# REPORT NO: M503

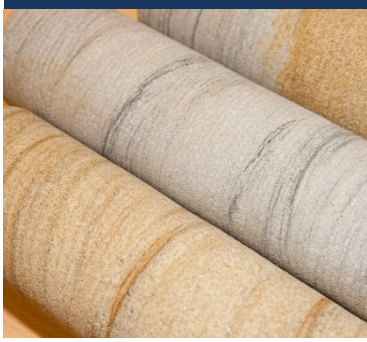
## GEOENVIRONMENTAL APPRAISAL FOR LAND AT

# MELLAND ROAD, MANCHESTER

## PREPARED FOR:

# SEDDON CONSTRUCTION LTD



● 1 THE OLD SHIPPON ● SANDLOW GREEN FARM ● HOLMES CHAPEL ROAD ● HOLMES CHAPEL ● CW4 8AS

● TEL: TEL: 01477 668142

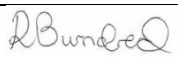
OHS 623618 FS586808 EMS 586809

| | |
|---|---|
| **Contract No.** | M503 |
| **Job Name** | MELLAND ROAD, MANCHESTER |

**REPORT REVISIONS**

| Revision No. | Issue Date | Details |
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VERIFICATION

| Revision No. | Issue Date | | Written By | Checked By | Verified By |
|---|---|---|---|---|---|
| | | **Initials** | RB | | |
| | | **Signature** |  | | |

# MELLAND ROAD, ROCHDALE – EXECUTIVE SUMMARY

## SUMMARY OF GEOENVIRONMENTAL ISSUES

| Issue | Remarks |
|---|---|
| **Grid Reference** | 388320, 395190 |
| **Proposed Development** | Two storey residential properties |
| **Former Uses** | Running track and playing fields. |
| **Present Uses** | An open field and part of Melland Road Playing Fields. |
| **Made Ground** | Up to 0.30m bgl. |
| **Natural Ground** | Firm slightly sandy, slightly gravelly clay. |
| **Hazardous Gas** | Gas monitoring is currently on going. |
| **Foundation Solution** | Strip foundations at 1.0m, deepened in accordance with NHBC guidance within the influencing distance of existing and previous trees. May require the use of trench fill or mini piles. |
| **Groundwater & Excavations** | No major groundwater flows encountered. Excavation trial pit the side walls were observed to be generally. Buried obstructions were not encountered during the investigation. |
| **Flooding** | Not within an indicative flood plain. |
| **Highways** | A CBR of at least 3% should be achievable within natural firm clay. |
| **Remediation and Preparatory Works** | Dunelm Remediation Strategy report ref. M503, dated June 2017. |

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# 1 INTRODUCTION

## 1.1 SCOPE OF INVESTIGATION

Dunelm Geotechnical and Environmental Limited (Dunelm) carried out a Geoenvironmental Appraisal of land at Melland Road, Rochdale, M18 7QA on behalf of Seddon Construction Ltd.

It is proposed to develop the site with residential properties.

Curtins Consulting have previously produced a Preliminary Geoenvironmental Appraisal Report (Ref EB1136/SH/3106) dated August 2013. Reference should be made to this report for details of the site's history and environmental setting. Curtins Consulting also produced a Phase 2 Intrusive Investigation report (Ref. EB1136/KR/311) dated June 2013 following on from a two-stage intrusive investigation which took place in February 2007 and September 2007.

The objectives of this exploratory phase of investigation were as follows:

- To investigate an area of previously inaccessible land within the existing site boundary to confirm anticipated ground conditions.

This report may be regarded as providing a Preliminary Risk Assessment and Generic Quantitative Risk Assessment in accordance with the Environment Agency's guidance document Model Procedures for the Management of Land Contamination (Contaminated Land Report 11, 2004).

Conditions of offer and notes on limitations relevant to all Dunelm Geoenvironmental investigations are described in Appendix C and should be read in conjunction with this report.

# 2 SITE RECONNAISSANCE

## 2.1 GENERAL

The centre of the site is located at OS Grid Ref 388320, 395190. The site is situated approximately 2km southeast of Manchester city centre. The site location is shown in Drawing Number M503/01 in Appendix A to this report.

## 2.2 TOPOGRAPHY AND SITE FEATURES

The site is relatively flat with a mound of material towards the centre of the site and towards the western boundary.

The site boundaries currently comprise timber fences and heras fencing towards the north, low level fencing towards the east and an open playing field towards the south. The western boundary is bound by residential properties.

## 2.3 EVIDENCE OF PRESENT AND FORMER LAND USE

The site is presently disused covered by rough grass and wood chippings. Fly tipped waste including glass, fabrics, plastic and timber was noted along the northern boundary.

# 3 GEOLOGICAL SETTING

## 3.1 INFORMATION SOURCES

The geological setting of the site was determined through reference to the following:

- British Geological Survey (BGS) 1: 50,000 scale sheet No 85 Manchester.
- Coal Authority Interactive mapping.
- BRE Publication BR211 *Radon: Guidance on Protective Measures for New Dwellings.*
- BGS borehole logs.

## 3.2 GEOLOGY

The site is shown to be underlain by Glacial Till. The solid geology underlying the site comprises Chester Pebble Beds Formation.

A BGS borehole log 40m northwest of the site (Ref. SJ89NE1809) recorded the following:

- Tarmac overlying 250mm soft brown clay FILL – 0.30m bgl
- Stiff becoming very stiff brown/ grey mottled CLAY with occasional gravel and coal fragments 3.00m bgl.

A single fault is shown in the vicinity of the site. The closest is located 100m east of the site and trends northwest-southeast.

# 4 PREVIOUS INVESTIGATIONS

Dunelm have examined the following reports:

- Preliminary Geo-Environmental Site Appraisal, Phase 2 – Intrusive Investigation (Ref. EB1136/KR/3117) dated June 2013 by Curtins Consulting. A summary of the works undertaken is shown in the Table 1 below together with the main findings.
- Remediation Strategy – (Ref. EB1136/KR/3122) dated June 2013 by Curtins Consulting. A summary of the remediation objectives are included below.
- Remediation Strategy – (Ref. M503) dated June 107 by Dunelm Geotechnical and Environmental. A summary of the remediation objectives are included below

**Table 1**: Curtins Consulting, Preliminary Geo-Environmental Site Appraisal, Phase 2 – Intrusive Investigation (Ref. EB1136/KR/3117) dated June 2013:

| Item | Scope of works | Main findings |
|---|---|---|
| Review of desk study information | Review of phase 1 desk study completed by Curtins Consulting in June 2013. | Site remains farmland until 1920s, with a pond located in the south west corner, until part of the site is occupied by a football ground and the pond is backfilled. By the 1950s a running track is located in the western side of the site until the 21st century. The site is then an open field and part of Melland Road Playing Fields.<br>From the 19h century residential development of the surrounding area occurs. Two railway lines are established 300m north and 600m east. By the 1950s industry in the surrounding area comprises brick works, iron works, refuse destructors, laundry, corporation yard and light industries. A large clay pit is recorded to the west of the site in the 1960s, and no longer recorded by 1980s.<br>The nearest surface water feature is an un-named drain 204m southeast of the site.<br>Site directly overlies an Unproductive Aquifer in the superficial deposits overlying a Principal Aquifer within the bedrock. |

| | | |
|---|---|---|
| | | The site is not situated within a Source Protection Zone (SPZ).<br>There is a groundwater abreaction point 458m south of the site for industrial/ commercial/public services: general use.<br>The site is at high risk of ground gas generating due to the backfilled pond on site and five historical landfill sites within 1000m of the site, with the closest located 165m west of the site.<br>UXO risk is moderate/low. |
| Trial pits | Total number: 31(TP1-TP31)<br>Depths: 2.50-3.20m bgl | Made ground: 0.05m - 0.45<br>Natural ground: 1.20m – 2.60m |
| Window sample boreholes | Total number: 4 (WS1-WS4)<br>Depths: 4.00-5.00m bgl | Made ground: 0.30m - 2.00m bgl<br>Natural ground:0.30- 5.00m bgl |
| Monitoring wells | Number: 4<br>In WS1-4 | Response zones in: natural |
| Gas Monitoring | Monitoring period: 6 visits over 3 months<br>Atmospheric pressure range: 994 to 1018mb. | Max. $CO_2$ value: 7.2%<br>Max. methane value: 0%<br>Max gas flow: 6.5l/hr |
| Chemical testing | Metals: Arsenic, Boron (water soluble), Cadmium, Chromium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Zinc<br>Asbestos Screen, pH, Soil Organic Matter,<br>Cyanide (total), Sulphate (total), Sulphide, Sulphur (elemental),<br>Phenols (screen) PAH's, (USEPA16)<br>TPH (CWG Banding - Aro/Ali Split) | The Polycyclic Aromatic Hydrocarbons (PAH's), Benzo[a]Pyrene, Benzo[a]Anthracene, and Dibenzo[a]Anthracene above Tier 1 thresholds in the made ground in TP3.<br>Benzo[a]Pyrene was also observed above Tier 1 thresholds in made-ground from, TP5 and TP10.<br>Arsenic was observed above the Tier 1 thresholds in made-ground sampled from TP3, TP27 and TP10; it was also on the threshold in TP5. |

**Table 2:** Curtins Consulting, Remediation Strategy – (Ref. EB1136/KR/3122) dated June 2013:

| Item | Scope of works |
|---|---|
| Prior to the removal of the running track | 4 no. trial trenches be undertaken on the north and south sections of the running track to distinguish the width of the track. |
| Further investigation of contamination in TP6 | To locate the lateral extent of the Arsenic and Polycyclic Aromatic Hydrocarbons (PAH's) contamination, not associated with the running track. |
| Validation sampling | Following removal of the track and bank, testing of the areas beneath the bank and track bed will then be required to prove removal of contamination. |
| Gas Protection Measures | It is advised that a supplementary round of gas monitoring be undertaken once enabling works are completed to verify the sites previously identified gas regime of Amber 1. |
| Cover/ Capping System | The provision of a 600mm thick clean and inert cover system in private rear gardens and a 300mm thick clean and inert cover system in private front gardens and landscaped areas. |

**Table 3:** Dunelm, Remediation Strategy – (Ref. M503) dated June 2017:

| Item | Scope of works |
|---|---|
| Additional Investigation Undertaken | 4 no. trial trenches were undertaken to locate the width of the running track (TP1-TP4) to depths of 0.5m bgl.<br>7 no. trial pits were undertaken to delineate around exploratory hole TP6 to locate the extent of the PAH's contamination. |
| Contamination testing | Elevated levels of arsenic lead, copper and PAHs associated with the running track were encountered.<br>Elevated levels of PAHs were encountered within TP6C. |
| Remediation Objectives | • Following confirmation of the running track width by trial trenches, the made-ground associated with the track bed and the western bank will be removed to a suitably licensed disposal facility.<br>• Remove contaminated material associated with TP6 and TP6C.<br>• Validation sampling of sides and base of trenches to confirm removal of contaminated |

| | |
|---|---|
| | materials.<br>• Import and deposit clean and inert material to fill excavated areas.<br>• Removal of pathways between hazardous gases and future residents, following subsequent gas monitoring. |
| Verification Works | • Contaminated soils associated with the running track and the area around TP6 and TP6C have been excavated & removed such that all soil concentrations are below SSAC 2 levels<br>• A minimum thickness of 1m of clay (supplemented with bentonite where necessary) is present beneath the whole of the site<br>• Thickness and suitability of cover material to landscaped area.<br>• Provisionally, installation of suitable gas protection measures in new structure. This will be confirmed at a later date following supplementary gas monitoring currently being undertaking. |

# 5 SITE WORKS AND LABORATORY TESTING

## 5.1 SUMMARY OF INVESTIGATION

The site has been subject to investigation previously which is summarised in section 4.

The exploratory hole listed below was advanced during May 2017 in order to investigate the area within the centre of the running, previously inaccessible, thought to be a pond. Record of the exploratory hole is included in Appendix B and the location is shown on Drawing Number M503/01 in Appendix A.

- Trial pit TP5

# 6 GROUND CONDITIONS & MATERIAL PROPERTIES

## 6.1 GENERAL

Strata encountered were generally similar to that encountered in previously undertaken investigations by Curtins in 2013 and Dunelm May 2017. Ground conditions are described in the following sections.

## 6.2 TOPSOIL

A brown sandy slightly gravelly topsoil to 0.05m bgl was encountered in the exploratory position. The topsoil consisted of occasional ash and frequent rootlets.

## 6.3 MADE GROUND

Directly underlying the topsoil made ground was encountered comprised of a gravelly sand, of ash and clinker to a depth of 0.30m bgl.

This is consistent with what was previously encountered. Curtins investigation encountered a localised deeper layer of made ground in exploratory holes TP2, TP3 towards the west of the site. However, this increased thickness is due to the elevated topography at the exploratory hole locations rather than indicative of a localised deepening of the made ground.

Given the shallow depth of the made ground and the material encountered is consistent to the rest of the material across the site, it does not appear that a backfilled pond was within this area of the site.

## 6.4 BURIED OBSTRUCTIONS

Buried obstructions were not encountered during the investigation. However, the developed nature of the site means that the likelihood of finding additional obstructions and/or buried relic foundations or structures remains.

## 6.5 NATURAL SOILS

The underlying natural soil was described as a firm slightly sandy, slightly gravelly clay. The gravel is of sandstone and coal to a depth of 1.20m bgl. To the trial pit base of 3.00m bgl, a firm sandy slightly gravelly

clay of sandstone, coal and limestone was encountered.

Classification testing within TP5 in the area to the west of the site not previously investigated indicates a clay of low to intermediate plasticity. Chapter 4.2 'Building near Trees' of the NHBC standards indicates that from the testing results, the modified plasticity index is between 19 and 23 indicating a clay of low to medium volume change potential.

### 6.6 ROCKHEAD

The underlying solid geology was not encountered during this investigation.

### 6.7 EXCAVATION STABILITY

During excavation of the trial pit, the side walls were observed to be generally stable.

### 6.8 GROUNDWATER

A slight water seepage was noted at 1.20m bgl.

The previous Curtins Consulting investigation did not encountered groundwater in any of the window sample holes. Slight groundwater ingress was encountered in trial pits TP1, TP4 and TP8 and is considered to be perched water contained in the sandy/silty lens in the upper clays.

### 6.9 HYDROCARBON CONTAMINATION

No visual or olfactory evidence of hydrocarbon contamination was noted during the investigation.

### 6.10 CONCRETE IN AGGRESSIVE GROUND

To enable buried concrete to be designed to resist sulfate attack, samples of made ground and natural strata from depths corresponding to the anticipated foundation depth have been tested for water-soluble sulfate and pH.

The maximum water-soluble sulfate from this site investigation, concentration is 319mg/l and the lowest recorded pH value is 7.7.

Based on the above results, Design Sulfate Class DS-1 and ACEC Classification AC-1 would be appropriate for buried concrete at the site.

The previous investigation recommended that well compacted buried concrete should be designed to in accordance with Class DS-1 requirements as specified in BRE Special Digest 1: 2005. The ACEC class for the site is AC-2z.

## 7 ASSESSMENT OF CONTAMINATION RISKS

### 7.1 SUMMARY OF CONTAMINATION SOURCES

**TOPSOIL**

Topsoil 0.05m thick is present within the centre of the running track, similar to that encountered across the wider site area.

**MADE GROUND**

Directly underlying the topsoil made ground was encountered comprised of a gravelly sand, of ash and clinker to a depth of 0.30m bgl.

Chemical testing previously undertaken of the made ground within the running track area of the site, show it to be contaminated with arsenic, copper lead and PAHs.

The previous investigation undertaken by Curtins Consulting in June 2013 also encountered PAH's, above Tier 1 thresholds at a concentration in the made ground in TP3, TP5 and TP10. Arsenic was also observed

above the Tier 1 thresholds in made-ground sampled from TP3, TP27 and TP10; it was also on the threshold in TP5.

It is therefore likely the area of TP5 with be similar. The made ground also contains materials such as ash and clinker which are unsuitable to remain in garden areas as a near-surface material.

**NATURAL**

The underlying natural soil was described as a firm slightly sandy, slightly gravelly clay.

# 8 FOUNDATIONS AND GEOTECHNICAL ISSUES

## 8.1 INTRODUCTION

The proposed development is understood to consist of 124 2 – 4 bedroom two storey residential.

Ground conditions encountered during this and previous investigations are generally consistent throughout the site and comprised made ground typically 0.5m thick consisting of a gravelly sand, of ash and clinker to depths of up to 0.80m bgl. The underlying natural ground consisted of generally firm silty sandy clays.

No evidence of a former/backfilled pond was encountered during the work with made ground thickness and description consistent with that encountered across the site. The was no noticeable change in either groundwater conditions during excavation, nor classification testing results when compared to the surrounding strata. However, as a precaution it is recommended that during the site strip careful inspection should take place for formation within the area of the former pond.

## 8.2 MINING

The site is not in an area affected by coal mining.

## 8.3 FOUNDATIONS

Due to the heterogeneous nature of the made ground, unacceptable total and differential settlements may occur if foundations are placed on made ground. Therefore, foundations should be taken through made ground onto underlying natural ground of adequate bearing capacity.

At this stage exact details of proposed loadings are unavailable however it is considered that for the proposed development of 2 storey residential dwellings, conventional strip or trench fill foundations should be suitable for the proposed structures.

Based on the visual description and laboratory testing, a safe bearing capacity of 80kN/m² has been determined for strip foundations 0.6m wide founding on the natural firm clay at a minimum depth of 0.90m bgl. At this width of foundation and bearing pressure settlements should be less than 25mm

Based on plasticity index results, all cohesive soils at the site should be regarded as being of low to medium volume change potential. Foundations should therefore be placed at a minimum depth of 0.90m below original or finished ground level, whichever is the lower.

Foundations near existing or proposed trees should be deepened and provided with appropriate heave precautions in accordance with NHBC Standards Chapter 4.2

It is understood that parts of the site have been recently been cleared of a range of semi-mature and mature trees. For these areas a medium volume change potential it is recommended and foundations should be deepened and designed in accordance with NHBC Standards. This will require the inclusion of appropriate void formers to protect against heave. The depth of formation level for the tree cleared area can be based on the existing heights of the trees derived from the tree constraints report providing there is no evidence of tree roots, desiccation or reduced moisture profile and subject to agreement with regulatory authorities. Alternatively a mini piled solutions may be preferable

It should be recognised that clay rich soils can deteriorate fairly rapidly on exposure, particularly in periods of wet

weather and frost. It would be prudent to protect all exposed soils in foundation excavations with a concrete blinding layer, particularly if they are likely to remain open for extended period of time.

Prior to placing foundation concrete, obvious soft or loose spots should be removed and replaced with suitably recompacted granular fill or lean mix concrete. In addition, all excavations should be inspected to ensure that they fully penetrate areas of disturbed ground.

If the founding stratum is found to be variable, and particularly if it is found to consist both of clay and sand, the foundations should be reinforced to limit differential settlement. For a standard 600mm wide, 225mm thick footing, a suitable reinforcement would be one layer of A193 mesh placed 50mm above the base of the footing. For other footing dimensions advice should be sought from a qualified structural engineer.

Further advice should be sought from Dunelm if unexpected ground conditions are encountered during redevelopment.

## 8.4 FLOOR SLABS

In accordance with NHBC guidelines, suspended floor slabs should be adopted where made ground exceeds 0.6m in thickness or where trees or cleared trees would impact a ground bearing slab. Therefore, on this site suspended floor slabs are recommended.

Alternatively, in order to utilise ground bearing slabs, made ground could be removed from beneath the footprint of the buildings and a blanket of compacted granular fill placed in accordance with an engineering specification.

## 8.5 BURIED OBSTRUCTIONS

Buried obstructions were not encountered during the investigation. However, the developed nature of the site means that the likelihood of finding additional obstructions and/or buried relic foundations or structures remains.

## 8.6 EXCAVATIONS

Observations made during the fieldwork indicate that groundwater flows are unlikely to be significant in shallow excavations. However, the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities. Therefore, water levels significantly higher than those found during this investigation may be encountered.

Shallow excavations should remain stable in the short term but if left open for a significant period of time or require man entry will require shoring. Excavation sides should be designed, constructed and supported in accordance with the recommendations given in CIRIA Report No. 97.

It is recommended that an adequate drainage system for surface water be installed by a competent contractor in order to prevent surface water ponding or collecting during and post construction, which may in turn lead to deterioration of the founding stratum.

Based on the nature of the ground conditions encountered, excavations should be within the capacity of normal earthworks plant although breaking out of relict foundations and other obstructions should be anticipated.

## 8.7 ROAD PAVEMENT DESIGN

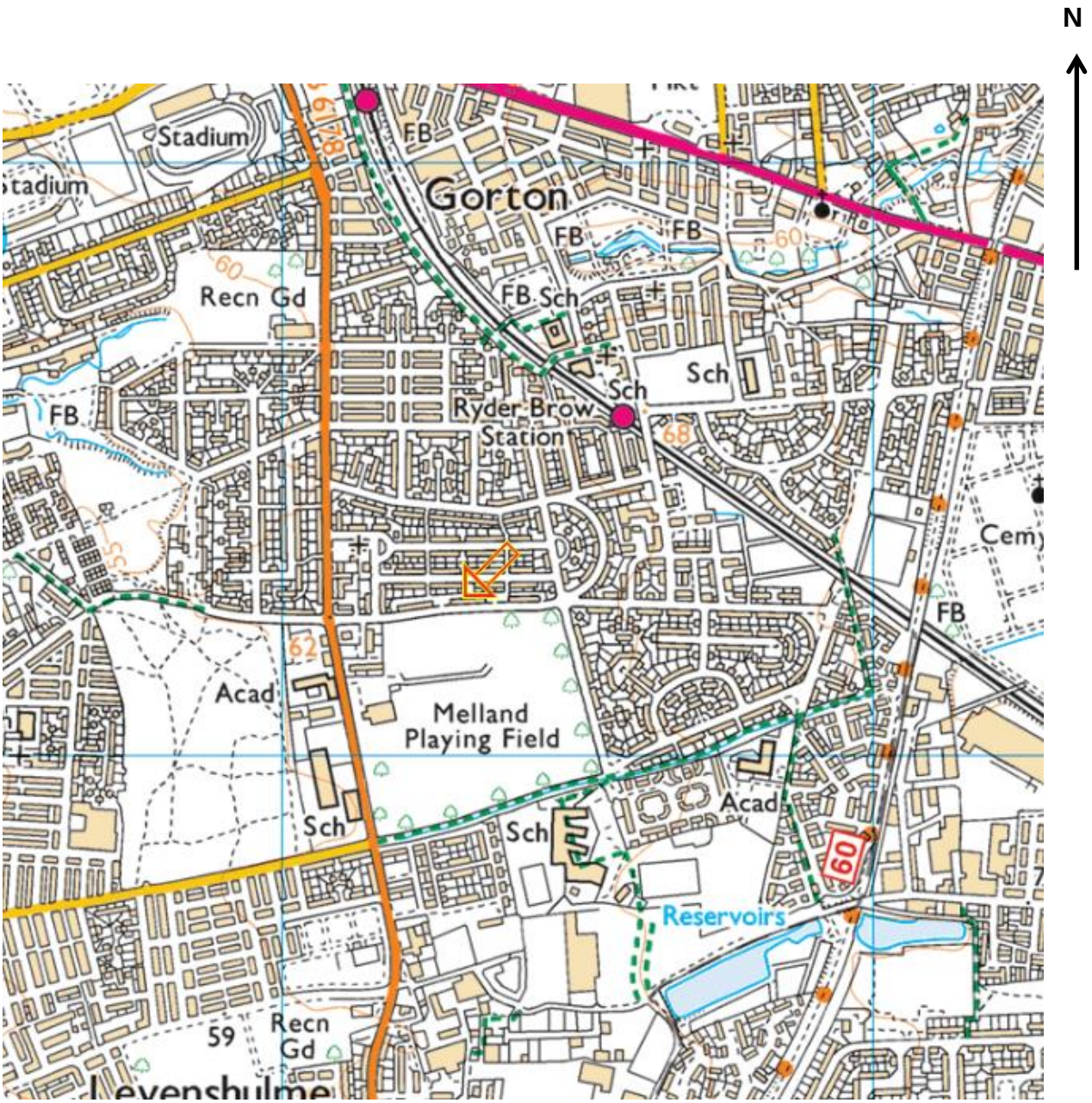
A CBR value of 3% should be assumed for highway construction within natural clays. This is based on visual inspection

## 8.8 FURTHER WORKS

Gas monitoring is still in progress and it is essential that the monitoring wells are protected from damage during preliminary re-development works such as site clearance.

# APPENDIX A

## Drawings




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| | | | | |
|---|---|---|---|---|
| DUNELM GEOTECHNICAL & ENVIRONMENTAL | **Contract:**<br>**Melland Road, Rochdale** | | | **Contract No:**<br>**M503** |
| | **Client:**<br>**Seddon Construction** | | | |
| **TEL: 01477 668142** | **Drawing Title:**<br>**Site Location Plan** | | | |
| **Drawing No:**<br>**M503/01** | **Date:**<br>**June 2017** | **Scale:**<br>**NTS** | **Status:**<br>**Final** | **Drawn by:**<br>**RB** |




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NOT TO SCALE: Contractor to check all dimensions on site before commencement of any works. No dimensions to be scaled from this drawing.

© Copyright Reserved

■ Machine excavated trial pit

CLIENT:

SEDDON CONSTRUCTION LTD

PROJECT TITLE:

MELLAND ROAD, MANCHESTER

DRAWING TITLE:

Exploratory Hole Location Plan

DRAWING NUMBER:

M503/02

DATE:

JULY 2017

# APPENDIX B

## Exploratory Hole Records

DUNELM GEOTECHNICAL & ENVIRONMENTAL

# TRIAL PIT RECORD

**TP No.** TP5

**Contract No.:** M503

**Site:** Melland Road, Rochdale

Scale 1:25

**Client:** Seddon Construction Ltd

**Logged By:** IJN

Sheet 1 of 1

**Method:** Machine Excavated Trial Pit

**Checked By:** SF

Dates: 19/05/2017

| SAMPLE DETAILS | | | Groundwater | STRATA RECORD Description | Depth (m) | Level (m AOD) PID (ppm) | Legend | Backfill |
|---|---|---|---|---|---|---|---|---|
| Type | Depth From-To (m) | Insitu Testing | | | | | | |
| ES | 0.02 | | | MADE GROUND: Brown sandy, slightly gravelly topsoil. Sand is fine to coarse of occasional ash. Gravel is angular to subangular, fine to coarse of clinker. Frequent roots and rootlets noted. | (0.05) 0.05 | | | |
| ES | 0.20 | | | MADE GROUND: Black gravelly sand. Sand is fine to coarse of ash. Gravel is angular to subangular, fine to coarse of clinker. | (0.25) 0.30 | | | |
| D | 0.50 | | | Firm, light brown, slightly sandy, slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone and coal. | (0.90) 1.20 | | | |
| D | 1.30 | | | Firm, dark brown grey, sandy, slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, coal and limestone. | (1.80) 3.00 | | | |
| D | 2.00 | | | | | | | |
| D | 3.00 | | | End of Trial Pit at 3.00 m | | | | |

| Remarks | Ground Water (m) | | Excavation Details | Orientation |
|---|---|---|---|---|
| 1. No groundwater encountered, however field drain damaged at 1.20m causing slight ingress. | Depth Strike | Remarks | Dimensions: 3.00m x 0.30m<br>Stability: Stable<br>Weather: Sunny<br>Remarks: Machine Excavated Trial Pit | A B C D 180° |

# APPENDIX C

## Dunelm Standard Conditions & Notes On Limitations

## Dunelm Conditions of Offer, Notes on Limitations & Basis for Contract

These conditions accompany our tender and supercede any previous conditions issued. The firm will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of the firm. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from the firm. A charge may be levied against such approval, the same to be made at the discretion of the firm.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, soil gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

The firm cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. The firm are not responsible for the action negligent or otherwise of subcontractors or third parties.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2001 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, the firm cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by the firm in the course of investigation is the property of the firm, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. The firm reserves the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning the firm, you understand and accept that you/your agent have a contractual relationship with the firm & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Dunelm are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete. Dunelm have not allowed for subsequent reinstatement as a result of settlement. No price has been provided or requested for a return visit to remove pipework and covers. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming the firm agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. We will also apply the right to claim any associated legal costs incurred with recovery of late payments. The firm is exempt from the CIS Scheme. The firm offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. The company are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by the firm, and we give notice that consequential loss as a direct or indirect result of the firm's activities or omission of the same are excluded.