	PID	<1ppm				(2.00)		
3.00 3.00	B2 D2							3.00	9.40	

PLAN DETAILS <p>Long Axis Orientation: 0.00</p> <p>Shoring / Support: None</p> <p>Stability: Stable</p> <p>Groundwater (description): Not encountered.</p>		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.	Termination Depth: 3.00m
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Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541434.21

Ground Level (mAOD)
12.33
Northing (OS mN)
266427.82

Start Date
17/03/2022
End Date
17/03/2022

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20	ES1	0.20	PID	<1ppm		MADE GROUND: Soft to Firm orangish brown silty gravelly CLAY with occasional pockets of greenish grey silty clay. gravel is occasional subangular-subrounded fine to coarse flint and rare clay pipe fragments. [MADE GROUND]		(0.30)	12.03	
0.50	ES2	0.50	PID	<1ppm		Firm light greenish grey mottled orangish brown silty gravelly CLAY occasional fine to coarse flint. [RIVER TERRACE DEPOSITS]		(1.00)		
1.00	ES3	1.00	PID	<1ppm		Stiff greenish grey silty extremely closely spaced fissured CLAY with rare pockets of orangish brown silty gravelly sand. Gravel is subangular to subrounded fine to coarse flint. [KIMMERIDGE CLAY FORMATION]		(1.30)	11.03	
1.10 1.10	B1 D1				(1.70)					
2.60 2.60	B2 D2							(3.00)	9.33	

PLAN DETAILS Long Axis Orientation: 0.00 Shoring / Support: None Stability: Stable Groundwater (description): Not encountered.		Remarks Trial pit terminated on Engineer's Instruction on achieving target depth. No groundwater encountered. No evidence of contamination observed.
		Termination Depth: 3.00m



Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541281.95

Ground Level (mAOD)
11.74
Northing (OS mN)
266578.57

Start Date
21/03/2022
End Date
21/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(ES1) 0.20				21/03/2022 11:30	0.00 Dry	MADE GROUND: Soft brown silty gravelly CLAY with occasional roots and rootlets and rare gravel size pockets of organic clay. Gravel is angular to subrounded fine to medium of brick. [MADE GROUND] Firm to stiff light greenish grey silty CLAY with rare 20mm pockets of orangish brown silty clay and occasional selenite crystals. [KIMMER DGE CLAY FORMATION]		(0.20)	11.54	
(ES2) 0.50 (D1) 0.70 (ES3) 1.00 (D) 1.20-1.65 (D2) 1.20-1.65	SPT(S) 1.20	N=11 (1,1/2,3,3,3)	Dry							
(ES4) 1.80	SPT(C) 1.80	N=25 (11,7/7,5,6,7)	Dry	21/03/2022 12:30	0.00 Dry	Occasional shell fragments.		2.25	9.49	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample										77	2.25					

Remarks
Window sample terminated due to refusal at 2.25m due to claystone band.
No groundwater encountered.
No evidence of contamination observed.

Termination Depth:
2.25m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541337.77

Ground Level (mAOD)
11.33
Northing (OS mN)
266548.26

Start Date
21/03/2022
End Date
21/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(ES1) 0.20				21/03/2022 13:00	0.00 Dry	MADE GROUND: Soft orangish brown and mottled brown silty sandy CLAY with occasional gravel size pockets of orangish brown sand and rare coarse gravel size pockets of organic clay and fine roots and rootlets. [MADE GROUND] MADE GROUND: Soft to Firm greenish brown and mottled orangish brown silty gravelly CLAY. [MADE GROUND] Firm to stiff light bluish grey silty CLAY with occasional pockets of orangish brown silty clay and occasional sand size to fine gravel size selenite crystals and fine decaying rootlets. [KIMMER DGE CLAY FORMATION]		0.30	11.02	
(D1) 0.50 (ES2) 0.50								0.30		
(ES3) 1.00								0.60		
(D) 1.20-1.65 (D2) 1.20-1.65	SPT(S) 1.20	N=12 (2,1/4,2,3,3)	Dry							
(D3) 2.00-2.45	SPT(S) 2.00	N=15 (2,2/3,3,4,5)	Dry							
	SPT(C) 2.80	N=33 (13,5/7,10,8,8)	Dry							
				21/03/2022 15:20	0.00 Dry			3.25	8.07	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample										77	2.00					
1.20	3.25											67	3.25					

Remarks
 Window sample terminated due to refusal at 3.25m due to claystone band.
 No groundwater encountered.
 No evidence of contamination observed.

Termination Depth:
3.25m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541287.21

Ground Level (mAOD)
11.84
Northing (OS mN)
266509.11

Start Date
16/03/2022
End Date
16/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(ES1) 0.20				16/03/2022 08:00	0.00 Dry	MADE GROUND: Soft light brown silty gravelly CLAY with occasional 100 - 200mm pocket of greenish grey silty clay and rare fine roots. gravel is subangular to subrounded fine to coarse of flint.		(0.65)	11.19	
(ES2) 0.50			[MADE GROUND] Firm bluish grey mottled orangish brown silty gravelly CLAY with occasional selenite crystals. Gravel is subangular fine and medium of siltstone. [KIMMER DGE CLAY FORMATION]			0.65				
(ES3) 1.00			rootlets noted.			(1.15)				
(B1) 1.20-1.80 (D) 1.20-1.65 (D1) 1.20-1.65	SPT(S) 1.20	N=10 (1,1/2,2,3,3)	Dry			1.80				
(B) 1.80-2.70 (B2) 1.80-2.70 (D2) 2.00-2.45 (ES4) 2.00	SPT(S) 2.00	N=13 (1,1/2,3,4,4)	Dry	16/03/2022 09:00	0.00 Dry	Firm greenish grey silty CLAY with rare selenite crystals. [KIMMER DGE CLAY FORMATION]		1.80	10.04	
						(1.35)				
	SPT(S) 2.70	N=28 (16,7/7,6,7,8)	Dry			Becoming stiff.		3.15		8.69

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample										77 67	2.00 3.15					

Remarks
Window sample terminated due to refusal at 3.15m due to claystone band.
No groundwater encountered.
No evidence of contamination observed.

Termination Depth:
3.15m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541405.08

Ground Level (mAOD)
11.61
Northing (OS mN)
266520.78

Start Date
16/03/2022
End Date
16/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(ES1) 0.10				16/03/2022 12:00	0.00 Dry	MADE GROUND: Soft dark grey slightly silty gravelly CLAY with rare rootlets Gravel is subangular to subrounded fine to coarse of flint.		(0.15)	11.46	
(ES2) 0.50						[MADE GROUND] Firm light greenish grey slightly silty gravelly CLAY. Gravel is subangular to subrounded fine to coarse of flint.		(0.60)		
(B1) 0.80-1.20						[POSSIBLE REWORKED NATURAL DEPOSITS] Orangish brown clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse of flint and quartzite.		0.75	10.86	
(ES3) 1.00						[RIVER TERRACE DEPOSITS] Stiff bluish grey silty CLAY with rare orangish brown clay pockets and rare sand size selenite crystals.		(0.45)		
(D1) 1.20-1.65	SPT(C) 1.20	N=10 (1,2/2,2,3,3)	1.10					1.20	10.40	
(D) 2.00-2.45 (D2) 2.00-2.45	SPT(S) 2.00	N=15 (2,2/3,3,5,4)	1.10					(1.95)		
	SPT(C) 2.70	N=42 (10,5/6,14,14,8)	1.10			Becoming very stiff.				
				16/03/2022 13:30	2.00 Dry			3.15	8.46	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample				16/03/2022 12:38	1.10					87	2.00	87	2.00			
1.20	3.15											67	3.15					

Remarks
Window sample terminated due to refusal at 3.15m due to claystone band.
Groundwater observed at 1.10m.
No evidence of contamination observed.

Termination Depth:
3.15m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541344.39

Ground Level (mAOD)
11.31
Northing (OS mN)
266487.85

Start Date
16/03/2022
End Date
16/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill	
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend				
(ES1) 0.20				16/03/2022 09:20	0.00 Dry	MADE GROUND: Soft brown silty gravelly CLAY with occasional fine roots. Gravel is subangular to subrounded fine to coarse of flint, brick and concrete with fragments of clay pipe. [MADE GROUND] Firm bluish grey slightly gravelly CLAY with occasional rootlets. Gravel is subangular to subrounded fine to coarse of flint and limestone. [MADE GROUND] Soft orangish brown slightly gravelly very sandy CLAY. [POSSIBLE RIVER TERRACE DEPOSITS] Firm to stiff bluish grey with occasional orangish brown mottling slightly silty CLAY. [KIMMER DGE CLAY FORMATION]		(0.55)			
(ES2) 0.50									0.55	10.76	
(ES3) 1.00									(0.35)		
	SPT(C) 1.20	N=15 (3,3/4,4,3,4)	Dry						0.90	10.41	
(B1) 1.50-2.00							(0.60)				
(D1) 2.00-2.45	SPT(S) 2.00	N=11 (3,2/3,2,3,3)	1.20								
(D2) 2.50-2.90											
	SPT(S) 3.00	N=20 (3,2/5,4,5,6)	1.20								
				16/03/2022 11:00	2.00 1.2						
								3.45	7.86		

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample				16/03/2022 11:18	0.00					87	2.00	87	2.00			
1.20	3.45											67	3.45					

Remarks
Window sample terminated on Engineer's Instruction on achieving target depth.
Groundwater seepage observed at 0.90m.
No evidence of contamination observed.

Termination Depth:
3.45m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541405.35

Ground Level (mAOD)
11.06
Northing (OS mN)
266460.36

Start Date
16/03/2022
End Date
16/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill	
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend				
(ES1) 0.05				16/03/2022 14:00	0.00 Dry	MADE GROUND: Orangish brown very silty sandy GRAVEL Gravel is subangular to subrounded fine to coarse of flint. [MADE GROUND] Firm bluish grey silty CLAY with rare selenite crystals. [KIMMER DGE CLAY FORMATION]		0.10	10.96		
(ES2) 0.50											
(ES3) 1.00											
(D) 1.20-1.65 (D1) 1.20-1.65	SPT(S) 1.20	N=14 (2,1/2,3,3,6)	Dry					(3.07)			
(D2) 2.00-2.45	SPT(S) 2.00	N=13 (2,3/2,3,4,4)	Dry								
(D) 2.70-2.80 (D3) 2.70-2.80	SPT(C) 2.80	N=39 (25,0/15,10,6,8)	Dry	16/03/2022 15:30	0.00 Dry	Becoming very stiff.		3.17	7.89		

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample										77	2.00					
1.20	3.17											67	3.17					

Remarks
 Window sample terminated due to refusal at 3.17m due to claystone band.
 No groundwater encountered.
 No evidence of contamination observed.

Termination Depth:
3.17m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541457.20

Ground Level (mAOD)
11.13
Northing (OS mN)
266458.14

Start Date
21/03/2022
End Date
21/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(ES1) 0.20				21/03/2022 10:00	0.00 Dry	MADE GROUND: Soft brown silty gravelly CLAY with occasional roots and rootlets. Gravel is subangular to subrounded fine to coarse of flint and brick.		(0.40)		
(ES2) 0.50 (D1) 0.60						[MADE GROUND]		0.40	10.73	
(ES3) 1.00						Firm light grey mottled orangish brown silty gravelly CLAY with occasional pockets of orangish brown silty clay. Gravel is subangular to subrounded fine to coarse of flint.		(0.40)		
(D) 1.20-1.65 (D2) 1.20-1.65	SPT(S) 1.20	N=11 (1,2/3,2,3,3)	Dry			[POSSIBLE REWORKED NATURAL DEPOSITS]		0.80 (0.20)	10.33	
						Orangish brown fine to medium clayey SAND with 100mm pockets of soft light grey organic rich clay.		1.00	10.13	
						[RIVER TERRACE DEPOSITS]				
						Firm light greenish grey silty CLAY with occasional pockets of orangish brown silty clay and selenite crystals.				
						[KIMMER DGE CLAY FORMATION]		(1.40)		
(D) 2.00-2.45 (D3) 2.00-2.45 (ES4) 2.00	SPT(S) 2.00	N=11 (2,1/2,3,3,3)	Dry			Firm greenish grey silty CLAY with 100mm pockets of orangish brown silty clay and occasional selenite crystals and shell fragments.		2.40	8.73	
						[KIMMER DGE CLAY FORMATION]				
(D4) 3.00	SPT(S) 3.00	N=11 (2,2/2,3,3,3)	Dry	21/03/2022 11:05	0.00 Dry			(1.05)		
								3.45	7.68	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample										77 67	2.00 3.45					

Remarks
Window sample terminated on Engineer's Instruction on achieving target depth.
No groundwater encountered.
No evidence of contamination observed.

Termination Depth:
3.45m

Project
Northstowe
Client
Homes England

Project No.
10052307
Easting (OS mE)
541406.67

Ground Level (mAOD)
11.36
Northing (OS mN)
266426.16

Start Date
21/03/2022
End Date
21/03/2022

Scale
1:50
Sheet 1 of 1

Samples		Tests		Progress		Strata		Depth (Thickness)	Level	Install/Backfill
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend			
(ES1) 0.20				21/03/2022 08:00	0.00 Dry	MADE GROUND: Soft brown silty gravelly CLAY with occasional roots and rootlets. Gravel is subangular to subrounded fine to coarse of flint.		(0.40)	10.96	
(ES2) 0.50			[MADE GROUND]			0.40				
(B) 0.70 (B1) 0.70 (D1) 0.70 (ES3) 1.00			Firm light greyish brown mottled orangish brown sandy very gravelly CLAY with occasional pockets of orangish brown sand. Gravel is subangular to subrounded fine to coarse of flint.			(0.20)				
(D2) 1.20-1.65	SPT(S) 1.20	N=14 (2,1/3,2,4,5)	Dry			0.60				
(D) 2.00-2.45 (D3) 2.00-2.45	SPT(S) 2.00	N=13 (2,1/3,3,3,4)	Dry	21/03/2022 10:00	0.00 Dry	Firm light greenish grey slightly gravelly CLAY with occasional pockets of orangish brown silty clay and occasional decaying rootlets and sand size selenite crystals. [KIMMER DGE CLAY FORMATION]		(2.30)	8.46	
(D4) 3.00-3.45	SPT(S) 3.00	N=23 (7,7/8,4,5,6)	Dry			2.90				
			Firm to stiff bluish grey silty CLAY with extremely weak claystone bands and occasional selenite crystals. [KIMMER DGE CLAY FORMATION]			(0.55)				
								3.45	7.91	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time (mins)	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Dynamic Sample										77	2.00					
	3.45											67	3.45					

Remarks
Window sample terminated on Engineer's Instruction on achieving target depth.
No groundwater encountered.
No evidence of contamination observed.

Termination Depth:
3.45m

APPENDIX D

CERTIFICATION OF FIELD APPARATUS

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref: AR2411
 Test Date: 20/06/2021
 Report Date: 20/06/2021
 File Name: AR2411.spt
 Test Operator: PR

Instrumented Rod Data

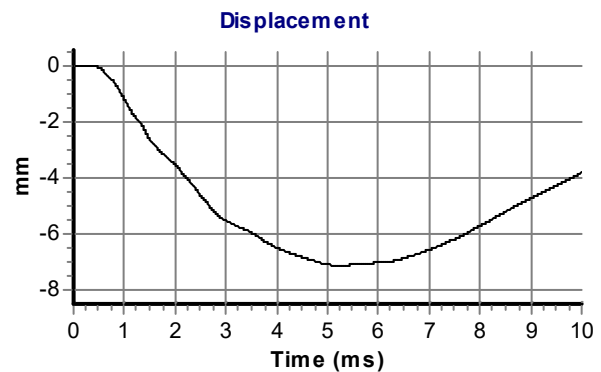
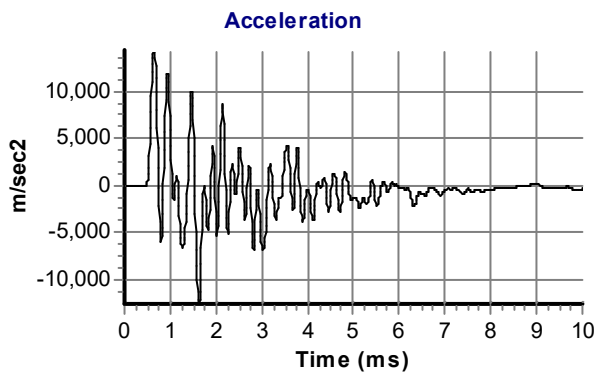
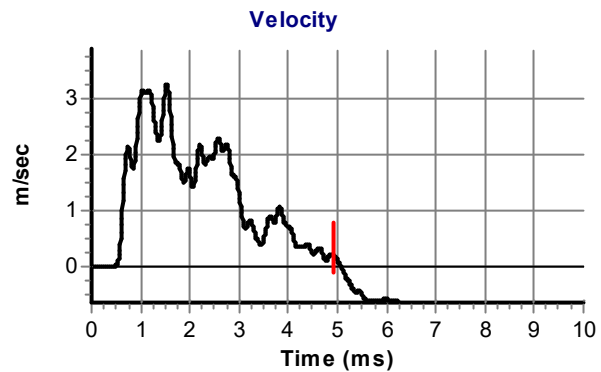
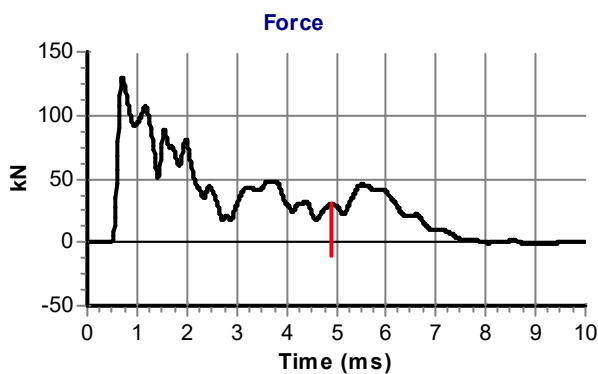
Diameter d_r (mm): 54
 Wall Thickness t_r (mm): 6.3
 Assumed Modulus E_a (GPa): 208
 Accelerometer No.1: 11853
 Accelerometer No.2: 10332

SPT Hammer Information

Hammer Mass m (kg): 63.0
 Falling Height h (mm): 760
 SPT String Length L (m): 15.0

Comments / Location

Maximum calibration interval is 6 months



Calculations

Area of Rod A (mm²): 944
 Theoretical Energy E_{theor} (J): 473
 Measured Energy E_{meas} (J): 366

Energy Ratio E_r (%): 77

Reg. 13(1)

Signed: PR
 Title: Operator

SPT Calibration Report

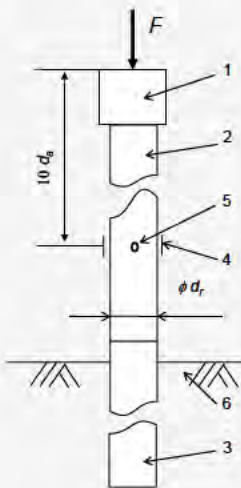
Hammer Energy Measurement Report

Type of Hammer: SPT HAMMER
 Test No: EQU3039_2
 Client: CJ ASSOCIATES

Test Depth (m): 9.80
 Mass of hammer: $m = 63.5 \text{ kg}$
 Falling height: $h = 0.76 \text{ m}$
 $E_{\text{theor}} = m \times g \times h = 473 \text{ J}$

Characteristics of the instrumented rod

Diameter: $d_r = 0.052 \text{ m}$
 Length of instrumented rod: 0.558 m
 Area: $A = 11.61 \text{ cm}^2$
 Modulus: $E_s = 206843 \text{ MPa}$



- Key**
- 1 Anvil
 - 2 Part of instrumented rod
 - 3 Drive Rod
 - 4 Strain Gauge
 - 5 Accelerometer
 - 6 Ground

F Force
 d_r Diameter of rod

Fig. B.1 and B.2
 BS EN ISO 22476-3 : 2005 + A1 : 2011

DATE OF TEST	VALID UNTIL	HAMMER ID
21/10/2021	21/10/2022	AR2521

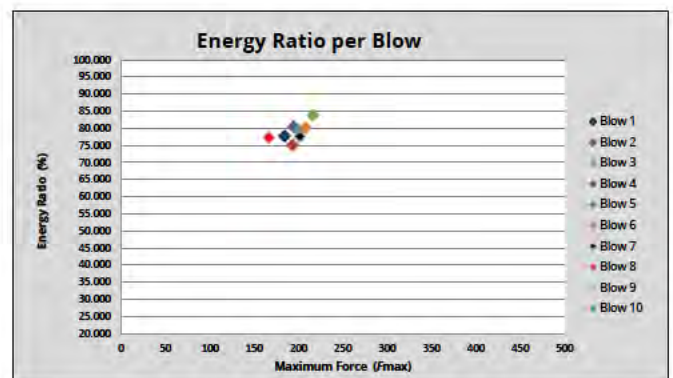
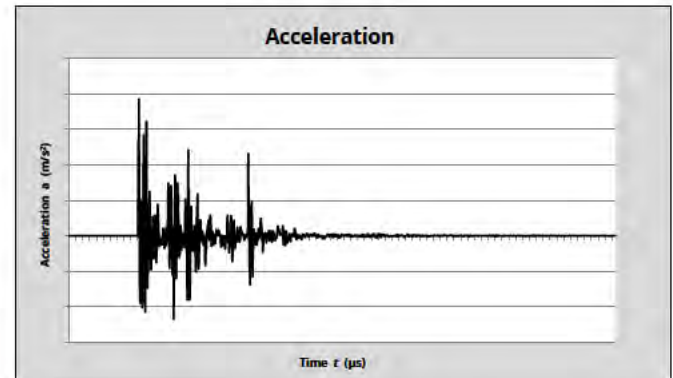
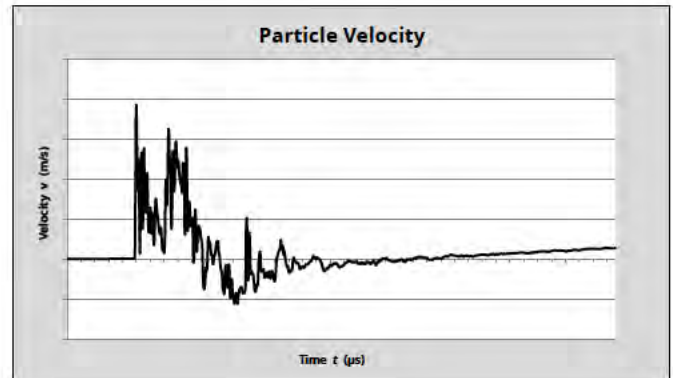
$E_{\text{meas}} = 0.374 \text{ kN-m}$

$E_{\text{theor}} = 0.473 \text{ kN-m}$

Comments

$$\text{Energy Ratio (Er)} = \frac{E_{\text{meas}}}{E_{\text{theor}}}$$

78.98%
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Equipe SPT Analyzer Operator



Certificate prepared by

Reg. 13(1)

Certificate checked by

Reg. 13(1)

Certificate date

03/11/2021

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref: DART489
 Test Date: 27/02/2022
 Report Date: 27/02/2022
 File Name: DART489.spt
 Test Operator: PR

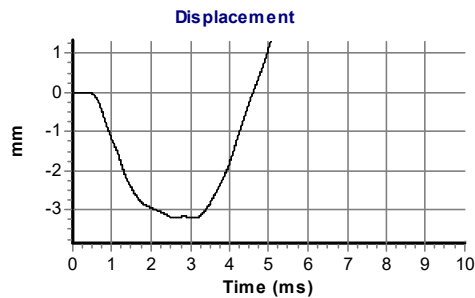
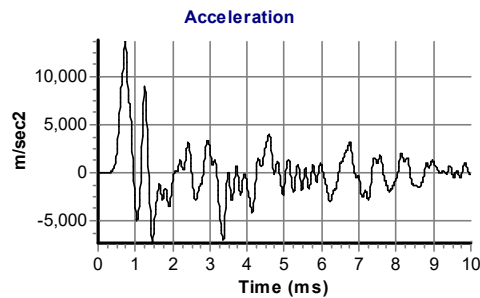
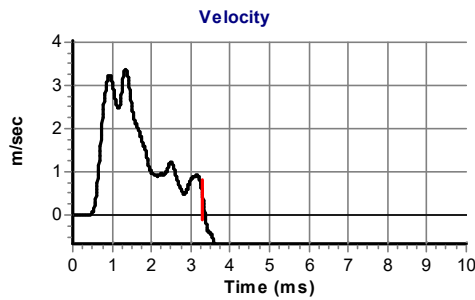
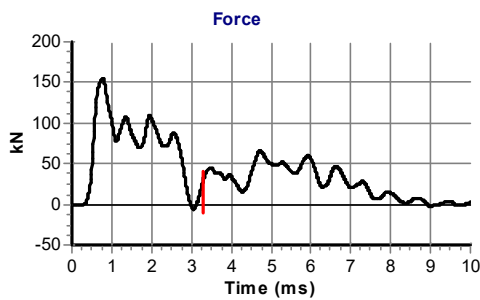
Instrumented Rod Data

Diameter d_r (mm): 54
 Wall Thickness t_r (mm): 6.3
 Assumed Modulus E_a (GPa): 208
 Accelerometer No.1: 11853
 Accelerometer No.2: 10332

SPT Hammer Information

Hammer Mass m (kg): 63.0
 Falling Height h (mm): 760
 SPT String Length L (m): 15.0

Comments / Location



Calculations

Area of Rod A (mm²): 944
 Theoretical Energy E_{theor} (J): 473
 Measured Energy E_{meas} (J): 390

Energy Ratio E_r (%): **82**

Reg. 13(1)

Signed: PR
 Title: Operator

APPENDIX E

MONITORING DATA

Well ID	Date Time	Baro mbar	Rel BH Pres mbar	Peak Flow l/h	Steady Flow l/h	O2 % min	CH4 % max	CO2 % max	CO ppm max	H2S ppm max	O2 % last	CH4 % last	CO2 % last	CO ppm last	H2S ppm last	Weather
BH2C103_A	07/04/2022	987	-0.1	0.1	0	20.6	0.1	0.2	2	0	21.2	0.1	0.1	0	0	Sunny, cloudy, very windy
BH2C104_A	07/04/2022	984	0.19	0.1	0.1	8.1	0.2	3.2	0	0	8.1	0.2	3.1	0	0	Sunny, cloudy, very windy
WS2C112_A	07/04/2022	987	0.36	0	0	22.1	0.2	0.2	0	0	22.1	0.2	0.1	0	0	Sunny, cloudy, very windy
WS2C121_A	07/04/2022	986	0.12	0	0	21	0.2	2	0	0	21	0.1	0.2	0	0	Sunny, cloudy, very windy
WS2C123_A	07/04/2022	989	0.16	0	0	2.6	0.2	0.2	1	0	20.7	0.2	0.1	0	0	Sunny, cloudy, very windy
WS2C120_A	07/04/2022	988	0.54	0	0	20.7	0.2	2	2	0	21.1	0.2	0.9	0	0	Sunny, cloudy, very windy

Well ID	Date	Depth to Water (m bgl)	Depth to Base (m bgl)	Weather
BH2C103_A	07/04/2022	2.744	14.86	Cloudy, cold, very windy
BH2C104_A	07/04/2022	3.413	5.53	Cloudy, cold, very windy
WS2C112_A	07/04/2022	0.474	1.29	Cloudy, cold, very windy
WS2C120_A	07/04/2022	0.656	2.45	Cloudy, cold, very windy
WS2C121_A	07/04/2022	Dry	1.62	Cloudy, cold, very windy
WS2C123_A	07/04/2022	Dry	1.52	Cloudy, cold, very windy

Well ID	Date Time	Baro mbar	Rel BH Pres mbar	Peak Flow l/h	Steady Flow l/h	O2 % min	CH4 % max	CO2 % max	CO ppm max	H2S ppm max	O2 % last	CH4 % last	CO2 % last	CO ppm last	H2S ppm last	Weather
BH2C101_A	08/04/2022 12:02	1000	2.54	0.1	0	15.8	0.2	0.9	1	0	15.8	0.2	0.9	1	0	Sunny, cloudy, cold
BH2C102_A	08/04/2022 10:59	1000	0.17	0.1	0	19.8	1	0.7	7	0	19.8	1	0.7	6	0	Sunny, cloudy, cold
WS2C101_A	08/04/2022 11:42	1000	0.02	0	0	21.6	0.2	0.2	2	0	21.6	0.1	0.2	1	0	Sunny, cloudy, cold
WS2C106_A	08/04/2022 10:35	1000	0.03	0	0	20.2	0.1	0.4	0	0	20.2	0.1	0.4	0	0	Sunny, cloudy, cold
WS2C108_A	08/04/2022 09:46	999	-0.05	0	0	18.6	0.3	0.3	1	0	19	0.3	0.3	1	0	Sunny, cloudy, cold
WS2C114_A	08/04/2022 10:05	1000	0.4	0	0	21.1	0.2	0.7	2	0	21.1	0.1	0.3	0	0	Sunny, cloudy, cold

Well ID	Date	Depth to Water (m bgl)	Depth to Base (m bgl)	Weather
BH2C101_A	08/04/2022	0.497	15.10	Cloudy, cold, sunny
BH2C102_A	08/04/2022	1.298	15.30	Cloudy, cold, sunny
WS2C101_A	08/04/2022	Dry	2.00	Cloudy, cold, sunny
WS2C106_A	08/04/2022	1.099	1.56	Cloudy, cold, sunny
WS2C108_A	08/04/2022	2.033	2.78	Cloudy, cold, sunny
WS2C114_A	08/04/2022	0.923	1.67	Cloudy, cold, sunny

Well ID	Date Time	Baro mbar	Rel BH Pres mbar	Peak Flow l/h	Steady Flow l/h	O2 % min	CH4 % max	CO2 % max	CO ppm max	H2S ppm max	O2 % last	CH4 % last	CO2 % last	CO ppm last	H2S ppm l	Depth to Water (m bgl)	Weather
BH2C101_	13/04/2022 09:15	1014	1.35	0.3	0.3	19.7	0.2	0.7	2	0	19.7	0.2	0.7	1	0	0.961	Clear
BH2C102_	13/04/2022 08:55	1014	1.3	0.2	0.1	17.8	0.2	0.3	2	0	21.3	0.2	0.3	1	0	1.957	Clear
BH2C103_	13/04/2022 10:35	1015	0.1	0.1	0.1	19.9	0.1	0.5	2	0	21.3	0.1	0.1	1	0	2.527	Clear
BH2C104_	13/04/2022 11:01	1015	0.19	0.1	0.1	16.4	0.1	1.2	2	1	16.4	0.1	1.2	1	0	3.027	Clear
WS2C101_	13/04/2022 09:06	1014	0.03	0.1	0.1	21.3	0.2	0.2	1	0	21.5	0.2	0.2	1	0	1.558	Clear
WS2C106_	13/04/2022 09:59	1015	0.1	0.1	0.1	21.3	0.2	0.4	2	0	21.3	0.2	0.4	0	0	0.967	Clear
WS2C108_	13/04/2022 08:43	1014	0.03	0.1	0.1	17.4	0.3	0.3	2	0	17.4	0.2	0.3	2	0	2.142	Clear
WS2C112_	13/04/2022 10:17	1015	-0.01	0.1	0.1	21.4	0.1	0.3	1	0	21.6	0.1	0.1	0	0	0.495	Clear
WS2C114_	13/04/2022 10:09	1015	0.03	0.1	0.1	21.2	0.1	0.5	1	0	21.4	0.1	0.3	0	0	1.253	Clear
WS2C120_	13/04/2022 10:26	1015	0.59	0.3	0.1	20.5	0.1	1.6	1	0	21.2	0.1	0.5	1	0	0.632	Clear
WS2C121_	13/04/2022 10:44	1015	0.01	0.1	0.1	21.4	0.1	0.1	1	0	21.6	0.1	0.1	1	0	1.071	Clear
WS2C123_	13/04/2022 10:53	1015	0.09	0.1	0.1	21.6	0.1	0.2	2	0	21.6	0.1	0.1	1	0 Dry		Clear

Well ID	Date Time	Baro mbar	Rel BH Pres mbar	Peak Flow l/h	Steady Flow l/h	O2 % min	CH4 % max	CO2 % max	CO ppm max	H2S ppm max	O2 % last	CH4 % last	CO2 % last	CO ppm last	H2S ppm last	Depth to Water (m bgl)	Weather
BH2C101_A	23/05/2022 09:14	1004	3.09	0.2	0.1	17.4	0	0.9	7	0	18.7	0	0.5	4	0	0.322	Cloudy
BH2C102_A	23/05/2022 08:52	1003	110.31	10.4	0.2	20	0.1	0.5	6	0	20	0	0.5	5	0	1.618	Cloudy
BH2C103_A	23/05/2022 09:51	1004	0.17	0	0	20.5	0	0.2	2	0	21.3	0	0.1	0	0	2.394	Cloudy
BH2C104_A	23/05/2022 10:15	1003	-0.05	0	0	16.2	0	2.5	1	0	16.2	0	2.5	0	0	2.907	Cloudy
WS2C101_A	23/05/2022 09:05	1004	-0.02	0	0	20.6	0	0.1	4	0	20.6	0	0.1	1	0	1.046	Cloudy
WS2C106_A	23/05/2022 09:25	1004	0.15	0	0	20.7	0	0.3	3	0	20.8	0	0.3	0	0	0.827	Cloudy
WS2C108_A	23/05/2022 08:41	1003	0.03	0	0	18.1	0.8	0.3	1	0	18.1	0.4	0.3	0	0	1.964	Cloudy
WS2C112_A	23/05/2022 09:34	1004	0.09	0	0	21.2	0	0.1	0	0	21.2	0	0.1	0	0	0.469	Cloudy
WS2C114_A	23/05/2022 10:24	1003	0.09	0	0	19.1	0	2.1	0	0	21.1	0	0.6	0	0	0.898	Cloudy
WS2C120_A	23/05/2022 09:59	1004	0.1	0	0	21.3	0	0.2	1	0	21.4	0	0.1	0	0	0.812	Cloudy
WS2C121_A	23/05/2022 09:43	1004	0.1	0	0	21.3	0	0.1	1	0	21.3	0	0.1	0	0	0.823	Cloudy
WS2C123_A	23/05/2022 10:07	1004	0.03	0	0	21.3	0	0.2	1	0	21.4	0	0.2	0	0 Dry		Cloudy

APPENDIX F

GEOTECHNICAL LABORATORY TEST DATA



Laboratory Report



GEO Site & Testing Services Ltd

Contract Number: 58610

Client Ref: **10052307**

Report Date: **27-04-2022**

Client PO: **14059902**

Client **Arcadis**
Fortran Rd
St Mellons
Cardiff
CF3 0EY

Contract Title: **Northstowe**
For the attention of: **Reg. 13(1)**

Date Received: **04-04-2022**

Date Completed: **27-04-2022**

Test Description	Qty
Samples Received - @ Non Accredited Test	898
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	99
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	98
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	29
BRE Full Suite includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate Sub-contracted Test	48
CBR: Remoulded Specimen and tested at top only BS 1377:1990 - Part 4 : 7 - * UKAS	13
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - * UKAS	8

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Reg. 13(1) (Business Support Manager) - Reg. 13(1) (Director) - Reg. 13(1) (Quality/Technical Manager)

Reg. 13(1) (Laboratory manager) - Reg. 13(1) (Site Manager) - Reg. 13(1) (Quality Assistant / Administrator / Health and Safety Coordinator)



Contract Number: 58610

Test Description	Qty
Natural Shear Strength by Hand Vane (3 measurements) - @ Non Accredited Test	6
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	21
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

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Reg. 13(1) (Laboratory manager) - Reg. 13(1) (Site Manager) - Reg. 13(1) (Quality Assistant / Administrator / Health and Safety Coordinator)



**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	58610
Site Name	Northstowe
Date Tested	18/04/2022
DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
				-		
TPTCA103	2	D	0.20	-	0.50	Brown gravelly sandy silty CLAY
TPTCA103	5	B	2.00	-	3.00	Brown silty clayey sandy GRAVEL
TPTCA105	4	D	1.00	-	2.00	Brown silty CLAY
TPTCA107	3	D	0.50	-	1.00	Brown gravelly sandy silty CLAY
TPTCA111	1	D	0.00	-	0.20	Brown gravelly silty CLAY
TPTCA113	4	D	1.00	-	2.00	Brown gravelly sandy silty CLAY
TPTCA114	5	D	2.00	-	3.00	Brown silty clayey sandy GRAVEL
TPTCA118	4	D	1.00	-	2.00	Brown silty CLAY
TPTCA118	5	D	2.00	-	3.00	Grey silty CLAY
TPTCA204	4	B	1.00	-	2.00	Brown gravelly silty CLAY
TPTCA204	5	D	2.00	-	3.00	Brown gravelly sandy silty CLAY
TPTCA205	4	B	1.00	-	2.00	Brown gravelly silty CLAY
TPTCA208	5	D	2.00	-	3.00	Brown gravelly silty CLAY
BHTCA101	7	B	2.70	-	3.00	Brown gravelly silty CLAY
BHTCA101	8	D	3.00	-	3.45	Grey silty CLAY
BHTCA101	14	D	5.00	-	5.45	Brown silty CLAY
BHTCA101	16	D	5.50	-	6.00	Grey silty CLAY
BHTCA202	9	D	2.50	-	3.00	Brown silty CLAY
BHTCA202	14	D	4.00	-	4.45	Brown silty CLAY
BHTCA202	24	D	7.00	-	7.45	Grey silty CLAY
WSTCA109	2	B	1.45	-	2.00	Brown silty CLAY
WSTCA112	1	B	0.90	-	1.30	Brown sandy gravelly silty CLAY
WSTCA112	2	B	1.30	-	2.00	Brown silty CLAY
WSTCA112	4	B	2.50	-	3.00	Brown silty CLAY

Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)



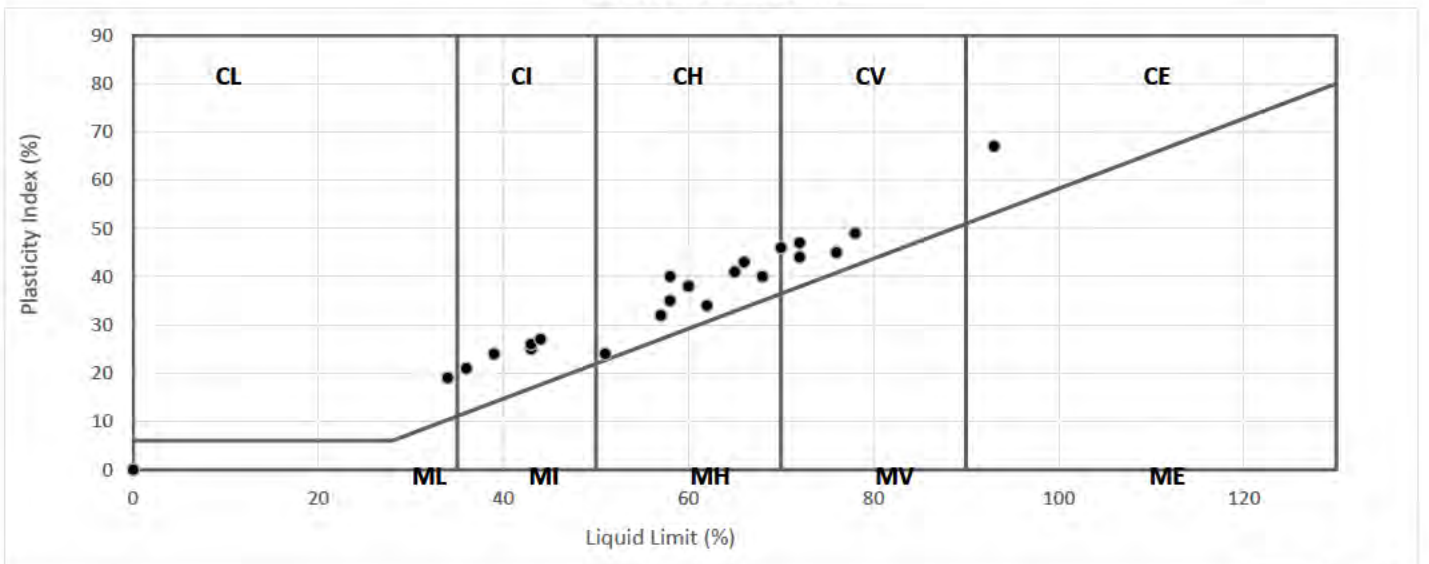
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	58610
Project Location	Northstowe
Date Tested	18/04/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
TPTCA103	2	D	0.20	-	0.50	14	36	15	21	89	CI Intermediate Plasticity
TPTCA103	5	B	2.00	-	3.00	13		NP		20	
TPTCA105	4	D	1.00	-	2.00	25	60	22	38	100	CH High Plasticity
TPTCA107	3	D	0.50	-	1.00	15	39	15	24	89	CI Intermediate Plasticity
TPTCA111	1	D	0.00	-	0.20	18	43	18	25	95	CI Intermediate Plasticity
TPTCA113	4	D	1.00	-	2.00	33	76	31	45	88	CV Very High Plasticity
TPTCA114	5	D	2.00	-	3.00	11		NP		21	
TPTCA118	4	D	1.00	-	2.00	27	60	22	38	100	CH High Plasticity
TPTCA118	5	D	2.00	-	3.00	31	65	24	41	100	CH High Plasticity
TPTCA204	4	B	1.00	-	2.00	31	51	27	24	89	CH High Plasticity
TPTCA204	5	D	2.00	-	3.00	19	43	17	26	89	CI Intermediate Plasticity
TPTCA205	4	B	1.00	-	2.00	28	58	23	35	89	CH High Plasticity
TPTCA208	5	D	2.00	-	3.00	13	44	17	27	87	CI Intermediate Plasticity
BHTCA101	7	B	2.70	-	3.00	23	68	28	40	89	CH High Plasticity
BHTCA101	8	D	3.00	-	3.45	33	72	28	44	100	CV Very High Plasticity
BHTCA101	14	D	5.00	-	5.45	27	57	25	32	100	CH High Plasticity
BHTCA101	16	D	5.50	-	6.00	20	58	18	40	100	CH High Plasticity
BHTCA202	9	D	2.50	-	3.00	29	72	25	47	100	CV Very High Plasticity
BHTCA202	14	D	4.00	-	4.45	33	62	28	34	100	CH High Plasticity
BHTCA202	24	D	7.00	-	7.45	32	66	23	43	100	CH High Plasticity
WSTCA109	2	B	1.45	-	2.00	39	78	29	49	100	CV Very High Plasticity
WSTCA112	1	B	0.90	-	1.30	13	34	15	19	84	CL Low Plasticity
WSTCA112	2	B	1.30	-	2.00	29	93	26	67	100	CE Extremely High Plasticity
WSTCA112	4	B	2.50	-	3.00	32	70	24	46	100	CH/V High/HighPlasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010**



Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)



Contract Number	58610
Site Name	Northstowe
Date Tested	18/04/2022
DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WSTCA116	1	B	1.20	-	1.50	Brown silty CLAY
WSTCA116	3	B	2.00	-	2.50	Brown silty CLAY
WSTCA116	4	B	2.50	-	3.00	Brown silty CLAY
BHTCA102	10	B	3.00	-	3.50	Grey silty CLAY
BHTCA102	9	D	3.45	-	3.55	Brown silty CLAY
BHTCA102	14	D	4.50	-	5.00	Grey silty CLAY
BHTCA102	21	D	6.50	-	7.00	Grey gravelly silty CLAY
BHTCA102	23	D	7.45	-	7.55	Brown silty CLAY
BHTCA103A	5	D	2.70	-	3.00	Brown silty CLAY
BHTCA103A	7	D	3.45	-	3.50	Brown silty CLAY
BHTCA103A	12	B	6.00	-	6.50	Grey silty CLAY
BHTCA103A	15	D	7.45	-	7.50	Brown silty CLAY
BHTCA103A	17	D	8.80	-	9.00	Grey silty CLAY
BHTCA103A	24	B	13.50	-	14.00	Grey silty CLAY
TPTCA104	3	D	0.80	-	1.70	Brown gravelly silty CLAY
TPTCA104	4	D	1.70	-	3.00	Brown gravelly silty CLAY
TPTCA119	4	D	1.20	-	3.00	Brown silty CLAY
BHTCA104	5	D	1.70	-	2.00	Brown gravelly sandy silty CLAY
BHTCA104	6	B	2.00	-	2.50	Brown silty CLAY
BHTCA104	11	D	4.00	-	4.45	Grey silty CLAY
BHTCA104	16	D	5.50	-	6.00	Brown silty CLAY
BHTCA104	19	D	6.50	-	7.00	Grey silty CLAY
BHTCA108	6	D	2.45	-	2.50	Brown silty CLAY
BHTCA108	7	D	3.00	-	3.45	Brown silty CLAY

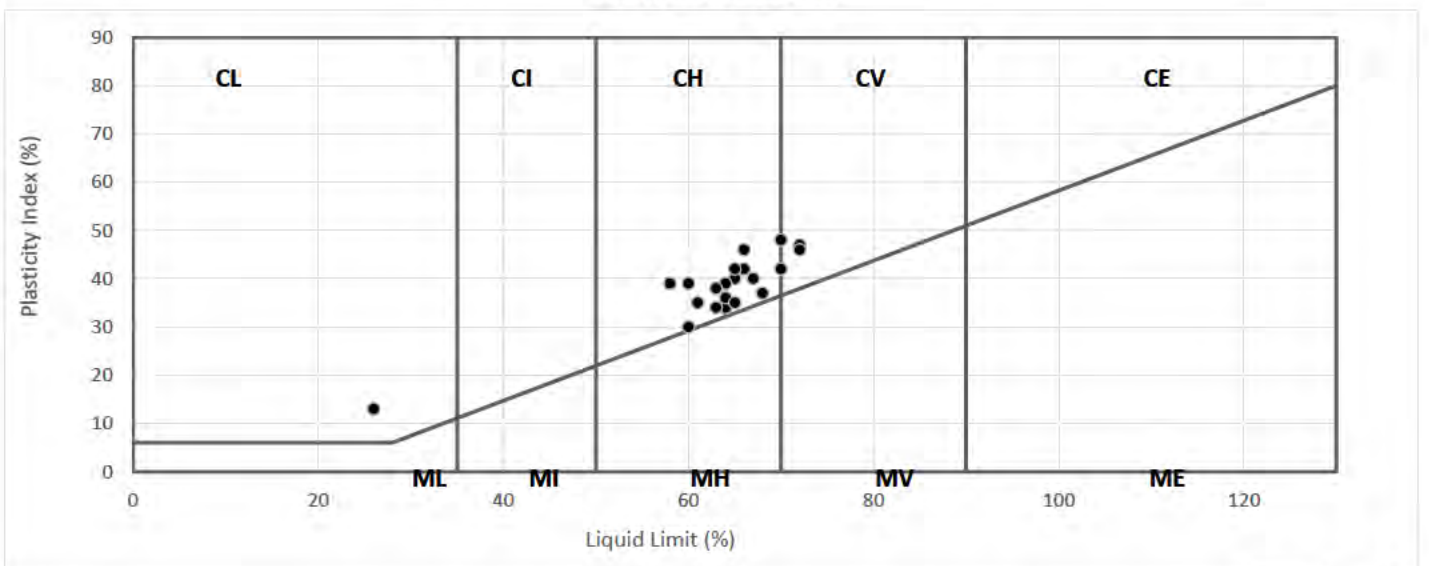
Operators	Checked	26/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1) (Quality/Technical Manager)

Contract Number	58610
Project Location	Northstowe
Date Tested	18/04/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
WSTCA116	1	B	1.20	-	1.50	32	63	25	38	100	CH High Plasticity
WSTCA116	3	B	2.00	-	2.50	28	65	25	40	100	CH High Plasticity
WSTCA116	4	B	2.50	-	3.00	38	60	30	30	100	CH High Plasticity
BHTCA102	10	B	3.00	-	3.50	29	67	27	40	100	CH High Plasticity
BHTCA102	9	D	3.45	-	3.55	46	64	30	34	100	CH High Plasticity
BHTCA102	14	D	4.50	-	5.00	28	64	25	39	100	CH High Plasticity
BHTCA102	21	D	6.50	-	7.00	34	64	30	34	87	CH High Plasticity
BHTCA102	23	D	7.45	-	7.55	26	70	22	48	100	CH/V High/HighPlasticity
BHTCA103A	5	D	2.70	-	3.00	37	64	30	34	100	CH High Plasticity
BHTCA103A	7	D	3.45	-	3.50	27	72	25	47	100	CV Very High Plasticity
BHTCA103A	12	B	6.00	-	6.50	27	58	19	39	100	CH High Plasticity
BHTCA103A	15	D	7.45	-	7.50	26	66	24	42	100	CH High Plasticity
BHTCA103A	17	D	8.80	-	9.00	33	63	29	34	100	CH High Plasticity
BHTCA103A	24	B	13.50	-	14.00	30	68	31	37	100	CH High Plasticity
TPTCA104	3	D	0.80	-	1.70	30	64	28	36	94	CH High Plasticity
TPTCA104	4	D	1.70	-	3.00	34	72	26	46	90	CV Very High Plasticity
TPTCA119	4	D	1.20	-	3.00	26	65	23	42	100	CH High Plasticity
BHTCA104	5	D	1.70	-	2.00	14	26	13	13	69	CL Low Plasticity
BHTCA104	6	B	2.00	-	2.50	36	65	30	35	100	CH High Plasticity
BHTCA104	11	D	4.00	-	4.45	29	66	20	46	100	CH High Plasticity
BHTCA104	16	D	5.50	-	6.00	25	60	21	39	100	CH High Plasticity
BHTCA104	19	D	6.50	-	7.00	35	61	26	35	100	CH High Plasticity
BHTCA108	6	D	2.45	-	2.50	31	63	25	38	100	CH High Plasticity
BHTCA108	7	D	3.00	-	3.45	27	70	28	42	100	CH/V High/HighPlasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010



Operators	Checked	26/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1) (Quality/Technical Manager)



**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	58610
Site Name	Northstowe
Date Tested	18/04/2022
DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
				-		
BHTCA108	14	D	6.45	-	6.50	Brown silty CLAY
WSTCA106	2	B	2.00	-	2.50	Brown gravelly silty CLAY
WSTCA106	3	B	2.50	-	3.00	Brown silty CLAY
WSTCA108	3	B	1.60	-	2.00	Brown clayey SILT
WSTCA117	4	B	2.50	-	2.80	Brown silty CLAY
WS2C101	2	D	1.20	-	1.65	Brown silty CLAY
WS2C106	2	D	1.20	-	1.65	Brown gravelly silty CLAY
WS2C106	3	D	2.00	-	2.45	Grey silty CLAY
WS2C108	1	D	1.20	-	1.65	Brown silty CLAY
WS2C108	2	D	2.00	-	2.45	Brown silty CLAY
WS2C112	1	B	0.80	-	1.20	Brown silty CLAY
WS2C112	1	D	1.20	-	1.65	Brown silty CLAY
WS2C114	1	B	1.50	-	2.00	Brown silty CLAY
WS2C120	1	D	1.20	-	1.65	Brown silty CLAY
WS2C120	3	D	2.70	-	2.80	Brown silty CLAY
WS2C121	2	D	1.20	-	1.65	Brown silty CLAY
WS2C121	3	D	2.00	-	2.45	Brown silty CLAY
WS2C123	1	D	0.70	-		Brown silty CLAY
WS2C123	3	D	2.00	-	2.45	Brown clayey SILT
BHTCA107	3	B	1.00	-	1.20	Grey silty CLAY
BHTCA107	5	B	1.70	-	2.00	Brown gravelly silty CLAY
BHTCA107	7	D	2.60	-	3.00	Grey silty CLAY
BHTCA107	9	D	3.45	-	3.55	Brown silty CLAY
BHTCA107	14	D	4.50	-	5.00	Grey silty CLAY

Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)





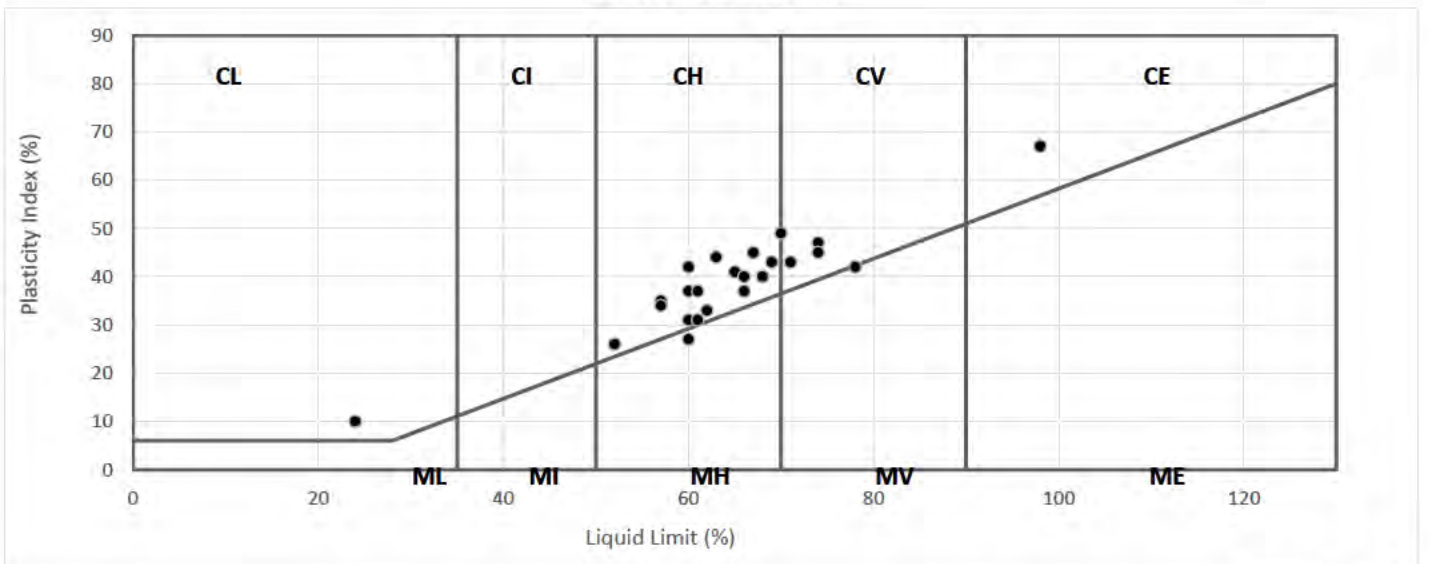
**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	58610
Project Location	Northstowe
Date Tested	18/04/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BHTCA108	14	D	6.45	-	6.50	10	24	14	10	100	CL Low Plasticity
WSTCA106	2	B	2.00	-	2.50	30	74	27	47	88	CV Very High Plasticity
WSTCA106	3	B	2.50	-	3.00	35	71	28	43	100	CV Very High Plasticity
WSTCA108	3	B	1.60	-	2.00	45	78	36	42	100	MV Very High Plasticity
WSTCA117	4	B	2.50	-	2.80	34	98	31	67	100	CE Extremely High Plasticity
WS2C101	2	D	1.20	-	1.65	28	69	26	43	100	CH High Plasticity
WS2C106	2	D	1.20	-	1.65	22	52	26	26	91	CH High Plasticity
WS2C106	3	D	2.00	-	2.45	28	60	23	37	100	CH High Plasticity
WS2C108	1	D	1.20	-	1.65	18	67	22	45	100	CH High Plasticity
WS2C108	2	D	2.00	-	2.45	33	63	19	44	100	CH High Plasticity
WS2C112	1	B	0.80	-	1.20	31	68	28	40	100	CH High Plasticity
WS2C112	1	D	1.20	-	1.65	27	70	21	49	100	CH/V High/HighPlasticity
WS2C114	1	B	1.50	-	2.00	27	61	24	37	100	CH High Plasticity
WS2C120	1	D	1.20	-	1.65	31	65	24	41	100	CH High Plasticity
WS2C120	3	D	2.70	-	2.80	29	60	18	42	100	CH High Plasticity
WS2C121	2	D	1.20	-	1.65	37	60	29	31	100	CH High Plasticity
WS2C121	3	D	2.00	-	2.45	30	74	29	45	100	CV Very High Plasticity
WS2C123	1	D	0.70	-		29	62	29	33	100	CH High Plasticity
WS2C123	3	D	2.00	-	2.45	34	60	33	27	100	MH High Plasticity
BHTCA107	3	B	1.00	-	1.20	37	61	30	31	100	CH High Plasticity
BHTCA107	5	B	1.70	-	2.00	27	57	22	35	88	CH High Plasticity
BHTCA107	7	D	2.60	-	3.00	28	66	26	40	100	CH High Plasticity
BHTCA107	9	D	3.45	-	3.55	37	66	29	37	100	CH High Plasticity
BHTCA107	14	D	4.50	-	5.00	26	57	23	34	100	CH High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010**



Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)





**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	58610
Site Name	Northstowe
Date Tested	18/04/2022
DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BHTCA107	16	D	5.50	-	6.00	Grey silty CLAY
BHTCA107	25	D	8.50	-	9.00	Grey silty CLAY
BHTCA110	7	D	2.80	-	3.00	Brown silty CLAY
BHTCA110	9	D	3.80	-	4.00	Grey silty CLAY
BHTCA110	12	B	5.00	-	5.50	Grey silty CLAY
BHTCA110	15	D	6.80	-	7.00	Grey silty CLAY
BHTCA301A	10	B	2.00	-	2.50	Brown silty clayey GRAVEL
BHTCA301A	12	D	3.00	-	3.45	Grey silty CLAY
BHTCA301A	16	D	4.45	-	4.50	Grey silty CLAY
BHTCA301A	19	D	6.00	-	6.10	Grey silty CLAY
BHTCA301A	22	D	7.45	-	7.50	Grey silty CLAY
BH2C101	11	D	2.45	-	2.50	Brown silty CLAY
BH2C101	15	D	4.45	-	4.50	Grey silty CLAY
BH2C101	18	D	6.45	-	6.50	Brown silty CLAY
BH2C102	7	D	2.50	-	3.00	Brown silty CLAY
BH2C102	10	D	3.50	-	4.00	Grey silty CLAY
BH2C102	12	D	4.45	-	4.55	Grey silty CLAY
BH2C102	20	D	6.50	-	7.00	Grey silty CLAY
BH2C103	17	D	1.20	-	1.65	Brown silty CLAY
BH2C103	19	D	4.45	-	4.50	Brown silty CLAY
BH2C103	20	D	6.45	-	6.50	Brown silty CLAY
BH2C103	21	D	7.00	-	7.45	Brown silty CLAY
BH2C104	14	B	3.70	-		Brown gravelly silty CLAY
BH2C104	18	D	5.00	-	5.45	Brown silty CLAY

Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)

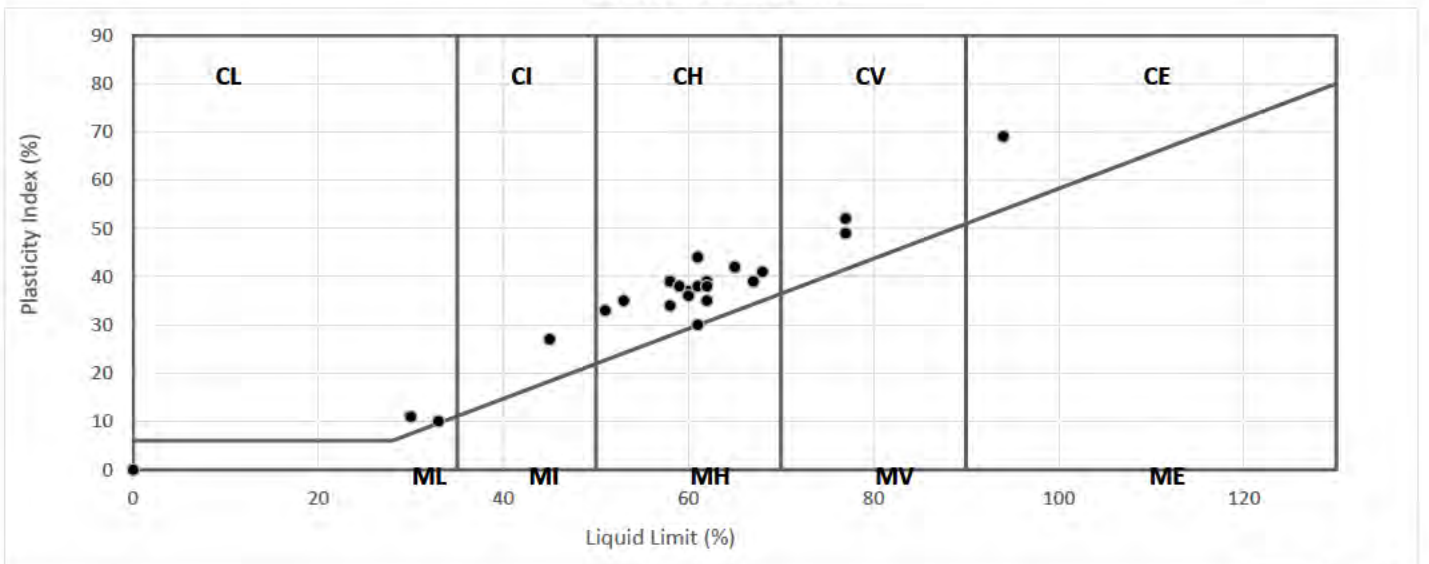


Contract Number	58610
Project Location	Northstowe
Date Tested	18/04/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BHTCA107	16	D	5.50	-	6.00	27	60	23	37	100	CH High Plasticity
BHTCA107	25	D	8.50	-	9.00	28	62	23	39	100	CH High Plasticity
BHTCA110	7	D	2.80	-	3.00	35	77	25	52	100	CV Very High Plasticity
BHTCA110	9	D	3.80	-	4.00	32	67	28	39	100	CH High Plasticity
BHTCA110	12	B	5.00	-	5.50	34	62	27	35	100	CH High Plasticity
BHTCA110	15	D	6.80	-	7.00	36	61	31	30	100	CH High Plasticity
BHTCA301A	10	B	2.00	-	2.50	10		NP		18	
BHTCA301A	12	D	3.00	-	3.45	24	58	19	39	100	CH High Plasticity
BHTCA301A	16	D	4.45	-	4.50	18	61	17	44	100	CH High Plasticity
BHTCA301A	19	D	6.00	-	6.10	20	51	18	33	100	CH High Plasticity
BHTCA301A	22	D	7.45	-	7.50	23	61	23	38	100	CH High Plasticity
BH2C101	11	D	2.45	-	2.50	16	30	19	11	100	CL Low Plasticity
BH2C101	15	D	4.45	-	4.50	17	33	23	10	100	CL Low Plasticity
BH2C101	18	D	6.45	-	6.50	27	94	25	69	100	CE Extremely High Plasticity
BH2C102	7	D	2.50	-	3.00	27	58	24	34	100	CH High Plasticity
BH2C102	10	D	3.50	-	4.00	35	60	24	36	100	CH High Plasticity
BH2C102	12	D	4.45	-	4.55	27	65	23	42	100	CH High Plasticity
BH2C102	20	D	6.50	-	7.00	39	68	27	41	100	CH High Plasticity
BH2C103	17	D	1.20	-	1.65	19	53	18	35	100	CH High Plasticity
BH2C103	19	D	4.45	-	4.50	30	77	28	49	100	CV Very High Plasticity
BH2C103	20	D	6.45	-	6.50	28	65	23	42	100	CH High Plasticity
BH2C103	21	D	7.00	-	7.45	26	62	24	38	100	CH High Plasticity
BH2C104	14	B	3.70	-		22	45	18	27	89	CI Intermediate Plasticity
BH2C104	18	D	5.00	-	5.45	24	59	21	38	100	CH High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010**



Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)





**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	58610
Site Name	Northstowe
Date Tested	18/04/2022
DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH2C104	21	D	6.45	-	6.50	Grey silty CLAY
BH2C104	26	D	8.45	-	8.50	Brown silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
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				-		
				-		
				-		

Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)





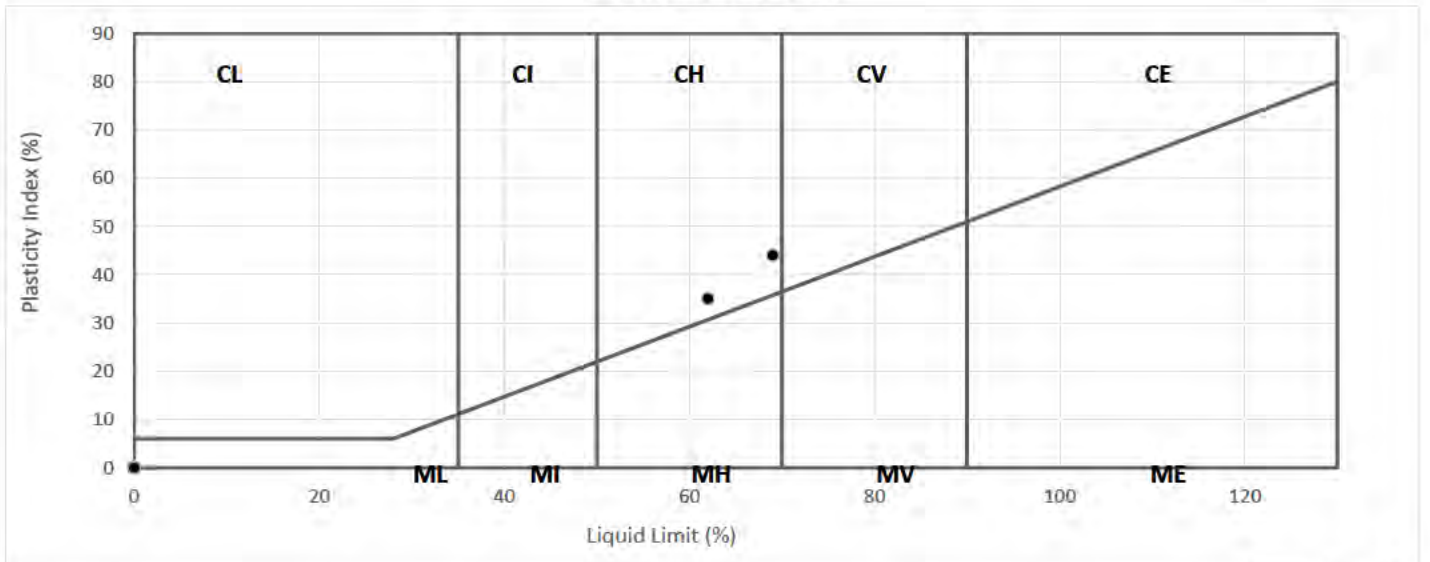
**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	58610
Project Location	Northstowe
Date Tested	18/04/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BH2C104	21	D	6.45	-	6.50	26	69	25	44	100	CH High Plasticity
BH2C104	26	D	8.45	-	8.50	30	62	27	35	100	CH High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010**



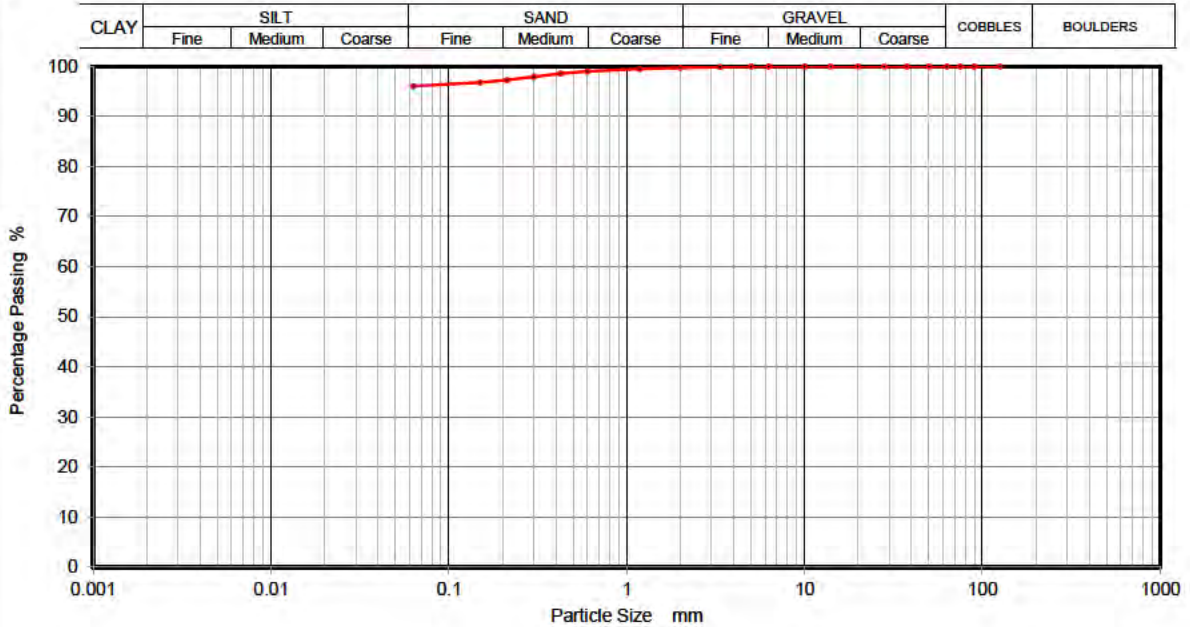
Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610	
	Borehole/Pit No.	BH2C101
Site Name	Northstowe	
Soil Description	Grey slightly fine to coarse sandy SILT/CLAY	
		Depth Top
	Depth Base	1.65
Date Tested	19/04/2022	
Sample Type	B	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
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	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	97		
0.15	97		
0.063	96		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	4
Silt and Clay	96

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

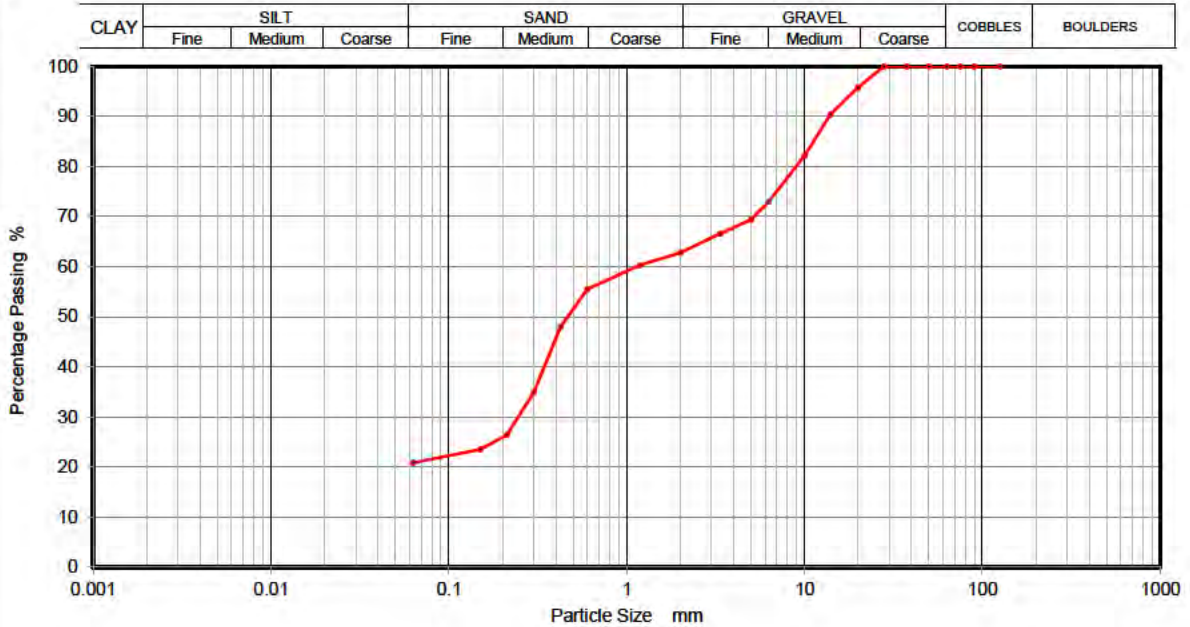




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BH2C102
Sample No.	4
Depth Top	1.40
Depth Base	1.70
Sample Type	B

Site Name	Northstowe
Soil Description	Brown silty/clayey fine to coarse gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	90		
10	82		
6.3	73		
5	69		
3.35	67		
2	63		
1.18	60		
0.6	56		
0.425	48		
0.3	35		
0.212	26		
0.15	24		
0.063	21		

Sample Proportions	% dry mass
Cobbles	0
Gravel	37
Sand	42
Silt and Clay	21

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

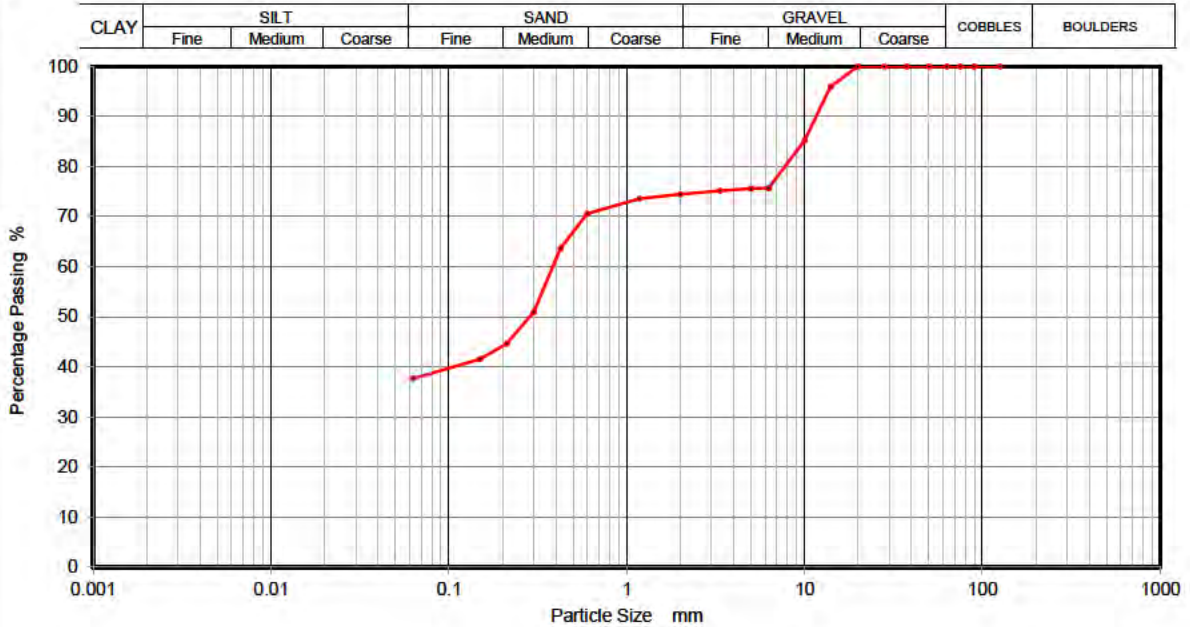




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BH2C103
Sample No.	9
Depth Top	1.00
Depth Base	1.20
Sample Type	B

Site Name	Northstowe
Soil Description	Grey fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	96		
10	85		
6.3	76		
5	76		
3.35	75		
2	74		
1.18	74		
0.6	71		
0.425	64		
0.3	51		
0.212	45		
0.15	42		
0.063	38		

Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	36
Silt and Clay	38

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

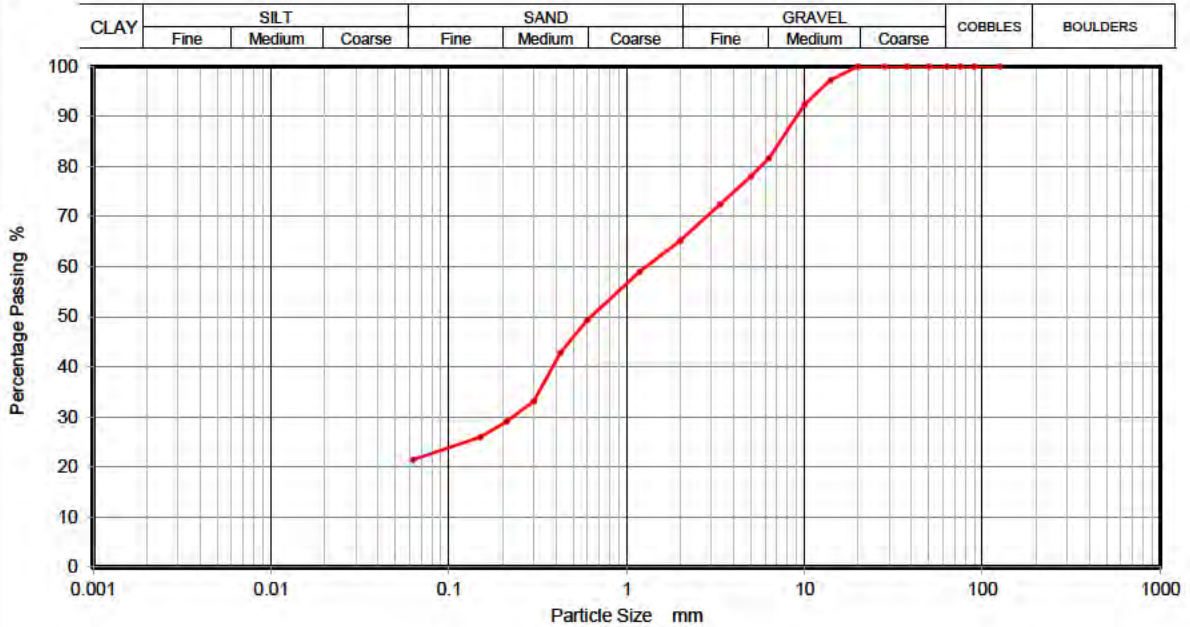




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BH2C104
Sample No.	3
Depth Top	0.50
Depth Base	1.00
Sample Type	B

Site Name	Northstowe
Soil Description	Brown silty/clayey fine to medium gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	92		
6.3	82		
5	78		
3.35	72		
2	65		
1.18	59		
0.6	49		
0.425	43		
0.3	33		
0.212	29		
0.15	26		
0.063	21		

Sample Proportions	% dry mass
Cobbles	0
Gravel	35
Sand	44
Silt and Clay	21

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

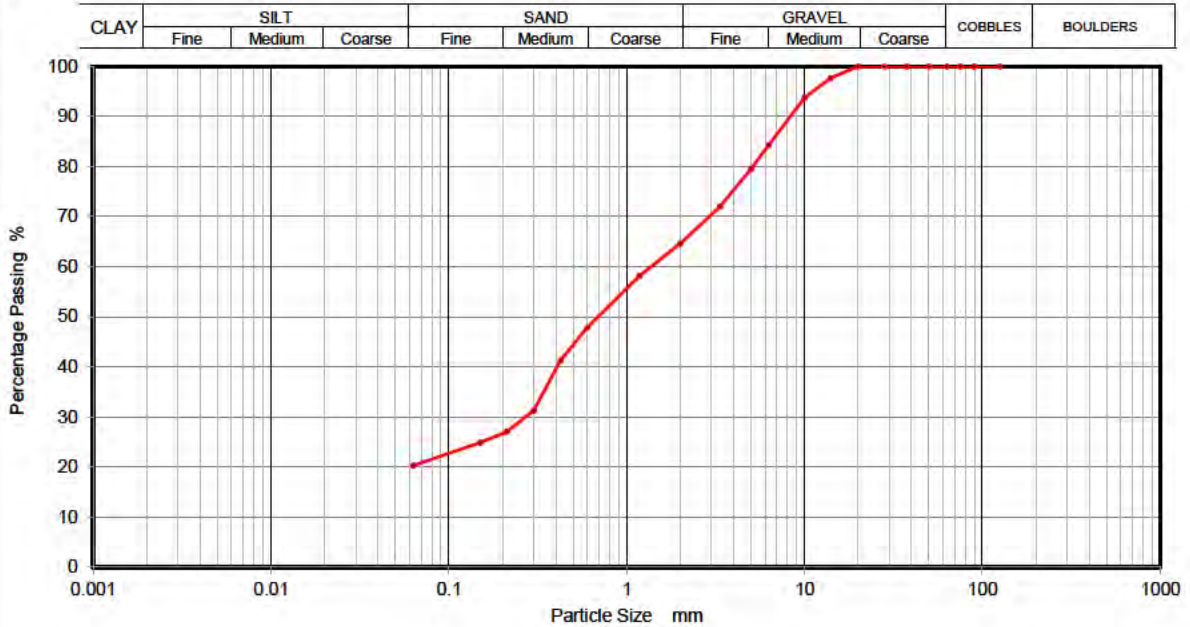




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BH2C104
Sample No.	8
Depth Top	2.00
Depth Base	2.45
Sample Type	D

Site Name	Northstowe
Soil Description	Brown clayey/silty fine to medium gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	94		
6.3	84		
5	80		
3.35	72		
2	65		
1.18	58		
0.6	48		
0.425	41		
0.3	31		
0.212	27		
0.15	25		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	35
Sand	45
Silt and Clay	20

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)	

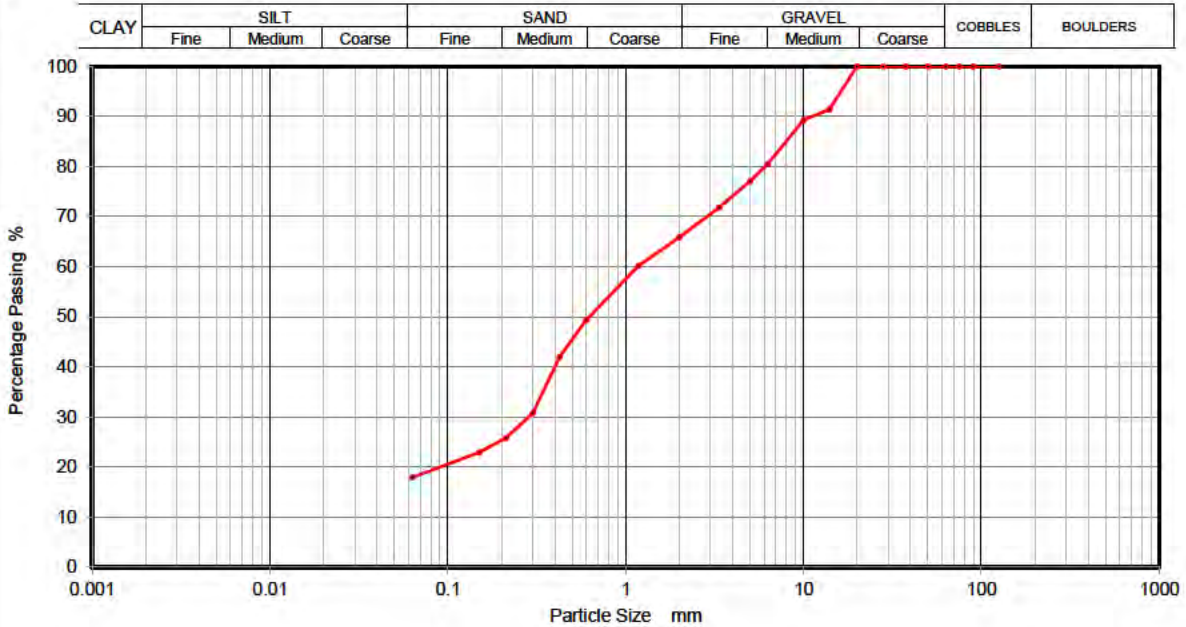




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BH2C104
Sample No.	11
Depth Top	3.00
Depth Base	3.45
Sample Type	D

Site Name	Northstowe
Soil Description	Grey clayey/silty fine to medium gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	91		
10	89		
6.3	80		
5	77		
3.35	72		
2	66		
1.18	60		
0.6	49		
0.425	42		
0.3	31		
0.212	26		
0.15	23		
0.063	18		

Sample Proportions	% dry mass
Cobbles	0
Gravel	34
Sand	48
Silt and Clay	18

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

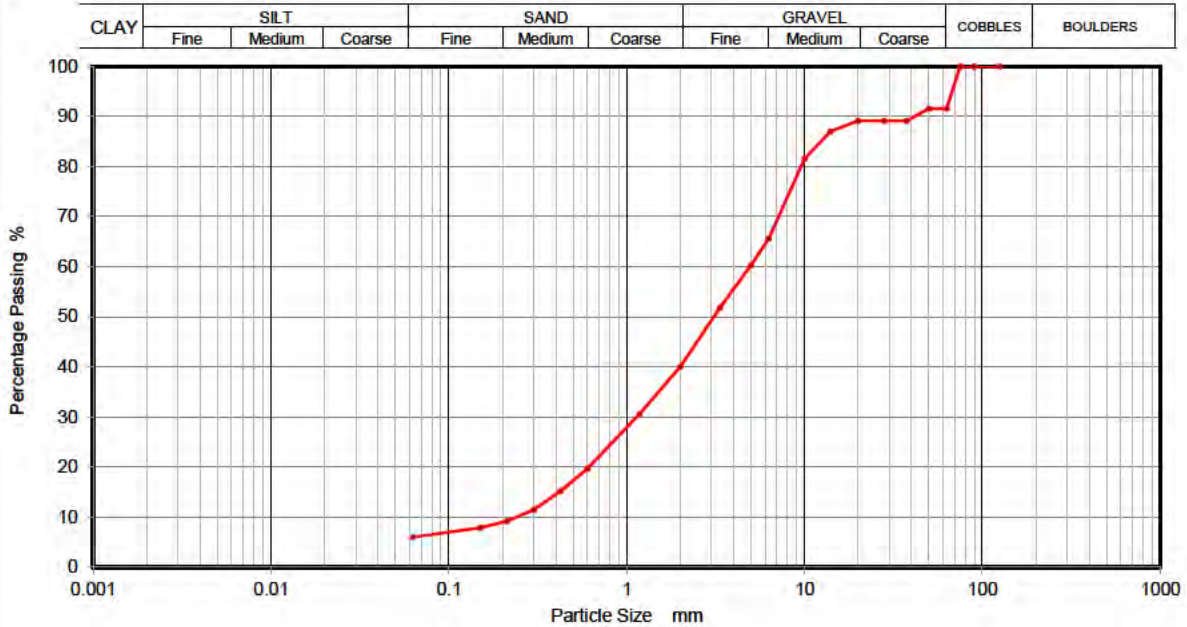




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BH2C104
Sample No.	16
Depth Top	4.00
Depth Base	4.50
Sample Type	B

Site Name	Northstowe
Soil Description	Grey slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	92		
50	92		
37.5	89		
28	89		
20	89		
14	87		
10	82		
6.3	66		
5	60		
3.35	52		
2	40		
1.18	31		
0.6	20		
0.425	15		
0.3	11		
0.212	9		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	8
Gravel	52
Sand	34
Silt and Clay	6

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

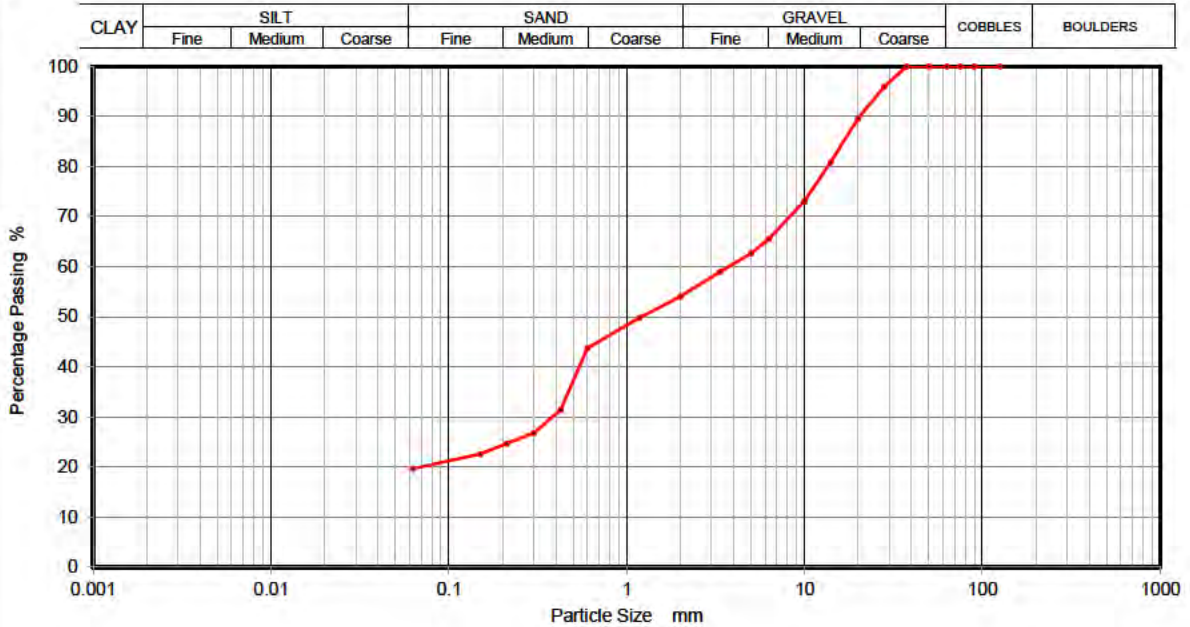




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA101
Sample No.	3
Depth Top	1.00
Depth Base	1.20
Sample Type	B

Site Name	Northstowe
Soil Description	Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	90		
14	81		
10	73		
6.3	65		
5	63		
3.35	59		
2	54		
1.18	50		
0.6	44		
0.425	31		
0.3	27		
0.212	25		
0.15	23		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	46
Sand	34
Silt and Clay	20

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

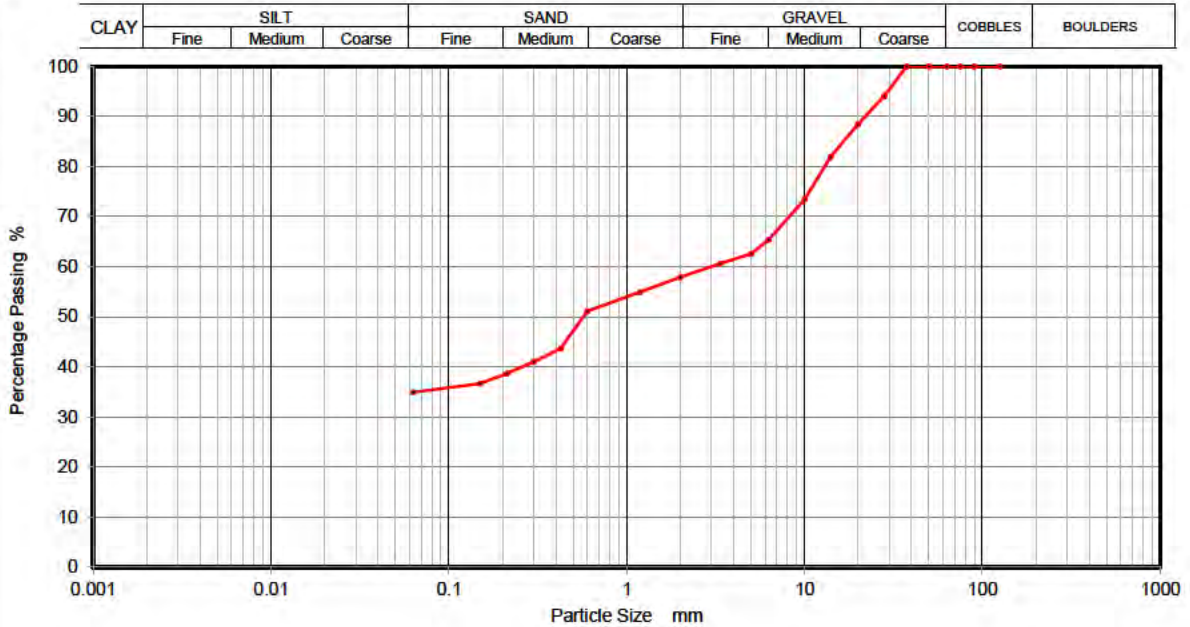




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA101
Sample No.	6
Depth Top	2.00
Depth Base	2.50
Sample Type	B

Site Name	Northstowe
Soil Description	Greyish brown fine to coarse sandy fine to coarse gravelly SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	94		
20	88		
14	82		
10	73		
6.3	65		
5	63		
3.35	61		
2	58		
1.18	55		
0.6	51		
0.425	44		
0.3	41		
0.212	39		
0.15	37		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	42
Sand	23
Silt and Clay	35

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	

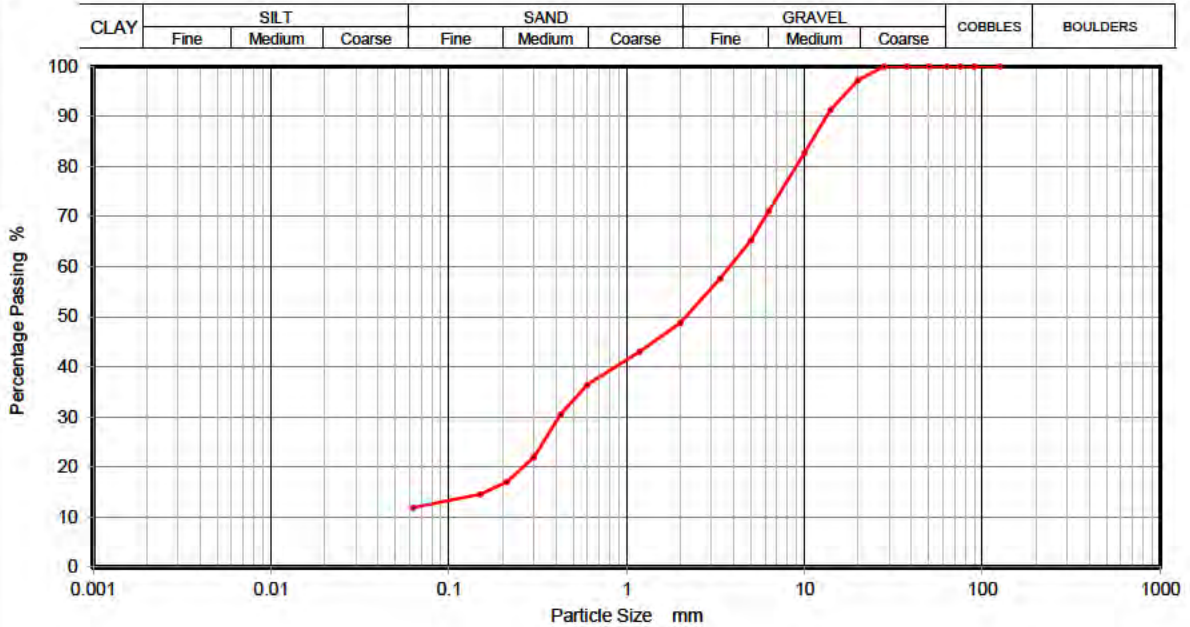




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA102
Sample No.	3
Depth Top	1.00
Depth Base	1.20
Sample Type	B

Site Name	Northstowe
Soil Description	Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	91		
10	83		
6.3	71		
5	65		
3.35	58		
2	49		
1.18	43		
0.6	36		
0.425	31		
0.3	22		
0.212	17		
0.15	15		
0.063	12		

Sample Proportions	% dry mass
Cobbles	0
Gravel	51
Sand	37
Silt and Clay	12

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

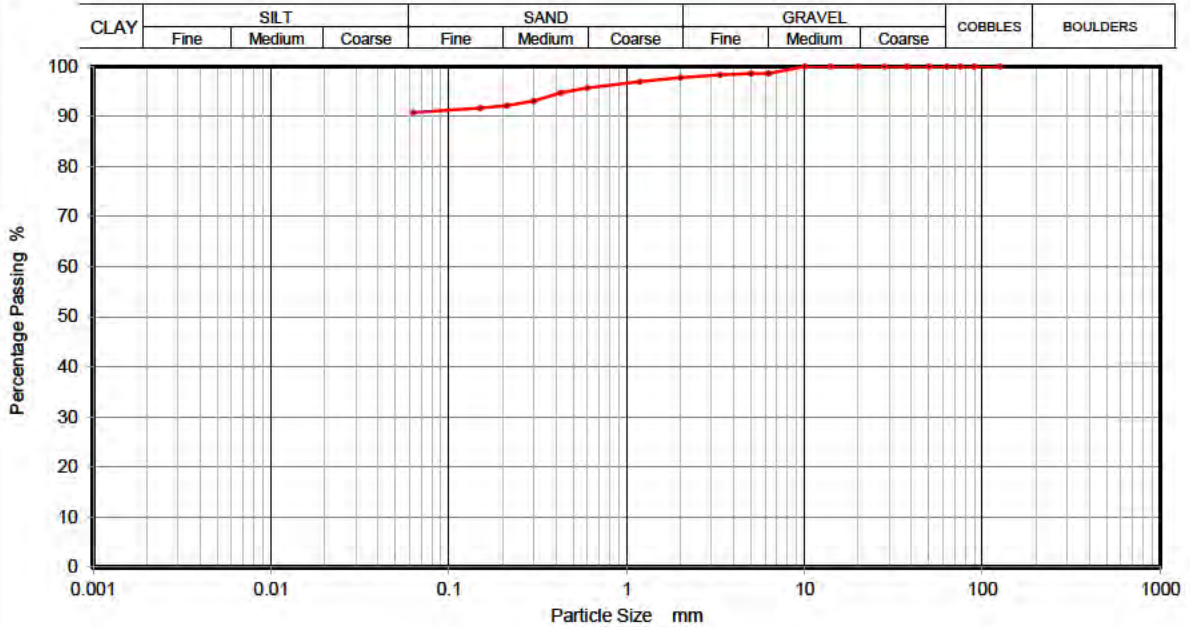




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA102
Sample No.	6
Depth Top	2.00
Depth Base	2.50
Sample Type	B

Site Name	Northstowe
Soil Description	Grey slightly fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	98		
1.18	97		
0.6	96		
0.425	95		
0.3	93		
0.212	92		
0.15	92		
0.063	91		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	7
Silt and Clay	91

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

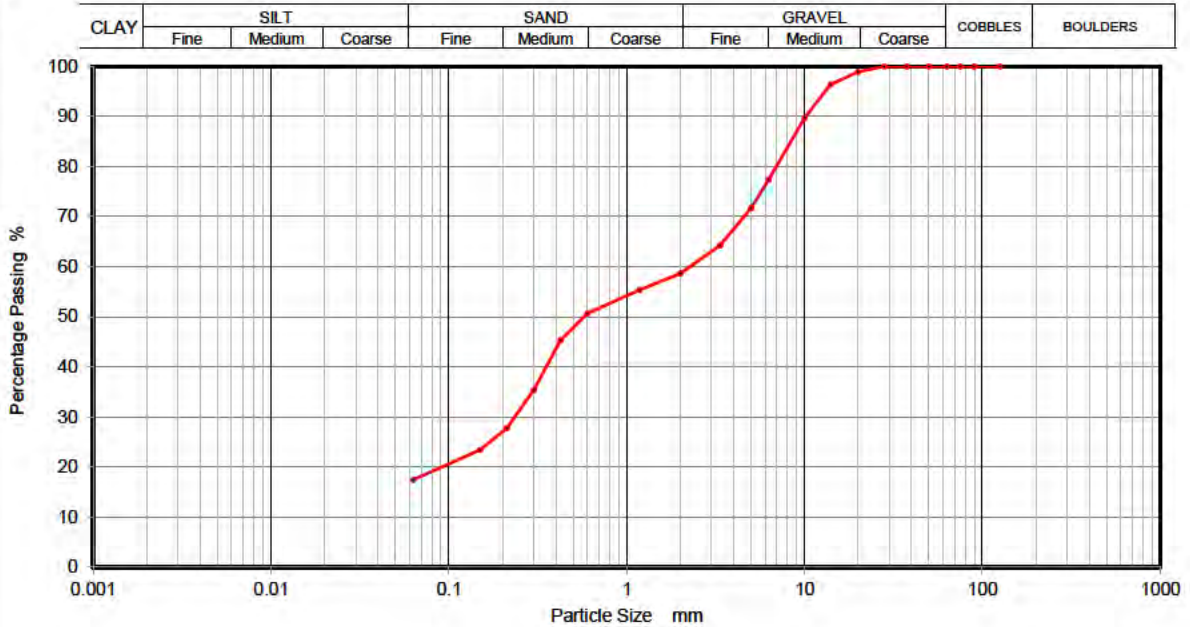




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA103A
Sample No.	3
Depth Top	1.80
Depth Base	2.00
Sample Type	D

Site Name	Northstowe
Soil Description	Brown clayey/silty fine to coarse gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	96		
10	90		
6.3	77		
5	72		
3.35	64		
2	59		
1.18	55		
0.6	51		
0.425	45		
0.3	35		
0.212	28		
0.15	23		
0.063	17		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	42
Silt and Clay	17

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

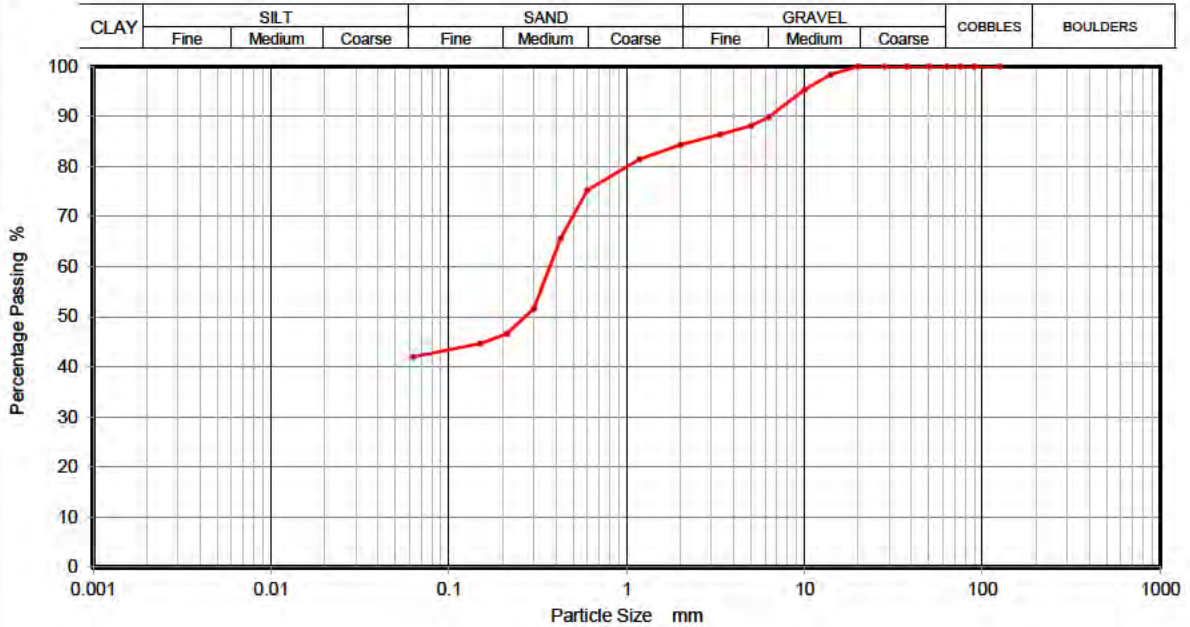




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA104
Sample No.	3
Depth Top	1.00
Depth Base	1.20
Sample Type	B

Site Name	Northstowe
Soil Description	Grey fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	95		
6.3	90		
5	88		
3.35	86		
2	84		
1.18	81		
0.6	75		
0.425	66		
0.3	52		
0.212	47		
0.15	45		
0.063	42		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	42
Silt and Clay	42

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

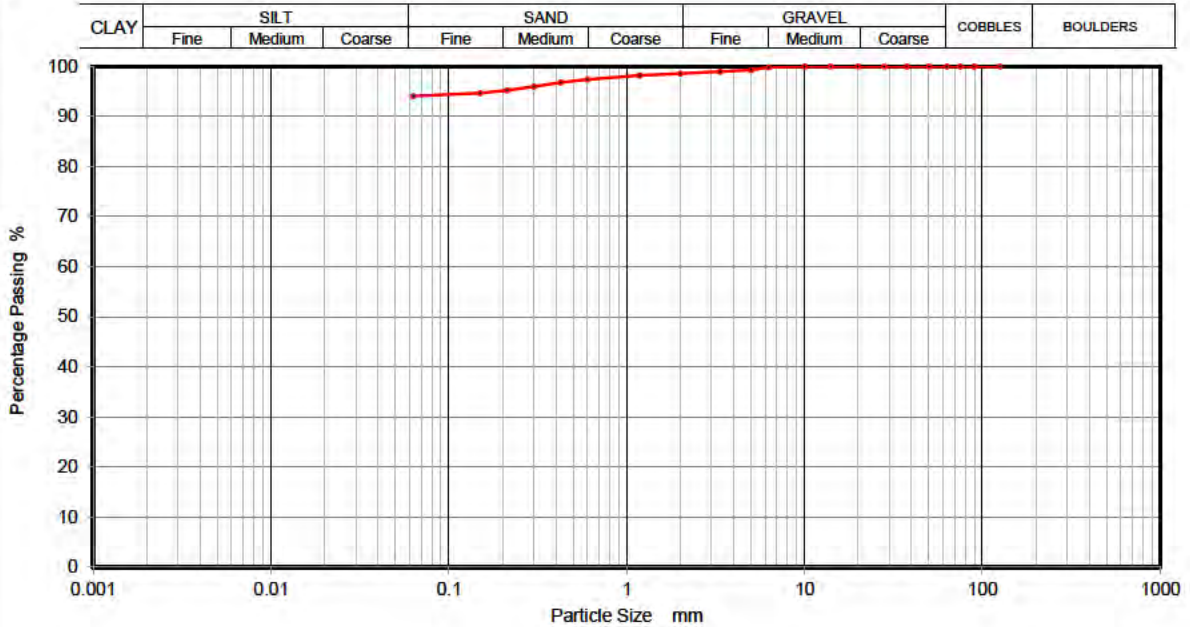




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA107
Sample No.	4
Depth Top	1.20
Depth Base	1.70
Sample Type	B

Site Name	Northstowe
Soil Description	Grey slightly fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
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	99		
3.35	99		
2	99		
1.18	98		
0.6	97		
0.425	97		
0.3	96		
0.212	95		
0.15	95		
0.063	94		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	5
Silt and Clay	94

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)	

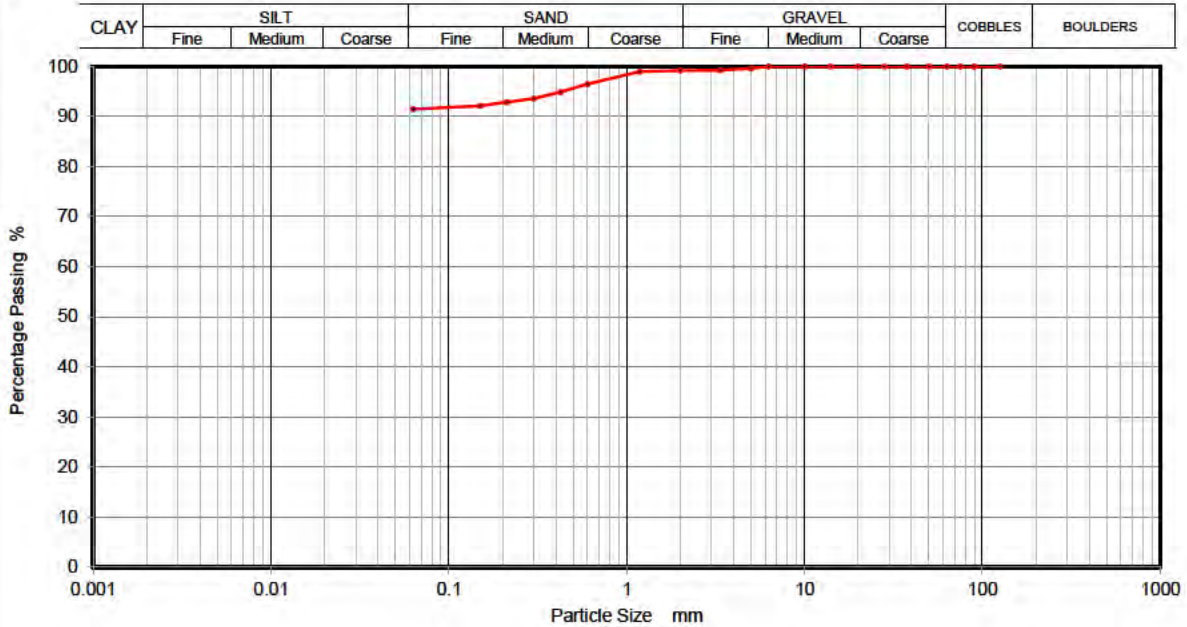




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	BHTCA110
Sample No.	4
Depth Top	1.20
Depth Base	1.70
Sample Type	B

Site Name	Northstowe
Soil Description	Brown slightly fine gravelly fine to coarse sandy silty CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
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	99		
2	99		
1.18	99		
0.6	96		
0.425	95		
0.3	94		
0.212	93		
0.15	92		
0.063	91		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	8
Silt and Clay	91

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
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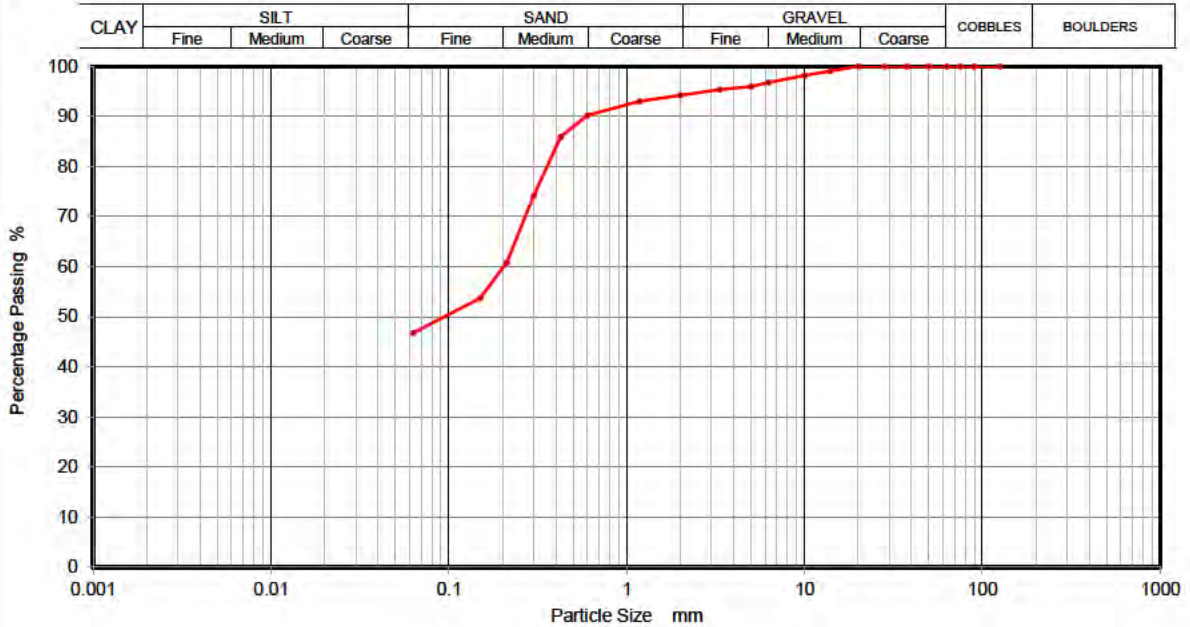




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA102
Sample No.	4
Depth Top	1.00
Depth Base	2.00
Sample Type	B

Site Name	Northstowe
Soil Description	Brown fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	97		
5	96		
3.35	95		
2	94		
1.18	93		
0.6	90		
0.425	86		
0.3	74		
0.212	61		
0.15	54		
0.063	47		

Sample Proportions	% dry mass
Cobbles	0
Gravel	6
Sand	47
Silt and Clay	47

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)	

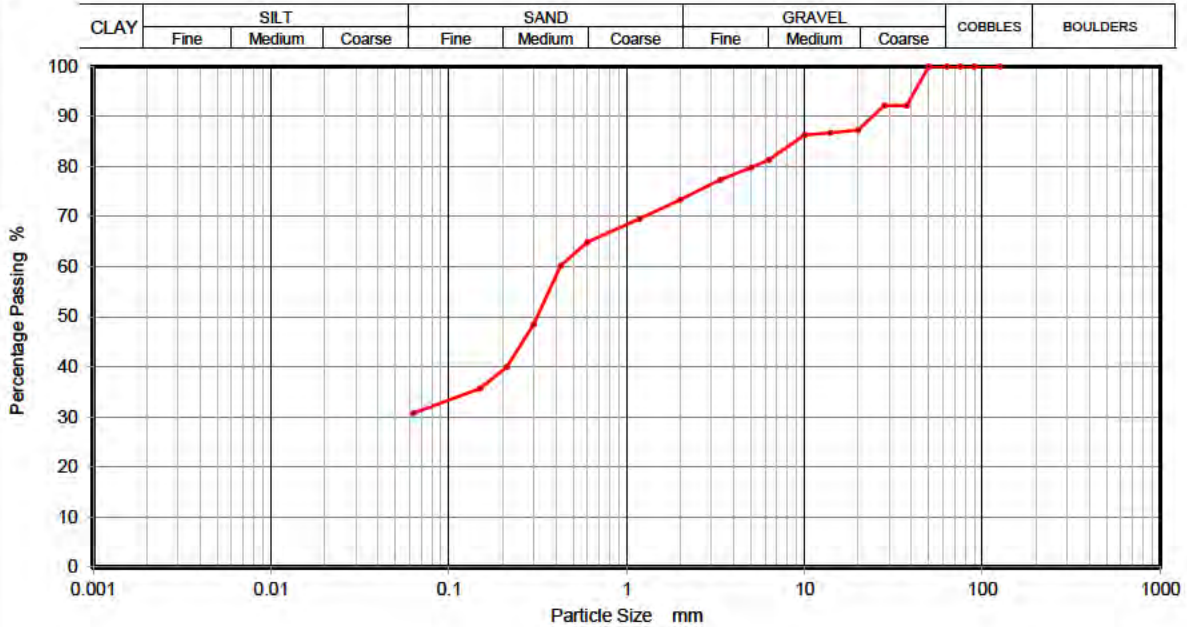




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA103
Sample No.	3
Depth Top	0.50
Depth Base	1.00
Sample Type	B

Site Name	Northstowe
Soil Description	Grey fine to coarse gravelly silty/clayey fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	92		
28	92		
20	87		
14	87		
10	86		
6.3	81		
5	80		
3.35	77		
2	73		
1.18	70		
0.6	65		
0.425	60		
0.3	48		
0.212	40		
0.15	36		
0.063	31		

Sample Proportions	% dry mass
Cobbles	0
Gravel	27
Sand	42
Silt and Clay	31

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	

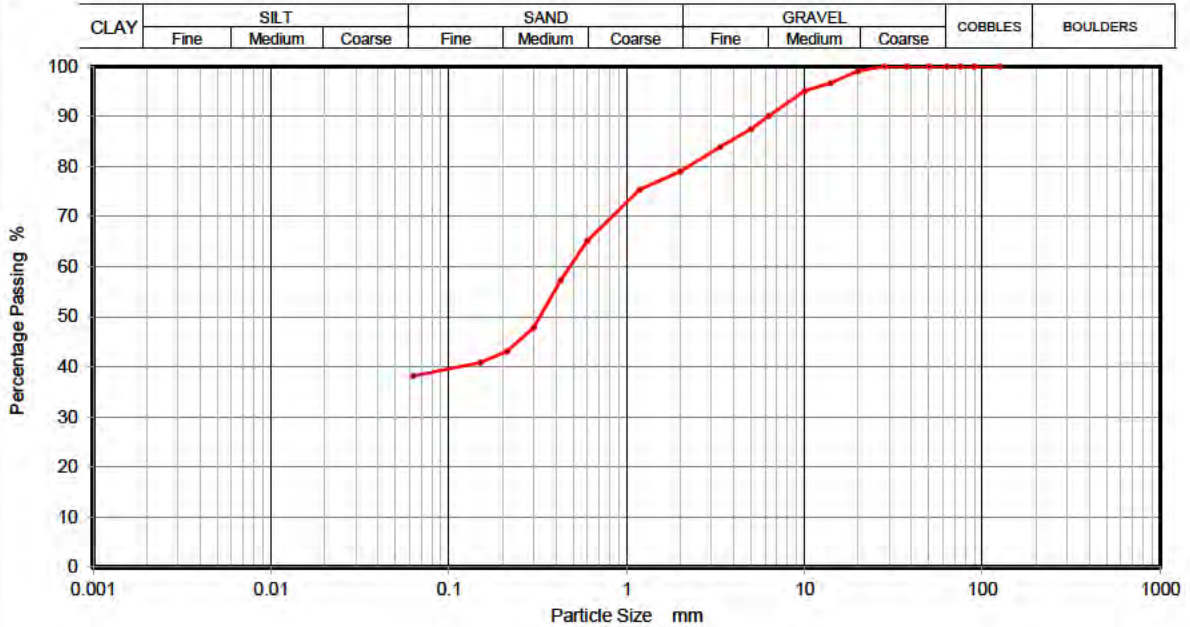




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA103
Sample No.	2
Depth Top	0.20
Depth Base	0.50
Sample Type	B

Site Name	Northstowe
Soil Description	Brown fine to coarse gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	97		
10	95		
6.3	90		
5	88		
3.35	84		
2	79		
1.18	75		
0.6	65		
0.425	57		
0.3	48		
0.212	43		
0.15	41		
0.063	38		

Sample Proportions	% dry mass
Cobbles	0
Gravel	21
Sand	41
Silt and Clay	38

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

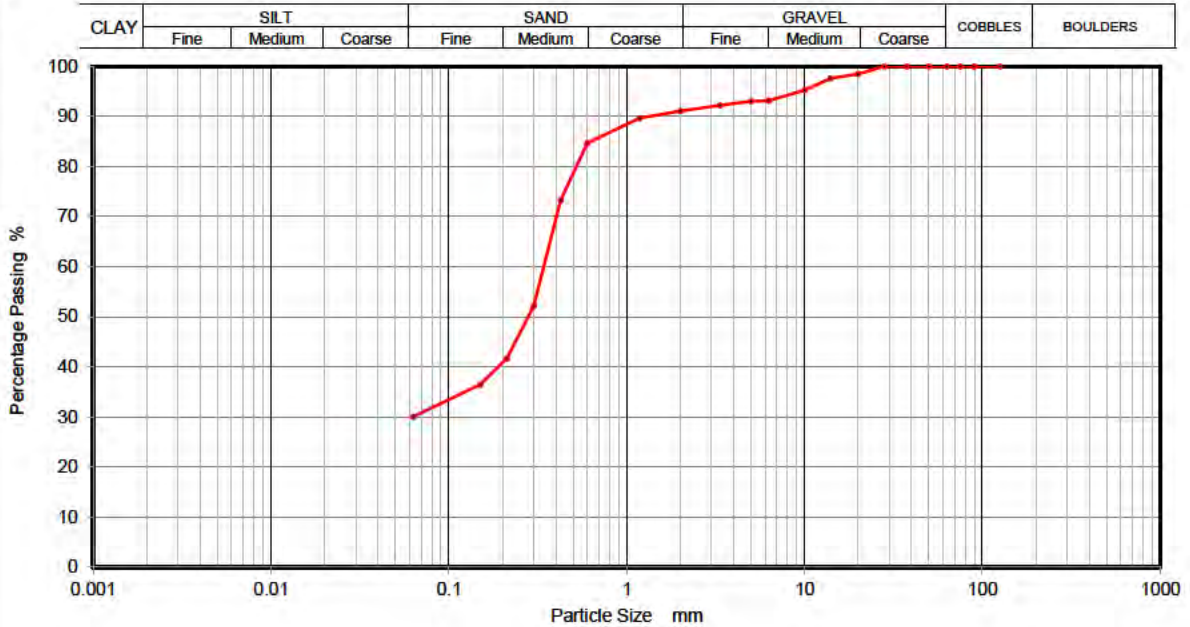




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA103
Sample No.	4
Depth Top	1.00
Depth Base	2.00
Sample Type	B

Site Name	Northstowe
Soil Description	Brown fine to coarse gravelly silty/clayey fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	98		
10	95		
6.3	93		
5	93		
3.35	92		
2	91		
1.18	90		
0.6	85		
0.425	73		
0.3	52		
0.212	42		
0.15	36		
0.063	30		

Sample Proportions	% dry mass
Cobbles	0
Gravel	9
Sand	61
Silt and Clay	30

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

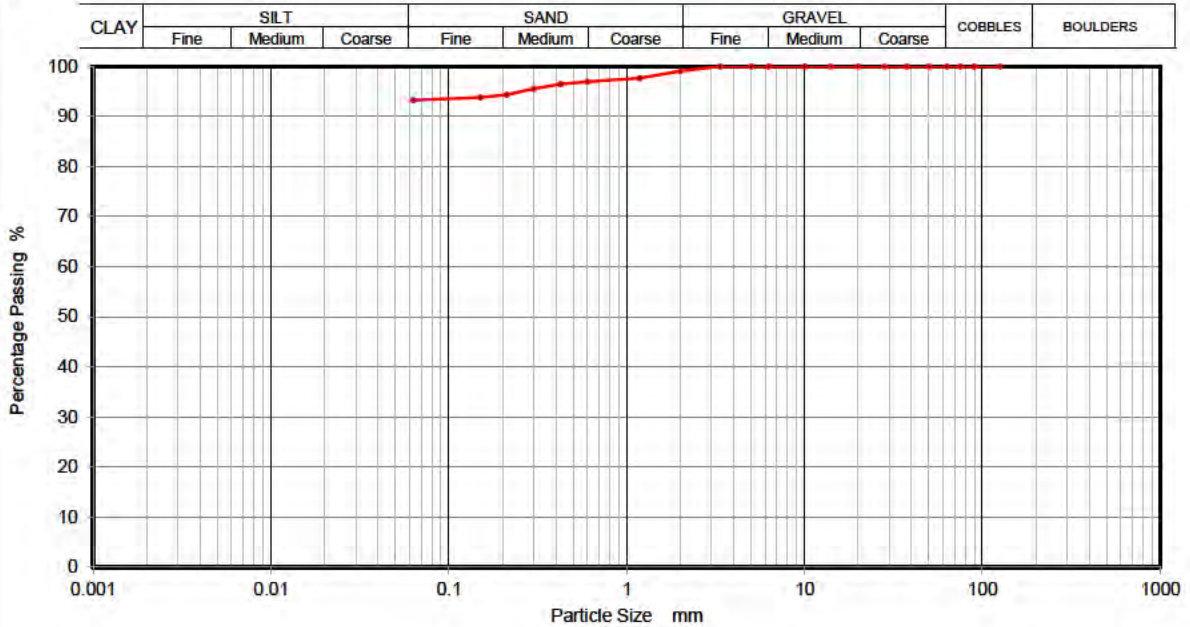




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA105
Sample No.	4
Depth Top	1.00
Depth Base	2.00
Sample Type	B

Site Name	Northstowe
Soil Description	Brown slightly fine gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
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	98		
0.6	97		
0.425	96		
0.3	96		
0.212	94		
0.15	94		
0.063	93		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	6
Silt and Clay	93

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

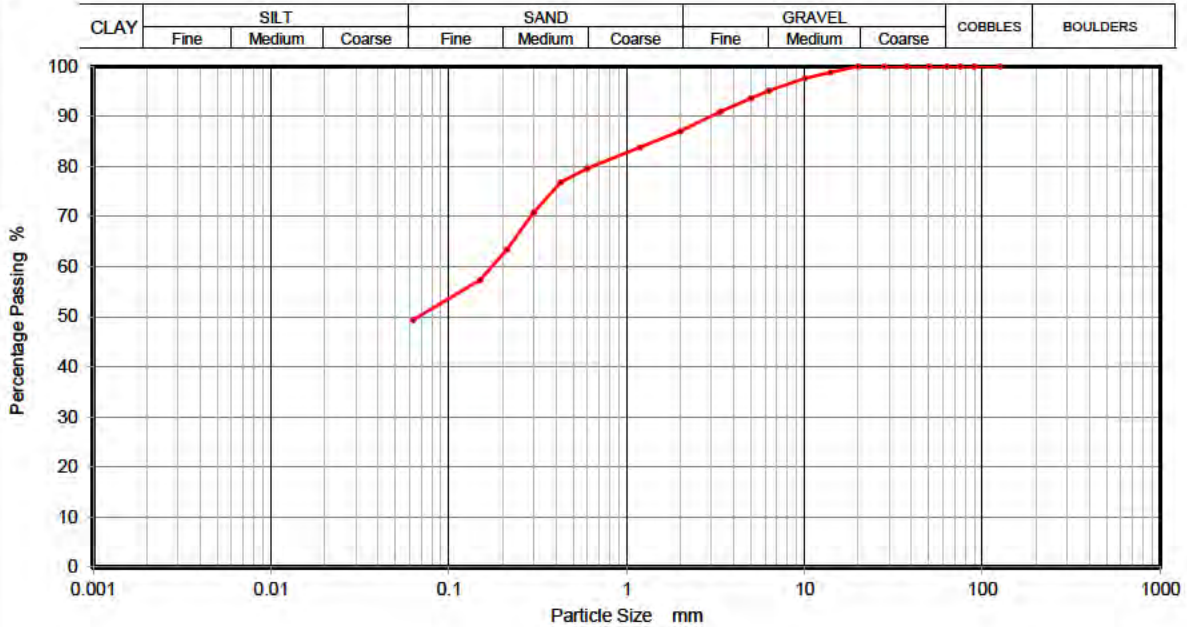




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA110
Sample No.	2
Depth Top	0.20
Depth Base	0.90
Sample Type	B

Site Name	Northstowe
Soil Description	Brown fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	95		
5	94		
3.35	91		
2	87		
1.18	84		
0.6	80		
0.425	77		
0.3	71		
0.212	63		
0.15	57		
0.063	49		

Sample Proportions	% dry mass
Cobbles	0
Gravel	13
Sand	38
Silt and Clay	49

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

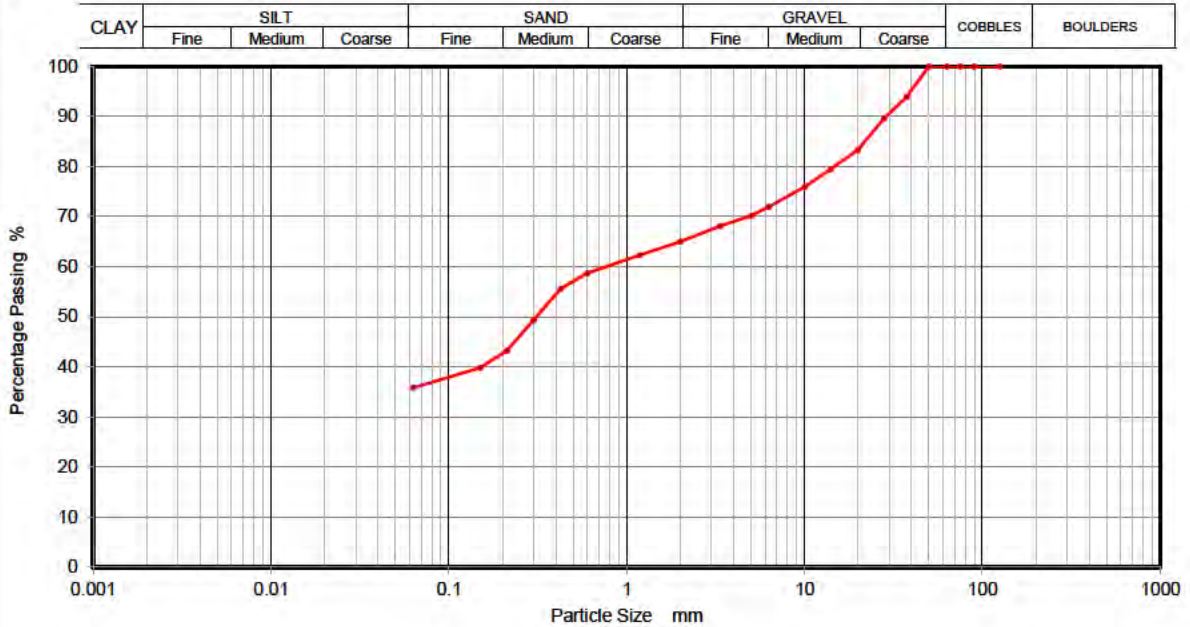




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA113
Sample No.	3
Depth Top	0.50
Depth Base	1.00
Sample Type	D

Site Name	Northstowe
Soil Description	Brown fine to coarse sandy fine to coarse gravelly SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	90		
20	83		
14	79		
10	76		
6.3	72		
5	70		
3.35	68		
2	65		
1.18	62		
0.6	59		
0.425	56		
0.3	49		
0.212	43		
0.15	40		
0.063	36		

Sample Proportions	% dry mass
Cobbles	0
Gravel	35
Sand	29
Silt and Clay	36

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

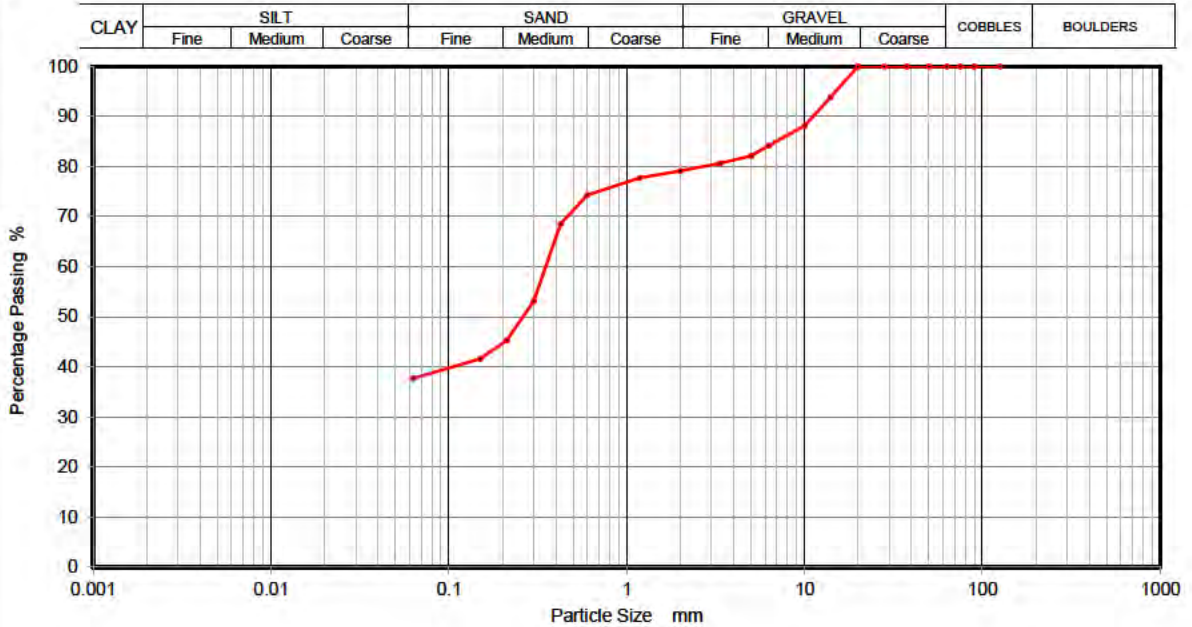




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA114
Sample No.	4
Depth Top	1.00
Depth Base	2.00
Sample Type	B

Site Name	Northstowe
Soil Description	Brown fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	94		
10	88		
6.3	84		
5	82		
3.35	81		
2	79		
1.18	78		
0.6	74		
0.425	69		
0.3	53		
0.212	45		
0.15	42		
0.063	38		

Sample Proportions	% dry mass
Cobbles	0
Gravel	21
Sand	41
Silt and Clay	38

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)	
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)	

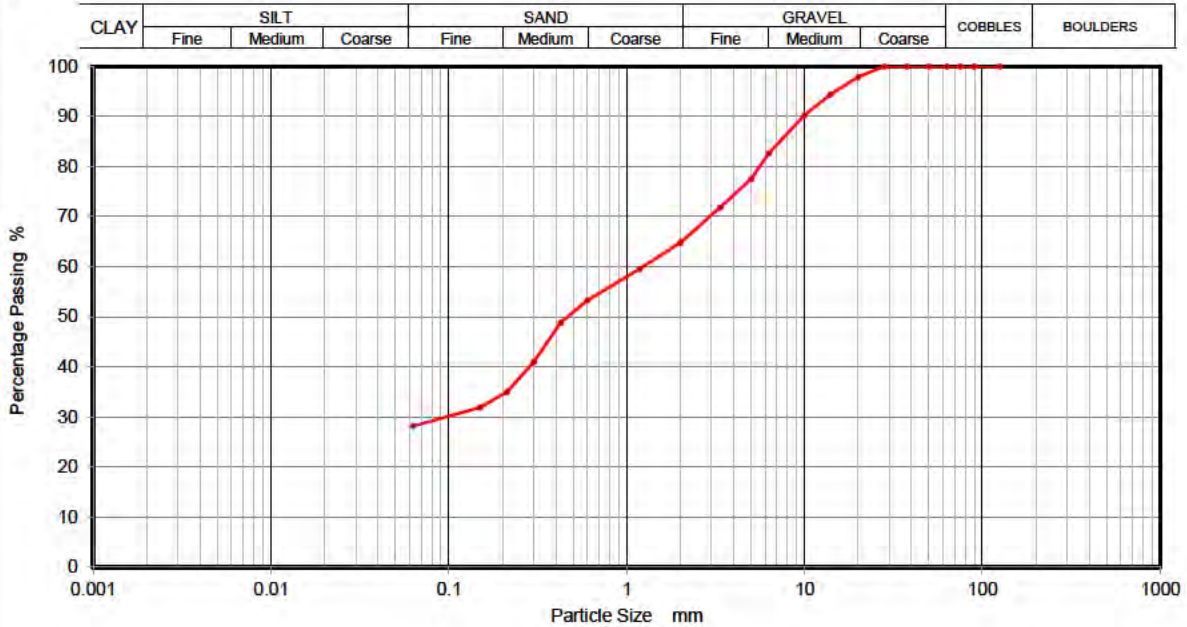




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA119
Sample No.	2
Depth Top	0.20
Depth Base	0.50
Sample Type	B

Site Name	Northstowe
Soil Description	Grey silty/clayey fine to coarse gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	94		
10	90		
6.3	83		
5	77		
3.35	72		
2	65		
1.18	60		
0.6	53		
0.425	49		
0.3	41		
0.212	35		
0.15	32		
0.063	28		

Sample Proportions	% dry mass
Cobbles	0
Gravel	35
Sand	37
Silt and Clay	28

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)	

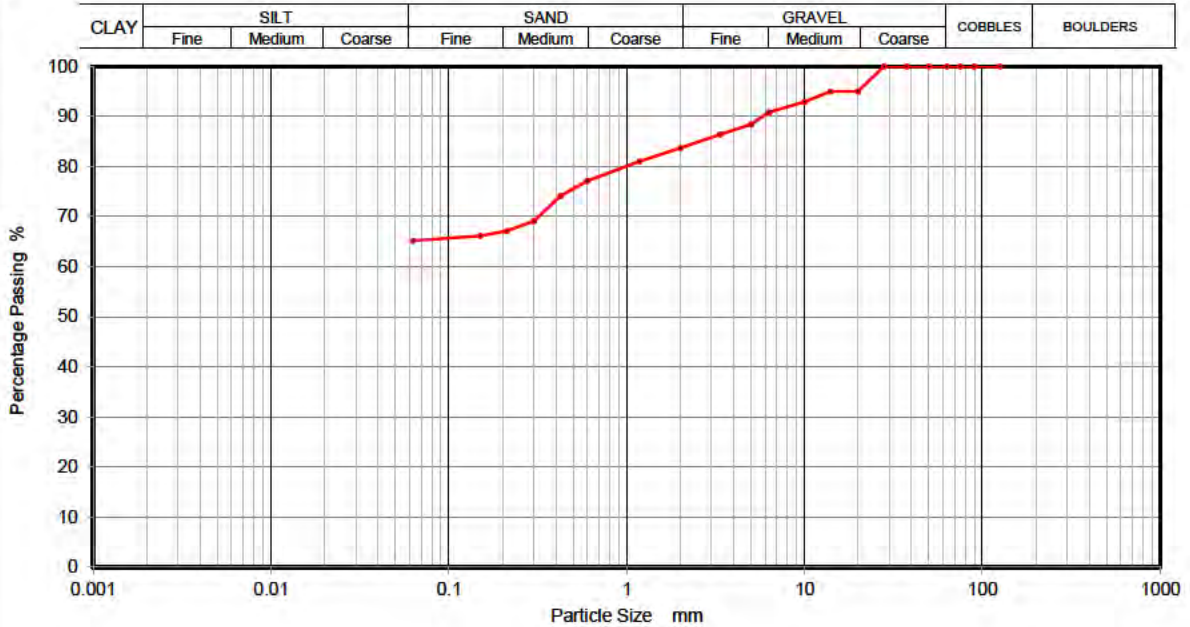




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA201
Sample No.	4
Depth Top	0.90
Depth Base	1.20
Sample Type	B

Site Name	Northstowe
Soil Description	Grey fine to coarse gravelly fine to coarse sandy SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	95		
10	93		
6.3	91		
5	88		
3.35	86		
2	84		
1.18	81		
0.6	77		
0.425	74		
0.3	69		
0.212	67		
0.15	66		
0.063	65		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	19
Silt and Clay	65

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

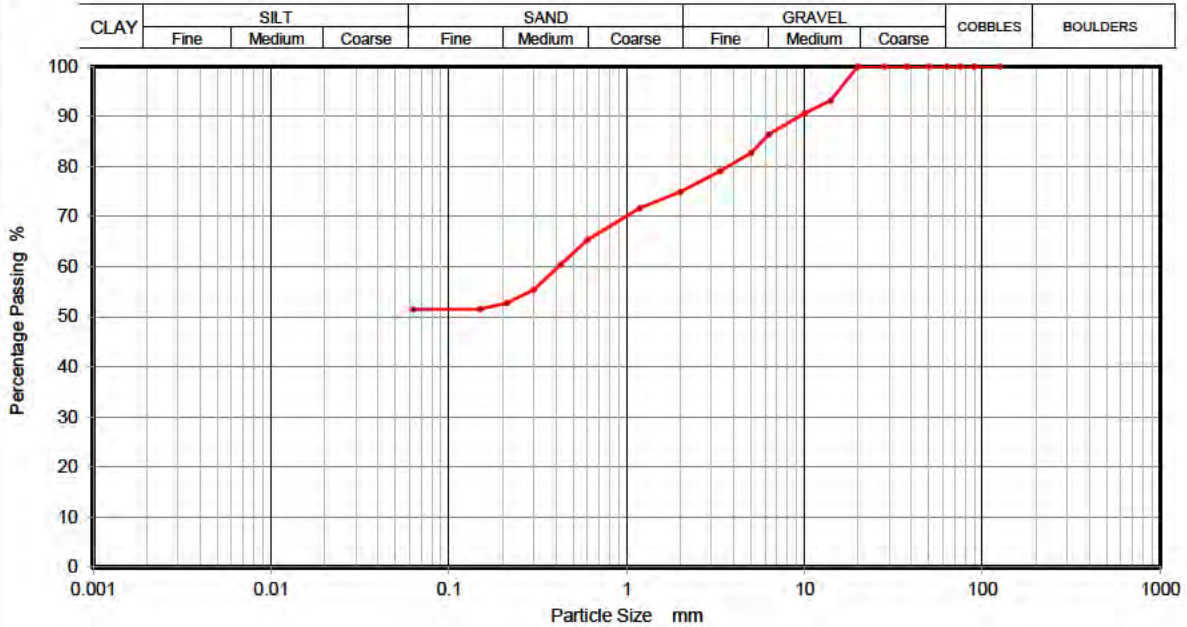




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	TPTCA204
Sample No.	4
Depth Top	1.00
Depth Base	2.00
Sample Type	D

Site Name	Northstowe
Soil Description	Grey fine to coarse sandy fine to medium gravelly SILT/CLAY
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	93		
10	91		
6.3	86		
5	83		
3.35	79		
2	75		
1.18	72		
0.6	65		
0.425	60		
0.3	55		
0.212	53		
0.15	52		
0.063	52		

Sample Proportions	% dry mass
Cobbles	0
Gravel	25
Sand	23
Silt and Clay	52

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

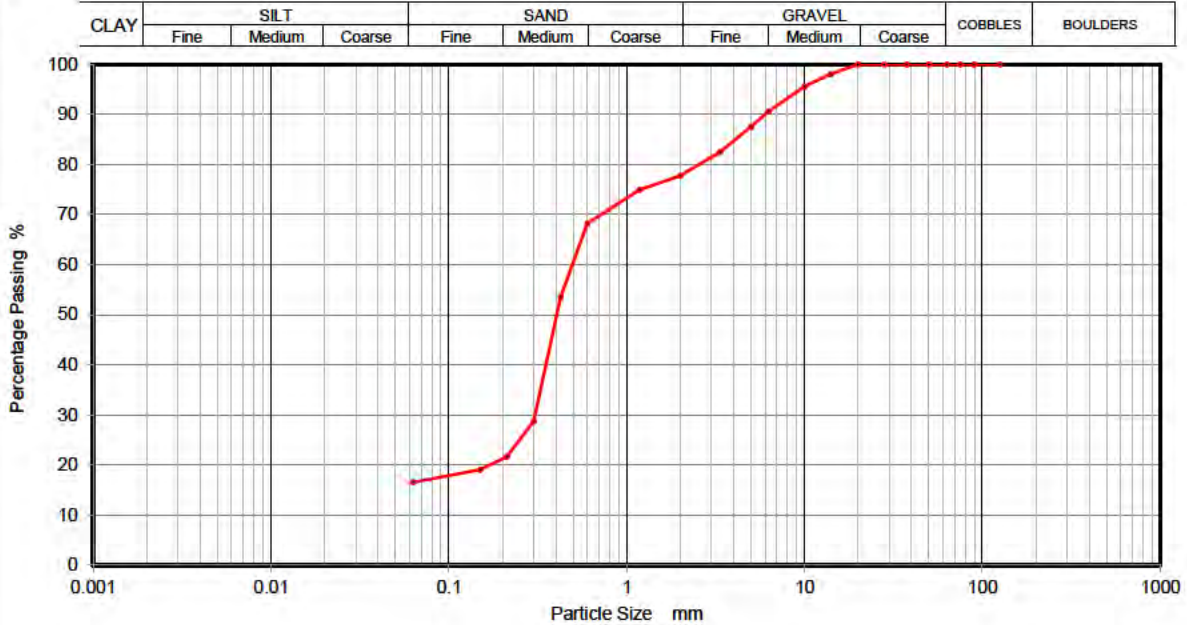
Reg. 13(1)





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610	
	Borehole/Pit No.	WSTCA101
Site Name	Northstowe	
Soil Description	Brown clayey/silty fine to medium gravelly fine to coarse SAND	
		Depth Top
	Depth Base	1.45
Date Tested	19/04/2022	
Sample Type	B	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	91		
5	88		
3.35	83		
2	78		
1.18	75		
0.6	68		
0.425	54		
0.3	29		
0.212	22		
0.15	19		
0.063	17		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	61
Silt and Clay	17

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

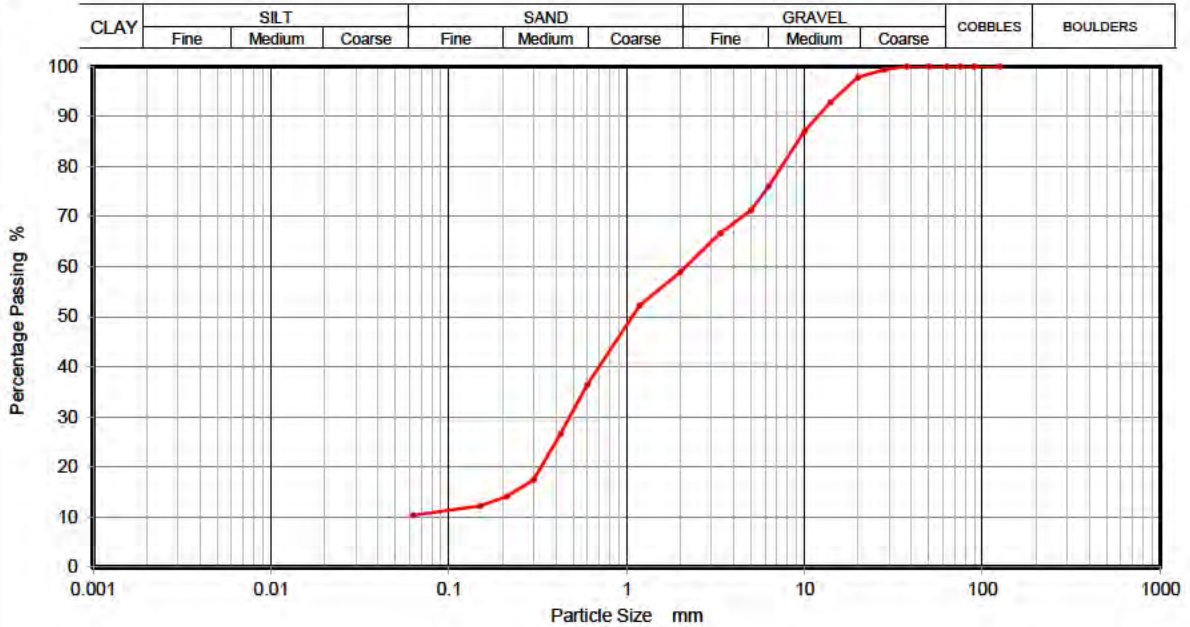




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	WSTCA106
Sample No.	1
Depth Top	1.20
Depth Base	1.80
Sample Type	B

Site Name	Northstowe
Soil Description	Brown clayey/silty fine to coarse gravelly fine to coarse SAND
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	98		
14	93		
10	87		
6.3	76		
5	71		
3.35	67		
2	59		
1.18	52		
0.6	36		
0.425	27		
0.3	18		
0.212	14		
0.15	12		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	49
Silt and Clay	10

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1)

Reg. 13(1)

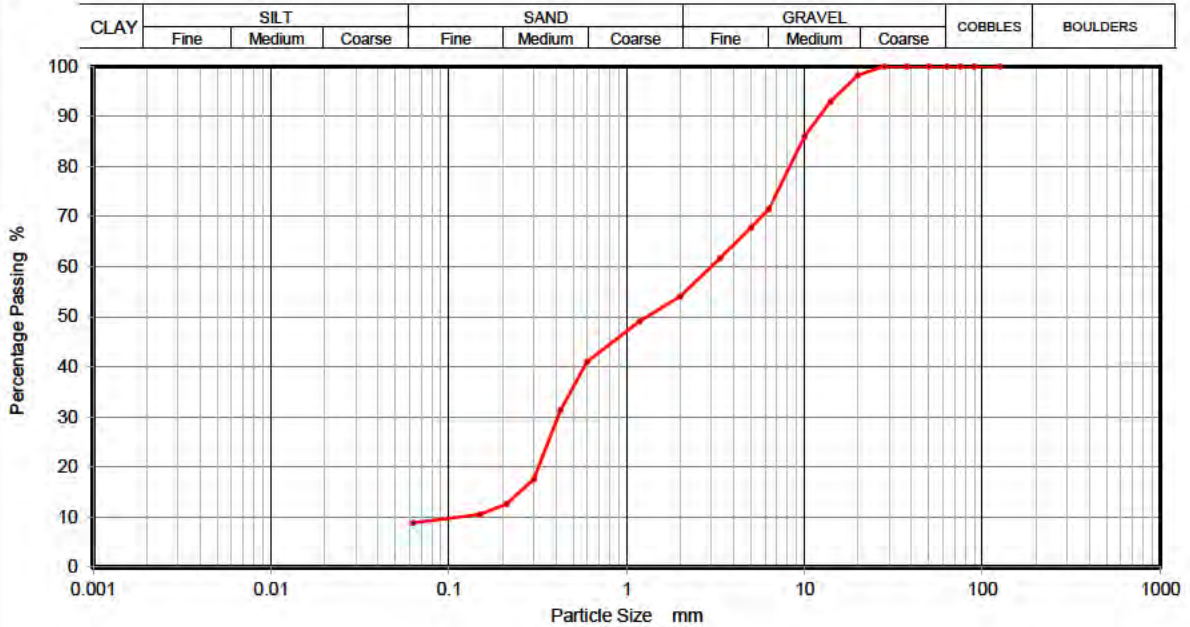




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	58610
Borehole/Pit No.	WSTCA109
Sample No.	1
Depth Top	0.70
Depth Base	1.45
Sample Type	B

Site Name	Northstowe
Soil Description	Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL
Date Tested	19/04/2022



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	93		
10	86		
6.3	71		
5	68		
3.35	62		
2	54		
1.18	49		
0.6	41		
0.425	31		
0.3	18		
0.212	13		
0.15	11		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	46
Sand	45
Silt and Clay	9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	24/04/2022	Reg. 13(1)
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Reg. 13(1)



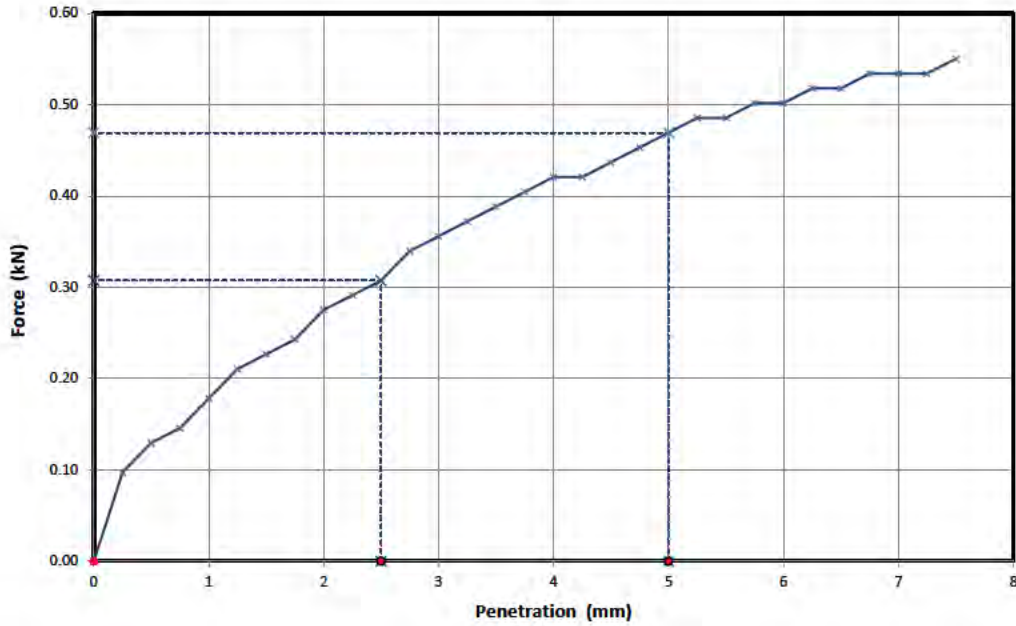


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA107

Site Name	Northstowe	Sample No.	2
Soil Description	Brown fine to coarse gravelly sandy silty CLAY	Depth Top	0 20
Compaction Method	2.5 Kg Rammer	Depth Base	0 50
Retained 20mm (%)	4	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	15
Moisture Top (%)	15
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.09
Dry Density (Mg/m3)	1.82

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	2.3	2.5mm Bottom	
5mm Top	2.3	5mm Bottom	
CBR Value %	2.3	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



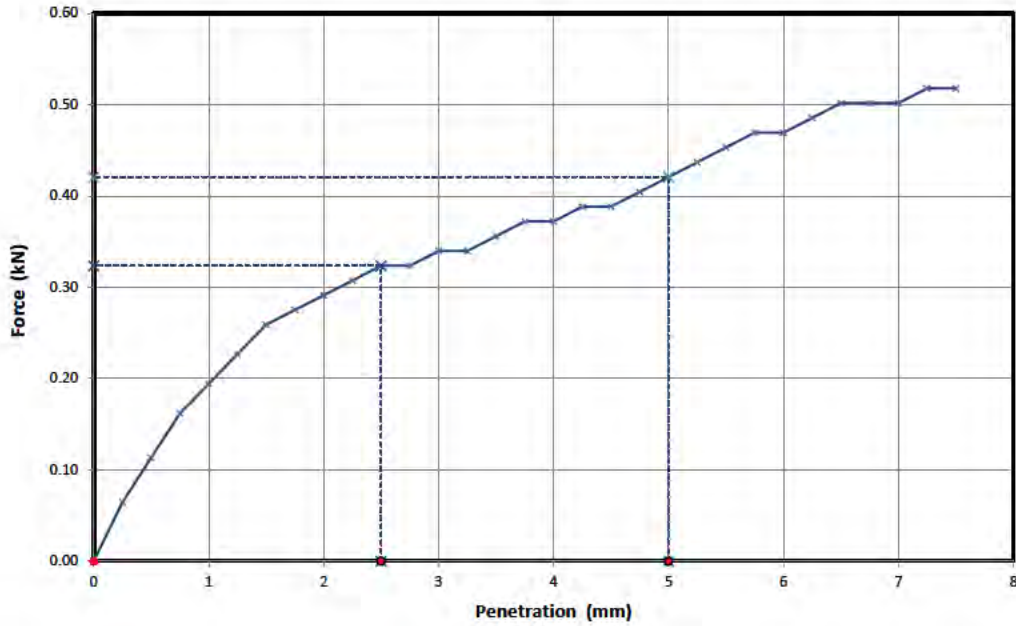


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA107

Site Name	Northstowe	Sample No.	3
Soil Description	Brown fine to coarse gravelly sandy silty CLAY	Depth Top	0 50
Compaction Method	2.5 Kg Rammer	Depth Base	1 00
Retained 20mm (%)	3	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	14
Moisture Top (%)	14
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.05
Dry Density (Mg/m3)	1.80

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	2.5	2.5mm Bottom	
5mm Top	2.1	5mm Bottom	
CBR Value %	2.5	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)



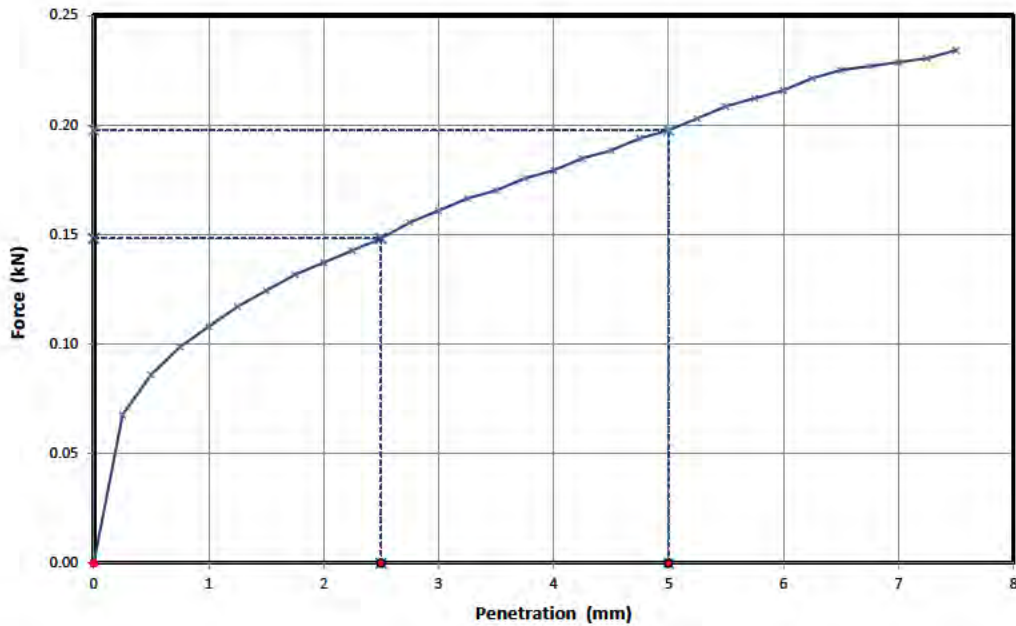


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA110

Site Name	Northstowe	Sample No.	1
Soil Description	Brown sandy fine to coarse gravelly silty CLAY	Depth Top	0 00
Compaction Method	2.5 Kg Rammer	Depth Base	0 20
Retained 20mm (%)	2	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	24
Moisture Top (%)	24
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.02
Dry Density (Mg/m3)	1.62

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.1	2.5mm Bottom	
5mm Top	0.99	5mm Bottom	
CBR Value %	1.1	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)



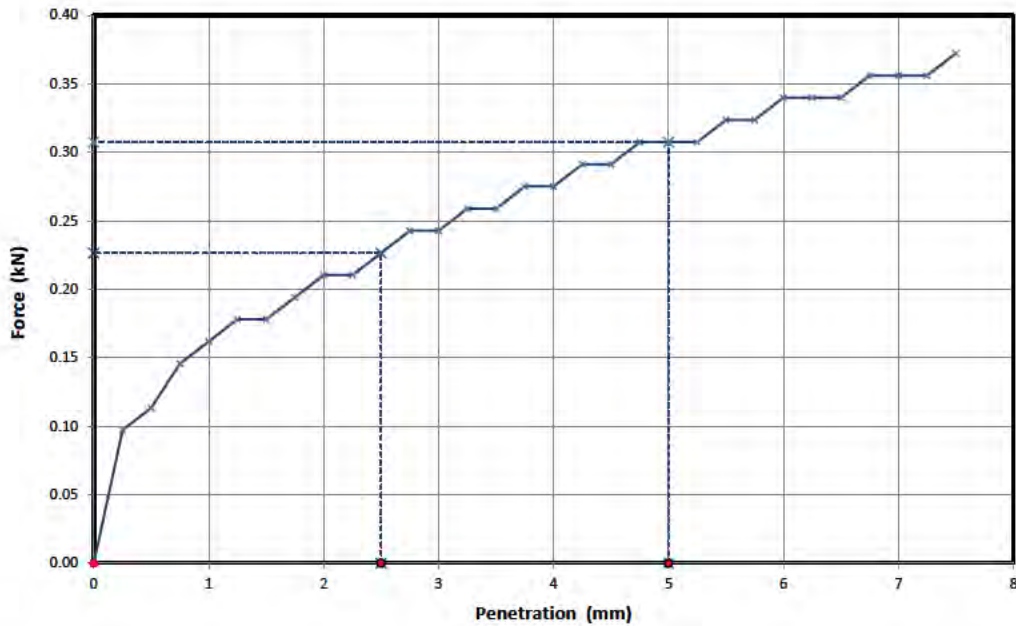


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA110

Site Name	Northstowe	Sample No.	2
Soil Description	Brown fine to medium gravelly fine to coarse sandy S LT/CLAY	Depth Top	0.20
Compaction Method	2.5 Kg Rammer	Depth Base	0.90
Retained 20mm (%)	0	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	22
Moisture Top (%)	22
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.05
Dry Density (Mg/m3)	1.68

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.7	2.5mm Bottom	
5mm Top	1.5	5mm Bottom	
CBR Value %	1.7	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



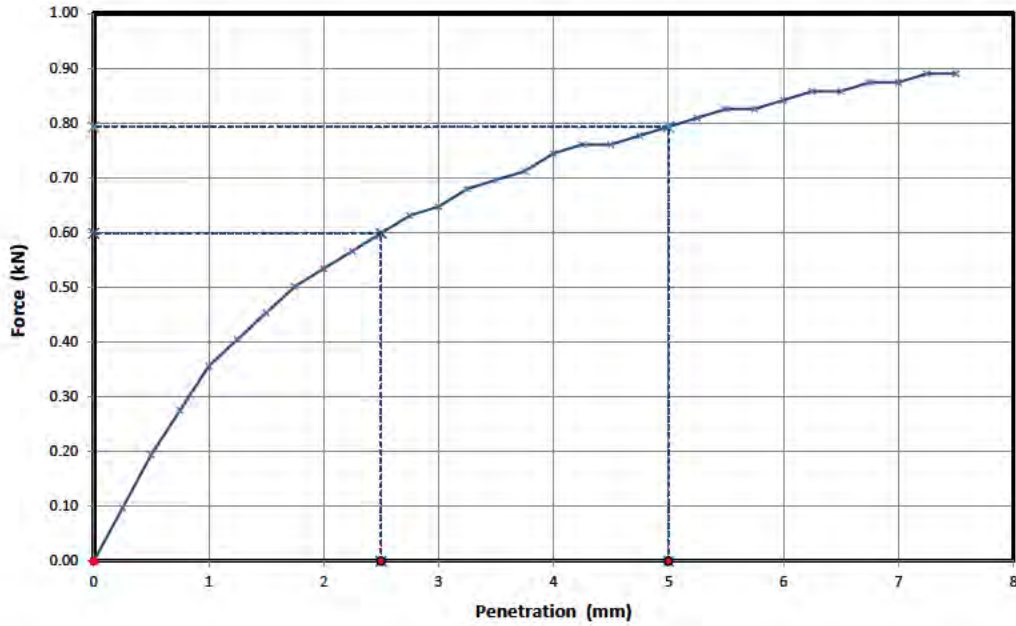


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA111

Site Name	Northstowe	Sample No.	2
Soil Description	Brown silty sandy fine to coarse gravelly CLAY	Depth Top	0 20
Compaction Method	2.5 Kg Rammer	Depth Base	0 50
Retained 20mm (%)	1	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	21
Moisture Top (%)	21
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.06
Dry Density (Mg/m3)	1.71

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	4.5	2.5mm Bottom	
5mm Top	4	5mm Bottom	
CBR Value %	4.5	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)



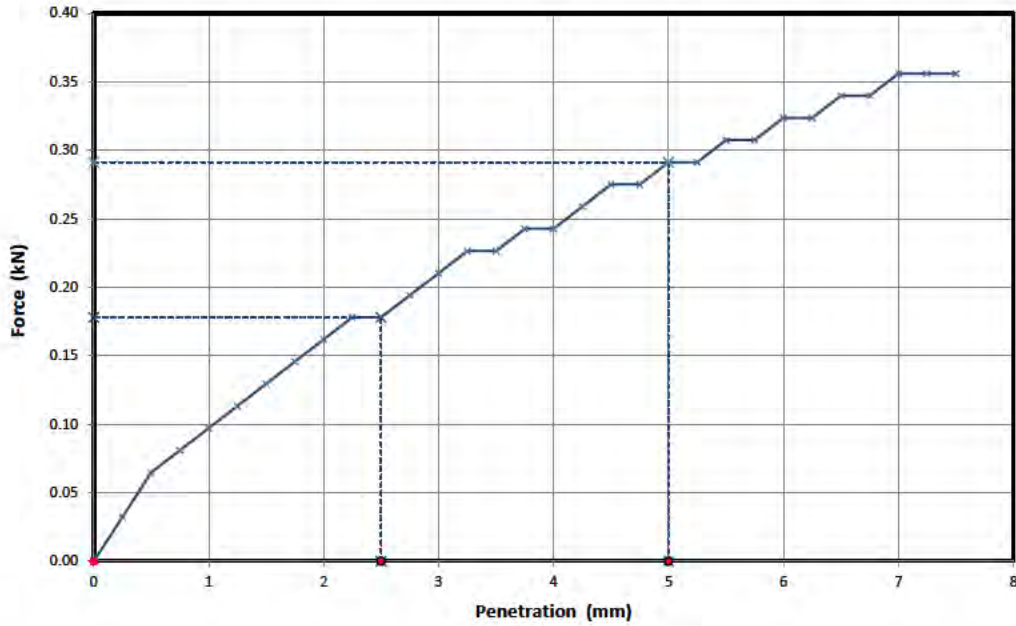


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA113

Site Name	Northstowe	Sample No.	3
Soil Description	Brown sandy fine to coarse gravelly silty CLAY	Depth Top	0.50
Compaction Method	2.5 Kg Rammer	Depth Base	1.00
Retained 20mm (%)	4	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	19
Moisture Top (%)	19
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.03
Dry Density (Mg/m3)	1.71

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.3	2.5mm Bottom	
5mm Top	1.5	5mm Bottom	
CBR Value %	1.5	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



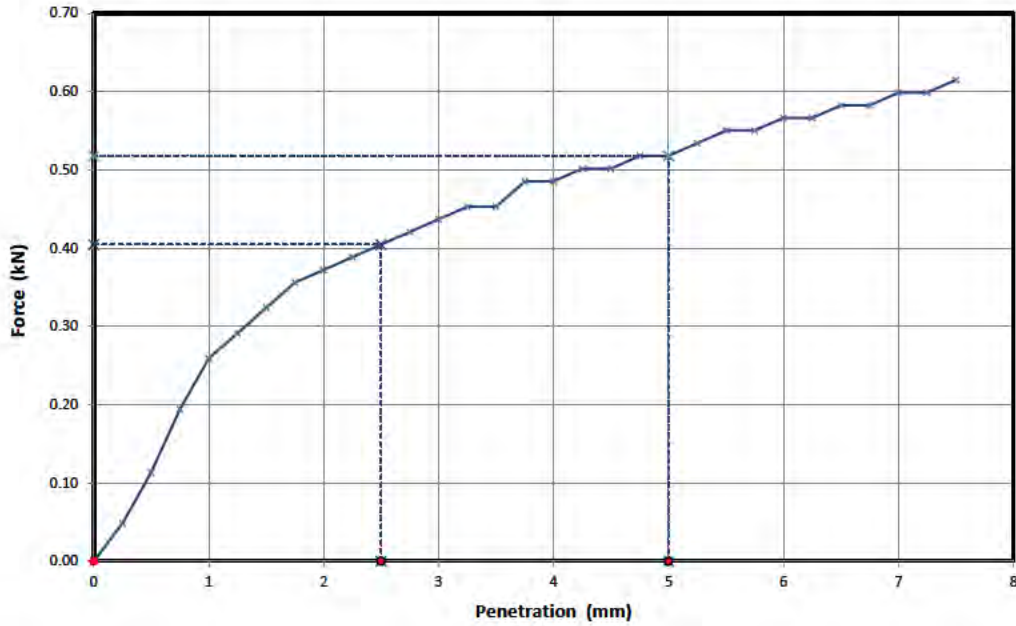


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA201

Site Name	Northstowe	Sample No.	2
Soil Description	Grey silty fine to coarse gravelly sandy CLAY	Depth Top	0 20
Compaction Method	2.5 Kg Rammer	Depth Base	0 50
Retained 20mm (%)	2	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	29
Moisture Top (%)	29
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.92
Dry Density (Mg/m3)	1.49

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	3.1	2.5mm Bottom	
5mm Top	2.6	5mm Bottom	
CBR Value %	3.1	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



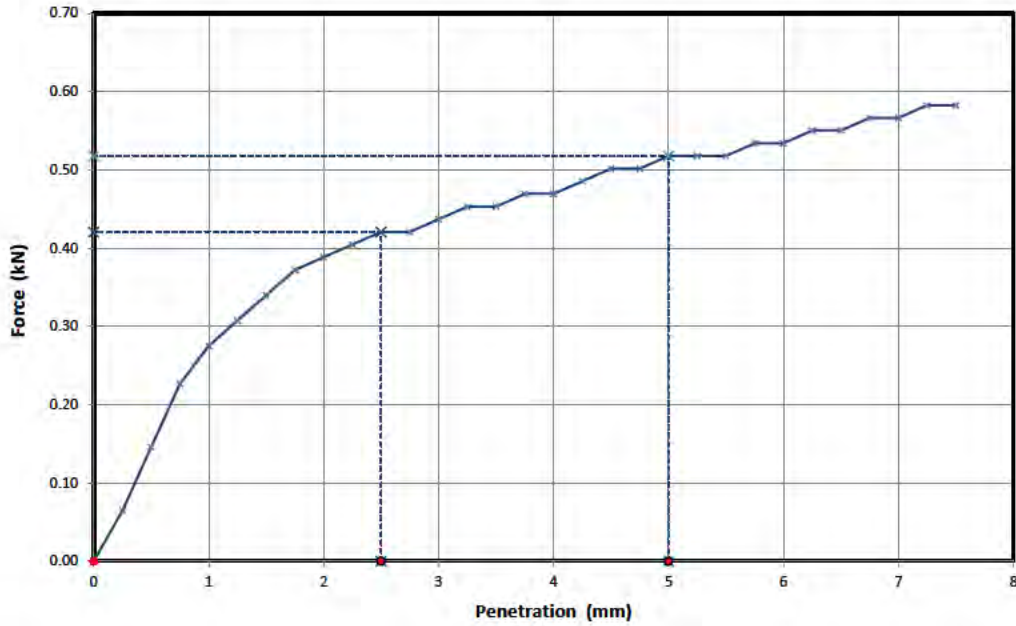


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA201

Site Name	Northstowe	Sample No.	3
Soil Description	Grey silty fine to coarse gravelly sandy CLAY	Depth Top	0 50
Compaction Method	2.5 Kg Rammer	Depth Base	0 90
Retained 20mm (%)	4	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	29
Moisture Top (%)	29
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.91
Dry Density (Mg/m3)	1.48

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	3.2	2.5mm Bottom	
5mm Top	2.6	5mm Bottom	
CBR Value %	3.2	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



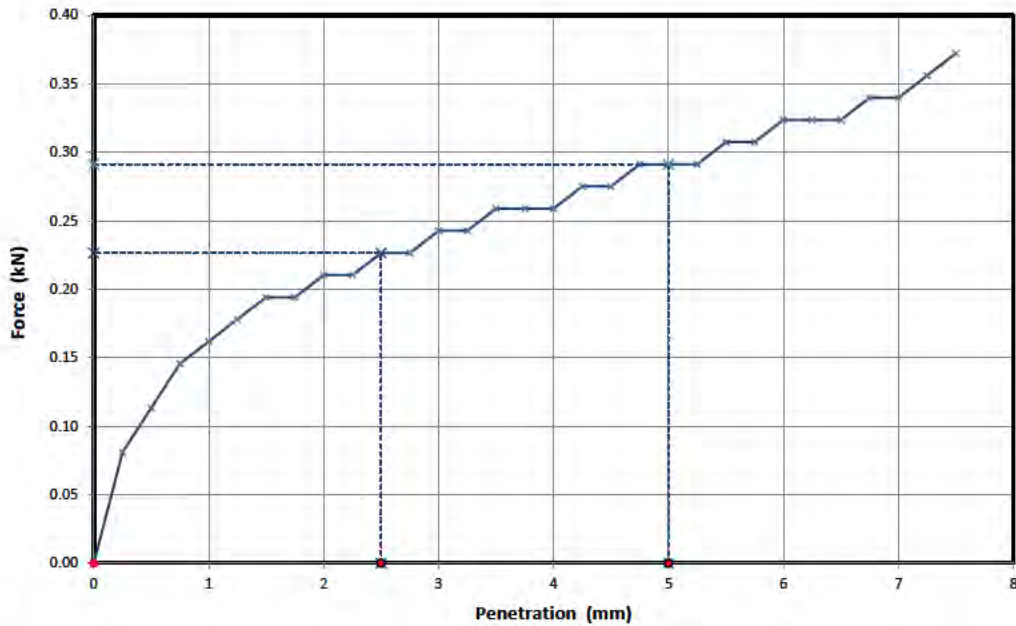


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA205

Site Name	Northstowe	Sample No.	2
Soil Description	Grey sandy fine to coarse gravelly silty CLAY	Depth Top	0 20
Compaction Method	2.5 Kg Rammer	Depth Base	0 50
Retained 20mm (%)	3	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	22
Moisture Top (%)	22
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.04
Dry Density (Mg/m3)	1.68

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.7	2.5mm Bottom	
5mm Top	1.5	5mm Bottom	
CBR Value %	1.7	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)



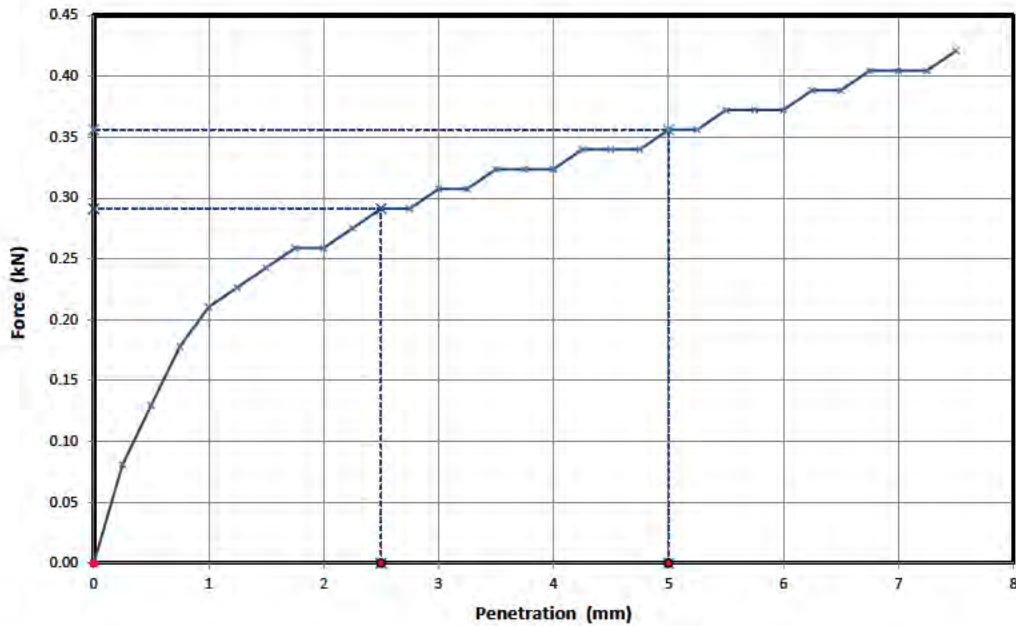


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA205

Site Name	Northstowe	Sample No.	3
Soil Description	Grey sandy fine to coarse gravelly silty CLAY	Depth Top	0 50
Compaction Method	2.5 Kg Rammer	Depth Base	1 00
Retained 20mm (%)	2	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	25
Moisture Top (%)	25
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.03
Dry Density (Mg/m3)	1.63

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	2.2	2.5mm Bottom	
5mm Top	1.8	5mm Bottom	
CBR Value %	2.2	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)



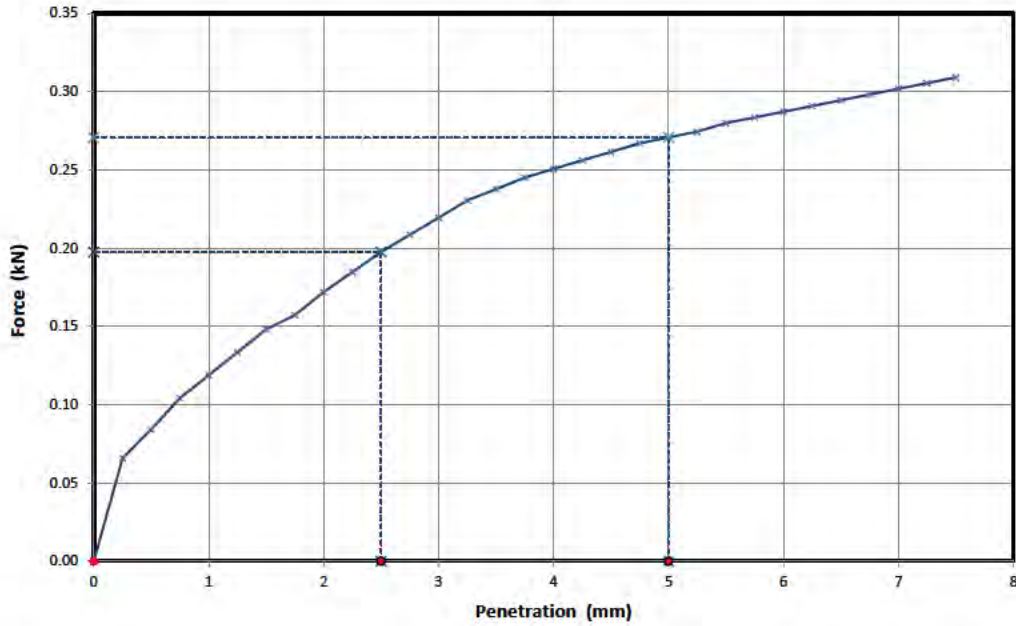


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA206

Site Name	Northstowe	Sample No.	1
Soil Description	Grey fine gravelly silty CLAY	Depth Top	0 00
Compaction Method	2.5 Kg Rammer	Depth Base	0 20
Retained 20mm (%)	0	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	33
Moisture Top (%)	33
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.92
Dry Density (Mg/m3)	1.45

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.5	2.5mm Bottom	
5mm Top	1.4	5mm Bottom	
CBR Value %	1.5	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)



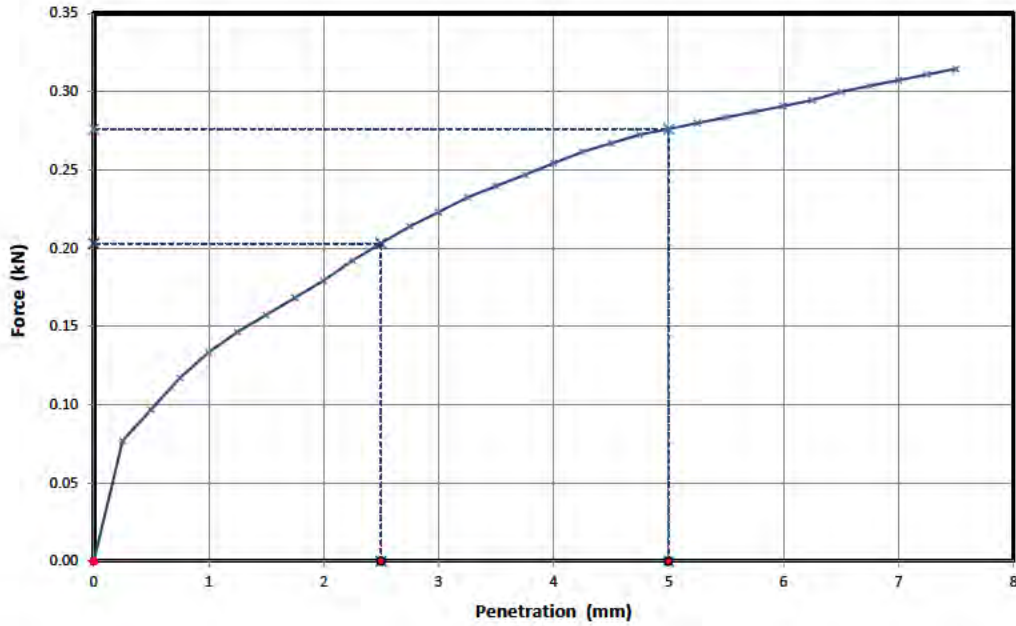


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. TPTCA206

Site Name	Northstowe	Sample No.	2
Soil Description	Grey fine gravelly silty CLAY	Depth Top	0 20
Compaction Method	2.5 Kg Rammer	Depth Base	0 50
Retained 20mm (%)	0	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	33
Moisture Top (%)	33
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.91
Dry Density (Mg/m3)	1.43

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.5	2.5mm Bottom	
5mm Top	1.4	5mm Bottom	
CBR Value %	1.5	CBR Value %	

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



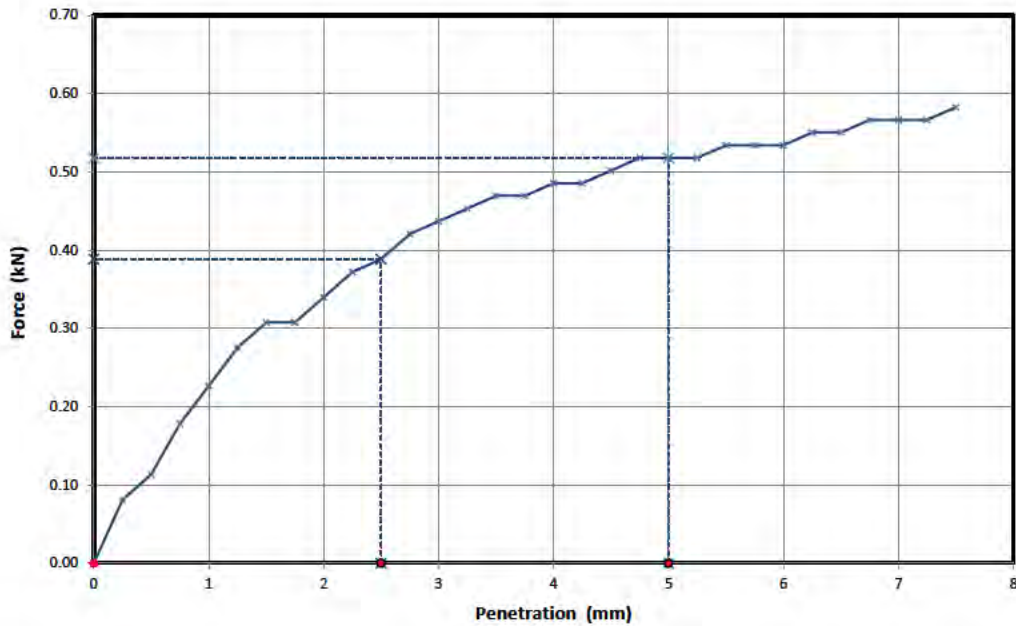


**California Bearing Ratio
BS 1377: Part 4: 1990 Clause 7**

Contract Number 58610

Borehole/Pit No. WSTCA108

Site Name	Northstowe	Sample No.	1
Soil Description	Brown fine to coarse gravelly silty sandy CLAY	Depth Top	0.80
Compaction Method	2.5 Kg Rammer	Depth Base	1.20
Retained 20mm (%)	3	Sample Type	B
Date Tested	14/04/2022		



Initial Sample Conditions	
Moisture Content (%)	19
Moisture Top (%)	19
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.11
Dry Density (Mg/m3)	1.78

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	2.9	2.5mm Bottom	
5mm Top	2.6	5mm Bottom	
CBR Value %	2.9	CBR Value %	

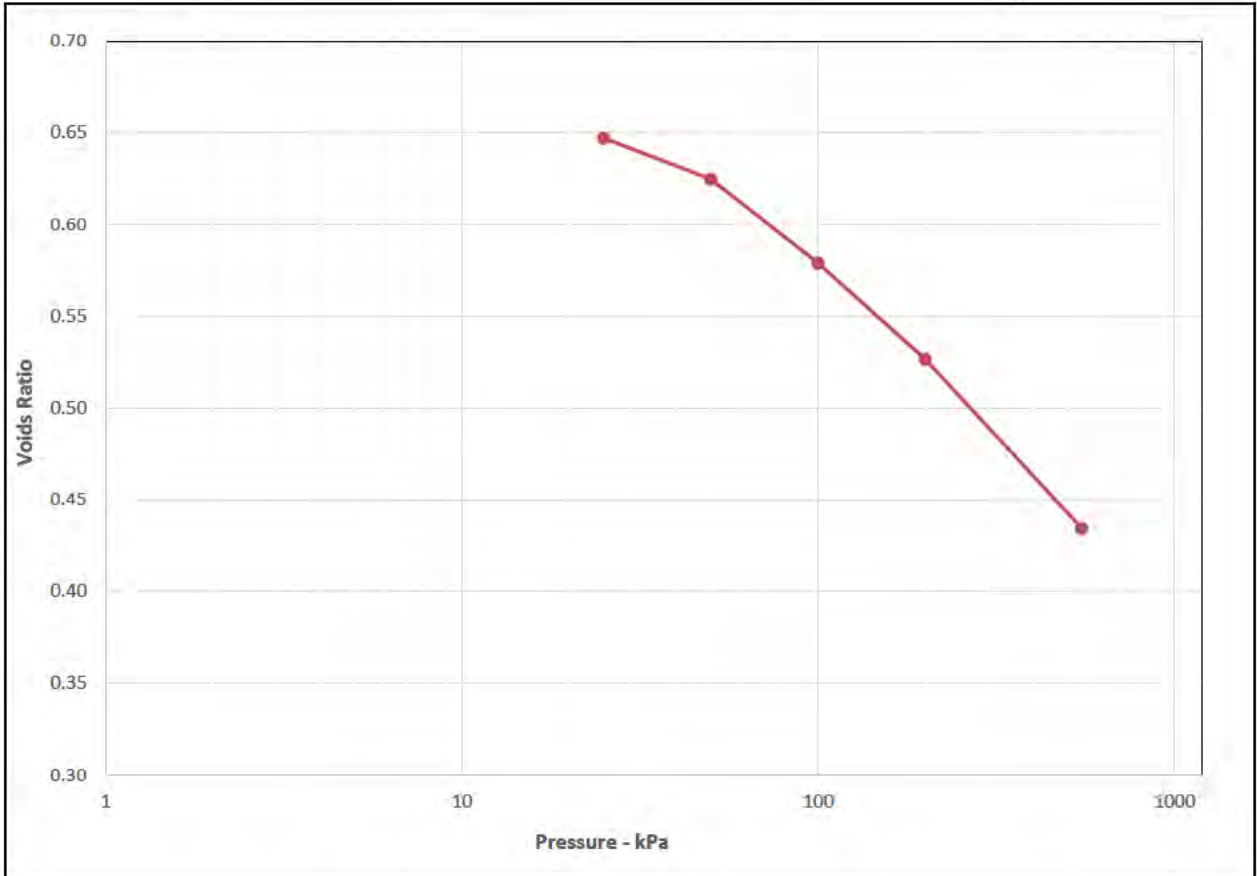
Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	





ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

		Contract Number	58610
		Borehole/Trialpit No.	BH2C101
Site Name	Northstowe	Sample No.	10
Soil Description	Grey silty CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	27	0	-	25	1	12			
Bulk Density (Mg/m3)	1.99	25	-	50	0.54	1.7			
Dry Density (Mg/m3)	1.57	50	-	100	0.56	2.3			
Voids Ratio	0.6896	100	-	200	0.33	1.0			
Degree of saturation	103.3	200	-	550	0.17	0.94			
Height (mm)	20.11		-						
Diameter (mm)	75.11		-						
Particle Density (Mg/m3)	2.65		-						

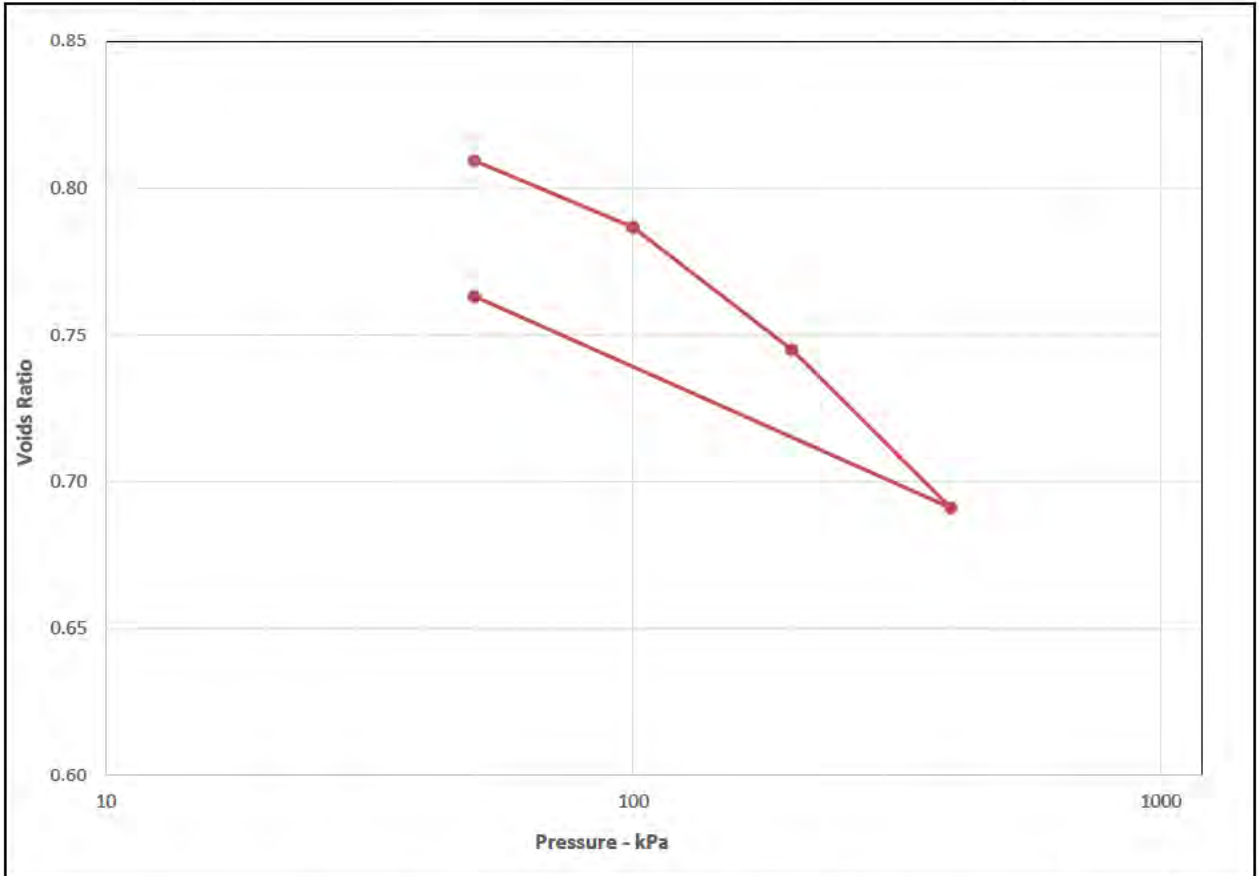
Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	





**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

		Contract Number	58610
		Borehole/Trialpit No.	BHTCA102
Site Name	Northstowe	Sample No.	8
Soil Description	Grey silty CLAY	Depth Top (m)	3.00
		Depth Base (m)	3.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	34	0	- 50	0.25	16		-		
Bulk Density (Mg/m3)	1.94	50	- 100	0.25	6.6		-		
Dry Density (Mg/m3)	1.45	100	- 200	0.23	1.6		-		
Voids Ratio	0.8321	200	- 400	0.15	4.0		-		
Degree of saturation	109.4	400	- 50	0.12	0.62		-		
Height (mm)	19.72		-				-		
Diameter (mm)	75.1		-				-		
Particle Density (Mg/m3)	2.65		-				-		

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

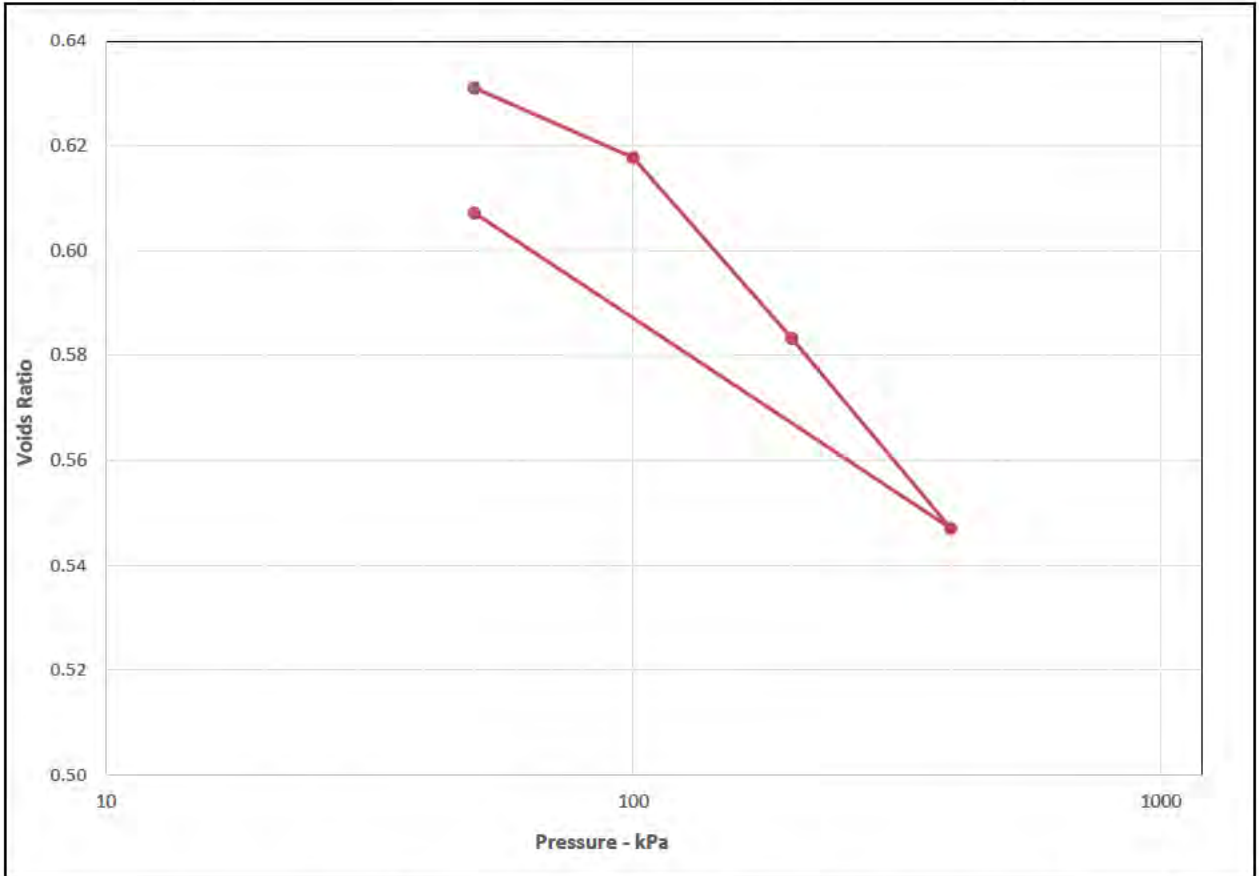
Reg. 13(1)





**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

		Contract Number	58610
		Borehole/Trialpit No.	BHTCA103A
Site Name	Northstowe	Sample No.	10
Soil Description	Grey silty CLAY	Depth Top (m)	5.00
		Depth Base (m)	5.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	28	0	- 50	0.16	9.7				
Bulk Density (Mg/m3)	2.06	50	- 100	0.16	2.7				
Dry Density (Mg/m3)	1.61	100	- 200	0.21	1.6				
Voids Ratio	0.6446	200	- 400	0.11	1.6				
Degree of saturation	113.4	400	- 50	0.11	0.8				
Height (mm)	19.65								
Diameter (mm)	75.15								
Particle Density (Mg/m3)	2.65								

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



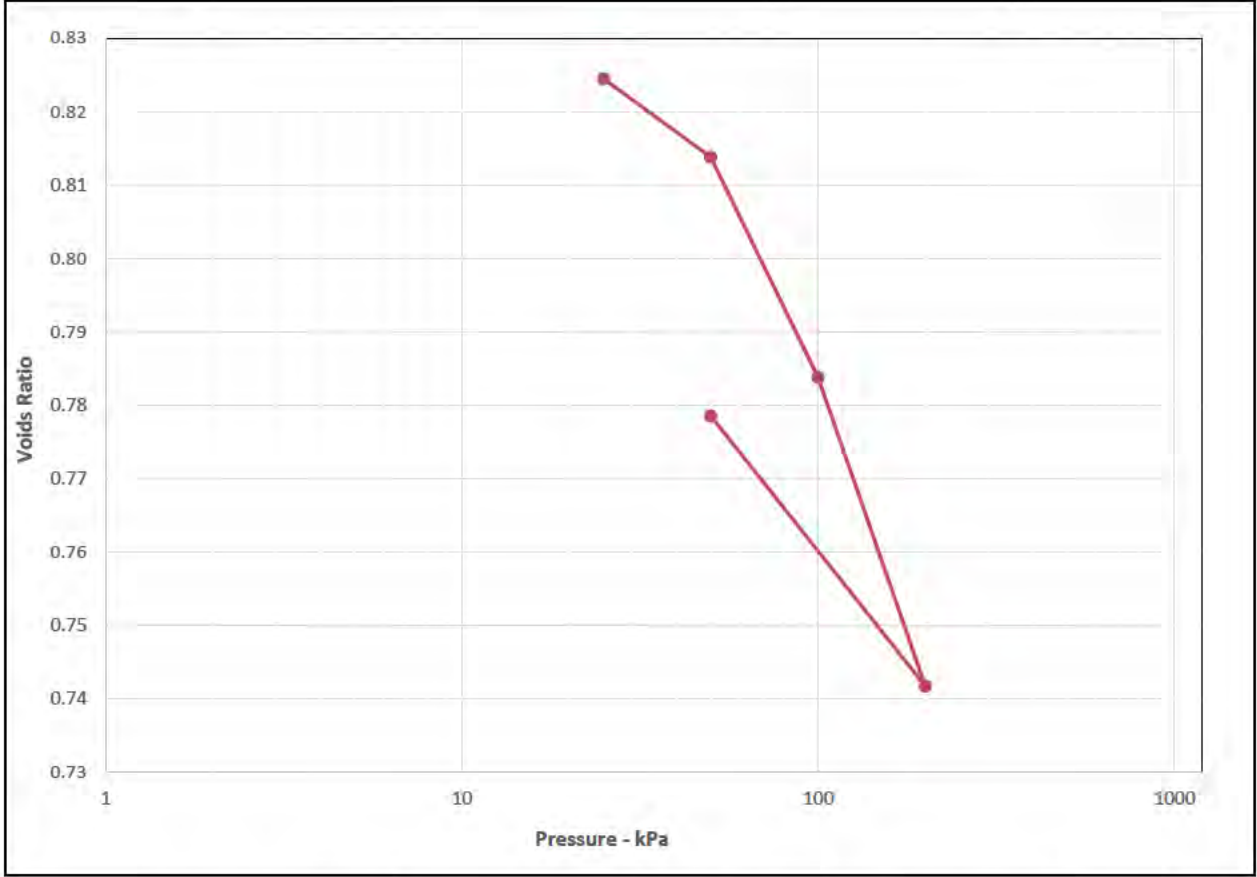


ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number 58610

Borehole/Trialpit No. BHTCA107

Site Name	Northstowe	Sample No.	8
Soil Description	Grey silty CLAY	Depth Top (m)	3.00
		Depth Base (m)	3.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	33	0	-	25	SWELL	SWELL			
Bulk Density (Mg/m3)	1.97	25	-	50	0.23	11			
Dry Density (Mg/m3)	1.48	50	-	100	0.33	7.3			
Voids Ratio	0.7932	100	-	200	0.24	7.0			
Degree of saturation	111.8	200	-	50	0.14	0.37			
Height (mm)	20.15		-						
Diameter (mm)	75.15		-						
Particle Density (Mg/m3)	2.65		-						

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	



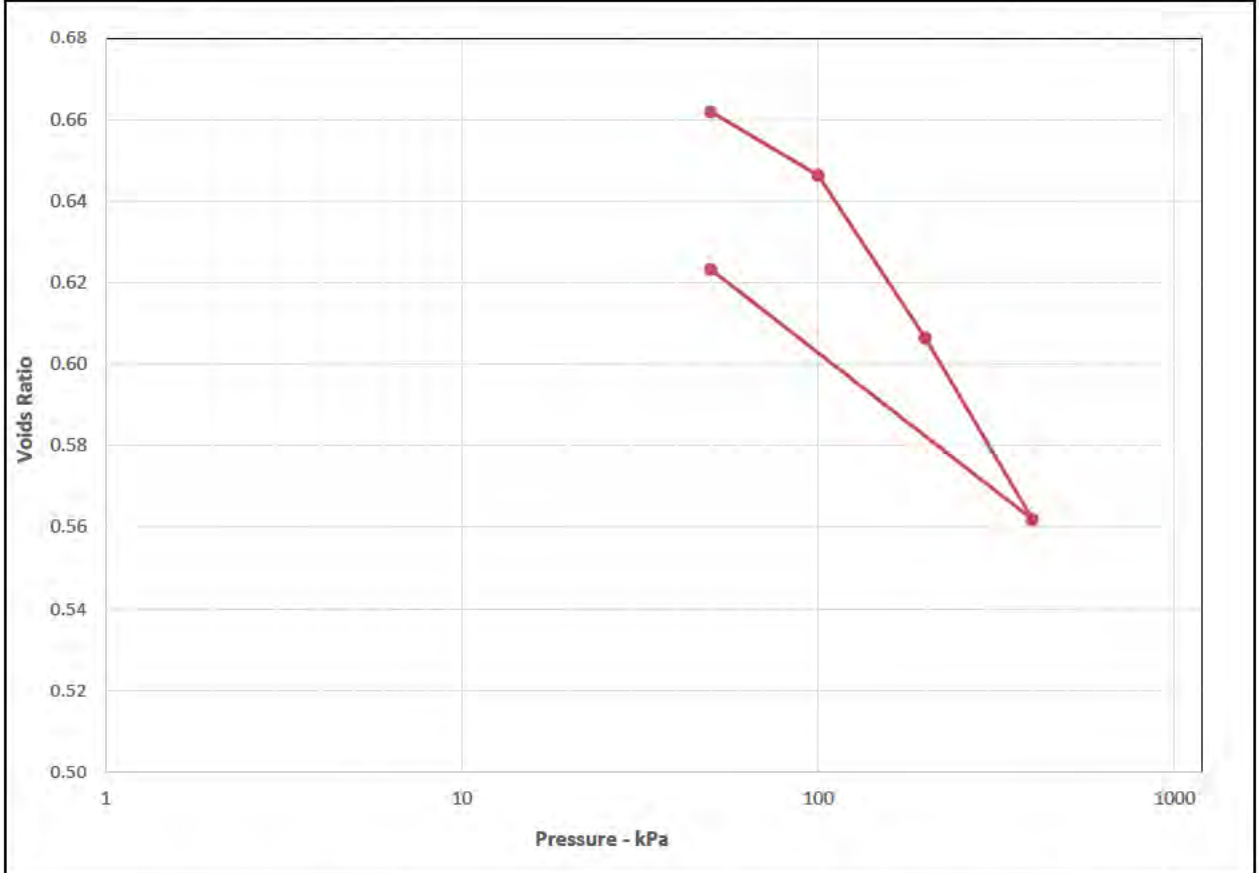


ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number 58610

Borehole/Trialpit No. BHTCA202

Site Name	Northstowe	Sample No.	10
Soil Description	Grey silty CLAY	Depth Top (m)	3.00
		Depth Base (m)	3.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	31	0	- 50	0.23	34				
Bulk Density (Mg/m3)	2.06	50	- 100	0.19	9.6				
Dry Density (Mg/m3)	1.58	100	- 200	0.24	3				
Voids Ratio	0.6814	200	- 400	0.14	4.4				
Degree of saturation	120.4	400	- 50	0.11	0.49				
Height (mm)	19.8								
Diameter (mm)	75.11								
Particle Density (Mg/m3)	2.65								

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

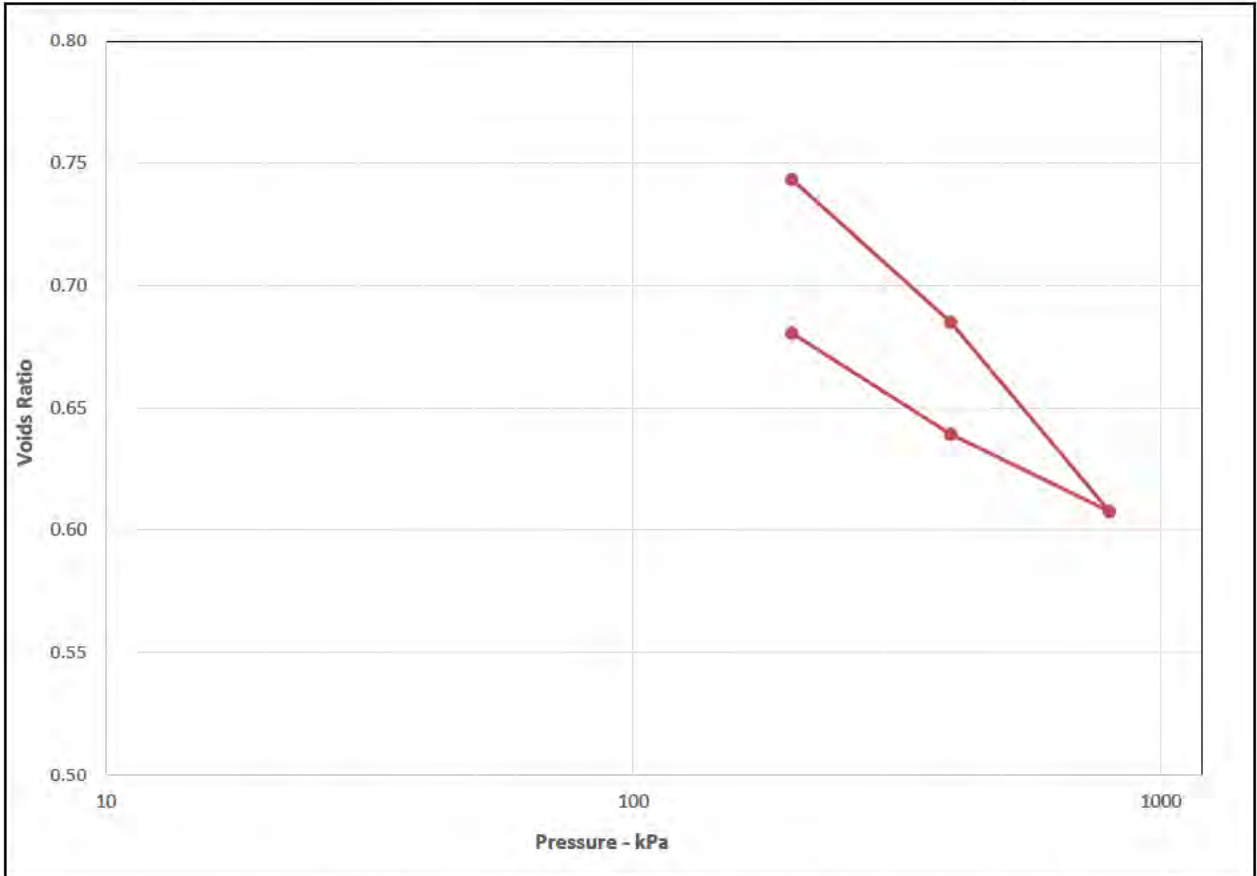
Reg. 13(1)





ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

		Contract Number	58610
		Borehole/Trialpit No.	BHTCA202
Site Name	Northstowe	Sample No.	34
Soil Description	Grey silty CLAY	Depth Top (m)	10.00
		Depth Base (m)	10.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
		Moisture Content (%)	33	0	-	200	0.095	15	
Bulk Density (Mg/m3)	1.99	200	-	400	0.17	3.7			
Dry Density (Mg/m3)	1.49	400	-	800	0.11	2.7			
Voids Ratio	0.7772	800	-	400	0.05	0.3			
Degree of saturation	113.1	400	-	200	0.13	0.18			
Height (mm)	18.81		-						
Diameter (mm)	75.09		-						
Particle Density (Mg/m3)	2.65		-						

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

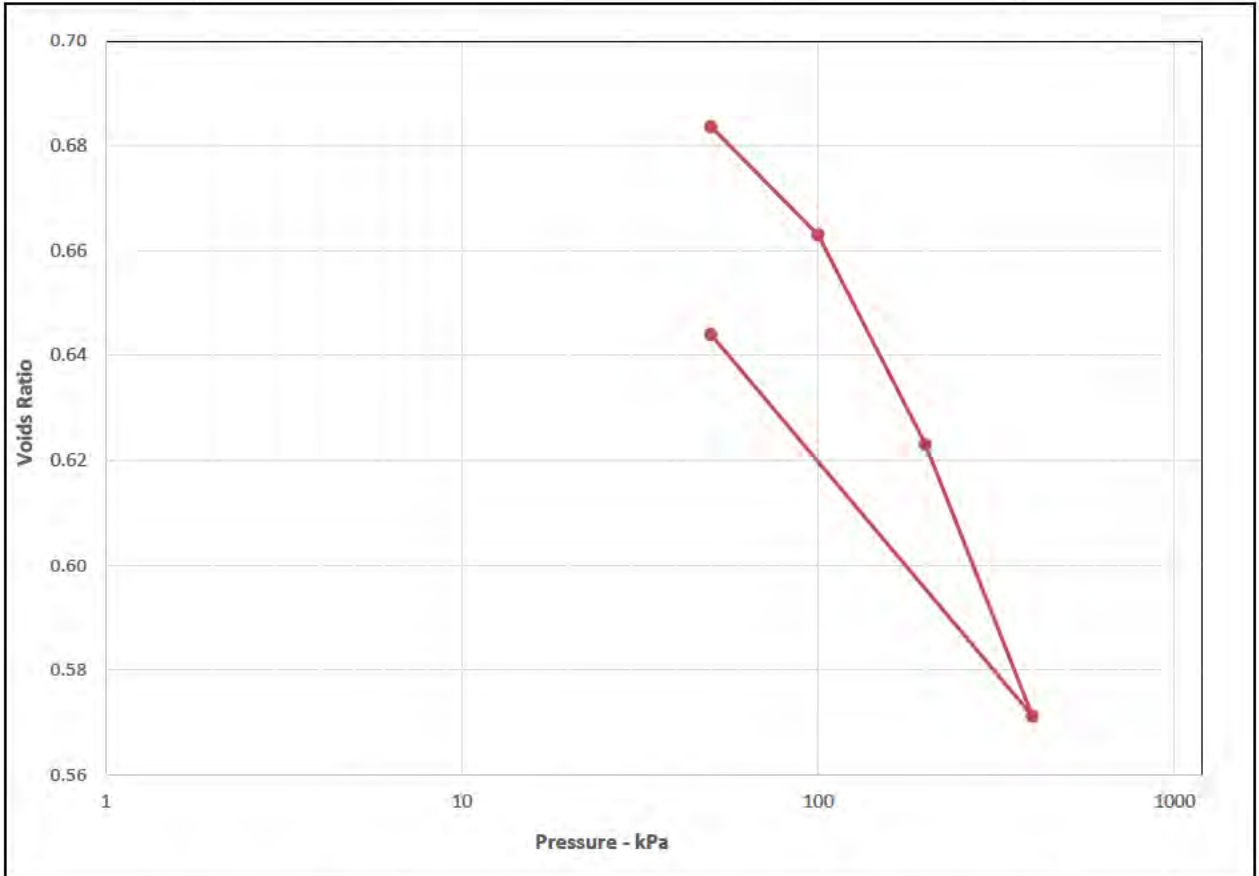
Reg. 13(1)





**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

		Contract Number	58610
		Borehole/Trialpit No.	BHTCA301A
Site Name	Northstowe	Sample No.	15
Soil Description	Grey silty CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	08/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	31	0	-	50	0.13	15			
Bulk Density (Mg/m3)	2.04	50	-	100	0.25	9			
Dry Density (Mg/m3)	1.56	100	-	200	0.24	3.9			
Voids Ratio	0.6945	200	-	400	0.16	2.8			
Degree of saturation	116.5	400	-	50	0.13	0.71			
Height (mm)	18.54								
Diameter (mm)	75.23								
Particle Density (Mg/m3)	2.65								

Operators	Checked	25/04/2022	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)

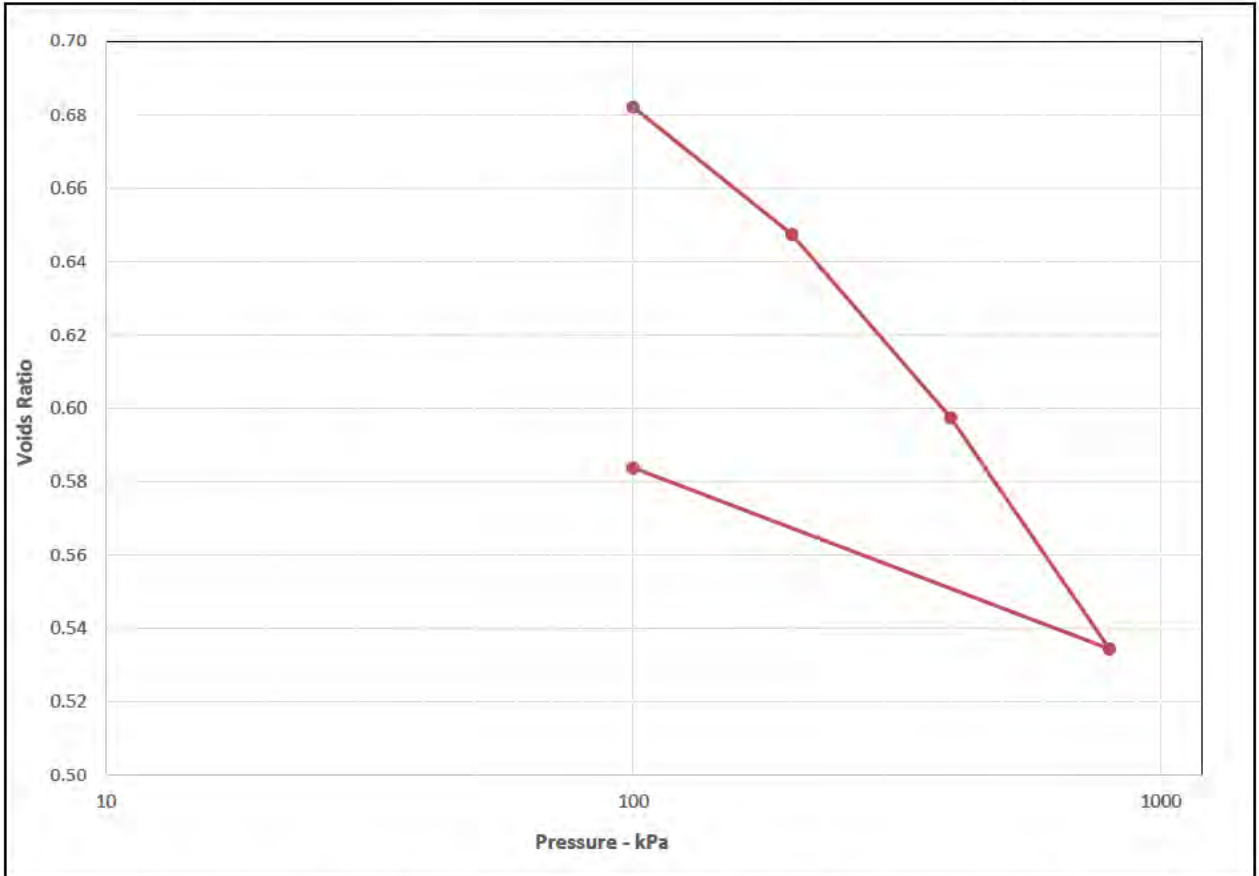
Reg. 13(1)





ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number	58610		
	Borehole/Trialpit No.	BHTCA301A	
Site Name	Northstowe	Sample No.	21
Soil Description	Grey silty CLAY	Depth Top (m)	7.00
		Depth Base (m)	7.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	07/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	31	0	- 100	0.28	2.5				
Bulk Density (Mg/m3)	2.01	100	- 200	0.21	1.6				
Dry Density (Mg/m3)	1.53	200	- 400	0.15	2.8				
Voids Ratio	0.7299	400	- 800	0.10	2.3				
Degree of saturation	114.3	800	- 100	0.046	0.98				
Height (mm)	19.9								
Diameter (mm)	50.21								
Particle Density (Mg/m3)	2.65								

Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	26/04/2022	Reg. 13(1)	





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C101

Site Name Northstowe

Sample No. 10

Soil Description Grey silty CLAY

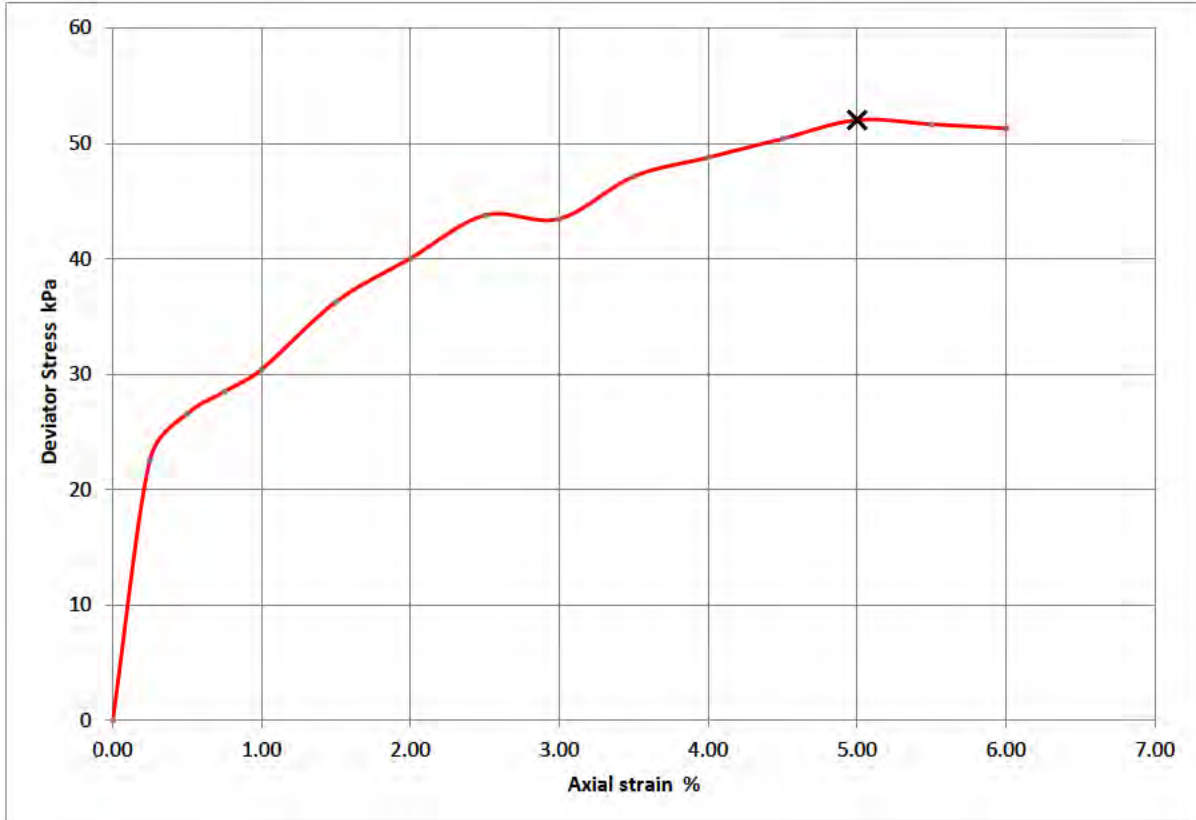
Depth Top (m) 2.00

Depth Base (m) 2.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	24
Bulk Density (Mg/m ³)	2.22
Dry Density (Mg/m ³)	1.79
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	52
Undrained Shear Strength (kPa)	26
Failure Strain (%)	5
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
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Reg. 13(1)





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C101

Site Name Northstowe

Sample No. 14

Soil Description Grey silty CLAY

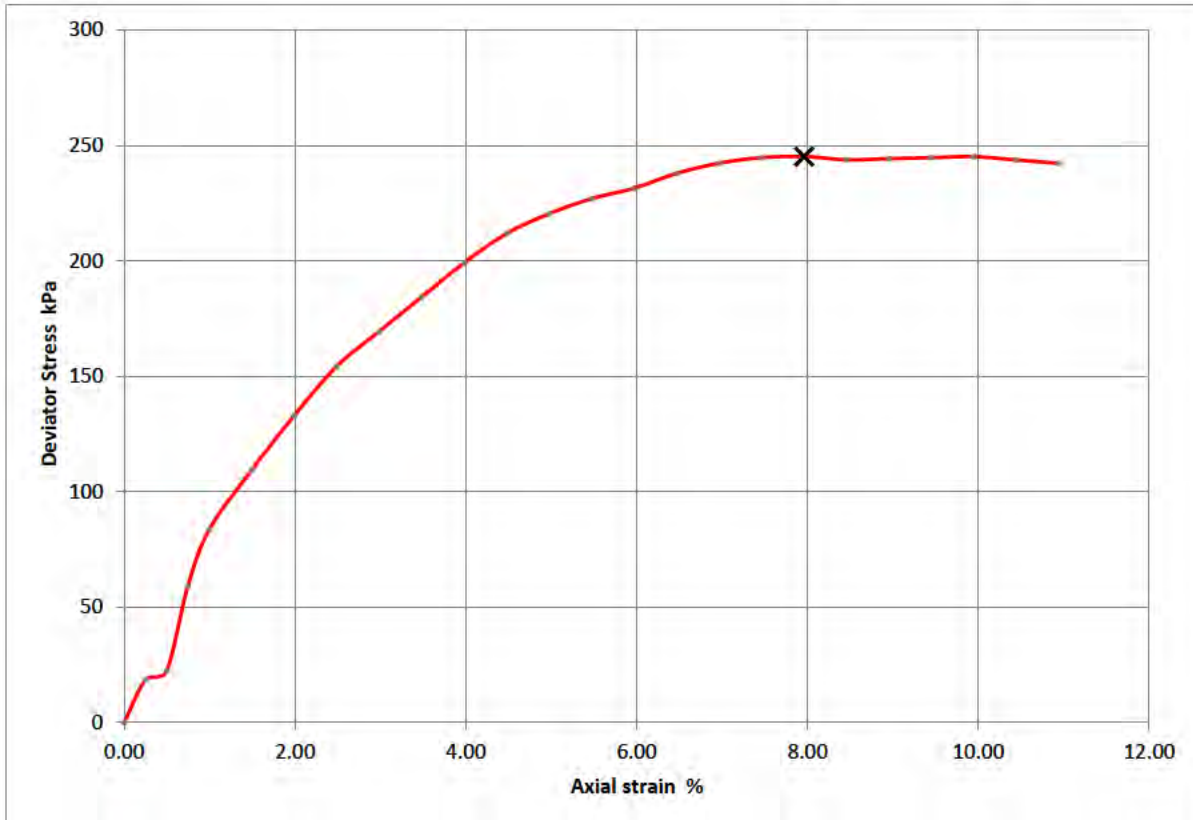
Depth Top (m) 4.00

Depth Base (m) 4.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	30
Bulk Density (Mg/m ³)	2.23
Dry Density (Mg/m ³)	1.71
Specimen Length (mm)	201
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	245
Undrained Shear Strength (kPa)	123
Failure Strain (%)	8
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.49

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	

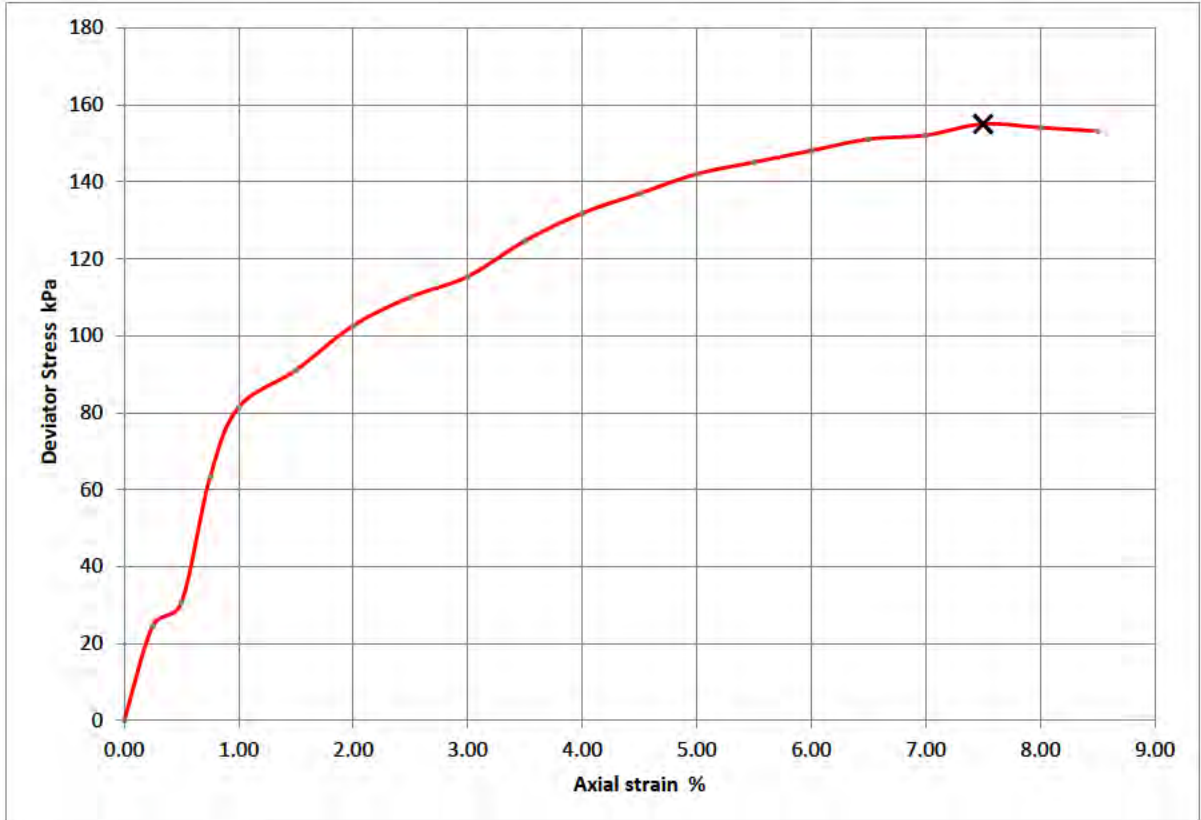




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BH2C101
Sample No.	17
Depth Top (m)	6.00
Depth Base (m)	6.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Dark grey silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	29
Bulk Density (Mg/m ³)	2.14
Dry Density (Mg/m ³)	1.67
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	155
Undrained Shear Strength (kPa)	78
Failure Strain (%)	8
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
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Reg. 13(1)





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C102

Site Name Northstowe

Sample No. 11

Soil Description Dark grey silty CLAY

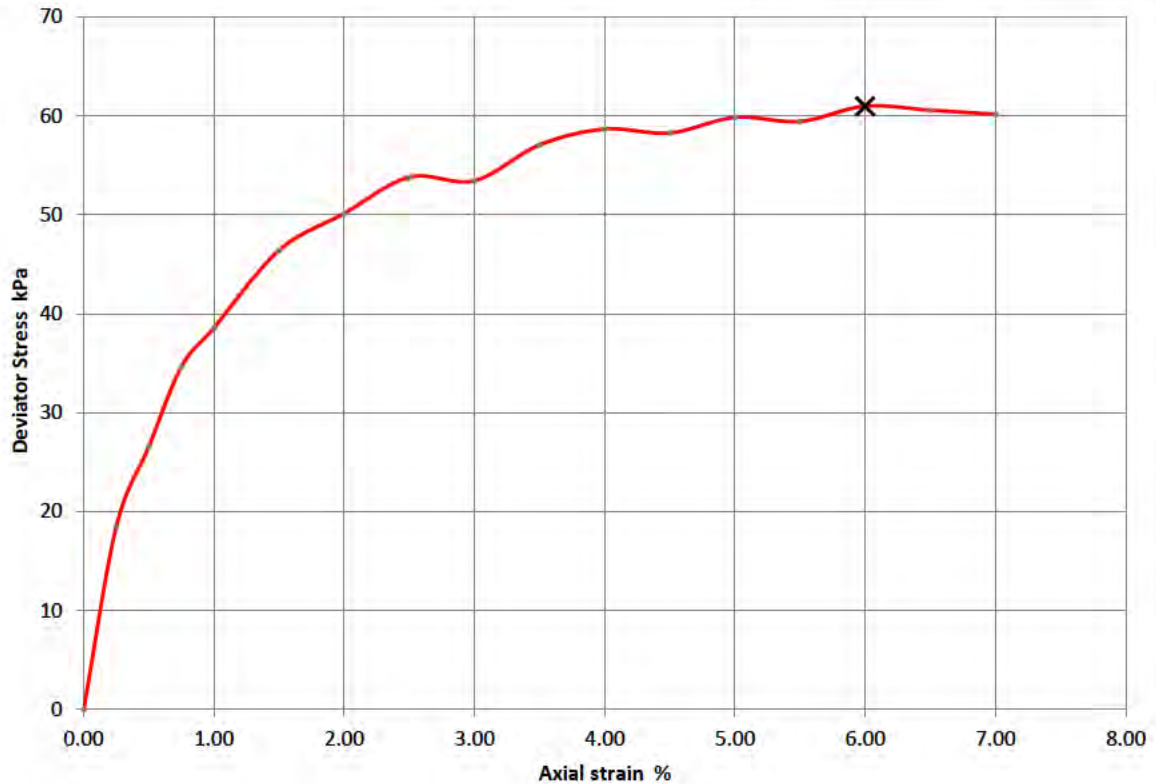
Depth Top (m) 4.00

Depth Base (m) 4.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	27
Bulk Density (Mg/m ³)	2.06
Dry Density (Mg/m ³)	1.62
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	61
Undrained Shear Strength (kPa)	30
Failure Strain (%)	6
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C102

Site Name Northstowe

Sample No. 18

Soil Description Dark grey silty CLAY

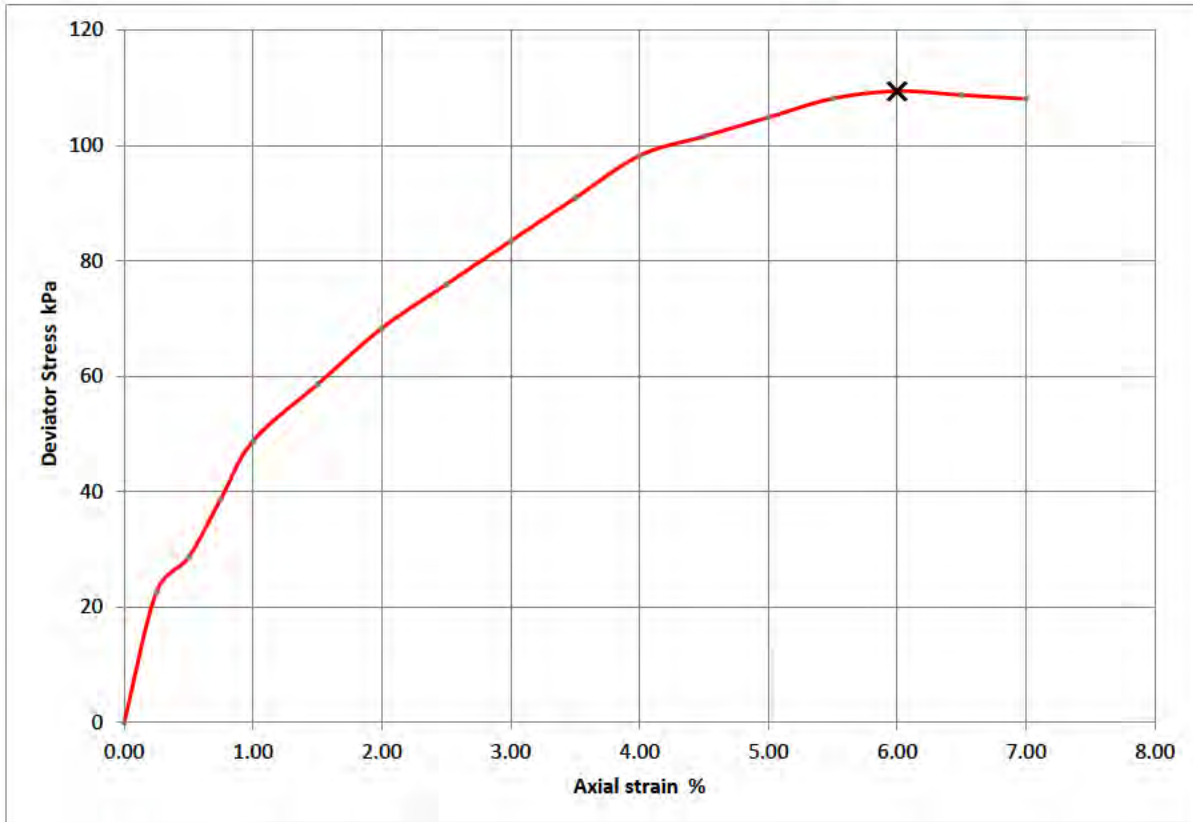
Depth Top (m) 6.00

Depth Base (m) 6.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	29
Bulk Density (Mg/m ³)	2.06
Dry Density (Mg/m ³)	1.60
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	109
Undrained Shear Strength (kPa)	55
Failure Strain (%)	6
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	26/04/2022	Reg. 13(1)
Approved	27/04/2022	Reg. 13(1)

Reg. 13(1)





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C103

Site Name Northstowe

Sample No. 31

Soil Description Dark grey silty CLAY

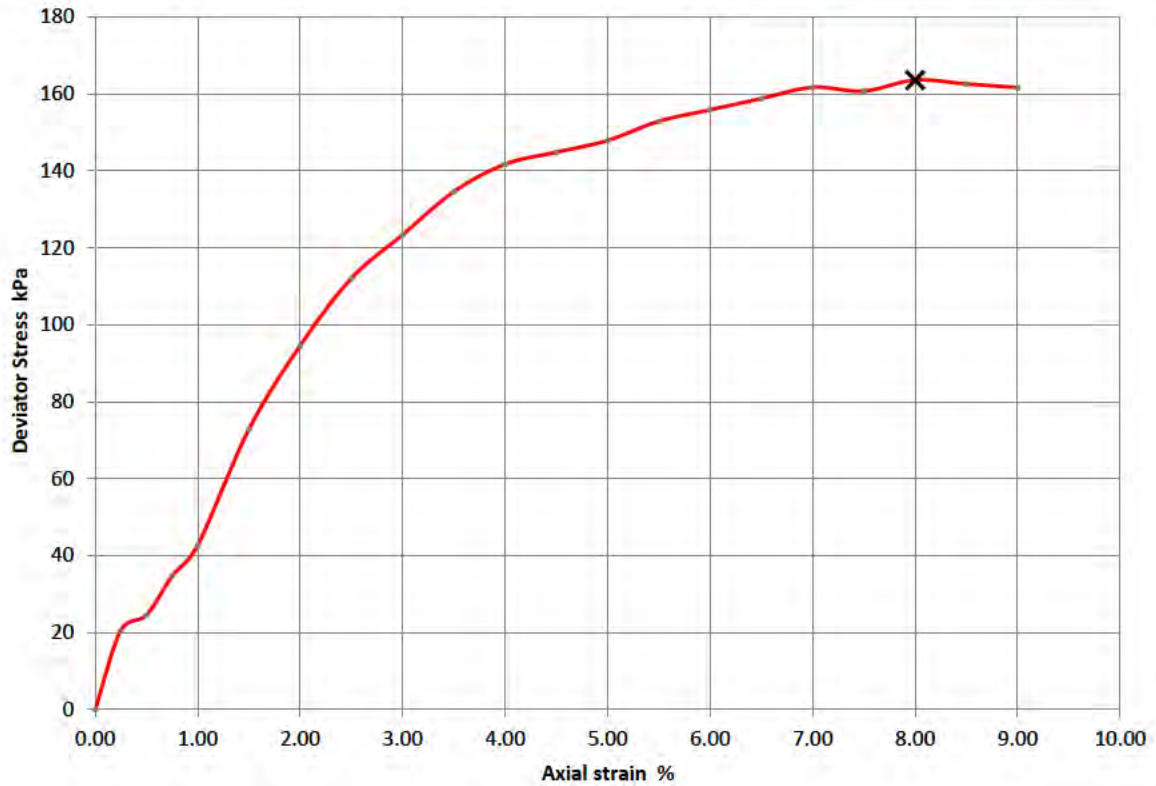
Depth Top (m) 4.00

Depth Base (m) 4.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	32
Bulk Density (Mg/m ³)	2.06
Dry Density (Mg/m ³)	1.57
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	164
Undrained Shear Strength (kPa)	82
Failure Strain (%)	8
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C103

Site Name Northstowe

Sample No. 32

Soil Description Dark grey silty CLAY

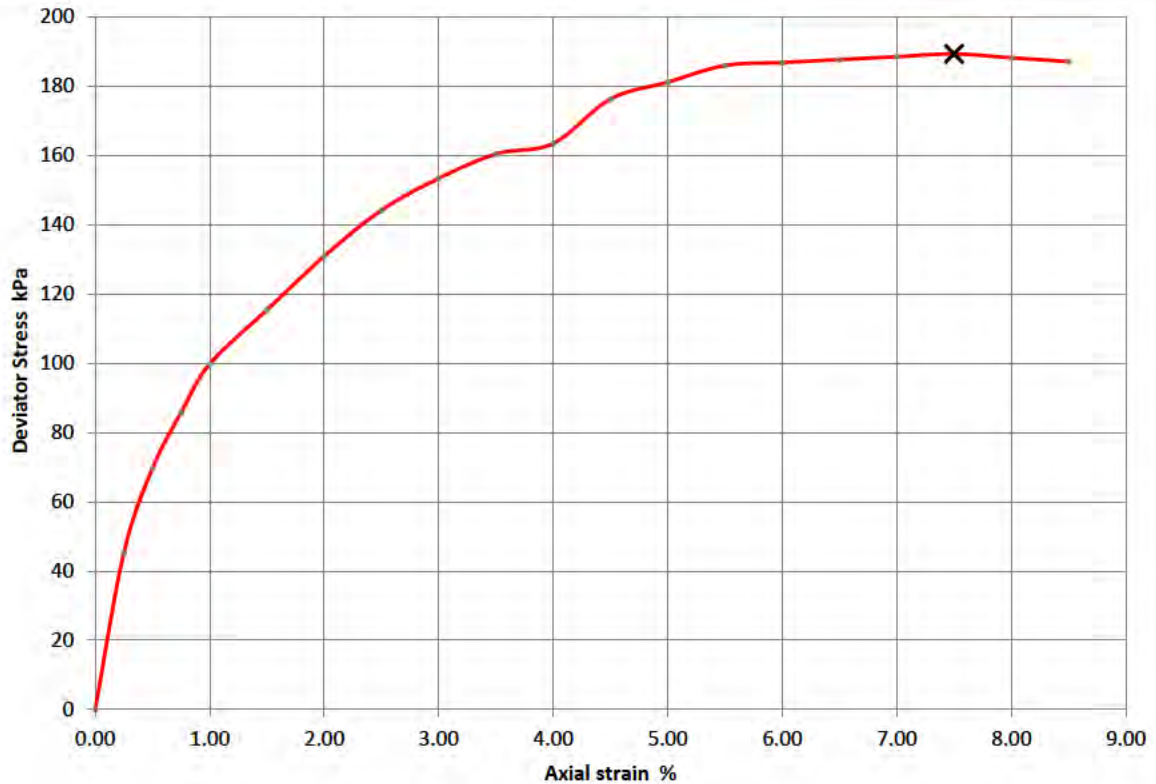
Depth Top (m) 6.00

Depth Base (m) 6.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	30
Bulk Density (Mg/m ³)	2.16
Dry Density (Mg/m ³)	1.67
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	189
Undrained Shear Strength (kPa)	95
Failure Strain (%)	8
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
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Reg. 13(1)

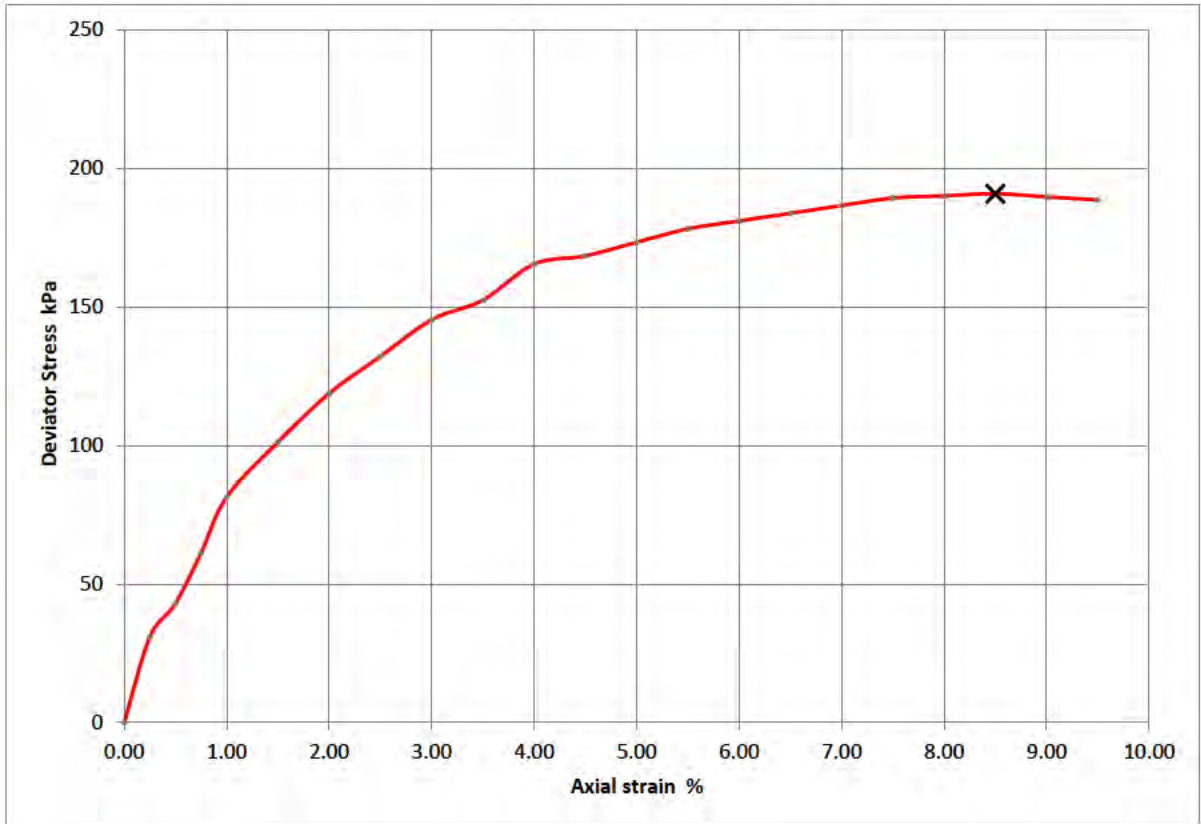




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BH2C103
Sample No.	33
Depth Top (m)	8.00
Depth Base (m)	8.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Dark grey silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	15
Bulk Density (Mg/m ³)	2.19
Dry Density (Mg/m ³)	1.91
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	191
Undrained Shear Strength (kPa)	95
Failure Strain (%)	9
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BH2C104

Site Name Northstowe

Sample No. 20

Soil Description Grey silty CLAY

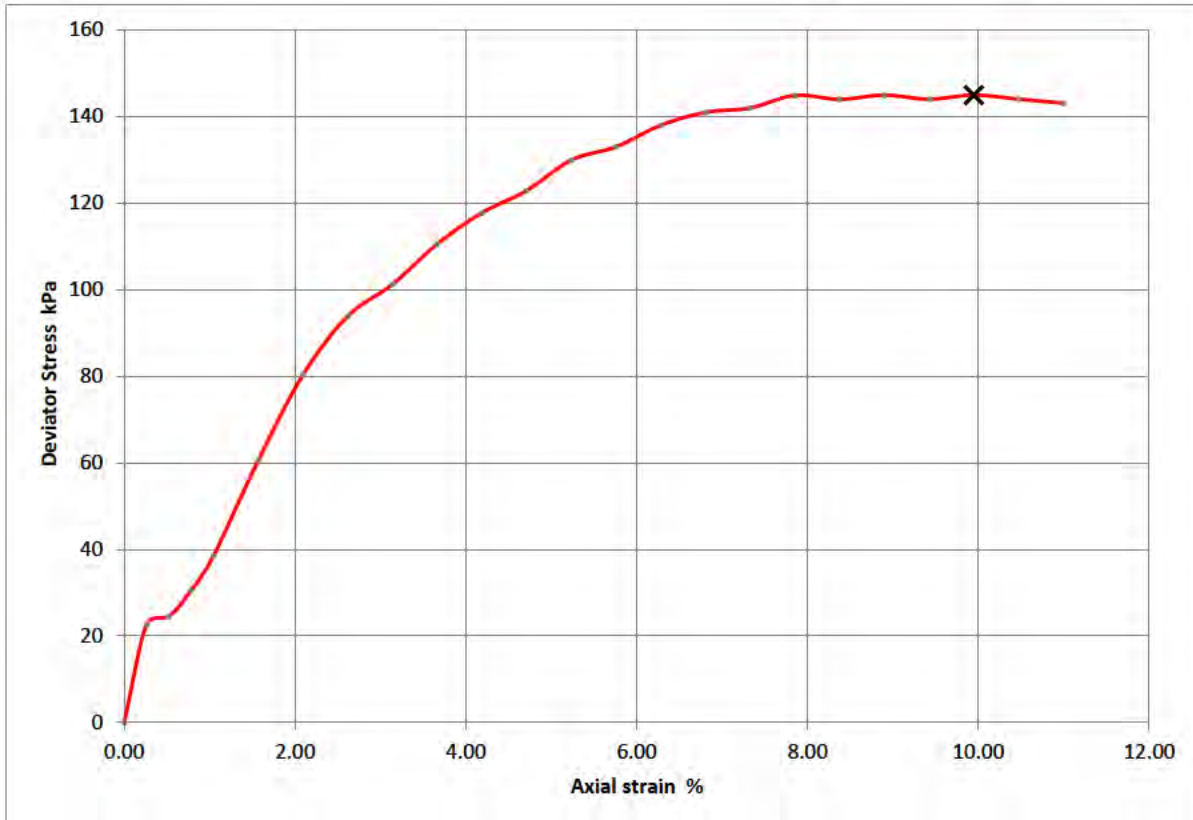
Depth Top (m) 6.00

Depth Base (m) 6.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	17
Bulk Density (Mg/m ³)	2.28
Dry Density (Mg/m ³)	1.95
Specimen Length (mm)	191
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	145
Undrained Shear Strength (kPa)	72
Failure Strain (%)	10
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.57

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BHTCA102

Site Name Northstowe

Sample No. 15

Soil Description Dark grey silty CLAY

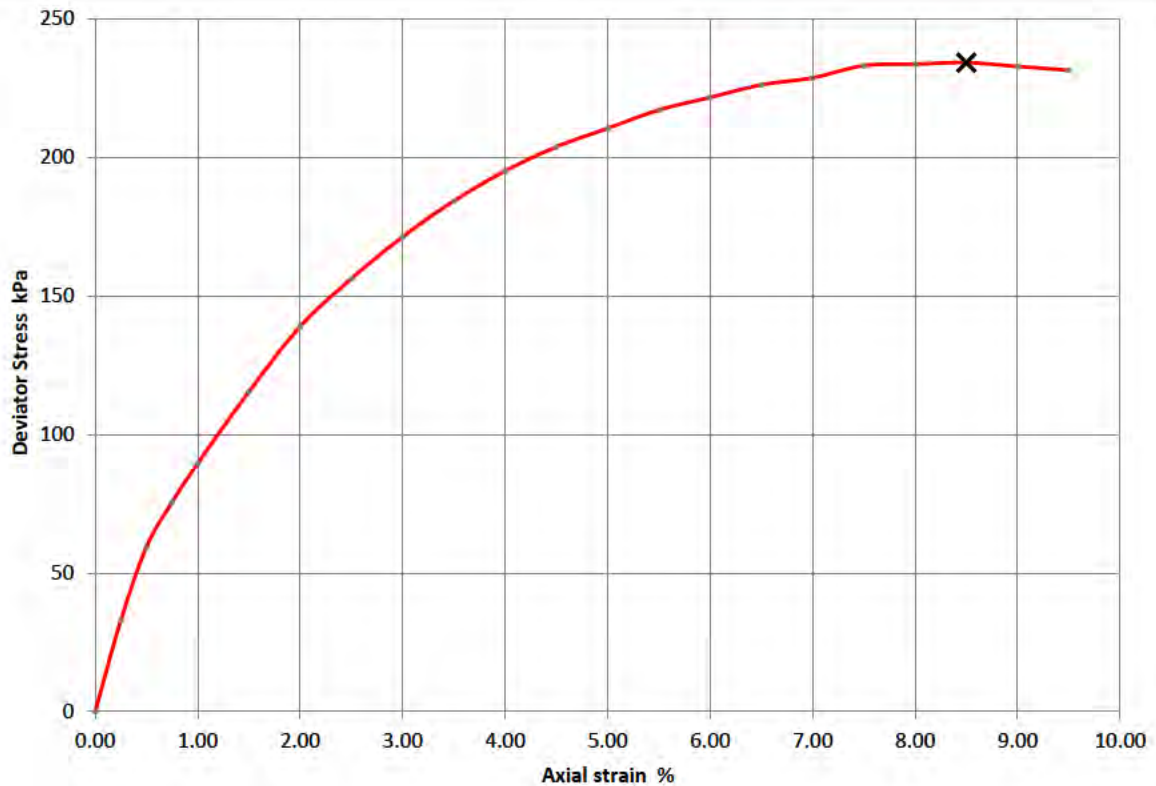
Depth Top (m) 5.00

Depth Base (m) 5.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	25
Bulk Density (Mg/m ³)	2.24
Dry Density (Mg/m ³)	1.80
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	234
Undrained Shear Strength (kPa)	117
Failure Strain (%)	9
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	

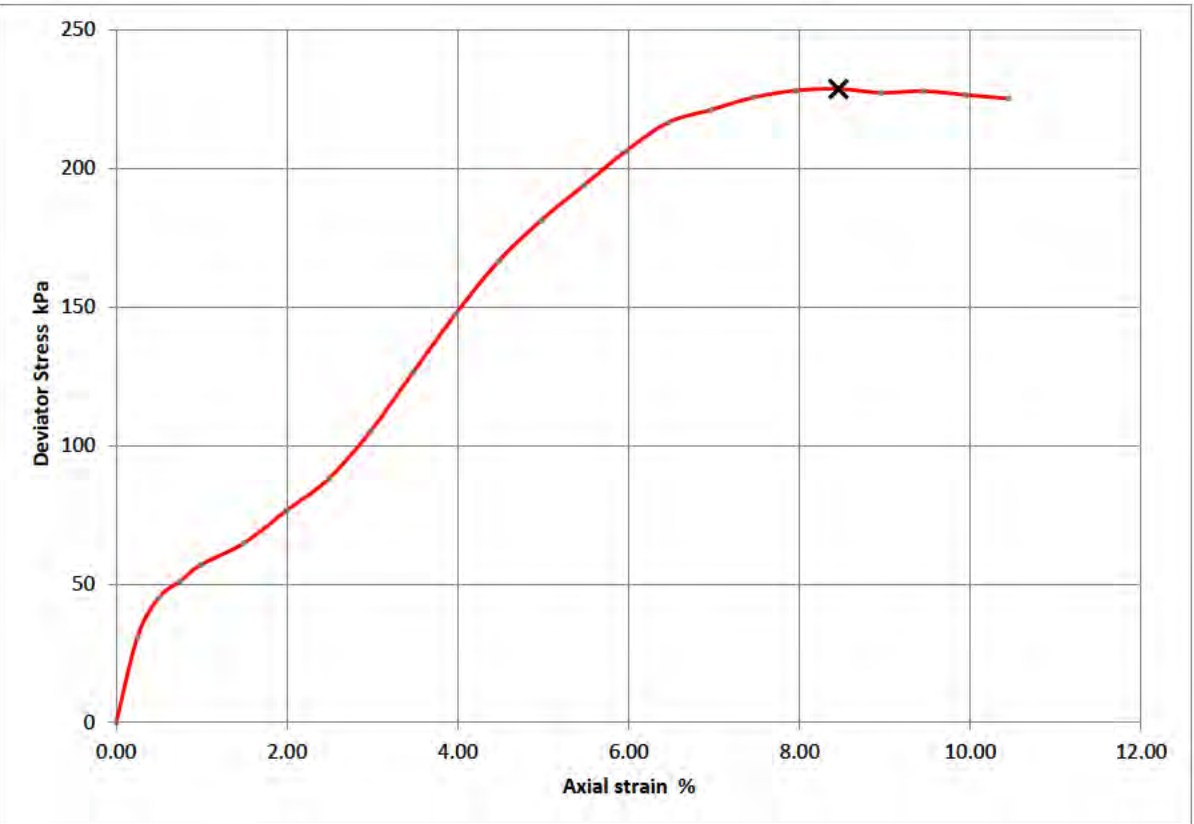




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA102
Sample No.	29
Depth Top (m)	9.00
Depth Base (m)	9.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Greyish brown silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	29
Bulk Density (Mg/m ³)	2.16
Dry Density (Mg/m ³)	1.67
Specimen Length (mm)	201
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	229
Undrained Shear Strength (kPa)	114
Failure Strain (%)	8
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.49

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	

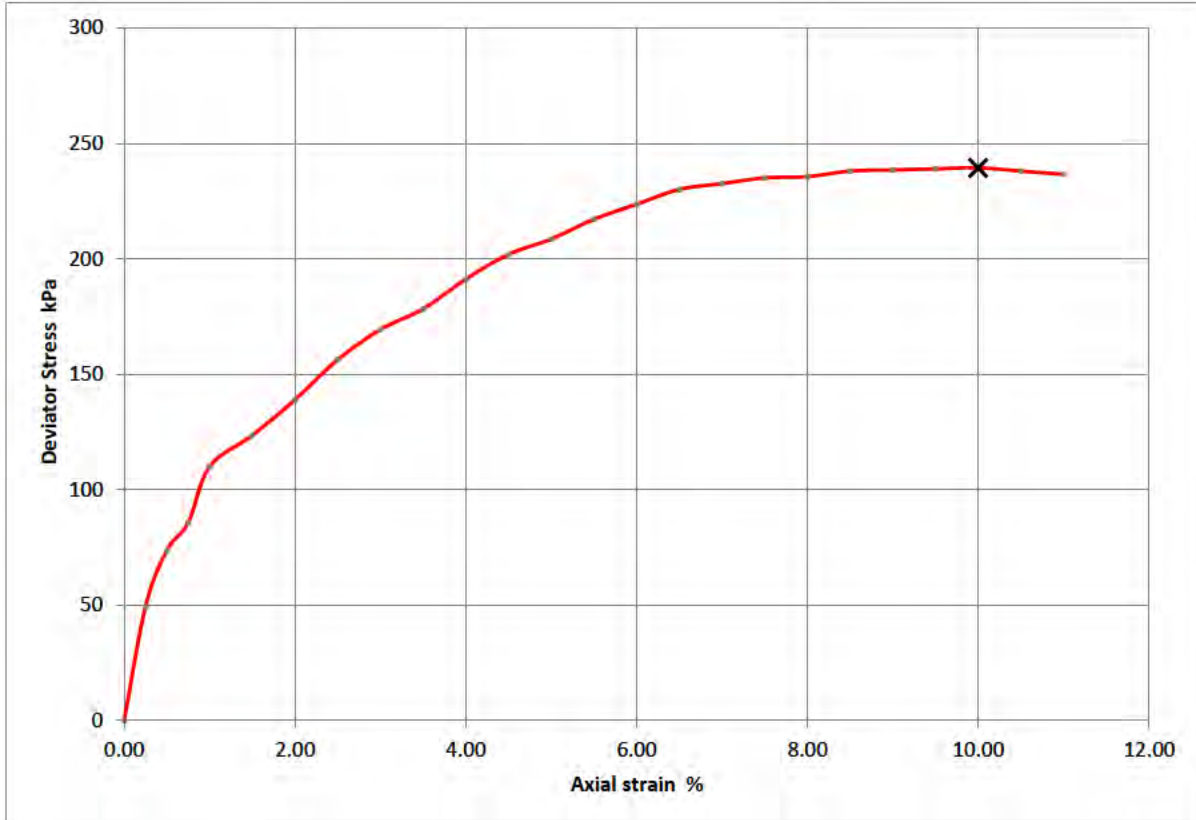




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA103A
Sample No.	14
Depth Top (m)	7.00
Depth Base (m)	7.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Dark grey silty CLAY
Date Tested	13/04/2022



Moisture Content (%)	28
Bulk Density (Mg/m ³)	2.23
Dry Density (Mg/m ³)	1.74
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	239
Undrained Shear Strength (kPa)	120
Failure Strain (%)	10
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	

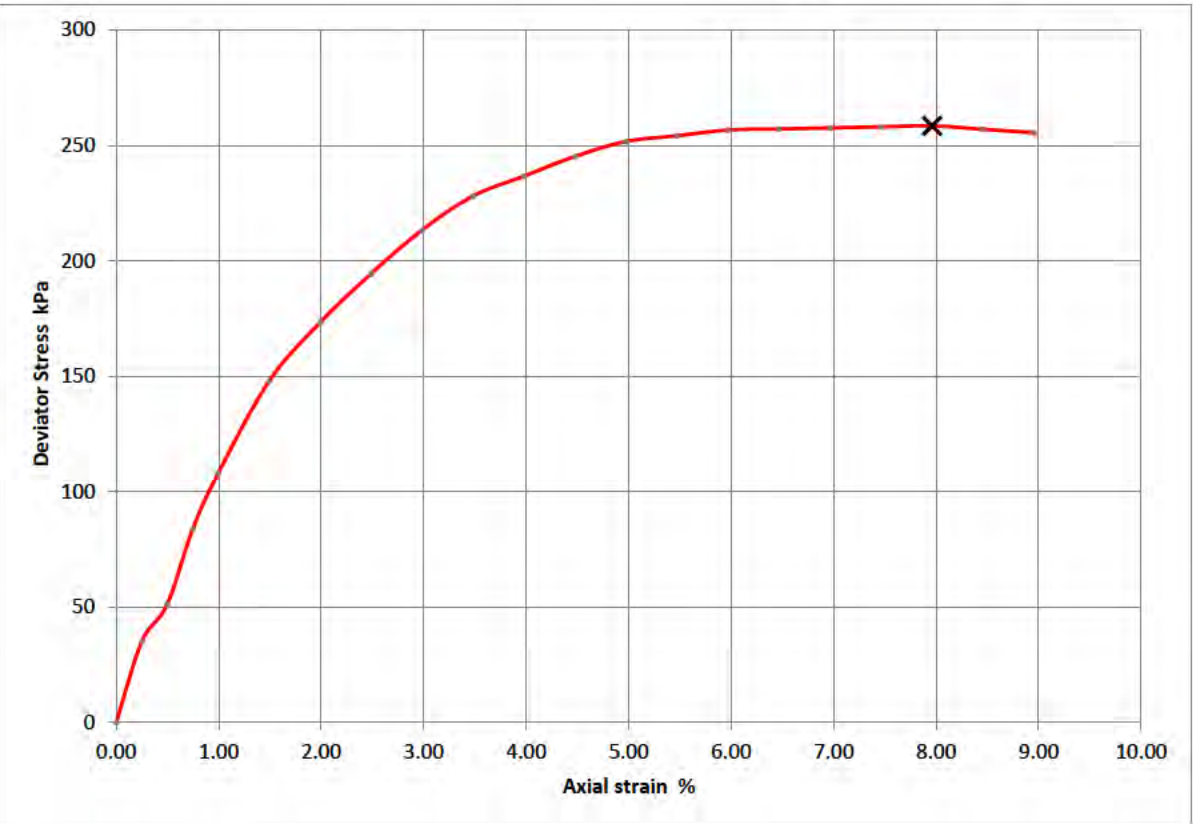




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA107
Sample No.	17
Depth Top (m)	6.00
Depth Base (m)	6.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Dark grey silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	26
Bulk Density (Mg/m ³)	2.23
Dry Density (Mg/m ³)	1.77
Specimen Length (mm)	201
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	259
Undrained Shear Strength (kPa)	129
Failure Strain (%)	8
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.49

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	

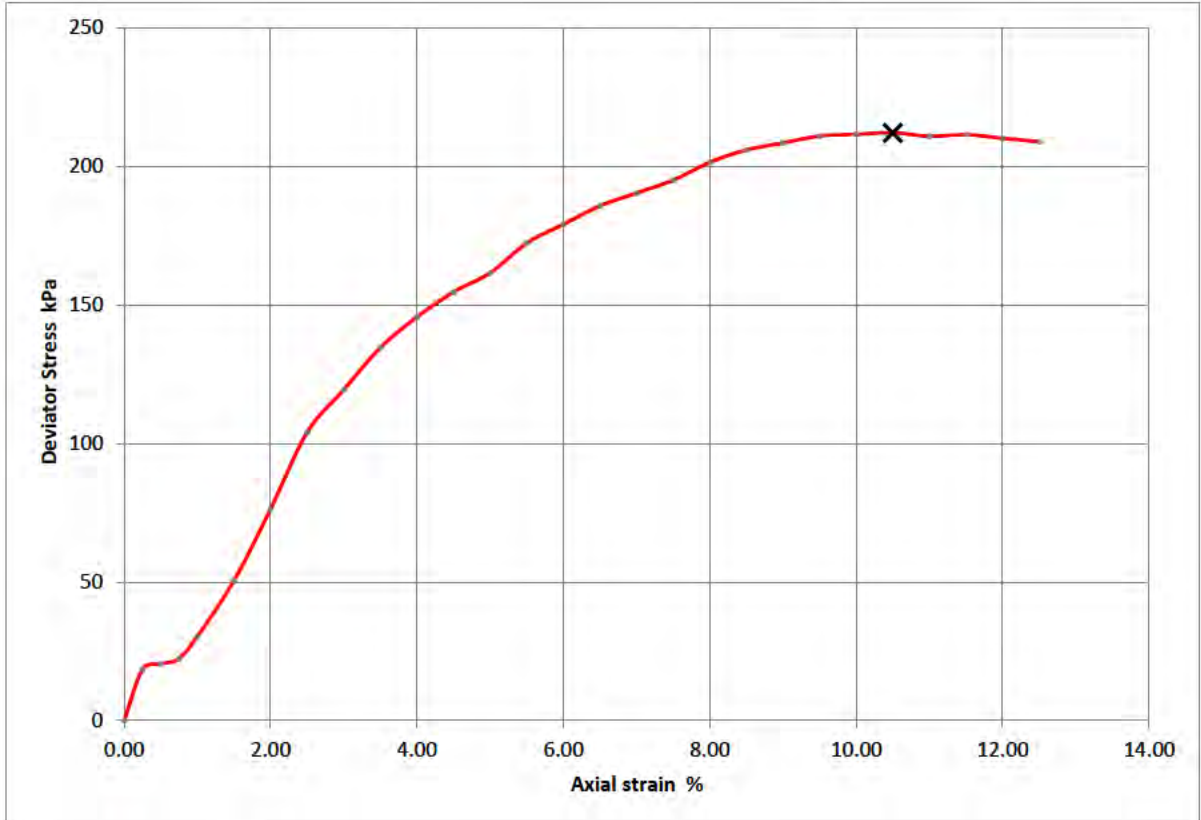




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA107
Sample No.	23
Depth Top (m)	8.00
Depth Base (m)	8.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Dark grey silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	26
Bulk Density (Mg/m ³)	2.16
Dry Density (Mg/m ³)	1.72
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	212
Undrained Shear Strength (kPa)	106
Failure Strain (%)	11
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

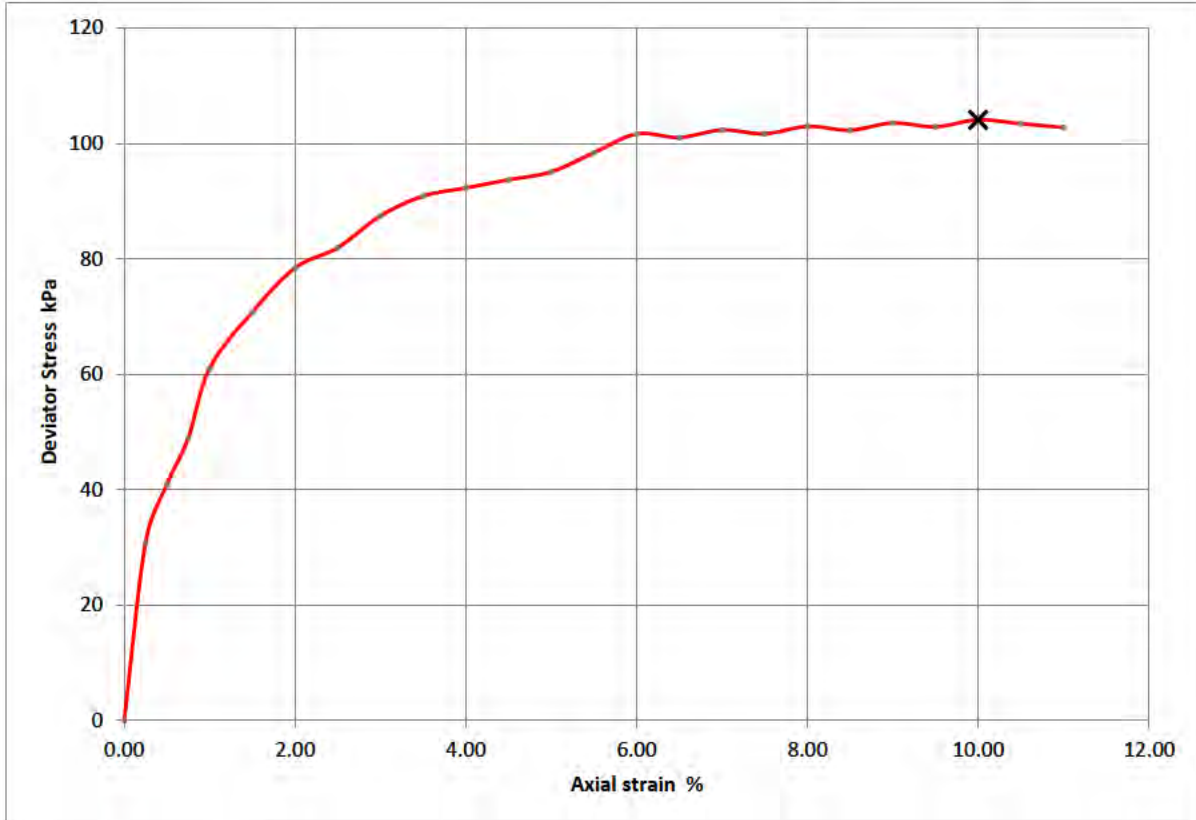




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA108
Sample No.	5
Depth Top (m)	2.00
Depth Base (m)	2.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Brown silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	30
Bulk Density (Mg/m ³)	2.11
Dry Density (Mg/m ³)	1.62
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	104
Undrained Shear Strength (kPa)	52
Failure Strain (%)	10
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

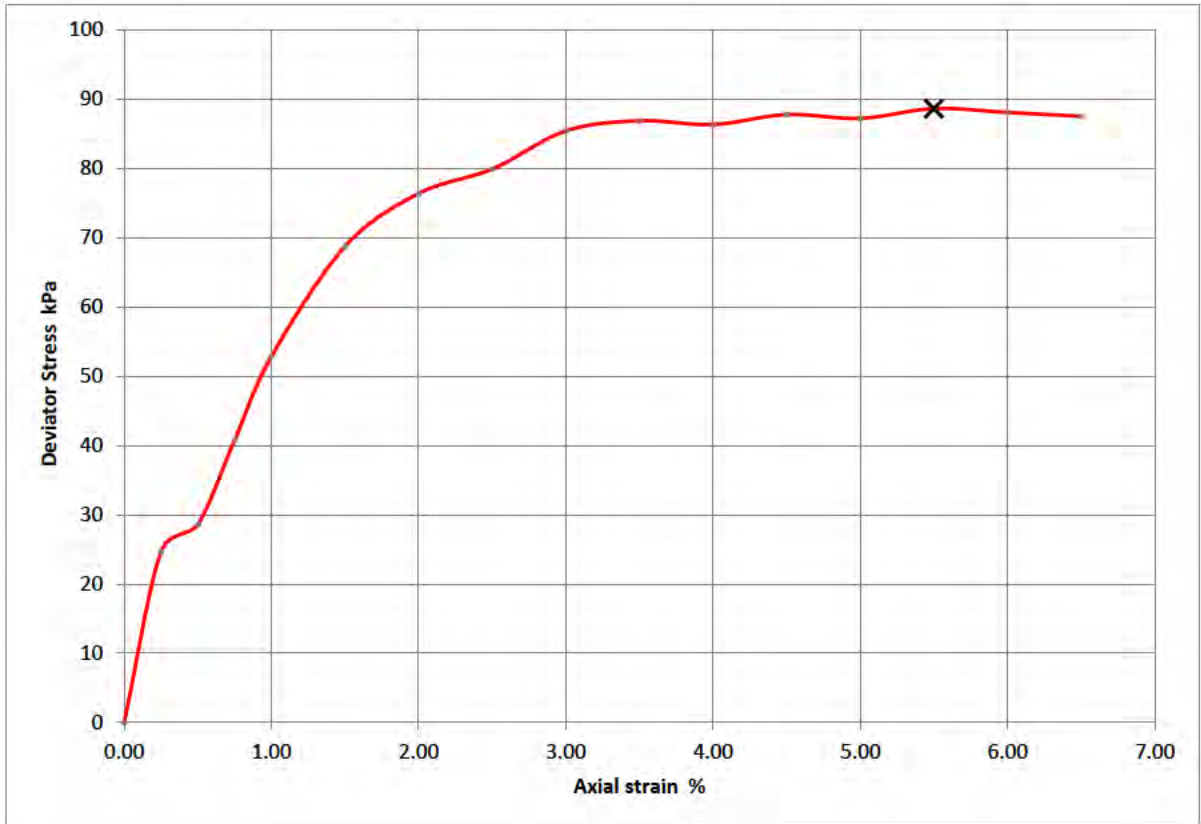




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA108
Sample No.	9
Depth Top (m)	4.00
Depth Base (m)	4.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Grey silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	36
Bulk Density (Mg/m ³)	2.09
Dry Density (Mg/m ³)	1.54
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	89
Undrained Shear Strength (kPa)	44
Failure Strain (%)	6
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)

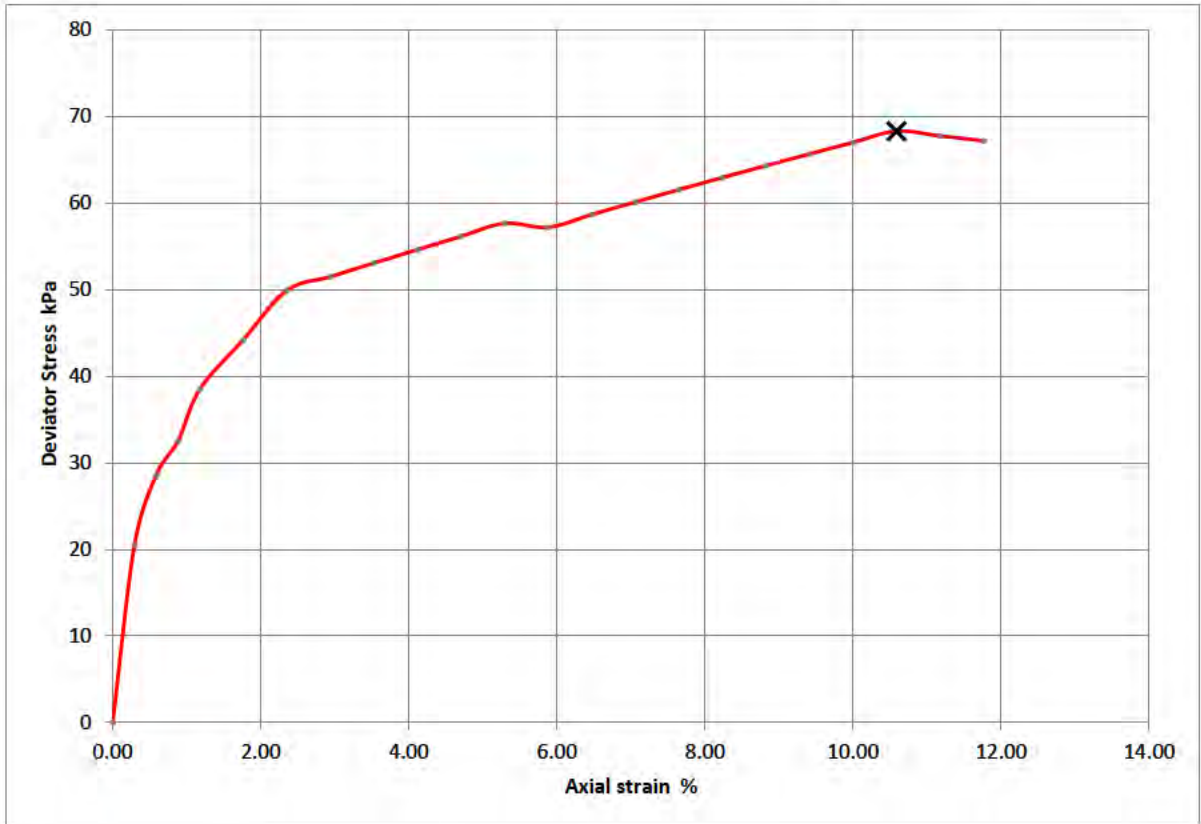




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA108
Sample No.	13
Depth Top (m)	6.00
Depth Base (m)	6.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Light grey silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	31
Bulk Density (Mg/m ³)	2.17
Dry Density (Mg/m ³)	1.65
Specimen Length (mm)	170
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	68
Undrained Shear Strength (kPa)	34
Failure Strain (%)	11
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.76

Checked	25/04/2022	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

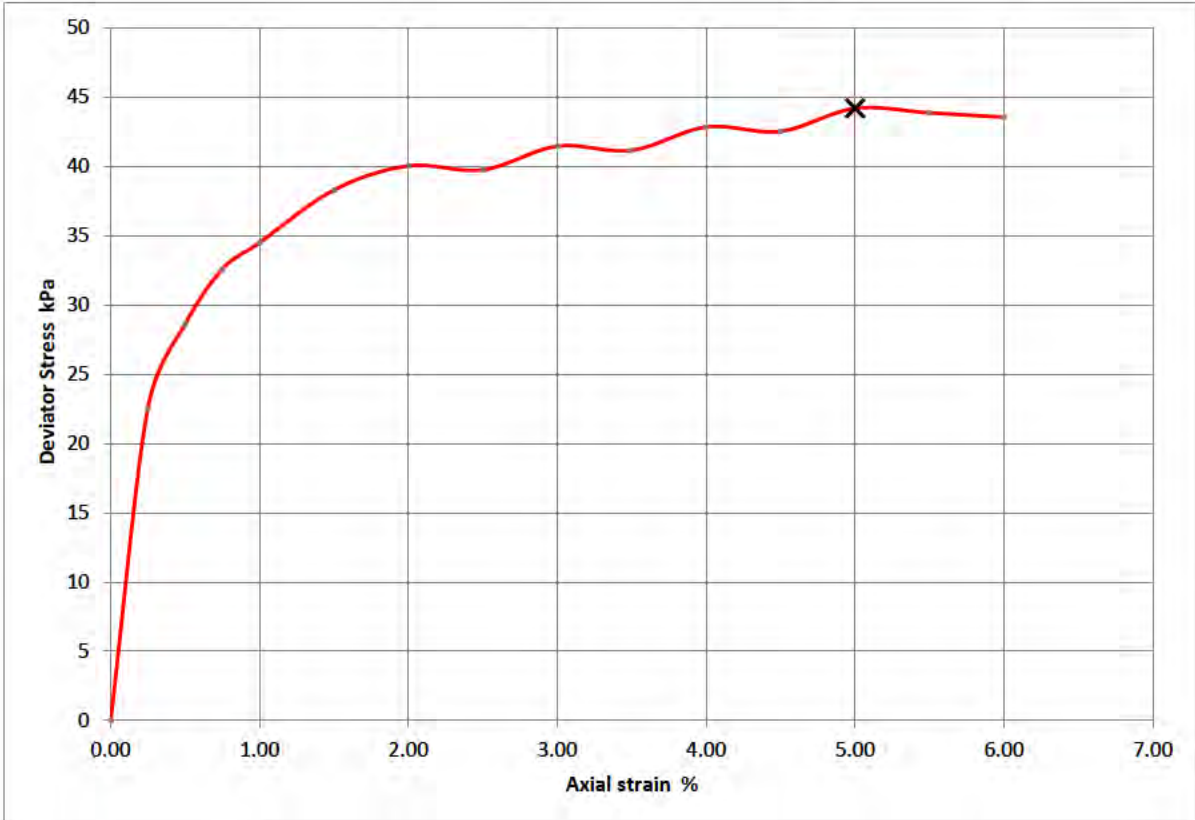




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA110
Sample No.	10
Depth Top (m)	4.00
Depth Base (m)	4.45
Sample Type	U
Technician	Jordan

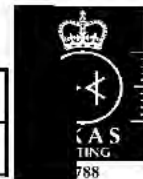
Site Name	Northstowe
Soil Description	Grey silty CLAY
Date Tested	13/04/2022



Moisture Content (%)	39
Bulk Density (Mg/m ³)	2.10
Dry Density (Mg/m ³)	1.51
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	44
Undrained Shear Strength (kPa)	22
Failure Strain (%)	5
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)

Reg. 13(1)

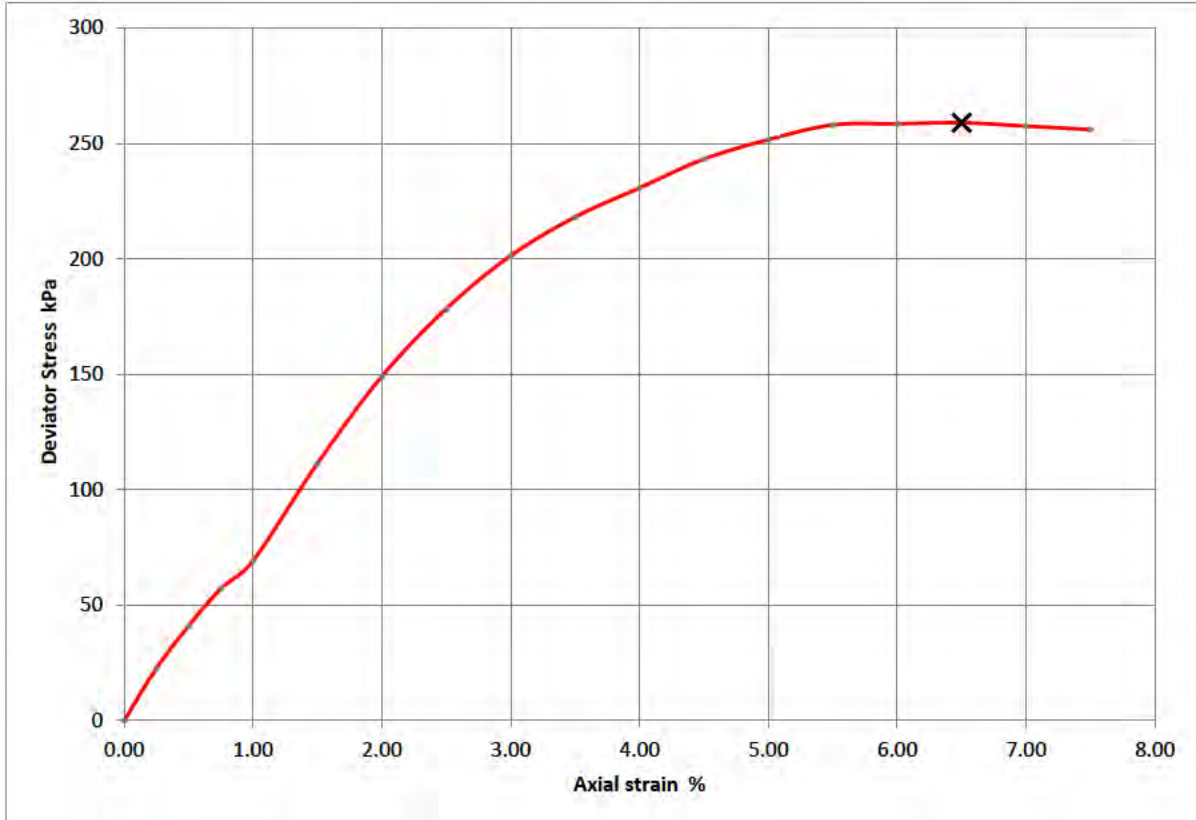




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA110
Sample No.	16
Depth Top (m)	7.00
Depth Base (m)	7.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Brown silty CLAY
Date Tested	18/04/2022



Moisture Content (%)	20
Bulk Density (Mg/m ³)	2.18
Dry Density (Mg/m ³)	1.81
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	259
Undrained Shear Strength (kPa)	129
Failure Strain (%)	7
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	

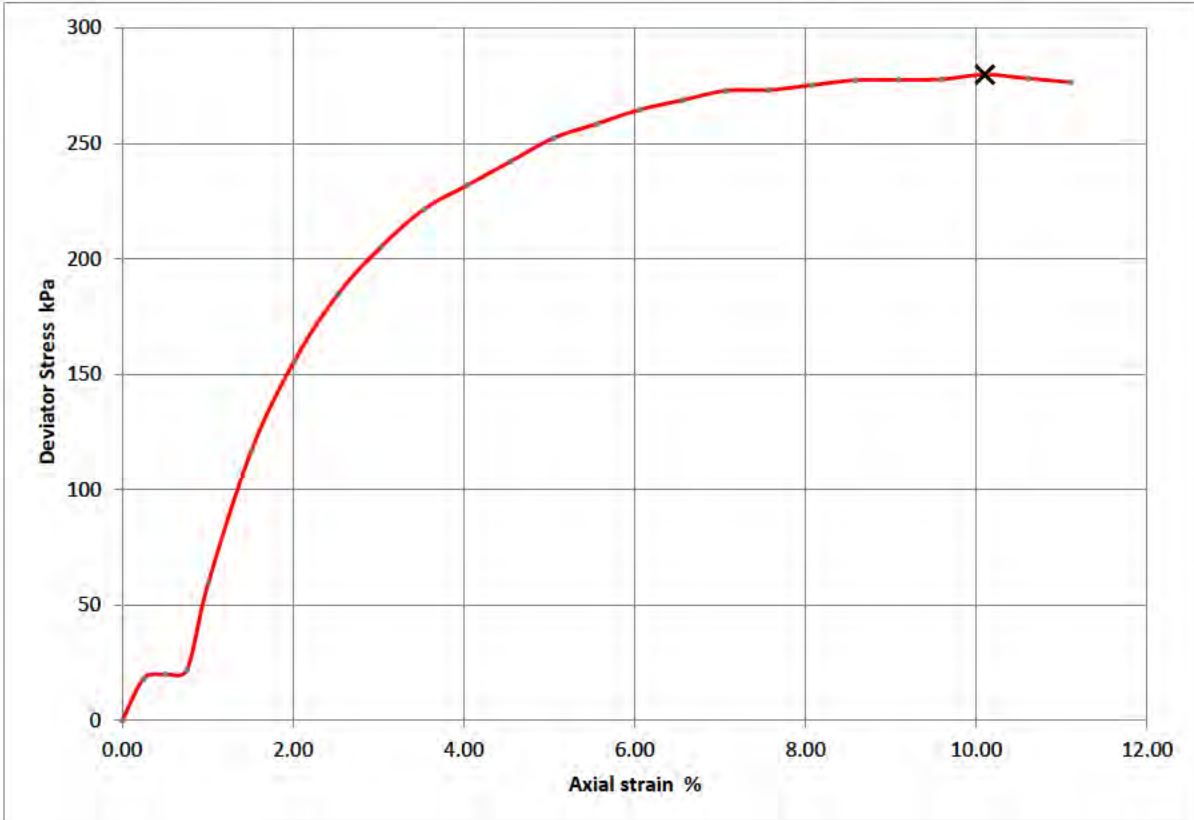




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	58610
Borehole/Pit No.	BHTCA202
Sample No.	20
Depth Top (m)	6.00
Depth Base (m)	6.45
Sample Type	U
Technician	Jordan

Site Name	Northstowe
Soil Description	Grey silty CLAY
Date Tested	13/04/2022



Moisture Content (%)	28
Bulk Density (Mg/m ³)	2.09
Dry Density (Mg/m ³)	1.63
Specimen Length (mm)	198
Specimen Diameter (mm)	101
Cell Pressure (kPa)	250
Deviator Stress (kPa)	280
Undrained Shear Strength (kPa)	140
Failure Strain (%)	10
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.52

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 58610

Borehole/Pit No. BHTCA202

Site Name Northstowe

Sample No. 27

Soil Description Greyish brown silty CLAY

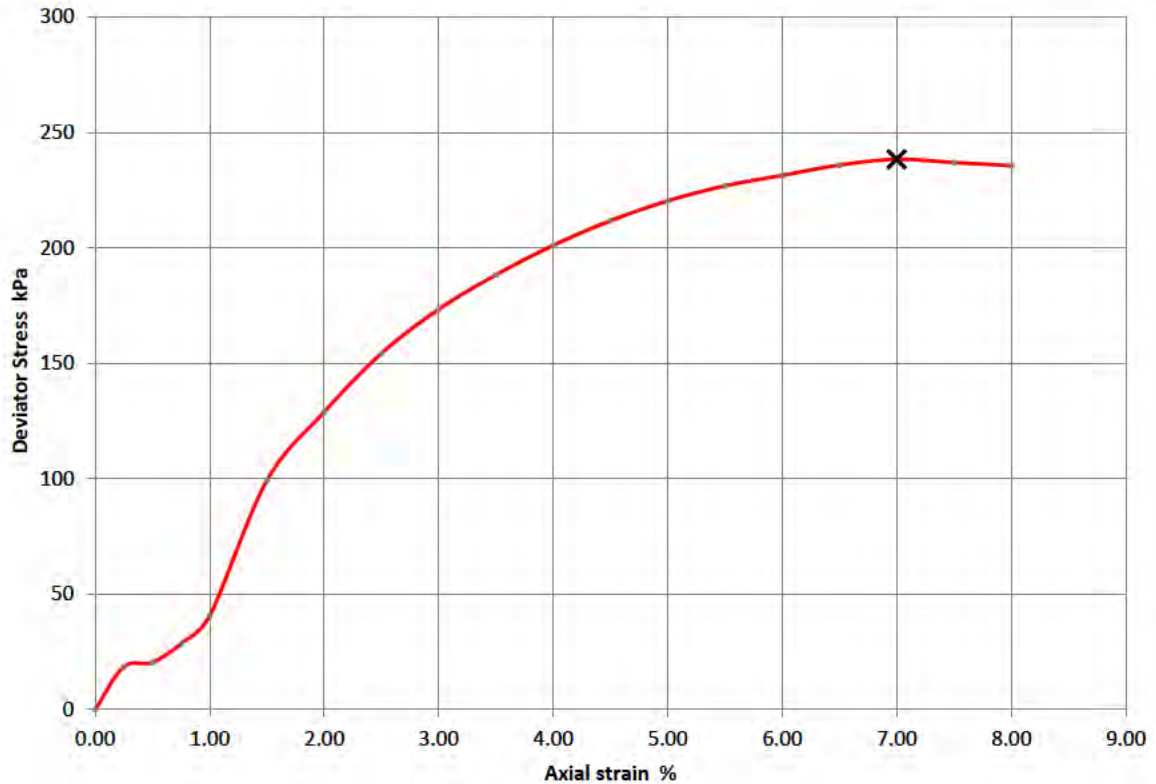
Depth Top (m) 8.00

Depth Base (m) 8.45

Date Tested 18/04/2022

Sample Type U

Technician Jordan



Moisture Content (%)	33
Bulk Density (Mg/m ³)	2.19
Dry Density (Mg/m ³)	1.65
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	238
Undrained Shear Strength (kPa)	119
Failure Strain (%)	7
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)
Approved	26/04/2022	Reg. 13(1)	





ANALYTICAL TEST REPORT

Contract no: 108224

Contract name: Northstowe

Client reference: NSTO

Clients name: Geo Site & Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 14 April 2022

Analysis started: 14 April 2022

Analysis completed: 25 April 2022

Report issued: 25 April 2022

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:

Reg. 13(1)

Reg. 13(1)

Reporting Team Lead

Chemtech Environmental Limited

SOILS

Lab number			108224-1	108224-2	108224-3	108224-4	108224-5	108224-6
Sample id			BHTCA101	BHTCA101	BHTCA101	BHTCA102	BH2C102	BHTCA102
Depth (m)			0.50-0.70	2.00-2.50	5.00-5.50	0.50-0.70	2.10- 2.50	3.50-4.00
Sample Type			B2	B6	B15	B2	B6	D11
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	8.7	8.9	8.8	8.6	8.2	7.9
Magnesium (2:1 water soluble)	CE061	mg/l Mg	1.8	2.5	13	28	14	55
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	6.0	3.6	7.7	8.0	8.9	67
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	5.9	1.2	1.9	20	2.2	4.4
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	427	55	362	1706	284	1066
Sulphate (total)	CE062 ^u	mg/kg SO ₄	2363	480	2787	4287	1770	4372
Sulphur (total)	CE119	mg/kg S	1060	229	7576	2907	909	4393
Sulphur (total)	CE119	% w/w S	0.11	0.02	0.76	0.29	0.09	0.44

Chemtech Environmental Limited

SOILS

Lab number			108224-7	108224-8	108224-9	108224-10	108224-11	108224-12
Sample id			BHTCA103A	BHTCA103A	BHTCA104	BHTCA104	BHTCA104	BHTCA107
Depth (m)			0.20-0.50	4.00-4.50	0.50-0.70	3.00-3.50	6.50-7.00	3.00-3.45
Sample Type			B1	B8	B2	B9	D19	B10
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	8.1	8.1	9.4	8.5	8.5	8.2
Magnesium (2:1 water soluble)	CE061	mg/l Mg	2.6	11	2.4	53	38	72
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	63	11	17	35	19	20
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	19	3.3	10	3.6	1.8	3.3
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	752	409	1456	1900	999	1626
Sulphate (total)	CE062 ^u	mg/kg SO ₄	2257	2065	3934	23098	4050	4946
Sulphur (total)	CE119	mg/kg S	1190	4559	1810	9459	8047	15498
Sulphur (total)	CE119	% w/w S	0.12	0.46	0.18	0.95	0.80	1.55

Chemtech Environmental Limited

SOILS

Lab number			108224-13	108224-14	108224-15	108224-16	108224-17	108224-18
Sample id			BHTCA107	BHTCA108	BHTCA108	BHTCA110	BHTCA202	BHTCA202
Depth (m)			5.00-5.45	0.50-0.80	5.00-5.45	0.40-0.60	0.20-0.60	1.70-2.00
Sample Type			B15	B1	D11	B2	B4	D7
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	8.2	8.3	8.0	8.0	8.1	8.3
Magnesium (2:1 water soluble)	CE061	mg/l Mg	38	8.6	82	34	31	19
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	11	7.4	18	9.2	7.8	8.1
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	2.4	6.8	1.7	20	31	5.6
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	884	240	1937	1505	1570	628
Sulphate (total)	CE062 ^u	mg/kg SO ₄	2989	660	18026	8075	10579	1596
Sulphur (total)	CE119	mg/kg S	6494	505	7555	2972	4256	683
Sulphur (total)	CE119	% w/w S	0.65	0.05	0.76	0.30	0.43	0.07

Chemtech Environmental Limited

SOILS

Lab number			108224-19	108224-20	108224-21	108224-22	108224-23	108224-24
Sample id			TPTCA102	TPTCA103	TPTCA104	TPTCA105	TPTCA113	TPTCA114
Depth (m)			0.50-1.00	0.50-1.00	0.20-0.80	0.20-0.50	2.00-3.00	0.20-0.50
Sample Type			D3	B3	D2	D2	B5	B2
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	8.3	8.0	8.2	10.1	9.0	8.1
Magnesium (2:1 water soluble)	CE061	mg/l Mg	2.6	16	5.6	<1	3.0	18
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	5.1	9.6	10	7.6	14	5.4
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	9.3	14	16	7.3	2.4	2.6
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	116	1510	167	608	116	1498
Sulphate (total)	CE062 ^u	mg/kg SO ₄	359	6568	488	1868	647	3732
Sulphur (total)	CE119	mg/kg S	173	3341	291	844	308	1486
Sulphur (total)	CE119	% w/w S	0.02	0.33	0.03	0.08	0.03	0.15

Chemtech Environmental Limited

SOILS

Lab number			108224-25	108224-26	108224-27	108224-28	108224-29	108224-30
Sample id			TPTCA114	TPTCA118	TPTCA204	TPTCA204	TPTCA208	WS2C101
Depth (m)			0.50-1.00	0.50-1.00	0.20-0.50	2.00-3.00	1.00-2.00	1.20-1.65
Sample Type			B3	B3	B2	D5	D4	D2
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	7.7	8.0	7.8	8.3	8.2	8.3
Magnesium (2:1 water soluble)	CE061	mg/l Mg	6.4	10	42	11	51	67
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	7.2	7.2	29	14	17	12
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	100	14	37	9.5	7.2	8.1
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	116	253	1630	763	1651	1715
Sulphate (total)	CE062 ^u	mg/kg SO ₄	539	904	14318	1750	8548	6178
Sulphur (total)	CE119	mg/kg S	317	370	5488	615	4331	2564
Sulphur (total)	CE119	% w/w S	0.03	0.04	0.55	0.06	0.43	0.26

Chemtech Environmental Limited

SOILS

Lab number			108224-31	108224-32	108224-33	108224-34	108224-35	108224-36
Sample id			WS2C106	WS2C108	WS2C108	WS2C112	WS2C120	WS2C120
Depth (m)			1.20-1.65	1.20-1.65	1.80-2.70	2.00-2.45	1.20-1.65	2.70-2.80
Sample Type			D2	D1	B2	D2	D1	D3
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	8.4	8.4	8.1	8.0	8.3	8.1
Magnesium (2:1 water soluble)	CE061	mg/l Mg	16	6.4	46	63	21	74
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	4.5	3.0	72	12	7.5	21
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	2.9	3.7	3.2	3.8	1.6	1.3
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	599	180	1586	1901	554	1932
Sulphate (total)	CE062 ^u	mg/kg SO ₄	1827	897	81273	16604	3367	26645
Sulphur (total)	CE119	mg/kg S	641	401	29260	6307	1373	10410
Sulphur (total)	CE119	% w/w S	0.06	0.04	2.93	0.63	0.14	1.04

Chemtech Environmental Limited

SOILS

Lab number			108224-37	108224-38	108224-39	108224-40	108224-41	108224-42
Sample id			WS2C121	WS2C121	WS2C123	WS2C123	WSTCA109	WSTCA112
Depth (m)			1.20-1.65	2.00-2.45	0.70	2.00-2.45	2.00-3.00	0.90-1.30
Sample Type			D2	D3	B1	D3	B3	B15
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	8.6	8.1	8.4	8.3	8.1	8.5
Magnesium (2:1 water soluble)	CE061	mg/l Mg	39	72	12	70	43	11
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	11	18	32	21	11	8.6
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	1.3	5.1	3.6	3.3	2.0	<1
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	1616	2066	873	1919	1820	431
Sulphate (total)	CE062 ^u	mg/kg SO ₄	5188	49024	2956	70761	16292	1402
Sulphur (total)	CE119	mg/kg S	1939	15257	1270	23080	11389	753
Sulphur (total)	CE119	% w/w S	0.19	1.53	0.13	2.31	1.14	0.08

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SOILS

Lab number			108224-43	108224-44
Sample id			WSTCA117	WSTCA117
Depth (m)			1.50-2.00	2.50-2.80
Sample Type			B2	B4
Date sampled			-	-
Test	Method	Units		
pH	CE004 ^u	un ts	8.1	7.7
Magnesium (2:1 water soluble)	CE061	mg/l Mg	5.9	69
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	9.6	19
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	1.3	1.7
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	138	1882
Sulphate (total)	CE062 ^u	mg/kg SO ₄	995	47633
Sulphur (total)	CE119	mg/kg S	457	16234
Sulphur (total)	CE119	% w/w S	0.05	1.62

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/l Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l Cl
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l NO ₃
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	100	mg/kg SO ₄
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		0.01	% w/w S

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
108224-1	BHTCA101	0.50-0.70	Y	All (NSD)
108224-2	BHTCA101	2.00-2.50	Y	All (NSD)
108224-3	BHTCA101	5.00-5.50	Y	All (NSD)
108224-4	BHTCA102	0.50-0.70	Y	All (NSD)
108224-5	BH2C102	2.10- 2.50	Y	All (NSD)
108224-6	BHTCA102	3.50-4.00	Y	All (NSD)
108224-7	BHTCA103A	0.20-0.50	Y	All (NSD)
108224-8	BHTCA103A	4.00-4.50	Y	All (NSD)
108224-9	BHTCA104	0.50-0.70	Y	All (NSD)
108224-10	BHTCA104	3.00-3.50	Y	All (NSD)
108224-11	BHTCA104	6.50-7.00	Y	All (NSD)
108224-12	BHTCA107	3.00-3.45	Y	All (NSD)
108224-13	BHTCA107	5.00-5.45	Y	All (NSD)
108224-14	BHTCA108	0.50-0.80	Y	All (NSD)
108224-15	BHTCA108	5.00-5.45	Y	All (NSD)
108224-16	BHTCA110	0.40-0.60	Y	All (NSD)
108224-17	BHTCA202	0.20-0.60	Y	All (NSD)
108224-18	BHTCA202	1.70-2.00	Y	All (NSD)
108224-19	TPTCA102	0.50-1.00	Y	All (NSD)
108224-20	TPTCA103	0.50-1.00	Y	All (NSD)
108224-21	TPTCA104	0.20-0.80	Y	All (NSD)
108224-22	TPTCA105	0.20-0.50	Y	All (NSD)
108224-23	TPTCA113	2.00-3.00	Y	All (NSD)
108224-24	TPTCA114	0.20-0.50	Y	All (NSD)
108224-25	TPTCA114	0.50-1.00	Y	All (NSD)
108224-26	TPTCA118	0.50-1.00	Y	All (NSD)
108224-27	TPTCA204	0.20-0.50	Y	All (NSD)
108224-28	TPTCA204	2.00-3.00	Y	All (NSD)
108224-29	TPTCA208	1.00-2.00	Y	All (NSD)
108224-30	WS2C101	1.20-1.65	Y	All (NSD)

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

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For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

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Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
108224-31	WS2C106	1.20-1.65	Y	All (NSD)
108224-32	WS2C108	1.20-1.65	Y	All (NSD)
108224-33	WS2C108	1.80-2.70	Y	All (NSD)
108224-34	WS2C112	2.00-2.45	Y	All (NSD)
108224-35	WS2C120	1.20-1.65	Y	All (NSD)
108224-36	WS2C120	2.70-2.80	Y	All (NSD)
108224-37	WS2C121	1.20-1.65	Y	All (NSD)
108224-38	WS2C121	2.00-2.45	Y	All (NSD)
108224-39	WS2C123	0.70	Y	All (NSD)
108224-40	WS2C123	2.00-2.45	Y	All (NSD)
108224-41	WSTCA109	2.00-3.00	Y	All (NSD)
108224-42	WSTCA112	0.90-1.30	Y	All (NSD)
108224-43	WSTCA117	1.50-2.00	Y	All (NSD)
108224-44	WSTCA117	2.50-2.80	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.



Contract Number: 59102

Client Ref:
Client PO: **14059902**

Report Date: **05-05-2022**

Client **Arcadis**
Fortran Rd
St Mellons
Cardiff
CF3 0EY

Contract Title: **Northstowe**
For the attention of: **Reg. 13(1)**

Date Received: **19-04-2022**
Date Completed: **05-05-2022**

Test Description	Qty
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	36
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	36
BRE Full Suite includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate Sub-contracted Test	7
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - * UKAS	5
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	3
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Reg. 13(1) (Business Support Manager) - Reg. 13(1) (Director) - Reg. 13(1) (Quality/Technical Manager)
Reg. 13(1) (Laboratory manager) - Reg. 13(1) (Site Manager) - Reg. 13(1) (Quality Assistant / Administrator / Health and Safety Coordinator)



**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	59102
Site Name	Northstowe
Date Tested	26/04/2022
DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BHTCA105	3	B	1.20	-	1.70	Brown gravelly silty CLAY
BHTCA105	5	B	2.00	-	2.50	Brown gravelly silty CLAY
BHTCA105	6	D	2.80	-	3.00	Grey fine to medium gravelly silty CLAY
BHTCA105	10	D	4.80	-	5.00	Grey silty CLAY
BHTCA105	14	D	6.80	-	7.00	Grey fine to medium gravelly silty CLAY
BHTCA105	18	D	8.80	-	9.00	Grey silty CLAY
BHTCA106	5	B	1.70	-	2.00	Brown gravelly silty CLAY
BHTCA106	10	D	3.45	-	3.55	Grey silty CLAY
BHTCA106	18	D	5.50	-	6.00	Grey fine to medium gravelly silty CLAY
BHTCA106	23	D	7.50	-	8.00	Grey silty CLAY
BHTCA106	26	D	8.50	-	9.00	Grey silty CLAY
BHTCA106	41	D	14.00	-	14.50	Brownish grey fine to medium gravelly silty CLAY
BHTCA106	49	D	17.00	-	17.50	Grey silty CLAY
TP2C102	3	D	1.60	-	3.00	Brown silty CLAY
TP2C103	6	D	0.50	-	1.40	Brown sandy silty CLAY
TP2C103	8	D	1.40	-	3.00	Grey silty CLAY
TP2C104	2	D	0.20	-	0.50	Brown gravelly silty CLAY
TP2C104	4	D	1.50	-	3.00	Grey silty CLAY
TP2C105	5	D	0.50	-	1.40	Brown silty CLAY
TP2C107	5	D	0.20	-	1.10	Brown silty CLAY
TP2C107	6	D	1.10	-	3.00	Brown silty CLAY
TP2C109	6	D	0.20	-	0.70	Brown gravelly silty CLAY
TP2C109	7	D	0.70	-	1.70	Brown silty CLAY
TP2C110	5	D	0.50	-	1.90	Brown silty CLAY

Operators	Checked	04/05/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	04/05/2022	Reg. 13(1) (Quality/Technical Manager)



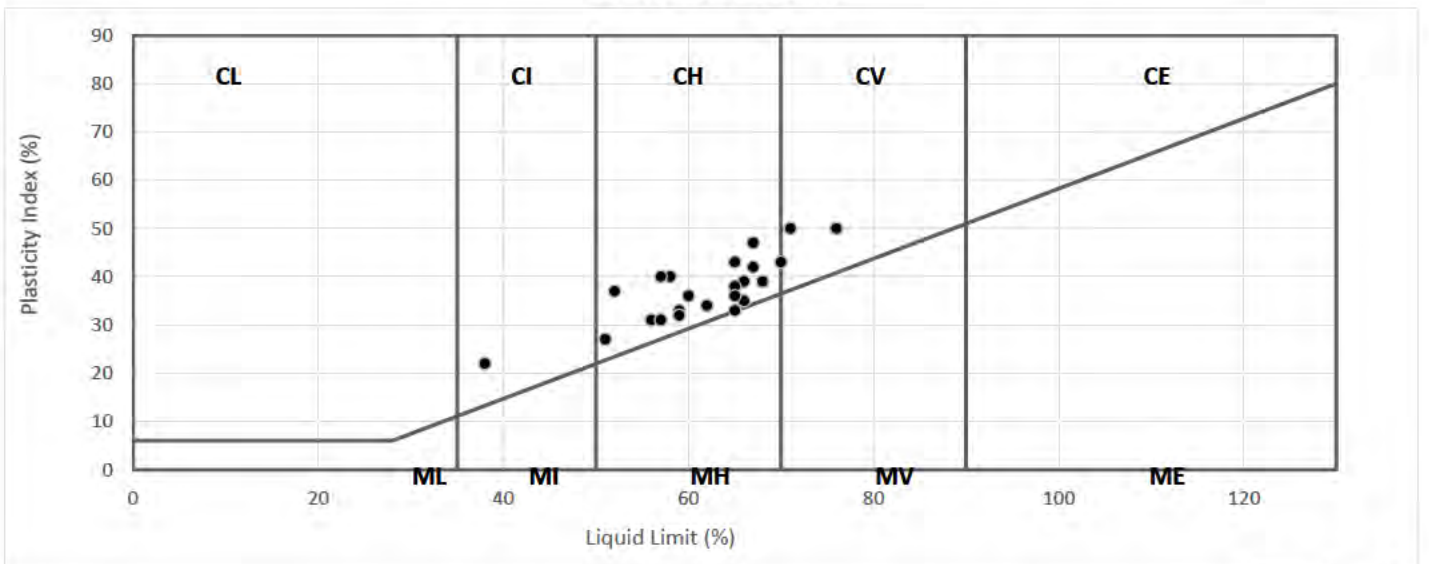
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	59102
Project Location	Northstowe
Date Tested	26/04/2022

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
				-							
BHTCA105	3	B	1.20	-	1.70	19	38	16	22	84	CI Intermediate Plasticity
BHTCA105	5	B	2.00	-	2.50	26	67	25	42	87	CH High Plasticity
BHTCA105	6	D	2.80	-	3.00	32	68	29	39	95	CH High Plasticity
BHTCA105	10	D	4.80	-	5.00	34	62	28	34	100	CH High Plasticity
BHTCA105	14	D	6.80	-	7.00	30	51	24	27	96	CH High Plasticity
BHTCA105	18	D	8.80	-	9.00	39	65	32	33	100	CH High Plasticity
BHTCA106	5	B	1.70	-	2.00	37	62	28	34	95	CH High Plasticity
BHTCA106	10	D	3.45	-	3.55	40	66	31	35	100	CH High Plasticity
BHTCA106	18	D	5.50	-	6.00	24	65	22	43	96	CH High Plasticity
BHTCA106	23	D	7.50	-	8.00	29	70	27	43	100	CH/V High/HighPlasticity
BHTCA106	26	D	8.50	-	9.00	32	66	27	39	100	CH High Plasticity
BHTCA106	41	D	14.00	-	14.50	34	56	25	31	96	CH High Plasticity
BHTCA106	49	D	17.00	-	17.50	32	57	26	31	100	CH High Plasticity
TP2C102	3	D	1.60	-	3.00	27	67	20	47	100	CH High Plasticity
TP2C103	6	D	0.50	-	1.40	27	76	26	50	100	CV Very High Plasticity
TP2C103	8	D	1.40	-	3.00	28	65	27	38	100	CH High Plasticity
TP2C104	2	D	0.20	-	0.50	29	59	26	33	94	CH High Plasticity
TP2C104	4	D	1.50	-	3.00	30	60	24	36	100	CH High Plasticity
TP2C105	5	D	0.50	-	1.40	33	58	18	40	100	CH High Plasticity
TP2C107	5	D	0.20	-	1.10	30	59	27	32	100	CH High Plasticity
TP2C107	6	D	1.10	-	3.00	40	65	29	36	100	CH High Plasticity
TP2C109	6	D	0.20	-	0.70	17	52	15	37	85	CH High Plasticity
TP2C109	7	D	0.70	-	1.70	18	57	17	40	100	CH High Plasticity
TP2C110	5	D	0.50	-	1.90	24	71	21	50	100	CV Very High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010



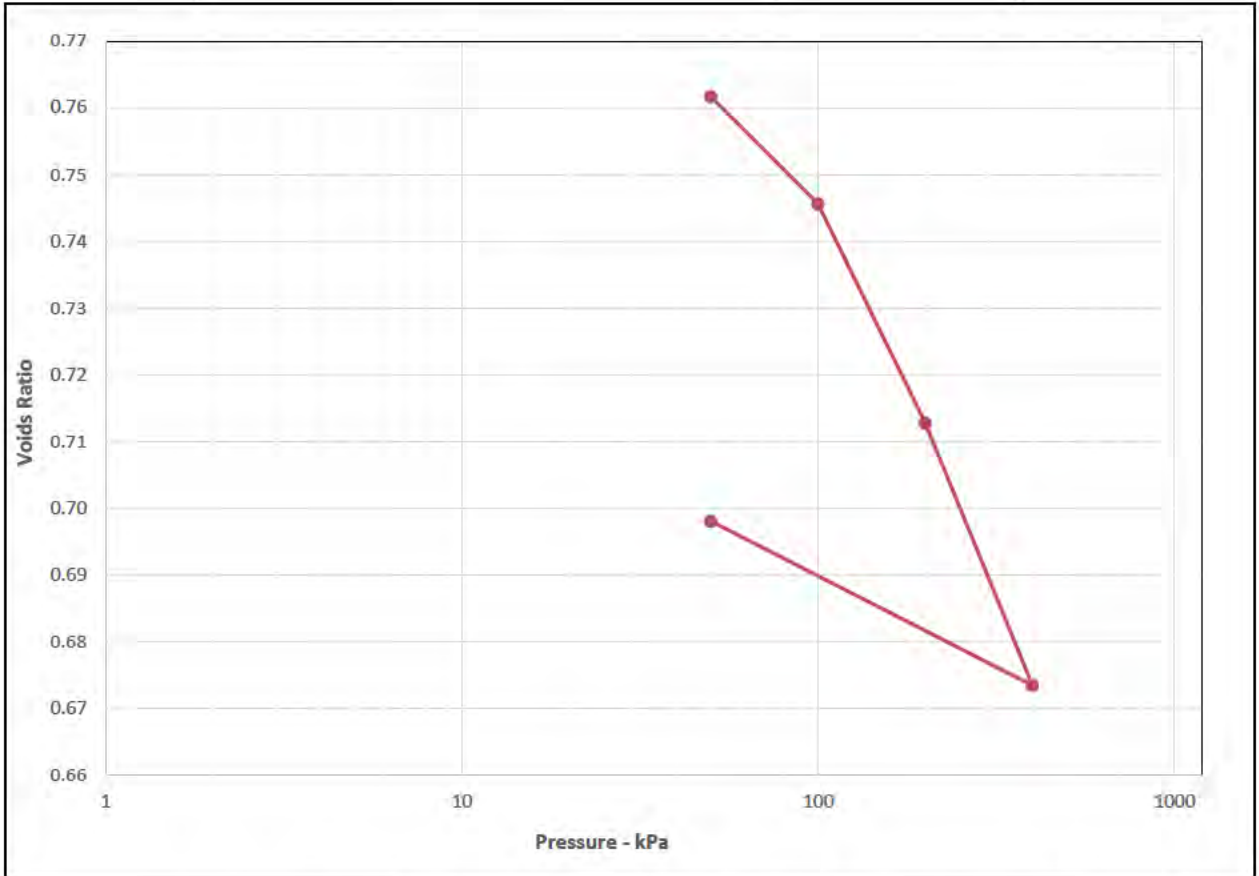
Operators	Checked	04/05/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	04/05/2022	Reg. 13(1) (Quality/Technical Manager)





**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

		Contract Number	59102
		Borehole/Trialpit No.	BHTCA105
Site Name	Northstowe	Sample No.	7
Soil Description	Grey silty CLAY	Depth Top (m)	3.00
		Depth Base (m)	3.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	26/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
		Moisture Content (%)	31	0	-	50	-0.2	SWELL	
Bulk Density (Mg/m3)	1.98	50	-	100	0.18	6.2			
Dry Density (Mg/m3)	1.52	100	-	200	0.19	3.1			
Voids Ratio	0.7488	200	-	400	0.11	0.2			
Degree of saturation	108.6	400	-	50	0.042	0.98			
Height (mm)	18.68		-						
Diameter (mm)	75.09		-						
Particle Density (Mg/m3)	2.65		-						

Operators	Checked	04/05/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	05/05/2022	Reg. 13(1)	





ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number

59102

Borehole/Trialpit No.

BHTCA105

Site Name

Northstowe

Sample No.

19

Soil Description

Grey silty CLAY

Depth Top (m)

9.00

Depth Base (m)

9.45

Lab Temperature

20°C

Sample Location

Top

Remarks

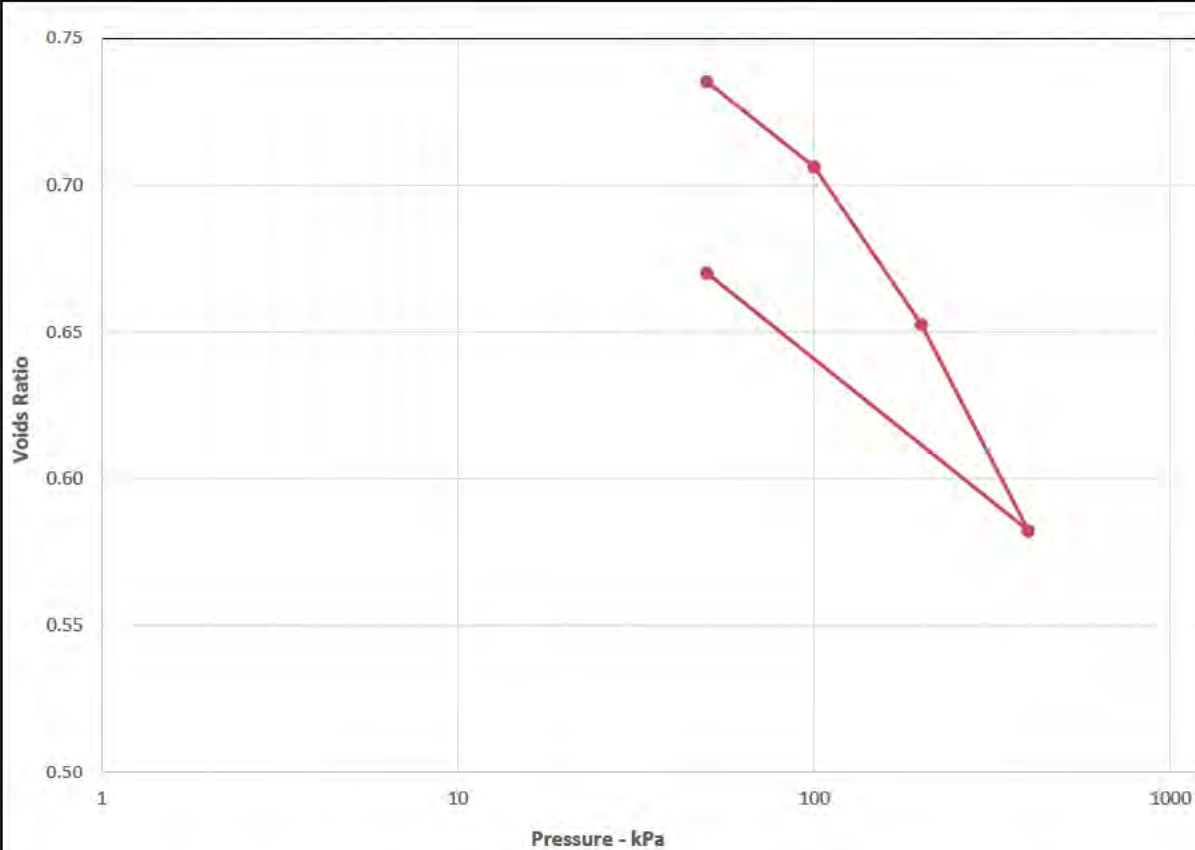
Cv Calculated Using T90
 Particle Density Assumed Unless Stated Otherwise

Sample Type

U

Date Tested

26/04/2022



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	29	0	- 50	-0.3	SWELL		-		
Bulk Density (Mg/m3)	1.99	50	- 100	0.33	10		-		
Dry Density (Mg/m3)	1.55	100	- 200	0.31	9.9		-		
Voids Ratio	0.7129	200	- 400	0.21	4.5		-		
Degree of saturation	106.2	400	- 50	0.16	1.6		-		
Height (mm)	19.8		-				-		
Diameter (mm)	75.11		-				-		
Particle Density (Mg/m3)	2.65		-				-		

Operators	Checked	04/05/2022	Reg. 13(1)	Reg. 13(1)
Reg. 13(1)	Approved	05/05/2022	Reg. 13(1)	

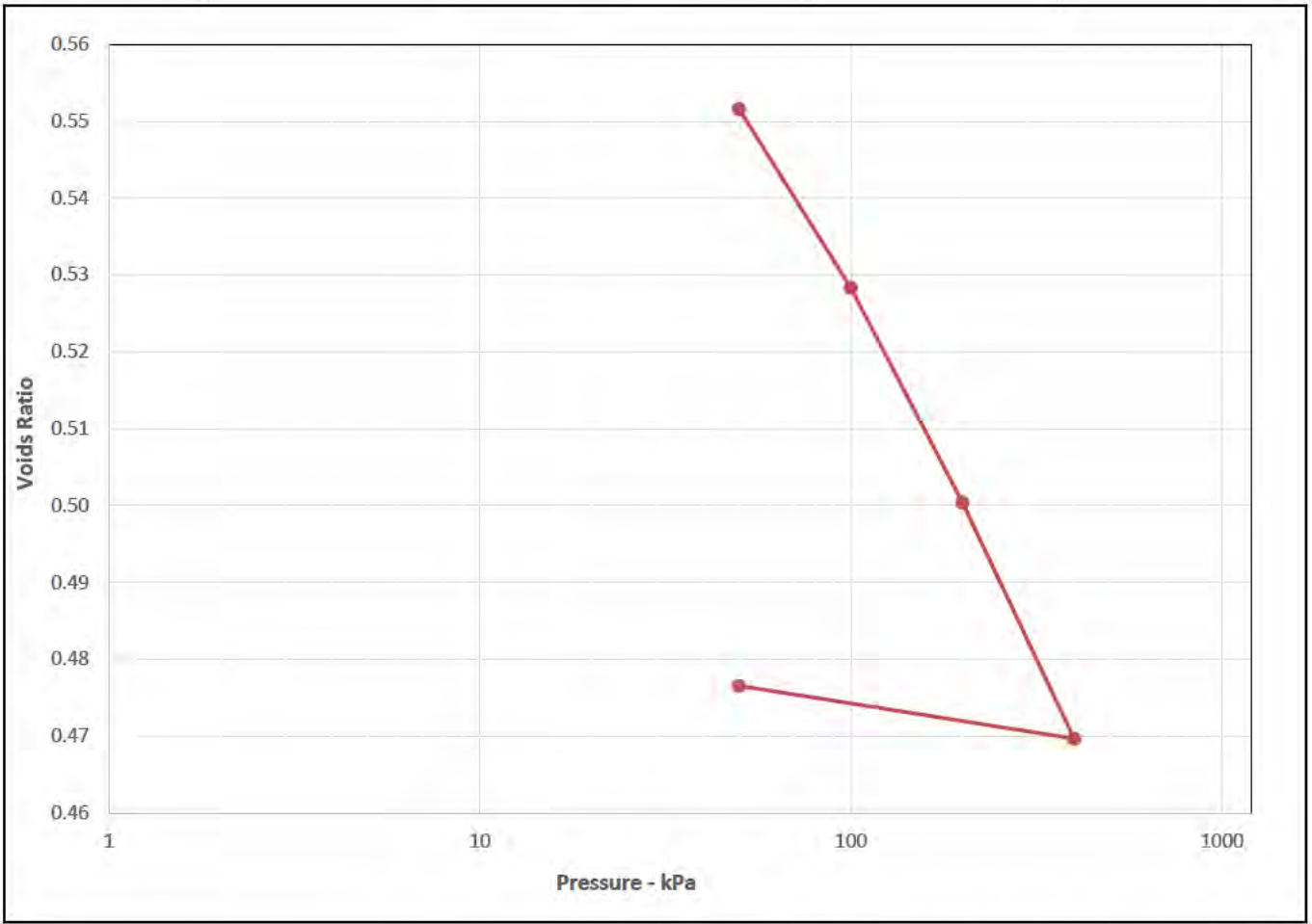




ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

Contract Number 59102
 Borehole/Trialpit No. BHTCA106

Site Name	Northstowe	Sample No.	9
Soil Description	Grey silty CLAY	Depth Top (m)	3.00
		Depth Base (m)	3.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	26/04/2022		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	24	0	-	50	0.5	1.3		-			
Bulk Density (Mg/m3)	2.07	50	-	100	0.3	1.8		-			
Dry Density (Mg/m3)	1.67	100	-	200	0.18	3.2		-			
Voids Ratio	0.5893	200	-	400	0.10	9.1		-			
Degree of saturation	108.2	400	-	50	0.013	6		-			
Height (mm)	20.27		-					-			
Diameter (mm)	50.28		-					-			
Particle Density (Mg/m3)	2.65		-					-			

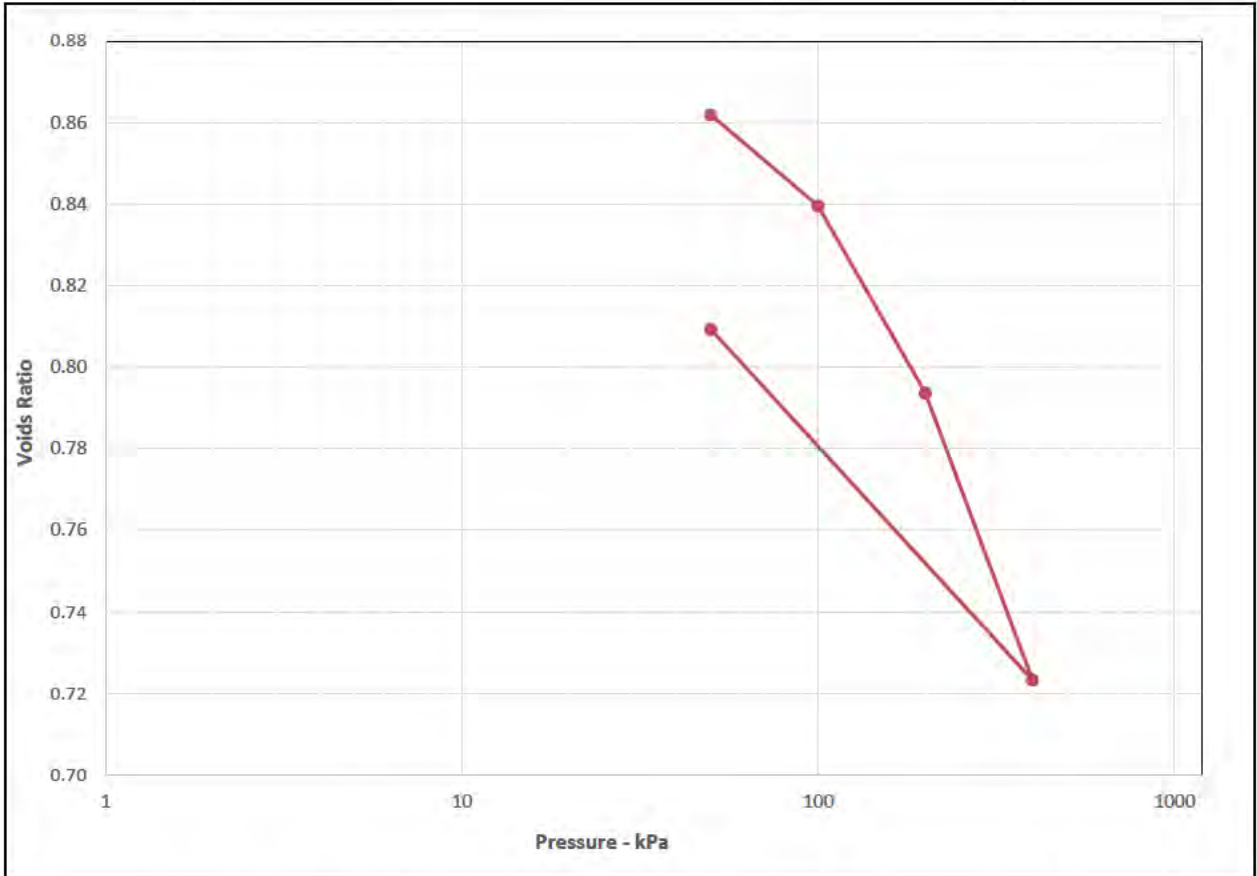
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Reg. 13(1)	Approved	05/05/2022	Reg. 13(1)	





ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3

		Contract Number	59102
		Borehole/Trialpit No.	BHTCA106
Site Name	Northstowe	Sample No.	24
Soil Description	Grey silty CLAY	Depth Top (m)	8.00
		Depth Base (m)	8.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	26/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	33	0	-	50	0.0	SWELL			
Bulk Density (Mg/m3)	1.90	50	-	100	0.24	1.9			
Dry Density (Mg/m3)	1.43	100	-	200	0.25	1.2			
Voids Ratio	0.8580	200	-	400	0.20	0.7			
Degree of saturation	101.8	400	-	50	0.14	0.33			
Height (mm)	20.15		-						
Diameter (mm)	50.3		-						
Particle Density (Mg/m3)	2.65		-						

Operators	Checked	04/05/2022	Reg. 13(1)
Reg. 13(1)	Approved	05/05/2022	Reg. 13(1)

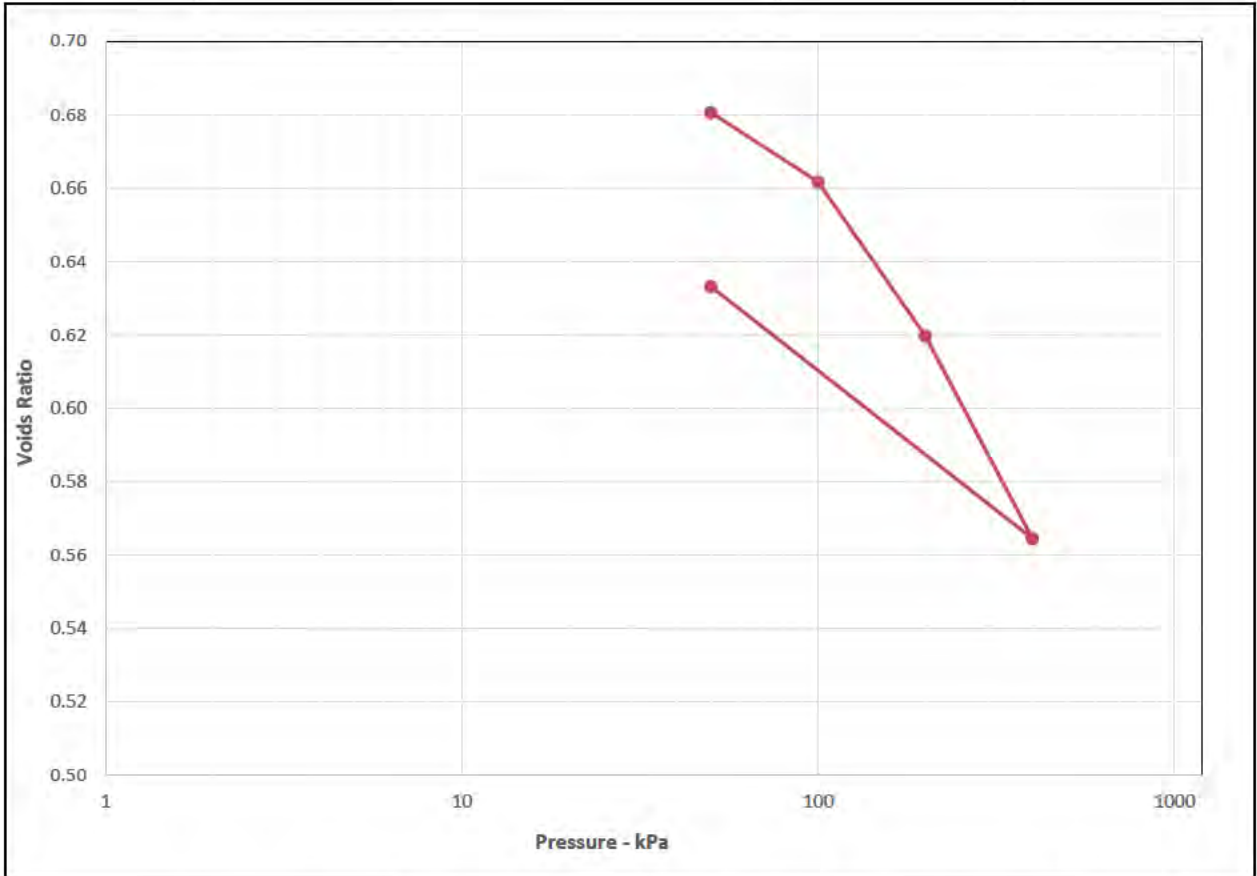
Reg. 13(1)





**ONE DIMENSIONAL CONSOLIDATION TEST
BS1377:Part 5:1990, clause 3**

Contract Number	59102		
	Borehole/Trialpit No.	BHTCA106	
Site Name	Northstowe	Sample No.	38
Soil Description	Grey silty CLAY	Depth Top (m)	13.00
		Depth Base (m)	13.45
Lab Temperature	20°C	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	26/04/2022		



Initial Sample Conditions		Pressure Range		Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr
Moisture Content (%)	29	0	- 50	-0.3	SWELL		-		
Bulk Density (Mg/m3)	2.06	50	- 100	0.22	3.7		-		
Dry Density (Mg/m3)	1.60	100	- 200	0.25	3.5		-		
Voids Ratio	0.6566	200	- 400	0.17	6.8		-		
Degree of saturation	115.8	400	- 50	0.13	1.1		-		
Height (mm)	19.9		-				-		
Diameter (mm)	50.21		-				-		
Particle Density (Mg/m3)	2.65		-				-		

Operators	Checked	04/05/2022	Reg. 13(1)
Reg. 13(1)	Approved	05/05/2022	Reg. 13(1)

Reg. 13(1)

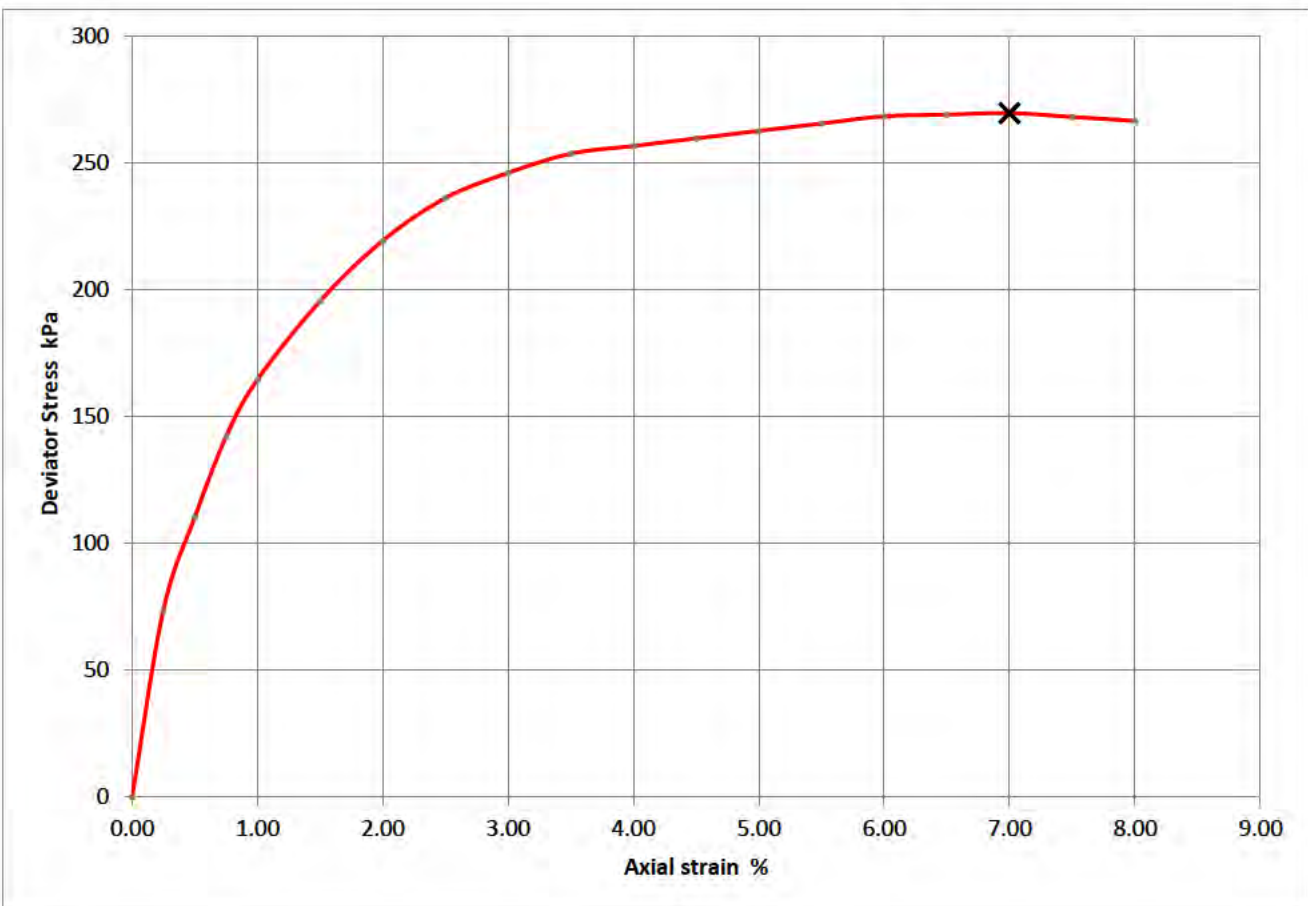




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	59102
Borehole/Pit No.	BHTCA105
Sample No.	15
Depth Top (m)	7.00
Depth Base (m)	7.45
Sample Type	U
Technician	Daniel B

Site Name	Northstowe
Soil Description	Grey silty CLAY
Date Tested	03/05/2022



Moisture Content (%)	25
Bulk Density (Mg/m ³)	1.74
Dry Density (Mg/m ³)	1.39
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	270
Undrained Shear Strength (kPa)	135
Failure Strain (%)	7
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	04/05/2022	Reg. 13(1)	Reg. 13(1)
Approved	05/05/2022	Reg. 13(1)	

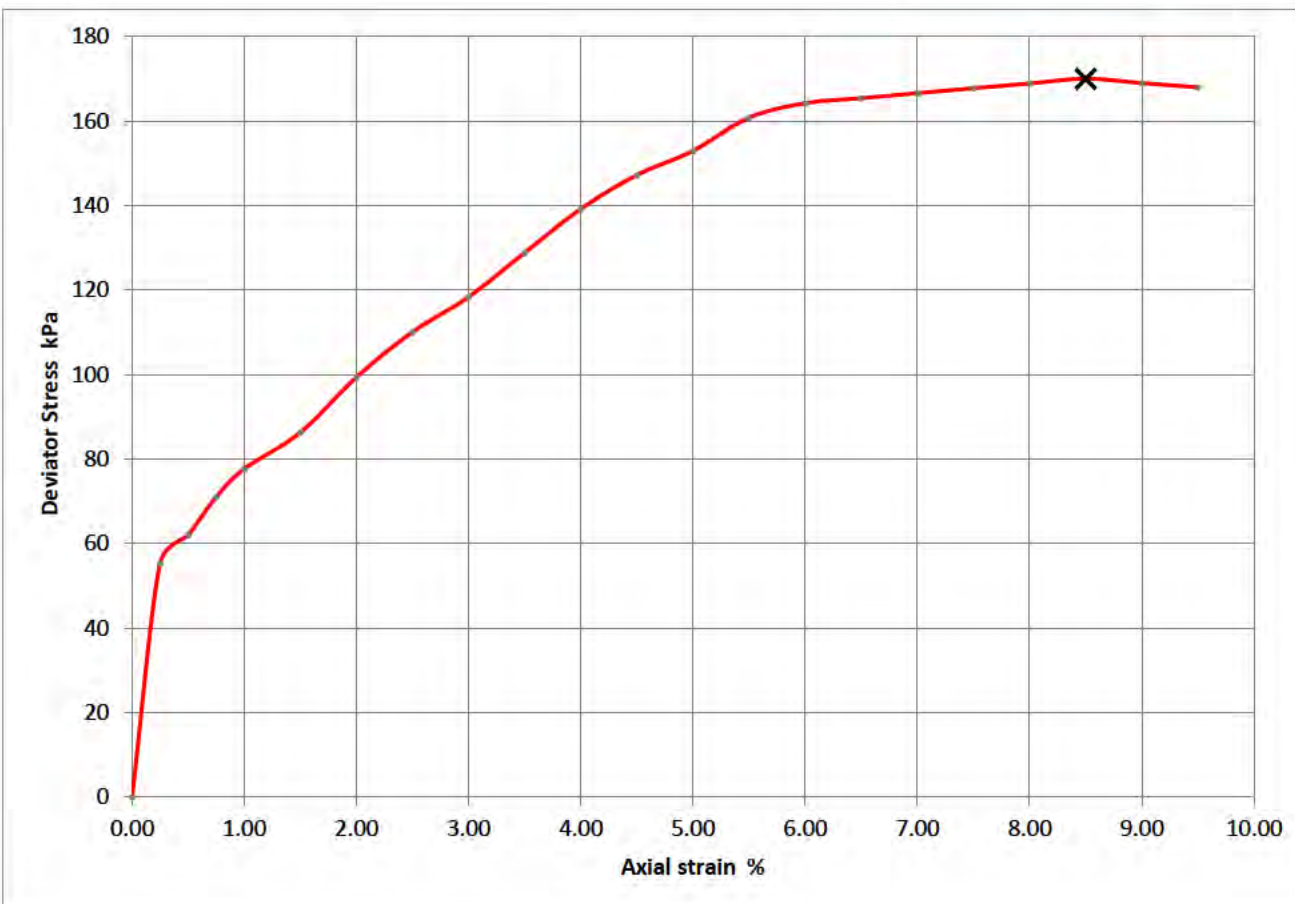




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	59102
Borehole/Pit No.	BHTCA106
Sample No.	16
Depth Top (m)	5.00
Depth Base (m)	5.45
Sample Type	U
Technician	Daniel B

Site Name	Northstowe
Soil Description	Grey CLAY
Date Tested	03/05/2022



Moisture Content (%)	26
Bulk Density (Mg/m ³)	2.21
Dry Density (Mg/m ³)	1.76
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	170
Undrained Shear Strength (kPa)	85
Failure Strain (%)	9
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	04/05/2022	Reg. 13(1)	Reg. 13(1)
Approved	05/05/2022	Reg. 13(1)	

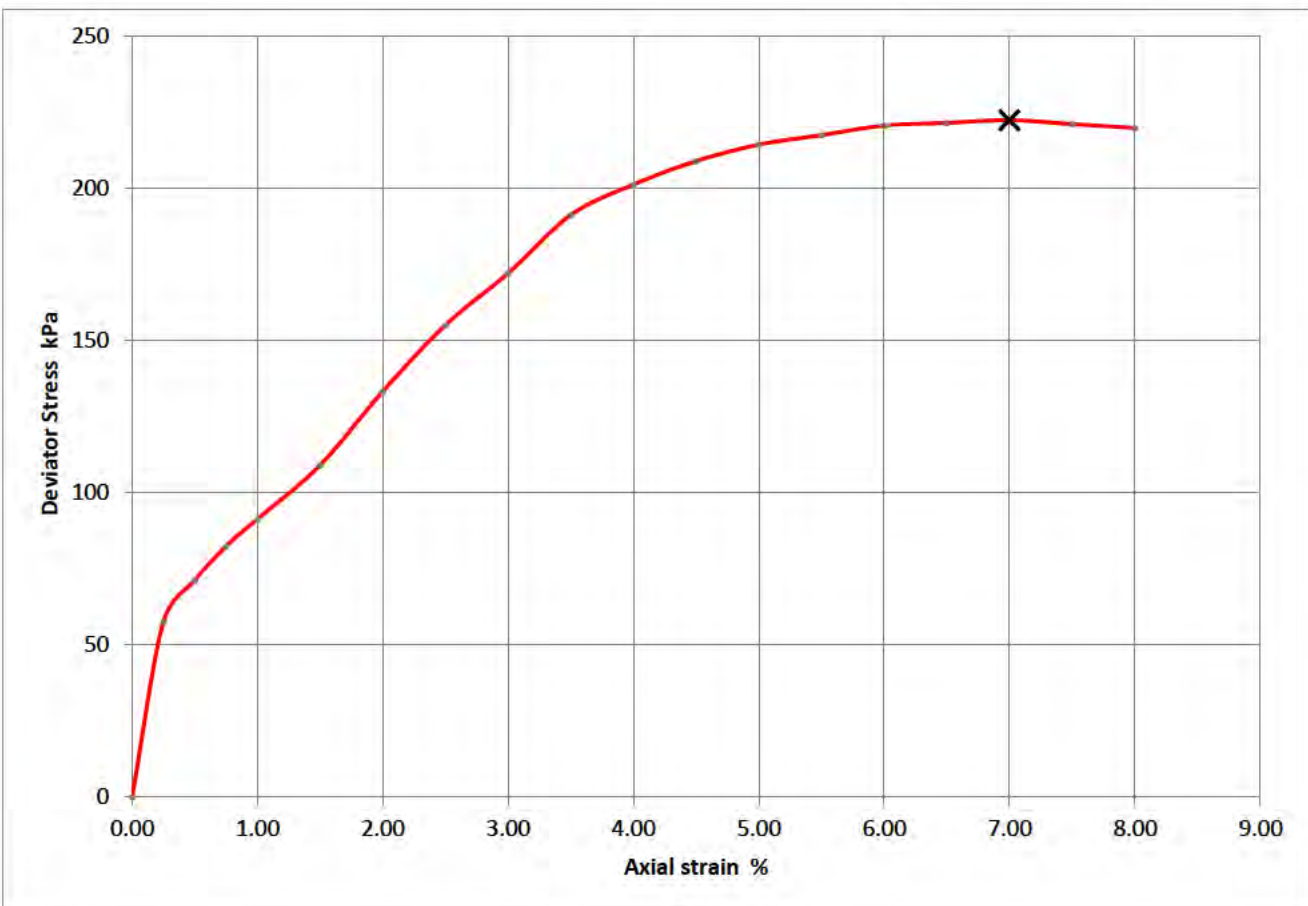




Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number	59102
Borehole/Pit No.	BHTCA106
Sample No.	24
Depth Top (m)	8.00
Depth Base (m)	8.45
Sample Type	U
Technician	Daniel B

Site Name	Northstowe
Soil Description	Grey silty CLAY
Date Tested	03/05/2022



Moisture Content (%)	38
Bulk Density (Mg/m ³)	1.44
Dry Density (Mg/m ³)	1.05
Specimen Length (mm)	200
Specimen Diameter (mm)	100
Cell Pressure (kPa)	250
Deviator Stress (kPa)	223
Undrained Shear Strength (kPa)	111
Failure Strain (%)	7
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.50

Checked	04/05/2022	Reg. 13(1)	Reg. 13(1)
Approved	05/05/2022	Reg. 13(1)	





ANALYTICAL TEST REPORT

Contract no: 108536

Contract name: Northstowe

Client reference: 59102

Clients name: Geo Site & Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 25 April 2022

Analysis started: 25 April 2022

Analysis completed: 03 May 2022

Report issued: 03 May 2022

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:

Reg. 13(1)

Reg. 13(1)

Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			108536-1	108536-2	108536-3	108536-4	108536-5	108536-6
Sample id			BHTCA105	BHTCA106	BHTCA106	BHTCA106	BHTCA106	BHTCA106
Depth (m)			0.10-0.50	0.20-0.40	1.70-2.00	4.00-4.50	7.00-7.50	14.50-15.00
Sample Type			B1	B1	B5	B14	B22	B43
Date sampled			-	-	-	-	-	-
Test	Method	Units						
pH	CE004 ^u	un ts	7.8	8.4	8.1	8.6	8.3	8.5
Magnesium (2:1 water soluble)	CE061	mg/l Mg	5.1	31	8.2	17	28	17
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	6.7	23	88	24	26	20
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	3.9	6.9	10	2.5	2.0	2.8
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	74	709	198	420	655	481
Sulphate (total)	CE062 ^u	mg/kg SO ₄	433	3777	856	826	3793	2959
Sulphur (total)	CE119	mg/kg S	594	7909	774	6351	12282	9993
Sulphur (total)	CE119	% w/w S	0.06	0.79	0.08	0.64	1.23	1.00

Chemtech Environmental Limited

SOILS

Lab number	108536-7		
Sample id	BHTCA106		
Depth (m)	16.50-17.00		
Sample Type	B48		
Date sampled	-		
Test	Method	Units	
pH	CE004 ^u	un ts	8.3
Magnesium (2:1 water soluble)	CE061	mg/l Mg	17
Chloride (2:1 water soluble)	CE049 ^u	mg/l Cl	60
Nitrate (2:1 water soluble)	CE049 ^u	mg/l NO ₃	5.9
Sulphate (2:1 water soluble)	CE061 ^u	mg/l SO ₄	638
Sulphate (total)	CE062 ^u	mg/kg SO ₄	2263
Sulphur (total)	CE119	mg/kg S	12399
Sulphur (total)	CE119	% w/w S	1.24

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/l Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l Cl
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l NO ₃
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	100	mg/kg SO ₄
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		0.01	% w/w S

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
108536-1	BHTCA105	0.10-0.50	Y	All (NSD)
108536-2	BHTCA106	0.20-0.40	Y	All (NSD)
108536-3	BHTCA106	1.70-2.00	Y	All (NSD)
108536-4	BHTCA106	4.00-4.50	Y	All (NSD)
108536-5	BHTCA106	7.00-7.50	Y	All (NSD)
108536-6	BHTCA106	14.50-15.00	Y	All (NSD)
108536-7	BHTCA106	16.50-17.00	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

APPENDIX G

GEO-ENVIRONMENTAL LABORATORY TEST DATA



Reg. 13(1)

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e: reception@i2analytical.com

Analytical Report Number : 22-45875

Project / Site name:	Northstowe	Samples received on:	15/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	15/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	3 soil samples		

Reg. 13(1)

Signed:

Reg. 13(1)

Technical Reviewer (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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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: 22-45875

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number				2206534	2206535	2206536
Sample Reference				BHTCA101	BHTCA202	BHTCA202
Sample Number				2	1	3
Depth (m)				0.50	0.20	1.00
Date Sampled				09/03/2022	09/03/2022	09/03/2022
Time Taken				1437	1440	1442
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	26	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.6	17	14
Total mass of sample received	kg	0.001	NONE	1	1	1

General Inorganics

Parameter	pH Units	N/A	MCERTS	9.5	8.8	8.2
pH - Automated						
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.011	0.007	0.0059

Heavy Metals / Metalloids

Parameter	mg/kg	1	MCERTS	14	17	15
Arsenic (aqua regia extractable)						
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	27	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	15	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	18	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	28	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	61	61	59

Petroleum Hydrocarbons

Parameter	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1
TPH Texas (C6 - C8) HS_1D_TOTAL						
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH Texas (C10 - C12) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	11	< 10	< 10
TPH Texas (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	21	< 10	< 10
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	32	< 10	< 10

Analytical Report Number: 22-45875

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2206534			2206535			2206536		
Sample Reference	BHTCA101			BHTCA202			BHTCA202		
Sample Number	2			1			3		
Depth (m)	0.50			0.20			1.00		
Date Sampled	09/03/2022			09/03/2022			09/03/2022		
Time Taken	1437			1440			1442		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

SVOCS

Compound	Units	Limit of detection	Accreditation Status	2206534	2206535	2206536
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	2.1	0.6	0.22
Anthracene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	5	1.4	0.49
Pyrene	mg/kg	0.05	MCERTS	5.3	1.4	0.49
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.6	0.67	0.2
Chrysene	mg/kg	0.05	MCERTS	2.2	0.67	0.24
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.1	0.78	0.31
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.1	0.35	0.07
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.5	0.57	0.23



Analytical Report Number: 22-45875
 Project / Site name: Northstowe
 Your Order No: 14059900

Lab Sample Number				2206534	2206535	2206536
Sample Reference				BHTCA101	BHTCA202	BHTCA202
Sample Number				2	1	3
Depth (m)				0.50	0.20	1.00
Date Sampled				09/03/2022	09/03/2022	09/03/2022
Time Taken				1437	1440	1442
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.29	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	0.39	< 0.05

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



Analytical Report Number : 22-45875
Project / Site name: Northstowe

* 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 *
2206534	BHTCA101	2	0.5	Brown clay and sand with gravel and stones.
2206535	BHTCA202	1	0.2	Grey clay and sand with gravel.
2206536	BHTCA202	3	1	Brown clay and sand with gravel.

Analytical Report Number : 22-45875

Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphencylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC FID	In-house method	L088/L076	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



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Analytical Report Number : 22-45878

Project / Site name:	Northstowe	Samples received on:	15/03/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	16/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	4 soil samples		

Signed:

Reg. 13(1)

Reg. 13(1)

Technical Reviewer (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: 22-45878

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number				2206546	2206547	2206548	2206549
Sample Reference				BHTCA102	BHTCA103	BHTCA103A	BHTCA103A
Sample Number				2	1	3	6
Depth (m)				0.50	0.20	1.00	2.00
Date Sampled				10/03/2022	10/03/2022	10/03/2022	10/03/2022
Time Taken				1539	1455	1612	1705
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	28	< 0.1
Moisture Content	%	0.01	NONE	14	10	9.6	11
Total mass of sample received	kg	0.001	NONE	1	1	1	1

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A		NTK		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.1	7.7	10.4	8.9
Total Cyanide	mg/kg	1	MCERTS	-	< 1.0	-	-
Free Cyanide	mg/kg	1	MCERTS	-	< 1.0	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.53	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.009	-	0.011	< 0.0010

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	0.23	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	1.7	-	-
Anthracene	mg/kg	0.05	MCERTS	-	0.42	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	4.5	-	-
Pyrene	mg/kg	0.05	MCERTS	-	3.9	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	2.2	-	-
Chrysene	mg/kg	0.05	MCERTS	-	1.6	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	1.6	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	1.3	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	1.9	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.99	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.25	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.99	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	21.6	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	18	14	15
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.9	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	0.5	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	23	23	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	17	22	9.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	19	25	7.5
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	23	22	21	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	71	63	82	28

Analytical Report Number: 22-45878

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2206546			2206547			2206548			2206549		
Sample Reference	BHTCA102			BHTCA103			BHTCA103A			BHTCA103A		
Sample Number	2			1			3			6		
Depth (m)	0.50			0.20			1.00			2.00		
Date Sampled	10/03/2022			10/03/2022			10/03/2022			10/03/2022		
Time Taken	1539			1455			1612			1705		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	2206546	2206547	2206548	2206549
TPH Texas (C6 - C8) <small>HS_1D_TOTAL</small>	mg/kg	0.1	ISO 17025	< 0.1	-	< 0.1	< 0.1
TPH Texas (C8 - C10) <small>HS_1D_TOTAL</small>	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
TPH Texas (C10 - C12) <small>EH_CU_1D_TOTAL</small>	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0
TPH Texas (C12 - C16) <small>EH_CU_1D_TOTAL</small>	mg/kg	4	MCERTS	< 4.0	-	< 4.0	< 4.0
TPH Texas (C16 - C21) <small>EH_CU_1D_TOTAL</small>	mg/kg	10	MCERTS	< 10	-	10	< 10
TPH Texas (C21 - C40) <small>EH_CU_1D_TOTAL</small>	mg/kg	10	MCERTS	25	-	26	< 10
TPH Texas (C6 - C40) <small>EH_CU+HS_1D_TOTAL</small>	mg/kg	10	NONE	25	-	36	< 10

Analytical Report Number: 22-45878

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2206546			2206547			2206548			2206549		
Sample Reference	BHTCA102			BHTCA103			BHTCA103A			BHTCA103A		
Sample Number	2			1			3			6		
Depth (m)	0.50			0.20			1.00			2.00		
Date Sampled	10/03/2022			10/03/2022			10/03/2022			10/03/2022		
Time Taken	1539			1455			1612			1705		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									

SVOCS

Compound	Units	Limit of detection	Accreditation Status	2206546	2206547	2206548	2206549
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.6	-	0.47	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.25	-	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	2.9	-	1.5	< 0.05
Pyrene	mg/kg	0.05	MCERTS	2.7	-	1.5	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	-	0.76	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.2	-	0.73	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	-	0.74	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1	-	0.39	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	-	0.77	< 0.05



Analytical Report Number: 22-45878

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number				2206546	2206547	2206548	2206549
Sample Reference				BHTCA102	BHTCA103	BHTCA103A	BHTCA103A
Sample Number				2	1	3	6
Depth (m)				0.50	0.20	1.00	2.00
Date Sampled				10/03/2022	10/03/2022	10/03/2022	10/03/2022
Time Taken				1539	1455	1612	1705
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
				Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1	-	0.45	< 0.05

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



Analytical Report Number : 22-45878

Project / Site name: Northstowe

* 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 *
2206546	BHTCA102	2	0.5	Brown clay and sand with gravel.
2206547	BHTCA103	1	0.2	Brown clay and sand with gravel.
2206548	BHTCA103A	3	1	Brown clay and sand with stones and gravel
2206549	BHTCA103A	6	2	Brown clay and sand with gravel.

Analytical Report Number : 22-45878

Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

Analytical Report Number : 22-45878
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC FID	In-house method	L088/L076	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Reg. 13(1)

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Analytical Report Number : 22-45879

Project / Site name:	Northstowe	Samples received on:	15/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	15/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	3 soil samples		

Reg. 13(1)

Signed:

Reg. 13(1)

Technical Reviewer (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: 22-45879

Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number				2206550	2206551	2206552
Sample Reference				WSTCA109	WSTCA112	WSTCA116
Sample Number				2	2	1
Depth (m)				0.50	0.50	0.10
Date Sampled				14/03/2022	14/03/2022	14/03/2022
Time Taken				1532	1515	1516
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	11	13
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.5

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.1	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
water soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.1	0.11	2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

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	0.66	< 0.05	0.47
Anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	< 0.05	1.2
Pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.55	< 0.05	0.69
Chrysene	mg/kg	0.05	MCERTS	0.54	< 0.05	0.7
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.6	< 0.05	0.69
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.36	< 0.05	0.56
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.5	< 0.05	0.84
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.32	< 0.05	0.41
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.35	< 0.05	0.47

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.75	< 0.80	7.2

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	14	16
Boron (water soluble)	mg/kg	0.2	MCERTS	3	0.9	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	29	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	17	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	19	26
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	20	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67	58	66

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



Analytical Report Number : 22-45879
Project / Site name: Northstowe

* 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 *
2206550	WSTCA109	2	0.5	Brown clay and sand with gravel.
2206551	WSTCA112	2	0.5	Brown clay and sand with gravel.
2206552	WSTCA116	1	0.1	Brown clay and sand with gravel.

Analytical Report Number : 22-45879
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Reg. 13(1)

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Analytical Report Number : 22-45898

Project / Site name:	Northstowe Boreholes	Samples received on:	15/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	15/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	17 soil samples		

Reg. 13(1)

Signed:

Reg. 13(1)

Technical Reviewer (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: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number	2206630			2206631			2206632			2206633			2206634		
Sample Reference	TPTCA102			TPTCA103			TPTCA103			TPTCA107			TPTCA111		
Sample Number	1			2			4			2			1		
Depth (m)	0.00-0.20			0.20-0.50			1.00-2.00			0.20-0.50			0.00-0.20		
Date Sampled	10/03/2022			10/03/2022			10/03/2022			11/03/2022			10/03/2022		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												
Stone Content	%	0.1	NONE	< 0.1	35	20	< 0.1	< 0.1							
Moisture Content	%	0.01	NONE	15	11	8	11	11							
Total mass of sample received	kg	0.001	NONE	2	2	2	1.4	1							

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SSZ		SSZ	SSZ	SSZ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.7	9.7	8.3	8.1	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.034	-	0.1	0.066	0.23
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	0.0078	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
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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	0.26	< 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	0.37	0.39
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.35	0.37
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.31	0.27
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.22	0.19
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.3	0.2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.2	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.35	0.27
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	2.36	1.91
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Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number	2206630	2206631	2206632	2206633	2206634
Sample Reference	TPTCA102	TPTCA103	TPTCA103	TPTCA107	TPTCA111
Sample Number	1	2	4	2	1
Depth (m)	0.00-0.20	0.20-0.50	1.00-2.00	0.20-0.50	0.00-0.20
Date Sampled	10/03/2022	10/03/2022	10/03/2022	11/03/2022	10/03/2022
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	18	27	17	14
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	-	0.3	0.5	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	27	24	26	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	17	11	24	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	23	10	24	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	23	27	23	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	58	39	62	64

Petroleum Hydrocarbons

TPH Texas (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	ISO 17025	-	< 0.1	-	-	-
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH Texas (C10 - C12) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	-	12	-	-	-
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-	37	-	-	-
TPH Texas (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-	85	-	-	-
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	-	130	-	-	-

Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number	2206630				2206631	2206632	2206633	2206634
Sample Reference	TPTCA102				TPTCA103	TPTCA103	TPTCA107	TPTCA111
Sample Number	1				2	4	2	1
Depth (m)	0.00-0.20				0.20-0.50	1.00-2.00	0.20-0.50	0.00-0.20
Date Sampled	10/03/2022				10/03/2022	10/03/2022	11/03/2022	10/03/2022
Time Taken	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	2206630	2206631	2206632	2206633	2206634
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	2.3	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	0.7	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	9.8	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	9.9	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	6.4	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	3.8	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	5.1	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	3	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	5.7	-	-	-

Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number				2206630	2206631	2206632	2206633	2206634
Sample Reference				TPTCA102	TPTCA103	TPTCA103	TPTCA107	TPTCA111
Sample Number				1	2	4	2	1
Depth (m)				0.00-0.20	0.20-0.50	1.00-2.00	0.20-0.50	0.00-0.20
Date Sampled				10/03/2022	10/03/2022	10/03/2022	11/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.62	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	2.9	-	-	-

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

Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number	2206635			2206636			2206637			2206638			2206639		
Sample Reference	TPTCA113			TPTCA114			TPTCA114			TPTCA118			TPTCA118		
Sample Number	1			1			3			1			3		
Depth (m)	0.00-0.20			0.00-0.20			0.50-1.00			0.00-0.20			0.50-1.00		
Date Sampled	11/03/2022			11/03/2022			11/03/2022			10/03/2022			10/03/2022		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	0.01	NONE	12	14	14	11	16							
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	1.4	1.4							

Asbestos in Soil	Type	N/A	ISO 17025					
Asbestos Analyst ID	N/A	N/A	N/A					

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.5	8.4	8.7	7.9
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0095	0.0064	0.0039	0.008	0.0015

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
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Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-	-
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Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number	2206635				2206636		2206637		2206638		2206639	
Sample Reference	TPTCA113				TPTCA114		TPTCA114		TPTCA118		TPTCA118	
Sample Number	1				1		3		1		3	
Depth (m)	0.00-0.20				0.00-0.20		0.50-1.00		0.00-0.20		0.50-1.00	
Date Sampled	11/03/2022				11/03/2022		11/03/2022		10/03/2022		10/03/2022	
Time Taken	None Supplied				None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Heavy Metals / Metalloids												
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	14	18	14	13				
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2				
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	24	32	25	31				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	15	17	16	17				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	21	15	22	14				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	21	30	21	25				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	59	55	50	56	46				

Petroleum Hydrocarbons

TPH Texas (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
TPH Texas (C10 - C12) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0				
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	12	< 10	< 10	< 10	< 10				
TPH Texas (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	43	23	< 10	29	< 10				
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	55	23	< 10	29	< 10				

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Lab Sample Number				2206635	2206636	2206637	2206638	2206639
Sample Reference				TPTCA113	TPTCA114	TPTCA114	TPTCA118	TPTCA118
Sample Number				1	1	3	1	3
Depth (m)				0.00-0.20	0.00-0.20	0.50-1.00	0.00-0.20	0.50-1.00
Date Sampled				11/03/2022	11/03/2022	11/03/2022	10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				SVOCs				
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	0.25	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.38	0.73	< 0.05	0.75	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.4	0.77	< 0.05	0.74	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.26	0.46	< 0.05	0.57	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.25	0.47	< 0.05	0.47	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.54	0.63	< 0.05	0.69	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.49	0.29	< 0.05	0.35	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	0.59	< 0.05	0.61	< 0.05

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Lab Sample Number				2206635	2206636	2206637	2206638	2206639
Sample Reference				TPTCA113	TPTCA114	TPTCA114	TPTCA118	TPTCA118
Sample Number				1	1	3	1	3
Depth (m)				0.00-0.20	0.00-0.20	0.50-1.00	0.00-0.20	0.50-1.00
Date Sampled				11/03/2022	11/03/2022	11/03/2022	10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.39	< 0.05	0.38	< 0.05

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

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Lab Sample Number	2206640	2206641	2206642	2206643	2206644			
Sample Reference	TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208			
Sample Number	2	1	2	2	1			
Depth (m)	0.20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20			
Date Sampled	10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022			
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	4.3	16	< 0.1
Moisture Content	%	0.01	NONE	14	15	14	10	12
Total mass of sample received	kg	0.001	NONE	1	1	1.5	1.5	0.4

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A					

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	7.8	7.7	8.7	8.4
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.011	0.0045	0.0041	0.013	0.0075

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
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Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-	-
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Lab Sample Number	2206640				2206641	2206642	2206643	2206644
Sample Reference	TPTCA120				TPTCA201	TPTCA205	TPTCA206	TPTCA208
Sample Number	2				1	2	2	1
Depth (m)	0.20-0.50				0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20
Date Sampled	10/03/2022				10/03/2022	09/03/2022	09/03/2022	10/03/2022
Time Taken	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	14	15	15	16
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	1.4
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	27	29	27	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	16	14	22	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	22	17	160	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	25	27	20	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	63	51	76	69

Petroleum Hydrocarbons

TPH Texas (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C10 - C12) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	16	< 10
TPH Texas (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	22	< 10	< 10	30	< 10
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	22	< 10	< 10	45	< 10



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Lab Sample Number				2206640	2206641	2206642	2206643	2206644
Sample Reference				TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208
Sample Number				2	1	2	2	1
Depth (m)				0.20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20
Date Sampled				10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.25	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.24	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.79	0.3	< 0.05	2.6	2.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.82	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	1.3	0.61	< 0.05	5.9	2
Pyrene	mg/kg	0.05	MCERTS	1.1	0.66	< 0.05	5.5	1.6
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.58	0.34	< 0.05	3.2	0.52
Chrysene	mg/kg	0.05	MCERTS	0.47	0.28	< 0.05	3	0.55
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.65	0.38	< 0.05	4.3	0.66
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	0.2	< 0.05	1.7	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.55	0.36	< 0.05	3.8	0.46

Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number				2206640	2206641	2206642	2206643	2206644
Sample Reference				TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208
Sample Number				2	1	2	2	1
Depth (m)				0.20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20
Date Sampled				10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.27
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.56	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	2.4	0.28

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

Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number				2206645	2206646
Sample Reference				TPTCA208	TPTCA208
Sample Number				3	5
Depth (m)				0.50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	16
Total mass of sample received	kg	0.001	NONE	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	-	-
Asbestos Analyst ID	N/A	N/A	N/A		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	7.8
Total Cyanide	mg/kg	1	MCERTS	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0056	0.0041

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-
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Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-
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Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number				2206645	2206646
Sample Reference				TPTCA208	TPTCA208
Sample Number				3	5
Depth (m)				0.50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	12
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	58

Petroleum Hydrocarbons

TPH Texas (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	ISO 17025	< 0.1	< 0.1
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH Texas (C10 - C12) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10
TPH Texas (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	< 10	< 10

Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number				2206645	2206646
Sample Reference				TPTCA208	TPTCA208
Sample Number				3	5
Depth (m)				0.50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
SVOCs					
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05



Analytical Report Number: 22-45898
 Project / Site name: Northstowe Boreholes
 Your Order No: 14059900

Lab Sample Number				2206645	2206646
Sample Reference				TPTCA208	TPTCA208
Sample Number				3	5
Depth (m)				0.50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

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

Analytical Report Number : 22-45898

Project / Site name: Northstowe Boreholes

* 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 *
2206630	TPTCA102	1	0.00-0.20	Brown clay and sand with gravel.
2206631	TPTCA103	2	0.20-0.50	Brown clay and sand with stones and gravel
2206632	TPTCA103	4	1.00-2.00	Brown clay and sand with stones and gravel
2206633	TPTCA107	2	0.20-0.50	Brown clay and sand with gravel.
2206634	TPTCA111	1	0.00-0.20	Brown clay and sand with gravel.
2206635	TPTCA113	1	0.00-0.20	Brown clay and sand with gravel.
2206636	TPTCA114	1	0.00-0.20	Brown clay and sand with gravel.
2206637	TPTCA114	3	0.50-1.00	Brown clay and sand with gravel.
2206638	TPTCA118	1	0.00-0.20	Brown clay and sand with gravel.
2206639	TPTCA118	3	0.50-1.00	Brown clay and sand with gravel.
2206640	TPTCA120	2	0.20-0.50	Grey clay and sand with gravel.
2206641	TPTCA201	1	0.20-0.50	Brown clay and sand with gravel.
2206642	TPTCA205	2	0.20-0.50	Brown clay and sand with stones and gravel
2206643	TPTCA206	2	0.50-1.00	Brown clay and loam with stones and gravel
2206644	TPTCA208	1	0.00-0.20	Brown clay and sand with gravel.
2206645	TPTCA208	3	0.50-1.00	Grey clay and sand with gravel.
2206646	TPTCA208	5	2.00-3.00	Grey clay and sand with gravel.

Analytical Report Number : 22-45898

Project / Site name: Northstowe Boreholes

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

Analytical Report Number : 22-45898

Project / Site name: Northstowe Boreholes

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC FID	In-house method	L088/L076	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-46172

Project / Site name:	Northstowe	Samples received on:	16/03/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	16/03/2022
Your order number:	14059900	Analysis completed by:	25/03/2022
Report Issue Number:	1	Report issued on:	25/03/2022
Samples Analysed:	4 soil samples		

Reg. 13(1)

Signed: _____

Reg. 13(1)
Technical Reviewer (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: 22-46172
 Project / Site name: Northstowe
 Your Order No: 14059900

Lab Sample Number	2208351		2208352		2208353		2208354	
Sample Reference	TPTCA104		TPTCA110		TPTCA119		TPTCA119	
Sample Number	1		2		1		3	
Depth (m)	0 00-0.20		0 20-0.90		0 00-0.20		0 50-1.20	
Date Sampled	15/03/2022		15/03/2022		15/03/2022		15/03/2022	
Time Taken	1526		1344		1209		1212	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	11	11	11	11
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.4	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A			DBU	DBU

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.1	7.8	8.3
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.89	0.054
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.012	0.0019	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	-	0.52	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	-	0.49	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.34	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	-	0.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.37	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.26	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.32	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	0.21	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	0.25	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	3.06	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	18	12	14
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.6	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	24	20	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	17	12	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	11	15	9.6
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	23	25	17	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	34	43	34

Analytical Report Number: 22-46172
 Project / Site name: Northstowe
 Your Order No: 14059900

Lab Sample Number				2208351	2208352	2208353	2208354
Sample Reference				TPTCA104	TPTCA110	TPTCA119	TPTCA119
Sample Number				1	2	1	3
Depth (m)				0 00-0.20	0 20-0.90	0 00-0.20	0 50-1.20
Date Sampled				15/03/2022	15/03/2022	15/03/2022	15/03/2022
Time Taken				1526	1344	1209	1212
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				

Petroleum Hydrocarbons

Analytical Parameter	Units	Limit of detection	Accreditation Status	2208351	2208352	2208353	2208354
TPH Texas (C6 - C8) <small>HS_ID_TOTAL</small>	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	-	-
TPH Texas (C8 - C10) <small>HS_ID_TOTAL</small>	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
TPH Texas (C10 - C12) <small>EH_CU_ID_TOTAL</small>	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-
TPH Texas (C12 - C16) <small>EH_CU_ID_TOTAL</small>	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-
TPH Texas (C16 - C21) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	< 10	< 10	-	-
TPH Texas (C21 - C40) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	13	< 10	-	-
TPH Texas (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	mg/kg	10	NONE	13	< 10	-	-

SVOCs

Analytical Parameter	Units	Limit of detection	Accreditation Status	2208351	2208352	2208353	2208354
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	0.99	< 0.05	-	-
Anthracene	mg/kg	0.05	MCERTS	0.22	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-

Analytical Report Number: 22-46172
 Project / Site name: Northstowe
 Your Order No: 14059900

Lab Sample Number				2208351	2208352	2208353	2208354
Sample Reference				TPTCA104	TPTCA110	TPTCA119	TPTCA119
Sample Number				1	2	1	3
Depth (m)				0 00-0.20	0 20-0.90	0 00-0.20	0 50-1.20
Date Sampled				15/03/2022	15/03/2022	15/03/2022	15/03/2022
Time Taken				1526	1344	1209	1212
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	2.5	< 0.05	-	-
Pyrene	mg/kg	0.05	MCERTS	2.1	< 0.05	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	< 0.05	-	-
Chrysene	mg/kg	0.05	MCERTS	0.86	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1	< 0.05	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.76	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.96	< 0.05	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.52	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.63	< 0.05	-	-

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

Analytical Report Number : 22-46172
Project / Site name: Northstowe

* 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 *
2208351	TPTCA104	1	0.00-0.20	Brown clay and loam with gravel and vegetation.
2208352	TPTCA110	2	0.20-0.90	Light brown loam and clay with gravel.
2208353	TPTCA119	1	0.00-0.20	Light brown loam and clay with gravel.
2208354	TPTCA119	3	0.50-1.20	Light brown sand with gravel.

Analytical Report Number : 22-46172
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC-FID	In-house method	L088/L076	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

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.

Analytical Report Number : 22-46172
 Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



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Analytical Report Number : 22-46874

Project / Site name:	Northstowe	Samples received on:	16/03/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	22/03/2022
Your order number:	14059900	Analysis completed by:	30/03/2022
Report Issue Number:	1	Report issued on:	30/03/2022
Samples Analysed:	4 soil samples		

Reg. 13(1)

Signed

Reg. 13(1)

Technical Reviewer

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: 22-46874
Project / Site name: Northstowe

Lab Sample Number			2211786	2211787	2211788	2211789	
Sample Reference			WSTCA101	WSTCA106	WSTCA108	WSTCA117	
Sample Number			1	2	2	2	
Depth (m)			0.20	0.50	0.50	0.50	
Date Sampled			15/03/2022	15/03/2022	15/03/2022	15/03/2022	
Time Taken			1258	1151	1038	1410	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	8.4	14	15
Total mass of sample received	kg	0.001	NONE	1.4	1.4	1.4	1.4

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MLO			

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	8.0	7.8	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.3	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	0.0059	0.0095	0.0094

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	0.39	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	0.61	-	-	-
Pyrene	mg/kg	0.05	MCERTS	0.58	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.28	-	-	-
Chrysene	mg/kg	0.05	MCERTS	0.34	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.27	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.28	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.94	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	19	13	13
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	32	27	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	16	16	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	15	21	23
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	24	29	22	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	58	58	62

Analytical Report Number: 22-46874
Project / Site name: Northstowe

Lab Sample Number	2211786	2211787	2211788	2211789
Sample Reference	WSTCA101	WSTCA106	WSTCA108	WSTCA117
Sample Number	1	2	2	2
Depth (m)	0.20	0.50	0.50	0.50
Date Sampled	15/03/2022	15/03/2022	15/03/2022	15/03/2022
Time Taken	1258	1151	1038	1410
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

Parameter	mg/kg	Limit of detection	Accreditation Status	2211786	2211787	2211788	2211789
TPH Texas (C6 - C8) <small>HS_ID_TOTAL</small>	0.1	ISO 17025	-	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C8 - C10) <small>HS_ID_TOTAL</small>	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C10 - C12) <small>EH_CU_ID_TOTAL</small>	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
TPH Texas (C12 - C16) <small>EH_CU_ID_TOTAL</small>	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
TPH Texas (C16 - C21) <small>EH_CU_ID_TOTAL</small>	10	MCERTS	-	< 10	< 10	< 10	< 10
TPH Texas (C21 - C40) <small>EH_CU_ID_TOTAL</small>	10	MCERTS	-	< 10	< 10	< 10	59
TPH Texas (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	10	NONE	-	< 10	< 10	< 10	59

SVOCs

Parameter	mg/kg	Limit of detection	Accreditation Status	2211786	2211787	2211788	2211789
Aniline	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	0.2	NONE	-	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	0.3	ISO 17025	-	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	0.35
Anthracene	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	0.05	MCERTS	-	< 0.05	0.59	0.59	0.6
Pyrene	0.05	MCERTS	-	< 0.05	0.65	0.65	0.49

Analytical Report Number: 22-46874
Project / Site name: Northstowe

Lab Sample Number				2211786	2211787	2211788	2211789
Sample Reference				WSTCA101	WSTCA106	WSTCA108	WSTCA117
Sample Number				1	2	2	2
Depth (m)				0.20	0.50	0.50	0.50
Date Sampled				15/03/2022	15/03/2022	15/03/2022	15/03/2022
Time Taken				1258	1151	1038	1410
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	0.31	0.33
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	0.37	0.32
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	0.22	0.21
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	0.17	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	0.25	0.2
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

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

Analytical Report Number : 22-46874

Project / Site name: Northstowe

* 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 *
2211786	WSTCA101	1	0.2	Brown clay and loam with gravel.
2211787	WSTCA106	2	0.5	Brown clay and loam with gravel.
2211788	WSTCA108	2	0.5	Brown clay and sand with gravel.
2211789	WSTCA117	2	0.5	Brown clay and sand with gravel and vegetation.

Analytical Report Number : 22-46874
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC-FID	In-house method	L088/L076	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

Analytical Report Number : 22-46874
 Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



Reg. 13(1)
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Analytical Report Number : 22-47225

Project / Site name:	Northstowe	Samples received on:	22/03/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	22/03/2022
Your order number:	14059900	Analysis completed by:	31/03/2022
Report Issue Number:	1	Report issued on:	31/03/2022
Samples Analysed:	6 soil samples		

Reg. 13(1)

Signed: _____

Reg. 13(1)

Technical Reviewer (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: 22-47225
Project / Site name: Northstowe

Lab Sample Number	2213697	2213698	2213699	2213700	2213701			
Sample Reference	WS2C106	WS2C108	WS2C114	WS2C120	WS2C121			
Sample Number	1	2	2	2	2			
Depth (m)	0.20	0.50	0.50	0.50	0.50			
Date Sampled	21/03/2022	15/03/2022	16/03/2022	16/03/2022	21/03/2022			
Time Taken	1355	1645	1104	1507	1106			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	17	15	12	12
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	JSW	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	7.7	8.2	8.3	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	17000	2200	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.7	-	-	0.09	0.098
Sulphide	mg/kg	1	MCERTS	-	13	< 1.0	-	-
Elemental Sulphur	mg/kg	5	MCERTS	-	< 5.0	< 5.0	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 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	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 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	< 0.80
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Analytical Report Number: 22-47225
Project / Site name: Northstowe

Lab Sample Number	2213697				2213698				2213699				2213700				2213701			
Sample Reference	WS2C106				WS2C108				WS2C114				WS2C120				WS2C121			
Sample Number	1				2				2				2				2			
Depth (m)	0.20				0.50				0.50				0.50				0.50			
Date Sampled	21/03/2022				15/03/2022				16/03/2022				16/03/2022				21/03/2022			
Time Taken	1355				1645				1104				1507				1106			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status																	

Heavy Metals / Metalloids

Parameter	Units	Limit of detection	Accreditation Status	2213697	2213698	2213699	2213700	2213701
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	14	16	12	19
Boron (water soluble)	mg/kg	0.2	MCERTS	2	-	-	0.4	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	27	32	22	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	-	-	22	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	13	13	9.6	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	-	-	25	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	-	-	36	44

Monoaromatics & Oxygenates

Parameter	Units	Limit of detection	Accreditation Status	2213697	2213698	2213699	2213700	2213701
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	2213697	2213698	2213699	2213700	2213701
TPH-CWG - Aliphatic >EC5 - EC6 _{HS,1D,AL}	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS,1D,AL}	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS,1D,AL}	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH,CU,1D,AL}	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH,CU,1D,AL}	mg/kg	2	MCERTS	-	< 2.0	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH,CU,1D,AL}	mg/kg	8	MCERTS	-	< 8.0	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH,CU,1D,AL}	mg/kg	8	MCERTS	-	< 8.0	< 8.0	-	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH,CU+HS,1D,AL}	mg/kg	10	MCERTS	-	< 10	< 10	-	-

Parameter	Units	Limit of detection	Accreditation Status	2213697	2213698	2213699	2213700	2213701
TPH-CWG - Aromatic >EC5 - EC7 _{HS,1D,AR}	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS,1D,AR}	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS,1D,AR}	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH,CU,1D,AR}	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH,CU,1D,AR}	mg/kg	2	MCERTS	-	< 2.0	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH,CU,1D,AR}	mg/kg	10	MCERTS	-	< 10	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH,CU,1D,AR}	mg/kg	10	MCERTS	-	< 10	< 10	-	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH,CU+HS,1D,AR}	mg/kg	10	MCERTS	-	< 10	< 10	-	-

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

Analytical Report Number: 22-47225
Project / Site name: Northstowe

Lab Sample Number				2213702
Sample Reference				WS2C123
Sample Number				1
Depth (m)				0.20
Date Sampled				21/03/2022
Time Taken				0947
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	16
Total mass of sample received	kg	0.001	NONE	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	-
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11
Sulphide	mg/kg	1	MCERTS	-
Elemental Sulphur	mg/kg	5	MCERTS	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.68
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1
Pyrene	mg/kg	0.05	MCERTS	0.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.52
Chrysene	mg/kg	0.05	MCERTS	0.51
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.4
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.39
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.42
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.21
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.26

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.32
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Analytical Report Number: 22-47225
Project / Site name: Northstowe

Lab Sample Number				2213702
Sample Reference				WS2C123
Sample Number				1
Depth (m)				0.20
Date Sampled				21/03/2022
Time Taken				0947
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	61

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-
Toluene	µg/kg	1	MCERTS	-
Ethylbenzene	µg/kg	1	MCERTS	-
p & m-xylene	µg/kg	1	MCERTS	-
o-xylene	µg/kg	1	MCERTS	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS,1D,AL}	mg/kg	0.001	MCERTS	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS,1D,AL}	mg/kg	0.001	MCERTS	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS,1D,AL}	mg/kg	0.001	MCERTS	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH,CU,1D,AL}	mg/kg	1	MCERTS	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH,CU,1D,AL}	mg/kg	2	MCERTS	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH,CU,1D,AL}	mg/kg	8	MCERTS	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH,CU,1D,AL}	mg/kg	8	MCERTS	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH,CU+HS,1D,AL}	mg/kg	10	MCERTS	-

TPH-CWG - Aromatic >EC5 - EC7 _{HS,1D,AR}	mg/kg	0.001	MCERTS	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS,1D,AR}	mg/kg	0.001	MCERTS	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS,1D,AR}	mg/kg	0.001	MCERTS	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH,CU,1D,AR}	mg/kg	1	MCERTS	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH,CU,1D,AR}	mg/kg	2	MCERTS	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH,CU,1D,AR}	mg/kg	10	MCERTS	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH,CU,1D,AR}	mg/kg	10	MCERTS	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH,CU+HS,1D,AR}	mg/kg	10	MCERTS	-

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

Analytical Report Number : 22-47225

Project / Site name: Northstowe

* 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 *
2213697	WS2C106	1	0.2	Brown clay and loam with gravel.
2213698	WS2C108	2	0.5	Brown clay with gravel.
2213699	WS2C114	2	0.5	Brown clay with gravel and chalk.
2213700	WS2C120	2	0.5	Brown clay and loam with gravel and chalk.
2213701	WS2C121	2	0.5	Brown clay and loam with gravel and chalk.
2213702	WS2C123	1	0.2	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 22-47225
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS

Analytical Report Number : 22-47225
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Analytical Report Number : 22-47225

Project / Site name: Northstowe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS2C108	2	S	2213698	c	Free cyanide in soil	L080-PL	c
WS2C108	2	S	2213698	c	Complex Cyanide in soil	L080-PL	c
WS2C108	2	S	2213698	c	Sulphide in soil	L010-PL	c
WS2C108	2	S	2213698	c	Total cyanide in soil	L080-PL	c



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Analytical Report Number : 22-47463

Project / Site name:	Northstowe	Samples received on:	22/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	23/03/2022
Your order number:	14059900	Analysis completed by:	31/03/2022
Report Issue Number:	1	Report issued on:	31/03/2022
Samples Analysed:	5 soil samples		

Signed: Reg. 13(1)

Reg. 13(1)
Senior Quality Specialist
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: 22-47463
Project / Site name: Northstowe

Lab Sample Number	2214824	2214825	2214826	2214827	2214828			
Sample Reference	BH2C102	BHTCA105	BHTCA106	BHTCA107	BHTCA110			
Sample Number	2	2	2	1	2			
Depth (m)	0.50	0.50-0.50	0.50	0.20	0.50			
Date Sampled	17/03/2022	11/03/2022	15/03/2022	16/03/2022	16/03/2022			
Time Taken	0903	0812	1330	1007	1000			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	11	11	11	18
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	1.0	1.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	NTK	NTK		NTK	NTK

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	7.5	-	7.2	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Water Soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.67	0.032	-	0.38	1.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
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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	0.42
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	1.1
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.98
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.56
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.56
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.54
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.29
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.48
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.24
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	0.31

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	-	< 0.80	5.49
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Analytical Report Number: 22-47463
Project / Site name: Northstowe

Lab Sample Number	2214824	2214825	2214826	2214827	2214828			
Sample Reference	BH2C102	BHTCA105	BHTCA106	BHTCA107	BHTCA110			
Sample Number	2	2	2	1	2			
Depth (m)	0.50	0.50-0.50	0.50	0.20	0.50			
Date Sampled	17/03/2022	11/03/2022	15/03/2022	16/03/2022	16/03/2022			
Time Taken	0903	0812	1330	1007	1000			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	13	-	17	15
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.8	-	0.8	0.5
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	34	34	-	27	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	14	-	25	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15	15	-	22	30
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	29	24	-	23	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	57	-	68	61

Monoaromatics & Oxygenates

Compound	µg/kg	Limit of detection	Accreditation Status					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6 HS_1D_AL	mg/kg	Limit of detection	Accreditation Status					
TPH-CWG - Aliphatic > EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	1.0	< 1.0	2.9	1.1	3.3
TPH-CWG - Aliphatic > EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	5.3	< 2.0	8.4	4.3	7.9
TPH-CWG - Aliphatic > EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	14	< 8.0	14
TPH-CWG - Aliphatic > EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	39	20	45
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	19	< 10	64	32	71
TPH-CWG - Aromatic > EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic > EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic > EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	12

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

Analytical Report Number : 22-47463

Project / Site name: Northstowe

* 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 *
2214824	BH2C102	2	0.5	Brown clay and loam with gravel and chalk.
2214825	BHTCA105	2	0.50-0.50	Light brown clay and sand with gravel.
2214826	BHTCA106	2	0.5	Brown clay and sand with gravel and chalk.
2214827	BHTCA107	1	0.2	Brown clay and sand with gravel and vegetation.
2214828	BHTCA110	2	0.5	Brown clay with gravel.

Analytical Report Number : 22-47463

Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Analytical Report Number : 22-47463
 Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Analytical Report Number : 22-47463

Project / Site name: Northstowe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BHTCA105	2	S	2214825	c	Free cyanide in soil	L080-PL	c
BHTCA105	2	S	2214825	c	Total cyanide in soil	L080-PL	c
BHTCA106	2	S	2214826	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
BHTCA106	2	S	2214826	b	TPHCWG (Soil)	L088/76-PL	b
BHTCA107	1	S	2214827	c	Free cyanide in soil	L080-PL	c
BHTCA107	1	S	2214827	c	Total cyanide in soil	L080-PL	c
BHTCA110	2	S	2214828	c	Free cyanide in soil	L080-PL	c
BHTCA110	2	S	2214828	c	Total cyanide in soil	L080-PL	c



Reg. 13(1)

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Analytical Report Number : 22-47721

Project / Site name:	Northstowe	Samples received on:	22/03/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	25/03/2022
Your order number:	14059900	Analysis completed by:	01/04/2022
Report Issue Number:	1	Report issued on:	04/04/2022
Samples Analysed:	19 soil samples		

Reg. 13(1)

Signed:

Reg. 13(1)

Technical Reviewer

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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: 22-47721
Project / Site name: Northstowe

Lab Sample Number	2216182				2216183		2216184		2216185		2216186	
Sample Reference	TP2C102				TP2C103		TP2C104		TP2C104		TP2C105	
Sample Number	1				1		1		2		1	
Depth (m)	0.40-1.60				0.00-0.20		0.00-0.20		0.20-0.50		0.00-0.50	
Date Sampled	16/03/2022				17/03/2022		16/03/2022		16/03/2022		17/03/2022	
Time Taken	1636				1103		1634		1634		1118	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	0.01	NONE	18	13	13	11	11	11	20	20	
Total mass of sample received	kg	0.001	NONE	1.2	1	1.4	1.4	1.4	1.4	0.8	0.8	

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	GFI	GFI	GFI	GFI	GFI

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	9.8	8.2	8.0	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
water soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.41	0.2	0.54	1.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.59	0.42	0.24
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	0.79	0.9
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	0.68	0.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.89	0.41	0.57
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.9	0.39	0.55
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	0.34	0.51
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.49	0.29	0.32
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.99	0.4	0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.55	< 0.05	0.38
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.7	< 0.05	0.47

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	9.4	3.72	5.34
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	14	16	20	14
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.7	1	0.7	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.1	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	24	27	28	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6	8.6	16	6	8.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.2	13	24	13	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	21	22	27	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	44	71	51	53

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number	2216182				2216183	2216184	2216185	2216186
Sample Reference	TP2C102				TP2C103	TP2C104	TP2C104	TP2C105
Sample Number	1				1	1	2	1
Depth (m)	0.40-1.60				0.00-0.20	0.00-0.20	0.20-0.50	0.00-0.50
Date Sampled	16/03/2022				17/03/2022	16/03/2022	16/03/2022	17/03/2022
Time Taken	1636				1103	1634	1634	1118
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

Parameter	Units	Limit of detection	Accreditation Status	2216182	2216183	2216184	2216185	2216186
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	2216182	2216183	2216184	2216185	2216186
TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Parameter	Units	Limit of detection	Accreditation Status	2216182	2216183	2216184	2216185	2216186
TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	14	< 10	12
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	19	12	16

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

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number				2216187	2216188	2216189	2216190	2216191
Sample Reference				TP2C107	TP2C107	TP2C109	TP2C110	TP2C111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.20	0.20-1.10	0.00-0.20	0.00-0.50	0.00-0.10
Date Sampled				17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Time Taken				1451	1451	1152	1448	1454
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	22	< 0.1
Moisture Content	%	0.01	NONE	18	21	13	12	14
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	1.2	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	GFI	GFI	GFI	GFI	GFI

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	7.8	8.2	8.1	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
water soluble SO ₄ 10111 extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.34	1.7	0.86	0.22	0.33

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.48	0.34	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.3	0.84	0.43
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.3	0.78	0.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.75	0.53	0.25
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.64	0.43	0.25
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.7	0.5	0.22
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.47	0.29	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.74	0.47	0.29
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.47	0.34	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58	0.41	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	7.42	4.93	2.06
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	13	21	19	16
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	1.9	1.1	1.2	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	27	28	29	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5.5	8.7	9.2	10	7.1
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	13	15	13	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	33	28	25	24	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70	63	59	60	48

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number	2216187	2216188	2216189	2216190	2216191
Sample Reference	TP2C107	TP2C107	TP2C109	TP2C110	TP2C111
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.20	0.20-1.10	0.00-0.20	0.00-0.50	0.00-0.10
Date Sampled	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Time Taken	1451	1451	1152	1448	1454
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	13	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	13	16	< 10

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

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number				2216192	2216193	2216194	2216195	2216196	2216197
Sample Reference				TP2C113	TP2C117	TP2C117	TP2C118	TP2C119	TP2C119
Sample Number				2	1	2	1	1	2
Depth (m)				0.50	0.20	0.50	0.20	0.20	0.50
Date Sampled				17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Time Taken				0949	1645	1645	1122	1132	1132
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	12	9.5	13	12	12
Total mass of sample received	kg	0.001	NONE	0.8	1.4	1.4	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	NTK	NTK	NTK	NTK	NTK	NTK

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.3	8.5	8.2	8.5	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
water soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.2	0.062	0.049	0.13	0.088	0.043

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 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	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 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	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	16	16	16	13	17
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	0.2	0.2	0.4	0.5	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	27	22	31	26	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	8.1	7.2	9.4	6.8	8.6
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	9.9	9.4	14	12	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.5	< 0.3	0.6	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	23	23	27	22	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	77	38	39	50	40	54

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number	2216192	2216193	2216194	2216195	2216196	2216197
Sample Reference	TP2C113	TP2C117	TP2C117	TP2C118	TP2C119	TP2C119
Sample Number	2	1	2	1	1	2
Depth (m)	0.50	0.20	0.50	0.20	0.20	0.50
Date Sampled	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Time Taken	0949	1645	1645	1122	1132	1132
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10

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

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number				2216198	2216199	2216200
Sample Reference				TP2C122	TP2C124	TP2C124
Sample Number				1	1	2
Depth (m)				0.20	0.20	0.50
Date Sampled				17/03/2022	17/03/2022	17/03/2022
Time Taken				1252	1446	1447
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	10	14
Total mass of sample received	kg	0.001	NONE	0.4	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	NTK	NTK	NTK

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.4	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
water soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.21	0.1	0.14

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
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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	0.5	0.33	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.2	0.43	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.1	0.38	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.64	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.56	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.63	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.36	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.58	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.3	< 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	0.34	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.21	1.14	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	18	13
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.9	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	25	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	6.9	9.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	13	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	22	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	48	52

Analytical Report Number: 22-47721
Project / Site name: Northstowe

Lab Sample Number				2216198	2216199	2216200
Sample Reference				TP2C122	TP2C124	TP2C124
Sample Number				1	1	2
Depth (m)				0.20	0.20	0.50
Date Sampled				17/03/2022	17/03/2022	17/03/2022
Time Taken				1252	1446	1447
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	MCERTS	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	12	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	MCERTS	17	< 10	< 10

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

Analytical Report Number : 22-47721

Project / Site name: Northstowe

* 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 *
2216182	TP2C102	1	0.40-1.60	Light brown clay and sand with gravel.
2216183	TP2C103	1	0.00-0.20	Light brown clay and sand with gravel.
2216184	TP2C104	1	0.00-0.20	Brown clay and loam with gravel.
2216185	TP2C104	2	0.20-0.50	Light brown clay and sand with gravel.
2216186	TP2C105	1	0.00-0.50	Light brown clay and sand with gravel.
2216187	TP2C107	None Supplied	0.00-0.20	Brown clay and sand with gravel.
2216188	TP2C107	None Supplied	0.20-1.10	Grey clay and sand with gravel.
2216189	TP2C109	None Supplied	0.00-0.20	Brown clay and loam with gravel.
2216190	TP2C110	None Supplied	0.00-0.50	Brown clay and loam with gravel and stones.
2216191	TP2C111	None Supplied	0.00-0.10	Brown clay and loam with gravel and vegetation.
2216192	TP2C113	2	0.5	Brown clay and loam with gravel.
2216193	TP2C117	1	0.2	Light brown clay and sand with gravel.
2216194	TP2C117	2	0.5	Light brown clay and sand with gravel.
2216195	TP2C118	1	0.2	Brown clay and loam with gravel.
2216196	TP2C119	1	0.2	Brown clay and sand with gravel.
2216197	TP2C119	2	0.5	Brown clay and sand with gravel.
2216198	TP2C122	1	0.2	Brown clay and loam with gravel.
2216199	TP2C124	1	0.2	Brown clay and sand with gravel and vegetation.
2216200	TP2C124	2	0.5	Light grey clay and sand with gravel.

Analytical Report Number : 22-47721

Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

Analytical Report Number : 22-47721
Project / Site name: Northstowe

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report



Analytical Report Number : 22-47721

Project / Site name: Northstowe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP2C102	1	S	2216182	c	Free cyanide in soil	L080-PL	c
TP2C102	1	S	2216182	c	Total cyanide in soil	L080-PL	c
TP2C103	1	S	2216183	c	Free cyanide in soil	L080-PL	c
TP2C103	1	S	2216183	c	Total cyanide in soil	L080-PL	c
TP2C104	1	S	2216184	c	Free cyanide in soil	L080-PL	c
TP2C104	1	S	2216184	c	Total cyanide in soil	L080-PL	c
TP2C104	2	S	2216185	c	Free cyanide in soil	L080-PL	c
TP2C104	2	S	2216185	c	Total cyanide in soil	L080-PL	c
TP2C105	1	S	2216186	c	Free cyanide in soil	L080-PL	c
TP2C105	1	S	2216186	c	Total cyanide in soil	L080-PL	c
TP2C107	None Supplied	S	2216187	c	Free cyanide in soil	L080-PL	c
TP2C107	None Supplied	S	2216187	c	Total cyanide in soil	L080-PL	c
TP2C107	None Supplied	S	2216188	c	Free cyanide in soil	L080-PL	c
TP2C107	None Supplied	S	2216188	c	Total cyanide in soil	L080-PL	c
TP2C109	None Supplied	S	2216189	c	Free cyanide in soil	L080-PL	c
TP2C109	None Supplied	S	2216189	c	Total cyanide in soil	L080-PL	c
TP2C110	None Supplied	S	2216190	c	Free cyanide in soil	L080-PL	c
TP2C110	None Supplied	S	2216190	c	Total cyanide in soil	L080-PL	c
TP2C111	None Supplied	S	2216191	c	Free cyanide in soil	L080-PL	c
TP2C111	None Supplied	S	2216191	c	Total cyanide in soil	L080-PL	c
TP2C113	2	S	2216192	c	Free cyanide in soil	L080-PL	c
TP2C113	2	S	2216192	c	Total cyanide in soil	L080-PL	c
TP2C117	1	S	2216193	c	Free cyanide in soil	L080-PL	c
TP2C117	1	S	2216193	c	Total cyanide in soil	L080-PL	c
TP2C117	2	S	2216194	c	Free cyanide in soil	L080-PL	c
TP2C117	2	S	2216194	c	Total cyanide in soil	L080-PL	c
TP2C118	1	S	2216195	c	Free cyanide in soil	L080-PL	c
TP2C118	1	S	2216195	c	Total cyanide in soil	L080-PL	c
TP2C119	1	S	2216196	c	Free cyanide in soil	L080-PL	c
TP2C119	1	S	2216196	c	Total cyanide in soil	L080-PL	c
TP2C119	2	S	2216197	c	Free cyanide in soil	L080-PL	c
TP2C119	2	S	2216197	c	Total cyanide in soil	L080-PL	c
TP2C122	1	S	2216198	c	Free cyanide in soil	L080-PL	c
TP2C122	1	S	2216198	c	Total cyanide in soil	L080-PL	c
TP2C124	1	S	2216199	c	Free cyanide in soil	L080-PL	c
TP2C124	1	S	2216199	c	Total cyanide in soil	L080-PL	c
TP2C124	2	S	2216200	c	Free cyanide in soil	L080-PL	c
TP2C124	2	S	2216200	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 22-48661

Project / Site name:	Northstowe	Samples received on:	29/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	30/03/2022
Your order number:	14059900	Analysis completed by:	07/04/2022
Report Issue Number:	1	Report issued on:	07/04/2022
Samples Analysed:	4 soil samples		

Reg. 13(1)

Signed:

Reg. 13(1)
Technical Reviewer (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: 22-48661
Project / Site name: Northstowe

Lab Sample Number	2220968	2220969	2220970	2220971			
Sample Reference	BHTCA301A	BHTCA301A	TPTCA115	TPTCA115			
Sample Number	4	6	1	3			
Depth (m)	0.50-0.60	1.00-1.10	0.20	1.00			
Date Sampled	23/03/2022	23/03/2022	Deviating	Deviating			
Time Taken	1440	1454	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.9	10	14	11
Total mass of sample received	kg	0.001	NONE	1.4	1.1	0.9	1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO	PDO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.1	8.1	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulfate Extraction (2:1 Tetrachloro Equivalent)	g/l	0.00125	MCERTS	0.054	0.085	1.8	0.072

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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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	0.28	< 0.05	0.91	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.6	< 0.05	1.9	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.7	< 0.05	1.7	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.87	< 0.05	0.99	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.75	< 0.05	0.83	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1	< 0.05	1.1	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.42	< 0.05	0.54	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.92	< 0.05	0.98	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.37	< 0.05	0.42	< 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	0.48	< 0.05	0.54	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.55	< 0.80	9.89	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	8.3	14	17
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	0.6	0.9	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	21	25	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	7.7	12	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	11	18	17
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	19	16	22	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	41	57	51

Analytical Report Number: 22-48661
Project / Site name: Northstowe

Lab Sample Number	2220968	2220969	2220970	2220971
Sample Reference	BHTCA301A	BHTCA301A	TPTCA115	TPTCA115
Sample Number	4	6	1	3
Depth (m)	0.50-0.60	1.00-1.10	0.20	1.00
Date Sampled	23/03/2022	23/03/2022	Deviating	Deviating
Time Taken	1440	1454	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Monoaromatics & Oxygenates

Compound	Units	Limit of detection	Accreditation Status	2220968	2220969	2220970	2220971
Benzene	µg/kg	1	MCERTS	< 10	-	< 10	-
Toluene	µg/kg	1	MCERTS	< 10	-	< 10	-
Ethylbenzene	µg/kg	1	MCERTS	< 10	-	< 10	-
p & m-xylene	µg/kg	1	MCERTS	< 10	-	< 10	-
o-xylene	µg/kg	1	MCERTS	< 10	-	< 10	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 10	-	< 10	-

Petroleum Hydrocarbons

Compound	Units	Limit of detection	Accreditation Status	2220968	2220969	2220970	2220971
TPH-CWG - Aliphatic >EC5 - EC6 _{HS,1D,AL}	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS,1D,AL}	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS,1D,AL}	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH,CU,1D,AL}	mg/kg	1	MCERTS	< 10	-	< 10	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH,CU,1D,AL}	mg/kg	2	MCERTS	< 20	-	< 20	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH,CU,1D,AL}	mg/kg	8	MCERTS	< 80	-	< 80	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH,CU,1D,AL}	mg/kg	8	MCERTS	< 80	-	< 80	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH,CU+HS,1D,AL}	mg/kg	10	MCERTS	< 10	-	< 10	-

Compound	Units	Limit of detection	Accreditation Status	2220968	2220969	2220970	2220971
TPH-CWG - Aromatic >EC5 - EC7 _{HS,1D,AR}	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS,1D,AR}	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS,1D,AR}	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH,CU,1D,AR}	mg/kg	1	MCERTS	< 10	-	< 10	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH,CU,1D,AR}	mg/kg	2	MCERTS	< 20	-	< 20	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH,CU,1D,AR}	mg/kg	10	MCERTS	< 10	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH,CU,1D,AR}	mg/kg	10	MCERTS	11	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH,CU+HS,1D,AR}	mg/kg	10	MCERTS	13	-	11	-

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



Analytical Report Number : 22-48661
Project / Site name: Northstowe

* 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 *
2220968	BHTCA301A	4	0.50-0.60	Brown loam and clay with gravel.
2220969	BHTCA301A	6	1.00-1.10	Brown clay and sand with gravel.
2220970	TPTCA115	1	0.2	Brown loam and clay with gravel and vegetation.
2220971	TPTCA115	3	1	Brown loam and clay with gravel.

Analytical Report Number : 22-48661
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Analytical Report Number : 22-48661
 Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report



Analytical Report Number : 22-48661

Project / Site name: Northstowe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TPUCA115	1	S	2220970	ab	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TPUCA115	1	S	2220970	ab	Monohydric phenols in soil	L080-PL	b
TPUCA115	1	S	2220970	ab	Speciated EPA-16 PAHs in soil	L064-PL	b
TPUCA115	1	S	2220970	ab	TPHCWG (Soil)	L088/76-PL	b
TPUCA115	3	S	2220971	ab	Monohydric phenols in soil	L080-PL	b
TPUCA115	3	S	2220971	ab	Speciated EPA-16 PAHs in soil	L064-PL	b



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Analytical Report Number : 22-48682

Project / Site name:	Northstowe	Samples received on:	29/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	30/03/2022
Your order number:	14059900	Analysis completed by:	08/04/2022
Report Issue Number:	1	Report issued on:	08/04/2022
Samples Analysed:	4 soil samples		

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Signed:

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Technical Reviewer (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: 22-48682
Project / Site name: Northstowe

Lab Sample Number	2221053	2221054	2221055	2221056			
Sample Reference	BH2C101	BH2C103	BH2C103	BH2C104			
Sample Number	1	1	2	2			
Depth (m)	0.20-0.30	0.10-0.20	0.50-0.60	0.10-0.20			
Date Sampled	21/03/2022	22/03/2022	22/03/2022	22/03/2022			
Time Taken	1804	1135	1136	1451			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	8.9	< 0.1
Moisture Content	%	0.01	NONE	19	11	12	8.8
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.5	1.5

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	LFT	LFT

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	8.2	8	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.37	0.13
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.7	0.6	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	-	0.7	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	-	0.28	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	-	1.3	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	-	0.74	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.29	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	-	0.26	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	3.58	< 0.80
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Analytical Report Number: 22-48682
Project / Site name: Northstowe

Lab Sample Number	2221053			2221054			2221055			2221056		
Sample Reference	BH2C101			BH2C103			BH2C103			BH2C104		
Sample Number	1			1			2			2		
Depth (m)	0 20-0.30			0.10-0.20			0 50-0.60			0.10-0.20		
Date Sampled	21/03/2022			22/03/2022			22/03/2022			22/03/2022		
Time Taken	1804			1135			1136			1451		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									

Heavy Metals / Metalloids

Element	Unit	Limit of detection	Accreditation Status	2221053	2221054	2221055	2221056
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	2.6	-	-
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	12	15	19
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.93	0.84	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	1	0.5	1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	25	37	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	11	12	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	13	15	13
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	25	21	28	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	45	47	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	44	60	47

Petroleum Hydrocarbons

Parameter	Unit	Limit of detection	Accreditation Status	2221053	2221054	2221055	2221056
TPH6 - Aliphatic (C6 - C8) <small>HS_1D_AL</small>	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-
TPH6 - Aliphatic (C8 - C10) <small>HS_1D_AL</small>	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-
TPH6 - Aliphatic (C10 - C12) <small>EH_CU_1D_AL</small>	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-
TPH6 - Aliphatic (C12 - C16) <small>EH_CU_1D_AL</small>	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-
TPH6 - Aliphatic (C16 - C21) <small>EH_CU_1D_AL</small>	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-
TPH6 - Aliphatic (C21 - C35) <small>EH_CU_1D_AL</small>	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-
TPH6 - Aliphatic (C6 - C35) <small>EH_CU+HS_1D_AL</small>	mg/kg	10	NONE	< 10	< 10	-	-

Parameter	Unit	Limit of detection	Accreditation Status	2221053	2221054	2221055	2221056
TPH6 - Aromatic (C6 - C8) <small>HS_1D_AR</small>	mg/kg	0.001	NONE	< 0.001	< 0.001	-	-
TPH6 - Aromatic (C8 - C10) <small>HS_1D_AR</small>	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-
TPH6 - Aromatic (C10 - C12) <small>EH_CU_1D_AR</small>	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-
TPH6 - Aromatic (C12 - C16) <small>EH_CU_1D_AR</small>	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-
TPH6 - Aromatic (C16 - C21) <small>EH_CU_1D_AR</small>	mg/kg	10	MCERTS	< 10	< 10	-	-
TPH6 - Aromatic (C21 - C35) <small>EH_CU_1D_AR</small>	mg/kg	10	MCERTS	< 10	< 10	-	-
TPH6 - Aromatic (C6 - C35) <small>EH_CU+HS_1D_AR</small>	mg/kg	10	NONE	< 10	< 10	-	-

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



Analytical Report Number : 22-48682

Project / Site name: Northstowe

* 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 *
2221053	BH2C101	1	0.20-0.30	Brown loam and clay with gravel and vegetation.
2221054	BH2C103	1	0.10-0.20	Brown loam and clay with gravel and vegetation.
2221055	BH2C103	2	0.50-0.60	Brown loam and clay with gravel and stones.
2221056	BH2C104	2	0.10-0.20	Brown loam and clay with gravel.

Analytical Report Number : 22-48682
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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
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
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
TPH6 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 22-48682
 Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report



Analytical Report Number : 22-48682

Project / Site name: Northstowe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH2C101	1	S	2221053	c	Total cyanide in soil	L080-PL	c
BH2C103	1	S	2221054	c	Total cyanide in soil	L080-PL	c
BH2C103	2	S	2221055	c	Free cyanide in soil	L080-PL	c
BH2C103	2	S	2221055	c	Total cyanide in soil	L080-PL	c
BH2C104	2	S	2221056	c	Free cyanide in soil	L080-PL	c
BH2C104	2	S	2221056	c	Total cyanide in soil	L080-PL	c



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Analytical Report Number : 22-51163

Project / Site name:	Northstowe	Samples received on:	08/04/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	11/04/2022
Your order number:	14059900	Analysis completed by:	20/04/2022
Report Issue Number:	1	Report issued on:	21/04/2022
Samples Analysed:	16 water samples		

Reg. 13(1)

Signed: _____

Reg. 13(1)

Junior Reporting Specialist
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: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235073		2235074		2235075		2235076		2235077	
Sample Reference	BHCA101		WSTCA108		BHCA105D		BHCA104		BHCA110	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Date Sampled	05/04/2022		05/04/2022		05/04/2022		06/04/2022		06/04/2022	
Time Taken	1045		1503		1612		1107		1415	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status							

General Inorganics

pH	pH Units	N/A	ISO 17025	7 8	7	7	7 6	7.1
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	458	338	817	509	524
Alkalinity as CaCO3	mg/l	3	ISO 17025	220	540	420	210	380

Phenols by HPLC

Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16



Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235073		2235074		2235075		2235076		2235077	
Sample Reference	BHCA101		WSTCA108		BHCA105D		BHCA104		BHCA110	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Date Sampled	05/04/2022		05/04/2022		05/04/2022		06/04/2022		06/04/2022	
Time Taken	1045		1503		1612		1107		1415	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status							

Heavy Metals / Metalloids

Element	Units	Limit of detection	Accreditation Status	2235073	2235074	2235075	2235076	2235077
Boron (dissolved)	µg/l	10	ISO 17025	1300	130	160	980	110
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.45	2.33	1.83	2.08	0.74
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.05	0.08	0.15	0.07	0.08
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.5	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	4.5	6.8	9.5	4.1	4
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.3	0.6	0.2	0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	8.5	21	28	7.3	13
Selenium (dissolved)	µg/l	0.6	ISO 17025	2.3	1.4	1.8	1.6	3.3
Zinc (dissolved)	µg/l	0.5	ISO 17025	6.6	7.2	5.5	8.8	18

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10) HS_ID_TOTAL	µg/l	10	ISO 17025	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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



Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235078		2235079		2235080		2235081		2235082	
Sample Reference	BHTCA103		BHTCA106		BHTCA107		BHTCA102		WS2C120	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Date Sampled	05/04/2022		06/04/2022		06/04/2022		05/04/2022		07/04/2022	
Time Taken	1403		1007		1015		1443		None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status							

General Inorganics

pH	pH Units	N/A	ISO 17025	7	7.7	7.5	7.3	7.2
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	1090	657	1260	476	1040
Alkalinity as CaCO3	mg/l	3	ISO 17025	370	230	370	270	390

Phenols by HPLC

Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16



Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235078		2235079		2235080		2235081		2235082	
Sample Reference	BHCA103		BHCA106		BHCA107		BHCA102		WS2C120	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Date Sampled	05/04/2022		06/04/2022		06/04/2022		05/04/2022		07/04/2022	
Time Taken	1403		1007		1015		1443		None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status							

Heavy Metals / Metalloids

Element	Units	Limit of detection	Accreditation Status	2235078	2235079	2235080	2235081	2235082
Boron (dissolved)	µg/l	10	ISO 17025	600	1000	890	930	95
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.64	1.41	1.29	0.86	3.75
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.14	0.05	0.03	0.05	0.06
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	5.1	4.9	3.9	4.5	5.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.2	0.3	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	56	13	12	7.4	13
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.9	9.7	1.5	2.1	3.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	110	14	29	9.6	8.4

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10) HS_ID_TOTAL	µg/l	10	ISO 17025	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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



Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235083		2235084		2235085		2235086		2235087	
Sample Reference	WS2C112		BH2C103		BH2C104		WSTCA117		BHTCA109	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Date Sampled	07/04/2022		07/04/2022		07/04/2022		07/04/2022		07/04/2022	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status							

General Inorganics

pH	pH Units	N/A	ISO 17025	7.4	7.4	7	6.9	6.9
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	936	1390	1380	519	1040
Alkalinity as CaCO3	mg/l	3	ISO 17025	260	280	250	510	610

Phenols by HPLC

Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16



Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235083		2235084		2235085		2235086		2235087	
Sample Reference	WS2C112		BH2C103		BH2C104		WSTCA117		BH2CA109	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Date Sampled	07/04/2022		07/04/2022		07/04/2022		07/04/2022		07/04/2022	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status							

Heavy Metals / Metalloids

Element	Unit	Limit	ISO 17025	2235083	2235084	2235085	2235086	2235087
Boron (dissolved)	µg/l	10	ISO 17025	98	930	240	190	330
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.72	0.7	1.95	1.81	0.55
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.19	0.13	0.13	0.06	0.07
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	4.5	3	4.2	3.8	3
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2	< 0.2	< 0.2	0.2	0.3
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	43	16	32	29	9
Selenium (dissolved)	µg/l	0.6	ISO 17025	40	3	< 0.6	1	3.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	9.7	11	28	12	11

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10) HS_ID_TOTAL	µg/l	10	ISO 17025	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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



Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number				2235088
Sample Reference				BHTCA108
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				07/04/2022
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	8
Total Cyanide	µg/l	10	ISO 17025	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	804
Alkalinity as CaCO3	mg/l	3	ISO 17025	210

Phenols by HPLC

Catechol	µg/l	0.5	NONE	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16
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Analytical Report Number: 22-51163
Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2235088		
Sample Reference	BHTCA108		
Sample Number	None Supplied		
Depth (m)	None Supplied		
Date Sampled	07/04/2022		
Time Taken	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status

Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	790
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	< 0.15
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	0.07
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	7.9
Zinc (dissolved)	µg/l	0.5	ISO 17025	5

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10) HS_ID_TOTAL	µg/l	10	ISO 17025	< 10.0
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_#1_#2_MS	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_#1_#2_MS	µg/l	10	NONE	< 10

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



Analytical Report Number : 22-51163
Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Phenols, speciated, in water, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
PRO (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW, GW.	In-house method based on USEPA8260	L088-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Analytical Report Number : 22-51163
 Project / Site name: Northstowe

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Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report



Analytical Report Number : 22-51163

Project / Site name: Northstowe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH2C103	None Supplied	W	2235084	c	pH at 20oC in water (automated)	L099-PL	c
BH2C104	None Supplied	W	2235085	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA101	None Supplied	W	2235073	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA102	None Supplied	W	2235081	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA103	None Supplied	W	2235078	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA104	None Supplied	W	2235076	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA105D	None Supplied	W	2235075	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA106	None Supplied	W	2235079	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA107	None Supplied	W	2235080	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA108	None Supplied	W	2235088	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA109	None Supplied	W	2235087	c	pH at 20oC in water (automated)	L099-PL	c
BHTCA110	None Supplied	W	2235077	c	pH at 20oC in water (automated)	L099-PL	c
WS2C112	None Supplied	W	2235083	c	pH at 20oC in water (automated)	L099-PL	c
WS2C120	None Supplied	W	2235082	c	pH at 20oC in water (automated)	L099-PL	c
WSTCA108	None Supplied	W	2235074	c	pH at 20oC in water (automated)	L099-PL	c
WSTCA117	None Supplied	W	2235086	c	pH at 20oC in water (automated)	L099-PL	c



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Analytical Report Number : 22-51965

Project / Site name:	Northstowe	Samples received on:	14/04/2022
Your job number:		Samples instructed on/ Analysis started on:	14/04/2022
Your order number:	14059900	Analysis completed by:	26/04/2022
Report Issue Number:	1	Report issued on:	26/04/2022
Samples Analysed:	4 water samples		

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Signed: _____

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Technical Reviewer

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: 22-51965
Project / Site name: Northstowe

Lab Sample Number				2239760	2239761	2239762	2239763
Sample Reference				BH2C101	WS2C108	WS2C114	BH2C102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

General Inorganics

	pH Units	N/A	ISO 17025	7.4	7.5	7.4	7.3
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	110	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Sulphate as SO4	µg/l	45	ISO 17025	1310000	2070000	701000	1900000
Sulphate as SO4	mg/l	0.045	ISO 17025	1310	2070	701	1900
Alkalinity as CaCO3	mg/l	3	ISO 17025	230	250	440	300

Phenols by HPLC

	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	950	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	950	< 3.5

Speciated PAHs

	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16



Analytical Report Number: 22-51965
Project / Site name: Northstowe

Lab Sample Number	2239760			2239761			2239762			2239763		
Sample Reference	BH2C101			WS2C108			WS2C114			BH2C102		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	None Supplied			None Supplied			None Supplied			None Supplied		
Date Sampled	Deviating			Deviating			Deviating			Deviating		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status									

Heavy Metals / Metalloids

Parameter	Units	Limit of detection	Accreditation Status	2239760	2239761	2239762	2239763
Boron (dissolved)	µg/l	10	ISO 17025	1300	310	130	1100
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.49	0.39	1.65	0.41
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04	0.05	0.09	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.4	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	2.3	2.8	4.1	2.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	6.5	5.7	11	9.6
Selenium (dissolved)	µg/l	0.6	ISO 17025	4.1	16	20	13
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.1	16	5.2	29

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6 _{HS,1D,AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 _{HS,1D,AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 _{HS,1D,AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 _{EH,1D,AL,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH,1D,AL,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH,1D,AL,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH,1D,AL,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH,1D,AL,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 _{HS,1D,AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS,1D,AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS,1D,AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH,1D,AR,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH,1D,AR,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH,1D,AR,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH,1D,AR,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) _{HS+EH,1D,AR,#1,#2,MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10

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



Analytical Report Number : 22-51965
Project / Site name: Northstowe

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Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Phenols, speciated, in water, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
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Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Analytical Report Number : 22-51965
 Project / Site name: Northstowe

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Analytical Report Number : 22-51965

Project / Site name: Northstowe

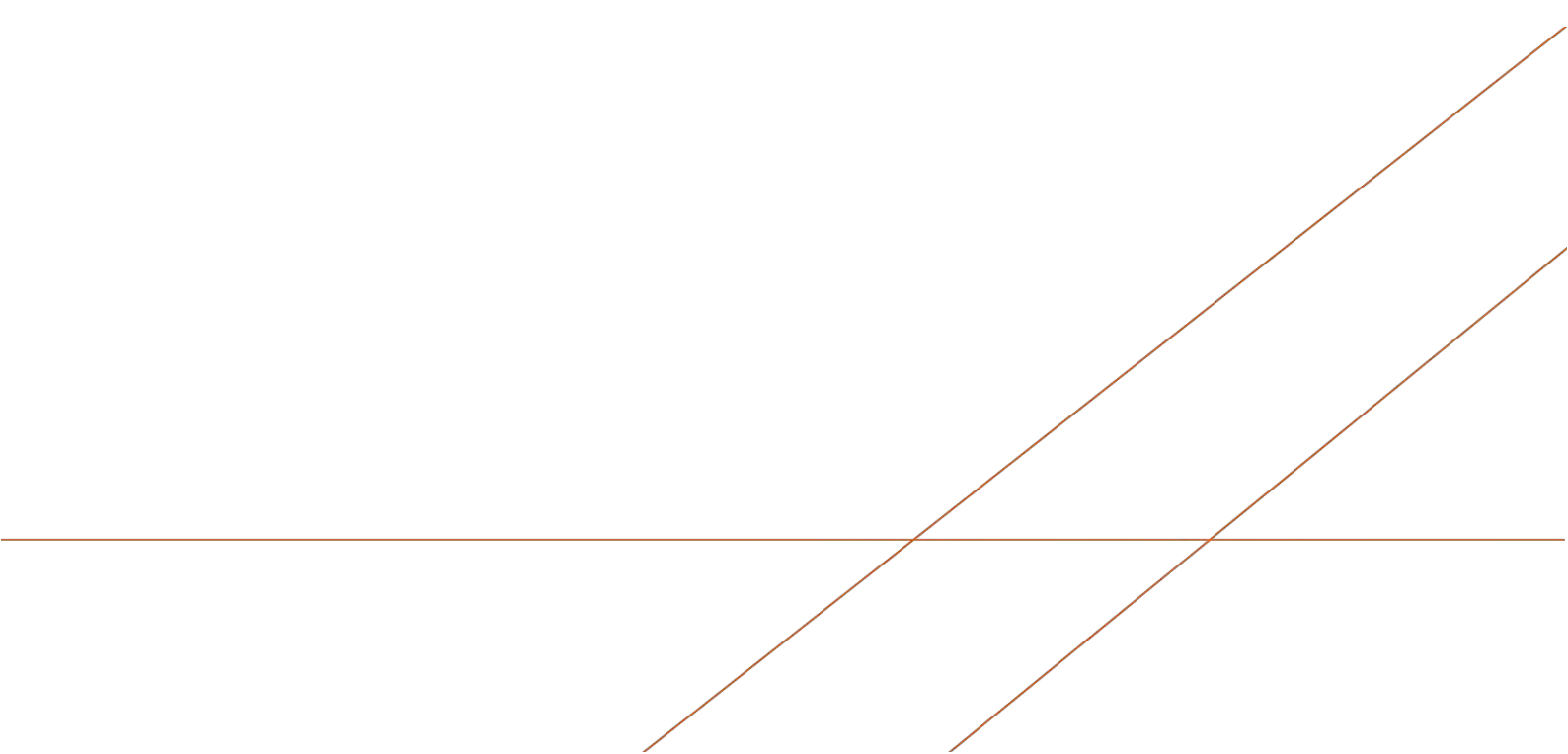
This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH2C101	None Supplied	W	2239760	a	None Supplied	None Supplied	None Supplied
BH2C102	None Supplied	W	2239763	a	None Supplied	None Supplied	None Supplied
WS2C108	None Supplied	W	2239761	a	None Supplied	None Supplied	None Supplied
WS2C114	None Supplied	W	2239762	a	None Supplied	None Supplied	None Supplied

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PHASE 1 DESK STUDY AND PHASE 2 INTRUSIVE INVESTIGATION; INTERPRETATIVE REPORT

Northstowe Phase 2 – Phase C1

Document Ref: 10018973-ARC-XX-XX-RP-YY-0004-03-PhC1

Revision: 00

JUNE 2022

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Phase 1 Desk Study and Phase 2 Intrusive Investigation; Interpretative Report

Northstowe Phase 2 – Phase C1

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This report dated 30 June 2022 has been prepared for Homes England (the “Client”) in accordance with the terms and conditions of appointment dated 01 February 2022 (the “Appointment”) between the Client and **Arcadis Consulting (UK) Ltd** / **Arcadis Consulting (UK) Limited** (“Arcadis”) for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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Exploratory Hole Plan

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Phase C1 Factual Report

1 Introduction

1.1 Terms of Reference

Arcadis Consulting (UK) Limited (Arcadis) was instructed by Homes England, 'the Client', to undertake a ground investigation at the proposed site, known as Phase C1 (the "Site") within the Northstowe development near Cambridge.

A review of the existing ground information data was undertaken to inform design of the this preliminary ground investigation. Previous work by Arcadis in 2019 completed a ground investigation in the north-western part of the C1 site. This has been considered within the assessment of this report.

The investigation undertaken across Phase C1 was based on a 50m grid, in order to provide greater certainty of the ground conditions and better investigate the presence of the sand and gravel channels that are present in this area.

Details of the most recent (supplementary) investigation are provided within the Factual Report [1].

1.2 Proposed Redevelopment

At the time of writing no fixed development layout plans are available for the Phase C1. It is therefore assumed that the majority of the development will be of mixed use, with buildings up to 6 storeys high.

The wider Phase 2 Northstowe development scheme comprises the following;

- Development of the main Phase 2 development area into approximately 3,500 dwellings, schools, town centre including employment uses, formal and informal recreation space and landscaped areas, the eastern sports hub, the busway, a primary road to the southern access, construction haul route and engineering and infrastructure works, and
- Construction of a highway link (Southern Access Road (West) (SARW)) between the proposed new town of Northstowe and the B1050, improvements to the B1050 and associated landscaping and drainage.

Plan 1, below, shows the Phase C1 redline boundary area within the main Phase 2 development area.

Plan 1 – Redline boundary for the Northstowe Phase C1



1.3 Supplementary Reporting

The assessment and recommendations made in this report are based upon the following documents which should be referred to for factual data:

- Arcadis, Northstowe Phase 2B – Factual Ground Investigation Report, October 2019 [25];
- Arcadis, Northstowe Phase 2B – Interpretive Ground Investigation Report Jan 2020 [26];
- Arcadis, Northstowe Phase C1 – Factual Ground Investigation Report, May 2022 [1];
- Arcadis, Northstowe Phase 2 and– Geo Environmental Assessment Report / Outline Remedial Strategy (Infrastructure), 2017 [24];
- WSP Environmental (UK) (2007) Northstowe Zone B - Interim Factual Report [2].

A combined exploratory hole location plan is presented within Appendix A.

1.4 Limitations

This report has been prepared for the client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document, including the electronic format shall remain the property of Arcadis.

This report has been compiled from a number of sources, which Arcadis believes to be trustworthy. However, Arcadis is unable to guarantee the accuracy of information provided by others. The report is based on information available at the time. Consequently, there is a potential for further information to become available, which may change this report's conclusion and for which Arcadis cannot be responsible.

It should be noted that ground conditions between exploratory holes may vary from those identified during and ground investigations; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, seasonal, climatic variations and those recorded in this report are solely dependent on the time the ground investigations were carried out and the weather before and during the investigations, (carried out at different times).

This report has been prepared for the Phase C1 boundary.

2 Site Setting

2.1 Site Location and Description

The Northstowe development is centred on the former RAF Oakington Airfield and surrounding farmland which is situated approximately 10km northwest of Cambridge. The National Grid Reference (NGR) is TL 408 665.

The Phase C1 site is approximately 3.8 hectares and generally flat. It is located centrally in the main Northstowe Phase 2 development. The Site sits adjacent along the northeast side to Northstowe Secondary College.

Previous specialist work, for example, UXO and archaeology surveys, have been undertaken by others across the area which includes the Phase 2 development.

2.2 Site History

The Phase C1 development area 'the Site' includes open space and limited hardstanding associated with the former RAF Oakington airfield, former barracks, and immigration centre. Accommodation blocks consisting of H-shaped buildings were previously located southwest of the Site and these have been demolished to ground level.

It is not the intention of this report to provide a full history, but to identify those past uses on and within the vicinity of the Site that could have resulted in contamination of the soils and/or waters. Significant changes to the land use of the Site and surrounding areas are summarised in Table 2.1 below, sourced from historic mapping [2].

Table 2.1 Site History

Year	On Site	Off Site
1886 – 1938	The site is undeveloped fields.	The surrounding area is farmland and associated buildings
1938 – 1952	No change.	The area to the south of site is now listed as Airfield.
1958 – 1973	A small building is located on the west side of the site.	South and west of the site contains H shaped accommodations blocks as well as roads and associated infrastructure. The airfield to the south and east of site has been further developed with additional buildings shown and runways.
1981 – 2006	The site is now listed as Oakington Barracks.	The airfield is now listed as Oakington Airfield, there have been changes to the layout of the runways.
2018	The site is now listed as Oakington Barracks (disused).	The airfield is now listed as Oakington Airfield (disused).

2.3 Published Geology, Hydrogeology, Hydrology and Relevant Environmental Information

Below is a summary of site information to assist with providing context to the report.

Table 2.3 Published information

<p>Geology / Aquifer Status</p>	<p>Superficial Deposits: River Terrace Deposits comprised of clay, sand and gravel.</p> <p>The Superficial Deposits (River Terrace Deposits) on the site are classified as a Secondary A aquifer by the Environment Agency (EA). Secondary A aquifers are defined as “permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers”.</p> <p>Their mode or occurrence is naturally variable and is not persistent across all areas. Where present there is a strong influence on local groundwater conditions.</p> <p>Solid Geology: Based on Geological Mapping at 1:50,000 scale, Sheet 187 (drift) Huntingdon and Sheet 188 (solid and drift) Cambridge, the geological sequence underlying the locality is River Terrace Deposits over Kimmeridge Clay and Ampthill Clay.</p> <p>The bedrock (Kimmeridge Clay Formation) is classified as Unproductive Strata. Unproductive Strata is defined as “rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow”</p> <p>Phase C1 is mapped as underlain by the Kimmeridge Clay only.</p>
<p>Additional Geological Information</p>	<p>There are no geological faults located on the site, according to the BGS mapping.</p> <p>The previous borehole/investigations, undertaken by the British Geological Survey between 1980’s and 1990’s across the whole Northstowe Phase 2 area, encountered between 0.2 m and 1.2 m of medium dense made ground overlying medium dense to dense River Terrace Sand and Gravel between 4 m and 6 m thick before proving the bedrock.</p>
<p>Radon</p>	<p>The radon risk has been reviewed based on available mapping which indicates that the site is not in a radon affected area, as less</p>

	<p>than 1% of properties are above the action level, therefore no protective measures are necessary.</p>
Source Protection Zone	<p>The site is not situated within a Source Protection Zone (SPZ).</p>
Licensed Groundwater Abstraction Points	<p>There are a number of groundwater abstractions within 2000m of the site, with groundwater being utilised by multiple sources for spray irrigation and agriculture purposes.</p>
Surface Water Features	<p>A newly created waterparks area, consisting of surface water ponds, is present approximately 500m east and southeast of the plot.</p> <p>A number of field drains within the surrounding agricultural land and Beck Brook located approximately 1km east of the Phase C1 site, which flows in a northerly direction.</p>
Likely Groundwater Flow Direction	<p>Groundwater flow is likely to be to the north and northeast and it is considered likely that groundwater is in continuity with Beck Brook to the east of the site. Groundwater is often found to be close to the surface.</p>

3 Preliminary Conceptual Site Model

Geo-environmental assessments are required, in accordance with current regulatory guidance (CIRIA C552 [4] and LCRM [5]), to consider the significance of potential contamination in terms of plausible contaminant source-pathway-receptor contaminant linkages. As part of this process, it is necessary to develop a conceptual model of these potential contaminant linkages by identifying the potential contamination sources, sensitive receptors and potential exposure pathways.

3.1 Potential Contaminant Sources

Based on the information obtained from the environmental site setting, historical mapping and previous investigations, there are a number of potential contaminative sources identified on and off-site. These are summarised in Table 3.1 below.

It should be noted that it is considered unlikely that all these substances would be present at significant concentrations across the Site.

Table 3.1 Potential Contaminant Sources

Source	Potential Contaminants
On Site	
Made Ground/ reworked ground/ imported ground associated with current use and historical use as the RAF Oakington with associated Barracks	Metals, polyaromatic hydrocarbons (PAHs), Fuel Spillages – petroleum hydrocarbons (TPHs), asbestos, ground gases and vapours.
Off Site	
RAF Oakington and former Barracks	Metals, PAH, TPH, ground gases

3.2 Potential Receptors

The potential receptors detailed below take into consideration the development of the site as a Town Centre Area with the most sensitive proposed future land use being residential housing (flats with no private gardens) and future end users (employees and shoppers) as a precautionary approach. It is considered possible that any potential contamination within the soils could be disturbed during the construction phase, or during gardening or landscaping undertaken by future Site users.

3.2.1 Human Health

- Site Users (residents, visitors, shoppers, employees, maintenance workers and contractors).

Contamination risks to construction workers are not appraised by chronic (long term) exposure human health risk assessments. There are no appropriate published criteria applicable to assessment of potential risks to construction workers. The potential risks should be addressed by a site-specific construction workers risk assessment and implementation of appropriate health and safety measures, to adequately mitigate any potential risks. All works should be conducted in accordance with the CDM Regulations (2015) or any other relevant guidance. Construction workers are not considered further in this assessment.

3.2.2 Controlled Waters

Groundwater – Secondary A Aquifer underlying the majority of the Site (River Terrace Deposits)

Surface Water – A newly created waterparks area, consisting of surface water ponds, is present approximately 500m east and southeast of the plot. Beck Brook approximately 1km east of the Site. Several surface water drains across the Site.

3.2.3 Buildings

- Underground building structures/services (water pipes, concrete).
- Proposed buildings and foundations.

3.3 Potential Pathways

Potential pathways are the routes that link the receptor to the contamination. The potential pathways for this site are summarised in the table below.

Table 3.2 Potential Pathways

Potential Pathway	Receptor
Accidental ingestion of contaminants within soil, water and dust	Human Health – residents, visitors, maintenance workers and contractors
Inhalation of dust, vapours and ground gases	
Dermal contact with contaminants within soil, water and dust	
Leaching of potential contaminants in soil or Made Ground into groundwater.	Controlled Waters (groundwater and surface water)
Vertical migration of soluble contaminants through the unsaturated zone into groundwater beneath the Site.	
Lateral migration of dissolved contaminant via groundwater flow	
Surface run-off of contaminants into surface water	

Potential Pathway	Receptor
Migration of contaminants via surface water drains/ channels/ preferential pathways	
<p>Direct contact of building services or foundations with contaminants in the soil and Made Ground.</p> <p>Gas accumulation in confined and poorly ventilated spaces.</p>	Buildings, services and foundations

4 Intrusive Ground Investigation

4.1 Historic Ground Investigations

Multiple ground investigations have been conducted on the wider Northstowe site, by WSP in 2007 and Arcadis Consulting in 2016, 2017, and 2018. The previous locations falling within the current Phase 2C redline boundary comprise the following:

- 4 no. cable percussive borehole (BH1001, BH2B01, BH2B02 and BH2B03) to up to 15.50 m below ground level (bgl) with dual 50mm HDPE installations in each location.
- 13 no. machine excavated trial pits (TP1001 – TP1004, TPB041, TPB41A, TPB41B, TP2B14, TP2B15, TP2B19, TP2B23, TP2B23A and TP2B40) to between 1.40 and 3.00 m bgl.

4.2 Arcadis Ground Investigation

The most recent phase of ground investigation works was carried out between the 15th – 23rd March 2022. The ground investigation scope, which was determined by Arcadis Consulting (UK) Limited, comprised:

- 11 no. cable percussive boreholes with 50mm HDPE installations to a maximum depth of 20.45m bgl.
- 7 no. dynamic exploratory holes with 50mm HDPE installations to a maximum depth of 3.45m bgl.
- 13 no. machine excavated trial pits to a maximum depth of 3.00m bgl.
- 1 no. machine excavated soakaway pits to a depth of 1.50m bgl.
- Geotechnical and geo-environmental sampling.
- 3 no. rounds of gas and groundwater monitoring from exploratory holes.

5 Ground Conditions

5.1 Introduction

The anticipated ground conditions outlined in Table 5.1 identified the potential for Made Ground across the site overlying superficial River Terrace Deposits, which overlie the Kimmeridge Clay bedrock.

The following ground model is based upon information relating to ground conditions encountered on site during the ground investigation works in both 2019 and 2022.

Full details of the ground conditions encountered are included in the exploratory logs contained in the Factual Reports [1, 25] and are summarised below.

It should be noted that topsoil was not encountered at all locations across the site as it has previously been reworked or stripped during prior archaeological investigations.

Table 5.1 Ground Conditions Summary

Strata	Maximum Strata Range (m bgl)	Thickness Range (m)	Description	In situ Data SPT N value
Made Ground	0.00 - 1.70	0.20 - 1.70	<u>Cohesive</u> Soft to firm encountered as dark brown occasional mottled orangish or bluish slightly sandy slightly gravelly to gravelly CLAY.	11 - 29
	0.00 - 1.20	0.20 - 1.00	<u>Granular</u> Typically, as fine to coarse GRAVEL with fragments of brick, concrete, chert or plastic, or gravelly SAND. <i>Found in TPSA1004, TPTCA105 and TPTCA119 only.</i>	-
Superficial Deposits River Terrace Deposits	0.20 – 2.50	0.20 – 1.80	<u>Cohesive</u> Soft to firm sandy gravelly CLAY or silty gravelly CLAY. Occasional rootlets and pockets of sand.	6 - 17
	0.50 – 2.70	0.10 – 1.90	<u>Granular</u> Typically, loose to dense clayey sandy fine to coarse GRAVEL or clayey gravelly SAND.	6 - 36
	-	-	<u>Not identified – RTD absent</u> BHTCA106, BHTCA108, TPTCA118, TPTCA120, WSTCA112 and WSTCA117	-

Strata	Maximum Strata Range (m bgl)	Thickness Range (m)	Description	In situ Data SPT N value
Bedrock (Kimmeridge Clay)	0.90 → 20.45 (Base not proven)	Up to 17.75 (Base not proven)	<p><u>Cohesive</u></p> <p>Typically, firm to very stiff bluish grey silty CLAY with occasional shelly fragments and selenite crystals. Frequent bands of extremely weak to weak light grey SILTSTONE.</p> <p><i>Bedrock not proven in TPTCA102 and WSTA101, locations completed within RTD</i></p>	9 - >50

5.2 Range of Geotechnical Parameters

The range of laboratory and *in situ* tests results for ground conditions encountered within the exploratory holes are summarised in Tables 5.2 to 5.5 below. These are based on laboratory test results, *in situ* test results and published data.

Table 5.2: Summary of Geotechnical Properties for Cohesive Made Ground

Test	No. of results	Min	Max
SPT N values	3	9	29
**Cu (kPa) from correlations	3	50	160
Natural moisture content (mc - %)	3	14	18
Liquid Limit (LL) %	3	36	48
Plastic Limit (PL) %	3	15	18
Plasticity Index (PI) %	3	21	25
*Modified Plasticity Index (MPI) %	3	18.7	23.8

* Modified Plasticity Index (NHBC)

Table 5.3: Summary of Geotechnical Properties for Cohesive River Terrace Deposits

Test	No. of results	Min	Max	Result
SPT N values	7	6	17	-
Natural moisture content (mc - %)	1	-	-	37
Liquid Limit (LL) %	1	-	-	61
Plastic Limit (PL) %	1	-	-	30
Plasticity Index (PI) %	1	-	-	31
*Modified Plasticity Index (MPI) %	1	-	-	31
**Cu (kPa) from correlations	7	33	93.5	-

* Modified Plasticity Index (NHBC) **In clay soils, $C_u = f_1 \times \text{SPTN}$. $f_1 = 5.5$ for a Plasticity index of <20% (After Stroud, 1974)

Reference: Stroud and Butler, The Standard Penetration Test and the Engineering Properties of Glacial Materials, 1975 Conf. of the Midlands Geotechnical Society.

Table 5.4: Summary of Geotechnical Properties for Granular River Terrace Deposits

Test	No. of results	Min	Max
SPT N values	12	6	36
Natural moisture content (mc - %)	6	13	36
Liquid Limit (LL) %	5	26	65
Plastic Limit (PL) %	5	13	30
Plasticity Index (PI) %	5	13	38
*Modified Plasticity Index (MPI) %	5	9	34

* Modified Plasticity Index (NHBC)

Table 5.5: Summary of Geotechnical Properties for Bedrock (Cohesive Kimmeridge Clay Deposits)

Test	No. of results	Min	Max
SPT N values	108	9	>50
***Cu (kPa) from correlations	108	50	250
Natural moisture content (mc - %)	79	10	46
Liquid Limit (LL) %	56	24	98
Plastic Limit (PL) %	56	14	36
Plasticity Index (PI) %	56	10	67
*Modified Plasticity Index (MPI) %	56	10	67
**Cu (kPa) (From laboratory testing) Based on a cell pressure of 250 kPa	12	22	135
Bulk Density Mg/m ³	19	1.94	2.24
Dry Density Mg/m ³	19	1.45	1.77
Voids Ratio	7	0.64	0.79

Test	No. of results	Min	Max
Cv M2/yr (From laboratory testing) (for applied pressure between 100 and 200 kPa)	6	1.6	7.09
Mv M2/MN (From laboratory testing) (for applied pressure between 100 and 220 kPa)	6	0.09	0.24
pH	17	7.7	9.0
Sulphate as SO ₄ (mg/l)	17	40	1937
Peak Shear Vane (kPa)	6	40	152
Residual Hand Vane (kPa)	6	14	76

* Modified Plasticity Index (NHBC)

** Cu taken from single stage unconsolidated undrained triaxial test with cell pressure of 250 kPa

*** In clay soils, $C_u = f_1 \times \text{SPTN}$. $f_1 = 5.5$ for a Plasticity index of <20% (After Stroud, 1974)

5.3 Standard Penetration Testing

5.3.1 Made Ground,

Due to the inconsistent presence, and shallow depth of Made Ground across the Phase C1 site, only 3 SPT tests were undertaken within the strata, all taken at 1.2m bgl. These reported N value of between 11 and 29.

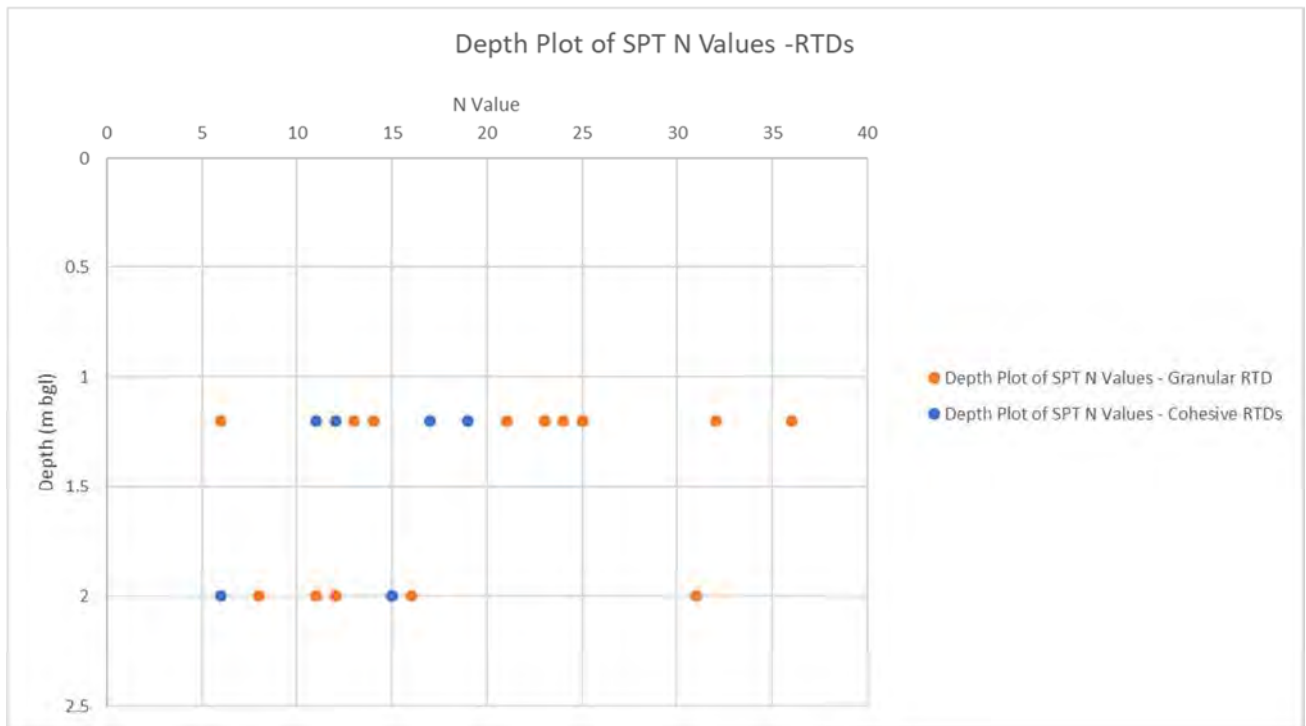
5.3.2 Superficial Deposits

SPT tests were undertaken within all boreholes and dynamically sample holes during the investigation.

The SPT results suggests River Terrace deposits (Granular) are typically loose to dense based on recorded SPT N-values of between 6 and 36. The SPTs undertaken within the cohesive River Terrace deposits are recorded on engineering logs as soft to stiff consistencies, with recorded SPT N-values of between 6 and 17. No relationship was observed between depth and N value.

Figure 5-1 below displays the relationship between depth and SPT N-value.

Figure 5-1 Depth plot of SPT N Values - RTDs



5.3.3 Kimmeridge Clay Formation

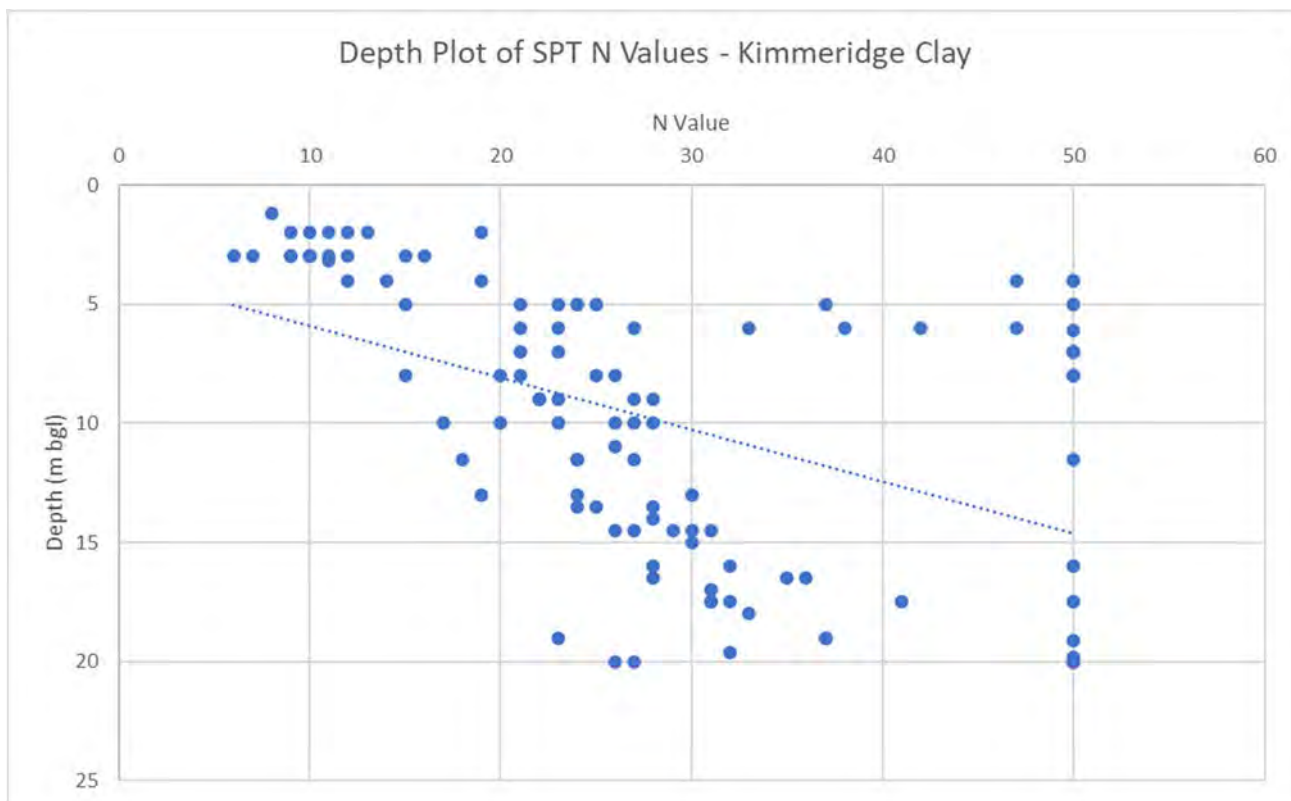
The Kimmeridge Clay was encountered below either Made Ground or the River Terrace Deposits across the Site at depths ranging from 0.90 m to >20.45 m bgl. The base of the Kimmeridge Clay was not proven during the ground investigation, not all shallow locations reached Bedrock (TPTCA102, WSTCA101).

The Kimmeridge Clay typically comprises a firm to stiff dark grey silty Clay with bands of extremely weak and very weak grey siltstone. Occasional selenite crystals, shelly fragments and pockets of sand were noted. Orange mottling was also encountered.

SPT testing undertaken within the Kimmeridge Clay recorded SPT N-values of between 9 and >50, and in general displayed an overall increase in strength with depth.

Figure 5-2 below displays a general trendline and the relationship between depth and the increase in SPT N-value.

Figure 5-2 Depth Plot of SPT N Values vs Depth - Kimmeridge Clay



5.4 Particle Size Distribution Test Results

20 no. PSD tests were undertaken within Made Ground, Superficial Deposits and Bedrock. These comprised 6 no. within Made Ground, 10 no. within granular River Terrace Deposits, 3 no. within cohesive River Terrace Deposits, and 1 no. within the bedrock of the Kimmeridge Clay Formation. The results were obtained by wet sieving soils to achieve a percentage passing for each grain size.

Log descriptions generally corresponded with the PSD results, with PSD results from the Kimmeridge Clay Formation returning as slightly sandy, slightly gravelly SILT/CLAY. The PSD results from the granular River Terrace Deposits returned as clayey/silty, very gravelly SAND to clayey/silty, sandy to very sandy GRAVEL and from the cohesive River Terrace Deposits as slightly sandy, slightly gravelly to gravelly SILT/CLAY. The PSD results from the cohesive Made Ground returned as slightly sandy to sandy, slightly gravelly SILT/CLAY.

The results are attached as part of the Factual Report (Appendix C).

5.5 Atterberg Tests

The Atterberg limits indicate the following plasticity for the clay particles encountered within the strata encountered. Calculation of the modified plasticity index has been done in accordance to NHBC Chapter 4.2 guidelines [6].

Made ground – intermediate to high plasticity with a low to medium volume change potential.

Bedrock – Kimmeridge Clay – intermediate to high plasticity with a low to high volume change potential.

5.6 Undrained Shear Strength

5.6.1 Correlations

The undrained strength of clay soils recovered from cohesive River Terrace Deposits and Kimmeridge Clay bedrock were also determined from correlation with the Standard Penetration Test (SPT) and have been extrapolated to estimate final N-values (uncorrected for overburden and/or hammer efficiency). Based on the correlations made, the cohesive River Terrace deposits recorded an undrained shear strength ranging between 30kPa to 95kPa which would correspond to low to high strength soils. Correlations made within the Kimmeridge clay deposits based upon SPT N values ranged between 30 kPa and 250 kPa this would correspond to low to very high strength soils.

Geotechnical test results are attached as part of the Factual Report (Appendix C).

5.6.2 Laboratory Testing

Twelve single stage unconsolidated undrained triaxial tests were carried out upon soil samples recovered Kimmeridge Clays (bedrock) and tested in accordance with BS1377:1990, Part 7, Section 8 [8]. Analysis of the test data indicates that for a cell pressure of 250 kPa a deviator stress was recorded between 44 kPa and 270 kPa. Undrained shear strength was also recorded between 22 kPa and 140 kPa for this cell pressure. This corresponds to low to high strength soils.

5.7 One Dimensional Consolidation Testing

One dimensional consolidation testing was undertaken on seven soil samples of recovered Kimmeridge Clays (bedrock) and tested in accordance with BS1377:1990, Part 5, Section 3 [8]. Analysis of the test data indicates that for a pressure range of 100 kPa to 200 kPa the coefficient of compressibility (m_v) was recorded between 0.09 m^2/MN and 0.24 m^2/MN which is indicative of low to medium compressibility.

Geotechnical test results are attached as part of the Factual Report (Appendix C).

5.8 Olfactory/Visual Contamination Evidence

No visual or olfactory contamination was recorded during the ground investigation.

5.9 Groundwater

Groundwater strikes within cable percussive and dynamically sampled boreholes and were noted at depths of between 0.70mbgl to 13.10mbgl within the River Terrace Deposits and the Kimmeridge Clay Formation. Groundwater monitoring within the River Terrace Deposits indicates a generally continuous shallow groundwater body. A number of strikes coincided with the top of the Kimmeridge Clay Formation or bands of siltstone within the Kimmeridge Clay Formation; these are potentially an indication of “semi-perched” water condition atop of the predominantly cohesive bedrock unit (lower relative permeability).

Post fieldwork monitoring has been undertaken on three occasions on the following dates;

- 5 - 7th April 2022.
- 12th April 2022; and
- 20rd May 2022; and

Groundwater levels recorded during monitoring ranged between 0.49m bgl and 3.00m bgl where groundwater was encountered. A number of shallow monitoring wells were recorded as dry during the monitoring period.

Groundwater strikes within trial pits were noted at depths of between 0.50m bgl and 3.00m bgl within the River Terrace Deposits and the Kimmeridge Clay Formation. Groundwater was recorded as seepages, indicative of the relatively low permeability of the Kimmeridge Clay Formation.

It should be appreciated that ground and groundwater conditions may vary between and away from the exploratory hole positions, and that no account can be taken in this report of such variations.

It should also be noted that groundwater levels may be affected by seasonal variations such as rainfall and that no account can be taken of such variations in this report due to the short monitoring period.

Details of groundwater strikes are presented on the exploratory hole logs and within the groundwater monitoring data in the factual reports.

6 Geotechnical Assessment

At the time of writing and with reference to the proposed development plans, the proposed development within Phase C1 is assumed to be of mixed use residential and commercial use, with buildings up to six storeys high.

The wider Phase 2 Northstowe development scheme comprises the following;

- Development of the main Phase 2 development area into approximately 3,500 dwellings, schools, town centre including employment uses, formal and informal recreation space and landscaped areas, the eastern sports hub, the busway, a primary road to the southern access, construction haul route and engineering and infrastructure works, and;
- Construction of a highway link, Southern Access Road (West) (SARW) between the proposed new town of Northstowe and the B1050, improvements to the B1050 and associated landscaping and drainage.

It is understood that the units will be a up to a maximum of six storeys.

The proposed loads are currently not known but are anticipated to be moderately loaded. Finished levels are yet to be finalised but it is expected some earthworks will be required. Foundations are likely to need to extend through the new fill to achieve adequate bearing and satisfactory settlement performance, unless special precautions are taken, regarding quality of fill and foundation type. Further comment on options is beyond the scope of this report. Should design plans change it is recommended that this assessment be revisited.

The below assessment is considered preliminary and has been based upon an indicative proposed load in the order of 80 kPa for the preliminary assessment purposes. Should the design loads be more than foundation recommendations should be reviewed.

The following assessment is based upon the information and ground conditions presented within the Factual Report (Appendix C).

The ground conditions across the site, as outlined in Table 5.1, were found to generally comprise a mixture of granular and cohesive made ground to a maximum depth of 1.70m bgl, overlying Superficial Deposits described as River Terrace Deposits. These were recovered as a mixture of cohesive and granular material but predominately recorded as gravelly SAND to sandy GRAVEL to a maximum depth of 2.90 m bgl and were above the Kimmeridge Clay bedrock, which comprised intermittent siltstone bands.

Groundwater levels recorded during the monitoring phase of works ranged between 0.49m bgl and 3.00m bgl. A number of wells were intermittently recorded as dry during the monitoring period, these include BHTCA105S, BHTCA301A WSTCA101, WSTCA106, and WSTCA116. WSTCA109 and WSTCA112 remained dry during all three monitoring rounds.

6.1 Foundations

6.1.1 Floor Slabs

Current building control regulations require a suspended floor slab where infilled ground is present to depths more than 600mm, the sub-stratum is variable in terms of the structure and settlement potential or where clay

soils are present within the influence of existing or proposed trees. The thickest amount of Made Ground from the ground investigation was 1.70m bgl, which lies above Kimmeridge Clay Formation deposits in areas at variable strength. Therefore, a suspended floor slab would be recommended.

Where site levels are raised, the quality of this fill will have an influence on house types and ground floor arrangements. Early consultation with Building Control and the homes insurance body (e.g. NHBC) should take place, in advance of site filling if possible, to reach agreement in principle.

6.1.2 Shallow Foundations

Shallow strip footings or pad foundations are likely to be the most appropriate foundation types for the proposed development, founding within either granular River Terrace Deposits or Kimmeridge Clay bedrock at a depth in the order of 1.50 m bgl or a maximum of 2.50 m bgl in areas of significant Made Ground.

It is recommended that foundations be within consistent strata to avoid the risk of differential settlement.

Alternatively in areas where the River Terrace Deposits are present and deemed viable as a founding stratum, a raft or semi-raft foundation may be preferred to help control and minimise the effects of differential settlements. It is understood that raft foundations have previously been used in the wider Northstowe development. It is recommended that once fixed development plans become available, settlement analysis is undertaken.

Made Ground is not considered to be a suitable founding stratum for the foundations and where fill material is placed over significant quantities for cohesive Made Ground of variable strength some consolidation is expected.

6.2 Excavations

It is anticipated that the overlying Made Ground, topsoil, River Terrace Deposits and Bedrock should be readily excavated using a conventional backhoe excavator. However, excavation through any buried construction may require the use of specialist breaking equipment, and the presence of a high groundwater table should be taken into account.

The site should be cleared and any vegetation below areas of proposed development stripped following Series 200 of the Specification for Highway Works [9]. Whilst not extensive, any roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void in-filled with suitable compacted engineered fill; and redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.

All excavations should be carried out following CIRIA Report 97 'Trenching Practice' [10] and BRE 440 Foundations, Basements, and External Works 2002 [11]. Random and sudden falls should be expected from the faces of near vertically sided excavations put down at the site. This situation is likely to be prevalent in the Made Ground and natural coarse soils and is likely to be exacerbated by water inflows. Nevertheless, the materials in excavations should be exposed for as little time as is practical to minimise the risk of softening any cohesive materials in the excavation.

If excavations are cut at a safe angle of repose or benched, a suitably qualified geotechnical engineer should be present to check for potential signs of instability. Where possible all soils should be kept on-site to reduce

disposal costs. Even then, the stability of excavation faces cannot be guaranteed thus temporary support to the excavation faces may become necessary unless the foundations are constructed using trench-fill techniques. In this method, the foundation trenches should be excavated, inspected, and backfilled with concrete as a continuous operation. Under no circumstances should operatives be allowed to enter unsupported excavations. Even where the excavations are supported, a risk assessment of the stability of any open excavation should be undertaken by a competent person and measures adopted to ensure safe working practice in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations [6].

Groundwater monitoring has identified groundwater levels between 0.49m bgl and 3.00m bgl, therefore, shallow excavations open for a short period are likely to be subject to groundwater ingress. Should seepage of groundwater be encountered it is considered that it could be dealt with using a simple form of de-watering. Such a system could include the excavation of sumps from which the water could be pumped.

6.3 Soakaway Performance

BRE 365 Soak Away [12] tests were conducted within granular River Terrace Deposits in a single location on the Phase C1 site within TPTCA104. The test was terminated due to time constraints before reaching the 25% effective storage depth required. The extrapolated data returned an infiltration rate f (ms^{-1}) of $9.84\text{E}-10$.

If a partial SuDs solution needs to be assessed further, close centred, detailed investigations would be required to locate and zone the limited occurrence of granular River Terrace Deposits. Further assessment of this limited potential should be confirmed through the use of 'full scale' BRE 365 soakaway testing, taking into account specific development proposals available for the site and the sites proposed increase in ground levels.

In addition, taking the high groundwater into account, the site has very low feasibility for a typical soakage-based SuDs drainage solution.

6.4 Road Pavements

It is likely that the pavement subgrade exposed at current formation levels would comprise both granular and cohesive River Terrace Deposits, variable Made Ground or cohesive strata of the Kimmeridge Clay Formation.

Pavement and road design should be based upon a suitable (equilibrium) CBR value for such formation soils. It is recommended that new road pavement and road construction design should be based upon a preliminary CBR value within the range 2% to 5%. Areas of soft ground should be excavated when identified during proof rolling. A conservative estimate of equilibrium CBR for the cohesive Kimmeridge Clay and cohesive rich RTDs ranges from 2-3%, while more granular RTDs can be expected to fall within the range of 4-5%.

The design value will need to be reviewed and confirmed by suitable in-situ testing at formation levels following earthwork operations (raising of site levels) and prior to pavement construction.

Notwithstanding this, the formation at all levels should be proof-rolled prior to pavement construction, and any soft zones thus revealed should be excavated out, with the resulting excavation in-filled with appropriately graded engineered granular fill.

It would thus be prudent to adopt a relatively low CBR in the preliminary design and to open discussions with the local authority highways department in order to agree pavement design approaches. This should be done at an early stage, as design traffic, drainage arrangements and thickness/stiffness of a pavement all play a part in achieving a satisfactory performance and an adoptable design.

6.5 Buried Concrete

36 no. soil samples were taken for BRE testing, these comprise 15 within Made Ground (14 cohesive, 1 granular), 4 within River Terrace Deposits (3 granular, 1 cohesive), and 17 with the cohesive Kimmeridge Clay Formation.

In accordance with BRE Special Digest 1 2005 Third Edition, "Concrete in Aggressive Ground" [13], and results of BRE BR 279 Chemical Analysis [14], below ground concrete should comply with Table C1 design sulphate class DS-3 and ACEC class AC-3 based on the results obtained for each strata detailed above. Design/mix of buried concrete should be undertaken in accordance with these classifications.

6.6 Other Development Considerations

6.6.1 Material Management

In the case of managing soil movements or earthworks (e.g. raising of the site level) it is important to also manage the intention to re-use materials, when a genuine need for the materials exists.

This will help avoid unnecessary additional regulation that can sometimes arise from a "waste management" perspective.

Providing materials are suitable for use, both chemically and geotechnically, and that re-use is certain, regulators should be able to agree that such materials do not need to enter the waste regulation system. A good approach to the management of this risk is via development of a Materials Management Plan (MMP) in line with the CL:AIRE Code of Practice, DoWCoP [15].

If certain materials do require regulation as waste exemptions have changed significantly in recent years and there are strict limitations on the quantity of soil that can be used and the thickness to which it can be deposited. The use of a permit could stigmatise the site for future conveyance. It is on this basis that we would recommend the development of the MMP route.

The MMP once drafted would be reviewed together with the approved site investigation and remediation documents by a Qualified Person, with their Declaration being issued to the Environment Agency; ultimately allowing the development to go ahead under a self-regulation approach.

The development of an MMP would require a "Cut and Fill" model and a detailed materials management strategy to identify the sources of and destinations for site-won materials. It is envisaged that site formation levels will need to be raised by approximately 1m, so formation levels should be designed to accommodate the required thickness for construction.

If removal of any localised contamination that might be found was undertaken, such materials would be waste and would require disposal at an appropriately permitted waste facility.

6.6.2 Local Contamination Areas and Excess Arisings

On the basis of the current information, it is likely that if materials became excess to requirements, the majority of the Made Ground and natural soils would classify as “Inert” for landfill disposal.

An appropriate waste classification can only be undertaken on the material due to be disposed of via further chemical testing, which should be completed prior to making disposal arrangements. In all cases where excess soils require off-site disposal, the materials need to be managed under the appropriate waste legislation and consideration given to any remedial techniques that could be used to improve the soil.

For Inert Waste and Hazardous Waste disposal, an allowance will need to be made for adequate Waste Acceptance Criteria (WAC) testing with appropriate consideration of the additional time and cost associated with this.

6.6.3 Health, Safety & Environment

Whilst very few samples tested were found to have contamination at concentrations of regulatory concern, there remains a low potential for more-significantly impacted soils to be encountered; consideration should therefore be given to the level of PPE that should be provided to future site operatives.

A watching brief should be established to check for such as yet undiscovered impact.

All work on site should be conducted in accordance with appropriate Health and Safety guidance, with particular reference to HSG66 [16].

Care should be taken to minimise the risk of potentially contaminative incidents occurring during redevelopment. Good working practices should be adopted during construction works in order to minimise the risk of contamination occurring as a result of spillage or leakage of fuels, oils or chemicals stored or used at the site during re-development. All such materials should be sited on an impervious base within a bund and should be adequately secured. In particular, care should be taken to prevent fuel, oils or other mobile contamination sources from entering any surface water drains at the site.

Throughout all redevelopment works, due regard should be given to potential detrimental effects on the surroundings including noise, vibration, odour and dust.

6.6.4 Potable Water Supply

There are currently no (fully adopted) national Standards for the protection of potable water supply pipes in potentially contaminated ground. However, the UKWIR [17] has published guidance in this respect and site testing should be undertaken with due recognition of this guidance.

On the basis of the ground conditions encountered, it is unlikely that specific protection measures may be required for potable water supply for the development. It is recommended that consultation is undertaken with the local supplier to confirm this, and a Water Pipeline Risk Assessment undertaken.

7 Geo-environmental Assessment - Soil

7.1 Human Health Risk Assessment

7.1.1 Data Used

32No. location of which 42No. soil samples were taken across the site during the most recent ground investigation undertaken by Arcadis.

5No. locations (BH1001, TP1001, TP1002, TP1003, TPSA1004) were completed within the site boundary during the previous ground investigation and are included within this assessment.

7.1.2 Generic Assessment Criteria (GAC)

The proposed end use of the site may include mixed use, including areas of residential development. In advance of development specifics, for the purpose of this assessment, all soil samples have been conservatively screened against criteria protective of residential development with soft landscaping and Public Open Space (POS) Residential. As such an end use of residential with plant uptake has been used for screening purposes.

As an initial screen, all the soil chemical data has been screened against the current LQM/CIEH Suitable for Use Levels (S4ULs) [18] for Human Health Risk Assessment for a residential without plant uptake scenario. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been adopted [19].

For organic contaminants GACs corresponding to a Soil Organic Matter (SOM) content of 1% has been used as Tier 1 screening values in the assessment. This is based on the average measured concentration of total organic carbon in the samples (0.65%).

7.1.3 Tier 1 Screening Assessment

7.1.3.1 Inorganics

The chemical results were assessed against the GAC for a residential without plant uptake land use and Public Open Space (POS) – Residential. No results from the ground investigations recorded concentrations above the relevant GACs.

7.1.3.2 Organics

The soil samples were analysed for a suite of organic compounds including PAH compounds, TPH, Phenol and BTEX. The chemical results were assessed against the GAC for a residential with plant uptake land use. Two locations, TPTCA103 and TPTCA206, noted exceedances of Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenz(a,h)anthracene when compared to Residential (without consumption of homegrown produce) end use. No other exceedances were encountered.

7.1.3.3 Asbestos

No asbestos was detected in any of the samples screened.

7.2 Risk to Controlled Waters

7.2.1 Data

12No. water samples were taken from boreholes installed across the site during the Arcadis ground investigation.

7.2.2 Water Quality Standards (WQS)

To assess the groundwater in terms of its potential as a source of contamination to Controlled Waters, the contaminant concentrations have been compared against appropriate Water Quality Standards (WQS). Given the location of the site above the Secondary A Aquifer and the close proximity of watercourses and especially Beck Brook, for completeness the results have been compared to both UK Drinking Water Standards (UK DWS) and Environmental Quality Standards for freshwater (EQS).

The EQS values have been taken from the Water Framework Directive (WFD) [11] which provides screening values to be protective to the surface water environment.

For some of the metals, the EQS guideline for copper, zinc, lead and nickel are based on bioavailability. Site specific Predicted No Effect Concentration (PNECs) values were previously calculated for the Arcadis, Northstowe Phase 2B – Factual Ground Investigation Report. The PNEC values presented below were based on the minimum measured concentration of calcium (104 mg/l), minimum pH of 7.2 pH units and an assumed dissolved organic carbon of 10 mg/l as a conservative (worst case) approach. The approach used is set out in the Water Framework Directive UK Technical Advisory Group guidance, Metal Bioavailability Assessment Tool [20].

- Copper: EQS 46 µg/l
- Zinc: 37 µg/l
- Nickel: 26.5 µg/l

7.2.3 Groundwater Assessment

From the monitoring round, 12 groundwater samples from 12 standpipes were analysed for a general suite of metals, non-metals and hydrocarbons (PAH, TPH, BTEX and phenol). Where present, water was sampled, and groundwater levels are detailed on the gas monitoring sheets in the Arcadis Factual Report. It is noted that generally the standing level of the water in the shallow and deep wells was very similar which indicates a general continuity of groundwater between shallow and the slightly deeper strata i.e. generally non-confined conditions.

7.2.3.1 Inorganics

The table below presents exceedances in the WQS screening values.