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**GEOENVIRONMENTAL
INVESTIGATION
REPORT**

NORDIC CONCEPT STAGE

FOR

HBPW LLP

GDP PROJECT NUMBER 19112

APRIL 2020

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1.0 INTRODUCTION

1.1 Authorisation, Purpose and Context

GD Pickles Ltd (GDP) was instructed by HBPW LLP (the Client) to undertake a Phase 2 Geoenvironmental Investigation of land at Immingham Docks (the 'Site').

The ground investigation is to be used to support the feasibility study for the project. The project is called Nordic Concept Stage.

This Report presents the findings of the Phase 2 intrusive site investigation and associated soil sampling, insitu and laboratory testing.

The primary purpose of the Report is to determine the likely ground conditions and if possible to provide preliminary geotechnical design parameters to inform engineering and drainage design.

The Report also includes a preliminary assessment of contamination including a Conceptual Site Model, Risk Assessments and preliminary recommendations for remediation where applicable. This has been undertaken to adequately consider risks for CDM and materials management purposes. Further assessment would be required once final development designs have been confirmed.

There were numerous constraints to the proposed investigation due to surface flooding, port and tenant activities and large areas obscured by stockpiled soils etc. A number of buried services were also present. Where possible locations were moved to accommodate constraints but several proposed locations were not completed and details of these are included later in this Report.

1.2 Site Location and Description

The Site is located towards the east of Immingham Docks and is made up of several land parcels accessed via a number of routes. The names of all these areas were not provided. A brief summary of the various site areas is as follows.

YARD 6: Land to the north of Robinson Road is known as Yard 6 and was in use for pumice storage. This area was busy with continuous movements of plant and haulage. The stockpiles were transient and moved on a daily basis.

Large parts of Yard 6 were flooded at the time of the investigation. The main water bodies were in the north of the Site and along the south. The reasons for the surface water flooding appear to be the undulating topography of the Site, being 'dished' over large areas, and the

likely associated failure of the surface water drainage system. Where visible the surfacing appeared to be concrete which was broken, cracked and deformed in many areas. There was a complicated series of gullies and surface water drainage in the north of the area but most was obscured by the flooding.

Land to the west of shed 26 was mainly laid to tarmac and the northern end was in use for stockpiling of shredded recycled metal. Central south in this area was the contractor compound for the former pumping station decommissioning works. Some bus chassis storage was present in the far south of this area.

Land to the south of Shed 26 was a large disused open area that was previously understood to be used for car storage. The surfacing was grey aggregate with thin layers of established organic materials. The Site surface was flat with some ponding of surface water particularly in the far south and east of the area. There were obvious roadways but no significant rutting of the surface.

It is understood that a formerly wide and deep surface water channel crosses this area, possibly now in culvert. The route following the noticeably angled fence line in the south west and crossing to the headwall where it joins the existing open channel to the east of the Site. There is no surface expression of this feature. There are a number of manholes near to the outfall which presumably lie along its route. The available services drawings appear to show that it may have instead been diverted to the east but ABP would know the actual circumstances. The conjectured location of the infilled channel is included on drawings later in this Report.

There is a surface water system (French drain) that is located in this area. The gully manholes were in good condition at surface and it is understood that this system was installed to control surface water problems in this area. This appears to coincide with the current wetter areas.

Land to the east of this area is separated from the main area by a fence and so access was via the haulage operation. This area was boggy and wet at surface with a great deal of rutting and damage to the surface layers caused by large vehicles. It is thought that this was probably caused during the stockpiling operations that have occurred historically and recently in this area. As a result there is significant surface water ponding with the near surface granular materials saturated at the time of the investigation. The north east of this area was obscured by stockpiles of what appear to be construction excavation arisings. Some materials were tipped very wet as they have slumped.

Foundry Sand Area. This area was in constant use with limited access to the central area. Most of the area, where not under the main stockpile, was covered by a thin layer of foundry sand although a concrete slab was evident in the north east. Redundant plumbing disconnected at ground level suggests a previous structure/temporary building(s) in the north of the area.

Land to the south of the Foundry Sand Area was accessed via the track running alongside the railway. Apart from a narrow strip along the boundary with the Foundry Sand Area this area was obscured by stockpiles. These contained a number of items that would puncture an excavator tyre and so no access was possible to investigate the underlying ground conditions. A larger excavator would also be required to reach the underlying formation.

1.3 Sources of Information

In completing this assessment, GDP has utilised the following information:

- ☀ Information supplied by the Client;
- ☀ Prior knowledge of the ground conditions around the Port; and
- ☀ Various on-line sources including The British Geological Survey.

2.0 SCOPE OF INTRUSIVE GROUND INVESTIGATIONS

2.1 Fieldwork

The scope of ground investigation was provided by HBPW LLP and presented on drawing SL06537.100 Proposed Ground Investigation and is included later in this Report.

A utilities clearance survey was undertaken by Avoin Maa Surveys Ltd between 5 and 6 February 2020. As a result a number of locations were moved to avoid underground services, suspected services or other constraints.

The ground investigation was undertaken between 24 and 29 February 2020. This comprised the completion of 6no. cable percussion boreholes, 1no. rotary percussive borehole, and 15no. machine excavated trial pits using a 9 te backhoe excavator. Insitu CBR was undertaken in trial pits where ground conditions allowed.

At the time of the investigation large parts of the Site were inaccessible or otherwise constrained and so 9no. of the trial pits were not completed.

Monitoring wells were installed in 2no. of the cable percussion boreholes (BH03 and BH05) to enable monitoring of groundwater level conditions. Installation details are provided on the exploratory hole records presented in Appendix 1.

The final positions of the exploratory holes are shown on Drawing No. 19112-01 presented later in this Report. This includes revised XYZ coordinates.

2.2 Laboratory Testing

Representative disturbed samples of excavated soils were collected for subsequent geotechnical and geochemical (contamination), and Waste Acceptability Criteria (WAC) testing.

Geotechnical samples were submitted to I2 for the following geotechnical testing;

- ☀ Atterberg limits and moisture content determination (19 samples)
- ☀ Laboratory hand shear vane on U100; (6 samples);
- ☀ Laboratory CBR (1 sample); and
- ☀ One Dimensional Consolidation (6 Samples).

Geochemical samples were submitted to I2 for a range of contamination testing including the following determinands;

- ☀ Asbestos Screen (15 samples);
- ☀ Soil Organic Matter (8 samples);
- ☀ Heavy metals: As, Ba, Be, Cd, Cr, Cr VI, Cu, Pb, Hg, Ni, Se, V, Zn, Mg (15 samples);
- ☀ Phenols (15 Samples);
- ☀ Total Cyanide(15 Samples);
- ☀ Water soluble Boron (15 samples);
- ☀ Speciated polyaromatic hydrocarbons (sPAH) (15 samples);
- ☀ TPH (CWG Split inc BTEX) (11 samples);
- ☀ BRE SD1 Suite for buried concrete (8 samples).

Laboratory testing certificates are presented at Appendix 4.

2.3 Insitu testing

2.3.1 Standard Penetration Testing

Standard penetration testing (SPT) was undertaken to the full depth in the cable percussion boreholes and within the Boulder Clay in the rotary percussive borehole. The results of the SPT testing are presented on the exploratory hole logs and also graphically on drawing 19112-02 *Insitu Testing SPT N vs Depth* presented later in this Report.

2.3.2 California Bearing Ratio

A total of 10no. insitu CBR tests were completed. These were undertaken on various formations to provide an indication of likely performance of the existing capping materials. Several tests were also undertaken at the upper surface of the underlying subgrade (always Made Ground).

Several locations could not be tested either due to water ingress, instability of the exploratory hole or suspected contamination.

The locations of the CBR tests are shown on drawing 19112-01 and the results are summarised later in this Report, included on the exploratory hole logs and on the photographic record. The CBR test certificates are presented at Appendix 5.

2.4 Groundwater Monitoring

Groundwater strikes and rise were recorded during the investigation.

Large parts of the Site were affected by ponded surface water that had saturated the upper soils and flowed this flowed into some open excavations.

Two groundwater and gas monitoring wells have been installed. The details are shown on the exploratory hole logs. No groundwater level monitoring has been undertaken to date.

2.5 Ground Gas Monitoring

No ground gas monitoring has been undertaken. This is discussed further later in this Report.

3.0 OBSERVED GROUND CONDITIONS

3.1 Ground Model

The exploratory holes were supervised and logged by a geoenvironmental engineer from GDP.

For full descriptions of the strata encountered please refer to the exploratory hole logs presented at Appendix 1 and Photographs of trial pits presented at Appendix 3.

No Phase 1 study has been completed prior to this investigation. As such the development history of the Site is not understood. However, land raising has evidently occurred when historically reclaiming the land from the estuary.

Table 3.1: Summary Ground Model

Stratum	Description	Typical depths to base.
Site Surface		
TOPSOIL	Topsoil was only encountered as a thin and poor quality layer in TP01 and TP13.	0.0 to 0.25m
SITE SURFACING	<p>The surfacing of the Site is variable. The approximate zoning is presented on drawing 19112-05.</p> <p>The west of the southern area (west of Shed 26) has a very thin layer of Tarmac (circa 0.05m) over a thin subbase. (TP03 and TP04).</p> <p>The area to the south of Shed 26 has been stabilised in the past. Based on the limited investigation density to date it is apparent that the northern most area has been cement stabilised to varying depth (0.2 to 0.4m) and density. There is no geotextile separator layer and there appears to be a mixing/plough line. (BH01, BH03, TP06 and TP07). Density ranges from hand diggable to needing the excavator hydraulic breaker.</p> <p>To the south and east of this area (BH02, TP05, TP08, TP09 and TP1010) there is a 100 to 150mm layer of stone over a woven geotextile which lies directly upon Made Ground materials.</p> <p>It is conjectured that the 2 southern areas were stabilised before infilling of the drain and that is why there is a different surface construction across the area. There is no other surface indication of where the surfacing changes.</p>	To 0.4m.

	<p>The French drain system appears to cross between these 2 areas.</p> <p>The surfacing beneath most of the Foundry Sand storage area is unknown. A concrete slab was investigated in TP15. There was no surfacing in TP16 and TP13.</p> <p>There is a small triangular area of soft landscaping to the immediate west of Shed 26 (TP01).</p> <p>Yard 6 is surfaced with a variable thickness of weak and badly damaged layer of what is described as lean mix concrete. There is no aggregate or reinforcement in locations investigated. (BH05, BH06, TP19, TP20 and TP24).</p> <p>Areas in the east of the Site are obscured by numerous stockpiles of construction excavation arisings. The stockpiles to the south of the Foundry Sand Area contained sharp materials that prevented safe access with a tyred excavator.</p>	
<p>MADE GROUND</p> <p>General Made Ground /Landfill</p>	<p>Over the majority of the areas investigated the Made Ground below the surfacing was found to comprise what looks to be industrial waste. These materials are predominantly cohesive in nature except where the quantity of anthropogenic materials such as bricks, tiles, kerb stones etc create a dominant granular content. In BH02 a railway sleeper was suspected.</p> <p>The upper surface of these soils usually presented as firm to stiff consistency and CBR results for this layer were surprisingly high in most cases. However, with increasing depth the relative density decreased and water ingress was relatively common below 0.9m particularly in the south of the Site. The content of the materials indicated that most was probably construction waste from nearby sites and towns dating to the 1950s and 60s and earlier (based on content/lack of plastics). The materials in Yard 6 (reclaimed land) were more akin to industrial perhaps even household wastes and were notably softer and wetter than elsewhere.</p> <p>The deepest fill (5m) was in TP16 and BH04 in the Foundry Sand Area which are suspected to lie close to the infilled former drain in that area.</p>	<p>0.8 to 5.0m. Typically 1.5 to 3.0m.</p>

<p>MADE GROUND</p> <p>Chalk Fill</p>	<p>Chalk fill was found in some trial pits located in the Foundry Sand Area and in the area west of Shed 26 (TP13 and TP15). It is suspected that these materials may be common in this wider area of the Site. This layer was found to be saturated in TP03 (west of Shed 26).</p>	<p>1.2m to base not proven in TP03.</p>
<p>TIDAL FLAT DEPOSITS</p> <p>Orange and dark brown slightly gravelly sandy CLAY and SAND</p>	<p>In a number of locations (TP19, TP20, BH05 and BH06) in the north of the Site, in Yard 6, an orange and dark brown variably gravelly sandy CLAY was encountered beneath the Made Ground. There were also bands of running brown SAND. This appears very similar in colour and elevation to the present Humber foreshore estuarine deposits. Similar soils were encountered elsewhere inland at the top of the Made Ground but were thus clearly re-worked. These deposits along with the underlying soft clays and silts are often known regionally as Warp.</p>	<p>3.5 to 3.7m.</p>
<p>TIDAL FLAT DEPOSITS</p> <p>Soft dark grey CLAY/SILT.</p>	<p>Soft brown and grey CLAY and SILT was encountered across the Site below Made Ground. This was distinctive as it contained organic matter, preserved and semi rotted vegetation. This contained less organic matter with depth. These deposits were proven to depths between 9.0 and 10.9m.</p>	<p>9 to 10.9m.</p>
<p>BOULDER CLAY</p> <p>Stiff brown mottled grey gravelly sandy CLAY.</p>	<p>Encountered as a firm and stiff mid brown gravelly sandy CLAY. The gravel is Chalk. The upper few metres are mottled grey.</p> <p>In this area there are common distinctive SAND and GRAVEL filled channels within the upper boundary between the Boulder Clay and the overlying Tidal Flat Deposits. These channels sometimes contain PEAT. It is likely that such a channel was encountered in RBH1 between 10.5 and 12m. No similar deposits were found in the cable boreholes. Dependant on the position within the channel the incised depths can be substantial leading to locally deeper soft deposits before reaching the stiff Glacial clays. This area (RBH1) is close to the location of the bridge south approach and so should be noted albeit bank seat/main pier piles are likely to extend to the Chalk bedrock.</p>	<p>Base proven at 19.3m</p>
<p>SAND & GRAVEL</p> <p>Dense SAND & GRAVEL</p>	<p>A dense SAND and GRAVEL and (apparently) loose brown SAND was encountered beneath the Boulder Clay. This is often referred to as the Chalk Gravels which is misleading as there is varied granular content. The layer is quite thin and the Chalk content often dominated the description. These deposits are often under sub-artesian pressure from the underlying Chalk Aquifer and also in continuity with the Humber. This proved problematic for rotary coring. Implications for pile design are discussed later in this Report.</p>	<p>Proven to 22.5m</p>

WEATHERED CHALK	It was not possible to recover a core sample from a point just above the blowing sands repeatedly causing sand ingress between casing and Geobore S. It was thus opted to seal the borehole with drilling mud (bentonite) and open hole through to prove hard CHALK. Between 22.5 and 28m the drilling was relatively easy with returns comprising Chalk gravel. This is interpreted to be the Chalk Gravels and then putty Chalk commonly encountered in this area.	Proven to 28m.
HARD CHALK	Below 28m the drilling resistance was very high and recovered returns/ chippings were hard Chalk. This is interpreted to be White Chalk.	Proven to 28.5m.
GROUNDWATER OBSERVATIONS	<p>Surface water was present at many locations and was observed to have saturated the upper granular fill and formed a perched water body within the Made Ground particularly in the south of the Site. Often this could be dug through to drier materials beneath before a second groundwater body was found within the Made Ground perched above the underlying cohesive Tidal Flat Deposits.</p> <p>In the cable percussion boreholes true groundwater was only found in BH04 at 3.6m which was also within Made Ground. This is not unusual when drilling through the TFD and Boulder Clay which are aquicludes. That is why sub artesian pressures often build up beneath these deposits.</p> <p>There are probably locally different groundwater conditions within the backfilled former drain that crosses the southern part of the Site. Dependant on how this was infilled it may be acting as a long and deep groundwater sump.</p>	

3.2 Observations of Contamination

Arisings obtained during excavations were examined for visual and olfactory indications of contamination.

Across the majority of the Site the Made Ground could be best described as typical of industrial/inert landfill. Although no gross visual (unusual colours or textures) or olfactory (odour) indications of contamination were noted most Made Ground was evidently construction waste arisings with various discolorations and often exhibited a general industrial odour.

No significant visual or olfactory evidence of hydrocarbon contamination was noted during the investigation albeit occasionally there were mild odours. Sometimes the underlying organic soils may have been responsible for the stronger odours.

Some areas comprised clean chalk fill overlying reworked natural or natural organic soils.

The Made Ground soils below Yard 6 were the most noticeably contaminated with a greater quantity of anthropogenic and unusual content such as a sink, hoses and more plastics noted.

A walkover of the stockpiled materials was undertaken to determine the general content (at surface) and in particular to identify any obvious asbestos containing materials (ACMs) or other potentially hazardous content. No immediately obvious ACMs or other potentially hazardous materials were noted during the brief inspection. However, there were varying amounts of tarmac which may be of an age that could contain coal tar.

There are some unidentified slurry materials which were not closely inspected.

Further comprehensive and specific investigation of the waste stockpiles is required including ground conditions beneath them and will require a significant investment in time and laboratory testing.

Establishing the timeline of the stockpiling may be beneficial in determining any effects that this surcharging will have had for engineering design.

4.0 ASSESSMENT OF CONTAMINATION

4.1 Initial Conceptual Site Model

An initial Conceptual Site Model (CSM) has been developed for the Site adopting the Source-Pathway-Receptor approach. The initial CSM is normally developed during the preliminary risk assessment stage (not undertaken) and is used to design the Phase 2 Intrusive Investigations (with regards to contamination). In this instance the Conceptual model has been developed during the Phase 2 investigation.




- ☀ **Sources (S)** are potential or known contaminant sources e.g. soil contamination resulting from a former land use;
- ☀ **Pathways (P)** are environmental systems through which a contaminant could migrate e.g. air, groundwater;
- ☀ **Receptors (R)** are sensitive environmental receptors that could be adversely affected by a contaminant. e.g. Human End User (longer-term risks) or groundworkers (shorter-term risks), surface or groundwater resources and ecology.

Where a source, relevant pathway and receptor are present, a plausible pollutant linkage is considered to exist whereby environmental harm could occur and a potential environmental liability could be realised.

The site specific potential pollutant linkages have been assessed and used to formulate the initial Conceptual Model for the site presented in Table 4.1.


Table 4.1 Initial Conceptual Model

POTENTIAL SOURCES		
CSM ID	Detailed Description	Summary Description for CSM
S1	For the purpose of this assessment and in the absence of a Phase 1 Study a historical land reclamation process/landfill site is assumed to be present beneath the majority of the Site. This investigation has confirmed that the fill could be a source of contaminants of concerns including permanent ground gases.	S1: Land reclamation/ Landfill
S2	Railway land is a potential source of metals (from use in herbicides), asbestos, PAHs, TPH and PCBs.	S2: Railway Land
S3	In addition to the landfill material there are other made ground materials associated with the site (Chalk Fill, reworked Tidal Flat Deposits, imported aggregates etc.).	S3: Made Ground

S4	Permanent ground gases originating from the natural ground (Tidal Flat Deposits) present beneath the site. In addition, the shallow natural ground is a potential source of sulphides and sulphates.	S4: Natural geology
POTENTIAL PATHWAYS		
CSM ID	Detailed Description	Summary description for CSM
P1	Human direct contact uptake pathways; <ul style="list-style-type: none">  Ingestion of excavated or exposed soils;  Inhalation of soil/dust due to dust generation both indoors and outdoors; and  Dermal contact with exposed soils or leachates. 	P1: Direct contact – human health
P2	Vapour inhalation of contaminants in outdoor and/or indoor air via vertical migration of volatile contaminants through unsaturated zone.	P2: Vapour inhalation
P3	Migration of permanent ground gases into buildings and structures	P3: Ground gas migration
P4	Horizontal and vertical migration of contaminants within groundwater and perched surface water	P4: Groundwater and surface water migration
P5	Direct contact of soils/groundwater with construction materials	P5: Direct contact – construction materials
POTENTIAL RECEPTORS		
CSM ID	Detailed Description	Summary description for CSM
R1	Construction/maintenance workers.	R1: Construction workers
R2	End-users. Users of Port, parking and buildings.	R2: End-users
R3	Construction materials - Buried concrete, buildings and potable water supply pipes.	R3: Construction materials
R4	Controlled waters – Non productive.	R4: Groundwater
R5	Controlled waters – Humber Estuary, other water courses (including transmission via surface water drainage).	R5: Surface water

4.2 Generic Assessment Criteria

In the absence of a complete published set of screening values derived by the Regulators using the new CLEA Framework, the assessment refers to the following in priority of use order:

-  *The LQM/CI EH S4ULs for Human Health Risk Assessment. Land Quality Press, 2015. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3222. All rights reserved.’;*

- ☀ The Soil Guidance Values (SGVs) published by the EA;
- ☀ Former SGVs for which no updated SGV has been published;
- ☀ The 2009 Chartered Institute of Environmental Health (CIEH)/Land Quality Management (LQM) Generic Assessment Criteria (GAC);
- ☀ The guidance values produced by the Environmental Industries Commission (EIC), the Association of Geotechnical and Geoenvironmental Specialists (AGS) and Contaminated Land: Application in Real Environments (CL:AIRE) in December 2009; and
- ☀ In house Generic Screening Values (HH-GSVs) derived by the Consultant and other non UK values where considered relevant.
- ☀ Consideration has been given to Category 4 Screening Levels as it is likely given recent government support that these will be considered by Local Planning Authorities during assessment of contaminated land.
- ☀ Dutch target and Intervention Values.

For the purpose of this assessment, the analytical results have been assessed against guidance values for a *Commercial* land-use. If external areas are to be used for public access then a more sensitive land use may be appropriate such as Public Open Space.

The S4ULs currently exclude Lead, therefore the Defra approved Category 4 Screening Levels (C4SLs) have been adopted.

Where sufficient sampling has occurred and in cases where contaminants are present in one or more samples in a specific averaging area, above their respective Tier 1 GAC, the results may be subject to statistical assessment in accordance with current best practice to establish if the true mean (upper 95th percentile) is above the screening criteria. If so, then further consideration is given to the risk presented by the contaminant of concern. This may include further detailed quantitative risk assessment and/or further sampling and testing.

No groundwater assessment has been undertaken or is required at this time.

4.3 Geochemical Test Results

Thirteen soil samples, representative of the main soil types encountered, were analysed for Soil Organic Matter (SOM). SOM ranges from 0.6% to 7%. The lowest was for cement stabilised materials and the highest for organic clay. The majority of values were between 2 and 3% and the mean average was 3.6%. Analytical results will be conservatively screened in the first instance against a SOM of 1% where applicable to assessment for organics.

4.3.1 Commercial Land Use

The laboratory analytical results from the investigation are presented at Appendix 3.

The findings of the geochemical analysis are presented in Table 4.3.1 below. The GAC for a Commercial land use has been applied.

Table 4.3.1: Comparison of soil samples to relevant GAC for Commercial land use

Contaminant	Units	Max	GAC	No of exceedances
Metals / Inorganics				
Arsenic (total)	mg/kg As	18	640*	0
Barium (total)	mg/kg Ba	240	22000#	0
Beryllium (total)	mg/kg Be	3.4	12*	0
Boron (water soluble)	mg/kg B	13	240000*	0
Cadmium (total)	mg/kg Cd	0.6	190*	0
Chromium (total)	mg/kg Cr	150	8600**	0
Chromium (VI)	mg/kg CrVI	<4.0	33*	0
Copper (total)	mg/kg Cu	100	68000*	0
Lead (total)	mg/kg Pb	92	2330*	0
Mercury (total)	mg/kg Hg	<0.3	25.8**	0
Nickel (total)	mg/kg Ni	100	980*	0
Selenium (total)	mg/kg Se	5.7	12000	0
Vanadium (total)	mg/kg V	77	9000*	0
Zinc (total)	mg/kg Zn	320	730000*	0
Speciated PAH				
Naphthalene	mg/kg	29	190*	0
Acenaphthylene	mg/kg	8.9	83000*	0
Acenaphthene	mg/kg	26	84000*	0
Fluorene	mg/kg	39	63000*	0
Phenanthrene	mg/kg	230	22000*	0
Anthracene	mg/kg	63	520000*	0
Fluoranthene	mg/kg	380	23000*	0
Pyrene	mg/kg	340	54000*	0

Benzo(a)anthracene	mg/kg	190	170*	1 (TP24, D1, 0.4-0.7)
Chrysene	mg/kg	160	350*	0
Benzo(b)fluoranthene	mg/kg	150	44*	1 (TP24, D1, 0.4-0.7)
Benzo(k)fluoranthene	mg/kg	96	1200*	0
Benzo(a)pyrene	mg/kg	150	35*	1 (TP24, D1, 0.4-0.7)
Indeno(1,2,3-cd)pyrene	mg/kg	76	500*	0
Dibenz(a,h)anthracene	mg/kg	22	3.5*	1 (TP24, D1, 0.4-0.7)
Benzo(ghi)perylene	mg/kg	85	3900*	0
BTEX/MTBE				
MTBE	mg/kg	<0.001	7900#	0
Benzene	mg/kg	<0.001	27*	0
Toluene	mg/kg	<0.001	56000*	0
Ethylbenzene	mg/kg	<0.001	5700*	0
m & p-Xylene	mg/kg	<0.001	5900* ^d	0
o-Xylene	mg/kg	<0.001	5900* ^d	0
TPH CWG				
TPH Aromatic EC5-EC7	mg/kg	<0.001	26000*	0
TPH Aromatic EC7-EC8	mg/kg	<0.001	56000*	0
TPH Aromatic EC8-EC10	mg/kg	<0.001	3500*	0
TPH Aromatic EC10-EC12	mg/kg	2.2	16000*	0
TPH Aromatic EC12-EC16	mg/kg	5.2	36000*	0
TPH Aromatic EC16-EC21	mg/kg	27	28000*	0
TPH Aromatic EC21-EC35	mg/kg	120	28000*	0
TPH Aromatic EC35-EC44	mg/kg	150	28000*	0
TPH Aliphatic EC5-EC6	mg/kg	<0.001	3200*	0
TPH Aliphatic EC6-EC8	mg/kg	<0.001	7800*	0
TPH Aliphatic EC8-EC10	mg/kg	<0.001	2000*	0
TPH Aliphatic EC10-EC12	mg/kg	3.7	9700*	0
TPH Aliphatic EC12-EC16	mg/kg	6.0	59000*	0

TPH Aliphatic EC16-EC35	mg/kg	58	1600000*	0
TPH Aliphatic EC35-EC44	mg/kg	200	1600000*	0
Asbestos screen	%		Presence ^e	0

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* LQM/CIEH GAC for commercial land use scenario based on a sandy loam soil and 1% SOM

EIC/AGS/CL:AIRE GAC for commercial land use scenario and 1% SOM

+ C4SL Commercial land use scenario based on a sandy loam soil. There is neither an S4UL nor a EIC/ AGS/ CL:AIRE/ GAC available for lead. In the absence of a GAC based on minimal risk, the C4SL for lead has been used. It is recognised that this is based on a "low level of toxicological concern" rather than on a minimal risk level. However, it is considered appropriate for use under planning as an initial screen.

- Based on GAC for trivalent chromium. All samples analysed for total chromium have also been analysed for hexavalent chromium-no exceedances of the laboratory limit of detection have been recorded, and therefore it is considered appropriate to compare the total chromium concentrations to the GAC for trivalent chromium.
- Based on the elemental mercury GAC as lowest GAC. GAC exceeds vapour concentration so vapour saturation limit has been adopted.
- It is understood that EFSA have recently reevaluated nickel and that this is likely to have the effect of reducing the HCV, and hence the assessment criteria. However it is noted that even the maximum concentration is significantly below the current S4UL.
- All xylene isomers should be compared to the lowest of the three GACs, which, in this case is p xylene.
- There currently is no published screening criteria for asbestos, however the limit of detection (0.001%) will be used as a preliminary screen.

Following the assessment against Commercial GAC the Made Ground soils sampled in TP24 (Yard 6) were found to contain elevated PAH. No other exceedances of GAC for a Commercial land use have been detected to date.

4.3.2 Asbestos in Soil

No asbestos was detected in the 15no. samples tested from various depths. No visible ACM was noted during the investigations to date.

4.3.3 Leachate Analysis

No significant contamination was identified therefore no leachate analysis has been undertaken to date.

There are no controlled waters considered to be at risk in proximity to the Site. Further assessment may be needed as part of piling risk assessment at a later stage wherein a pathway between the shallow Made Ground soils and the Chalk Aquifer may be created.

4.4 Risk Evaluation

The assessment of risk assumes no specific remediation measures but does take account of obvious pathway disruption due to the existence of hardstandings, building footprints or existing Site layout.

For each potential pollutant linkage identified within the Conceptual Model the potential risk has been evaluated for potential receptors using the Qualitative Risk Assessment based on the probability of the pollution event and the severity it poses to Site users and the environment. The risk assessment methodology is presented in Appendix 6.

Following the limited Phase 2 investigation a Conceptual Model is now presented in Table 4.4 below.

Table 4.4: Conceptual Site Model CSM

Potential Source	Potential Pathway	Potential Receptor	Consequence	Probability	Risk	Comments
S1: Land reclamation/Land fill S2: Railway Land S3: Made ground	P1: Direct contact – human health	R1: Construction workers	Mild	Likely	Moderate/Low	Direct contact pathways would be active throughout the construction phase of the project, however, typical mitigation measures such as personal protective equipment (PPE) would be used to help mitigate the risk.
		R2: End-users	Mild	Likely	Moderate/Low	Tested soils are suitable for use in a Commercial land-use except for a single location TP24, Yard 6. Contamination may be present elsewhere. The potentially contaminated soils are currently covered by hardstanding or other surfacing that prevents contact with the end-users. The proposed development will include similar surfacing and/or engineered construction.
	P2: Vapour inhalation	R2: End-users	Mild	Likely	Moderate/Low	No source of vapours has been identified during the Phase 2 investigation.
	P4: Groundwater migration	R4: Groundwater R5: Surface water	Mild	Likely	Moderate/Low	Surface water was present in many areas. Shallow perched groundwater was encountered during trial pitting. No significant groundwater encountered in Tidal Flat Deposits or Boulder Clay. Sub artesian groundwater was encountered below Boulder Clay. Cohesive strata form significant aquiclude protecting the Chalk Aquifer. There are no potentially active pollutant linkages to



						controlled water receptors associated with the Site.
	P5: Direct contact construction materials	R3: Construction materials	Medium	Likely	Moderate	Given the past uses of the site it is considered that there could be the potential for contaminants to be present in the ground that presents a risk to future construction materials (e.g. buried concrete and buried water pipes).
S1: Land reclamation/Land fill S3: Made ground S4: Natural geology	P3: Ground gas migration	R2: End users and R3: Construction materials	Medium	Likely	Moderate	The Site is underlain by made ground comprising mixed cohesive, granular and construction wastes to a maximum depth of 5m bgl. Organic natural strata could be potential sources of permanent ground gas. No gas monitoring undertaken to date. Gas monitoring should be undertaken at detailed design stage. Permanent buildings may require protection from hazardous ground gases.

5.0 REMEDIATION PROPOSALS

5.1 Outline Remediation Requirements

The detail of the proposed development levels are not known at this time. However, it is unlikely that they will be lower than existing.

These recommendations are made on the basis of the investigations undertaken to date. Further contamination issues may arise construction phases and further assessment may then be required.

The findings of intrusive investigations and risk assessments indicate that all contaminants tested for are within acceptable limits for a Commercial land use except for at 1 location (TP24 in Yard 6). Soils at this location will be covered by hard standing and so no remediation is required.

No ground gas monitoring has been undertaken to date. This would very likely encounter elevated ground gases due to the nature of the Made Ground throughout the Site and the presence of organic natural soils at shallow depth. A period of ground gas monitoring should be undertaken once development proposals are finalized. At this time it would be prudent to assume that gas protection is recommended to be installed in ground floors to any buildings that are in contact with the ground or otherwise have no ventilation beneath them to prevent ground gases entering the accommodation.

If the scheme requires planning permission the LPA may require a Remediation Method Statement to specify the gas protection requirements and other issues pertinent to the development of a brownfield site.

Importing Soil

It is expected that any soils for landscaping (if proposed) will need to be imported. The existing limited topsoil soil is suitable for re-use but is thought to be site generated from years of self seeded vegetative matter. Topsoil should be tested and proved suitable for its intended use before placement. This may need to be screened against Commercial land use or Public Open Space land use depending on the final design.

Imported aggregates may need to be validated as suitable for use (particularly if they are a recycled product). Assuming a commercial end use the geochemical suitability should be based on generic assessment criteria for a Commercial land use as presented in Table 4.3.1.

Construction Phase Risks

At construction phase any small risk posed by the soils on Site to ground workers can be adequately and economically mitigated by adopting best practice standards of personal hygiene with appropriate levels of personal protective equipment (PPE) provided.

Unexpected Contamination

There remains the possibility of encountering unexpected contamination during the construction Phase. The Construction Phase Health and Safety Plan should contain a procedure for assessment of any unexpected contamination particularly asbestos (albeit non has been found to date).

5.2 Other Development Considerations

5.2.1 Buried Water Supply

Only low concentrations of hydrocarbon contamination has been identified to date and there may not be any requirement to provide upgraded supply at this time. However, elevated phenols may be of concern. Connections may cross land not investigated and so if any evidence of contamination, particularly, hydrocarbons is identified along the service route then further assessments may be required.

For any new adoptable connections the Water Authority usually require analysis of soils in the areas where new supplies are to be installed in accordance with their in-house or UKWIR guidance. This guidance, as for most utilities companies, is based upon the UKWIR Assessment.

In practice the costs of undertaking the necessary analysis is high and opting to install basic barrier pipe such as 'Protectaline' is normally only a small uplift above standard materials and provides cost certainty. The exception may be where a very long supply length is required and further assessments to prove no special requirements may be of commercial benefit. New services should always be placed in a dedicated trench backfilled with inert aggregate.

5.2.2 Materials Management and Waste Disposal

The waste classification of the soils has not been formally undertaken as part of this investigation. Where it is proposed to discard soils from Site it is recommended that the chemical test results (including WAC testing) are forwarded to a waste disposal contractor or landfill operator to establish the waste classification.

The following applies to uncontaminated natural soils arising (excludes the made ground at this Site). In accordance with the Regulations *“uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the Site from which it was excavated”*, is excluded from waste regulation by the Waste Framework Directive (2008). Hence, provided there is a planned use for excavated soils they can be re-used on Site without a waste permit or exemption provided they meet the required engineering specification.

However, any soils that cannot be accommodated on Site within the works are surplus to requirements and a ‘waste’ under the Regulations and should only be disposed at a facility or a Site licensed to accept the materials.

If after classification the surplus soils are to be deposited in an inert or hazardous landfill, then allowance should be made for Waste Acceptance Criteria (WAC) testing of the surplus materials to confirm compliance with the limits for these materials.

Five samples of Made Ground from varying depths were submitted for WAC Testing. The results indicated that although contamination levels were generally low based on leachates all samples would be accepted at as Stable Non- reactive HAZARDOUS Waste in a non-hazardous landfill. The Made Ground is unlikely to classify as Inert.

Under the Duty of Care Regulations, the producer of the waste is also obliged to ensure that all wastes are disposed of appropriately.

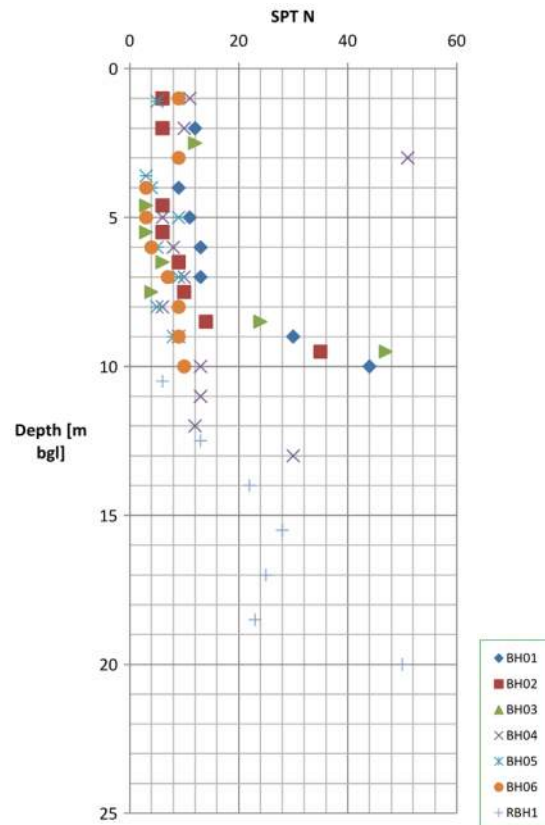
6.0 ENGINEERING ASSESSMENT

6.1 Geotechnical Material Properties

6.1.1 Insitu Testing

Standard Penetration Tests (SPT) were undertaken in all of the boreholes.

SPT N values are included on the exploratory hole logs presented at Appendix 1, presented on Drawing 19112-02 *Insitu Testing SPT N vs Depth* and summarised below;



6.1.2 Classification Testing

Plasticity testing was undertaken on 19no. selected samples of cohesive soils at depths ranging from 0.9m to 13m. Plasticity index, I_p , ranges between 12 and 55%. Lower plasticity was associated with the Boulder Clay and the higher plasticity soils were the organic clays and silts which also had high moisture contents.

The laboratory test results are presented at Appendix 4.

6.1.3 Geotechnical Parameters

A number of corrections are required to SPT N values before use in design.

The most significant correction is for Energy Ratio (ER_M). The value of ER_M is specific to the particular SPT test equipment used. In the absence of calibration certificates for the particular equipment used CIRIA 143 recommends $ER_M = 73\%$. The calibration certificate for the cable percussion rig used on this Site is $ER_M = 64\%$.

A further correction, λ , is applied to account for the energy loss within the drill rods. This correction factor ranges from 0.75 for 3m and less increasing to unity at 10m.

The SPT N value can be corrected in granular deposits to allow for overburden effect. However, at 1m bgl a correction factor, C_N (after Seed et al), of 1.0 can be applied to SPT $(N')_{60}$. At 3m C_N is negligible. C_N should never exceed 1.5. No soils considered to be granular were encountered in the upper 18m during this investigation so no corrections have been applied.

6.1.4 Undrained Shear Strength

Shear strength of the cohesive formation can be tentatively estimated from Stroud's relationship between SPT (uncorrected) and Plasticity Index. Empirical relationship was originally developed for stiff glacial soils and can give a useful indication of insitu undrained shear strength for comparison with other field measurements (such as hand shear vanes) and laboratory testing.

For medium to high plasticity soils, such as determined for this Site, this relationship can be taken as undrained shear strength, C_u , is equivalent to approximately 4.5 to 7 times the corrected SPT N value (after Stroud, 1989). A mid range value of $f_1 = 5$ has initially been used to estimate undrained shear strength with depth and the results are plotted graphically on drawing 19112-03. These are only indicative and more detailed plots could be produced assigning more accurate f_1 values to each stratum based on plasticity index.

Laboratory hand shear vane tests were undertaken on undisturbed samples at depths ranging from 1.0m to 3.0m. These targeted the upper sandy CLAY and the top of the underlying soft organic Clay/Silt. The undrained shear strength ranged between 13 and 76 kPa. The lowest value was in a sample described as reddish brown organic CLAY with woods (BH03, 1.70 – 2.15m). Samples of the brown and brown sandy CLAY recorded values of between 20 and 76 kPa.

In considering the various lines of evidence, lab testing and empirical correlation with SPT a characteristic value for undrained shear strength has been tentatively assigned to the various cohesive strata as follows;

STRATA	Typical Description	Undrained Shear Strength, C_u [kPa]	Comments
MADE GROUND	Variable, predominantly cohesive.	Variable.	
UPPER TIDAL FLAT DEPOSITS	Orange brown sandy CLAY	45	
LOWER TIDAL FLAT DEPOSITS	Soft grey (sometimes organic) CLAY	20 kPa	
BOULDER CLAY	Stiff brown gravelly sandy CLAY	>150	Hand shear vanes attempted on undisturbed rotary core samples of Boulder Clay were beyond range of shear vane scale.

6.1.5 One Dimensional Consolidation

A total of 6no. one dimensional consolidation tests were undertaken on samples collected from depths between 1 and 3m to determine the likely compressibility of the Upper and Lower Tidal Flat deposits at shallow depth where the greatest increase in surcharge pressure is expected.

The proposed development loadings were not known so a range of applied pressures between 20 and 160 kPa was scheduled with a single stage unloading to 80 kPa. One dimensional consolidation tests also include measurement of dry and bulk density before and after the test. The results are presented in Appendix 4.

Further assessment for consolidation settlement magnitude and duration can be undertaken dependent on the design applied pressure and thus the appropriate M_v value(s) selected for design.

As for undrained shear strength M_v can also be estimated from SPT N using Stroud's relationship. This has been undertaken initially assuming an f_2 value of 0.45 (Table 1.5, Tomlinson 7th Edition). The results of M_v vs Depth have been presented on drawing 19112-04.

6.4 Discussion of Foundation Issues

6.4.1 Bearing Capacity and Settlement

Structural details of the proposed development are not known at present so the foundation loads are not available at time of writing.

Made Ground was found across the whole Site and was variable in depth, consistency, relative density and groundwater levels. This strata has unknown depositional and stress history and unpredictable settlement potential. This strata is not suitable to support traditional shallow foundations. However, some areas are more competent and were described as very dense such as the Chalk fill as encountered in TP15 and TP03. Where such fills are present and not underlain by weak deposit it may be possible to support lightly loaded structures such as portable or temporary buildings that are not sensitive to moderate differential settlements.

Where the firm orange brown sandy CLAY is encountered at a depth where traditional foundations can be constructed then it is plausible that lightly loaded structures or raft foundations could be supported. Based on a characteristic C_u of 45 kPa a safe bearing capacity (FOS 3.0) would be in the order of 75 kN/m². These deposits may have a higher shear strength and so it would be prudent to check this at any specific location where a building is proposed to derive optimum parameters. Foundations constructed in this layer may create a pressure bulb that applies increased stress to the underlying soft Clay. In this instance an assessment would be required to determine whether the underlying materials would support the applied pressure and whether settlement then became an issue.

The Soft Clay is not suitable to support traditional foundations due to its low shear strength and compressibility.

The proposed bridge foundations and approaches will be piled. Lessons learnt elsewhere within the Docks indicates that driven piles are likely to encounter difficulties penetrating the dense granular deposits below the Boulder Clay. The dense deposits can be quite thin and are underlain by weak Chalk which can lead to longer-term settlement of piles and/or pile groups that end bear onto the dense granular deposits.

During this investigation a dense SAND and GRAVEL and (apparently) loose brown SAND was encountered beneath the Boulder Clay. This is often referred to as the Chalk Gravels which is misleading as there is varied granular content. The layer is quite thin and the Chalk content often dominated the description. These deposits are often under sub-artesian pressure from the underlying Chalk aquifer and also in continuity with the Humber. The latter often means that severity of blowing conditions vary and are connected to tidal fluctuations which can change daily. The blowing conditions result in sands flowing up the borehole and if not noted

any SPT test undertaken without counterbalancing the subartesian pressure results in a misleading low N value. Often this can occur even if water is added to the borehole greater than the calculated minimum. This is a common oversight and can give the false impression that driven piles will be successful in reaching the underlying Chalk. These conditions proved problematic for rotary coring.

It was not possible to recover any further rotary core samples from a point just above the blowing sands. Sand ingress to the drill string causing repeated jamming. It was thus opted to seal the borehole with drilling mud (bentonite) to prevent further ingress of blowing sands and open hole through to prove hard CHALK. Between 22.5 and 28m the drilling was relatively easy with returns comprising Chalk gravel. This is interpreted to be the Chalk Gravels and then putty Chalk commonly encountered in this area. Below 28m the drilling resistance was very high and recovered returns/ chippings were hard Chalk. This is interpreted to be White Chalk (hard bedrock).

It was not possible to undertake any SPT tests in the Chalk.

On the basis of the findings of the deeper borehole it is expected that bored or augered piles would need to extend to at least 28m. This is consistent with previous experience in the area. BGS borehole records close to the Site record hard White Chalk rock head from between 25 and 33m. (BGS Logs are included at Appendix 2). Rock head tends to deepen towards the estuary.

6.5 Pavement Design

South of the Site

The majority of the south of the Site appears to have had ground treatment to support a previous use as car storage. There is an area which appears to have been cement stabilised and a larger area where a stone layer overlies a woven geotextile. The area to the west of Shed 26 is surfaced with a thin layer of Tarmac and sub base above a subgrade of generally more compact Made Ground including dense Chalk fill. All areas are underlain by variable Made Ground. Drainage is installed in some areas but large areas were inundated with surface water at the time of the investigation. An infilled former drain channel crosses this area of the Site.

The area of the foundry sand storage operation was largely obscured but is at least in part covered by a concrete slab with subbase below. The Made Ground in this area appears compact and contains some Chalk fill.

North of the Site

The area of Yard 6 appears to be surfaced with a variable thickness of unreinforced, aggregate free lean mix concrete sitting directly on highly variable and often soft fill. Large settlements of the surface have occurred in the past probably due to stockpile surcharges. The existing surfacing would not have resisted any deflections, the surface water system is broken and no longer effective. Due to the large vertical deflections it may be necessary to completely replace this hard standing. It would break up easily and crush to a usable fill grading albeit a large quantity of fines would be expected.

CBR testing was undertaken at various levels within the existing pavement construction and Made Ground subgrade. The results of the CBR testing including depth are included on the Photographic record for ease of reference and presented at Appendix 3. The Laboratory Certificates are presented at Appendix 5.

The existing capped and/or hard surfaced areas are relatively flat and with the exception of the south east are unrutted. This suggests that the existing improved ground will form a good capping layer above which the new construction can be designed. Removal of the existing surfacing would be problematical and reveal a subgrade of Made Ground that will be very difficult to work on.

A large area in the east is currently obscured by stockpiled materials as discussed earlier in this Report. Further investigation is likely to be required in this area.

The conjectured extent of the various existing pavement construction has been presented on drawing 19112-05. This is only an initial assessment based on the limited investigations to date.

6.6 Design of Buried Concrete

An assessment of the chemical conditions beneath the Site has been undertaken for the purposes of designing buried concrete in accordance with BRE Special Digest 1:2005 *Concrete in aggressive ground*.

The Site has been classified as a '*brownfield location*'.

Mobile groundwater conditions have been assumed.

Eight samples of the natural and Made Ground soils were tested for BRE SD1 Suite. The 2:1 water soluble sulphate results range between 98 and 3130 mg/l. 4 results are >500 mg/l. The highest values appear to be associated with the cement stabilised materials.

The corresponding pH values range between 7.0 and 10.2. The design pH is taken as the lowest value 7.0.

Table 6.6: Summary Data for Buried Concrete Design

Made Ground	Water Soluble Sulphate as SO ₄ (mg/l)	pH
Minimum	98	7.0
Maximum	3130	10.2
Mean Average	1068	9
Total No. Tests	8	8

Adopting the assumptions outlined above the Site is on average classified as Design Sulphate Class DS-2. The Aggressive Chemical Environment for Concrete (ACEC) Class is AC2.

This is an average assessment. Foundation and/or structure specific assessments should be undertaken at detailed design stage.

6.7 Excavation Stability

Excavation stability was generally good during the investigations.

Groundwater was encountered as shallow perched bodies and in saturated near surface granular deposits.

Groundwater conditions are recorded on the logs and discussed earlier in this Report.

6.8 Drainage and SuDS

The cohesive nature of the Made Ground and natural soils and high groundwater indicates that soakaways will not be effective.

Construction of new drainage will present challenges with regards to control of groundwater and disposal of excavation arisings.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Summary of Site Description

The Site is split into several land parcels as described earlier in this Report. The various surface conditions are summarized on drawing 19112-05.

Some areas were obscured by stockpiles or otherwise inaccessible.

7.2 Summary Ground Conditions

Below the various surface treatments a layer of Made Ground was found across the whole Site. This was variable and in most areas appeared to be imported construction /industrial waste probably dating to the time when the land was originally reclaimed. The maximum depth of Made Ground was 5.0m but it was generally between 0.8 and 3m in depth. There was often perched groundwater within the Made Ground.

Below the Made Ground natural strata of the Tidal Flat Deposits are found. The shallow soils often comprised a firm orange brown sandy CLAY and extended to depths of up to 3.0m. Below these soils were the soft grey Clays and Silts which are variably organic.

The Boulder Clay is encountered from circa 10m and comprises a stiff brown gravelly sandy CLAY. In RBH1 this was proven to 18.5m.

Beneath the Boulder Clay dense SAND & GRAVEL was initially encountered and then a thin layer of blowing sands. Below this strata interpreted to be the Chalk Gravels, Putty Chalk and hard White Chalk were encountered the latter encountered at 28m.

Groundwater was encountered a perched water bodies in the Made Ground across the Site.

No notable groundwater table was encountered in Tidal Flat Deposits or the Boulder Clay.

Groundwater under sub artesian pressure was encountered at 18m in RBH1.

Surface water ponding occurs across the south, east and north of the wider site.

7.3 Summary Contaminated Land Status

Testing indicates that, except in 1 location in Yard 6, all contaminants are at concentrations that do not exceed GAC for a Commercial Land-use. This is surprising given the nature of some of the fill materials.

No asbestos containing materials were noted during the investigations. No asbestos was detected in the samples tested.

Based on the limited dataset available, there is currently no identified requirement for remediation. Contamination including asbestos may be present in areas not investigated. Imported materials will need to be suitable for a Commercial Land-use as described earlier in this Report. Topsoil may need to be suitable for either Commercial land use or Public Open Space, depending on final designs.

7.4 Engineering Recommendations

The Made Ground is generally considered unsuitable as a bearing strata.

The firm clays of the upper TFD may be suitable for lightly loaded foundations although the presence of the soft and compressible soils immediately below would require consideration in design.

Piled foundations for large loads would need to be constructed to depths of approximately 28 to 30m along with any required rock socket.

Driven piles are unlikely to penetrate the dense sands and gravels below the Boulder Clay. Local knowledge and BGS records indicate that the Boulder Clay can also contain horizons of Sands Gravels. Incised and deep channels can also be cut into the top of the Boulder Clay which often contain PEAT. This could prove problematic for short piles into the Boulder Clay.

Existing engineered pavements and ground treatments are likely to be suitable as capping or considered to be a strong subgrade. Wherever possible the existing surfacing should be retained as the underlying Made Ground in much of the Site would cause difficulties. The unusual surfacing in Yard 6 may need to be removed and reprocessed due to significant changes in level in this area due to subsidence.

Installation of new drainage and any other excavations may require onerous groundwater control dependent on location on the Site. However, excavation stability was generally very good.

The chemical conditions in relation to the design of buried concrete indicate that on average DS-2, ACEC-AC2 will apply. However, structure specific investigations are recommended as locally higher protection may be required.

7.5 Recommended Additional Ground Investigation

Obtaining archive records for the various site preparation, particularly in the south would be beneficial to detailed engineering assessment.

The stockpiles across the east of the Site prevented access for investigation. The stockpiles and the ground conditions beneath them will need investigation using large tracked excavation plant.

Further GI for contamination may be required depending on development proposals.

A ground gas assessment may be required depending on the proposed building type and design.

An additional deep borehole may be required at the north of the bridge. However, the underlying ground conditions are unlikely to change significantly from this encountered in RBH1. The findings of this investigation are consistent with what was expected based on nearby BGS records and experience elsewhere in the Port. Any further investigations may best be placed upon the piling contractor.

8.0 LIMITATIONS

8.1 General

GD Pickles Ltd (GDP) have prepared this report solely for the use of HBPW LLP. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from GDP; a charge may be levied against such approval.

GDP accepts no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned or the consequences of this document being used by any third party with whom an agreement has not been executed.

The Client should be aware that property development carries risk and that unidentified development abnormalities should be anticipated particularly on brownfield sites with regard to in-ground risks such as contamination, asbestos, waste and underground obstructions/made ground. This Report provides an assessment of the potential and actual ground conditions found based upon the available information and in the context of the scope of works performed. It does not provide a flood, drainage, asbestos, ecological, mining, archaeological or legal assessments or provide advice on other technical matters which may be appropriate when considering site ownership and development. The Client should satisfy itself that it has adequate information on which to make its own decision with regards the commercial and legal merit of acquiring and developing the site. All development risk rests with the developer and owner. GDP will employ all reasonable endeavours to assist the Client manage and mitigate those risks, however, no liability is accepted by GDP for any loss, damages, or consequential or third party losses which may be suffered by the Client from the inappropriate use or misinterpretation of the content of this report and all liability is limited to those set out in our terms and conditions at the time of instruction.

8.2 Phase I Desk Studies and Preliminary Risk Assessments

The work undertaken in producing this report comprised a study of available in-house and third party documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The assessments and opinions given in this report rely on such information and activities and are only relevant to the purpose for which the report was commissioned. Any information reviewed should not be considered exhaustive and has been accepted and used in good faith as providing accurate and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, GDP reserves the right to review and if necessary modify the opinions accordingly. It should be noted that any risks

identified in a Phase 1 report are perceived risks based on the information reviewed; actual risks can usually only be quantified following a physical investigation of the site.

8.3 Phase II Intrusive Geotechnical and Geoenvironmental Investigations

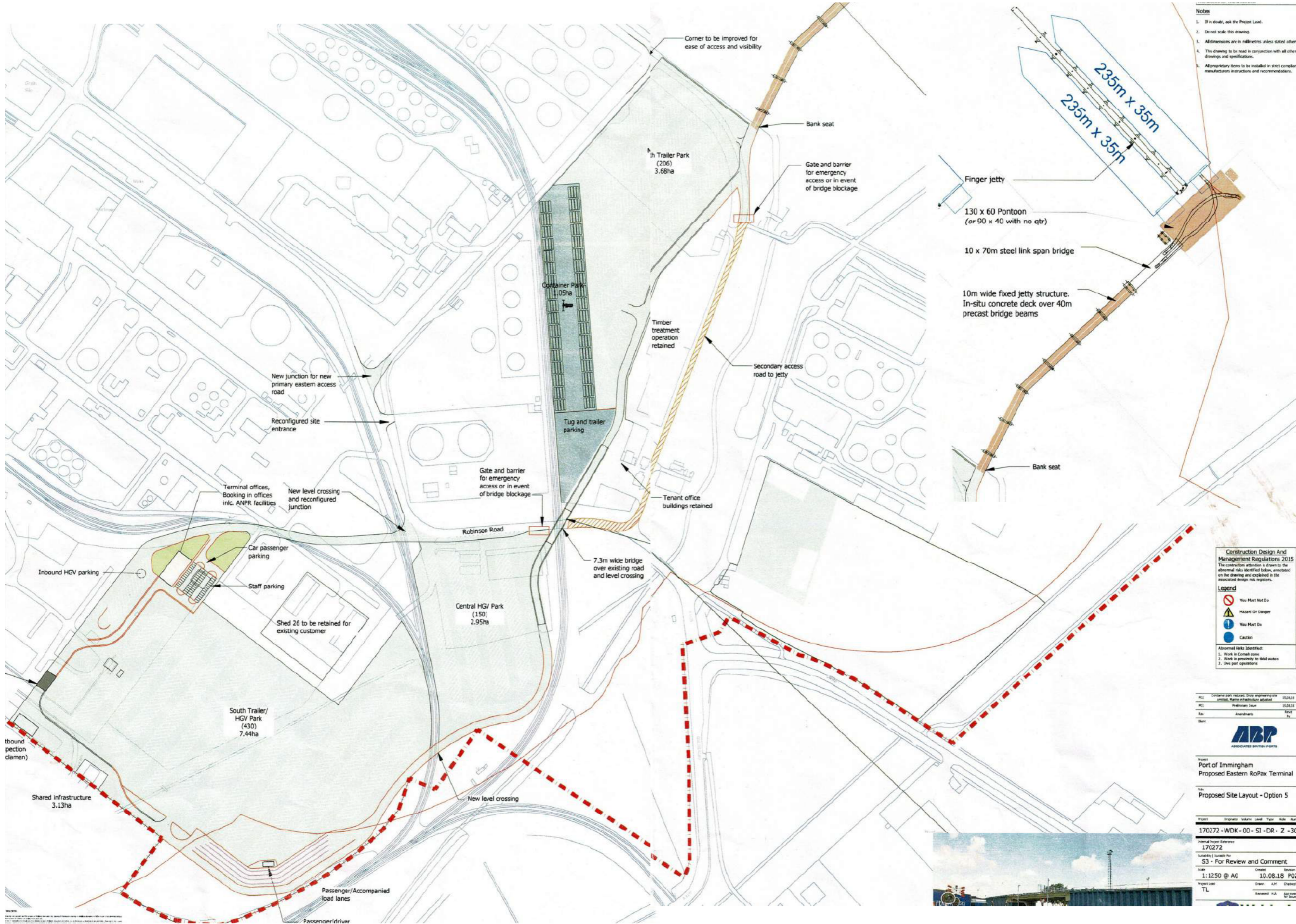
The investigation of the site has been carried out to provide sufficient information concerning the type and significance of contamination and or geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environment risks together with engineering and development implications. If costs have been included in relation to site development professional cost advice should be sought.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site for each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report. Whilst exploratory testing is intended to gain an accurate representation of the site, the very nature of sampling and testing is such that it cannot ensure that all localised conditions are detected.

The comments made on groundwater conditions are based on observations made at the time the site work was conducted. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects. The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Drawings



- Notes**
1. If in doubt, ask the Project Lead.
 2. Do not scale this drawing.
 3. All dimensions are in millimetres unless stated otherwise.
 4. This drawing to be read in conjunction with all other risk drawings and specifications.
 5. All proprietary items to be installed in strict compliance with manufacturers instructions and recommendations.

Construction Design And Management Regulations 2015
 The construction activities shown in this drawing are drawn to the abnormal risks identified below, annotated on the drawing and explained in the associated design risk registers.

Legend

- You Must Not Do
- Hazard or Danger
- You Must Do
- Caution

Abnormal Risks Identified:

1. Work in Cornish zone
2. Work in proximity to tidal waters
3. Live port operations

PC1	Complete path network, civil engineering etc. amended. Many infrastructure added	15.08.18
PC1	Preliminary Issue	15.08.18
Rev	Amendments	Rev 0
Sheet		17



Project: Port of Immingham
 Proposed Eastern RoPax Terminal
 Proposed Site Layout - Option 5

Project	Originator	Volume	Level	Type	Date	Number
170272 - WDK - 00 - SI - DR - Z - 300						
Internal Project Reference: 170272						
Suitability / Suitable for: S3 - For Review and Comment						
Scale:	1:1250 @ A0	Created:	10.08.18	Revision:	P02	
Project Lead:	TL	Drawn:	AJM	Checked:	AJ	
Reviewed:	HJA	Appr. issued:	17/08/18			



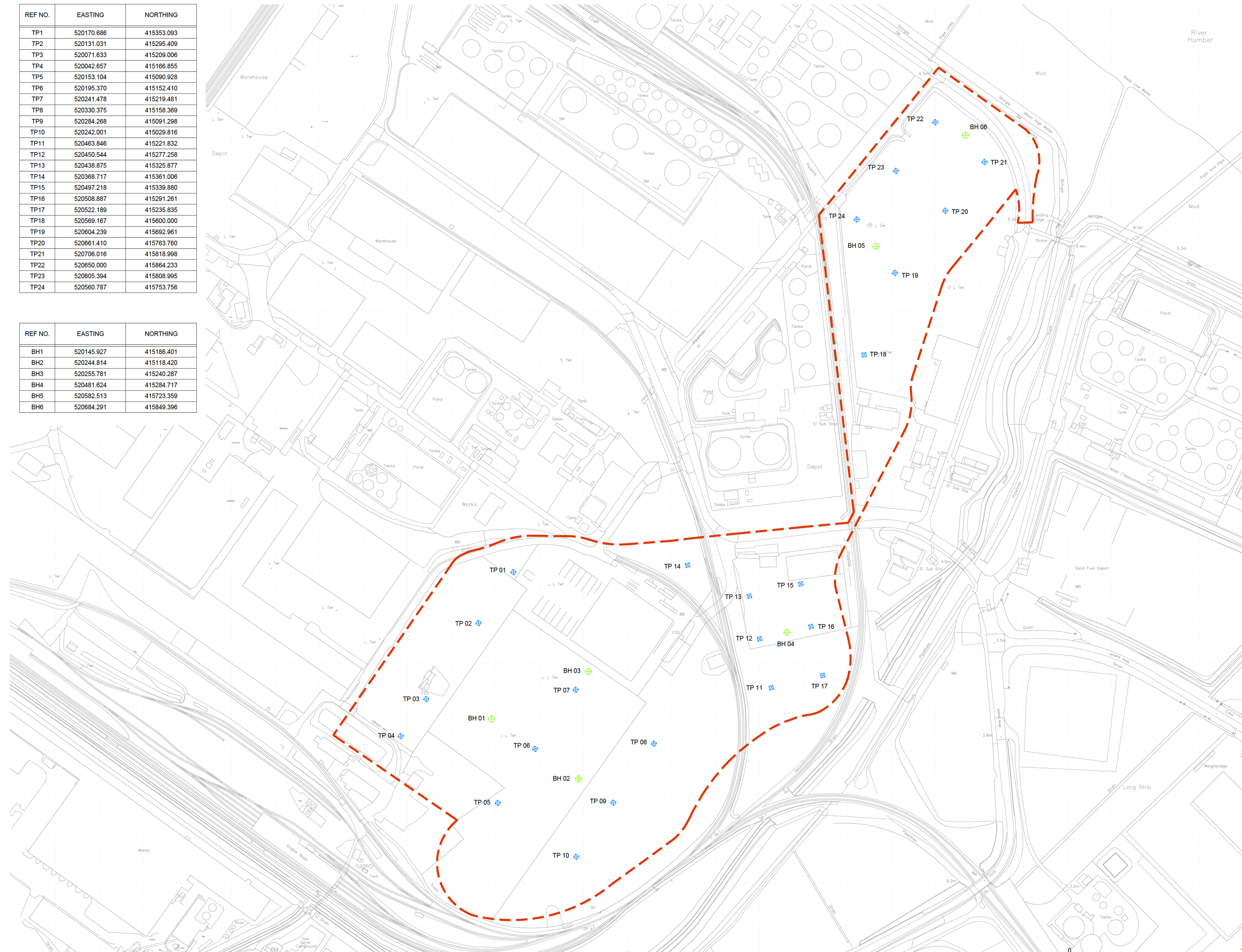
NOTES
 This drawing is the property of the client and is not to be used for any other purpose without the written consent of the client. It is to be used in conjunction with all other drawings and specifications. It is to be read in conjunction with the project brief and the project programme of works.

- DO NOT SCALE
- This drawing is to be read in conjunction with all other relevant drawings.
- Should there be any conflict between the details indicated on this drawing and those indicated on other drawings the Engineer should be informed PRIOR to construction on site.
- Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings and details issued are PRELIMINARY and NOT FOR CONSTRUCTION. Should the contractor commence site work prior to approval being given, it is entirely at his own risk.
- All dimensions are in millimetres unless otherwise stated.
- It is the responsibility of the contractor to execute the works at all times in strict accordance with the requirements of the Health And Safety At Work Act 1974 and CDM regulations 2015. The contractor will be deemed to have allowed for full compliance, including full liaison with the Principal Design, within his rates.

LEGEND	
	Trial Pits + Plate Bearing test
	Borehole to 10m
	Site Development Boundary

REF NO.	EASTING	NORTHING
TP1	520170.686	415353.093
TP2	520131.031	415295.409
TP3	520071.633	415209.006
TP4	520042.657	415166.855
TP5	520153.104	415090.928
TP6	520195.370	415152.410
TP7	520241.478	415219.481
TP8	520330.375	415158.369
TP9	520284.268	415091.298
TP10	520242.001	415029.816
TP11	520463.846	415221.832
TP12	520450.544	415277.258
TP13	520438.875	415325.877
TP14	520368.717	415361.006
TP15	520497.218	415339.880
TP16	520508.887	415291.261
TP17	520522.189	415235.835
TP18	520569.167	415600.000
TP19	520604.239	415692.961
TP20	520661.410	415763.760
TP21	520706.016	415818.998
TP22	520650.000	415864.233
TP23	520605.394	415808.995
TP24	520560.787	415753.756

REF NO.	EASTING	NORTHING
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BH2	520244.814	415118.420
BH3	520255.781	415240.287
BH4	520481.624	415284.717
BH5	520582.513	415723.359
BH6	520684.291	415849.396



APPROVAL

HEALTH, SAFETY AND ENVIRONMENTAL INFORMATION

In addition to the hazards/ risks associated with the types of work detailed on this drawing please note the following:

Construction:

Cleaning / Maintenance:

Demolition:

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

REV	DESCRIPTION	BY	CHK	APP	DATE
-	1ST ISSUE	KA	EP	PW	13.11.19

REVISION TABLE	
HBPW	CONSULTING ENGINEERS
43 BRIDGEGATE RETFORD NOTTINGHAMSHIRE DN22 7UX	TEL: (01777) 899896 www.hbpw.co.uk

CLIENT: **ABP ASSOCIATED BRITISH PORTS**

CONTRACTOR: **GRAHAM**

HBPW PROJECT NUMBER: **SL06537**

PROJECT: **NORDIC CONCEPT STAGE**

DRAWING: **PROPOSED GROUND INVESTIGATION**

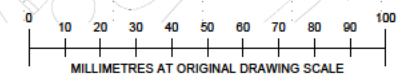
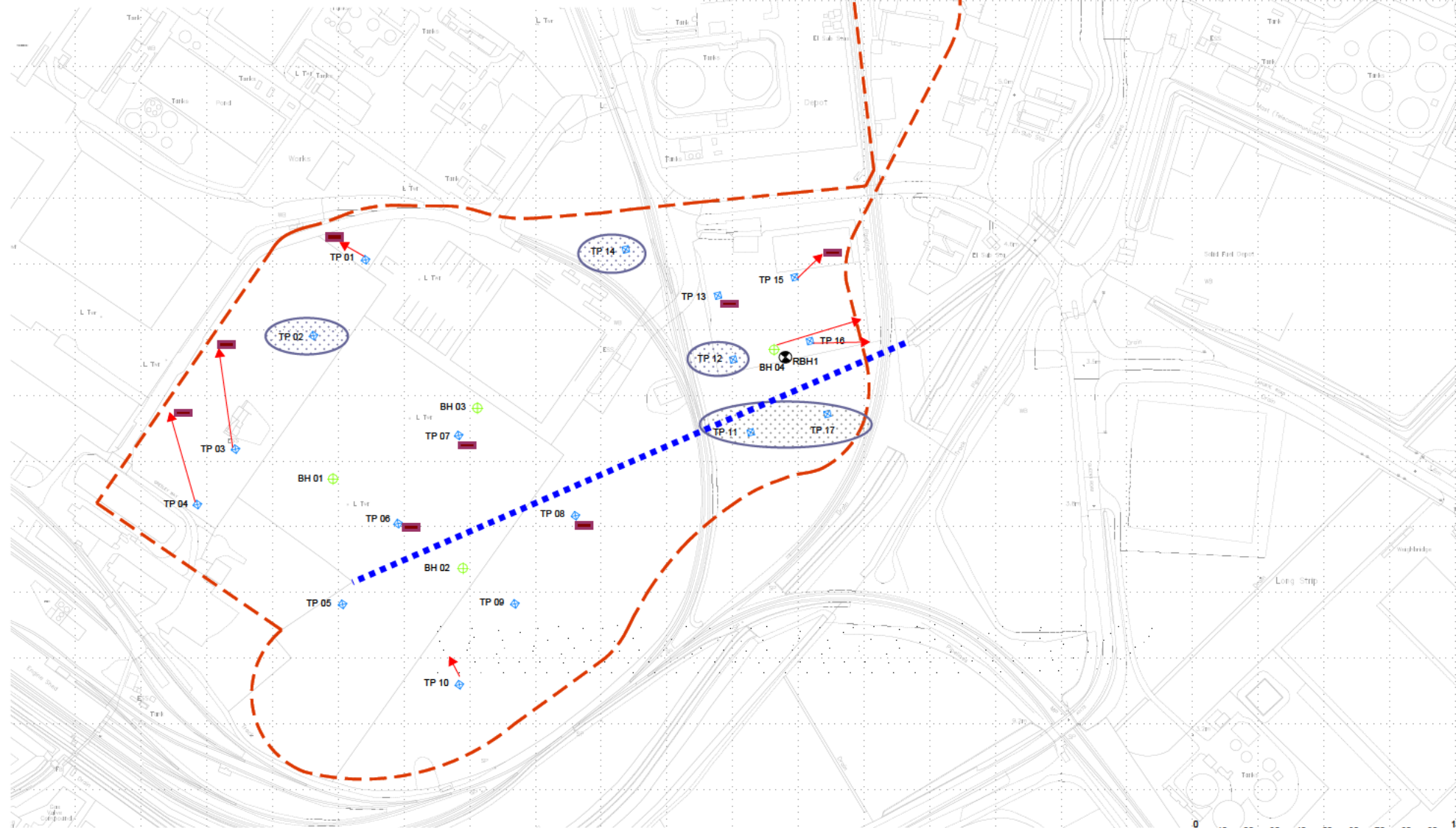
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CHECKED: EP	APPROVED: MT
DATE: 13 NOV 2019	SCALE: 1:2000
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BH02	520237.582	415105.948	4.088
BH03	520250.891	415233.9531	3.833
BH04	520489.739	415279.270	5.980
BH05	520553.128	415738.108	4.734
BH06	520606.052	415802.036	4.081
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TP02	520096.840	415245.132	4.026
TP03	520025.171	415252.036	5.104
TP04	520024.407	415210.522	4.871
TP05	520156.584	415091.948	4.871
TP06	520190.247	415143.059	3.721
TP07	520234.872	415209.989	3.878
TP08	520300.473	415157.889	4.214
TP09	520255.691	415091.647	4.112
TP10	520207.359	415026.613	4.188
TP11	520463.483	416243.260	5.260
TP12	520448.440	416276.368	5.383
TP13	520440.149	415319.274	5.811
TP14	520384.043	416309.148	4.024
TP15	520524.847	415363.646	5.838
TP16	520549.957	415297.747	5.677
TP17	520535.508	416274.321	5.848
TP18	520566.830	416644.780	4.617
TP19	520591.626	415676.077	4.288
TP20	520851.656	415754.655	3.590
TP21	520713.246	416841.607	3.081
TP22	520685.681	416884.408	3.033
TP23	520607.682	416831.280	4.038
TP24	520547.788	415751.090	4.894

Abandoned/not completed

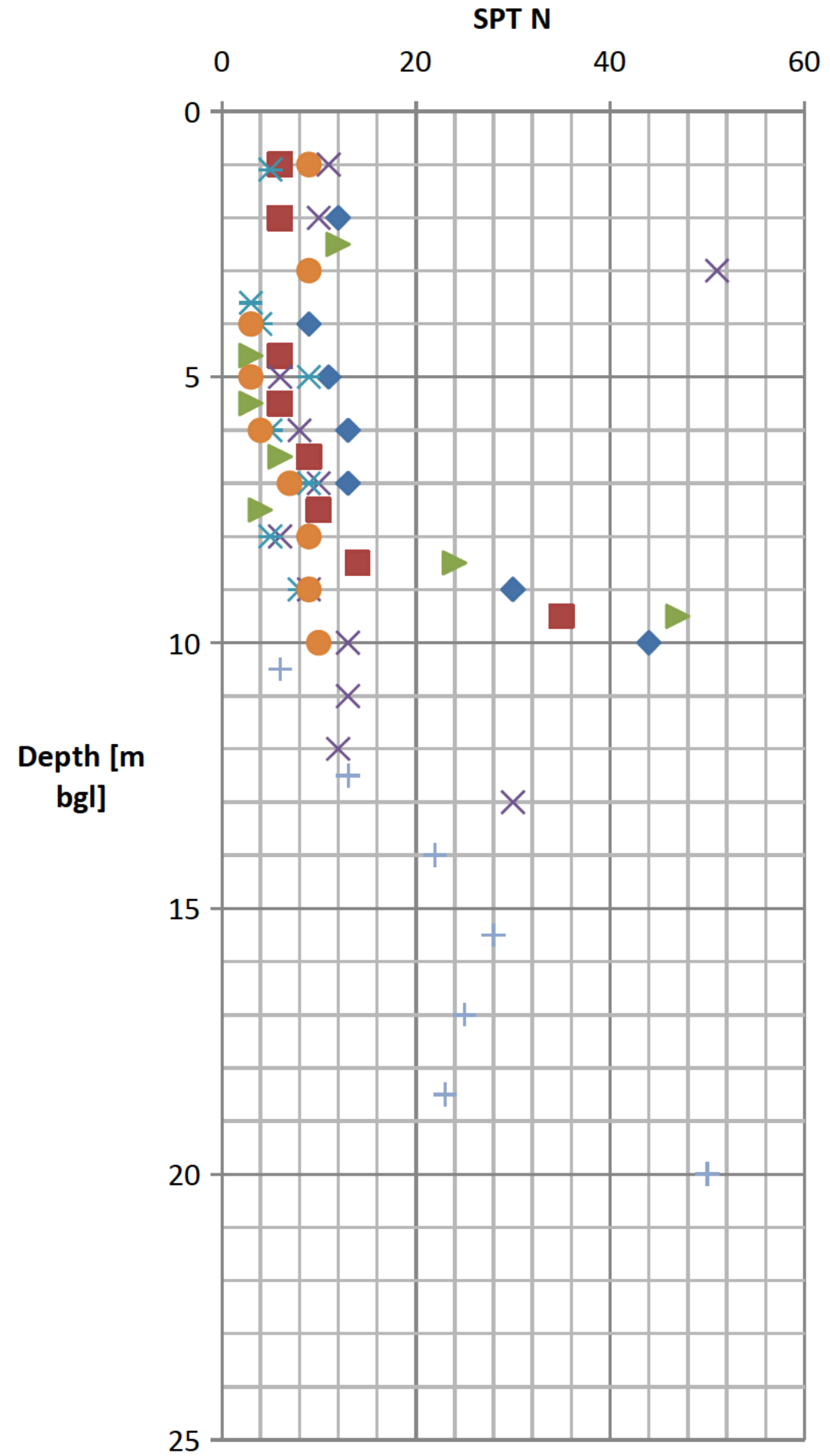
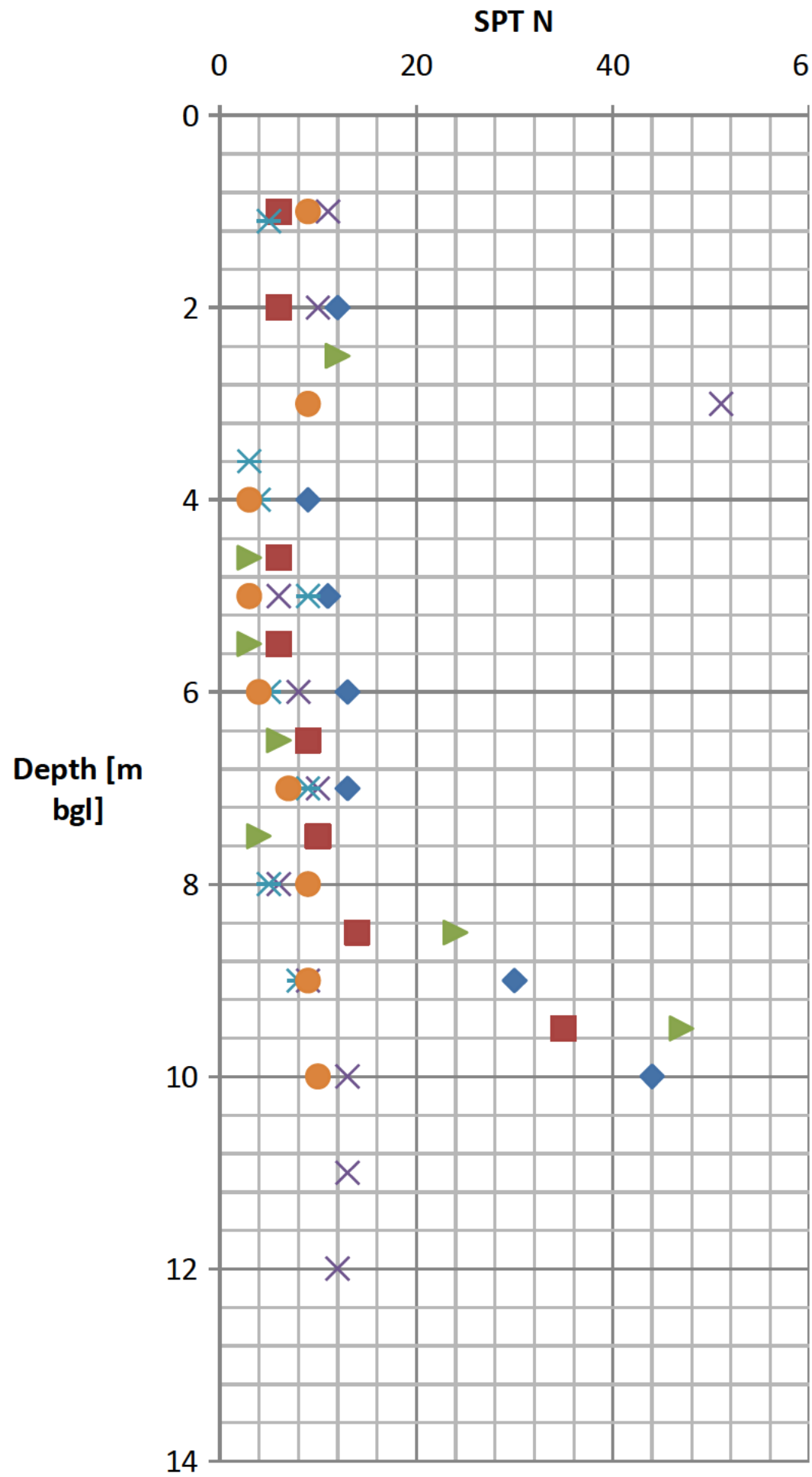
Legend

- Trial Pit
- Cable Percussion Borehole (circa 10m)
- Rotary Percussive Borehole (circa 29m)
- Insitu CBR
- Abandoned/not completed locations (refer Report Text and Photographic record for reason)
- Revised Location
- Site Development Boundary
- Approximate route of deep culvert / drain




NOTES		
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D		
<p>Brownfield Consulting & Development GD Pickles Ltd, registered in the UK: 09387115 Billions Farm, South Scale Lane, Gwintowry, Lincoln, LN6 5JA</p>		
CLIENT		
HBPW LLP		
SITE		
Nordic Concept Stage		
DRAWING TITLE		
Exploratory Hole Location Plan		
DRAWING NO. 19112-01	REVISION NO. 0	
DRAWN BY JRF	APPROVED BY GDP	
DATE April 2020	SCALE NTS	PAPER SIZE A3

- ◆ BH01
- BH02
- ▲ BH03
- × BH04
- ✱ BH05
- BH06
- + RBH1



NOTES

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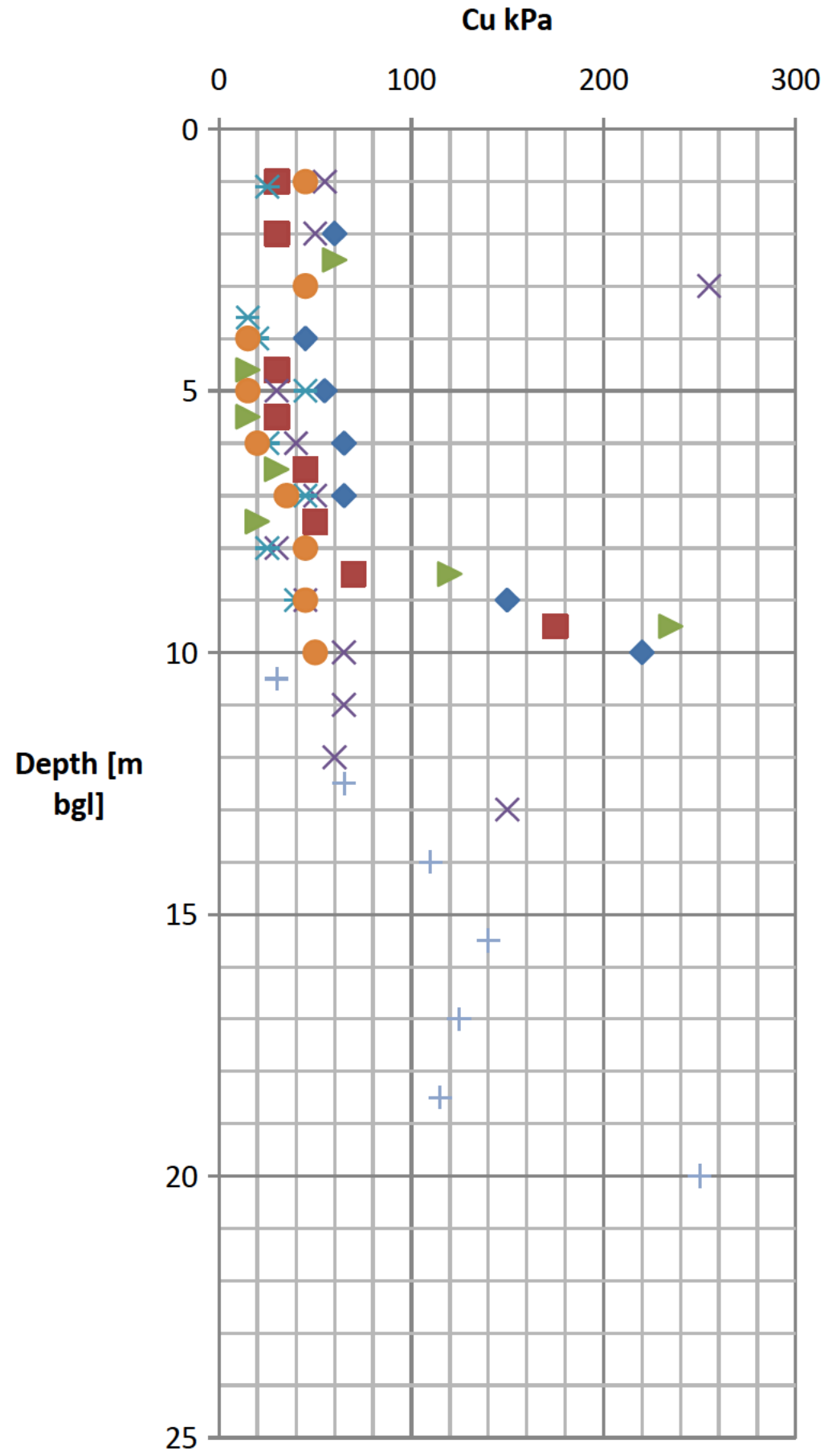
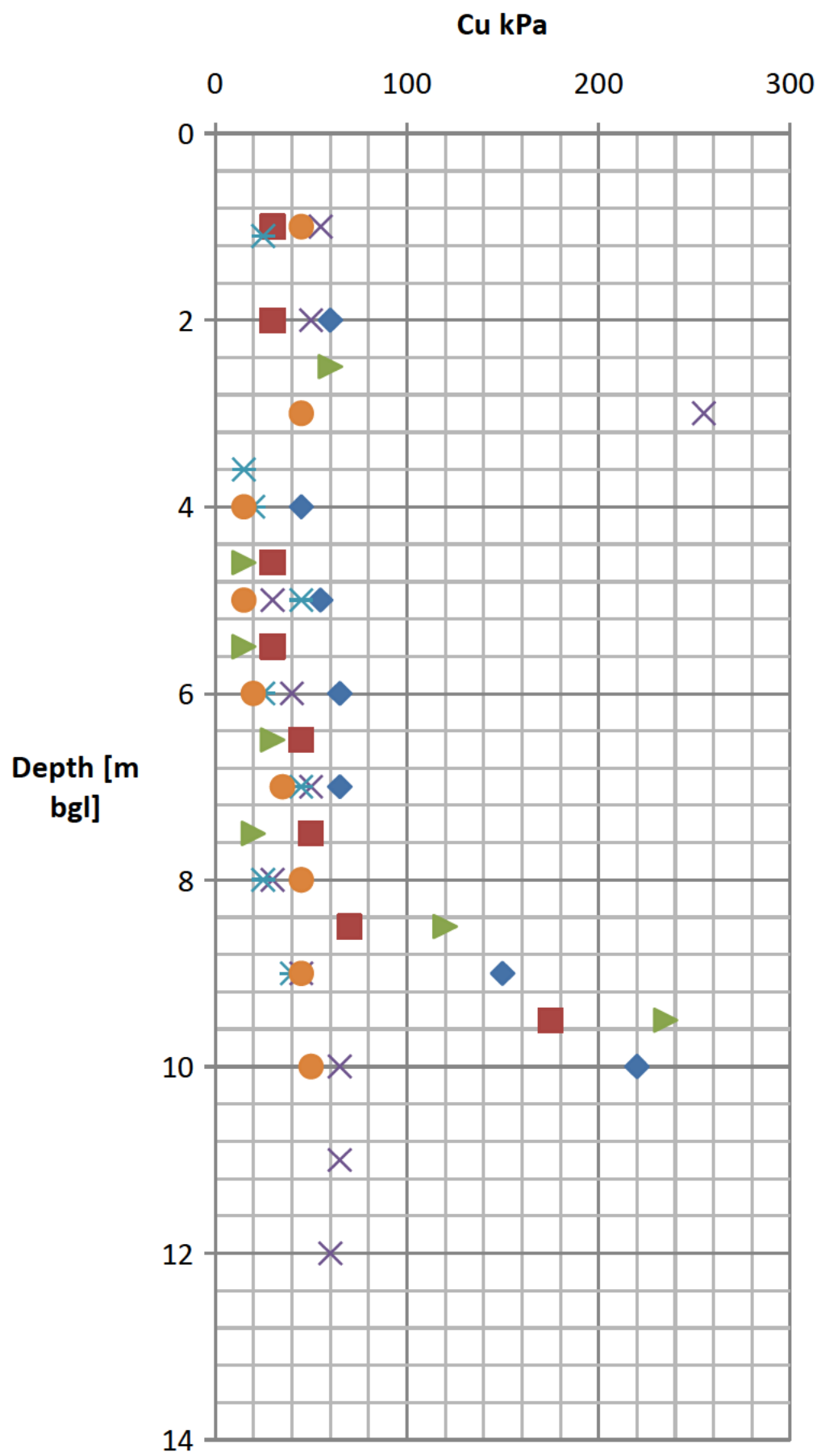
SITE
Nordic Concept Stage

DRAWING TITLE
Insitu Testing (SPT vs Depth)

DRAWING NO. 19112-02	REVISION NO. 0	
DRAWN BY JRF	APPROVED BY GDP	
DATE April 2020	SCALE NTS	PAPER SIZE A3



- ◆ BH01
- BH02
- ▲ BH03
- × BH04
- ✕ BH05
- BH06
- + RBH1



NOTES

$Cu = f1 \times SPT\ N$, where $f1 = 5$
 (Tomlinson Ed. 7, Fig 1.5)

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HBPW LLP

SITE

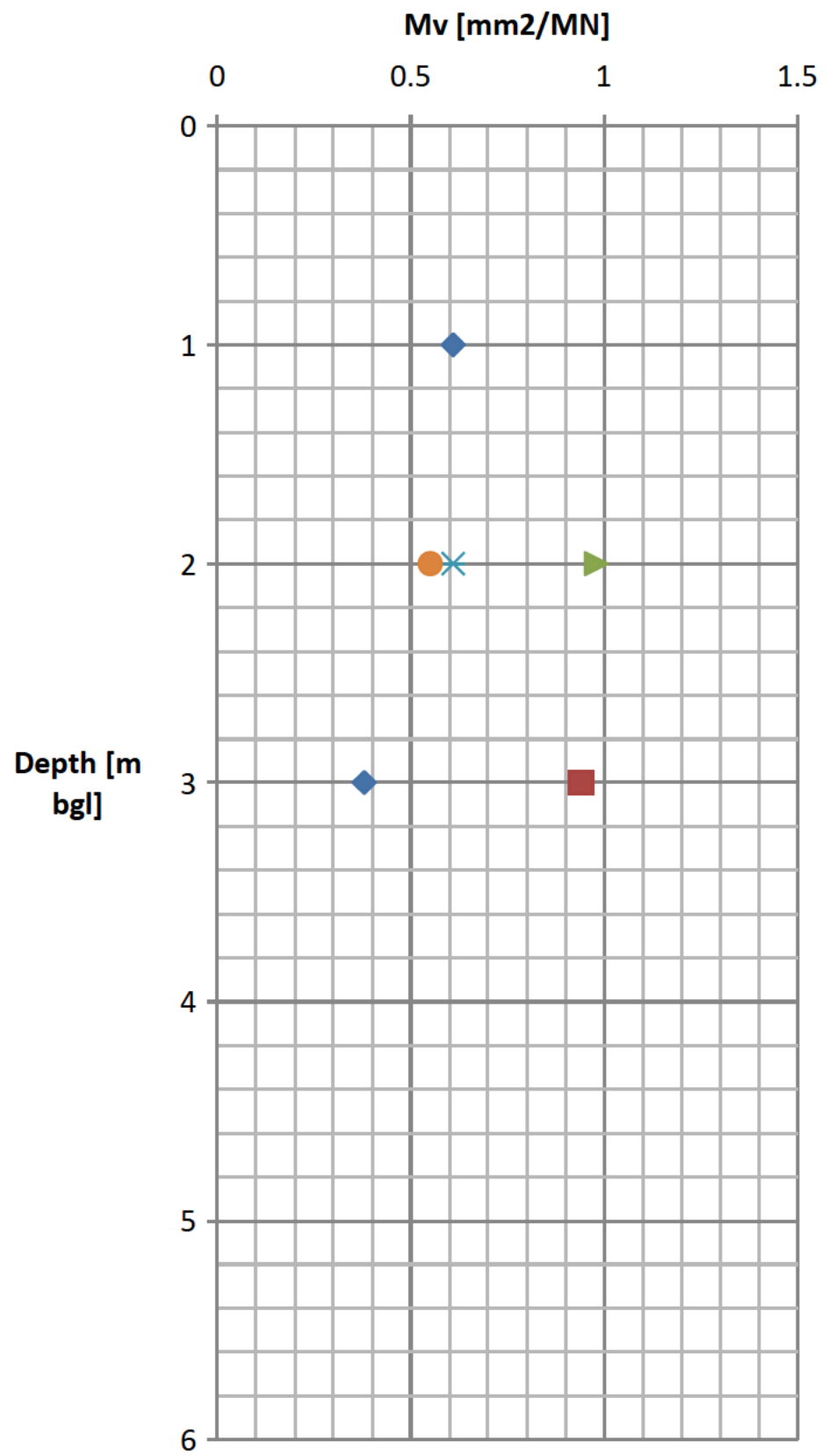
Nordic Concept Stage

DRAWING TITLE

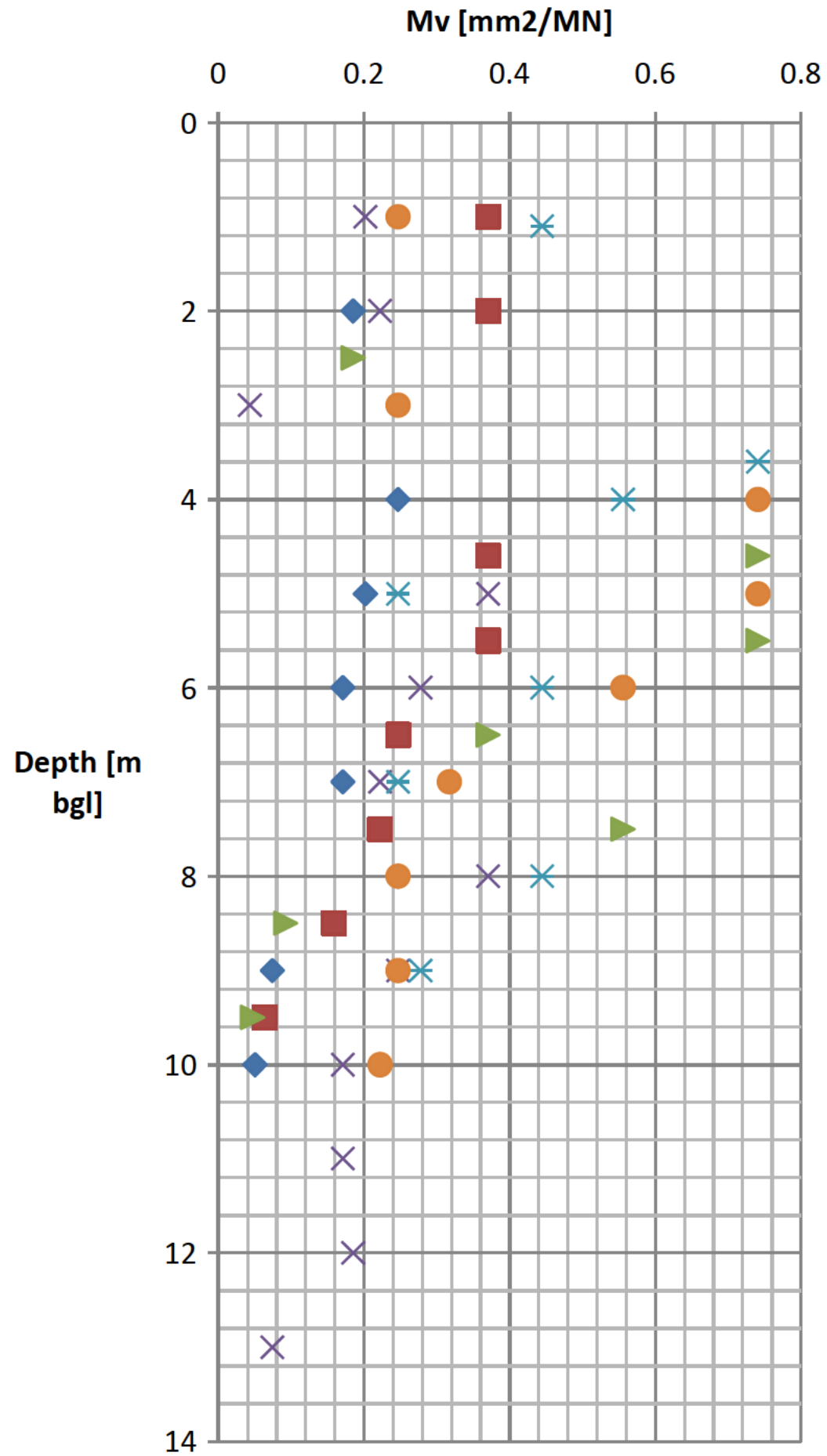
Insitu Testing (Cu vs Depth)

DRAWING NO. 19112-03	REVISION NO. 0
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DATE April 2020	SCALE NTS
	PAPER SIZE A3





Laboratory Testing (at 20 kPa Applied Pressure)




Estimation from SPT N

- ◆ BH01
- BH02
- ▲ BH03
- × BH04
- * BH05
- BH06

NOTES

$Cu = f2 \times SPT\ N$, where $f1 = 0.45$
(Tomlinson Ed. 7, Fig 1.5)

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SITE

Nordic Concept Stage

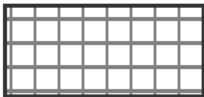





DRAWING TITLE

Insitu & Lab Testing
(Mv vs Depth)









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DRAWN BY JRF	APPROVED BY GDP
DATE April 2020	SCALE NTS
	PAPER SIZE A3

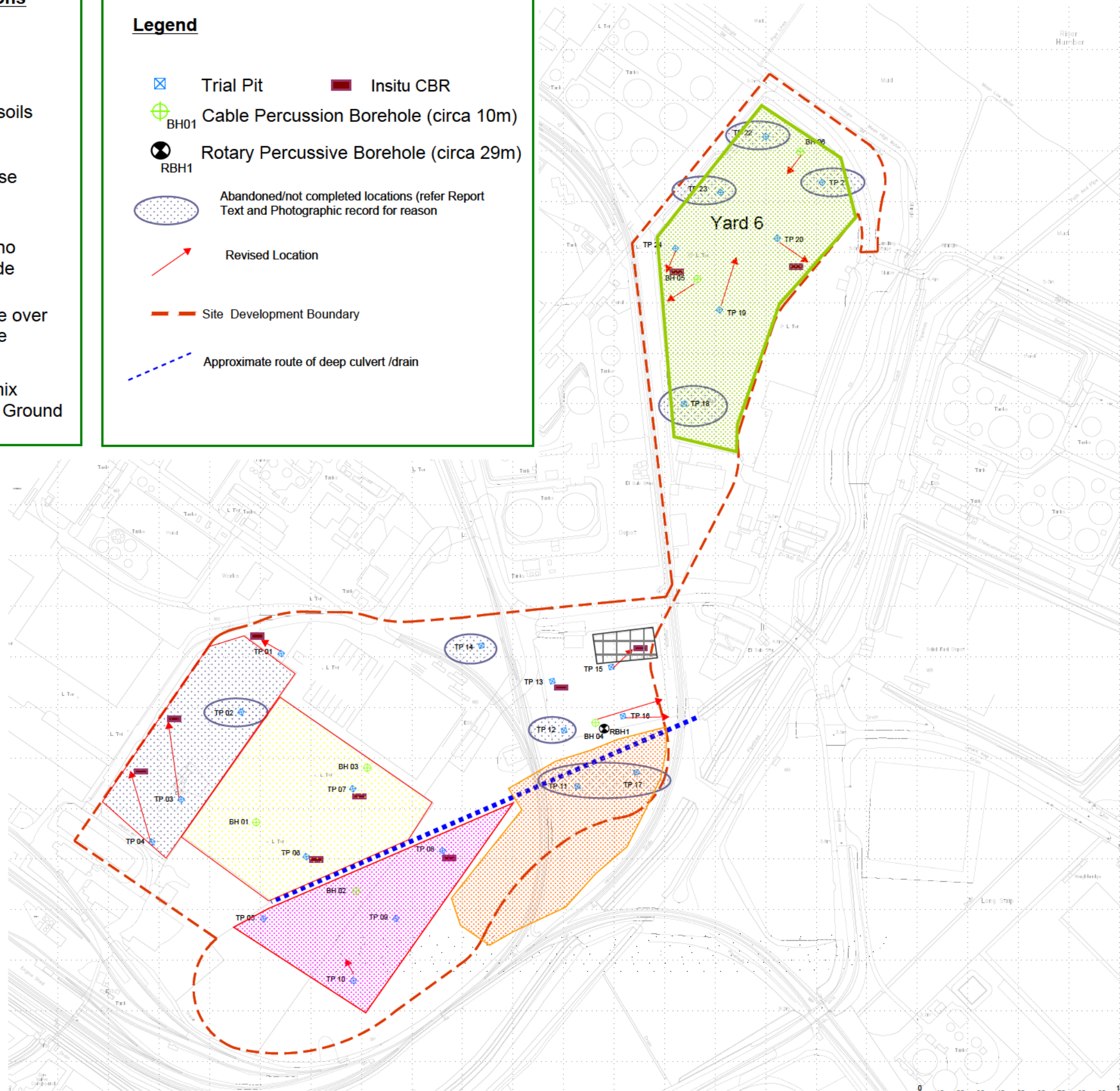


Conjectured Surface Conditions

-  Concrete Slab
-  Stockpiles of waste soils
-  Tarmac, thin sub base over Made Ground
-  Cement stabilized (no geotextile) over Made Ground
-  100 to 150mm Stone over geotextile over Made Ground
-  200 -400mm Lean mix concrete over Made Ground

Legend

-  Trial Pit
-  Insitu CBR
-  Cable Percussion Borehole (circa 10m)
BH01
-  Rotary Percussive Borehole (circa 29m)
RBH1
-  Abandoned/not completed locations (refer Report Text and Photographic record for reason)
-  Revised Location
-  Site Development Boundary
-  Approximate route of deep culvert / drain



NOTES

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HBPW LLP

SITE

Nordic Concept Stage

DRAWING TITLE

Conjectured Ground Treatment & Surfacing

DRAWING NO.
19112-05

REVISION NO.
0

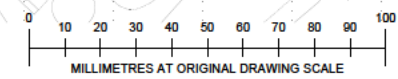
DRAWN BY
JRF

APPROVED BY
GDP

DATE
April 2020

SCALE
NTS

PAPER SIZE
A3



Appendix 1

Exploratory Hole Logs

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 Bilton's Farm,
 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
jay@gdpickles.co.uk

Trial Pit Record :TP03



Logged By: JRF	Date: 26 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 5.1 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
		0.00	/	Flexible surfacing. Thin, soft bituminous.	CBR 43%	
			x	MADE GROUND: Brown very sandy fine to medium gravel of limestone. Sub base.		
			o	MADE GROUND: Orange brown sandy slightly gravelly clay.		
		-0.50	x	MADE GROUND: Very dense chalk fill.		
		-1.00	o			
		-1.50				
		-2.00				
		-2.50				
		-3.00				

Groundwater Observations / Stability / Remarks:

Pit stable. Rapid groundwater ingress at 0.8m within chalk fill.

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 Bilton's Farm,
 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
jay@gdpickles.co.uk

Trial Pit Record :TP04



Logged By: JRF	Date: 28 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.9 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
D1		0.00	X	Flexible surfacing. Thin, soft bituminous.		
		-0.50	X	MADE GROUND: Grey very sandy fine to medium gravel of limestone. Sub base. MADE GROUND: Orange brown sandy slightly gravelly clay.	CBR 6.9%	
		-1.00	X			
		-1.50	X			
		-2.00	X			
		-2.50	X			
		-3.00	X			

Groundwater Observations / Stability / Remarks:

Pit stable. Dry.

Trial Pit Record :TP05

Logged By: JRF	Date: 24 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.9 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
D1 WAC1		0.00		MADE GROUND: Light grey Type 1/2 over light grey woven geotextile.		
		-0.50		MADE GROUND: Multi-coloured mix of sand, clay with bricks, concrete, clay pipes, re-bar, wire.		▼
		-1.00				
		-1.50				
		-2.00		Orange SAND [Possibly natural but running and water ingress from 1.5m making excavation and description difficult].		
		-2.50				
		-3.00				

Groundwater Observations / Stability / Remarks:

Formation is stone layer over a woven geotextile. Groundwater ingress at 1.5m from fill/running sands. Standing at 0.9m.

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 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
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Trial Pit Record :TP06



Logged By: JRF	Date: 25 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 3.7 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
D1		0.00		MADE GROUND: Light grey Type 1/2 over light grey woven geotextile.		CBR >100%
		-0.50		MADE GROUND: Loose/soft white and pinkish grey silty clay matrix with bricks, kerb stones, angular concrete fragments up to small boulder size (look like broken out hard standings).		
		-1.00				▼
		-1.50				
		-2.00				
		-2.50				
		-3.00				

Groundwater Observations / Stability / Remarks:

Formation is stone layer over a woven geotextile. Groundwater ingress at 0.9m rising to 0.5m. Depth estimated as pit continuously collapsing due to water and sandy consistency of fill.

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 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
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Trial Pit Record :TP07



Logged By: JRF	Date: 25 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 3.9 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description			In Situ/ Lab Test	Groundwater Levels
D1		0.00	[Cross-hatched pattern]	MADE GROUND: Cement stabilised layer of varying thickness.				
D2			[Cross-hatched pattern]	MADE GROUND: Dark brown sandy gravelly clay with fine to medium gravel of mixed lithology. In 2 faces tapering seam of chalk gravel.				
D3		-0.50	[Cross-hatched pattern]	Brown Sandy CLAY. No anthropogenic material noted so possibly natural.			CBR 11%	
		-1.00	[Dotted pattern]					
		-1.50	[Dotted pattern]					
		-2.00	[Dotted pattern]					
		-2.50	[Dotted pattern]	Soft grey organic CLAY.				
		-3.00	[Dotted pattern]					

Groundwater Observations / Stability / Remarks:

Probably cement stabilised as unhydrated cement pockets and odour, hard, no geotextile separator and undulating base suggests ploughed in. Pit dry and stable.

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 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
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Trial Pit Record :TP08



Logged By: JRF	Date: 28 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.2 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description			In Situ/ Lab Test	Groundwater Levels
		0.00	MADE GROUND	MADE GROUND: Turf over dark brown/black organic soil.				
			MADE GROUND	MADE GROUND: Variable thickness of grey possibly cement stabilised sandy gravel and brown gravelly clay.				
		0.50	MADE GROUND	MADE GROUND: Firm orange brown slightly gravelly clay with occasional brick and concrete fragments. Possibly re-worked natural with some deleterious ingress in upper layers.			CBR 6.2%	▼
		1.00						
		1.50	CLAY	Firm and soft grey organic CLAY.				
		2.00						
		2.50						
		3.00						

Groundwater Observations / Stability / Remarks:

Pit stable. Groundwater ingress from top of organic Clay and rose to 1.2m. Slight organic/industrial odour from fill and strong natural organic odour from natural Clay.

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 Bilton's Farm,
 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
jay@gdpickles.co.uk

Trial Pit Record :TP09



Logged By: JRF	Date: 28 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.1 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
		0.00	X	MADE GROUND: Possibly cement stabilised Type 1/2 layer. Consistent thickness 250mm with no geotextile separator noted.		
		-0.50	X	MADE GROUND: Firm stiff orange brown sandy clay. Rare red brick fragments.		
		-1.00	X	MADE GROUND: Soft dirty grey and black brown clay and sand matrix with brick, concrete, rubber hoses, tiles.		▼
		-1.50	X			
		-2.00	X			
		-2.50	X			
		-3.00	X			

Groundwater Observations / Stability / Remarks:

Pit stable with water ingress from stone/cement stabilised layer and rising from base at end of excavation.

Trial Pit Record :TP10

Logged By: JRF	Date: 28 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.2 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
		0.00	█	MADE GROUND: Grey Type 2 graded Limestone over light grey woven geotextile.		
		-0.50	█	MADE GROUND: Initially cohesive becoming more granular with depth mixture of clay, sand and demolition rubble including bricks, kerbs, pipes, rebar.		▼
		-1.00	█			
		-1.50	█			
		-2.00	█			
		-2.50	█			
		-3.00	█			

Groundwater Observations / Stability / Remarks:
 Pit stable. Rapid water ingress from 1.2m. Industrial odour from fill.

Trial Pit Record :TP13



Logged By: JRF	Date: 26 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 5.8 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
D1/WC4		0.00		MADE GROUND: Turf over dark brown clayey organic topsoil. MADE GROUND: Chalk gravel.		
		-0.50		MADE GROUND: Brown, orange brown sandy clay with brick flakes.	CBR 1.5%	
		-1.00				
		-1.50				
		-2.00				
		-2.50				
		-3.00				

Groundwater Observations / Stability / Remarks:

Pit stable. Dry. Terminated at 1.0m as suspect gravel infill possibly a service trench in end of pit.

GD Pickles Limited
 Bilton's Farm,
 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
jay@gdpickles.co.uk

Trial Pit Record :TP15



Logged By: JRF	Date: 26 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 5.8 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description			In Situ/ Lab Test	Groundwater Levels
D1		0.00		Concrete slab. No reinforcement noted but appears rigid.				
				MADE GROUND: Brown sandy gravel subbase.				
				MADE GROUND: Chalk gravel.				
		-0.50		POSSIBLY MADE GROUND: Stiff dark brown slightly gravelly clay.			CBR 63%	
		-1.00						
		-1.50						
		-2.00						
		-2.50						
		-3.00						

Groundwater Observations / Stability / Remarks:

Pit stable and dry.

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Trial Pit Record :TP16



Logged By: JRF	Date: 25 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 5.7 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
D1		0.00		MADE GROUND: Loose white/creme foundry sand from stockpiles.		
		-0.50		MADE GROUND: Dark brown soily clay and mixed gravel of brick and concrete.		
D2		-1.00		Dark brown black PEAT.		
		-1.50				
		-2.00				
		-2.50				
		-3.00				

Groundwater Observations / Stability / Remarks:

Pit collapsing in Peat layer. Oragnic smell from base, natural. May be within area of infilled/culveretd drain that had a wide open channel at this point. Manhole visible approx 6m beyond fence along line of culvert.

GD Pickles Limited
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 South Scarle Lane,
 Swinderby, Lincoln, LN6 9JA
jay@gdpickles.co.uk

Trial Pit Record :TP19



Logged By: JRF	Date: 27 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.3 (m AOD)	Shoring: (No)



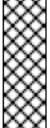

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	In Situ/ Lab Test	Groundwater Levels
D1		0.00		MADE GROUND: Varying between 150mm and 250mm lean mix concrete. No aggregate, no reinforcement.		
				MADE GROUND: Light brown sandy gravel sub base.		
		-0.50		MADE GROUND: Brown, grey , black mainly clay fill including, bricks, concrete, wire, plastic bag, a steel sink, a cold tap, re-bar, wood posts, cables. Slight oily odour.		
		-1.00		Firm brown organic CLAY. Frequent roots/vegetation in discrete layers with natural organic odour.		
		-1.50				
		-2.00				
		-2.50				
		3.00				

Groundwater Observations / Stability / Remarks:

Pit stable and dry.

Trial Pit Record :TP20

Logged By: JRF	Date: 27 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 3.6 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description			In Situ/ Lab Test	Groundwater Levels
		0.00		MADE GROUND: Varying between 350mm and 400mm lean mix concrete. No aggregate, no reinforcement.				
		-0.50		MADE GROUND: Light brown sandy gravel sub base.				
		-0.75		MADE GROUND: Brown, grey, black mainly clay fill including, bricks, concrete, wire, re-bar, wood fragments, metal shards, pottery. Slight organic/industrial (not hydrocarbon) odour.			CBR 8.3%	
		-1.00		Firm brown and dark grey organic CLAY. Frequent roots/vegetation in discrete layers with natural organic odour.				
		-1.50						
		-2.00						
		-2.50						
		-3.00						

Groundwater Observations / Stability / Remarks:

Pit stable and dry.

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Trial Pit Record :TP24



Logged By: JRF	Date: 27 Feb 2020	GDP Job Ref: 19112
Hire Company: Hawley Plant Hire	Location: Nordic Concept Stage	Bucket: (mm)
Excavator: Backhoe Excavator	Ground Elevation: 4.9 (m AOD)	Shoring: (No)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description			In Situ/ Lab Test	Groundwater Levels
WAC5 D1		0.00		MADE GROUND: Lean mix concrete. No aggregate, no reinforcement.			CBR 13%	
				MADE GROUND: Light brown sandy gravel sub base.				
		-0.50		MADE GROUND: Compact, brown and black, mainly sandy clay with bricks, tiles, a plastic bag, slight industrial odour.				
				Stiff orange brown sandy CLAY.				
D2/D3		-1.00						
		-1.50						
		-2.00						
		-2.50						
		-3.00						

Groundwater Observations / Stability / Remarks:

Pit stable and dry.

Borehole Record :BH01



DRILLING DETAILS	Drilling Date: 25/26 Feb 2020	GDP Project Ref: 19112
Drilling Company: J & S Drilling	Location: Nordic Immingham	Bore Diameter: 150 (mm)
Drilling Method: Cable Percussion	Ground Elevation: 4.087 (mAOD)	Co-ordinates:

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels		
					0 10 20 30 40 50 60				
U100 D		0.00		MADE GROUND: Clay and brick fill (Drillers description).					
		0.50		Soft brown and grey SILT.					
D		1.00							
		2.00							
U100 D		3.00							
		4.00							
D		4.50							
		5.00							
D		6.00							
		6.50							
D		7.00							
		7.50							
D		8.00							
		8.50							
D		9.00		Dark brown mottled grey slightly gravelly sandy CLAY.					
		9.50							
D		10.00							
		10.50							
		11.00							
		11.50							
		12.00							
		12.50							
		13.00							
		13.50							
		14.00							

Groundwater Observations:

Dry cased to full depth.

Borehole Record :BH02



DRILLING DETAILS	Drilling Date: 25 Feb 2020	GDP Project Ref: 19112
Drilling Company: J & S Drilling	Location: Nordic Immingham	Bore Diameter: 150 (mm)
Drilling Method: Cable Percussion	Ground Elevation: 4.088 (mAOD)	Co-ordinates:
























Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels		
					0 10 20 30 40 50 60				
		0.00	[Cross-hatch pattern]	MADE GROUND: Stone fill (Driller's description).					
		0.50	[Cross-hatch pattern]	MADE GROUND: Mixture of dark brown and black/grey clay and grey crushed rock.					
D		1.00			▲	N=6			
		1.50							
D		2.00			▲	N=6			
		2.50	[Cross-hatch pattern]	MADE GROUND: Grey SILT with SAND laminations.					
D		2.60	[Dotted pattern]	MADE GROUND: Wood obstruction, railway sleeper, chipboard.					
U100		2.70	[Dotted pattern]	Dark brown mottled grey slightly gravelly sandy CLAY.					
		3.00	[Cross-hatch pattern]	Soft dark grey SILT. Occasional bands of red brown semi-rotted vegetation. Sand pockets.					
B/U100		4.00	[Cross-hatch pattern]						
		4.50							
D		5.00			▲	N=6			
		5.50							
D		5.50			▲	N=6			
		6.00							
D		6.50			▲	N=9			
		7.00							
D		7.50			▲	N=10			
		8.00							
D		8.50			▲	N=14			
		9.00							
D		9.50		Dark brown mottled grey slightly gravelly sandy CLAY.	▲	N=35			
		10.00							
		10.50							
		11.00							
		11.50							
		12.00							
		12.50							
		13.00							
		13.50							
		14.00							

Groundwater Observations:

Dry. Chiseling between 2.6 and 2.9m. Cased to full depth.

Borehole Record :BH03

DRILLING DETAILS	Drilling Date: 24 Feb 2020	GDP Project Ref: 19112
Drilling Company: J & S Drilling	Location: Nordic Immingham	Bore Diameter: 150 (mm)
Drilling Method: Cable Percussion	Ground Elevation: 3.933 (mAOD)	Co-ordinates:

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
U100 NR		0.00		MADE GROUND: Fine to medium Type 1 graded with cement (Possibly cement stabilised).			
		0.50		MADE GROUND: Mixture of dark brown and black/grey clay and grey crushed rock.			
		1.00		Soft grey mottled brown sandy CLAY.			
U100		2.00					
D		2.50		Dark brown mottled grey slightly gravelly sandy CLAY.	▲	N=12	
		3.00					
U100 nr		3.50		Soft dark grey SILT. Occasional bands of red brown semi-rotted vegetation. Sand pockets.			
D		4.50			▲	N=3	
D		5.50			▲	N=3	
D		6.50			▲	N=6	
D		7.50			▲	N=4	
D		8.50					
D		9.00		Dark brown mottled grey slightly gravelly sandy CLAY.	▲	N=24	
D		9.50					
		10.00			▲	N=47	
		10.50					
		11.00					
		11.50					
		12.00					
		12.50					
		13.00					
		13.50					
		14.00					

Groundwater Observations:

Dry cased to full depth.

Borehole Record :BH04

DRILLING DETAILS	Drilling Date: 26 Feb 2020	GDP Project Ref: 19112
Drilling Company: J & S Drilling	Location: Nordic Immingham	Bore Diameter: 150 (mm)
Drilling Method: Cable Percussion	Ground Elevation: 5.96 (mAOD)	Co-ordinates:






























Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
		0.00		MADE GROUND: Stone, ash and clay.			
D		0.50					
		1.00					
D		1.50			▲	N=11	
		2.00					
D		2.50		MADE GROUND: Multicoloured clay, gravel and brick fill.	▲	N=10	
		3.00					
U100		3.50					
D		4.00		MADE GROUND: Grey, black and red/puple gravelly ash with wood fragments.			▼
		4.50			▲	N=51	
D		5.00		Soft dark grey SILT.	▲	N=6	
		5.50					
D		6.00					
		6.50			▲	N=8	
D		7.00					
		7.50			▲	N=10	
D		8.00					
		8.50			▲	N=6	
D		9.00					
		9.50			▲	N=9	
D		10.00					
		10.50			▲	N=13	
D		11.00		Dark brown mottled grey slightly gravelly sandy CLAY.	▲	N=13	
		11.50					
D		12.00			▲	N=12	
		12.50					
D		13.00			▲	N=30	
		13.50					
		14.00					

Groundwater Observations:

GW strike at 3.80m rose to 3.70m and cased off at 5.5m. Borehole thought to be located in area of deep backfilled ditch. Initial location failed on obstruction.

Borehole Record :BH05

DRILLING DETAILS	Drilling Date: 27 Feb 2020	GDP Project Ref: 19112
Drilling Company: J & S Drilling	Location: Nordic Immingham	Bore Diameter: 150 (mm)
Drilling Method: Cable Percussion	Ground Elevation: 4.734 (mAOD)	Co-ordinates:

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
		0.00		Concrete - no reinforcement noted.			
		0.50		MADE GROUND: Black and grey ash with concrete blocks.			
D		1.00		MADE GROUND: Grey, black, brown ashy clay with occasional brick, pottery, rare wood fragments.		N=5	
U100		1.50		Dark brown mottled grey slightly gravelly sandy CLAY.			
D		2.00					
D		2.50					
B/U100		3.00		Soft dark grey SILT.			
D		3.50				N=3	
D		4.00				N=4	
D		4.50					
D		5.00				N=9	
D		5.50					
D		6.00					
D		6.50				N=5	
D		7.00				N=9	
D		7.50					
D		8.00				N=5	
D		8.50					
D		9.00				N=8	
		9.50					
		10.00					
		10.50					
		11.00					
		11.50					
		12.00					
		12.50					
		13.00					
		13.50					
		14.00					

Groundwater Observations:

Dry cased to full depth. Chiseling GL to 0.30m.

Borehole Record :BH06



DRILLING DETAILS	Drilling Date: 28 Feb 2020 Location: Nordic Immingham Ground Elevation: 4.081 (mAOD)	GDP Project Ref: 19112 Bore Diameter: 150 (mm) Co-ordinates:
Drilling Company: J & S Drilling Drilling Method: Cable Percussion		

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
		0.00		TARMAC	0 10 20 30 40 50 60		
D		0.50		MADE GROUND: Grey, black, brown ashy clay with mixed granular materials, occasional brick, pottery, rare wood and metal fragments.	▲	N=9	
U100		1.50		Dark brown mottled grey slightly gravelly sandy CLAY.			
D		2.50					
D		3.50			▲	N=9	
D		4.00		Soft dark grey SILT.	▲	N=3	
D		4.50			▲	N=3	
D		5.50			▲	N=4	
D		6.50			▲	N=7	
D		7.50			▲	N=9	
D		8.50			▲	N=9	
D		9.50			▲	N=10	
D		10.00			▲		
		10.50					
		11.00					
		11.50					
		12.00					
		12.50					
		13.00					
		13.50					
		14.00					

Groundwater Observations:
 Dry cased to full depth.

Borehole Record :RBH1

DRILLING DETAILS	Drilling Date: 24/29 Feb 2020	GDP Project Ref: 19112
Drilling Company: J S Drilling Services Ltd	Location: Nordic Immingham	Bore Diameter: 102 (mm)
Drilling Method: Rotary Percussive T41	Ground Elevation: 5.96 (mAOD)	Co-ordinates:

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
		0.00		MADE GROUND: Foundry sand.			
		0.50		MADE GROUND: Medium dense black and grey ash with small concrete boulders.			
		1.00					
		1.50					
		2.00					
		2.50					
		3.00		MADE GROUND: Soft grey silt with concrete obstructions.			
		3.50					
		4.00					
		4.50		Soft grey mottled brown silty CLAY.			
		5.00					
		5.50					
		6.00					
		6.50	x-x-	Firm brown silty CLAY and PEAT bands.			
		7.00	x-x-				
		7.50	x-x-				
		8.00	x-x-				
		8.50	x-x-				
		9.00	x-x-				
		9.50	x-x-				
		10.00	x-x-				
		10.50					
C		11.00		Medium dense grey silty SAND.	▲	N=6	
		11.50					
		12.00		Stiff brown mottled grey CLAY.	▲	N=13	
C		12.50					
		13.00		Stiff brown slightly gravelly sandy CLAY.	▲	N=22	
C		13.50					
		14.00					
		14.50					
C		15.00					
		15.50					
C		16.00					
		16.50					
C		17.00					
		17.50					
C		18.00					
		18.50					
C		19.00					
		19.50		Dense SAND and GRAVEL			
		20.00					
C		20.50					
		21.00					
		21.50		Loose brown SAND. [Note: proably not loose, piezometric pressure causing uplift and apparent loosening and low SPT N].			
		22.00		Probably weathered CHALK, CHALK gravel. [Returns are CHALK].			
		22.50					
		23.00					
		23.50					
		24.00					
		24.50					
		25.00					
		25.50					
		26.00					
		26.50					
		27.00					
		27.50					
		28.00		Probably CHALK [Returns are hard CHALK gravel]			
		28.50					
		29.00					

Groundwater Observations:

Concrete obstructions at 1.0 and 4.0m. Dense sands and gravel at 19.3m. SPT failed at 21m due to blowing sands. Sand rose to 17.8m. No recovery below 20m so used Geobore mud to stabilise bore and open hole. Soft drilling 17.5m to 19.0m re-drilling in blown sand, lost flush 19.0 to 22.5m. Firm drilling with chalk gravel returns to 28m hard drilling with chalk gravel returns to 28.5m.

Rotary Core Recovery

Diameter (mm)	Run Length (m)	Start (m bgl)	End (m bgl)	TCR	TCR(%)	Flush Return
102	2	10.5	12.5	1.15	57.5	100%
102	1.5	12.5	14	1	66	80%
102	2.5	14	15.5	1.6	64	100%
102	2	15.5	17	0.9	0.45	100%
102	1.5	17	18.5	1.3	87	100%
102	1.5	18.5	20	0.7	46	80%
102	1.5	20	21.5	NIL	0	50%

Appendix 2

BGS Logs

(For Survey use only)
 GEOLOGICAL
 CLASSIFICATION

NATURE OF STRATA

If measurements start below
 ground surface, state how far... ..

	THICKNESS		DEPTH	
	feet	Inches	feet	Inches

Made Up Ground	2	0.61	2	0.61
Soft Brown Warp.	12	3.66	14	4.27
Soft Blue Warp.	21	6.40	35	10.61
Boulder clay, with seams of Running Sand.	23	7.01	58	17.68
Sand and Gravel	14	4.27	72	21.75
Boulder clay	13	3.76	85	25.71
Chalk Gravel	5	1.52	90	27.43
Soft Dirty Chalk.	10	3.05	100	30.48
White Chalk.	100	30.48	200	61.56



IMMINGHAM DOCK.

RECORD OF WELL (SHAFT OF BORE)

Registered No. **N 462 N 388**
189

At Immingham Dock
 Town or Village Immingham
 County Lincolnshire Six-inch quarter sheet XIII. S.E.
 For Mr. L.N.E. Railway Co.
 Exact site of well L.N.E.R. Gattage
Immingham Dock

(Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface 3.05 ft. above sea-level (O.D.) If well-top is not at ground level, state how far ... (above; below; ft.)

SHAFT _____ ft.; diameter _____ ft. Details of headings _____

JA / 20411522
 SC

BORE 102 ft.; diameter of bore: at top 2 1/2 ins.; at bottom 2 1/2 ins. Lengths, diameters, perforations, etc., of lining tubes 86'-0" x 2 1/2" Galv tubes

Water struck at depths, below well top, of (feet) _____

Rest-level of water 1 ft. ^{above} below well-top. Suction at 15 ft. Yield on 4 hours' pumping, 500 gal. per hour with depression to _____ ft. below well-top, Capacity of pump 500 g.p.h. Recovery to rest level in _____ mins. hours Date of measurements April 1946 Date of well 13.4.46

Quality of water (attach copy of analysis if available) _____

Well made by H. Smith and Son (Grimsby) Ltd

Information from " " " " " " 5 Osborne St Grimsby Lincs

Additional notes in space overleaf.

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA		THICKNESS		DEPTH	
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far		Feet	Ins.	Feet	Ins.
	Made up ground	→	1	0.30	1	0.30
	Soft brown warp		11	3.35	12	3.66
	Soft blue warp		18	5.49	30	9.14
	Peat	→	2	0.61	32	9.75
	moist clay		18	5.49	50	15.24
	black gravel		25	7.62	75	22.86
	black		27	8.23	102	31.09

Continued over leaf

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map	on 6" Map
	<u>4/5/46</u>		<u>81.</u>		<u>o</u>	<u>o</u>

Appendix 3

Photographs



TP01

CBR at GL below organic layer (Sub grade clay fill) 10%



BH1 Location (Cement stabilised layer broken out)

Abandoned, processed shredded metal stockpiles in use and growing, metal sharps all over areas too greater risk of JCB puncture. Alternative locations too close to TP01 and TP03 and 11kV supply.

TP02



TP03

CBR at GL (below thin tarmac) 43%



TP04

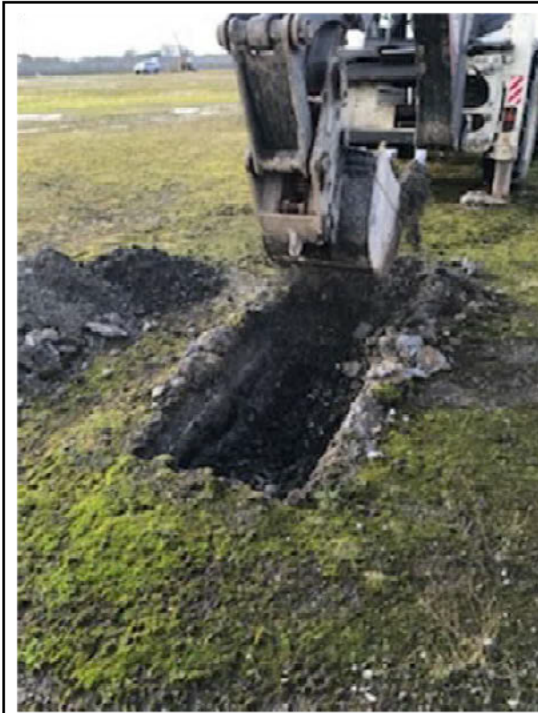
CBR at 550mm (Sub grade clay fill) 6.9%



TP05 (Stone over geotextile, location is close to route of now culverted former deep and wide drain)

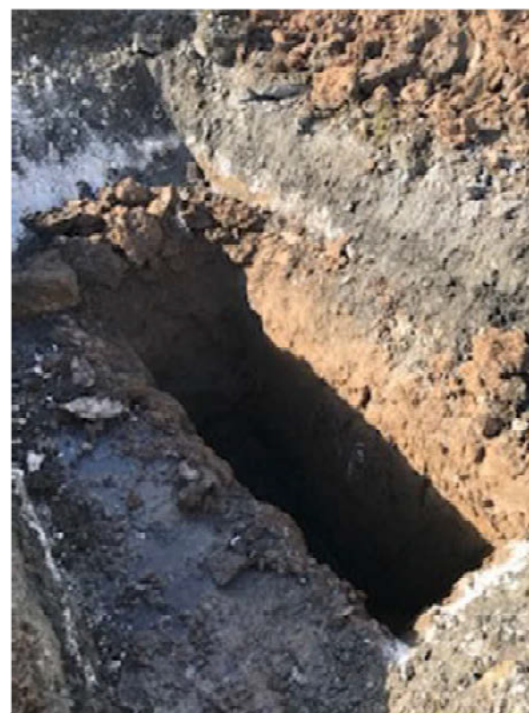
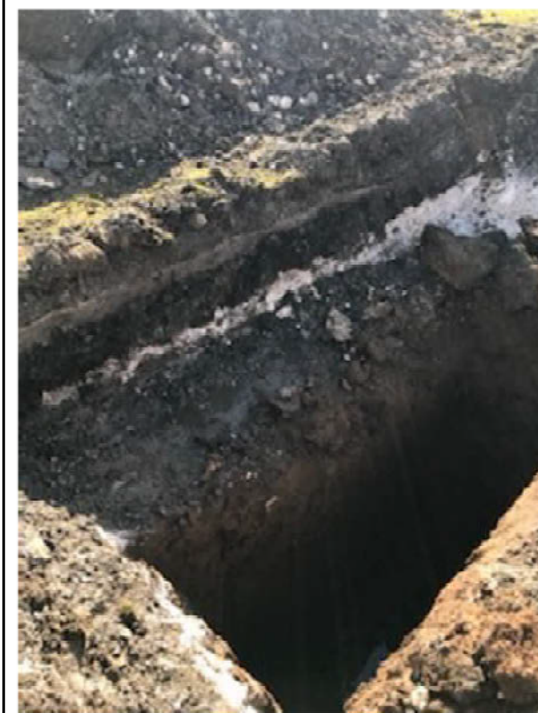


TP06 (Stone over geotextile) **CBR at Ground Level after cleaning off organic layer >100%**

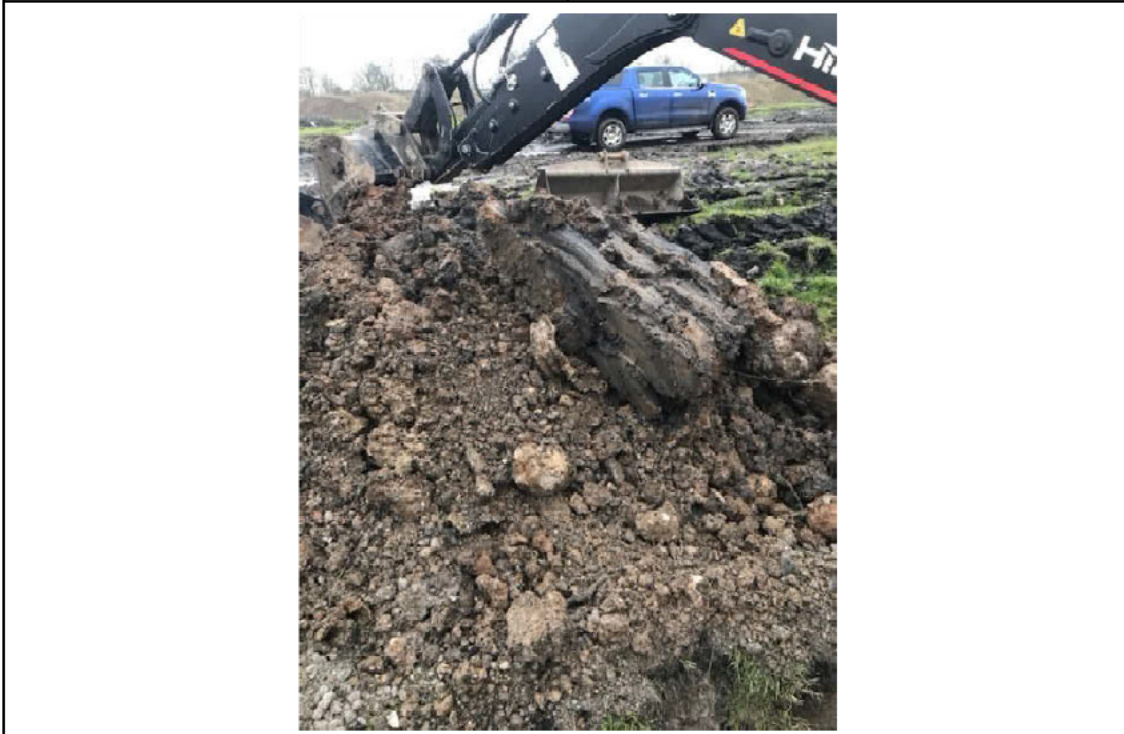


TP07 (Cement stabilised, no geotextile)

CBR at 550mm (Sub grade clay fill) 11%



TP07 (Deepened below ground improvement).



TP08

CBR at 550mm (Sub grade clay fill) 6.2%



TP09 (Formation wet and contaminated, no CBR). Clay was of firm to stiff consistency). Most of area flooded in stone, water perched above clay fill or deeper where fill is granular.



TP10 (stone over geotextile, fill is demolition and excavation arisings)

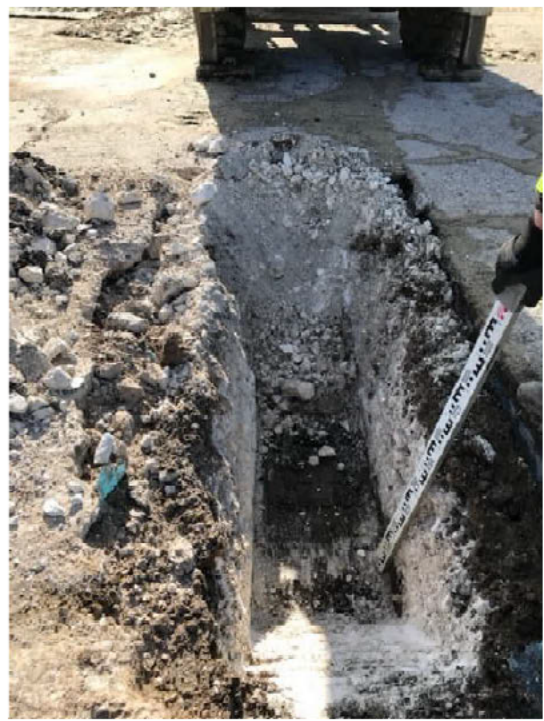


Area between TP08 and railway. Recent construction/excavation waste stockpiling. Large quantities of asphalt, kerbstones etc. Matrix is mixture of sands and clays, appears to be graded and possible crusher waste. Some very wet slurry tipping of unknown composition.



TP15 (Concrete, Chalk fill/capping, clay fill)

CBR at 100mm (Sub base above chalk fill) 63%



TP15



TP16 next to BH04 (Foundry sand waste, deep fill, Peat, possibly edge of backfilled culverted drain).

Obscured by stockpiled waste soil/demolition arisings. Metal, re-bar etc. no access for wheeled excavator. Appears to be tarmac hardstanding beneath northern part of this area.

TP17



TP18 Area flooded. Only accessible areas around edges affected by services.

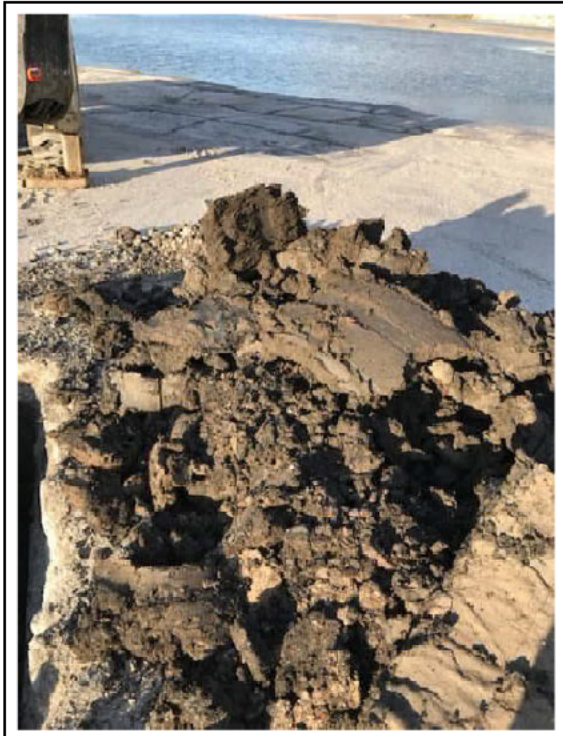


TP19 (Lean mix, subbase, landfill (including a sink, alluvial Clay)



TP20 (Lean mix surfacing, subbase, landfill, alluvial Clay)

CBR at 550mm (Sub grade clay fill) 8.3%

	
<p>TP20 (Alluvial Clay)</p>	<p>TP20 (Surfacing is unreinforced, no aggregate concrete/lean mix) Breaks with sharp blow from a spade.</p>
<p>Flooded.</p>	
<p>TP21</p>	
<p>Flooded.</p>	
<p>TP22</p>	
<p>No access as pumice stockpile placed over wider area after utilities clearance survey.</p>	
<p>TP23</p>	



YARD 6, TP24 and BH05 with CBR testing underway



TP24 (Note: orange sand is from CBR test)



CBR at base of concrete/top of fill) 13%

Appendix 4

Laboratory Test Results



TEST CERTIFICATE

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



Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: Not Given
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

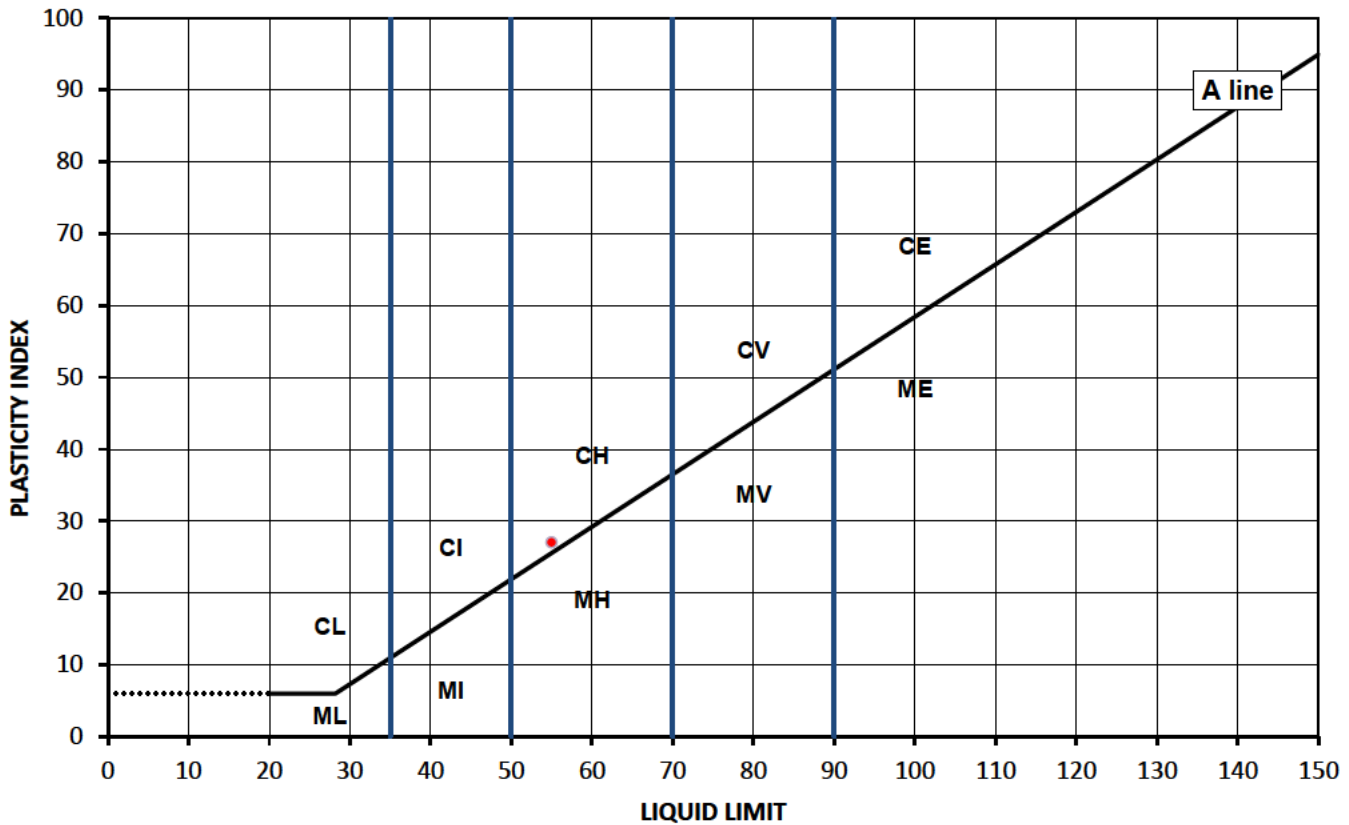
Test Results:

Laboratory Reference: 1465487
Hole No.: TP01 B1
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 0.90
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
23	55	28	27	96



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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

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Environmental Science

Liquid and Plastic Limits

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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 25/02/2020
Date Received: 02/03/2020
Date Tested: 11/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

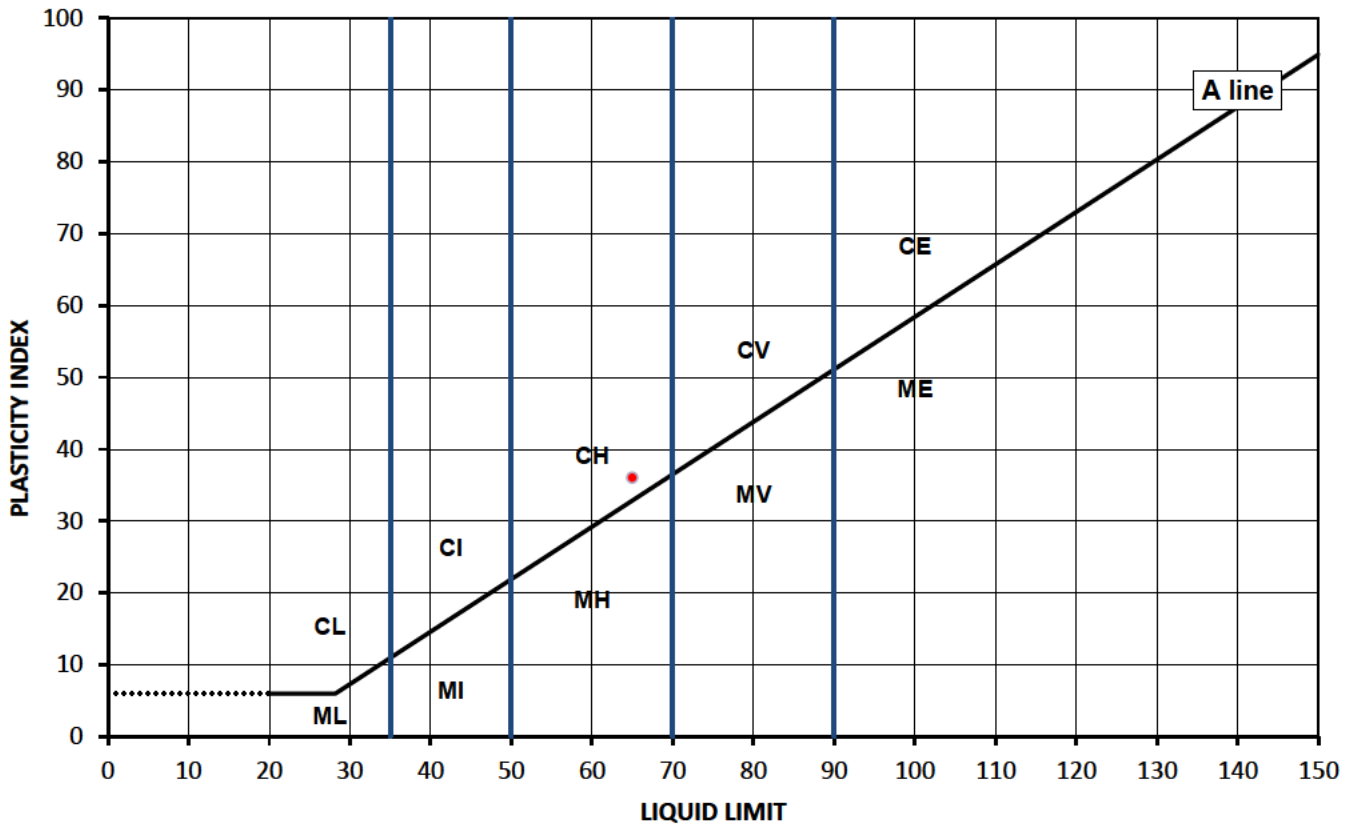
Test Results:

Laboratory Reference: 1465488
Hole No.: BH1
Sample Reference: Not Given
Soil Description: Brown CLAY

Depth Top [m]: 1.00
Depth Base [m]: 1.45
Sample Type: U

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	65	29	36	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 25/02/2020
Date Received: 02/03/2020
Date Tested: 11/03/2020
Sampled By: Not Given

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

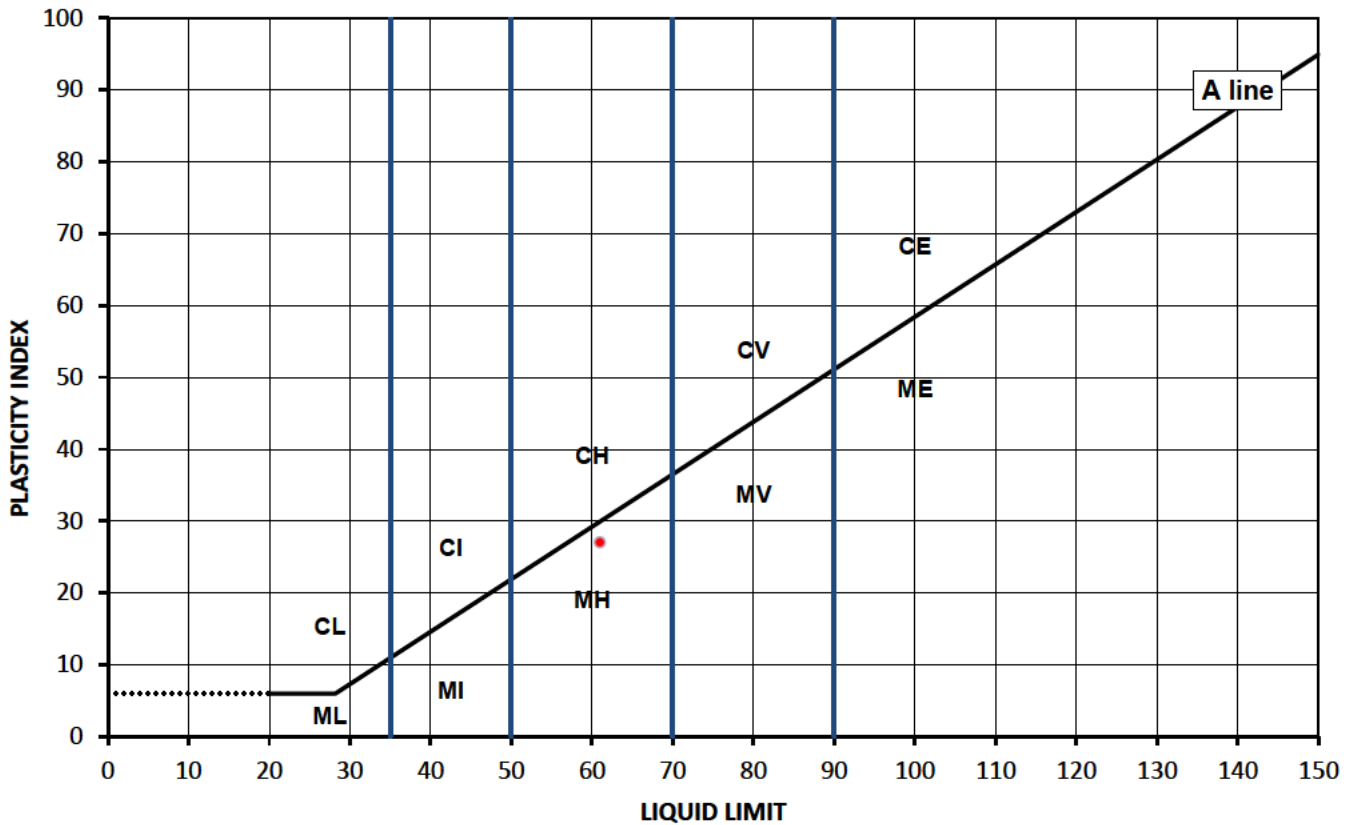
Test Results:

Laboratory Reference: 1465489
Hole No.: BH1
Sample Reference: Not Given
Soil Description: Brown CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: U

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
37	61	34	27	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	L	Low	Liquid Limit	below 35
M	Silt	I	Medium		35 to 50
		H	High		50 to 70
		V	Very high		70 to 90
		E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Liquid and Plastic Limits

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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 26/02/2020
Date Received: 02/03/2020
Date Tested: 11/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

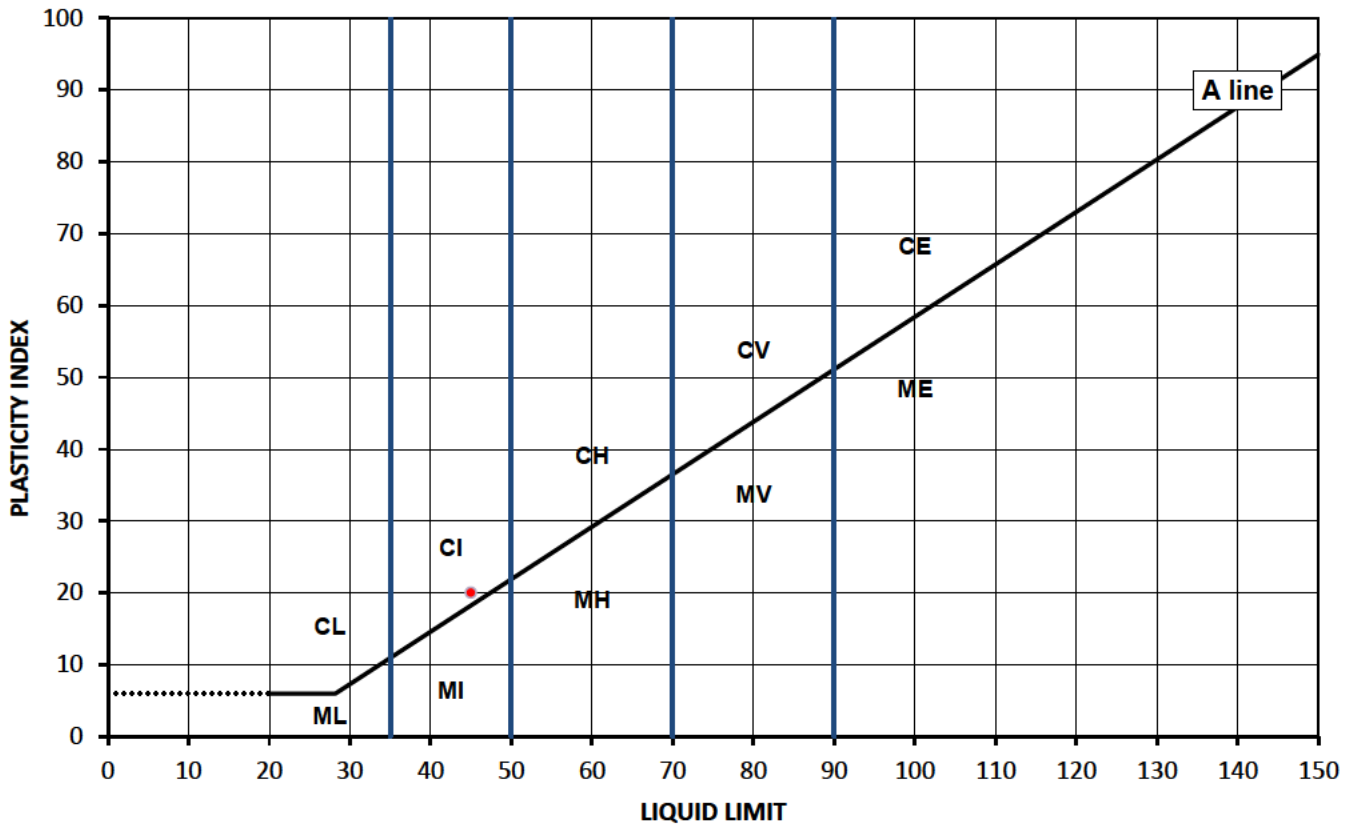
Test Results:

Laboratory Reference: 1465490
Hole No.: BH2
Sample Reference: Not Given
Soil Description: Brown slightly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: U

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
27	45	25	20	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	L	Low		Liquid Limit
M	Silt	I	Medium		below 35
		H	High		35 to 50
		V	Very high		50 to 70
		E	Extremely high		70 to 90
					exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 24/02/2020
Date Received: 02/03/2020
Date Tested: 11/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

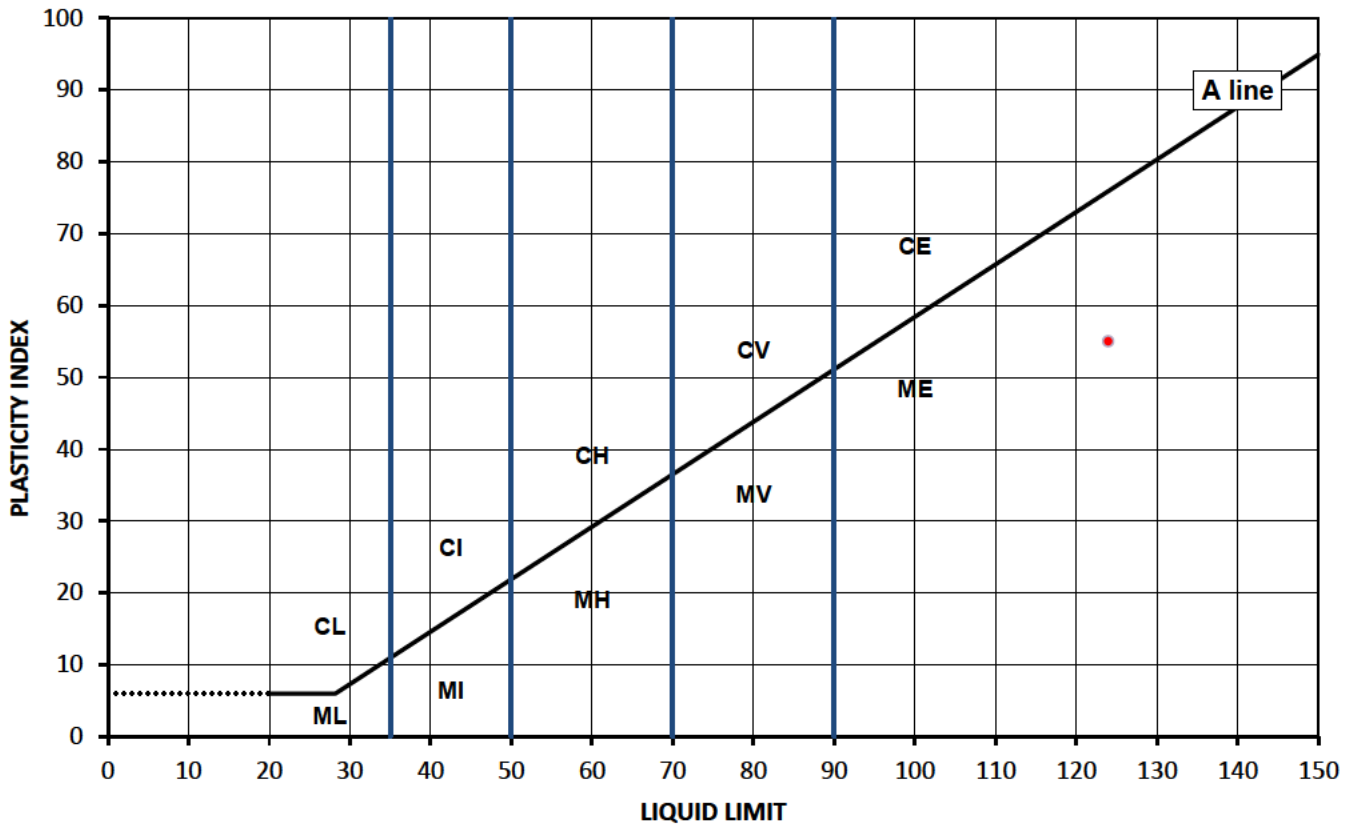
Test Results:

Laboratory Reference: 1465491
Hole No.: BH3
Sample Reference: Not Given
Soil Description: Reddish brown organic CLAY with woods

Depth Top [m]: 1.70
Depth Base [m]: 2.15
Sample Type: U

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
73	124	69	55	99



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 27/02/2020
Date Received: 02/03/2020
Date Tested: 11/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

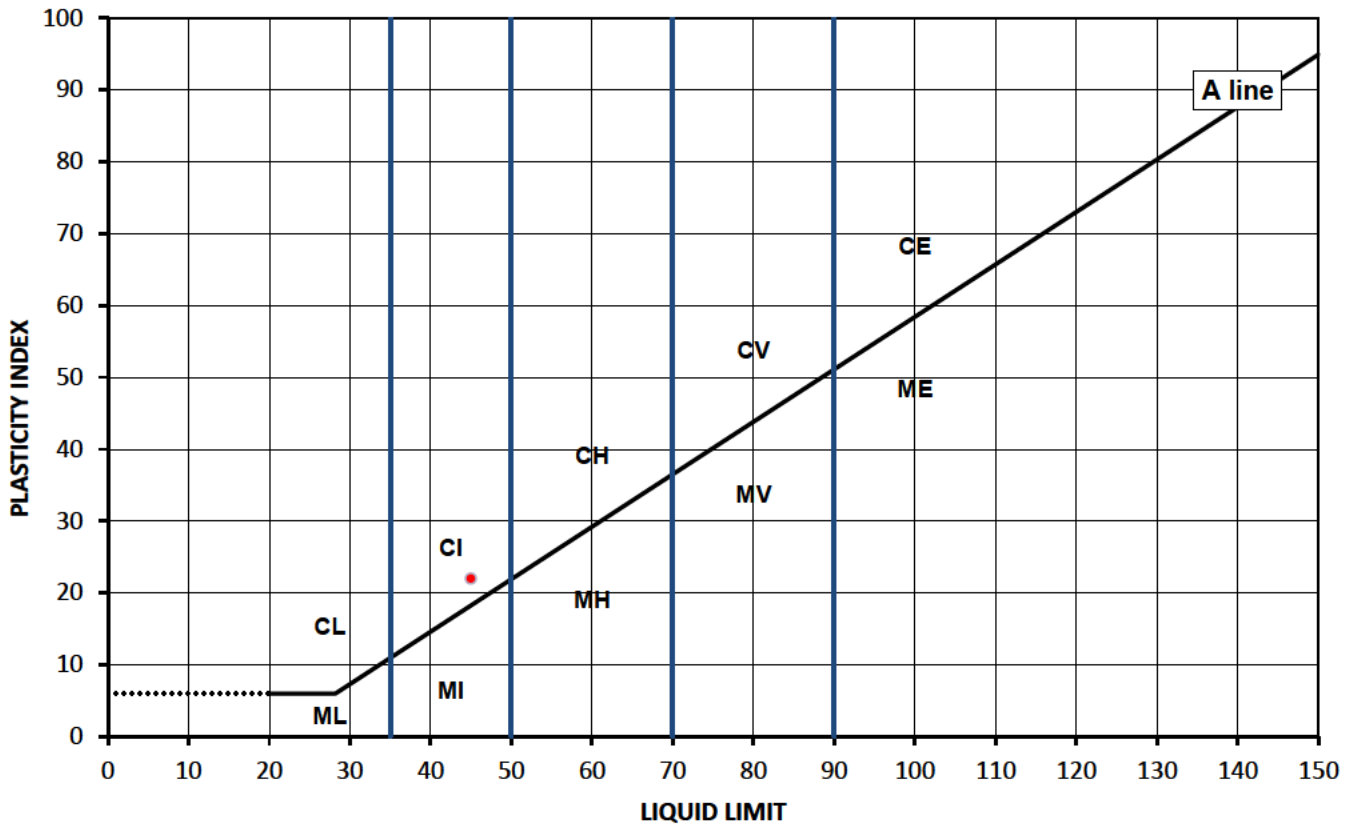
Test Results:

Laboratory Reference: 1465492
Hole No.: BH5
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	45	23	22	94



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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4041

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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 28/02/2020
Date Received: 02/03/2020
Date Tested: 11/03/2020
Sampled By: Not Given

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

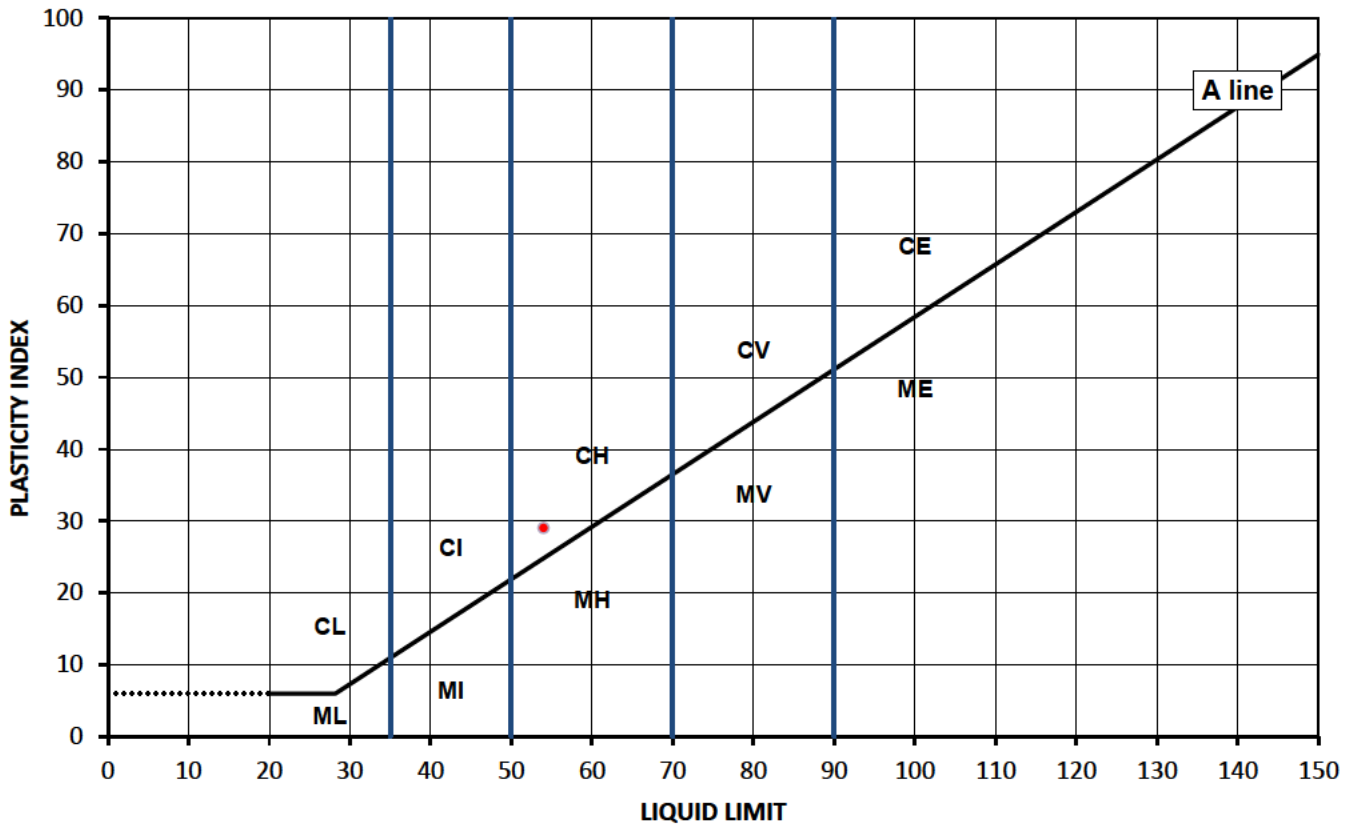
Test Results:

Laboratory Reference: 1465493
Hole No.: BH6
Sample Reference: Not Given
Soil Description: Brown slightly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
28	54	25	29	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	L	Low	Liquid Limit	below 35
M	Silt		I	Medium		35 to 50
			H	High		50 to 70
			V	Very high		70 to 90
			E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 25/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

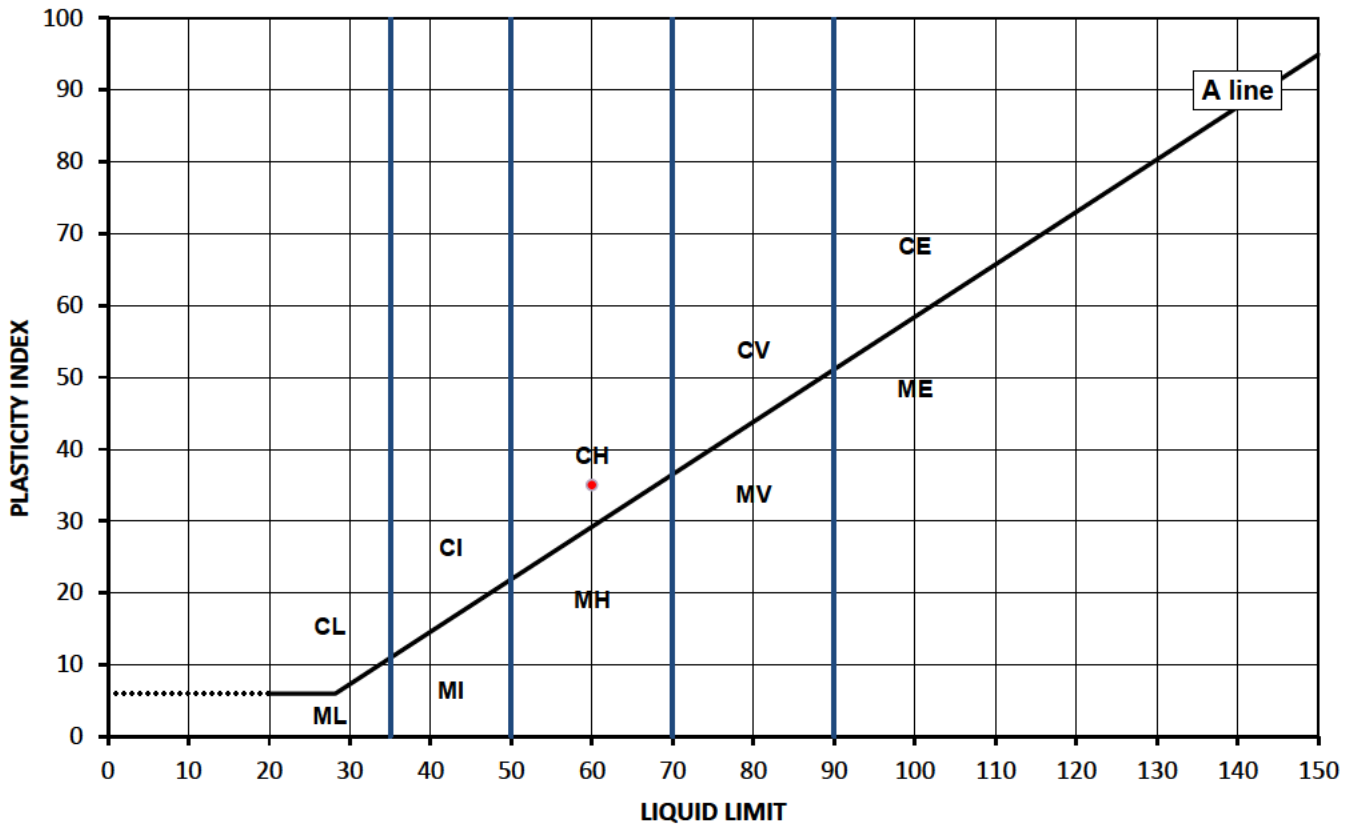
Test Results:

Laboratory Reference: 1465494
Hole No.: BH2
Sample Reference: Not Given
Soil Description: Brown to black CLAY

Depth Top [m]: 4.00
Depth Base [m]: 4.60
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
42	60	25	35	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	L	Low	Liquid Limit	below 35
M	Silt	I	Medium		35 to 50
		H	High		50 to 70
		V	Very high		70 to 90
		E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 25/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

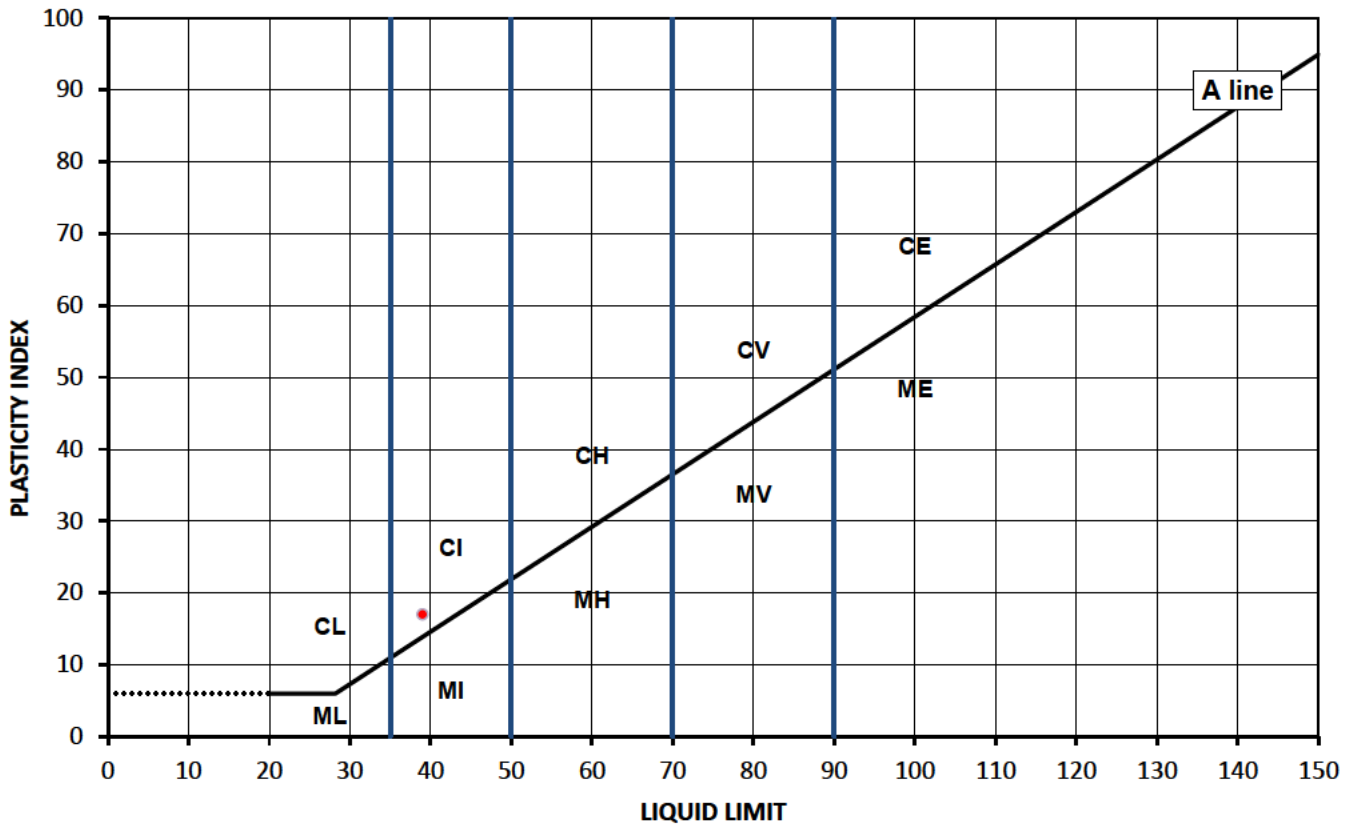
Test Results:

Laboratory Reference: 1465495
Hole No.: BH2
Sample Reference: Not Given
Soil Description: Brown to grey slightly gravelly sandy CLAY

Depth Top [m]: 9.00
Depth Base [m]: 9.25
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
23	39	22	17	99



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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PL Deputy of Head of Geotechnical Section
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Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 24/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

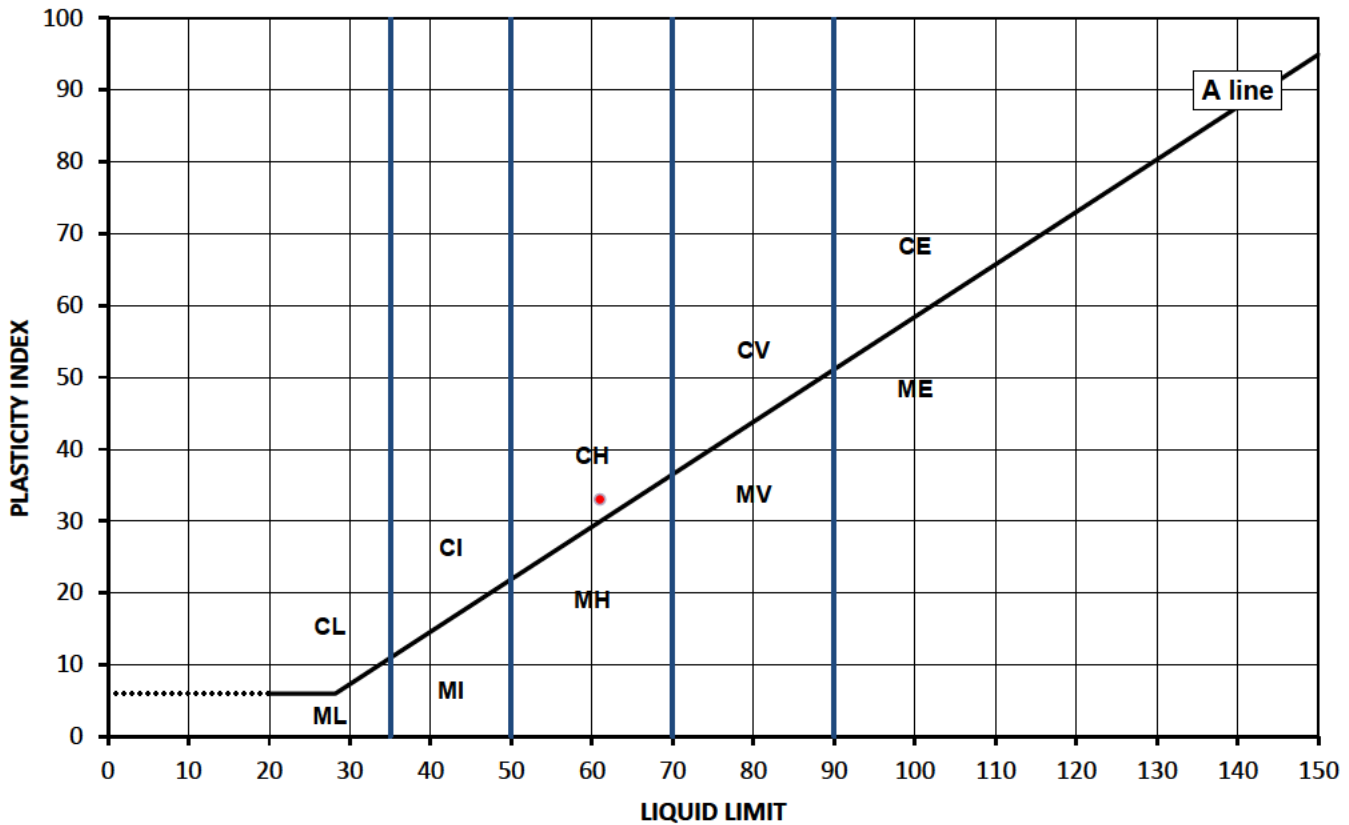
Test Results:

Laboratory Reference: 1465496
Hole No.: BH3
Sample Reference: Not Given
Soil Description: Brown to dark brown CLAY

Depth Top [m]: 4.50
Depth Base [m]: 4.95
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
50*	61	28	33	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	L	Low	Liquid Limit	below 35
M	Silt	I	Medium		35 to 50
		H	High		50 to 70
		V	Very high		70 to 90
		E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks: *Sample is wet

Signed:

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LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 24/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

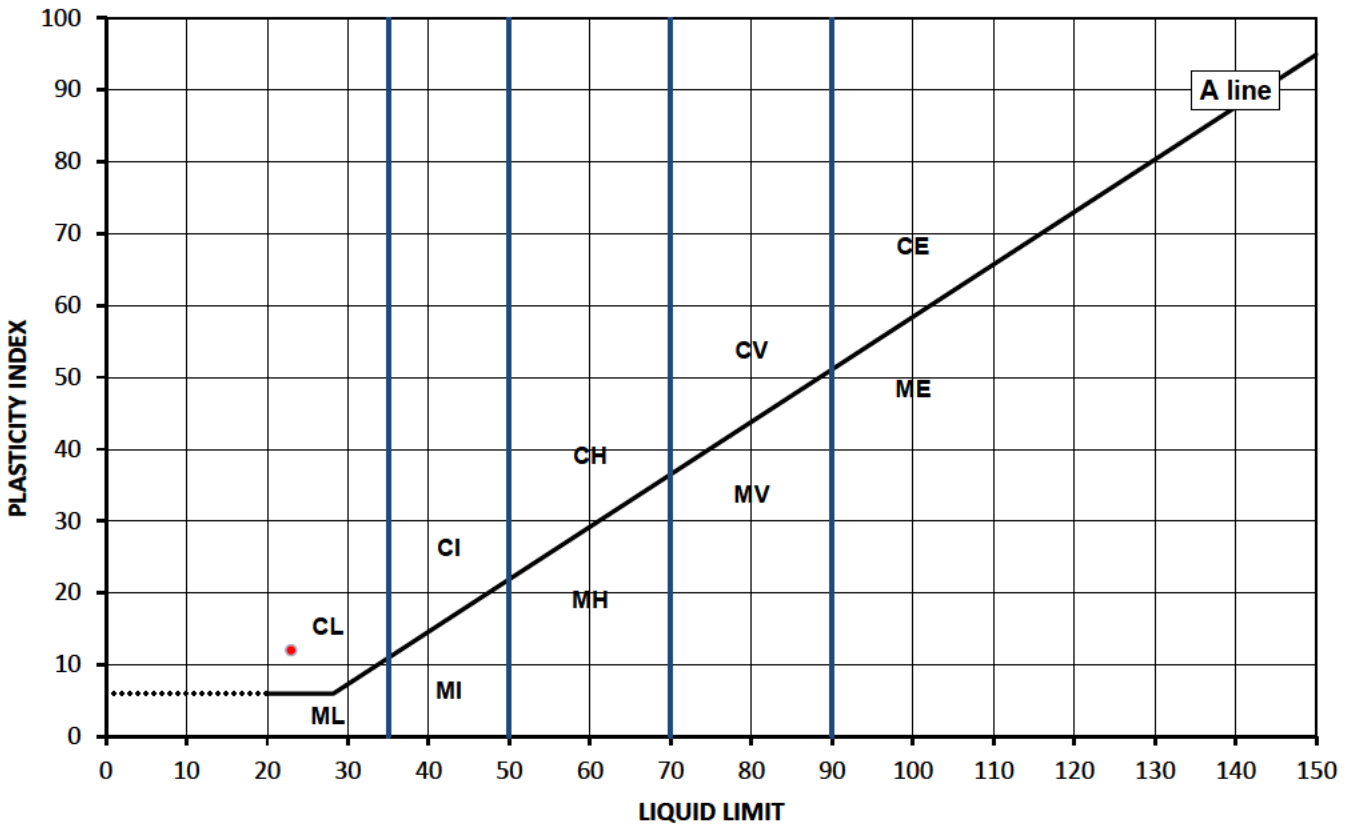
Test Results:

Laboratory Reference: 1465497
Hole No.: BH3
Sample Reference: Not Given
Soil Description: Brown slightly gravelly clayey SAND

Depth Top [m]: 9.00
Depth Base [m]: 9.25
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	23	11	12	92



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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

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TEST CERTIFICATE

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



Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 26/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

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

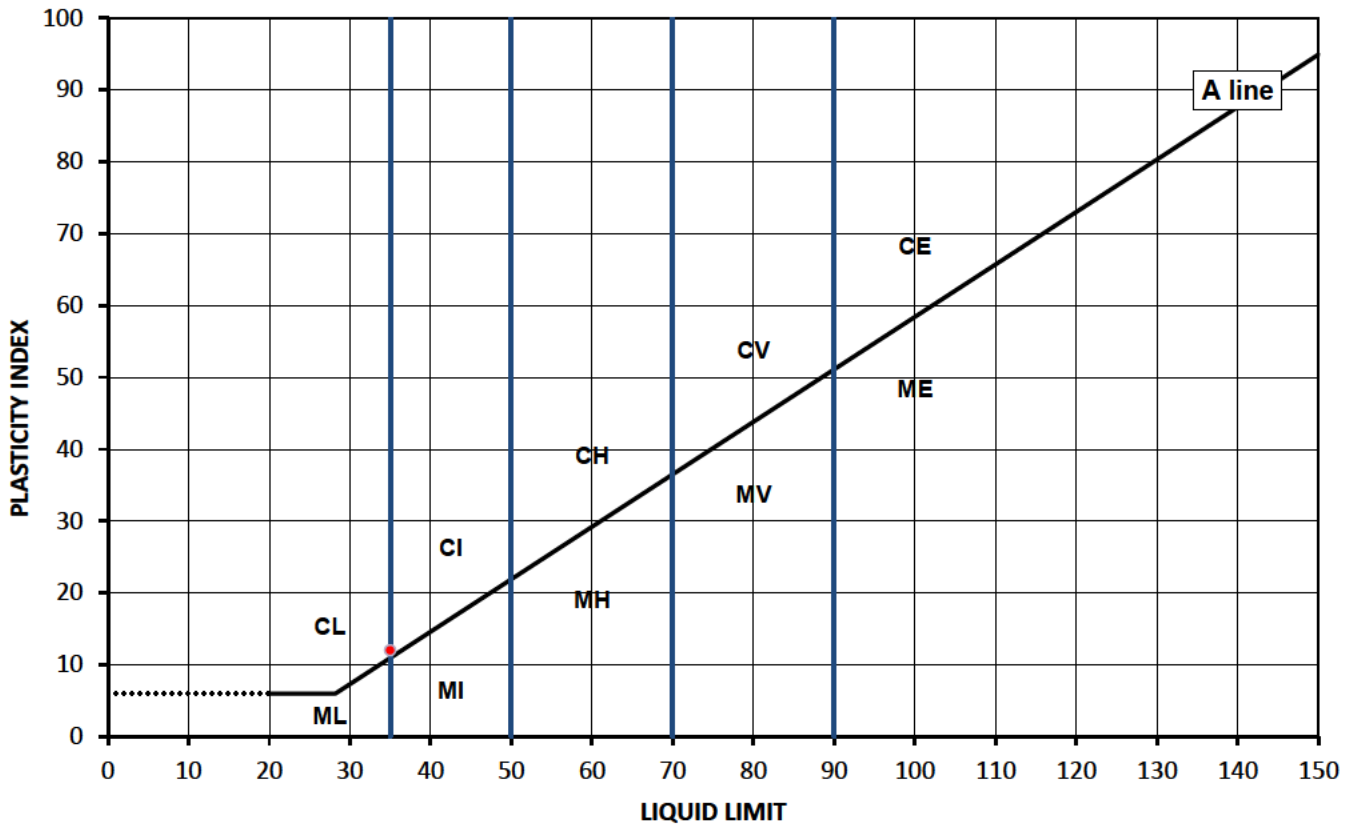
Test Results:

Laboratory Reference: 1465498
Hole No.: BH4A
Sample Reference: Not Given
Soil Description: Black to brown sandy CLAY

Depth Top [m]: 6.00
Depth Base [m]: 6.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
34	35	23	12	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	L	Low	Liquid Limit	below 35
M	Silt		I	Medium		35 to 50
			H	High		50 to 70
			V	Very high		70 to 90
			E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
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TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 26/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

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

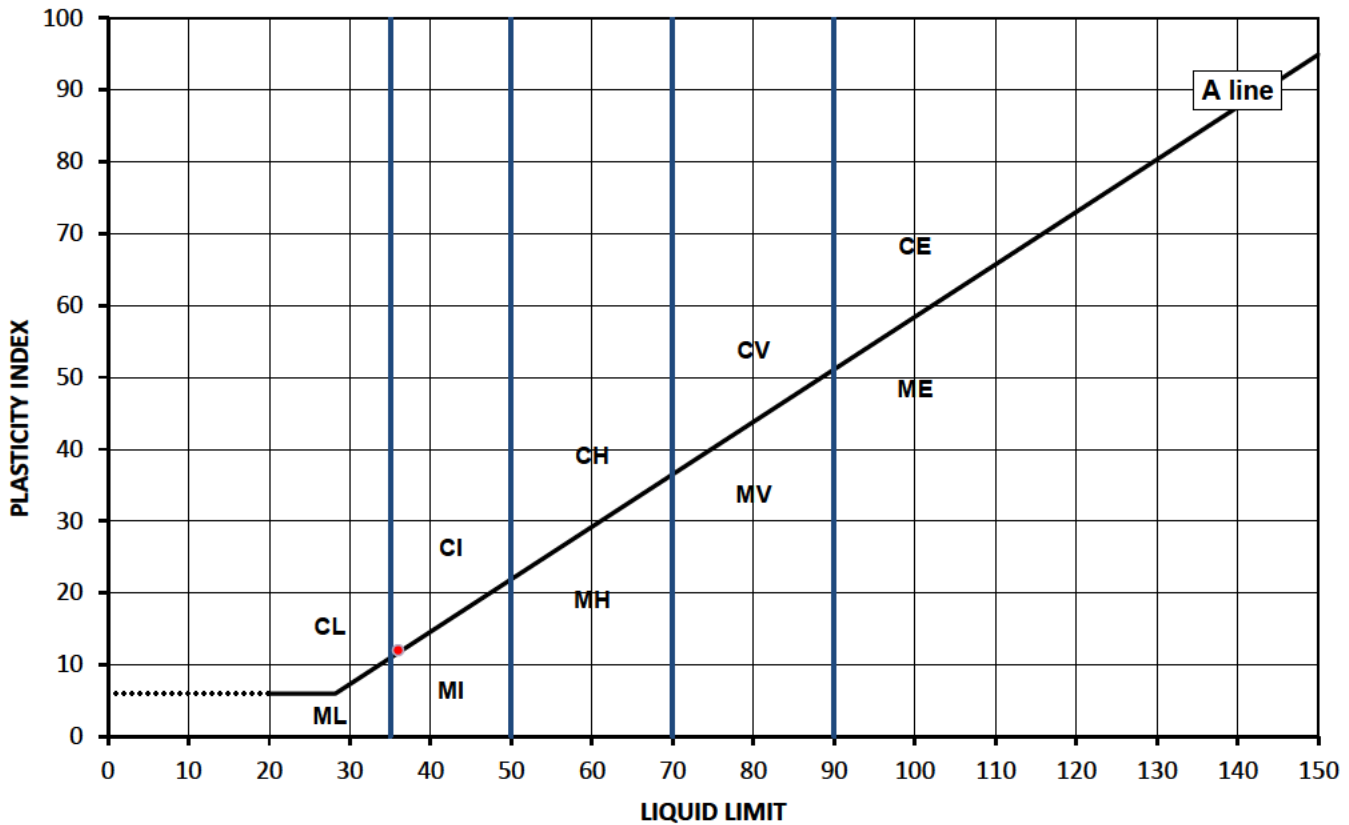
Test Results:

Laboratory Reference: 1465499
Hole No.: BH4A
Sample Reference: Not Given
Soil Description: Black to brown sandy CLAY

Depth Top [m]: 11.00
Depth Base [m]: 11.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
48*	36	24	12	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	L	Low	Liquid Limit	below 35
M	Silt		I	Medium		35 to 50
			H	High		50 to 70
			V	Very high		70 to 90
			E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks: *Sample is wet

Signed:

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

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TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 26/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

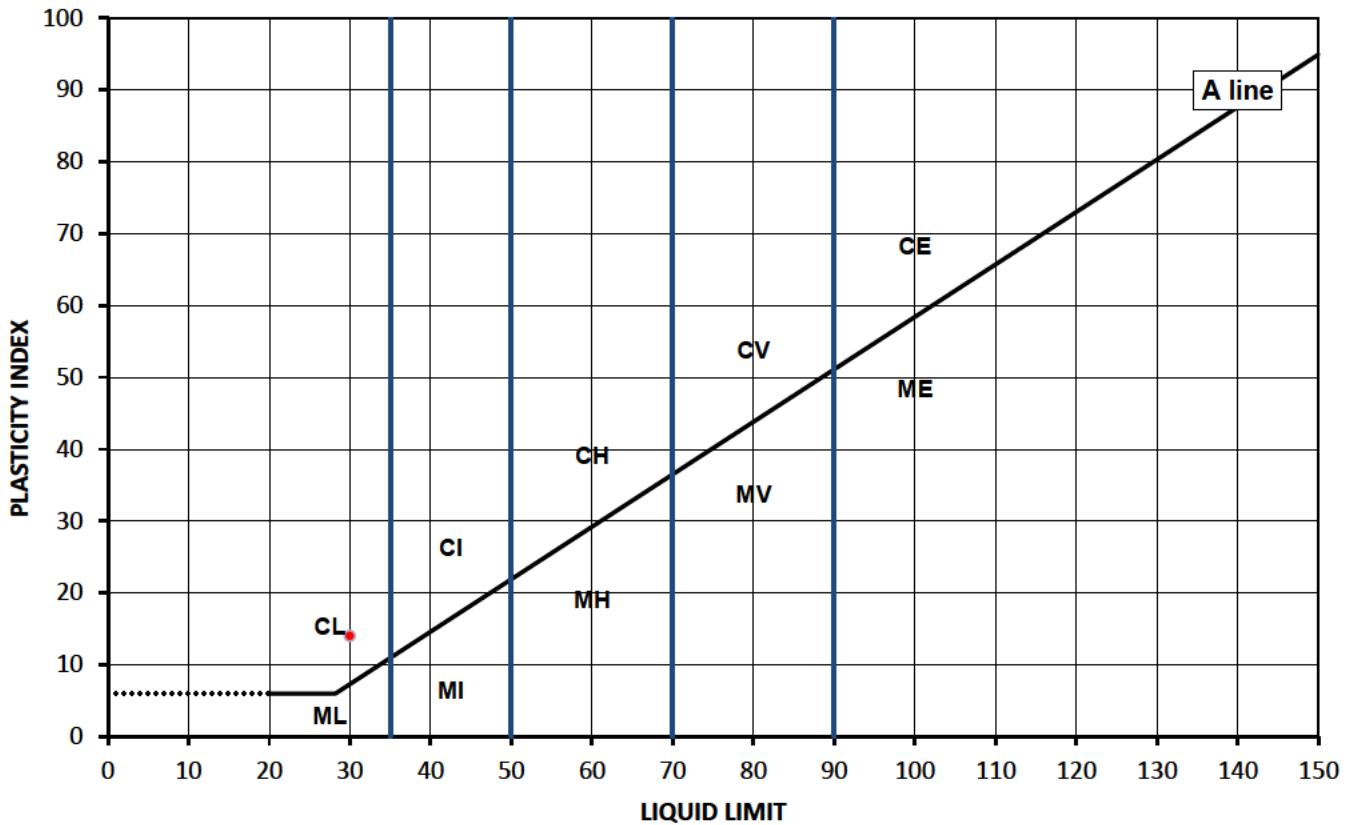
Test Results:

Laboratory Reference: 1465500
Hole No.: BH4A
Sample Reference: Not Given
Soil Description: Brown to black very sandy CLAY with fragments of chalk

Depth Top [m]: 13.00
Depth Base [m]: 13.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
25	30	16	14	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	L	Low	Liquid Limit	below 35
M	Silt		I	Medium		35 to 50
			H	High		50 to 70
			V	Very high		70 to 90
			E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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

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TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 27/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

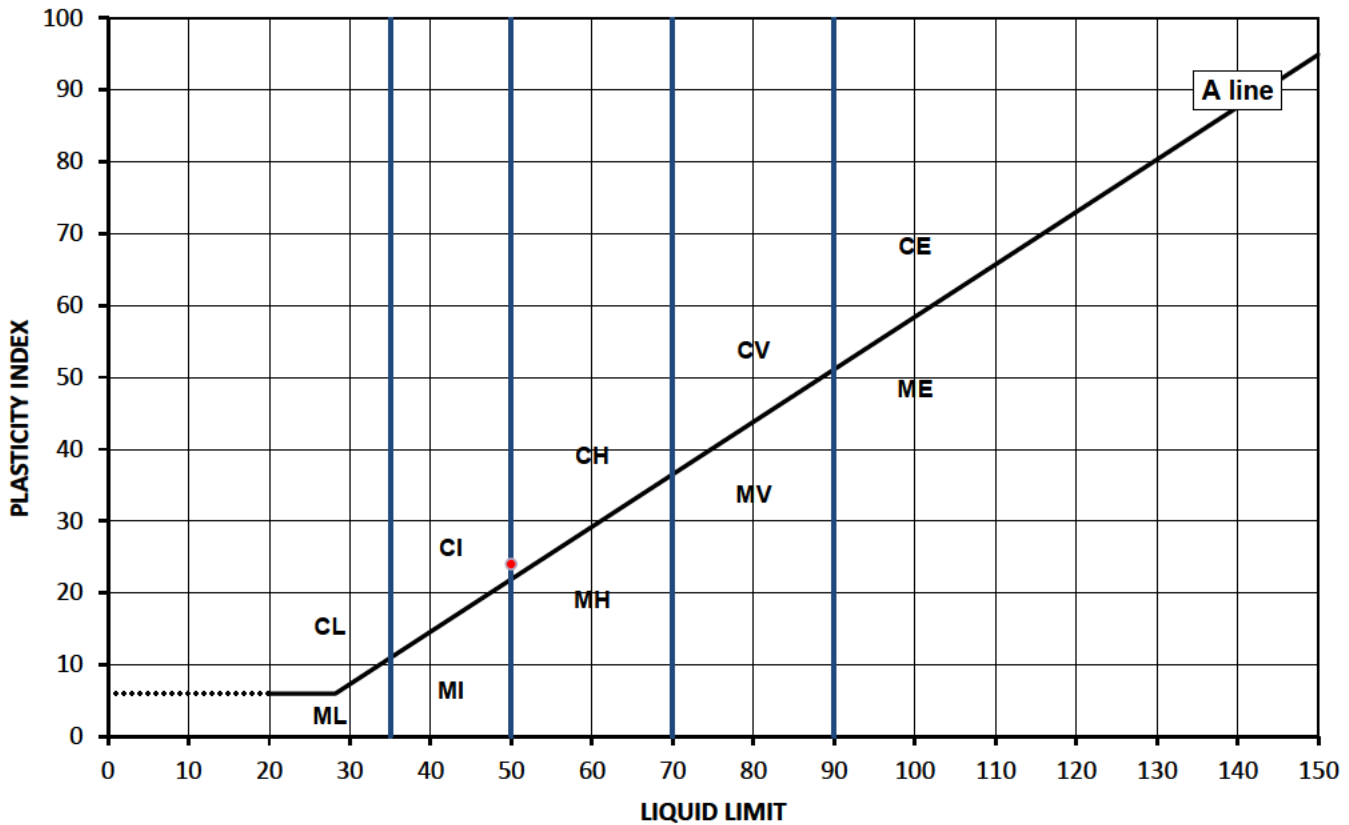
Test Results:

Laboratory Reference: 1465501
Hole No.: BH5
Sample Reference: Not Given
Soil Description: Black to brown slightly sandy CLAY

Depth Top [m]: 5.50
Depth Base [m]: 5.15
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
45	50	26	24	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	L	Low	Liquid Limit	below 35
M	Silt	I	Medium		35 to 50
		H	High		50 to 70
		V	Very high		70 to 90
		E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 27/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

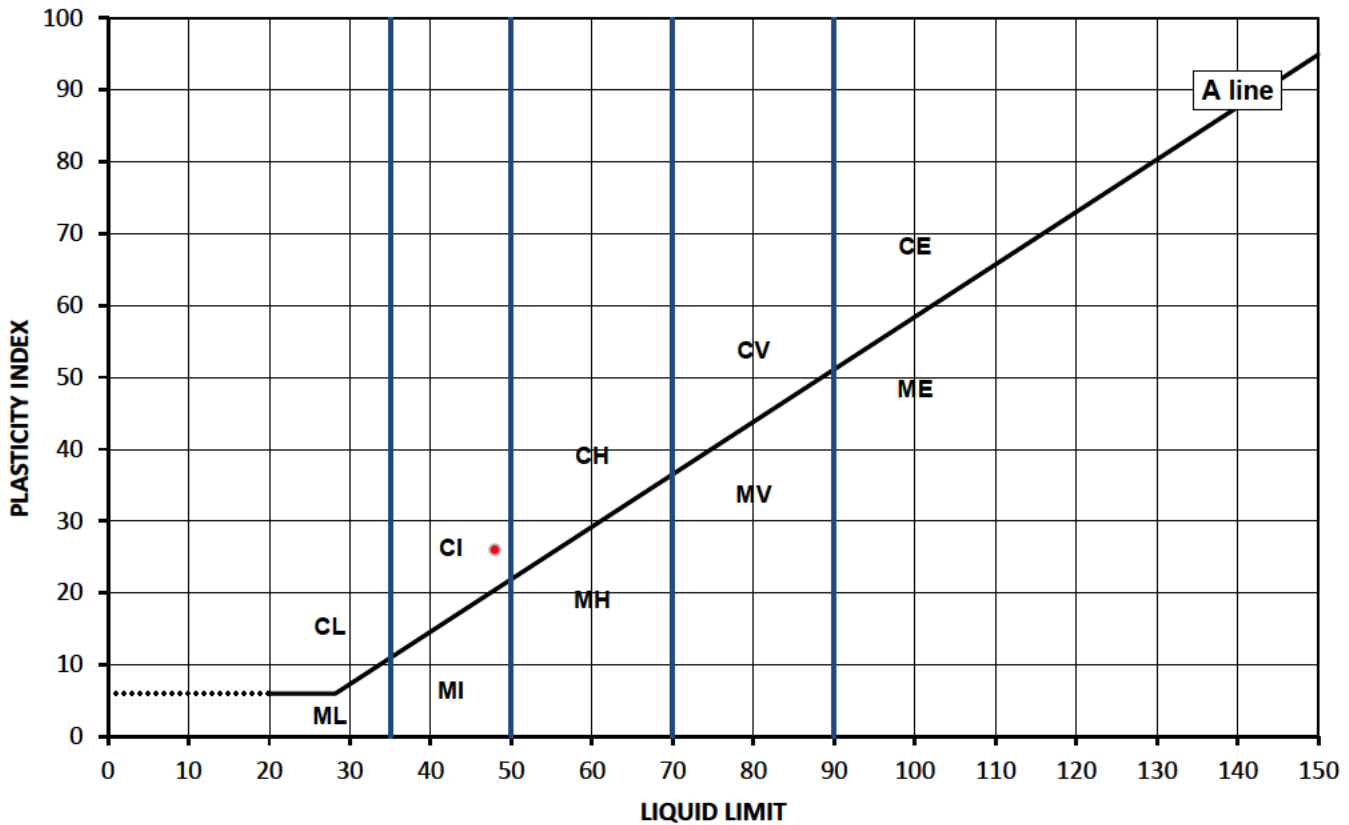
Test Results:

Laboratory Reference: 1465502
Hole No.: BH5
Sample Reference: Not Given
Soil Description: Dark brown to brown slightly sandy CLAY

Depth Top [m]: 9.50
Depth Base [m]: 9.95
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
42*	48	22	26	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	L	Low	Liquid Limit	below 35
M	Silt		I	Medium		35 to 50
			H	High		50 to 70
			V	Very high		70 to 90
			E	Extremely high		exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks: *Sample is wet

Signed:

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

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TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 28/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

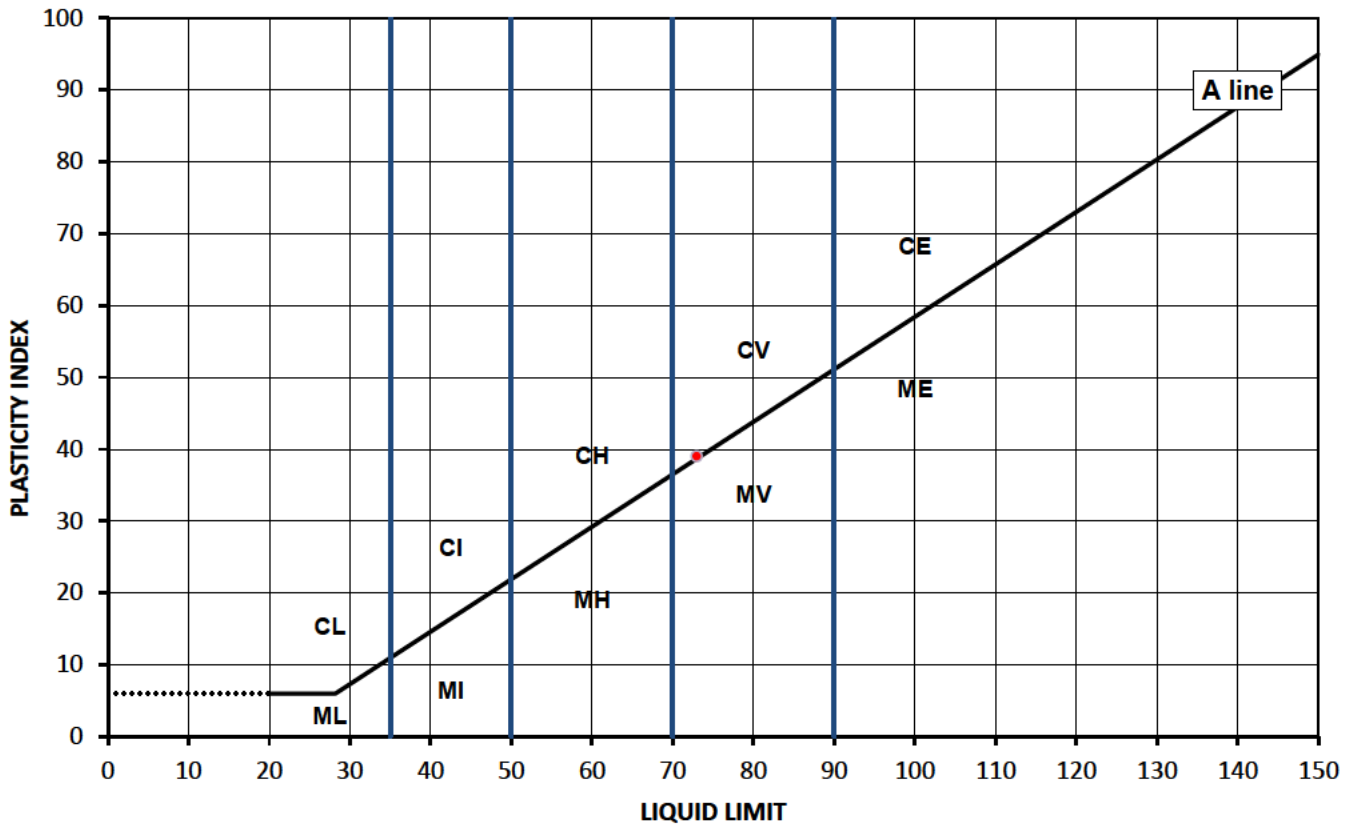
Test Results:

Laboratory Reference: 1465503
Hole No.: BH6
Sample Reference: Not Given
Soil Description: Brown to black organic CLAY

Depth Top [m]: 6.00
Depth Base [m]: 6.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
53	73	34	39	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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PL Deputy of Head of Geotechnical Section
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TEST CERTIFICATE

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



Environmental Science

Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 28/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

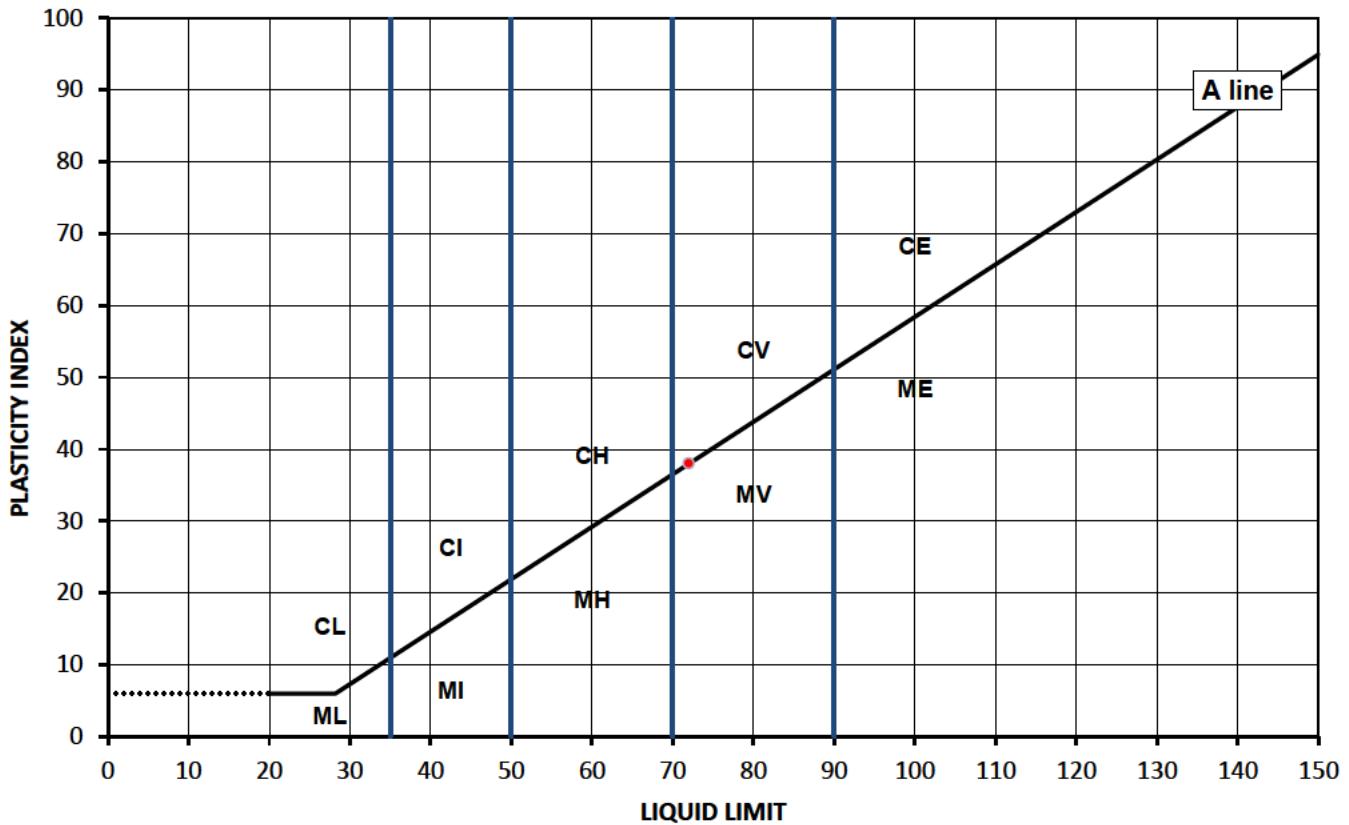
Test Results:

Laboratory Reference: 1465504
Hole No.: BH6
Sample Reference: Not Given
Soil Description: Brown to black organic CLAY

Depth Top [m]: 10.00
Depth Base [m]: 10.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
58	72	34	38	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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PL Deputy of Head of Geotechnical Section
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TEST CERTIFICATE

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



Liquid and Plastic Limits

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 26/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

Contact: Jay Fox
Site Address: Nordic, Immingham

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

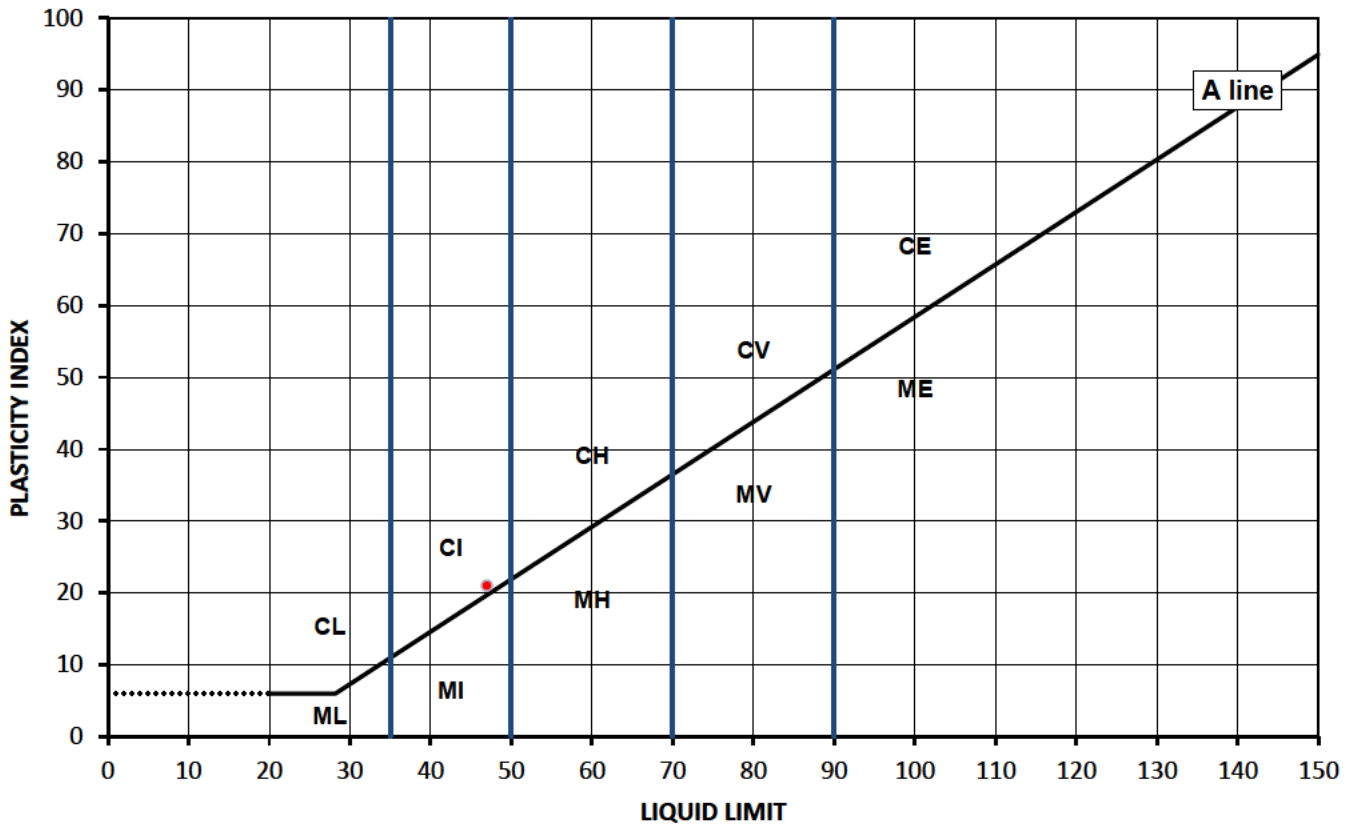
Test Results:

Laboratory Reference: 1465505
Hole No.: BH1
Sample Reference: Not Given
Soil Description: Brown to black slightly sandy CLAY

Depth Top [m]: 7.00
Depth Base [m]: 7.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
37	47	26	21	100



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			exceeding 90

Organic

O append to classification for organic material (eg CHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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SUMMARY REPORT

Summary of Classification Test Results

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



Environmental Science

Tested in Accordance with:

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

MC by BS 1377-2: 1990: Clause 3.2; WC by BS EN 17892-1: 2014; Atterberg
by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990:
Clause 8.2

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 24/02 - 26/02/2020
Date Received: 02/03/2020
Date Tested: 10/03 - 11/03/2020
Sampled By: Not Given

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC %	WC %	Atterberg				Density			Total Porosity# %
		Reference	Depth Top m	Depth Base m	Type					% Passing 425um	LL %	PL %	PI %	bulk Mg/m3	dry Mg/m3	PD Mg/m3	
1465488	BH1	Not Given	1.00	1.45	U	Brown CLAY	Atterberg 1 Point	24		100	65	29	36				
1465489	BH1	Not Given	3.00	3.45	U	Brown CLAY	Atterberg 1 Point	37		100	61	34	27				
1465505	BH1	Not Given	7.00	7.45	D	Brown to black slightly sandy CLAY	Atterberg 1 Point	37		100	47	26	21				
1465490	BH2	Not Given	3.00	3.45	U	Brown slightly sandy CLAY	Atterberg 1 Point	27		100	45	25	20				
1465494	BH2	Not Given	4.00	4.60	D	Brown to black CLAY	Atterberg 1 Point	42		100	60	25	35				
1465495	BH2	Not Given	9.00	9.25	D	Brown to grey slightly gravelly sandy CLAY	Atterberg 1 Point	23		99	39	22	17				
1465491	BH3	Not Given	1.70	2.15	U	Reddish brown organic CLAY with woods	Atterberg 1 Point	73		99	124	69	55				
1465496	BH3	Not Given	4.50	4.95	D	Brown to dark brown CLAY	Atterberg 1 Point	50*		100	61	28	33				
1465497	BH3	Not Given	9.00	9.25	D	Brown slightly gravelly clayey SAND	Atterberg 1 Point	15		92	23	11	12				
1465498	BH4A	Not Given	6.00	6.45	D	Black to brown sandy CLAY	Atterberg 1 Point	34		100	35	23	12				

Note: # Non accredited; NP - Non plastic

Comments: *Sample is wet

Signed:



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

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SUMMARY REPORT

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



Environmental Science

Summary of Classification Test Results

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; WC by BS EN 17892-1: 2014; Atterberg
by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990:
Clause 8.2

Client Reference: 19112

Job Number: 20-91280

Date Sampled: 26/02 - 28/02/2020

Date Received: 02/03/2020

Date Tested: 10/03 - 11/03/2020

Sampled By: Not Given

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA

Contact: Jay Fox
Site Address: Nordic, Immingham

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC %	WC %	Atterberg				Density			Total Porosity# %	
		Reference	Depth Top m	Depth Base m	Type					% Passing 425um %	LL %	PL %	PI %	bulk Mg/m3	dry Mg/m3	PD Mg/m3		
1465499	BH4A	Not Given	11.00	11.45	D	Black to brown sandy CLAY	Atterberg 1 Point	48*		100	36	24	12					
1465500	BH4A	Not Given	13.00	13.45	D	Brown to black very sandy CLAY with fragments of chalk	Atterberg 1 Point	25		100	30	16	14					
1465492	BH5	Not Given	2.00	2.45	U	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	24		94	45	23	22					
1465501	BH5	Not Given	5.50	5.15	D	Black to brown slightly sandy CLAY	Atterberg 1 Point	45		100	50	26	24					
1465502	BH5	Not Given	9.50	9.95	D	Dark brown to brown slightly sandy CLAY	Atterberg 1 Point	42*		100	48	22	26					
1465493	BH6	Not Given	2.00	2.45	U	Brown slightly sandy CLAY	Atterberg 1 Point	28		100	54	25	29					
1465503	BH6	Not Given	6.00	6.45	D	Brown to black organic CLAY	Atterberg 1 Point	53		100	73	34	39					
1465504	BH6	Not Given	10.00	10.45	D	Brown to black organic CLAY	Atterberg 1 Point	58		100	72	34	38					
1465487	TP01 B1	Not Given	0.90	Not Given	B	Dark brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	23		96	55	28	27					

Note: # Non accredited; NP - Non plastic

Comments: *Sample is wet

Signed:



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PL Deputy of Head of Geotechnical Section
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TEST CERTIFICATE

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



Determination of California Bearing Ratio

4041

Tested in Accordance with: BS 1377-4: 1990: Clause 7

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

Client Reference: 19112
Job Number: 20-91280
Date Sampled: Not Given
Date Received: 02/03/2020
Date Tested: 20/03/2020
Sampled By: Not Given

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

Test Results:

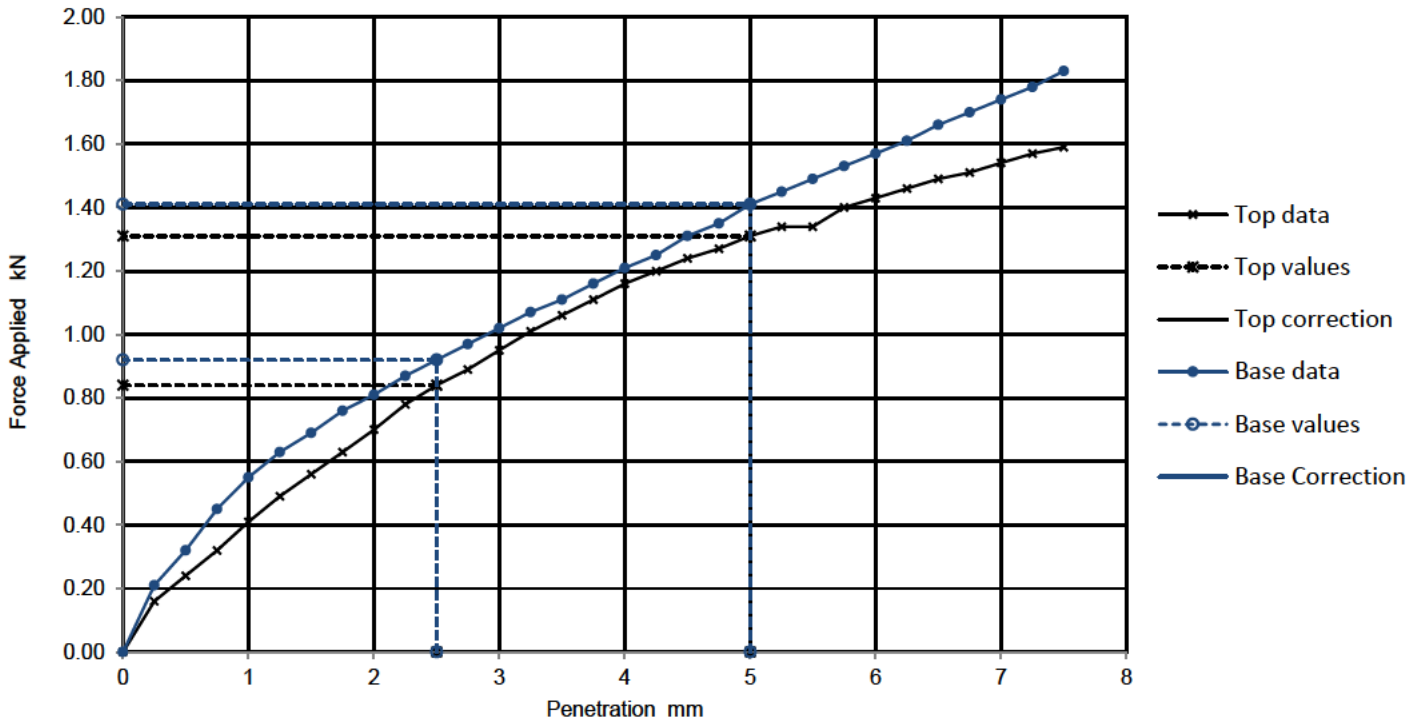
Laboratory Reference: 1465487
Hole No.: TP01 B1
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 0.90
Depth Base [m]: Not Given
Sample Type: B

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m ³
Initial Specimen details	Bulk density 1.90 Mg/m ³	Surcharge applied	8 kg
	Dry density 1.54 Mg/m ³		4.9 kPa
	Moisture content 23 %		

Force v Penetration Plots



Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	6.4	6.6	6.6	6.8
No	7.0	7.1	7.1	

Moisture Content %	23
	25

Remarks:

Test/ Specimen specific remarks:

Signed:

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

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report are representative of the samples submitted for analysis.

SUMMARY REPORT

Summary of Undrained Shear Strength Using Hand Vane Apparatus Test Results

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



Environmental Science

Tested in Accordance with: In-house Method G074
Guideline for Hand Held Shear Vane Test, New Zealand
Geotechnical Society INC, August 2001

Client: G D Pickles Ltd
Client Address: Biltons Farm, South Scarle Lane,
Swinderby, Lincoln,
LN6 9JA
Contact: Jay Fox
Site Address: Nordic, Immingham

Client Reference: 19112
Job Number: 20-91280
Date Sampled: 24/02 - 28/02/2020
Date Received: 02/03/2020
Date Tested: 10/03/2020
Sampled By: Not Given

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Shear Vane Reading 1	Shear Vane Reading 2	Shear Vane Reading 3	Shear Vane Reading 4	Shear Vane Reading Average	TV						
		Reference	Depth Top	Depth Base	Type														
		m		m				kPa		kPa		kPa							
1465488	BH1	Not Given	1.00	1.45	U	Brown CLAY		32	44	46	46	42							
1465489	BH1	Not Given	3.00	3.45	U	Brown CLAY		72	58	70	60	65							
1465490	BH2	Not Given	3.00	3.45	U	Brown slightly sandy CLAY		56	40	44	42	46							
1465491	BH3	Not Given	1.70	2.15	U	Reddish brown organic CLAY with woods		12	10	10	18	13							
1465492	BH5	Not Given	2.00	2.45	U	Brown slightly gravelly sandy CLAY		80	70	78	76	76							
1465493	BH6	Not Given	2.00	2.45	U	Brown slightly sandy CLAY		20	22	20	18	20							

Note: UTP - Unable To Penetrate

Comments:

Signed:



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

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Analytical Report Number : 20-90870

Project / Site name:	Nordic, Immingham	Samples received on:	02/03/2020
Your job number:	19112	Samples instructed on:	05/03/2020
Your order number:	19112-I2	Analysis completed by:	17/03/2020
Report Issue Number:	1	Report issued on:	19/03/2020
Samples Analysed:	15 soil samples		

Signed: 

Zina Abdul Razzak
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.

Iss No 20-90870-1 Nordic, Immingham 19112

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The results included within the report are representative of the samples submitted for analysis.

Page 1 of 14



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number	1463234	1463235	1463236	1463237	1463238			
Sample Reference	TP01	TP01	TP01	TP05	TP06			
Sample Number	D1	D2	D3	D1	D1			
Depth (m)	0.05-0.15	0.10-0.50	0.70	0.20-0.50	0.20-0.50			
Date Sampled	25/02/2020	25/02/2020	25/02/2020	24/02/2020	24/02/2020			
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
Moisture Content	%	N/A	NONE	18	16	17	33	15
Total mass of sample received	kg	0.001	NONE	0.44	0.40	0.40	0.44	0.43

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.0	7.8	7.5	7.4	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	%	0.005	MCERTS	0.195	-	0.615	-	1.49
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.30	-	2.0	-	3.1
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	303	-	1970	-	3130
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	47	-	94	-	28
Total Sulphur	%	0.005	MCERTS	0.216	-	0.228	-	0.661
Ammonium as NH ₄	mg/kg	0.5	MCERTS	0.6	-	6.2	-	8.3
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	0.06	-	0.62	-	0.83
Organic Matter	%	0.1	MCERTS	6.4	2.4	2.3	6.4	2.9
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	-	< 2.0	-	< 2.0

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	0.30
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.31
Phenanthrene	mg/kg	0.05	MCERTS	0.98	1.1	< 0.05	0.81	2.8
Anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	0.21	0.67
Fluoranthene	mg/kg	0.05	MCERTS	1.8	0.83	< 0.05	1.7	4.2
Pyrene	mg/kg	0.05	MCERTS	1.6	0.80	< 0.05	1.4	3.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	0.42	< 0.05	1.1	3.2
Chrysene	mg/kg	0.05	MCERTS	1.3	0.51	< 0.05	0.96	2.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.6	0.44	< 0.05	1.2	3.2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.73	0.20	< 0.05	0.52	1.0
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.0	0.24	< 0.05	0.70	2.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.55	< 0.05	< 0.05	0.29	1.0
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	0.74	< 0.05	< 0.05	0.54	1.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	11.9	4.52	< 0.80	9.41	26.7
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	18	13	18	12
Barium (aqua regia extractable)	mg/kg	1	MCERTS	170	130	130	120	220
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	3.0	1.1	0.98	2.6	2.6
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	3.7	2.8	9.3	5.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	< 0.2	< 0.2	0.6	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	67	33	32	49	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	23	25	43	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	92	33	26	47	36
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	35	33	34	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	62	51	45	77	53
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	320	100	98	190	120



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M CERTS



Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number				1463234	1463235	1463236	1463237	1463238
Sample Reference				TP01	TP01	TP01	TP05	TP06
Sample Number				D1	D2	D3	D1	D1
Depth (m)				0.05-0.15	0.10-0.50	0.70	0.20-0.50	0.20-0.50
Date Sampled				25/02/2020	25/02/2020	25/02/2020	24/02/2020	24/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Magnesium (water soluble)	mg/kg	5	NONE	17	-	190	-	130
Magnesium (leachate equivalent)	mg/l	2.5	NONE	8.5	-	94	-	63



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number	1463234	1463235	1463236	1463237	1463238
Sample Reference	TP01	TP01	TP01	TP05	TP06
Sample Number	D1	D2	D3	D1	D1
Depth (m)	0.05-0.15	0.10-0.50	0.70	0.20-0.50	0.20-0.50
Date Sampled	25/02/2020	25/02/2020	25/02/2020	24/02/2020	24/02/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Compound	Units	Limit of detection	Accreditation Status					
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	< 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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	< 2.0	3.9
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	< 8.0	< 8.0	27
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	< 8.0	< 8.0	120
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	< 10	< 10	150

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	< 2.0	6.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	< 10	16	36
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	< 10	< 10	130
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	< 10	24	170



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number	1463239	1463240	1463241	1463242	1463243			
Sample Reference	TP04	TP07	TP07	TP15	TP16			
Sample Number	D1	D1	D2	D1	D1			
Depth (m)	0.30-0.50	0.00-0.30	0.30-0.50	0.70	0.20-0.50			
Date Sampled	28/02/2020	25/02/2020	25/02/2020	26/02/2020	25/02/2020			
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
Moisture Content	%	N/A	NONE	19	7.6	9.3	15	13
Total mass of sample received	kg	0.001	NONE	0.37	0.41	0.40	0.44	0.41

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	10.4	8.9	7.9	10.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	0.503	-	0.264
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	1.3	-	0.32
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	1280	-	325
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	38	-	49
Total Sulphur	%	0.005	MCERTS	-	-	0.272	-	0.202
Ammonium as NH ₄	mg/kg	0.5	MCERTS	-	-	12	-	< 0.5
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	1.19	-	< 0.05
Organic Matter	%	0.1	MCERTS	3.8	0.6	3.3	2.5	3.9
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	-	< 2.0

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.21	0.45	3.3
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.79
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.26	1.3
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.33	2.1
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.46	2.9	17
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.73	6.9
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.90	4.1	20
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.85	3.5	20
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.55	2.0	19
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.42	1.4	14
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.42	1.3	18
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.31	0.93	5.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.40	1.2	14
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.17	0.53	6.0
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.8
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.66	6.6

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	4.69	20.3	156

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	< 1.0	9.1	14	13
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	190	170	140	170
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	2.5	2.2	1.8	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	6.4	2.5	3.9	2.1	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.4	0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	77	68	29	150
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	13	31	37	51
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	16	23	22	54
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	5.5	17	27	100
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	5.4	3.8	3.2	4.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	53	63	40	75
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93	38	69	99	180



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number				1463239	1463240	1463241	1463242	1463243
Sample Reference				TP04	TP07	TP07	TP15	TP16
Sample Number				D1	D1	D2	D1	D1
Depth (m)				0.30-0.50	0.00-0.30	0.30-0.50	0.70	0.20-0.50
Date Sampled				28/02/2020	25/02/2020	25/02/2020	26/02/2020	25/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Magnesium (water soluble)	mg/kg	5	NONE	-	-	37	-	7.2
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	18	-	3.6



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number	1463239			1463240		1463241		1463242		1463243	
Sample Reference	TP04			TP07		TP07		TP15		TP16	
Sample Number	D1			D1		D2		D1		D1	
Depth (m)	0.30-0.50			0.00-0.30		0.30-0.50		0.70		0.20-0.50	
Date Sampled	28/02/2020			25/02/2020		25/02/2020		26/02/2020		25/02/2020	
Time Taken	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status								
Monoaromatics & Oxygenates											
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 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	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 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	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 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	< 1.0	< 1.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	4.7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	3.8	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	18	< 10	< 10	< 10	< 10	< 10	15	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	10	< 10	< 10	< 10	< 10	< 10	26	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	33	< 10	< 10	< 10	< 10	< 10	45	-



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number	1463244	1463245	1463246	1463247	1463915			
Sample Reference	TP16	TP19	TP24	TP24	TP13			
Sample Number	D2	D1	D1	D2	D1			
Depth (m)	0.50-1.00	0.40	0.40-0.70	0.70-0.90	0.50-0.80			
Date Sampled	25/02/2020	27/02/2020	27/02/2020	27/02/2020	26/02/2020			
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
Moisture Content	%	N/A	NONE	15	14	14	18	14
Total mass of sample received	kg	0.001	NONE	0.43	0.46	0.46	0.43	2.0

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

pH - Automated	pH Units	N/A	MCERTS	10.1	9.5	9.0	7.9	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	0.384	0.075	0.172
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	1.2	0.098	0.27
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	1170	98.0	271
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	1200	470	96
Total Sulphur	%	0.005	MCERTS	-	-	0.323	0.095	0.170
Ammonium as NH ₄	mg/kg	0.5	MCERTS	-	-	30	32	< 0.5
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	3.03	3.23	< 0.05
Organic Matter	%	0.1	MCERTS	-	7.0	-	2.1	2.7
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0	< 2.0

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	0.74	0.76	29	< 0.05	0.72
Acenaphthylene	mg/kg	0.05	MCERTS	0.30	0.20	8.9	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.27	0.32	26	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.46	0.39	39	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	5.0	3.1	230	< 0.05	1.1
Anthracene	mg/kg	0.05	MCERTS	1.6	0.76	63	< 0.05	0.21
Fluoranthene	mg/kg	0.05	MCERTS	11	5.1	380	< 0.05	1.1
Pyrene	mg/kg	0.05	MCERTS	10	4.7	340	< 0.05	1.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.8	2.9	190	< 0.05	0.83
Chrysene	mg/kg	0.05	MCERTS	5.2	2.6	160	< 0.05	0.68
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	6.0	3.5	150	< 0.05	0.79
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.8	0.81	96	< 0.05	0.27
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.1	2.1	150	< 0.05	0.43
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.3	1.2	76	< 0.05	0.25
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.73	0.50	22	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.5	1.4	85	< 0.05	0.28

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	60.9	30.3	2040	< 0.80	7.69
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	14	16	9.4	17
Barium (aqua regia extractable)	mg/kg	1	MCERTS	150	230	240	100	110
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.5	1.8	3.4	1.2	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	9.6	4.0	13	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.3	0.3	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	93	100	120	36	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	74	69	93	21	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	40	47	76	19	22
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	26	35	68	39	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	4.0	5.2	5.7	4.1	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	77	51	71	36	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	200	270	74	66



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number				1463244	1463245	1463246	1463247	1463915
Sample Reference				TP16	TP19	TP24	TP24	TP13
Sample Number				D2	D1	D1	D2	D1
Depth (m)				0.50-1.00	0.40	0.40-0.70	0.70-0.90	0.50-0.80
Date Sampled				25/02/2020	27/02/2020	27/02/2020	27/02/2020	26/02/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Magnesium (water soluble)	mg/kg	5	NONE	-	-	21	68	24
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	21	34	8.5



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Analytical Report Number: 20-90870

Project / Site name: Nordic, Immingham

Your Order No: 19112-I2

Lab Sample Number	1463244	1463245	1463246	1463247	1463915
Sample Reference	TP16	TP19	TP24	TP24	TP13
Sample Number	D2	D1	D1	D2	D1
Depth (m)	0.50-1.00	0.40	0.40-0.70	0.70-0.90	0.50-0.80
Date Sampled	25/02/2020	27/02/2020	27/02/2020	27/02/2020	26/02/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
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	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	2.2	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.2	-	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	18	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	83	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	110	-	-	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.7	-	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	-	-	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	58	-	-	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	120	-	-	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	200	-	-	< 10	< 10



Analytical Report Number : 20-90870

Project / Site name: Nordic, Immingham

* 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 *
1463234	TP01	D1	0.05-0.15	Grey loam with gravel and vegetation.
1463235	TP01	D2	0.10-0.50	Brown clay with vegetation.
1463236	TP01	D3	0.70	Brown clay with gravel.
1463237	TP05	D1	0.20-0.50	Grey sandy clay with gravel and vegetation.
1463238	TP06	D1	0.20-0.50	Grey sand with gravel.
1463239	TP04	D1	0.30-0.50	Grey sandy clay.
1463240	TP07	D1	0.00-0.30	Grey sand with gravel.
1463241	TP07	D2	0.30-0.50	Grey sand with gravel.
1463242	TP15	D1	0.70	Grey clay with gravel.
1463243	TP16	D1	0.20-0.50	Brown clay and sand with gravel.
1463244	TP16	D2	0.50-1.00	Brown clay and sand with gravel.
1463245	TP19	D1	0.40	Brown clay and sand with gravel.
1463246	TP24	D1	0.40-0.70	Brown clay and sand with gravel.
1463247	TP24	D2	0.70-0.90	Brown clay and sand with gravel.
1463915	TP13	D1	0.50-0.80	Brown clay and sand with vegetation and gravel



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Analytical Report Number : 20-90870

Project / Site name: Nordic, Immingham

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	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
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
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-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	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
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
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
Organic matter (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
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
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
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
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
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 Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 20-90870

Project / Site name: Nordic, Immingham

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	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
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-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.



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Analytical Report Number : 20-90875

Project / Site name:	Nordic, Immingham	Samples received on:	02/03/2020
Your job number:	19112	Samples instructed on:	05/03/2020
Your order number:	19112-I2	Analysis completed by:	17/03/2020
Report Issue Number:	1	Report issued on:	17/03/2020
Samples Analysed:	5 10:1 WAC samples		

Signed: [redacted]

Zina Abdul Razzak
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.

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The results included within the report are representative of the samples submitted for analysis.

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Waste Acceptance Criteria Analytical Results							
Report No:	20-90875						
				Client: GDICKLES			
Location	Nordic, Immingham						
Lab Reference (Sample Number)	1463266 / 1463267			Landfill Waste Acceptance Criteria			
Sampling Date	25/02/2020			Limits			
Sample ID	TP01 WAC 3			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.10-0.50						
Solid Waste Analysis							
TOC (%)**	1.8			3%	5%	6%	
Loss on Ignition (%) **	5.3			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	84			100	--	--	
pH (units)**	7.5			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	9.1			--	To be evaluated	To be evaluated	
Eluate Analysis							
	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	< 0.0011		< 0.0110	0.5	2	25	
Barium *	0.0347		0.288	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	0.0006		0.0052	0.5	10	70	
Copper *	0.0068		0.057	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	0.0071		0.0590	0.5	10	30	
Nickel *	< 0.0003		< 0.0030	0.4	10	40	
Lead *	0.0071		0.059	0.5	10	50	
Antimony *	< 0.0017		< 0.017	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.0046		0.038	4	50	200	
Chloride *	24		200	800	15000	25000	
Fluoride	5.6		47	10	150	500	
Sulphate *	190		1600	1000	20000	50000	
TDS*	340		2800	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	8.28		68.7	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	77						
Moisture (%)	23						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

i2 Analytical

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Watford, WD18 8YS

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Waste Acceptance Criteria Analytical Results							
Report No:	20-90875						
				Client: GDICKLES			
Location	Nordic, Immingham						
Lab Reference (Sample Number)	1463268 / 1463269			Landfill Waste Acceptance Criteria			
Sampling Date	24/02/2020			Limits			
Sample ID	TP05 WAC 1			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.30-1.00						
Solid Waste Analysis							
TOC (%)**	2.0			3%	5%	6%	
Loss on Ignition (%) **	5.4			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	120			500	--	--	
Total PAH (WAC-17) (mg/kg)	59			100	--	--	
pH (units)**	7.5			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	3.0			--	To be evaluated	To be evaluated	
Eluate Analysis							
	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.0286		0.237	0.5	2	25	
Barium *	0.0358		0.298	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	< 0.0004		< 0.0040	0.5	10	70	
Copper *	0.0024		0.020	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	0.0127		0.106	0.5	10	30	
Nickel *	0.0008		0.0064	0.4	10	40	
Lead *	0.0068		0.057	0.5	10	50	
Antimony *	< 0.0017		< 0.017	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.012		0.10	4	50	200	
Chloride *	4.5		37	800	4000	25000	
Fluoride	7.6		63	10	150	500	
Sulphate *	1400		12000	1000	20000	50000	
TDS*	1300		11000	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	5.19		43.2	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	82						
Moisture (%)	18						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Waste Acceptance Criteria Analytical Results							
Report No:	20-90875						
				Client: GDICKLES			
Location	Nordic, Immingham						
Lab Reference (Sample Number)	1463270 / 1463271			Landfill Waste Acceptance Criteria			
Sampling Date	24/02/2020			Limits			
Sample ID	TP06 WAC 2			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.20-1.00						
Solid Waste Analysis							
TOC (%)**	1.8			3%	5%	6%	
Loss on Ignition (%) **	3.9			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	170			500	--	--	
Total PAH (WAC-17) (mg/kg)	41			100	--	--	
pH (units)**	7.4			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	4.9			--	To be evaluated	To be evaluated	
Eluate Analysis							
	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.0434		0.363	0.5	2	25	
Barium *	0.0458		0.384	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	0.0009		0.0074	0.5	10	70	
Copper *	0.0052		0.044	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	0.0169		0.141	0.5	10	30	
Nickel *	0.0006		0.0050	0.4	10	40	
Lead *	< 0.0010		< 0.010	0.5	10	50	
Antimony *	0.012		0.10	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.0062		0.052	4	50	200	
Chloride *	4.0		33	800	4000	25000	
Fluoride	4.4		37	10	150	500	
Sulphate *	1000		8600	1000	20000	50000	
TDS*	910		7600	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	7.37		61.7	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	82						
Moisture (%)	18						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Waste Acceptance Criteria Analytical Results							
Report No:	20-90875						
				Client: GPICKLES			
Location	Nordic, Immingham						
Lab Reference (Sample Number)	1463272 / 1463273			Landfill Waste Acceptance Criteria			
Sampling Date	26/02/2020			Limits			
Sample ID	TP13 WAC 4			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.50-0.80						
Solid Waste Analysis							
TOC (%)**	1.7			3%	5%	6%	
Loss on Ignition (%) **	6.3			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	9.4			100	--	--	
pH (units)**	8.1			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	7.3			--	To be evaluated	To be evaluated	
Eluate Analysis							
	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	< 0.0011		< 0.0110	0.5	2	25	
Barium *	0.0259		0.218	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	< 0.0004		< 0.0040	0.5	10	70	
Copper *	0.0035		0.030	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	0.0020		0.0165	0.5	10	30	
Nickel *	< 0.0003		< 0.0030	0.4	10	40	
Lead *	0.0080		0.068	0.5	10	50	
Antimony *	< 0.0017		< 0.017	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.0057		0.048	4	50	200	
Chloride *	20		160	800	4000	25000	
Fluoride	3.0		25	10	150	500	
Sulphate *	180		1500	1000	20000	50000	
TDS*	310		2600	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	7.97		67.1	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	86						
Moisture (%)	14						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							

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Waste Acceptance Criteria Analytical Results							
Report No:	20-90875						
				Client: GDICKLES			
Location	Nordic, Immingham						
Lab Reference (Sample Number)	1463274 / 1463275			Landfill Waste Acceptance Criteria			
Sampling Date	27/02/2020			Limits			
Sample ID	TP24 WAC 5			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.30-0.60						
Solid Waste Analysis							
TOC (%)**	3.7			3%	5%	6%	
Loss on Ignition (%) **	8.3			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	320			500	--	--	
Total PAH (WAC-17) (mg/kg)	240			100	--	--	
pH (units)**	8.3			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	20			--	To be evaluated	To be evaluated	
Eluate Analysis							
	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.0275		0.239	0.5	2	25	
Barium *	0.0190		0.165	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	0.0010		0.0084	0.5	10	70	
Copper *	0.018		0.15	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	0.0674		0.584	0.5	10	30	
Nickel *	0.0092		0.080	0.4	10	40	
Lead *	0.0041		0.036	0.5	10	50	
Antimony *	0.017		0.15	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.019		0.17	4	50	200	
Chloride *	130		1100	800	4000	25000	
Fluoride	1.3		12	10	150	500	
Sulphate *	180		1600	1000	20000	50000	
TDS*	430		3800	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	16.2		140	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	82						
Moisture (%)	18						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							

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Analytical Report Number : 20-90875

Project / Site name: Nordic, Immingham

* 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 *
1463266	TP01	WAC 3	0.10-0.50	Brown clay and sand with vegetation and gravel
1463268	TP05	WAC 1	0.30-1.00	Brown clay and sand with vegetation and gravel
1463270	TP06	WAC 2	0.20-1.00	Brown clay and sand with gravel.
1463272	TP13	WAC 4	0.50-0.80	Brown clay and sand with vegetation and gravel
1463274	TP24	WAC 5	0.30-0.60	Brown clay and sand with gravel.



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Environmental Science

Analytical Report Number : 20-90875

Project / Site name: Nordic, Immingham

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-PL	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as received, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Speciated WAC-17 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. MCERTS accredited except Coronene.	L064-PL	D	NONE
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
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 20-90875

Project / Site name: Nordic, Immingham

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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

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.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP01	WAC 3	S	20-90875	1463266	b	BTEX in soil (Monoaromatics)	L073B-PL	b
TP01	WAC 3	S	20-90875	1463266	b	Total BTEX in soil (Poland)	L073-PL	b
TP05	WAC 1	S	20-90875	1463268	b	BTEX in soil (Monoaromatics)	L073B-PL	b
TP05	WAC 1	S	20-90875	1463268	b	Total BTEX in soil (Poland)	L073-PL	b
TP06	WAC 2	S	20-90875	1463270	b	BTEX in soil (Monoaromatics)	L073B-PL	b
TP06	WAC 2	S	20-90875	1463270	b	Total BTEX in soil (Poland)	L073-PL	b
TP13	WAC 4	S	20-90875	1463272	b	BTEX in soil (Monoaromatics)	L073B-PL	b
TP13	WAC 4	S	20-90875	1463272	b	Total BTEX in soil (Poland)	L073-PL	b
TP24	WAC 5	S	20-90875	1463274	b	BTEX in soil (Monoaromatics)	L073B-PL	b
TP24	WAC 5	S	20-90875	1463274	b	Total BTEX in soil (Poland)	L073-PL	b

Appendix 5

CBR Test Certificates



TEST CERTIFICATE

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



Determination of Equivalent CBR Value derived from Plate Bearing test BS1377-9

Tested in accordance with In House Procedure based upon SHW Design manual IAN73/06

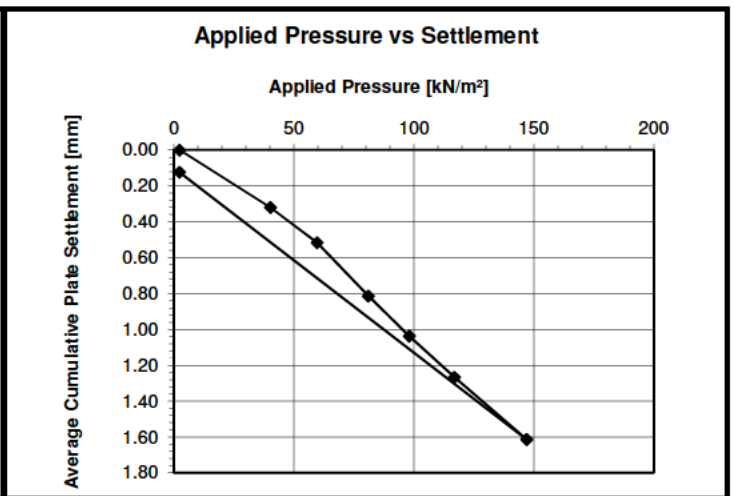
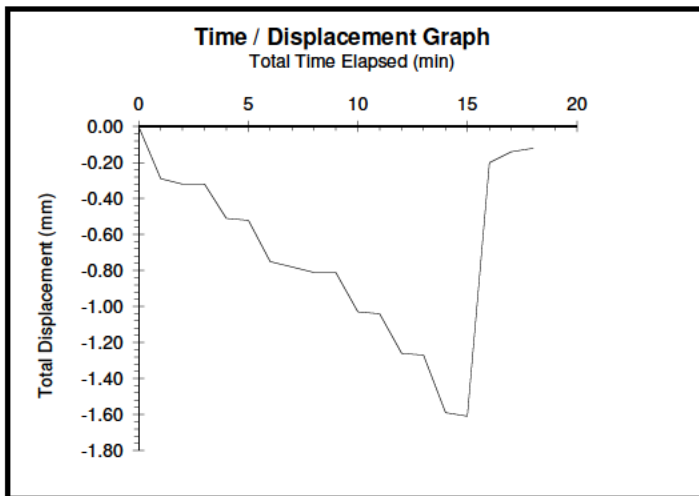
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-88559_1
Date Tested: 25.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 1
Test Reference: 1
Material Description: Brown CLAY
Test Location: TP 7 CBR 7
Depth Top (mm): 550
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.6 T Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
6.40	40	0.32
9.50	60	0.52
12.90	81	0.81
15.60	98	1.04
18.60	117	1.27
23.40	147	1.61
0.39	2	0.12
End of Test		



Pressure at 1.25mm Settlement: 116 kN/m²
Modulus of Subgrade Reaction: 58 MN/m²/m
Equivalent CBR By Plate Loading: 11 %
Moisture Content: 23 %
Remarks:

Signed:

Darren Berrill
Geotechnical Director



Date Reported: 02/03/2020

Page: 1 of 1

for and on behalf of i2 Analytical Ltd

*Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
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The results included within the report are representative of the samples submitted for analysis.
All 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.
The analysis was carried out at site mentioned above. Moisture Content was carried out at i2 Analytical Limited, Unit 8, 8 Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB*



TEST CERTIFICATE

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



Determination of Equivalent CBR Value derived from Plate Bearing test BS1377-9
Tested in accordance with In House Procedure based upon SHW Design manual IAN73/06

Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

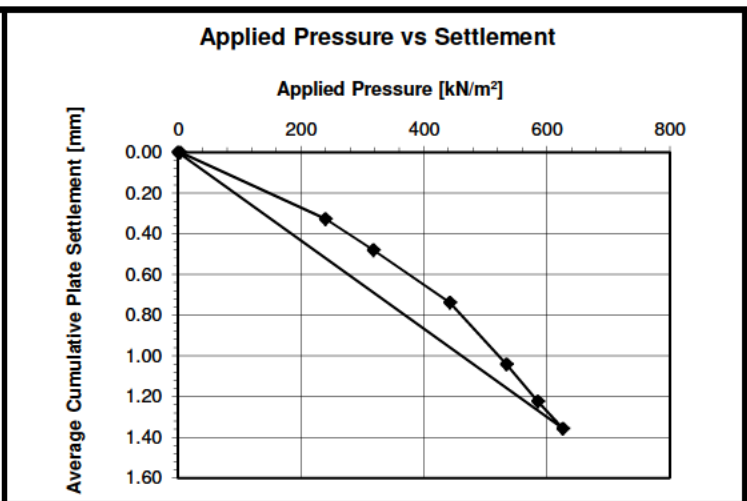
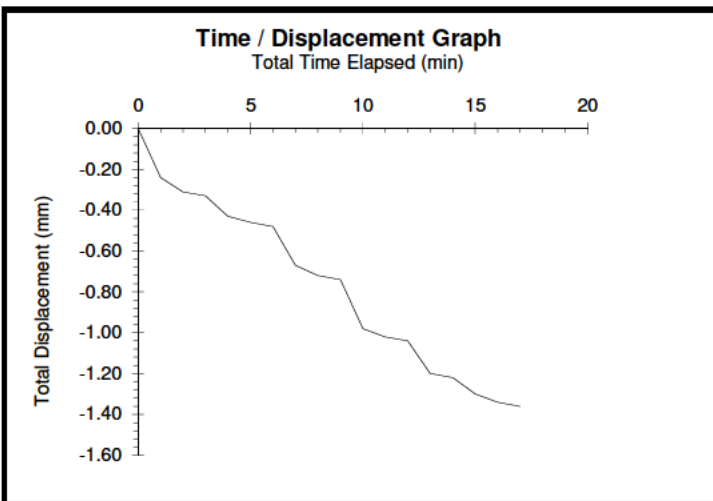
Client Reference: 19112
Job Number: 20-88559_2
Date Tested: 25.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 2
Test Reference: 2
Material Description: Crushed Grey Stone
Test Location: TP 6 CBR 6

Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 T Digger
Plate Diameter [m]: 0.30

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.24	3	0.00
16.95	240	0.33
22.45	318	0.48
31.25	442	0.74
37.75	534	1.04
41.35	585	1.22
44.25	626	1.36
End of Test		



Pressure at 1.25mm Settlement: 593 kN/m²
Modulus of Subgrade Reaction: 210 MN/m²/m
Equivalent CBR By Plate Loading: >100%
Moisture Content: N/A
Remarks:

Signed:

Darren Berrill
Geotechnical Director



Date Reported: 02/03/2020

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for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

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Watford Herts WD18 8YS



Determination of Equivalent CBR Value derived from Plate Bearing test BS1377-9
Tested in accordance with In House Procedure based upon SHW Design manual IAN73/06

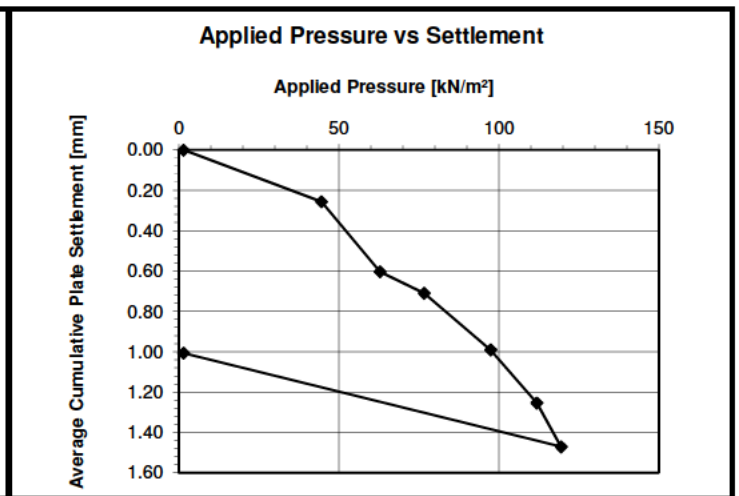
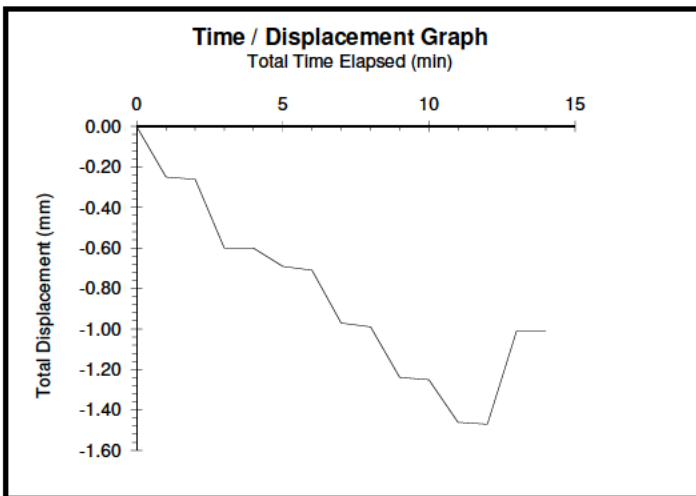
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-88559_3
Date Tested: 25.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 3
Test Reference: 3
Material Description: Crushed Grey Stone
Test Location: N/A **Note by GDP: This is TP1**
Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 T Digger
Plate Diameter [m]: 0.45

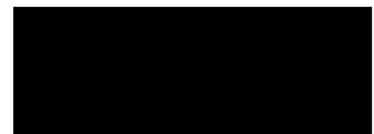
Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.24	2	0.00
7.10	45	0.26
10.00	63	0.60
12.20	77	0.71
15.50	97	0.99
17.80	112	1.25
19.00	119	1.47
0.24	2	1.01
End of Test		



Pressure at 1.25mm Settlement: 112 kN/m²
Modulus of Subgrade Reaction: 56 MN/m²/m
Equivalent CBR By Plate Loading: 10 %
Moisture Content: N/A
Remarks:

Signed:

Darren Berrill
Geotechnical Director



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Watford Herts WD18 8YS



Determination of Equivalent CBR Value derived from Plate Bearing test BS1377-9

Tested in accordance with In House Procedure based upon SHW Design manual IAN73/06

Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

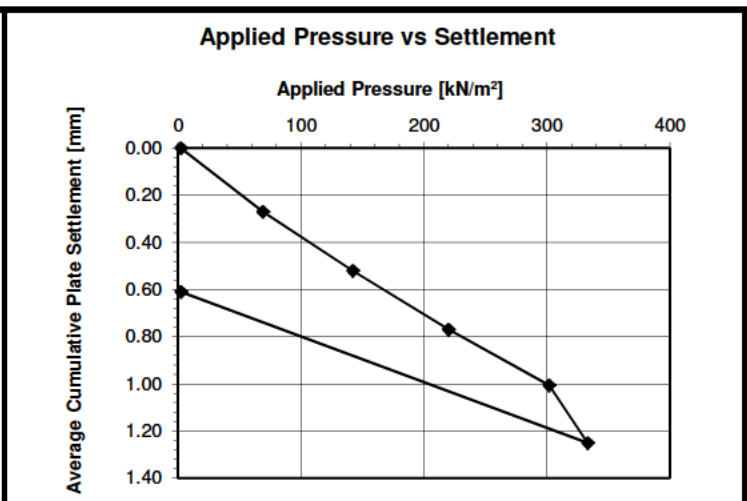
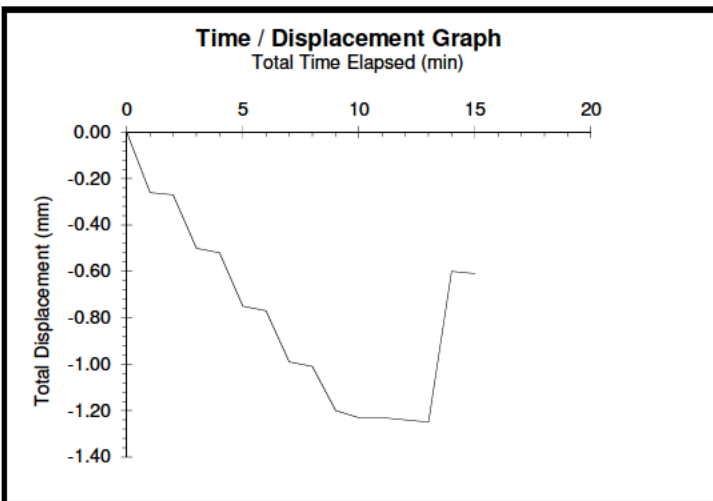
Client Reference: 19112
Job Number: 20-88844_1
Date Tested: 26.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 1
Test Reference: 1
Material Description: Brown Sandy Gravel
Test Location: TP 15 CBR 15

Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
11.00	69	0.27
22.60	142	0.52
35.00	220	0.77
48.00	302	1.01
53.00	333	1.25
0.39	2	0.61
End of Test		



Pressure at 1.25mm Settlement: 319 kN/m²
Modulus of Subgrade Reaction: 159 MN/m²/m
Equivalent CBR By Plate Loading: 63 %
Moisture Content: 15 %
Remarks:

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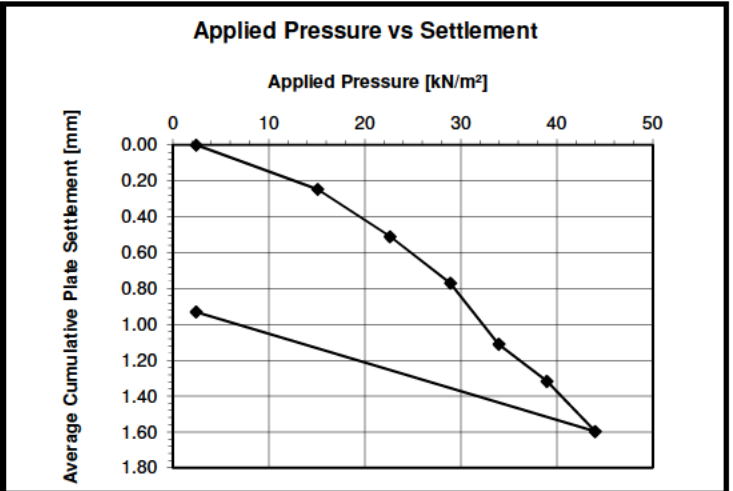
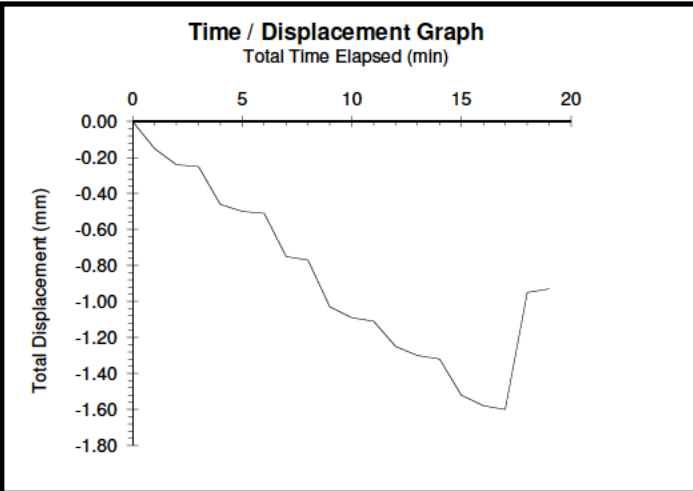
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-88844_2
Date Tested: 26.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 2
Test Reference: 2
Material Description: Dark Grey CLAY
Test Location: TP 13 CBR 13
Depth Top (mm): 400
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
2.40	15	0.25
3.60	23	0.51
4.60	29	0.77
5.40	34	1.11
6.20	39	1.32
7.00	44	1.60
0.39	2	0.93
End of Test		



Pressure at 1.25mm Settlement: 37 kN/m²
Modulus of Subgrade Reaction: 19 MN/m²/m
Equivalent CBR By Plate Loading: 1.5 %
Moisture Content: 21 %
Remarks:

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Geotechnical Director



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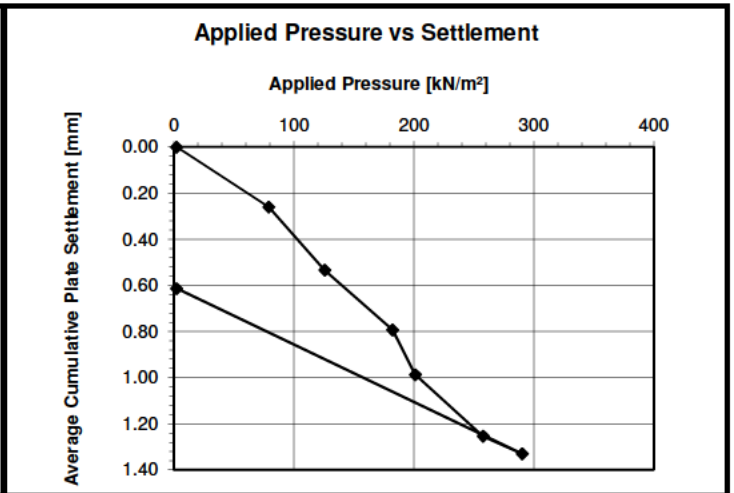
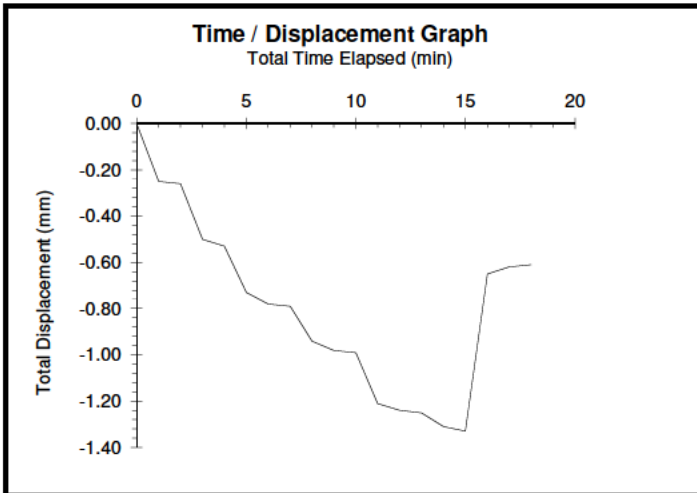
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-88844_3
Date Tested: 26.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 3
Test Reference: 3
Material Description: Brown Sandy Gravel
Test Location: TP 03 CBR 3
Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9 T Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
12.60	79	0.26
20.00	126	0.53
29.00	182	0.79
32.00	201	0.99
41.00	258	1.25
46.20	290	1.33
0.39	2	0.61
End of Test		



Pressure at 1.25mm Settlement: 257 kN/m²
Modulus of Subgrade Reaction: 128 MN/m²/m
Equivalent CBR By Plate Loading: 43 %
Moisture Content: 13 %

Remarks:

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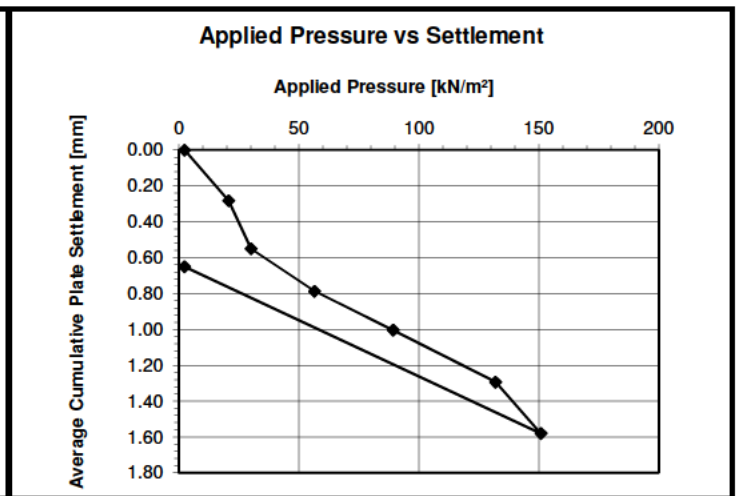
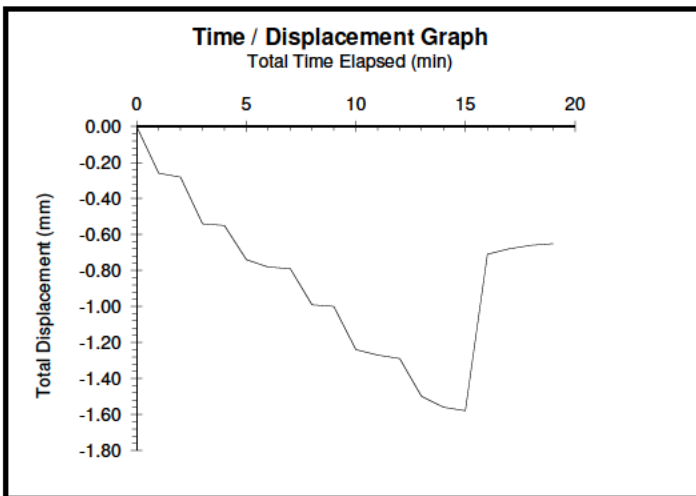
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-89121_1
Date Tested: 27.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 1
Test Reference: 1
Material Description: Sandy Dark CLAY
Test Location: TP 24 CBR 24
Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
3.30	21	0.28
4.80	30	0.55
9.00	57	0.79
14.20	89	1.00
21.00	132	1.29
24.00	151	1.58
0.39	2	0.65
End of Test		



Pressure at 1.25mm Settlement: 126 kN/m²
Modulus of Subgrade Reaction: 63 MN/m²/m
Equivalent CBR By Plate Loading: 13 %
Moisture Content: 10 %

Remarks:

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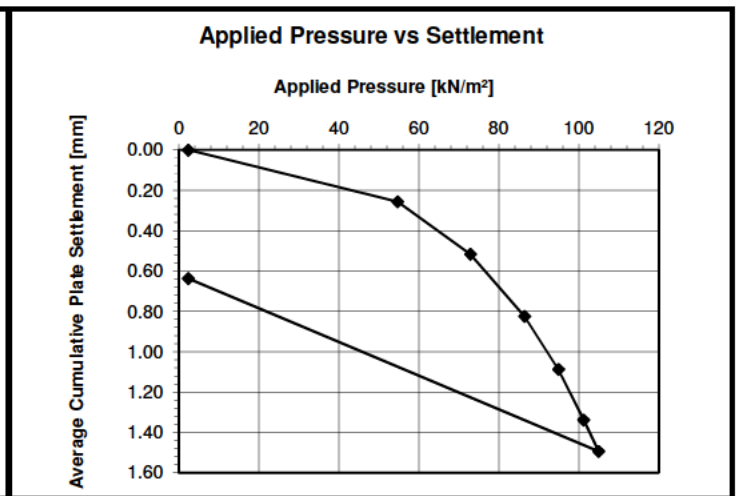
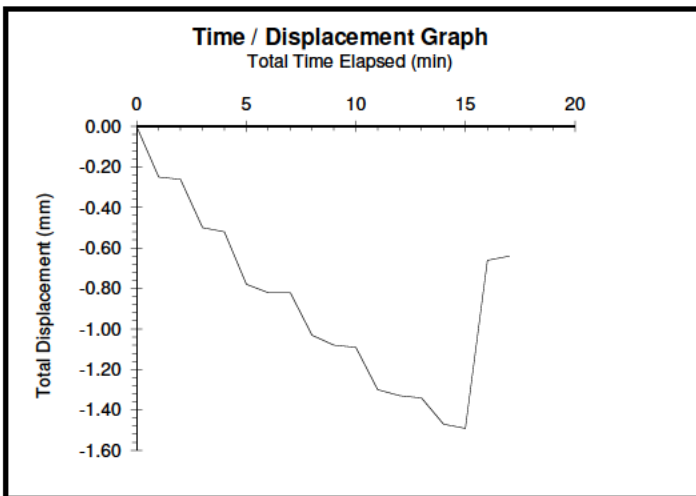
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-89121_2
Date Tested: 27.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 2
Test Reference: 2
Material Description: Brown Sandy Gravel
Test Location: TP 20 CBR 20
Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
8.70	55	0.26
11.60	73	0.52
13.75	86	0.82
15.10	95	1.09
16.10	101	1.34
16.70	105	1.49
0.39	2	0.64
End of Test		



Pressure at 1.25mm Settlement: 99 kN/m²
Modulus of Subgrade Reaction: 49 MN/m²/m
Equivalent CBR By Plate Loading: 8.3 %
Moisture Content: 27 %

Remarks:

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Geotechnical Director



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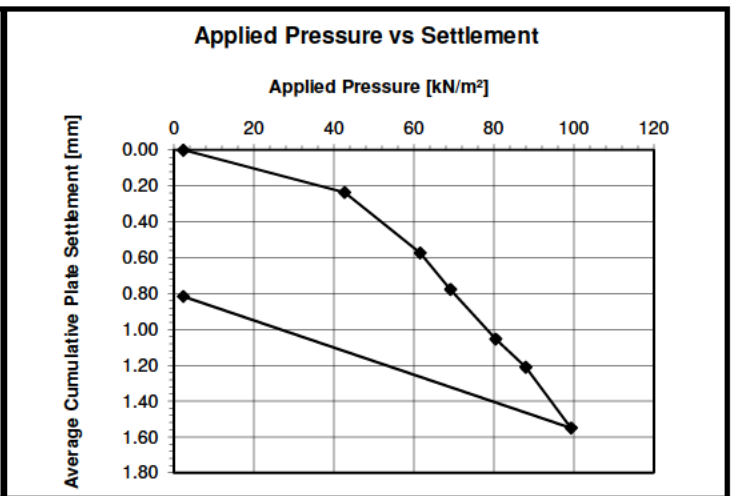
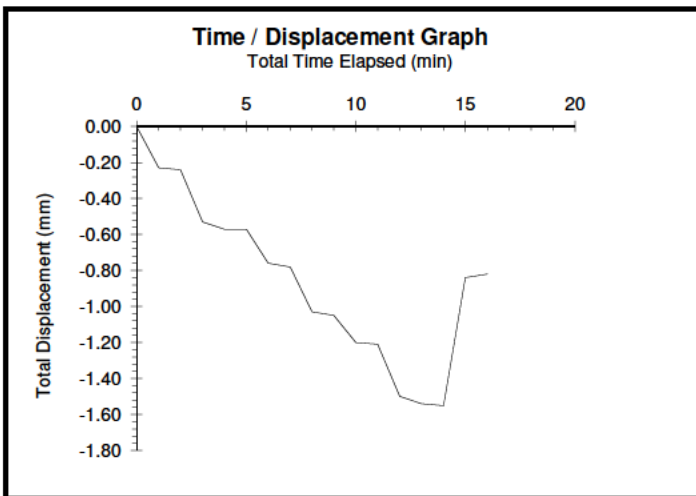
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-89374_1
Date Tested: 28.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 1
Test Reference: 1
Material Description: Grey Gravel
Test Location: TP 4 CBR 4
Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
6.80	43	0.24
9.80	62	0.57
11.00	69	0.78
12.80	80	1.05
14.00	88	1.21
15.80	99	1.55
0.39	2	0.82
End of Test		



Pressure at 1.25mm Settlement: 89 kN/m²
Modulus of Subgrade Reaction: 45 MN/m²/m
Equivalent CBR By Plate Loading: 6.9 %
Moisture Content: 21 %
Remarks:

Signed:

Darren Berrill
Geotechnical Director



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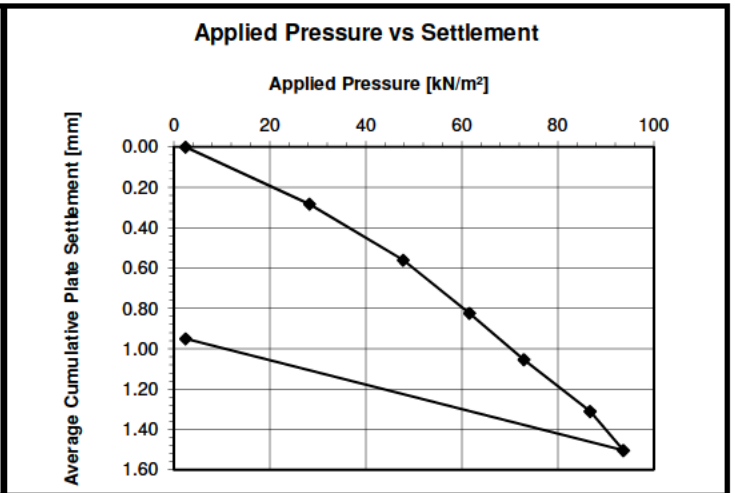
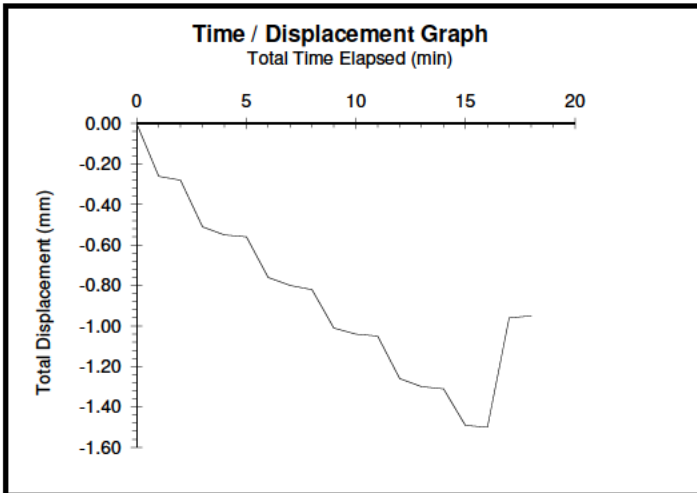
Client: G D Pickles Ltd
Client Address: Biltons Farm
South Scarle Lane
Swinderby, Lincoln
LN6 9JA
Contact: Jay Fox
Site: Nordic, Immingham

Client Reference: 19112
Job Number: 20-89374_2
Date Tested: 28.02.20
Tested By: NS

Test Results

Laboratory Reference: PL 2
Test Reference: 2
Material Description: Grey Gravel
Test Location: TP 8 CBR 8
Depth Top (mm): Ground Level
Layer Thickness (mm): N/A
Weather Conditions: Dry/Overcast
Kentledge Type: 9.5 Digger
Plate Diameter [m]: 0.45

Applied Load [kN]	Applied Pressure [kN/m ²]	Average Plate Settlement [mm]
0.39	2	0.00
4.50	28	0.28
7.60	48	0.56
9.80	62	0.82
11.60	73	1.05
13.80	87	1.31
14.90	94	1.50
0.39	2	0.95
End of Test		



Pressure at 1.25mm Settlement: 84 kN/m²
Modulus of Subgrade Reaction: 42 MN/m²/m
Equivalent CBR By Plate Loading: 6.2 %
Moisture Content: 16 %

Remarks:

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Geotechnical Director



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Appendix 6

Contaminated Land Risk Assessment Methodology

Contaminated Land Risk Assessment Methodology

The following classification was published by the NHBC, EA, and CIEH (2008). This was developed from *DOE Guide to Risk Assessment and Risk Management for Environmental Protection and the Statutory Guidance on Contaminated Land* (Defra September 2006).

The methodology differs from that presented in *Contaminated Land Risk Assessment, A Guide to Good Practice* (CIRIA C552, 2001), particularly in terms of the definitions of classification of consequence, which includes consideration of immediacy of hazards. The risk assessment methodology is now better aligned with health and safety and geotechnical risk assessment processes.

The designation of risk is based upon the consideration of both:

- **the magnitude of the potential consequence (i.e. severity).**
[takes into account both the potential severity of the hazard and the sensitivity of the receptor]
- **the magnitude of probability (i.e. likelihood).**
[takes into account both the presence of the hazard and receptor and the integrity of the pathway]

The potential consequences of contamination risks occurring at this Site are classified in accordance with Table 1 below:

Table 1: Classification of Consequence (Source: R&D 66:2008)

Classification	Definition of Consequence
Severe	<p>Highly elevated concentrations likely to result in “significant harm” to human health as defined by the EPA 1990, Part 2A, if exposure occurs.</p> <p>Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.</p> <p>Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.</p> <p>Catastrophic damage to crops, buildings or property.</p>
Medium	<p>Elevated concentrations which could result in “significant harm” to human health as defined by the EPA 1990, Part 2A if exposure occurs.</p> <p>Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.</p> <p>Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.</p> <p>Significant damage to crops, buildings or property.</p>
Mild	<p>Exposure to human health unlikely to lead to “significant harm”.</p> <p>Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce.</p> <p>Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.</p> <p>Minor damage to crops, buildings or property.</p>
Minor	No measurable effect on humans.

Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services.

The probability of contamination risks occurring at this Site is classified in accordance with Table 2 below.
 Note: A pollution linkage must first be established before probability is classified. If there is no pollution linkage then there is no potential risk. If there is no pollution linkage then it follows that there is no need to apply tests for probability and consequence.

Table 2: Classification of Probability

Classification	Definition of Probability
High Likelihood	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low Likelihood	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

For each possible pollutant linkage (source-pathway-receptor) identified, the potential risk can be evaluated based upon the following probability x consequence matrix shown in Table 3 below.

Table 3: Overall Contamination Risk Matrix

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate / Low risk	Low risk
	Low likelihood	Moderate risk	Moderate / Low risk	Low risk	Very low risk
	Unlikely	Moderate / Low risk	Low risk	Very low risk	Very low risk

R&D 66:2008 presents definitions of the risk categories, together with the investigatory and remedial actions that are likely to be necessary for each outcome. These definitions are reproduced in Table 4. These risk categories apply to each pollutant linkage, i.e. not only to each hazard or receptor.

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Table 4: Definition of Risk Categories and Likely Actions Required

Risk Category	Definition and likely actions required
Very high	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the Site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be Site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the Site without remediation action. Realisation of the risk is likely to present a substantial liability to the Site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to Site owner/occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the Site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.
No potential risk	There is no potential risk if no pollution linkage has been established.

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