

YORK GARDENS, GOSBERTON

PHASE II
GEO-ENVIRONMENTAL INVESTIGATION
FOR
GLEESON

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PHASE II GEO-ENVIRONMENTAL INVESTIGATION: YORK GARDENS, GOSBERTON

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Executive Summary

This presents the salient points of the report and should not be referred to in isolation. The conclusions and recommendations presented below are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and therefore copies of this report should be sent to the appropriate Regulatory Authorities and / or other organisations (as appropriate) by the Client for their comments and approval prior to undertaking any irrecoverable works associated with the subject site.

Enabling Works	Specific testing (e.g. waste acceptance criteria testing) may be required at the discretion of the Client's designated waste handler if the off-site movement / disposal of soils is undertaken. Where applicable, such requirements must be verified directly with them by the Client. Where soils are imported; or re-use on site; there will be the necessity to ensure compliance with all regulatory licensing procedures (i.e. U1, MMP etc) and also to validate the soils prior to importation, subject to the approval of the Local Authority / NHBC.
Foundations	Highly variable ground conditions have been recorded during the recent investigation and during previous investigations. Given this variability site-wide shallow / traditional foundation recommendation is not considered to be appropriate for the proposed development, and it is therefore recommended that a mixture of foundation options will need to be considered / engineer designed (e.g. raft and / or piled foundations) should be adopted for the site. Due to the recorded soft ground within the Tidal Flats Deposits, it is recommended that your structural engineer will need to engineer design a site wide solution in this stratum. For piled foundations deepened into the competent Oxford Clay then we would recommend that from approx. 9m the allowable bearing capacity would be 200kN/m ² .
Floor Slab	Your structural engineer will need to provide suitable floor slab design within their Engineer designed foundation solution within the Tidal Flats Deposits although a suspended slab will be required where a piled solution is proposed.
Building Near Trees	Cohesive soils were recorded across the site therefore foundation designs / floor slabs may need to be adjusted in general accordance with guidance such as the NHBC Standards (Chapter 4.2). Soils of medium volume change potential should be assumed across the site when calculating foundation depths for such assessments. It is recommended that any proposed planting be chosen so as to have no detrimental impact on the proposed development.
Groundwater	Widespread groundwater was not encountered across the site although several locations have recorded damp/wet soils from approx 2.0 m begl. Groundwater / perched groundwater levels at the site are likely to be subject to seasonal variations associated with rainfall etc. Based on the above, it is considered unlikely that significant dewatering or other forms of water management will be required for excavations across parts of the site.
Drainage	At this stage it is considered that the soils encountered during our recent site investigation will not be suitable for in situ drainage (i.e. soakaways) due to the predominantly cohesive nature / low strengths of the materials encountered. All drainage proposals are subject to <i>in situ</i> testing and should be agreed with the Local Authority prior to finalising designs. All drainage strategies should be approved by the relevant statutory authority prior to implementation and must adhere to the standard design and ground setting requirements, upon which your appointed drainage design engineers should advise you.
Ground Gas	Significant gas has been monitored within the gas wells installed through the peat but the shallower gas wells (up to 5m begl) have not recorded such significant high levels. A ground gas risk assessment should be undertaken where the foundation option chosen would penetrate through the peat layer via a piling risk assessment.

Excavations	The exploratory holes completed by Geo-Matters Ltd during our recent investigation works were generally stable for the time they were open. However, all excavations should be assumed to be unstable as a precautionary measure. No man entry into unsupported excavations should therefore be allowed without an appropriate risk assessment by the Client and / or their appointed site contractors. Reference to CIRIA report 97 (1983) should be made to establish a suitable means of support or battering of excavation sides.
Contamination	Chemical analysis results have been compared with current relevant guidance and site-specific screening values which indicates that there are no widespread elevated levels of contaminants present across the site based on the proposed continued end-use. A minor localised sample (TP08 @ 0.1m begl) was recorded requiring further works.
Remediation	Widespread remediation works to protect human health are not considered necessary at this stage subject to the approval of the Regulatory Authorities. Localised removal around TP08 (suggest 1m x 1m x depth of topsoil) of the contaminated soil would be recommended.
Further Works	<ul style="list-style-type: none"> • Piling Risk Assessment to address the areas where the proposed foundation option would penetrate the peat identified at depth; • Validation of localised soil removal around TP08.

The executive summary given above is an overview of the key findings and conclusions of the report. There may be other information contained in the body of the report which puts into context the findings of the executive summary. No reliance should be placed on the executive summary until the whole report has been read in full.

1.0 INTRODUCTION

1.1 Preamble

Geo-Matters Ltd were appointed by Gleeson (hereafter referred to as 'the Client') to undertake a Phase II Geo-Environmental Investigation prior to the construction of a housing area at York Gardens, Gosberton (hereafter referred to as 'the site').

1.2 Report Status

This report provides factual geotechnical and environmental information, alongside associated construction issues and recommendations, in relation to the proposed construction of a housing area (see Section 1.4 below, and our notes concerning our terms and conditions at the end of this report).

This document is written for the use of the client only. No other third party may rely on or reproduce the contents of this report without the prior written approval of Geo-Matters Ltd. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors do not owe them a Duty of Care or Skill.

1.3 Previous Reports

Geo-Matters Ltd have not been made aware of any previous third party geotechnical and / or environmental reports relating to the site.

1.4 Proposed Development

Drawings showing the Site Location Plan (Drawing 001), General Site Features (Drawing 002), General Photographic Record (Drawing 003) and Site Investigation Layout (Drawing 004) are presented within Appendices I, II, III and IV respectively.

1.5 Site Setting, Location and Description

The proposed construction area is situated approximately at grid reference 523988, 331915 as presented on the Site Location Plan (Drawing 001) in Appendix I.

The site is currently an arable field and is surrounded to the north and to the east by other arable fields. To the south and west of the site there are residential dwellings.

Both a Site Features Plan (Drawing 002) and a General Photographic Record (Drawings 003) showing the general aspects of the site are included in Appendix II and Appendix III respectively.

Table 1.0 below presents a summary of the site's geo-environmental setting and related information.

Table 1.0 Geo-Environmental Site Setting

Information Source	Data	Comment
British Geological Survey	Site is shown to be underlain by Superficial Deposits-Tidal Flat Deposits-Clay and Silt. Solid Geology is Oxford Clay Formation-Mudstone.	Cohesive soils may be expected in boreholes or pits during investigation / construction works.
Coal Authority	Site is not shown to be in a Coal Mining Reporting Area.	No further assessments necessary.

It should be noted that a full Phase I 'Desk Study' has not been commissioned at this stage and therefore the above is limited and should only be used for general information purposes at this stage in the absence of further assessments.

2.0 RATIONALE FOR PHASE II INVESTIGATION

2.1 Scope of Environmental Investigation

The following updated potential sources of contamination have been identified based on the recent visits to the site by Geo-Matters Ltd, which required further assessment through intrusive works at the site:

It should be noted that the site is considered unlikely to present a significant source of contamination.

The initial Phase II Environmental Investigation will comprise the recovery of soil samples from all exploratory holes positioned to provide optimum coverage across accessible areas of the site as outlined on the Site Investigation Plan presented in Appendix IV (Drawing 004) in general accordance with BS5930:2015. Samples will be selected for analysis on the basis of their onsite visual descriptions with particular attention given to samples displaying any olfactory evidence of contamination.

All samples will be taken in snap top plastic containers and 250ml amber glass jars or vials as appropriate. All samples will be placed in cooled containers and transported to Geo-Matters Ltd.'s storage facility before awaiting transfer to a UKAS / MCERTS accredited laboratory.

The samples taken during the intrusive investigation will be analysed for a range of contaminants in accordance with NHBC Standards Chapter 4.1 'Land Quality – managing ground conditions' and CLR 8 'Potential Contaminants for the Assessment of Land' (withdrawn but used for reference purposes where applicable).

The soil samples will be analysed for the following parameters: arsenic, cadmium, chromium, copper, nickel, zinc, lead, mercury, selenium, vanadium, hexavalent chromium, sulphate, and phenols, with selected samples also analysed for total petroleum hydrocarbons (TPH) associated with the existing / historical onsite land uses and surrounding land uses. Laboratory Testing data is presented in Appendix VI.

If samples are observed to display widespread visual or olfactory evidence of further contamination (e.g. evidence of asbestos, SVOC / VOCs, or hydrocarbon staining), they shall be scheduled for appropriate analysis.

2.2 Scope of Geotechnical Investigation

The initial geotechnical investigation will comprise the advancement of exploratory locations across accessible areas of the site to determine the characteristics of the soils underlying the site. The visual description of the soils will be used as the basis of determining the basic engineering properties of the soils encountered and all soil logging will be in accordance to BS5930:2015 where applicable.

During site works, samples will be collected; where necessary; to allow for classification testing and chemical analysis to be undertaken to determine the potential effects of soil upon the performance of building materials.

Equivalent *in situ* SPT's / Hand Shear Vane testing will be taken within all exploratory location to allow strength profiling of the underlying strata to be determined.

3.0 SITE WORKS

All fieldwork and soil descriptions were carried out in general accordance with BS EN 14688 'Geotechnical Investigation and Testing – Identification and Classification of Soil' and / or BS5930:2015. Each of the exploratory locations was positioned on site by Geo-Matters Ltd in positions agreed with by the Client prior to site works. The locations of these exploratory holes are shown on the Site Investigation Plan presented in Appendix IV (Drawing 004).

Prior to any excavation, reference was made to the statutory services plans provided to us by the Client and all locations were scanned using specialist utilities detection tools.

All exploratory locations were backfilled with the arisings once representative samples had been obtained.

3.1 Scope of Investigation

A summary of the initial ground investigation undertaken by Geo-Matters Ltd is outlined in the table below:

Table 3.1: Method of Investigation

Method of Investigation	No.	Max Depth (m)	Sampling Regime
Window Sample Drilling	10	5.0	1 & 2
Trial Pit	24	3.40	1 & 2
Cable Percussive Drilling	4	19.50	1 & 2

¹ – 500ml plastic tubs, 250ml amber jars and 40ml glass vials.

² – Bulk bags.

The investigation was carried out under the supervision of suitably qualified Engineers from Geo-Matters Ltd.

Disturbed samples were collected from each discrete horizon within the exploratory holes (where possible) to provide soils for laboratory testing.

Exploratory Hole Logs are presented in Appendix V.

3.2 Limitations to the Investigation

No significant limitations were encountered across the investigation area of the site.

4.0 PHASE II GEOTECHNICAL ASSESSMENT

4.1 Proven Ground Conditions

The geotechnical element of the works was undertaken concurrently with the environmental investigation. The ground conditions encountered within the exploratory locations are summarised in the sections below with the logs for all the exploratory locations presented in Appendix V.

In general, the exploratory holes at the site encountered topsoil overlying clayey sand, silty sand or sandy clay. These were recorded to be overlying medium dense silty sand or soft silty/sandy clay or soft sandy clayey silt. A band of peat was encountered as well between 7m and 9.30m begl. Peat in turn is underlain by stiff to very stiff clay.

4.1.1 Soils – Made Ground / Topsoil

Topsoil was encountered across the site during the recent site works. This was encountered in thickness ranging between 0.20m and 0.3m. Topsoil is found to be dark brown slightly sandy clayey material.

Given the composition and strength observed, the topsoil material is not considered to be suitable bearing strata.

Where topsoil is discussed, it has been described and classified in general accordance with prevailing logging practice (e.g. BS5930 / ISO14688). Additional inspection(s) and analyses will be required should classification of such material be required against standards such as BS3882: 2015 'Specification for Topsoil'.

4.1.2 Soils – Natural Strata

Natural Strata consists of soft to medium dense silty/clayey sand and soft sandy/silty with peat. A band of peat was encountered in BH02, BH03 and BH04 between 7.0m and 9.30m begl. Stiff to very stiff boulder clay is underlying peat. The natural strata encountered across the site made be considered to be a suitable bearing stratum for the proposed development. Alternative foundation options and / or precautions will need to be taken where soft soils are encountered or if site levels are altered significantly.

4.1.3 Visual and Olfactory Observations and Field Measurements

No staining or olfactory evidence of contamination (such as by hydrocarbons or other chemicals) was noted across the site during our recent works.

4.1.4 Groundwater and Excavations

The following observations were noted during the recent site works in relation to perched water / groundwater:

- WS01 – WS10 No water encountered;
- TP01 – TP24 No water encountered;
- BH01 – damp conditions encountered at 2.00m begl;
- BH02 – BH04 No water encountered.

Groundwater / perched groundwater levels at the site are likely to be subject to seasonal variations associated with rainfall etc. Based on the above, it is considered unlikely that dewatering or other forms of water management will be required for shallow short-term excavations across the majority of the site.

4.2 Contamination and Performance of Building Materials

4.2.1 Sulphates

pH concentrations in 10 no. soil samples were analysed as part of the recent investigation. The results were assessed in accordance with the requirements of BRE Special Digest 1 (2005), 'Concrete in Aggressive Ground', assuming mobile groundwater conditions and a greenfield site.

Soil samples were tested for pH and water soluble sulphate. Accordingly, **DS-1 – AC-1** conditions are present across the site in accordance with BRE Special Digest 1 'Concrete in Aggressive Ground 2005'. Minimum concrete specification should be in general accordance with guidance such as the NHBC Standards, Section 3.1.

4.3 Geotechnical Testing

The geotechnical laboratory testing was carried out in accordance with BS EN 14688 'Geotechnical Investigation and Testing – Identification and Classification of Soil'. Full details of the test results are presented in Appendix VI.

Plasticity Index Results

Representative soil samples were tested for Atterberg Limits, with additional samples analysed for moisture content, the results are presented in Table 4.1 overleaf:

Table 4.1: Plasticity Index Results

Determinand	no. of Samples	Range	Remark
Moisture Content	5	24 – 48%	-
% passing 425µm test sieve	5	100.0%	-
Plasticity Index (unmodified)	5	19 – 37%	Low to Medium Platicity
Modified Plasticity Index	5	19 – 37%	Low to Medium Plasticity

On-site cohesive soils have been calculated to have a maximum modified plasticity index of 37%. Therefore, the underlying cohesive strata should be classified as displaying a **Medium** volume change potential as a maximum classification, which should be used when calculating foundation depths across the site in general accordance with the guidance such as the NHBC Standards, Chapter 4.2.

Standard Penetration Testing (SPT)

Equivalent *in situ* SPTs were undertaken at suitable depths within the natural strata in the window sampler exploratory holes advanced across the site. Results are summarised in Table 4.2 (Strata Type) and Table 4.3 (Depth) below and overleaf.

Table 4.2: *In Situ* SPT 'N' Value Results v Strata Type

Strata	'N' Value Range Reported	Remark
Tidal Flats Deposits (above the PEAT)	0 - 9	Very Loose / Soft
Oxford CLAY (below the PEAT)	26 - +50	Stiff to Very Stiff

Table 4.3: *In Situ* SPT 'N' Value Results v Depth

Depth (m begl)	Range Reported
1.0m	4 - 9
2.0m	0 - 7
3.0m	0 - 6
4.0m	1 - 8
5.0m	0 - 5
6.0	0 - 4
7.0m	4 - 8
9.0m	26 - 29
10.0m	34 - 40
11.0m	35 - +50
12.0m	+50
13.0m	+50
15.0m	44 - +50
16.0m	+50
18.0m	+50
19.0m	+50

4.4 Geotechnical Hazards for the Proposed Development

It is understood that the proposed development at the site is to develop a housing area. Table 4.4; overleaf; summarises the main geotechnical hazards identified during intrusive works associated with the proposed development.

Table 4.4: Summary of Geotechnical Hazards

Hazard	Comment
Granular Soils & Groundwater	Granular material were present on site. No significant groundwater was encountered on site although damp / wet comments were noted in the tidal sands at around 2m begl. If significant water is found during construction, then alternative foundation strategies may need to be considered as groundwater will reduce the bearing capacity of these materials.
Cohesive Soils	Laboratory data indicates that cohesive soils at the site are classified as having a maximum medium volume change potential. Foundation depths may therefore need to be deepened in accordance with guidance, especially where within an influencing distance from trees.
Services	Services / utilities are known to cross the peripheries of the site. Foundation layouts may need to compensate for / avoid these features appropriately, or alternatively diversions etc. may be required.
Soft / Weak Soils	Low SPT's have been recorded on site which will necessitate an engineer designed foundation solution which may also need to include the use of piles.
Gas	High methane levels have been recorded from the identified PEAT beneath the site, a pile risk assessment will therefore need to be undertaken where this foundation option is proposed.

Foundations terminating within cohesive soils will need to be deepened due to the maximum recorded **medium** volume change potential of natural soils beneath the site.

Due to the low strengths encountered, it is advised that your structural engineer determines suitable bearing pressures and designs accordingly any proposed shallow foundation within the tidal flats deposits at the site. The bearing capacity within the Oxford Clay from approx. 9m begl is around 200kN/m².

Advice should be sought where foundations straddle variable soil types (i.e. cohesive / granular) as an adjustment of the foundation depths or a suitable mesh reinforcement may be sufficient to mitigate against differential settlement.

4.5 Ground Gas:

Due to the sensitive nature of the proposed redevelopment (residential housing) and identified potential ground gas sources (as discussed in our Phase I report) a ground gas monitoring programme was considered prudent to confirm the absence of risks. A ground gas monitoring exercise was therefore commenced concurrently with the site investigation works discussed herein.

The monitoring is ongoing with ten visits over the last three calendar months (July - October 2021) from up to fourteen monitoring standpipes (namely WS01, WS02, WS03, WS04, WS05, WS06, WS07, WS08, WS09, WS010, BH01, BH02, BH03 and BH04) have been undertaken during varying atmospheric pressures.

Ground gas monitoring sheets are included in Appendix XII.

4.5.1 Ground Gas Assessment Methodology

Interpretation of gas monitoring data is specified in CIRIA C665 (2007) 'Assessing risks posed by hazardous ground gases to buildings', BS 8485:2015+A1:2019 'Code of Practice for the Design or Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings' and other related guidance (as appropriate). This guidance includes the calculation of volumetric flow rates of ground based on maximum recorded gas concentrations and maximum recorded gas flow rates. Limiting factors are applied to the gas monitoring results and a characteristic situation is then applied to the site. This provides a worst-case scenario in relation to the ingress of gas to future structures.

4.5.2 Ground Gas Assessment and Volumetric Flow Rate Calculations

Summary gas data and volumetric flow rate calculations are shown in Tables 4.5 and 4.6.

Table 4.5 Calculation of Volumetric Flow Rates for Deeper Cable Holes

Monitoring Point	Maximum Steady CH ₄ %v/v	Maximum Steady CO ₂ %v/v	Maximum Positive Flow Rate (l/hr)~	CH ₄ Max. Volumetric Flow Rate (l/hr)	CO ₂ Max. Volumetric Flow Rate (l/hr)
BH01	89.6	8.5	15.3	13.71	-
BH02	8.8	8.9	0.3	-	-
BH03	20.2	14.5	7.1	-	1.03
BH04	0.1	1.5	0.0	-	-

*Maximum steady state ground gas concentration multiplied by maximum steady state flow rate to provide a worst-case & conservative risk assessment

As summarised in Tables 4.5 above, the monitoring recorded maximum steady state concentrations of carbon dioxide (CO₂) at 1.03% by volume (v/v) and maximum steady state concentrations of methane (CH₄) at 13.71%.

The high methane readings have been attributed to the peat layer beneath the site. In order to validate this, Geo-Matters Limited were instructed to install further monitoring wells across the site at maximum depths varying between 3-5m begl.

The additional wells were installed and the monitoring program continued in both the borehole wells and window sampler wells – Table 4.6 outlines the results for the shallower Window Sampler wells. Table 4.5 above contained all the monitoring results undertaken in the deeper boreholes.

Table 4.6. Calculation of Volumetric Flow Rates for Shallower Boreholes

Monitoring Point	Maximum Steady CH4 %v/v	Maximum Steady CO2 %v/v	Maximum Positive Flow Rate (l/hr)~	CH4 Max. Volumetric Flow Rate (l/hr)	CO2 Max. Volumetric Flow Rate (l/hr)
WS01	1.7	5.3	0.1	0.002	-
WS02	0.9	3.5	0.3	-	-
WS03	0.1	3.7	0.8	-	-
WS04	0.1	2.8	0.4	-	-
WS05	0.1	7.1	0.6	-	0.043
WS06	0.1	5.0	0.3	-	-
WS07	0.1	4.8	0.1	-	-
WS08	0.3	0.6	0.3	-	-
WS09	0.2	4.5	0.3	-	-
WS10	0.1	0.9	0.1	-	-

*Maximum steady state ground gas concentration multiplied by maximum steady state flow rate to provide a worst-case & conservative risk assessment

As summarised in Tables 4.6 above, the monitoring recorded maximum steady state concentrations of carbon dioxide (CO₂) at 0.043% by volume (v/v) and maximum steady state concentrations of methane (CH₄) at 0.002%.

7.7.3 Ground Gas Classification and Selection of Protection Measures

We have assumed that the criteria for foundations within the Tidal Flats Deposits where methane concentrations have been detected slightly above 1% by volume (v/v) and carbon dioxide slightly above 5% by volume (v/v), the site is therefore classified in accordance with BS8485:2015+A1:2019 as CS1 (equivalent to a C665 / NHBC classification of Amber 1). Although as both Methane and Carbon Dioxide have gone over their threshold then we would advise increasing to CS2 / Amber 1 respectively.

For foundations where a piled solution is proposed then a Piling Risk Assessment against gasses will need to be undertaken to determine the gas risk

Based upon the categorisation of the proposed development (private residential dwellings, as described in Table 3 of BS8485:2015+A1:2019), a 'Type A' building type has been established. At this stage, based upon Table 4 of BS8485:2015+A1:2019, this would require a 'gas protection score' of 3.5 points, see Table 4.7 below.

Table 4.7 Gas Protection Score Matrix (Assumed Designs)

Feature	Design Notes*	Score (from BS8485:2015)	Comments
Floor Design (Table 5 BS8485:2015)	Ground Bearing Raft with limited service penetration	0.5 - 1.5	Assumed Design
Ventilation Type (Table 6 BS8485:2015)	Passive Sub-Floor Void (assumed to be clear of obstructions and min. thickness 200mm)	1 - 2.5	Ranged based upon performance, clear void with adequate venting beneath / through cavity should be at the upper end of the range shown.
Membrane (Table 7 BS8485:2015)	Meeting Min. Standards BS8485:2015~	2.0#	Min. 0.4mm thickness (equivalent to 370g/m ² for polyethylene) reinforced membrane (virgin polymer).
Overall Design	Based on all above Design Notes	6.0	Total score.

* Based on the assumed design, subject to Client confirmation and submission of design detail drawings to appropriate regulators.

~ As outlined in BS8485:2015+A1:2019 the performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints.

If a membrane is installed that does not meet all the criteria in column 1 of Table 7 of BS8485:2015 then the score is zero.

If the Client's proposed design with respect to ground gas protection measures adheres to / corresponds with the details listed in the table above, then no additional measures should be required (subject to the considerations below and subject to regulatory / NHBC approval). Apart from those discussed in the 'Additional Considerations' section below.

In addition to the above (and / or for clarification) this would therefore provisionally require the following for the site, subject to Regulatory Authority / NHBC approval:

General Precautions:

- Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft).
- All joint and penetrations sealed.
- Proprietary gas resistant membrane and ventilated or positively pressurised underfloor sub-space.
- Oversight capping
- In-ground venting layer and in-ground venting wells or barriers.

NHBC Traffic Light System – Amber 1:

- Ventilation – subfloor venting to achieve at least one air exchange per day.
- Membrane- must be suitable for purpose (criterion detailed in BS8485 clause 7.2.4).
- Membrane installation to achieve complete integrity across entire building footprint. Penetrations and joints sealed.

7.7.4 Verification Requirements

In accordance with the latest NHBC guidance, BS8485:2015+A1:2019 and CIRIA C735, appropriate verification should be undertaken to ensure that the required ground gas protection measures have been correctly installed and maintained (i.e. to prevent damage etc.) for all required structures at the site. It is recommended that site staff develop, maintain and update an appropriate installation and verification plan in accordance with the aforementioned guidance documents to complement this.

5.0 ANALYSIS, RESULTS AND INTERPRETATION

5.1 Chemical Analyses of Soils

A combined set of currently available authoritative and 'best practice' soil screening values has been used to initially determine risks to future site users. This includes DEFRA 'Category 4 Screening Levels' (C4SLs) and similar screening values from third parties (e.g. LQM, CIEH etc.).

With reference to the construction of a housing area, the standard CLEA 'residential with plant uptake' also known as the 'residential with home-grown produce' end-use scenario is considered to be appropriate at this stage. Should a less sensitive end-use be proposed then the findings of this investigation may need to be updated / revised accordingly.

Due to ongoing revisions to the contaminated land assessment framework (including the derivation and release of authoritative screening values), the following assessment (and related conclusions / recommendations) may be revised by Geo-Matters Ltd should replacement screening values etc. be released in the near future.

5.1.1 Testing

Representative soil samples from the exploratory locations were analysed for the range of contaminants outlined earlier in this report. Representative samples of the near surface and underlying natural strata were analysed. The environmental analysis was scheduled by Geo-Matters Ltd and carried out by a UKAS / MCERTS accredited laboratory.

The full details of the chemical test results are presented in Appendix VI and are summarised in Table 5.1 overleaf.

Table 5.1: Laboratory Analysis of Soil Samples

Determinand	No. of Samples Analysed	Concentration Max (mg/kg)	Tier 1 Screening Values (mg/kg)	No. Exceeding Threshold
Metals				
Arsenic	10	19	37.0 ^b	0
Cadmium	10	<0.2	110 ^b	0
Chromium (Total)	10	30	910.0 ^b	0
Chromium VI	10	<4.0	6.0 ^b	0
Lead	10	33	200.0 ^a	0
Selenium	10	<1.0	250.0 ^b	0
Nickel	10	25	130.0 ^b	0
Copper	10	20	2400.0 ^b	0
Zinc	10	72	3700.0 ^b	0
Mercury	10	<0.3	40 ^b	0
Organics and Inorganics				
Benzo(a)pyrene	10	<0.05	3.2 ^b	0
PAHs	10	<0.8	Various	0
TPH C ₆ -C ₁₀	7	<0.1	27.0 ^b	0
TPH >C ₁₀ -C ₂₅	7	81	74.0 ^b	1
TPH >C ₂₅ - C ₄₀	7	<10	1100.0 ^b	0
Asbestos	2	Non-Detected	-	ND
Pesticide	3	Non-Detected	-	ND

^a DEFRA C4SL values for a 'residential with produce' end use;

^b LQM 'S4UL' values (at 1% SOM for organics) for a 'residential with produce' end use (Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3676 All Rights Reserved);

^c Geo-Matters Ltd general screening level;

* Contaminants all recorded below laboratory limits of detection; and

N/A = Not Applicable, ND = Not Detected, D = Detected.

5.2 Summary of Chemical Analysis

Metals

None of the samples analysed for Metals recorded any exceedances across the site against the relevant guidance, therefore no risks are present at the site from these determinands within the locations tested.

Organics and Inorganics

None of the samples analysed for Organics and Inorganics recorded any significant exceedances across the site against the relevant guidance. One minor exceedance was recorded in TP08 at 0.1m begl (81mg/kg against 74mg/kg). Therefore a highly localised risk may be present at the site within the locations tested.

General Contaminants

Visual, Olfactory and Field Measurements

No significant visual or olfactory evidence of any other potential contamination was noted within any other exploratory locations advanced at the site.

6.0 PHASE II ENVIRONMENTAL ASSESSMENT

6.1 Phase II Conceptual Model

6.1.1 Site Summary

The results of the chemical testing analyses indicate that **no** determinands have been recorded at concentrations sufficient to act as a source in a SOURCE-PATHWAY-RECEPTOR scenario. The SOURCE-PATHWAY-RECEPTOR characteristics have been re-assessed as outlined in Table 6.1 below.

Table 6.1: Identified Pollutant Linkages¹

Potential Source	Pathway	Receptors					SPL*
		Controlled Waters	Ground workers	End-users	Flora	Building materials	
Metal / metalloids and inorganics in SOIL	Direct Ingestion						N/A
	Dermal Contact						N/A
	Inhalation						N/A
	Leaching/direct movement						
Asbestos containing materials in SOIL	Inhalation						N/A
Organics in SOIL (hydrocarbons, pesticides, pathogenic bacteria, PAHs etc.)	Direct Ingestion		✓	✓	✓		✓
	Dermal Contact		✓	✓	✓		✓
	Inhalation		✓	✓	✓		✓
	Leaching/direct movement						N/A
Metal / metalloids and inorganics in CONTROLLED WATER	Direct Ingestion						N/A
	Dermal Contact						N/A
	Inhalation						N/A
	Leaching/direct movement						N/A
Organics in CONTROLLED WATER (hydrocarbons, PAHs etc.)	Direct Ingestion						N/A
	Dermal Contact						N/A
	Inhalation						N/A
	Leaching/direct movement						N/A
GROUND GAS[#] (Carbon Dioxide and Methane)	Direct Ingestion			✓			✓
	Inhalation			✓			✓
	Leaching/direct movement			✓			✓

*Subject to Local Authority / NHBC approval; and

¹ Where boxes in the above table are empty it indicates that feasible pollutant linkages have not been identified based on the ground investigation findings presented herein.

- near surface <5m begl

6.1.2 Model Status, Uncertainty and Justification

On the basis of the above and also upon available data, the geo-environmental setting and proposed end-uses, a qualitative Source-Pathway-Receptor risk assessment (Table 6.2) is presented below.

Table 6.2: Qualitative Risk Assessment Summary Table

Source	Pathway	Target (Receptor)	Comments	Risk Level	Action*
Metals / Metalloids in soils and dust	Direct ingestion (active) Inhalation (passive) Dermal contact.	Ground workers, End users	Significant contamination was not encountered	LOW	NO FURTHER ACTION REQUIRED
Metals / Metalloids in soils and dust	Near surface soils	Plants within the proposed landscaped areas and gardens.	Significant contamination was not encountered	LOW	NO FURTHER ACTION REQUIRED
Metal / Metalloids compounds in waters	As above (plus skin contact)	Ground workers, Site users	Significant groundwater was not encountered	LOW	NO FURTHER ACTION REQUIRED
Inorganics in soils and dust	Direct ingestion (active) Inhalation (passive)	Ground workers, End users and the Property	Significant contamination was not encountered	LOW	NO FURTHER ACTION REQUIRED
Organic compounds in soils and dust	As above (plus skin contact)	Ground workers, Site Users	Widespread significant contamination was not encountered	LOW	MINOR REMOVAL REMEDIAL WORKS
Organic compounds in waters	As above (plus skin contact)	Ground workers, Site Users	Significant groundwater was not encountered	LOW	NO FURTHER ACTION REQUIRED
Ground Gas [#]	Inhalation (Passive), Ingress	End-Users	Widespread Significant ground gas was not recorded	LOW	CS2 / AMBER 1 REGIME
Asbestos	Inhalation (passive), Ingress	End users	Asbestos was not encountered	LOW	NO FURTHER ACTION REQUIRED

Notes: LOW / MODERATE / HIGH - Risk level is assigned a low / moderate / high qualitative value, based on assessed requirement for action in context of Part II EPA 90;

* Subject to Local Authority Approval.

[#] - near surface <5m begl

6.3 Site Status

Human Health Risks

The Phase II Conceptual Model and the Qualitative Risk Assessment outlined above indicate that generally soils should be treated as **uncontaminated**, except one highly localised area around TP08 subject to regulatory authority approval.

7.0 RECOMMENDATIONS

The conclusions and recommendations presented below are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and therefore copies of this report should be sent to the appropriate Regulatory Authorities and / or other organisations (as appropriate) by the Client for their comments and approval prior to undertaking any irrecoverable works associated with the subject site.

- 7.1 Enabling / Earthworks:** Specific testing (e.g. waste acceptance criteria testing) may be required at the discretion of the Client's designated waste handler if the off-site movement / disposal of soils is undertaken. Where applicable, such requirements must be verified directly with them by the Client. Where soils are imported; or re-use on site; there will be the necessity to ensure compliance with all regulatory licensing procedures (i.e. U1, MMP etc) and also to validate the soils prior to importation, subject to the approval of the Local Authority / NHBC.
- 7.2 Foundations:** Highly variable ground conditions have been recorded during the recent investigation and during previous investigations. Given this variability site-wide shallow / traditional foundation recommendation is not considered to be appropriate for the proposed development, and it is therefore recommended that a mixture of foundation options will need to be considered / engineer designed (e.g. raft and / or piled foundations) should be adopted for the site. Due to the recorded soft ground within the Tidal Flats Deposits, it is recommended that your structural engineer will need to engineer design a site wide solution in this stratum. For piled foundations deepened into the competent Oxford Clay then we would recommend that from approx. 9m the allowable bearing capacity would be 200kN/m².
- 7.3 Floor Slabs:** Your structural engineer will need to provide suitable floor slab design within their Engineer designed foundation solution within the Tidal Flats Deposits although a suspended slab will be required where a piled solution is proposed.
- 7.4 Building Near Trees:** Cohesive soils were recorded across the site therefore foundation designs / floor slabs may need to be adjusted in general accordance with guidance such as the NHBC Standards (Chapter 4.2). Soils of **medium** volume change potential should be assumed across the site when calculating foundation depths for such assessments. It is recommended that any proposed planting be chosen so as to have no detrimental impact on the proposed development.

7.5 Groundwater: Widespread groundwater was not encountered across the site although several locations have recorded damp/wet soils from approx 2.0 m begl. Groundwater / perched groundwater levels at the site are likely to be subject to seasonal variations associated with rainfall etc. Based on the above, it is considered unlikely that significant dewatering or other forms of water management will be required for excavations across parts of the site.

7.6 Drainage: At this stage it is considered that the soils encountered during our recent site investigation will not be suitable for in situ drainage (i.e. soakaways) due to the predominantly cohesive nature / low strengths of the materials encountered.

All drainage proposals are subject to *in situ* testing and should be agreed with the Local Authority prior to finalising designs. All drainage strategies should be approved by the relevant statutory authority prior to implementation and must adhere to the standard design and ground setting requirements, upon which your appointed drainage design engineers should advise you.

7.7 Ground Gas: Significant gas has been monitored within the gas wells installed through the peat but the shallower gas wells (up to 5m begl) have not recorded such significant high levels. A ground gas risk assessment should be undertaken where the foundation option chosen would penetrate through the peat layer via a piling risk assessment.

Ground gas monitoring sheets are included in Appendix XII.

7.8 Excavations: The exploratory holes completed by Geo-Matters Ltd during our recent investigation works were generally stable for the time they were open. However, all excavations should be assumed to be unstable as a precautionary measure. No man entry into unsupported excavations should therefore be allowed without an appropriate risk assessment by the Client and / or their appointed site contractors. Reference to CIRIA report 97 (1983) should be made to establish a suitable means of support or battering of excavation sides.

7.9 Contamination: Chemical analysis results have been compared with current relevant guidance and site-specific screening values which indicates that there are **no** widespread elevated levels of contaminants present across the site based on the proposed continued end-use. A minor localised sample (TP08 @ 0.1m begl) was recorded requiring further works.

7.10 Remediation: Widespread remediation works to protect human health are **not** considered necessary at this stage subject to the approval of the Regulatory Authorities. Localised removal around TP08 (suggest 1m x 1m x depth of topsoil) of the contaminated soil would be recommended.

7.11 Further Works: At this stage the further works are deemed necessary subject to comments from the Regulatory Authorities:

- Piling Risk Assessment to address the areas where the proposed foundation option would penetrate the peat identified at depth;
- Validation of localised soil removal around TP08.

INFORMATION SOURCES

Geological data	British Geological Survey (BGS) 1:50,000 scale Series Solid and Drift Edition. Coal Mining Searches, The Law Society Guidance Notes and Directory 1998 Edition.
Environmental	<p>BRE Report BR211 <i>"Radon: Guidance on protective measures for new dwellings"</i> (2015 Edition).</p> <p>Environment Agency (EA) & DEFRA: <i>"Model Procedures for the Management of Land Contamination – Contaminated Land Report 11"</i> (CLR11) (2004)</p> <p>Department for Environment, Food and Rural Affairs (DEFRA) – <i>"SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document"</i> (December 2014)</p> <p>DEFRA and Contaminated Land: Applications in Real Environments (CL:AIRE) <i>"SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination: Final Project Report"</i> (Revision 2 dated 24th September 2014)</p> <p>Chartered Institute of Environmental Health (CIEH): <i>"Professional Practice Note: Reviewing human health risk assessment reports invoking contaminant oral bioavailability measurements or estimates"</i> (2009)</p> <p>CL:AIRE in Association with EIC and AGS: <i>"Soil Generic Assessment Criteria for Human Health Risk Assessment"</i> (updated January 2010 version) (Reference purposes)</p> <p>Food Standards Agency: Factsheet 13/10 (Edible Crops) <i>"Monitoring Microbial Food Safety of Fresh Produce"</i> (July 2010)</p>

Terms and Conditions

This report has been prepared for the sole use and reliance of the Client and their appointed agents (e.g. Geo-Matters Ltd). No other third party may rely upon or reproduce the content of this report without the written approval of Geo-Matters Ltd. If any unauthorised third party comes into possession of this report, they rely upon it entirely at their own risk and the authors do not owe them any warranty, duty of care or skill.

The findings and recommendations made in this report are based on published information (as referenced in Section 3 and at the end of this report). Geo-Matters Ltd cannot accept responsibility for the reliability and authenticity of published information or reports prepared by third parties. There may be conditions prevailing on site which have not been revealed by this assessment and which have not been taken into account by this report. Responsibility cannot be accepted for any conditions not revealed by this investigation and assessment. It should be noted that groundwater levels etc. may vary due to seasonal and other effects. Whilst it may be utilised by others for reference purposes at the Client's discretion, it has not been prepared for any other purposes (e.g. waste classification, drainage excavations etc.) and therefore additional works may be required by third parties dependent upon their own requirements / works. Any works which are proposed at greater depths than reported herein may require confirmatory investigation works as necessary.

Should the development proposals alter (e.g. layout, type or foundation option), then the recommendations in this report may be subject to change.

The conclusions and recommendations presented herein are considered reasonable based on the assessments of the site undertaken by Geo-Matters Ltd. However, these cannot be guaranteed to gain regulatory approval and therefore copies of this report should be sent to the appropriate regulatory authorities and / or other organisations (as appropriate) by the Client for their comments and approval prior to undertaking any irrecoverable works associated with the site.

The possibility of significant variation in ground conditions existing between / beneath test locations / depths cannot be discounted and must be considered within the design proposals for the subject site. All soakaway designs should be approved by the relevant statutory authority prior to implementation and must adhere to the standard design and ground setting requirements, upon which your appointed drainage design engineers should advise you.

Standard Risk Assessment – Considerations and Methodology

Geo-Matters Ltd have based our standard risk assessment methodology upon current legislation and prevailing best practice and available guidance. This includes the DEFRA / EA document 'Contaminated Land Report 11 (CLR11) Model Procedures for the Management of Land Contamination' (2004) and the NHBC / EA / CIEH document 'Guidance for the Safe Development of Housing on Land Affected by Contamination' (2008).

Our risk assessment methodology is based upon a phased approach, which takes the following steps:

1. Hazard Identification and Assessment:

- a. Preliminary risk assessment;
- b. Derivation of initial conceptual site model (CSM); and
- c. Identification of feasible pollutant linkages (which leads onto step '2' if identified).

2. Risk Estimation and Evaluation:

- a. Investigation of the identified potential risks (as highlighted in CSM);
- b. Completion of Generic Quantitative Risk Assessment (GQRA); and
- c. Evaluation of risks / confirmation of pollutant linkages (leading onto step '3' if identified).

3. Remediation Design / Implementation / Verification:

- a. Completion of Detailed Quantitative Risk Assessment (DQRA) if necessary;
- b. Collation of remedial strategy;
- c. Implementation of remedial strategy / validation; and
- d. Final reporting.

Risk terminology and classification is defined through standard wording and descriptions, as contained in the documents referenced above. This includes the balance, comparison and assessment of risk as a dynamic categorisation / classification of probability vs. possible consequence(s), as shown in the table A1 below:

Table A1: Risk Categorisation					
Probability (Likelihood)		Consequence			
		<i>Severe</i>	<i>Medium</i>	<i>Mild</i>	<i>Minor</i>
	<i>High Likelihood</i>	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	<i>Likely</i>	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	<i>Low Likelihood</i>	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	<i>Not likely</i>	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Risk levels are described as follows:

Table A1: Risk Level Descriptions	
Term	Description
Very High Risk	A high probability exists that severe / significant harm could arise to someone or something from the hazard which has been identified. Remedial action is required.
High Risk	Harm is likely to arise to someone or something from the hazard which has been identified. Remedial action is usually required.
Moderate Risk	Harm could potentially arise to someone or something from the hazard which has been identified without remedial action, although it is considered to be relatively <u>unlikely</u> that such harm would be severe.
Low Risk	Harm could theoretically arise to someone or something from the hazard which has been identified without remedial action, although it is considered that any effects would be mild.
Very Low Risk	Harm is not likely to arise to someone or something from the hazard which has been identified.

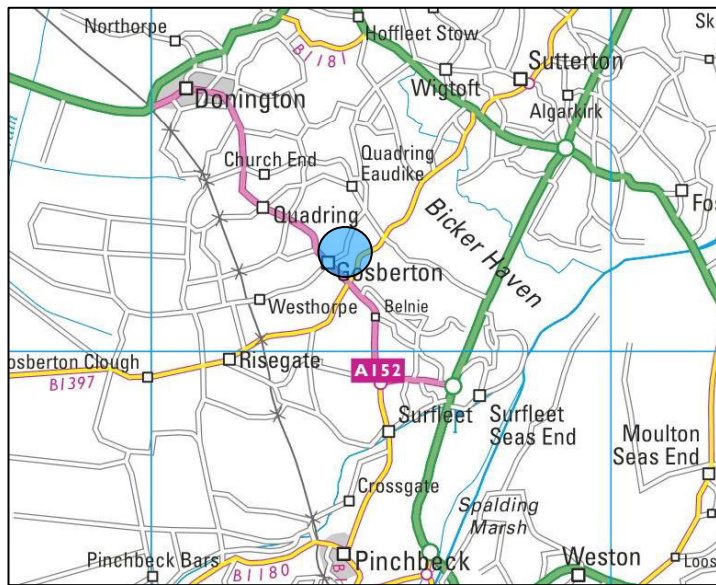
The NHBC / EA / CIEH document 'Guidance for the Safe Development of Housing on Land Affected by Contamination' (2008) defines the following (reproduced verbatim):

"Severity (consequence) can be defined as the adverse effects (or harm) arising from a defined hazard, which impairs the quality of human health or the environment in the short or longer term. For example a consequence defined as "Severe" could be defined as "Highly elevated concentrations likely to result in 'significant harm' to human health as defined by the EPA 1990, Part 2A, if exposure occurs". The type and form of the contaminant needs to be known in order to understand the effect on humans and therefore severity of potential harm. For instance different forms of cyanide behave differently. Complex cyanide ("blue billy") is relatively "non toxic" whereas free cyanide is "highly toxic" (Environment Agency 2002b).

Probability can be defined as the chance of a particular event occurring in a given period of time. For example, a "High Likelihood" could be defined as "where 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"

APPENDIX I

Site Location Plan

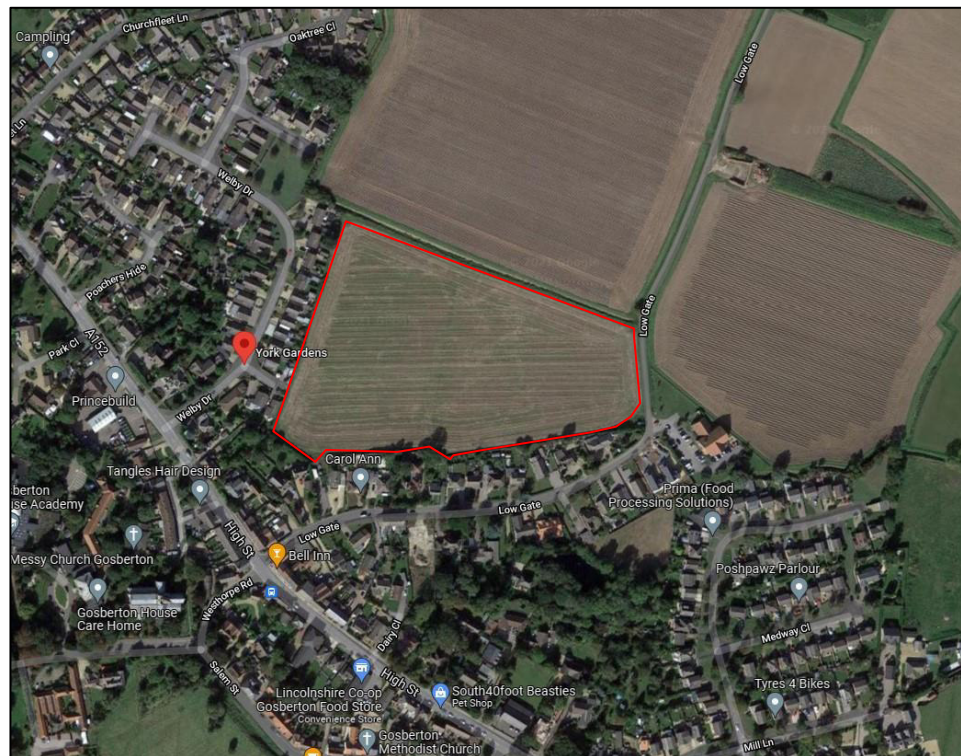


DO NOT SCALE

NOTES:

 Approx. Site Location

 Approx. Site Boundary



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consulting engineers

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info@geo-matters.com

CLIENT:

gleeson

PROJECT:

York Gardens, Gosberton

TITLE:

Site Location Plan

SCALE@SIZE :

NTS

ISSUE:

Final

DESIGN/DRAWN :

AZ

DATE:

Oct. 2021

PROJECT No:

GML21156

DRAWING No:

001

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APPENDIX II

Site Features Plan



DO NOT SCALE
NOTES:
 Approx. Site Boundary

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gleeson

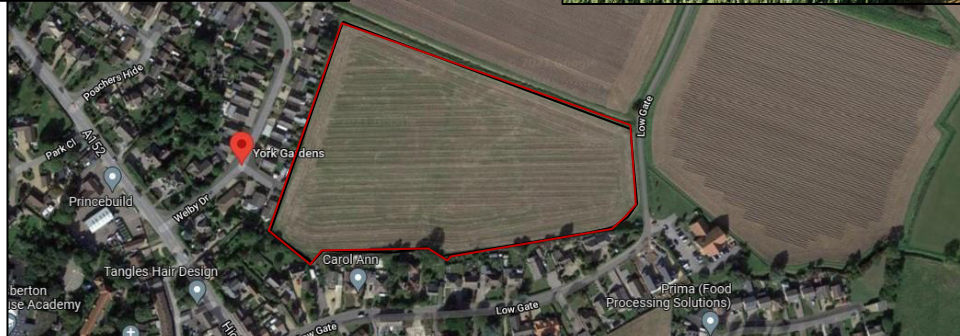
PROJECT:
York Gardens, Gosberton

TITLE:
Site Features Plan

SCALE@SIZE : NTS	ISSUE: Final
DESIGN/DRAWN : AZ	DATE: Oct. 2021
PROJECT No: GML21156	DRAWING No: 002

APPENDIX III

General Photographic Record



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NOTES:



Approx. Site Boundary



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TITLE:

General Photographic Record

SCALE@SIZE :

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ISSUE:

Final

DESIGN/DRAWN :

AZ

DATE:

Oct. 2021

PROJECT No:

GML21156

DRAWING No:

003a

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WS01



WS02



WS03



WS04



WS06



WS07

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NOTES:



Approx. Site Boundary

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TITLE:

Window Sampling Photographic
Record

SCALE@SIZE :

NTS

ISSUE:

Final

DESIGN/DRAWN :

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DATE:

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003b

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TP05



TP03



TP13



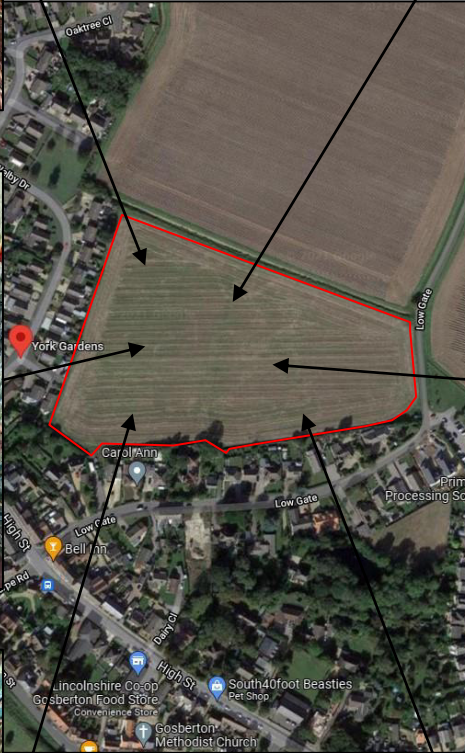
TP10



TP23



TP16



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NOTES:



Approx. Site Boundary



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PROJECT:

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TITLE:

Trial Pit Photographic Record

SCALE@SIZE :

NTS

ISSUE:

Final

DESIGN/DRAWN :

AZ

DATE:

Oct. 2021

PROJECT No:

GML21156

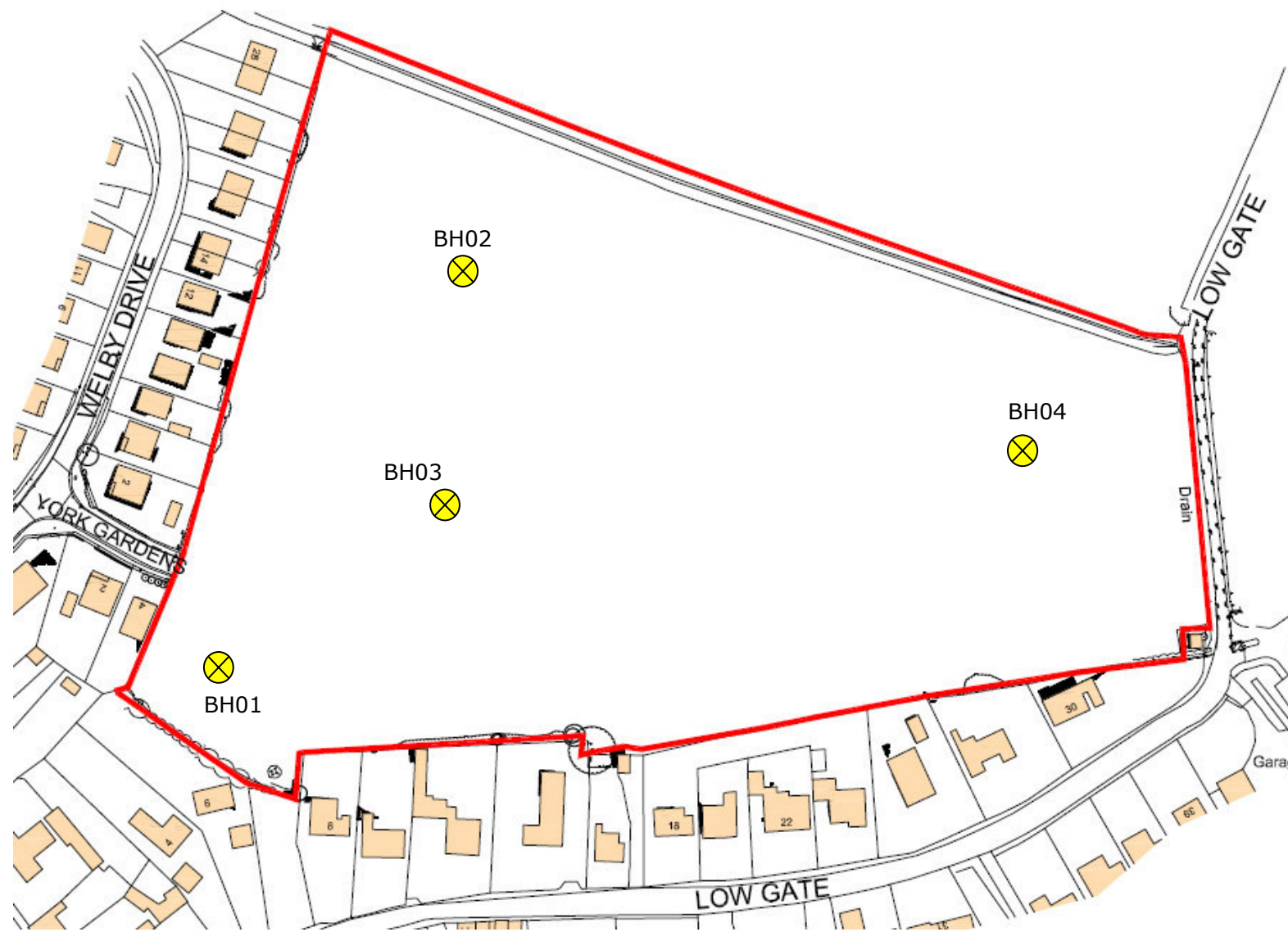
DRAWING No:

003c

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APPENDIX IV

Site Investigation Plan



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NOTES:



 Cable Locations



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CLIENT:


PROJECT:
York Gardens, Gosberton

TITLE:
Exploratory Location Plan

SCALE@SIZE : NTS	ISSUE: Final
DESIGN/DRAWN : ML	DATE: July 2021
PROJECT No: GML21156	DRAWING No: 004a

DO NOT SCALE
NOTES:



 Window Sample Locations

Even Numbers = 5m Depth

Odd Numbers = 3m Depth.

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CLIENT:

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PROJECT:

York Gardens, Gosberton

TITLE:

Exploratory Location Plan

SCALE@SIZE :

NTS

ISSUE:

Final

DESIGN/DRAWN:

ML

DATE:

Sept 2021

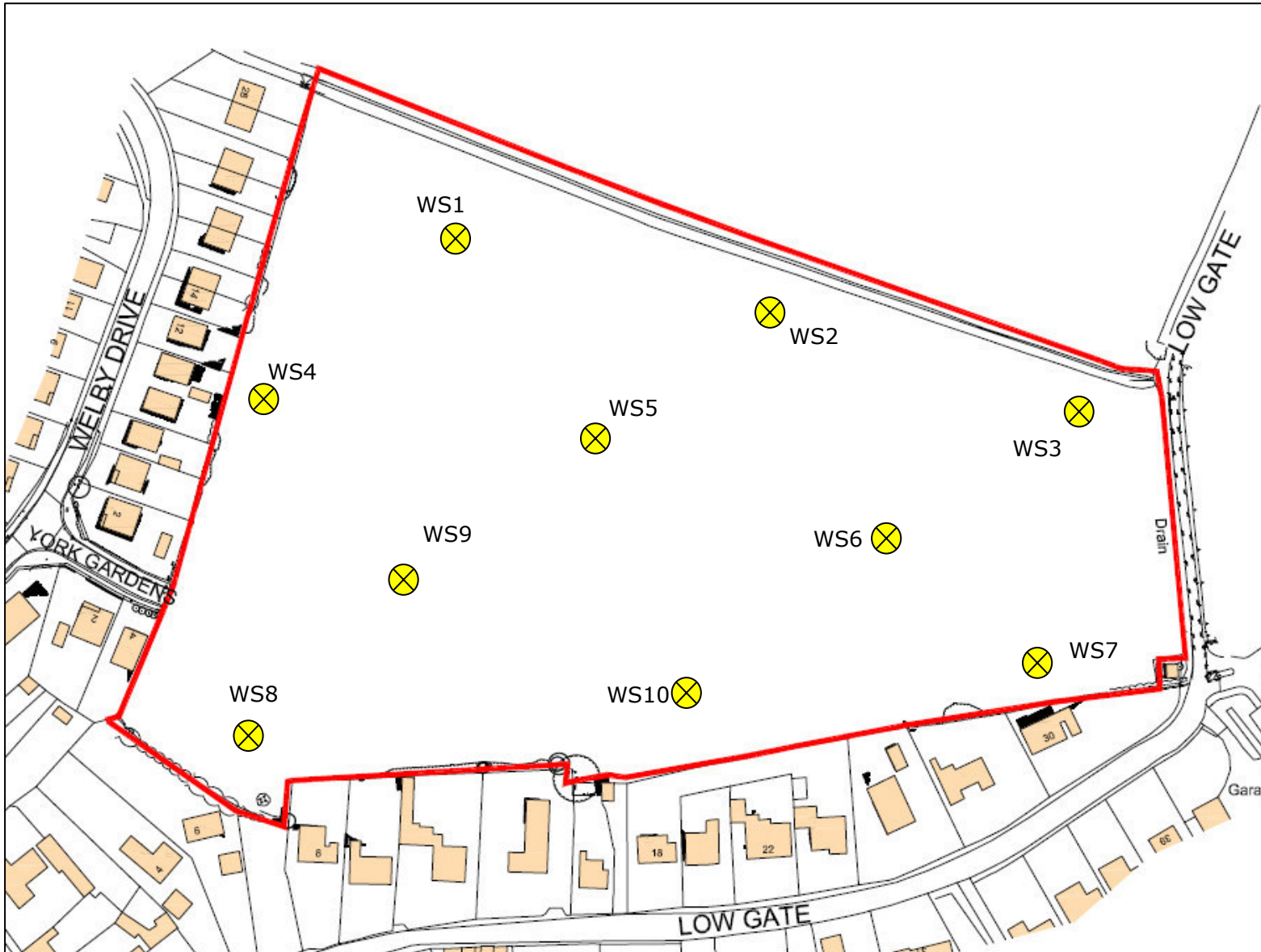
PROJECT No:

GML21156

DRAWING No:

004b

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APPENDIX V

Exploratory Hole Logs

		Site: York Gardens, Gosberton		TP01	
		Client: Gleeson			
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1	
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021	
Field Monitoring and Sampling		Strata		Legend	
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description	
0.10	JT	HSV @ 1.10m = 110, 120, 120	0.20	Dark brown slightly sandy clayey TOPSOIL.	
				0.20	Stiff yellowish brown sandy CLAY.
1.20	JT		1m		
					... becoming firm to stiff from 1.60m depth.
1.90	B	HSV @ 2.10m = 70, 79, 80	2m		
				2.70	Soft dark grey silty CLAY.
				3.30	Exploratory location completed at 3.30m depth.
		HSV @ 3.30m = 29, 29, 31	4m		
				5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021	
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD	
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion			
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton		TP02
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.40	JT	HSV @ 1.50m = 42, 48, 62	0.20	Dark brown slightly sandy clayey TOPSOIL.
2.10	JT		1m	Stiff yellowish brown sandy CLAY.
2.20	B	HSV @ 3.10m = 23, 27, 31	2m	... becoming firm from 1.20m depth.
			2.60	Soft dark grey silty CLAY.
			3m	
			3.20	Exploratory location completed at 3.20m depth.
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP03
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.20	JT	HSV @ 0.60m = 120, 120, 120	0.20	Dark brown slightly sandy clayey TOPSOIL.
0.70	B		1m	Stiff yellowish brown sandy CLAY.
1.70	JT	HSV @ 1.60m = 96, 120, 120	2m	... becoming firm from 2.00m depth.
		HSV @ 2.00m = 50, 53, 57	2.60	Soft dark grey silty CLAY.
			3.00	Exploratory location completed at 3.00m depth.
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP04
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.60	JT	HSV @ 3.00m = 25, 28, 32	0.20	Dark brown slightly sandy clayey TOPSOIL.
				Yellowish brown slightly clayey SAND. (approx. medium dense)
1.00				
1.50	B			Dark grey silty SAND. (approx. medium dense)
1.90	JT			
2.40				Soft brown sandy silty CLAY.
			3.20	Exploratory location completed at 3.20m depth.
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP05
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.10	JT		0.20	Dark brown slightly sandy clayey TOPSOIL.
			1m	Yellowish brown slightly clayey SAND. (approx. medium dense)
1.30	JT		1.20	Firm brown sandy SILT/CLAY.
2.30	B	HSV @ 2.00m = 58, 62, 68 HSV @ 2.70m = 30, 32, 33	2.40	Soft dark grey silty CLAY.
			3.00	Exploratory location completed at 3.00m depth.
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP06
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
1.00	JT		0.20	Dark brown slightly sandy clayey TOPSOIL.
			1m	Yellowish brown slightly clayey SAND (approx. medium dense).
				1.30
2.10	JT	HSV @ 2.00m = 65, 73, 78	2m	
2.50	B	HSV @ 2.50m = 25, 26, 29	2.30	Soft dark grey silty CLAY.
			2.70	Exploratory location completed at 2.70m depth.
			3m	
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP07
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.20	JT	HSV @ 1.10m = 120, 120, 120	0.30	Dark brown slightly sandy clayey TOPSOIL.
1.20	B		1m	Stiff yellowish brown sandy CLAY.
1.50	JT	2m	2.20	
		HSV @ 1.70m = 120, 120, 120	2.90	Soft dark grey silty CLAY.
			3m	Exploratory location completed at 2.90m depth.
		HSV @ 2.80m = 22, 24, 27	4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP08
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.10	JT	HSV @ 1.70m = 61, 62, 71	0.20	Dark brown slightly sandy clayey TOPSOIL.
1.90 2.00	JT B		HSV @ 2.70m = 21, 23, 25	1m
		2m		
		2.20		Soft dark grey silty CLAY.
		2.80		Exploratory location completed at 2.80m depth.
			3m	
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP09
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.50	JT	HSV @ 1.80m = 61, 65, 69	0.40	Dark brown slightly sandy clayey TOPSOIL.
1.70	B		1m	Stiff yellowish brown sandy CLAY. ... becoming firm from 1.50m depth.
2.10	JT		2m	Soft dark grey silty CLAY.
			2.80	Exploratory location completed at 2.80m depth.
			3m	
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 28/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP10			
		Client: Gleeson					
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1			
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021			
Field Monitoring and Sampling		Strata		Legend			
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description			
0.80	B	HSV @ 1.90m = 81, 82, 93	0.20	Dark brown slightly sandy clayey TOPSOIL.			
			1m	Stiff yellowish brown sandy CLAY.			
					2m		
						2.90	
			3.10	Soft dark grey silty CLAY.			
1.90	JT	Exploratory location completed at 3.10m depth.	4m	5m			
2.30	JT						
Sheet 1 of 1 Logged by: PD					Groundwater: No groundwater encountered during excavation.		Date : 28/06/2021 Logged by: PD
EXPLORATORY RECORD					Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
					Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP02	
		Client: Gleeson			
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1	
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021	
Field Monitoring and Sampling		Strata		Legend	
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description	
0.10	JT	HSV @ 1.90m = 54, 55, 61 HSV @ 2.10m = 45, 49, 59	0.20	Dark brown slightly sandy clayey TOPSOIL.	
1.00	JT		1m		Stiff yellowish brown sandy CLAY.
					... becoming firm from 1.70m depth.
				2.00	Soft/firm brown clayey SILT.
2.40	B		3m	2.90	Soft dark grey silty CLAY.
				3.20	Exploratory location completed at 3.20m depth.
		4m			
			5m		
Sheet 1 of 1		Groundwater:		Date : 28/06/2021	
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD	
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion			
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton		TP12
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.10	JT	HSV @ 3.30m = 18, 19, 20	0.20	Dark brown slightly sandy clayey TOPSOIL.
				Yellowish brown slightly clayey SAND (approx. medium dense).
1.20	B		1m	
1.60	JT		1.50	Grey silty SAND (approx. medium dense).
			2m	
			2.20	Very soft grey silty CLAY.
			3m	
			3.40	Exploratory location completed at 3.40m depth.
			4m	
			5m	

Sheet 1 of 1	Groundwater:	Date : 28/06/2021
Logged by: PD	No groundwater encountered during excavation.	Logged by: PD
EXPLORATORY RECORD		
Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		
Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP13
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.80	JT	HSV @ 1.90m = 62, 81, 93	0.20	Dark brown slightly sandy clayey TOPSOIL.
			1m	Yellowish brown slightly clayey SAND (approx. medium dense).
1.20	Firm to stiff brown slightly sandy silty CLAY.			
2m	Soft grey silty CLAY.			
2.20	Exploratory location completed at 3.20m depth.			
2.00	B	3m		
		3.20		
		4m		
		5m		

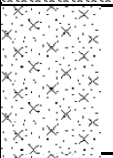
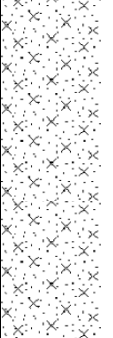
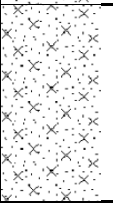
Sheet 1 of 1	Groundwater:	Date : 28/06/2021
Logged by: PD	No groundwater encountered during excavation.	Logged by: PD
EXPLORATORY RECORD		
Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		
Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

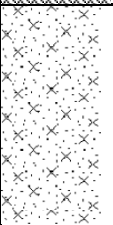
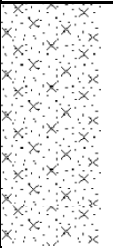
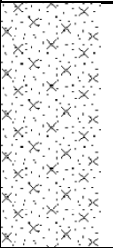
		Site: York Gardens, Gosberton		TP14
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.10	JT	HSV @ 1.90m = 41, 52, 53 HSV @ 2.90m = 20, 21, 22	0.20	Dark brown slightly sandy clayey TOPSOIL.
0.90	JT		1.10	Yellowish brown slightly silty SAND (approx. medium dense).
			2.50	Firm light brown mottled grey silty sandy CLAY.
			3.20	Very soft/soft dark grey mottled light brown clayey SILT.
1.80	B			Exploratory location completed at 3.20m depth.
Sheet 1 of 1		Groundwater:		Date : 29/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP15
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.40	JT	HSV @ 0.80m = 91, 92, 110	0.20	Dark brown slightly sandy clayey TOPSOIL.
0.90	B		1m	Stiff light brown mottled grey silty sandy CLAY. ... becoming soft to firm from 1.50m depth.
2.10	JT	HSV @ 2.00m = 40, 58, 58	2.20	Soft dark grey mottled light brown clayey SILT.
			2.90	Exploratory location completed at 2.90m depth.
			3m	
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 29/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

Contractor: N/A				Project No: GML21156		Sheet: 1 of 1	
Equipment: JCB 3CX Excavator				Logged by: PD		Date: 29th June 2021	
Field Monitoring and Sampling				Strata			Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description			
0.10	JT	HSV @ 1.50m = 73, 74, 94		Dark brown slightly sandy clayey TOPSOIL.			
			0.20	Yellowish brown slightly silty SAND (approx. medium dense).			
			0.80	Firm to stiff light brown mottled grey silty sandy CLAY.			
1.40	JT		2.00	Soft light brown mottled grey silty sandy CLAY.			
2.30	B	2.70	Soft grey silty CLAY.				
		HSV @ 2.40m = 32, 39, 41	3.20	Exploratory location completed at 3.20m depth.			
Sheet 1 of 1				Groundwater:		Date : 29/06/2021	
Logged by: PD				No groundwater encountered during excavation.		Logged by: PD	
EXPLORATORY RECORD				Remarks:			
				1) Trial pit remained stable during excavation and backfilled with arisings on completion			
GEO MATTERS consulting engineers				Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa). PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton		TP17
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.30	JT		0.20	Dark brown slightly sandy clayey TOPSOIL.
				Yellowish brown slightly silty SAND (approx. medium dense).
1.60	B		1.20	Light yellow silty SAND (approx. medium dense).
1.90	JT		2.00	Soft grey silty CLAY.
			2.70	Exploratory location completed at 2.70m depth.
			3m	
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 29/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

				Site: York Gardens, Gosberton		TP18
				Client: Gleeson		
Contractor: N/A				Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator				Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling				Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description		
0.60 0.90 1.20	JT JT B		0.20	Dark brown slightly sandy clayey TOPSOIL.	    	
				Yellowish brown slightly silty SAND (approx. medium dense).		
			0.80			
			1m	Light yellow silty SAND (approx. medium dense).		
			2m			
2.20		Dark grey silty SAND (approx. medium dense).				
		3.00	Exploratory location completed at 3.00m depth.			
			4m			
			5m			
Sheet 1 of 1				Groundwater:		Date : 29/06/2021
Logged by: PD				No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD				Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
				Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton			TP19
		Client: Gleeson			
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1	
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021	
Field Monitoring and Sampling			Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description	
0.10	JT		0.30	Dark brown slightly sandy clayey TOPSOIL.	
			1m	Yellowish brown slightly silty SAND (approx. medium dense).	
1.30	JT		1.20	Light yellow silty SAND (approx. medium dense).	
2.00	B		2m	Dark grey silty SAND (approx. medium dense).	
			3m	Exploratory location completed at 3.20m depth.	
			3.20		
			4m		
			5m		
Sheet 1 of 1		Groundwater:		Date : 29/06/2021	
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD	
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion			
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton		TP20	
		Client: Gleeson			
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1	
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021	
Field Monitoring and Sampling		Strata		Legend	
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description	
0.50 0.80 1.70	JT B JT		0.20	Dark brown slightly sandy clayey TOPSOIL.	
			1m	Yellowish brown slightly silty SAND (approx. medium dense).	
				1.30	Light yellow silty SAND (approx. medium dense).
				1.50	Dark grey silty SAND (approx. medium dense).
			3m	3.10	Exploratory location completed at 3.10m depth.
4m					
			5m		
Sheet 1 of 1		Groundwater:		Date : 29/06/2021	
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD	
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion			
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton		TP21
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.10	JT		0.20	Dark brown slightly sandy clayey TOPSOIL.
1.00	B			Yellowish brown slightly silty SAND (approx. medium dense).
			0.90	
1.80	JT		1m	Light brown mottled grey silty clayey SAND (approx. medium dense).
			2m	
			2.70	Dark grey silty SAND (approx. medium dense).
		3m	3.20	Exploratory location completed at 3.20m depth.
		4m		
			5m	
Sheet 1 of 1		Groundwater:		Date : 29/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP22
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.70	JT		0.20	Dark brown slightly sandy clayey TOPSOIL.
				Light brown mottled grey silty clayey SAND (approx. medium dense).
	1m			
	2m			
1.80	B		2.10	Dark grey silty SAND (approx. medium dense).
2.30	JT		2.90	Exploratory location completed at 2.90m depth.
			3m	
			4m	
			5m	
Sheet 1 of 1		Groundwater:		Date : 29/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		TP23	
		Client: Gleeson			
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1	
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021	
Field Monitoring and Sampling		Strata		Legend	
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description	
0.10	JT	HSV @ 2.80m = 25, 32, 35	0.20	Dark brown slightly sandy clayey TOPSOIL.	
1.20	JT		1m	Yellowish brown slightly silty SAND (approx. medium dense).	
				1.80	Dark grey silty SAND (approx. medium dense).
2.30	B		2.70	Soft dark grey mottled light brown CLAY/SILT.	
				3.00	Exploratory location completed at 3.00m depth.
		4m			
		5m			
Sheet 1 of 1		Groundwater:		Date : 29/06/2021	
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD	
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion			
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

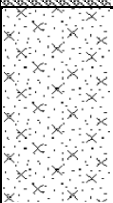
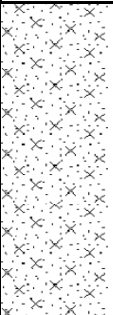
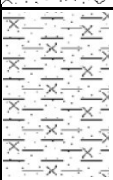
		Site: York Gardens, Gosberton		TP24
		Client: Gleeson		
Contractor: N/A		Project No: GML21156		Sheet: 1 of 1
Equipment: JCB 3CX Excavator		Logged by: PD		Date: 29th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (HSV/PP)	depth (m)	Description
0.10	JT		0.20	Dark brown slightly sandy clayey TOPSOIL.
0.70	JT		1m	Yellowish brown slightly silty SAND (approx. medium dense).
			2m	
			2.10	Dark grey silty SAND (approx. medium dense).
1.70	B		2.80	Exploratory location completed at 2.80m depth.
		3m		
		4m		
		5m		
Sheet 1 of 1		Groundwater:		Date : 29/06/2021
Logged by: PD		No groundwater encountered during excavation.		Logged by: PD
EXPLORATORY RECORD		Remarks: 1) Trial pit remained stable during excavation and backfilled with arisings on completion		
		Strength descriptions of granular soils are based on Engineer's field description(s) HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

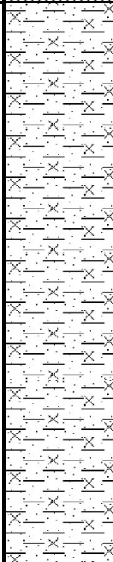
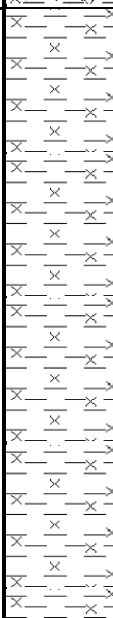
		Site: Gleeson, York Gardens		BH 1
		Client: Goesberton		
Contractor: DMW Drilling		Project No: GML21156		Sheet: 1 of 1
Equipment: Rotary Drilling Rig		Logged by: Drillers		Date: 28th June 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description
1.20		N=7	0.60	Brown topsoil
2.00		N=0	1.60	brown fine silty sand
3.00		N=0	2.00	Fine grey SAND wet
4.00		U1 0% for 3blows	5m	Soft brown grey silty CLAY
5.00		N=2		
6.00		U1 90% for 5blows		
7.50		N=8		
9.00		N=26	8.50	Grey SILT
10.50		U1 100% for 35blows	9.30	
12.00		N=35	10.00	Sand & gravel wet
13.50	U1 80% for 36blows	15m	Stiff grey boulder CLAY	
15.00	N=44			
16.50	U1 100% for 50blows			
18.00	N=+50			
19.00	N=+50	19.00	Exploratory location completed at 19.00m depth.	
			20m	
			25m	
Sheet 1 of 1		Groundwater:		Date : 28/06/21
		Groundwater encountered from 2.00m depth.		Drilled by: DMW
EXPLORATORY RECORD		Remarks:		
		1) refusal on hard ground		
		<div>1400</div> <div>HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm²)</div>		

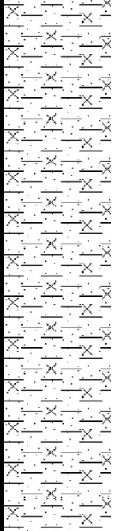
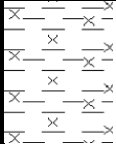
		Site: Gleeson, York Gardens Client: Goesberton		BH2	
Contractor: DMW Drilling		Project No: GML21156		Sheet: 1 of 1	
Equipment: Rotary Drilling Rig		Logged by: Drillers		Date: 24th June 2021	
Field Monitoring and Sampling		Strata		Legend	Well
Depth (m)	Type	Result (SPT)	depth (m)	Description	
1.20		N=4	0.60	Crop brown topsoil with brick fragments	
2.00		N=4	1.60	Fine brown mottled clayey SAND	
3.00		N=6		Fine grey/brown SAND / wet	
4.00		N=6			
5.00		U1 0% for 3blows	4.60		
6.00		N=4		Soft grey silty CLAY	
7.50		N=4	8.10		
9.00		U1 100% for 12blows	8.90	PEAT	
10.50		N=40		Stiff grey boulder CLAY with sand lenses/bands	
12.00		U1 75% for 36blows	12.00		
13.50		N=+50		Stiff grey boulder CLAY	
15.00		U1 55% for 50blows			
16.50		N=+50			
18.00		N=+50		 becoming very stiff	
19.5		N=+50	19.50		
			20m	Exploratory location completed at 19.50m depth.	
			25m		
Sheet 1 of 1		Groundwater:		Date : 24/06/21	
		No groundwater encountered during excavation.		Drilled by: DMW	
EXPLORATORY RECORD		Remarks:			
		HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

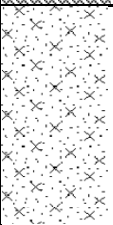
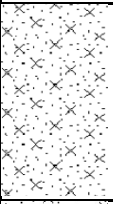
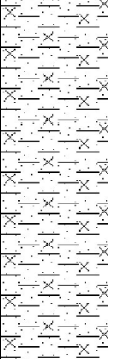
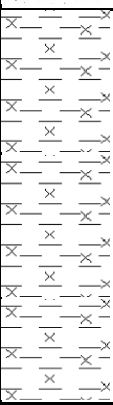
Contractor: DMW Drilling				Project No: GML21156		Sheet: 1 of 1	
Equipment: Rotary Drilling Rig				Logged by: Drillers		Date: 29th June 2021	
Field Monitoring and Sampling				Strata		Legend	Well
Depth (m)	Type	Result (SPT)	depth (m)	Description			
1.20		N=5	0.50	Brown topsoil			
2.00		N=1	1.70	fine brown sand			
3.00		N=0	3.00	Grey silty SAND wet			
4.00		N=1		Soft grey brown very silty CLAY/ clayey SILT			
5.00		N=0					
6.00		N=0					
7.50		U1 100% for 9blows	7.00				
9.00		N=29	9.00	PEAT			
10.50		U1 100% for 17blows	9.80	Fine brown clayey SAND			
12.00		N=+50	11.70	Stiff brown/ grey boulder CLAY			
13.50		U1 60% for 45blows		Stiff grey boulder CLAY			
15.00		N=+50	15.45				
				Exploratory location completed at 15.45m depth.			
Sheet 1 of 1				Groundwater:		Date : 29/06/21	
				No groundwater encountered during excavation.		Drilled by: DMW	
EXPLORATORY RECORD				Remarks:			
				HSV = Hand Shear Vane (kPa). PP = Pocket Penetrometer (daN/cm ²)			

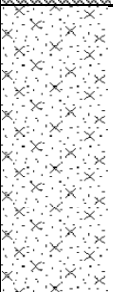
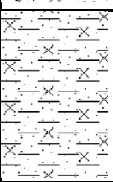
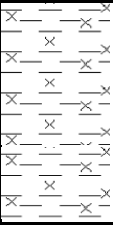
		Site: Gleeson, York Gardens Client: Goesberton		BH4	
Contractor: DMW Drilling		Project No: GML21156		Sheet: 1 of 1	
Equipment: Rotary Drilling Rig		Logged by: Drillers		Date: 23th June 2021	
Field Monitoring and Sampling		Strata		Legend	Well
Depth (m)	Type	Result (SPT)	depth (m)	Description	
1.20		U1 100% for 7blows	0.50	crop/brown soil	
2.00		N=2	2.00	Firm brown sandy CLAY	
3.00		N=1		Soft grey CLAY	
4.00		N=1	4.00		
5.00		N=1	5.00	Grey SILT	
6.00		U1 95% for 4blows		Grey SILT	
7.50		N=8	7.00	Soft organic CLAY	
9.00		U1 100% for 13blows	7.70	PEAT	
10.50		N=34	9.30	Stiff brown mottled grey boulder CLAY with flint gravels and chalk pieces	
12.00		U1 70% for 15blows	11.50	Stiff grey boulder CLAY with chalk pieces	
13.50		N=+50			
15.00		U1 70% for 49blows			
16.50		N=+50	16.95		
18.00		U1 60% for 50blows		Very very stiff grey boulder CLAY	
19.50		N=+50	19.50		
			20m	Exploratory location completed at 19.50m depth.	
			25m		
Sheet 1 of 1		Groundwater:		Date : 23/06/21	
		No groundwater encountered during excavation.		Drilled by: DMW	
EXPLORATORY RECORD		Remarks:			
		HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton			WS01
		Client: Gleeson			
Contractor: RP Drilling			Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig			Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling			Strata		Legend Well
Depth (m)	Type	Result (SPT)	depth (m)	Description	
0.50		HSV = UTT N=8	0.20	Dark brown slightly sandy clayey TOPSOIL	
				Medium dense yellowish brown slightly clayey SAND	
1.50		HSV = UTT N=7		Medium dense grey silty SAND	
				Soft brown sandy silty CLAY	
				Exploratory location completed at 3.00m depth	
		N=0			
Sheet 1 of 1			Groundwater: No groundwater encountered.		Date : 2-3/09/21 Drilled by: RP
EXPLORATORY RECORD			Remarks: 1) UTT = unable to take		
					
			HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

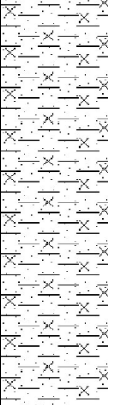
		Site: York Gardens, Gosberton			WS02
		Client: Gleeson			
Contractor: RP Drilling			Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig			Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling			Strata		Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description	
0.50		HSV = 40	0.20	Dark brown slightly sandy clayey TOPSOIL	
				Firm becoming soft yellow brown sandy CLAY	
1.50		N=4	1m		
1.50		HSV = 28	2m		
1.50		N=0	2.50		
1.50		N=0	3m	Soft grey silty CLAY	
1.50		N=3	4m		
1.50		N=3	5m		
Exploratory location completed at 5.00m depth					
Sheet 1 of 1			Groundwater:		Date : 2-3/09/21
			No groundwater encountered.		Drilled by: RP
EXPLORATORY RECORD			Remarks:		
			1)		
			HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton			WS03
		Client: Gleeson			
Contractor: RP Drilling			Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig			Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling			Strata		Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description	
0.50		HSV = 52 N=8	0.20	Dark brown slightly sandy clayey TOPSOIL	
			1m	Stiff yellowish brown sandy CLAY	
1.50		HSV = 32 N=3	2m		
			2.40	Soft dark grey silty CLAY	
		N=1	3m		
			4m	Exploratory location completed at 3.00m depth	
			5m		
Sheet 1 of 1			Groundwater: No groundwater encountered.		Date : 2-3/09/21 Drilled by: RP
EXPLORATORY RECORD			Remarks: 1)		
					
			HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton			WS04
		Client: Gleeson			
Contractor: RP Drilling			Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig			Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling			Strata		Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description	
0.50		HSV = UTT N=5	0.20	Dark brown slightly sandy clayey TOPSOIL	
			1.10	Medium dense light brown clayey SAND	
1.50		HSV = UTT N=3 N=5 N=1	1.90	Medium dense brown grey silty SAND	
			2m	Soft to firm brown grey sandy CLAY	
			3m		
			3.40	Soft grey silty CLAY	
		N=1	5m		
				Exploratory location completed at 5.00m depth	
Sheet 1 of 1			Groundwater: No groundwater encountered.		Date : 2-3/09/21 Drilled by: RP
EXPLORATORY RECORD			Remarks: 1)		
			HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton			WS05
		Client: Gleeson			
Contractor: RP Drilling			Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig			Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling			Strata		Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description	
0.50		HSV = UTT	0.20	Dark brown slightly sandy clayey TOPSOIL	
				Loose yellowish brown slightly clayey SAND	
1.50		N=4	1m		
			1.40		
				Soft brown sandy clayey SILT	
			2m		
		N=0	2.10	Soft grey CLAY	
		N=0	3m		
			4m		
			5m		
				Exploratory location completed at 3.00m depth	
Sheet 1 of 1			Groundwater:		Date : 2-3/09/21
			No groundwater encountered.		Drilled by: RP
EXPLORATORY RECORD			Remarks:		
			1)		
			HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		WS06				
		Client: Gleeson						
Contractor: RP Drilling		Project No: GML21156		Sheet: 1 of 1				
Equipment: Window Sampler Rig		Logged by: Drillers		Date: 2-3rd Sept 2021				
Field Monitoring and Sampling		Strata		Legend				
Depth (m)	Type	Result (SPT)	depth (m)	Description				
0.50		HSV = 44	0.30	Dark brown slightly sandy clayey TOPSOIL				
			1m	Firm yellowish brown sandy CLAY				
					1.50	HSV = 21		
							1.70	Soft grey silty CLAY
3m	N=0							
		3.70	Soft grey sandy SILT					
4m	N=3							
		5m	N=3					
Exploratory location completed at 5.00m depth								
Sheet 1 of 1		Groundwater:		Date : 2-3/09/21				
		No groundwater encountered.		Drilled by: RP				
EXPLORATORY RECORD		Remarks:						
		1)						
		HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)						

		Site: York Gardens, Gosberton			WS07
		Client: Gleeson			
Contractor: RP Drilling			Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig			Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling			Strata		Legend Well
Depth (m)	Type	Result (SPT)	depth (m)	Description	
0.50		HSV = 46 N=5	0.20	Dark brown slightly sandy clayey TOPSOIL	
			1m	Firm light brown grey sandy CLAY	
			1.50	HSV = 35 N=0	1.90
		N=0	4m	Exploratory location completed at 3.00m depth	
			5m		
Sheet 1 of 1			Groundwater: No groundwater encountered.		Date : 2-3/09/21 Drilled by: RP
EXPLORATORY RECORD			Remarks: 1)		
			HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

		Site: York Gardens, Gosberton		WS08
		Client: Gleeson		
Contractor: RP Drilling		Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig		Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling		Strata		Legend Well
Depth (m)	Type	Result (SPT)	depth (m)	Description
0.50		HSV = UTT N=9	0.20	Dark brown slightly sandy clayey TOPSOIL
			1m	Medium dense yellowish brown silty SAND
1.50		HSV = UTT N=4		1.90
			2m	
3.80		N=3	3m	 becoming medium dense
			4m	
4.50		N=8 N=0		4m
			5m	
Exploratory location completed at 5.00m depth				
Sheet 1 of 1		Groundwater: No groundwater encountered.		Date : 2-3/09/21 Drilled by: RP
EXPLORATORY RECORD		Remarks: 1)		
				
HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)				

		Site: York Gardens, Gosberton			WS09
		Client: Gleeson			
Contractor: RP Drilling		Project No: GML21156		Sheet: 1 of 1	
Equipment: Window Sampler Rig		Logged by: Drillers		Date: 2-3rd Sept 2021	
Field Monitoring and Sampling		Strata			Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description	Well
0.50		HSV = UTT	0.20	Dark brown slightly sandy clayey TOPSOIL	
				Medium dense brown silty SAND	
1.50		N=5	1.90		
				Loose to medium dense silty clayey SAND	
		HSV = UTT			
		N=1			
		N=1		Soft brown grey very sandy CLAY	
				Exploratory location completed at 3.00m depth	
Sheet 1 of 1		Groundwater:		Date : 2-3/09/21	
		No groundwater encountered.		Drilled by: RP	
EXPLORATORY RECORD		Remarks:			
		1)			
		HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)			

		Site: York Gardens, Gosberton		WS10
		Client: Gleeson		
Contractor: RP Drilling		Project No: GML21156		Sheet: 1 of 1
Equipment: Window Sampler Rig		Logged by: Drillers		Date: 2-3rd Sept 2021
Field Monitoring and Sampling		Strata		Legend
Depth (m)	Type	Result (SPT)	depth (m)	Description
0.50		HSV = UTT N=4	0.20	Dark brown slightly sandy clayey TOPSOIL
				Loose yellowish light brown silty SAND
1.50		HSV = UTT N=1	1m	
4.50		N=0 N=2	2m	Soft grey silty sandy CLAY
		N=5	3m	
			4m	
			5m	 becoming firmer
Exploratory location completed at 5.00m depth				
Sheet 1 of 1		Groundwater: No groundwater encountered.		Date : 2-3/09/21 Drilled by: RP
EXPLORATORY RECORD		Remarks:		
		1)		
		HSV = Hand Shear Vane (kPa), PP = Pocket Penetrometer (daN/cm ²)		

APPENDIX VI

Laboratory Testing Data

Mark Lewis
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104 Bondgate
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DE74 2NR

t: 01332817644
e: info@geo-matters.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS
t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-84963

Project / Site name:	York Gardens Gosberton	Samples received on:	02/07/2021
Your job number:	GML21156	Samples instructed on/ Analysis started on:	04/07/2021
Your order number:	ML GML21156 003	Analysis completed by:	08/07/2021
Report Issue Number:	1	Report issued on:	08/07/2021
Samples Analysed:	6 soil samples		

Signed: *Karolina Marek*

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

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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

Analytical Report Number: 21-84963
Project / Site name: York Gardens Gosberton
Your Order No: ML GML21156 003

Lab Sample Number				1926777	1926778	1926779	1926780	1926781
Sample Reference				TP01	TP02	TP03	TP05	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	1.70	1.30	1.00
Date Sampled				28/06/2021	28/06/2021	28/06/2021	28/06/2021	28/06/2021
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	%	0.01	NONE	12	14	16	20	16
Total mass of sample received	kg	0.001	NONE	1.2	1.5	1.5	1.5	1.5

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

pH - Automated	pH Units	N/A	MCERTS	7.9	-	8.3	8.2	-
Total Sulphate as SO4	mg/kg	50	MCERTS	480	-	360	290	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	-	0.026	0.028	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.5	-	0.7	0.6	-

Total Phenols

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

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

Total PAH

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

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	-	19	12	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	-	27	21	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	-	19	13	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	-	14	9.6	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	-	24	18	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	-	62	48	-

Analytical Report Number: 21-84963
 Project / Site name: York Gardens Gosberton
 Your Order No: ML GML21156 003

Lab Sample Number				1926777	1926778	1926779	1926780	1926781
Sample Reference				TP01	TP02	TP03	TP05	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	1.70	1.30	1.00
Date Sampled				28/06/2021	28/06/2021	28/06/2021	28/06/2021	28/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH (C10 - C25)	mg/kg	10	MCERTS	< 10	-	-	-	< 10
TPH (C25 - C40)	mg/kg	10	MCERTS	< 10	-	-	-	< 10

Pesticide and Herbicide Screen

GCMS Pesticide Screen		N/A	NONE	-	None Detected	-	-	-
-----------------------	--	-----	------	---	---------------	---	---	---

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

Analytical Report Number: 21-84963
Project / Site name: York Gardens Gosberton
Your Order No: ML GML21156 003

Lab Sample Number				1926782
Sample Reference				TP08
Sample Number				None Supplied
Depth (m)				0.10
Date Sampled				28/06/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	12
Total mass of sample received	kg	0.001	NONE	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-
----------------------------	-------	---	--------	---

Speciated PAHs

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

Total PAH

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

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-

Analytical Report Number: 21-84963
 Project / Site name: York Gardens Gosberton
 Your Order No: ML GML21156 003

Lab Sample Number				1926782
Sample Reference				TP08
Sample Number				None Supplied
Depth (m)				0.10
Date Sampled				28/06/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Petroleum Hydrocarbons				
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C25)	mg/kg	10	MCERTS	81
TPH (C25 - C40)	mg/kg	10	MCERTS	10

Pesticide and Herbicide Screen

GCMS Pesticide Screen		N/A	NONE	-
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-84963

Project / Site name: York Gardens Gosberton

* 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 *
1926777	TP01	None Supplied	0.1	Brown clay and loam with gravel and vegetation.
1926778	TP02	None Supplied	0.4	Brown clay with gravel and vegetation.
1926779	TP03	None Supplied	1.7	Brown clay with gravel and vegetation.
1926780	TP05	None Supplied	1.3	Brown clay.
1926781	TP06	None Supplied	1	Brown loam and sand with gravel and vegetation.
1926782	TP08	None Supplied	0.1	Brown clay with gravel and vegetation.

Analytical Report Number : 21-84963

Project / Site name: York Gardens Gosberton

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total 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
TPH Oils (Soils)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS
DRO (Soil)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS
GC Pesticide Screen (TIC)	Analysis of unknown pesticides by GCMS	GC Pesticide Screen (TIC)	L064B	D	NONE

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

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

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



Analytical Report Number : 21-84963
Project / Site name: York Gardens Gosberton

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



TEST CERTIFICATE

Liquid and Plastic Limits

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



4041

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

Client: Geo-Matters Limited
Client Address: 104 Bondgate, Castle Donington,
DE74 2NR

Contact: Mark Lewis
Site Address: York Gardens, Gosberton

Client Reference: GML21156
Job Number: 21-85139
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 13/07/2021
Sampled By: Client - ML

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

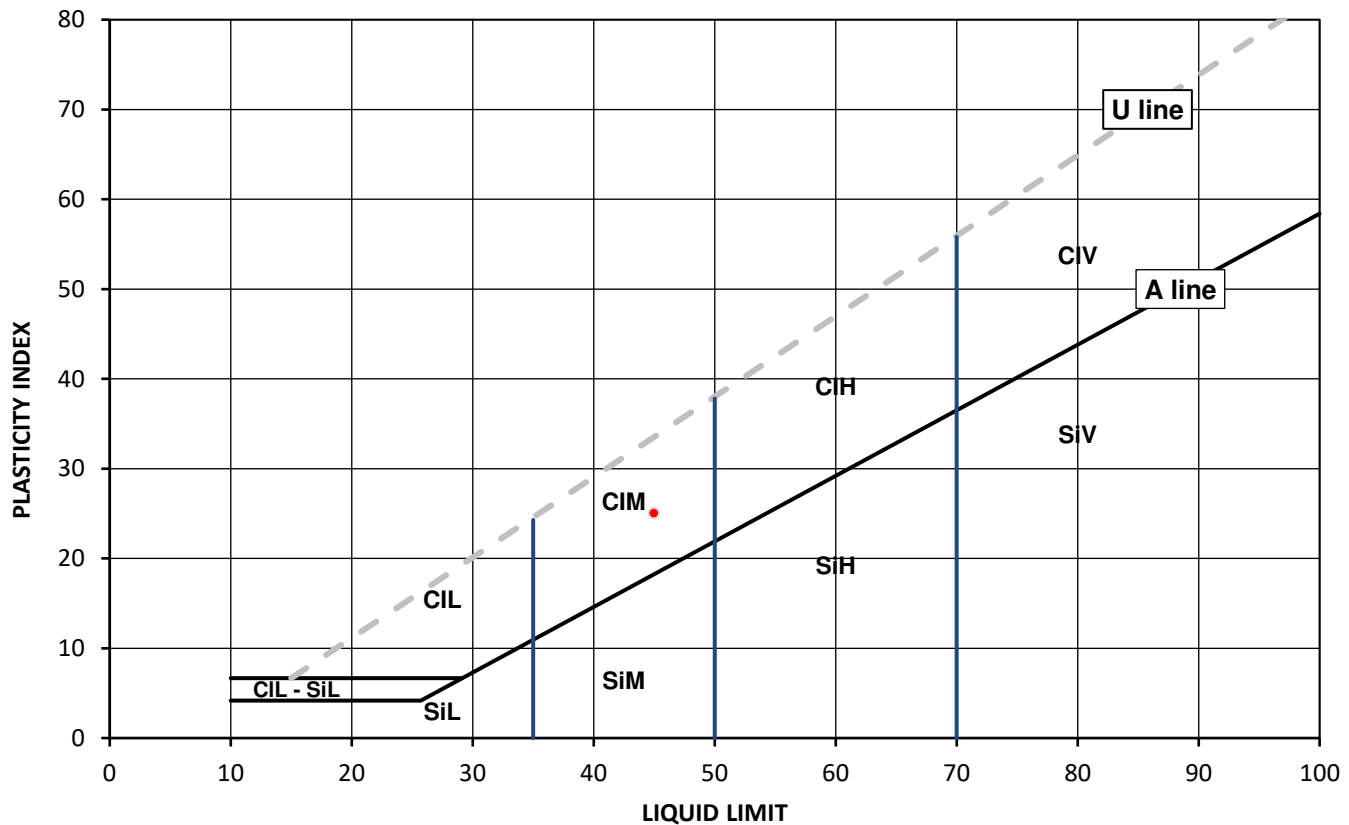
Test Results:

Laboratory Reference: 1927730
Hole No.: TP01
Sample Reference: Not Given
Soil Description: Brown slightly sandy CLAY

Depth Top [m]: 1.90
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	45	20	25	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
	H High 50 to 70	V Very high exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

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

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Date Reported: 20/07/2021

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TEST CERTIFICATE

Liquid and Plastic Limits

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



4041

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

Client: Geo-Matters Limited
Client Address: 104 Bondgate, Castle Donington,
DE74 2NR

Contact: Mark Lewis
Site Address: York Gardens, Gosberton

Client Reference: GML21156
Job Number: 21-85139
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 13/07/2021
Sampled By: Client - ML

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

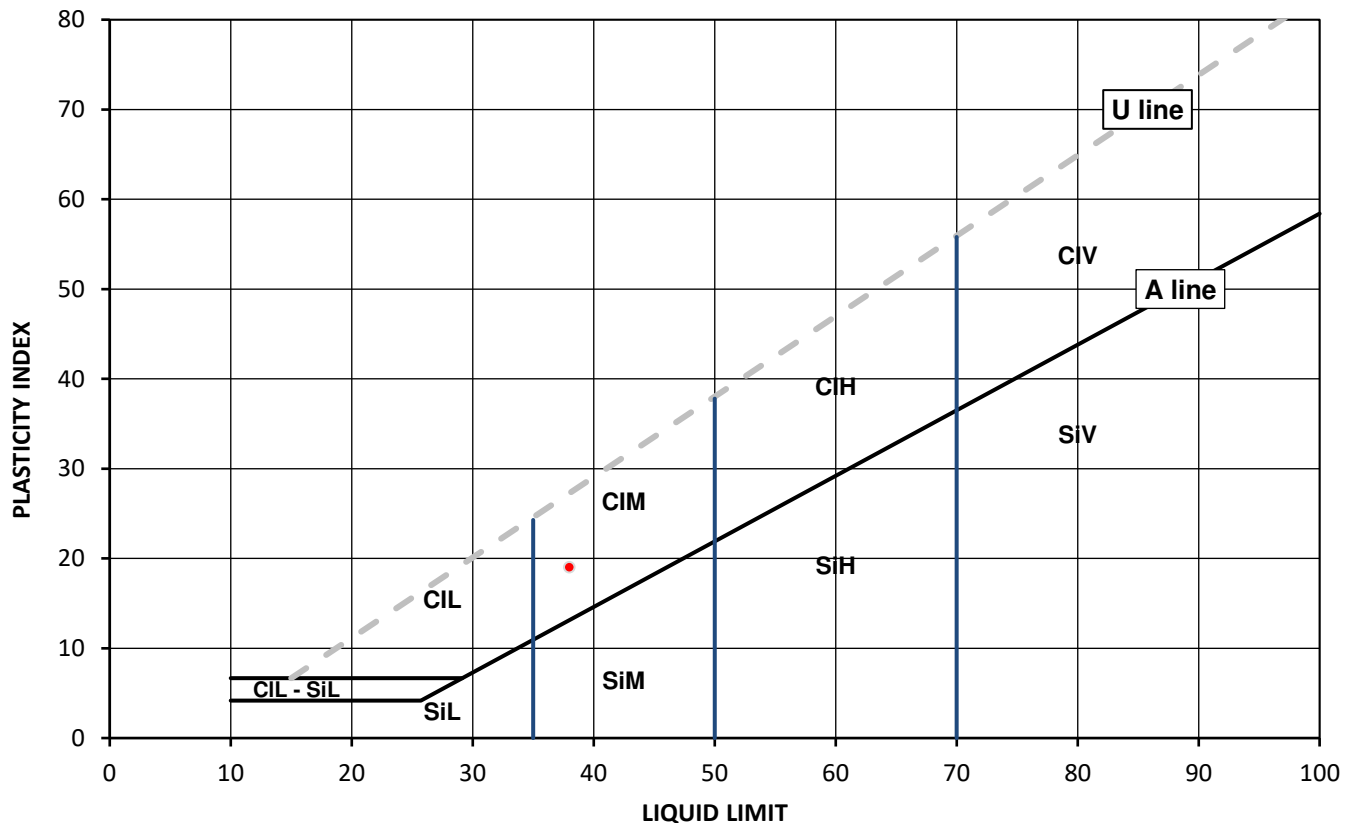
Test Results:

Laboratory Reference: 1927731
Hole No.: TP05
Sample Reference: Not Given
Soil Description: Brown sandy CLAY

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

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	38	19	19	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	append to classification for organic material (eg CIHO)
	V Very high	
	O Organic	

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

Remarks:

Signed:

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

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Liquid and Plastic Limits

i2 Analytical Ltd
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Northampton NN4 7EB



4041

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

Client: Geo-Matters Limited
Client Address: 104 Bondgate, Castle Donington,
DE74 2NR

Contact: Mark Lewis
Site Address: York Gardens, Gosberton

Client Reference: GML21156
Job Number: 21-85139
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 13/07/2021
Sampled By: Client - ML

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

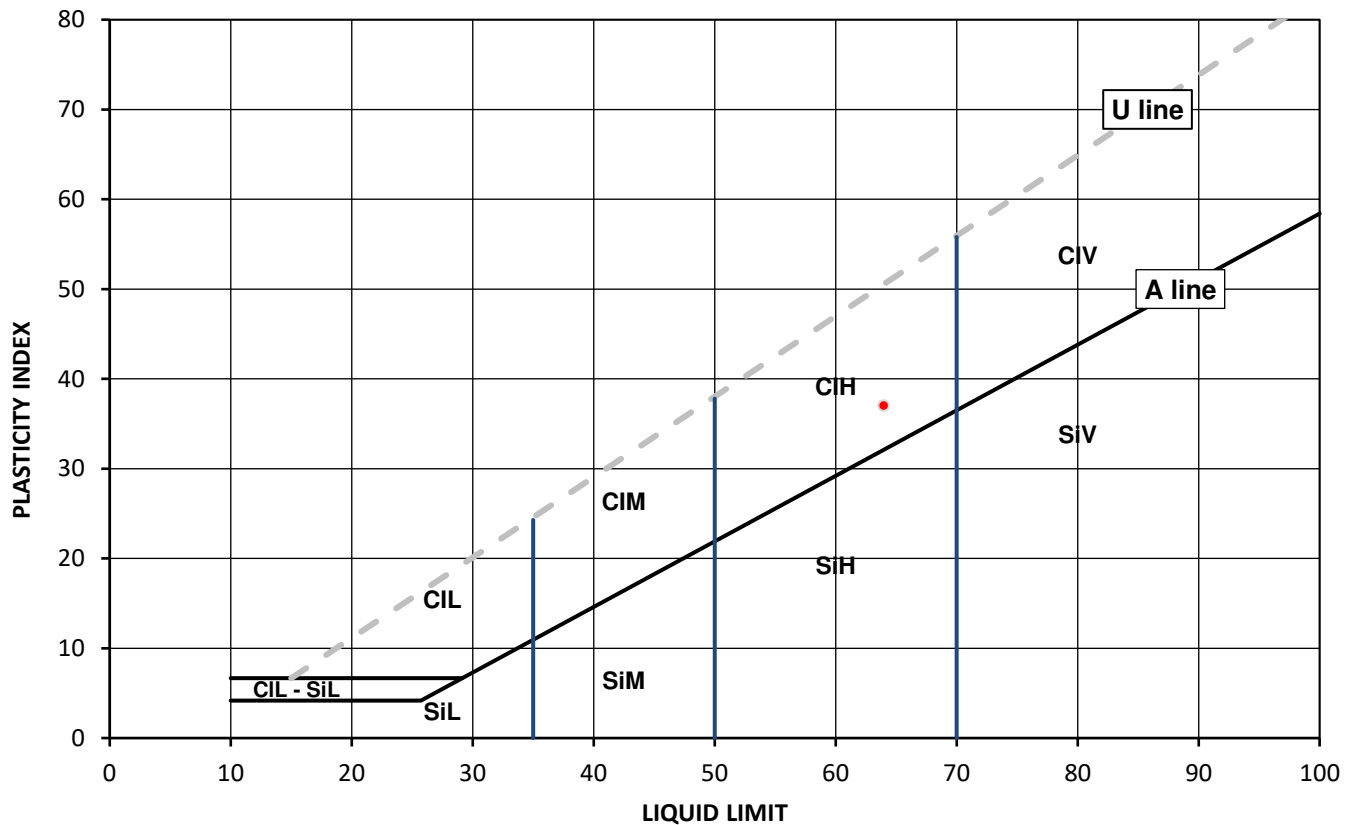
Test Results:

Laboratory Reference: 1927732
Hole No.: TP06
Sample Reference: Not Given
Soil Description: Brown CLAY

Depth Top [m]: 2.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
48	64	27	37	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

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

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TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

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

Client: Geo-Matters Limited
Client Address: 104 Bondgate, Castle Donington,
DE74 2NR

Contact: Mark Lewis
Site Address: York Gardens, Gosberton

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

Client Reference: GML21156
Job Number: 21-85139
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 13/07/2021
Sampled By: Client - ML

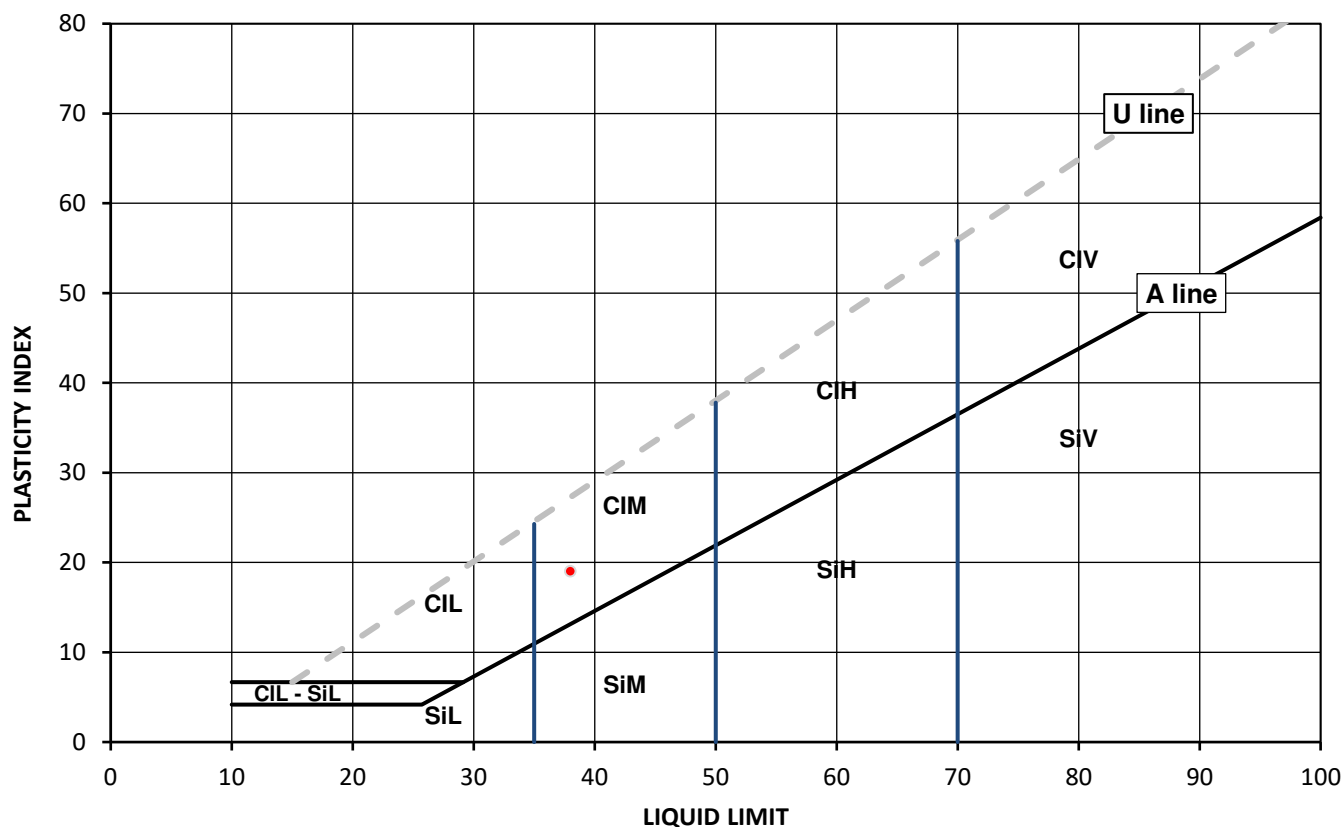
Test Results:

Laboratory Reference: 1927733
Hole No.: TP13
Sample Reference: Not Given
Soil Description: Brown sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
27	38	19	19	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

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

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Szczepan Bielatowicz

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Date Reported: 20/07/2021

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TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

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

Client: Geo-Matters Limited
Client Address: 104 Bondgate, Castle Donington,
DE74 2NR

Contact: Mark Lewis
Site Address: York Gardens, Gosberton

Client Reference: GML21156
Job Number: 21-85139
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 13/07/2021
Sampled By: Client - ML

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

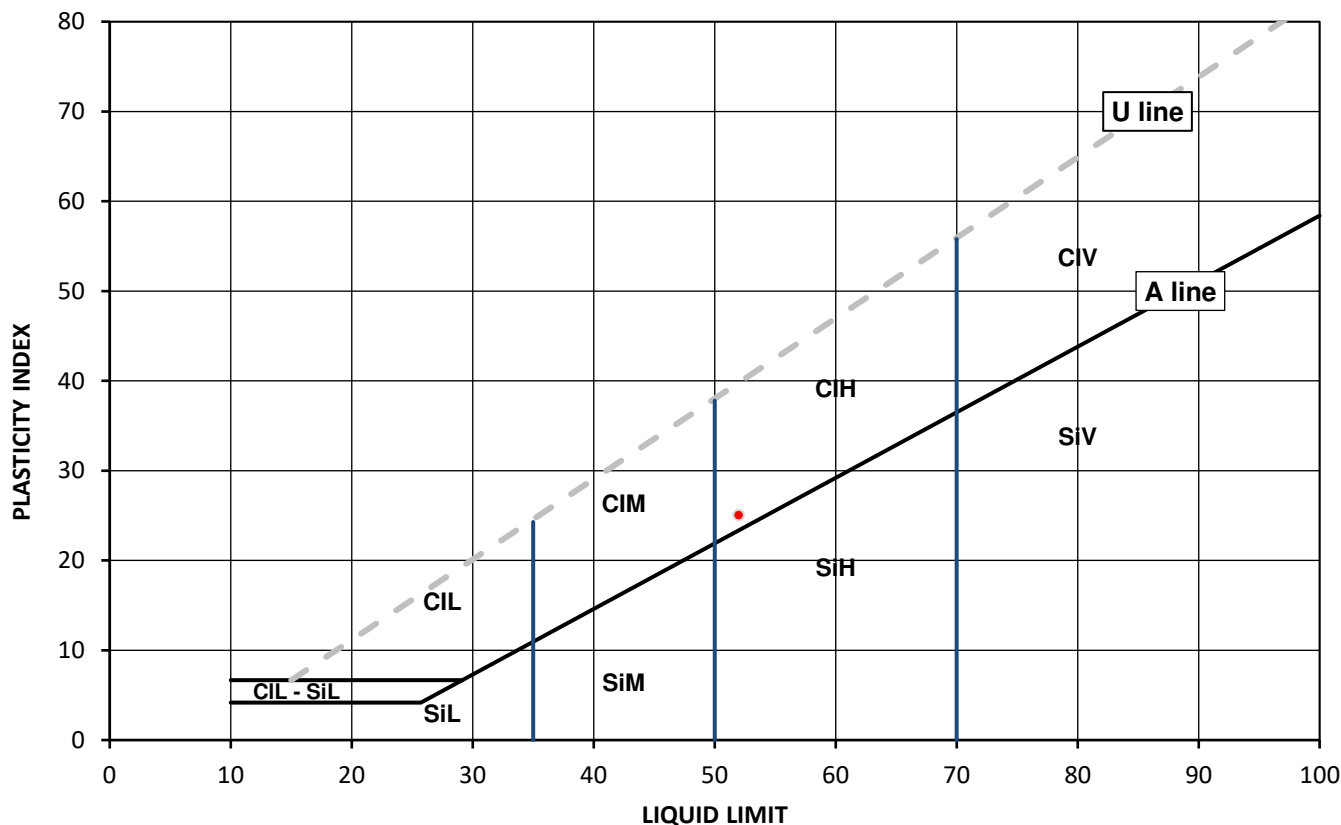
Test Results:

Laboratory Reference: 1927734
Hole No.: TP14
Sample Reference: Not Given
Soil Description: Brown slightly sandy CLAY

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

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
32	52	27	25	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

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

Remarks:

Signed:

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

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Date Reported: 20/07/2021

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4041

Client: Geo-Matters Limited
 Client Address: 104 Bondgate, Castle Donington,
 DE74 2NR

Contact: Mark Lewis
 Site Address: York Gardens, Gosberton

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

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN
 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test),
 Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

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



Environmental Science

Client Reference: GML21156
 Job Number: 21-85139
 Date Sampled: Not Given
 Date Received: 02/07/2021
 Date Tested: 13/07/2021
 Sampled By: Client - ML

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m															
1927730	TP01	Not Given	1.90	Not Given	D	Brown slightly sandy CLAY	Atterberg 1 Point	30		100	45	20	25						
1927731	TP05	Not Given	2.30	Not Given	D	Brown sandy CLAY	Atterberg 1 Point	24		100	38	19	19						
1927732	TP06	Not Given	2.50	Not Given	D	Brown CLAY	Atterberg 1 Point	48		100	64	27	37						
1927733	TP13	Not Given	2.00	Not Given	D	Brown sandy CLAY	Atterberg 1 Point	27		100	38	19	19						
1927734	TP14	Not Given	1.80	Not Given	D	Brown slightly sandy CLAY	Atterberg 1 Point	32		100	52	27	25						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

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

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APPENDIX VII

Gas Monitoring Data Sheets

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	12/07/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Overcast
Pressure at Start & End (mb):	1014

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
BH01	1688	1688	84.4	84.4	7.0	7.0	0.90	0.90	3.3	3.3	1.43	5.24
BH02	110	110	5.5	5.5	2.7	2.7	16.8	16.8	0.3	0.3	2.21	9.97
BH03	092	092	4.6	4.6	9.9	9.9	8.1	8.1	0.3	0.3	2.01	19.57
BH04	002	002	0.1	0.1	1.5	1.5	18.4	18.4	0.0	0.0	1.88	18.08

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	19/07/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	1020

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
BH01	384	384	19.2	19.2	8.1	8.1	9.7	9.7	0.0	0.0	1.69	5.24
BH02	158	158	7.9	7.9	3.3	3.3	15.8	15.8	0.0	0.0	2.21	9.97
BH03	068	068	3.4	3.4	10.6	10.6	19.6	19.6	0.0	0.0	2.00	19.57
BH04	000	000	0.0	0.0	1.5	1.5	19.8	19.8	0.0	0.0	1.86	18.08

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	26/07/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	1009

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
BH01	360	360	18.0	18.0	7.1	7.1	12.5	12.5	0.1	0.1	1.74	5.24
BH02	176	176	8.8	8.8	3.9	3.9	15.5	15.5	0.0	0.0	2.24	9.97
BH03	234	234	11.7	11.7	5.0	5.0	11.0	11.0	0.0	0.0	2.06	19.57
BH04	000	000	0.0	0.0	1.4	1.4	20.4	20.4	0.0	0.0	1.71	18.08

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	04/08/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	1005

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
BH01	548	548	27.4	27.4	8.5	8.5	10.4	10.4	0.8	0.8	1.63	5.24
BH02	156	156	7.8	7.8	4.1	4.1	15.3	15.3	0.3	0.3	2.38	9.97
BH03	176	176	8.8	8.8	12.9	12.9	10.5	10.5	0.4	0.4	1.98	19.57
BH04	000	000	0.0	0.0	1.1	1.1	20.4	20.4	0.0	0.0	1.48	18.08

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	AMT
Date of Visit:	03/09/2021
Equipment Used:	GA2000 – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	1001

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
BH01	367	367	18.8	18.8	5.7	5.5	12.2	12.2	0.0	0.0	2.01	5.23
BH02	066	066	3.3	3.3	3.6	3.6	16.3	16.3	0.1	0.1	1.70	10.00
BH03	130	130	6.5	6.5	9.6	9.6	12.2	12.2	0.1	0.1	2.24	20.00
BH04	002	002	0.1	0.1	0.7	0.7	19.8	19.8	0.1	0.1	1.80	18.07

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	14/09/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Raining
Pressure at Start & End (mb):	1010

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
WS1	034	034	1.7	1.7	3.2	3.2	15.1	15.1	0.1	0.1	2.29	3.10
WS2	018	018	0.9	0.9	2.0	2.0	19.3	19.3	0.1	0.1	2.58	4.59
WS3	000	000	0.0	0.0	3.7	3.7	19.1	19.1	0.1	0.1	2.66	3.11
WS4	000	000	0.0	0.0	2.1	2.1	19.8	19.9	0.0	0.0	2.18	4.66
WS5	000	000	0.0	0.0	7.1	7.1	15.9	15.9	0.1	0.1	2.17	3.00
WS6	000	000	0.0	0.0	5.0	5.0	16.7	16.7	0.0	0.0	2.17	4.54
WS7	000	000	0.0	0.0	2.6	2.6	18.9	18.9	0.1	0.1	2.18	3.00
WS8	006	006	0.3	0.3	0.3	0.3	20.0	20.0	0.0	0.0	1.45	3.80
WS9	000	000	0.0	0.0	4.4	4.4	18.1	18.1	0.3	0.3	2.28	2.99
WS10	000	000	0.0	0.0	0.5	0.5	20.9	20.9	0.1	0.1	2.16	4.40
BH1	342	342	17.1	17.1	5.0	5.0	13.8	13.8	0.5	0.5	1.80	5.23
BH2	102	102	5.1	5.1	4.2	4.2	16.3	16.3	0.3	0.3	2.42	9.95
BH3	148	148	7.4	7.4	10.6	10.6	12.8	12.8	0.0	0.0	2.08	19.51
BH4	000	000	0.0	0.0	0.8	0.8	20.6	20.6	0.0	0.0	1.30	18.06

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	21/09/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	1022

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
WS1	022	022	1.1	1.1	5.1	5.1	14.2	14.2	0.1	0.1	2.28	3.10
WS2	014	014	0.7	0.7	3.4	3.4	18.1	18.1	0.1	0.1	2.25	4.59
WS3	000	000	0.0	0.0	2.2	2.2	19.6	19.6	0.8	0.8	2.49	3.11
WS4	000	000	0.0	0.0	2.1	2.1	19.4	19.4	0.4	0.4	2.15	4.66
WS5	000	000	0.0	0.0	6.7	6.7	15.4	15.4	0.1	0.1	1.91	3.00
WS6	000	000	0.0	0.0	1.2	1.2	20.4	20.4	0.1	0.1	1.91	4.54
WS7	000	000	0.0	0.0	4.6	4.6	17.6	17.6	0.1	0.1	2.01	3.00
WS8	000	000	0.0	0.0	0.6	0.6	20.9	20.9	0.3	0.3	1.52	3.80
WS9	000	000	0.0	0.0	4.4	4.4	18.1	18.1	0.1	0.1	2.20	2.99
WS10	000	000	0.0	0.0	0.9	0.9	20.6	20.6	0.0	0.0	2.03	4.40
BH1	1792	1792	89.6	89.6	8.2	8.2	0.6	0.6	3.4	3.4	1.57	5.23
BH2	148	148	7.4	7.4	5.8	5.8	12.9	12.9	0.1	0.1	2.35	9.95
BH3	116	116	5.8	5.8	10.8	10.8	12.0	12.0	0.1	0.1	2.07	19.51
BH4	000	000	0.0	0.0	0.9	0.9	20.6	20.6	0.0	0.0	1.40	18.06

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	28/09/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	1014

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
WS1	022	022	1.1	1.1	5.3	5.3	14.0	14.0	0.1	0.1	2.31	3.10
WS2	018	018	0.9	0.9	3.5	3.5	17.9	17.9	0.3	0.3	2.20	4.59
WS3	002	002	0.1	0.1	2.2	2.2	19.5	19.5	0.1	0.1	2.47	3.11
WS4	002	002	0.1	0.1	2.1	2.1	19.5	19.5	0.1	0.1	2.16	4.66
WS5	000	000	0.0	0.0	6.7	6.7	15.3	15.3	0.4	0.4	1.86	3.00
WS6	002	002	0.1	0.1	1.1	1.1	20.8	20.8	0.1	0.1	1.86	4.54
WS7	002	002	0.1	0.1	4.8	4.8	17.1	17.1	0.0	0.0	2.04	3.00
WS8	002	002	0.1	0.1	0.5	0.5	21.1	21.1	0.0	0.0	1.51	3.80
WS9	000	000	0.0	0.0	4.5	4.5	17.9	17.9	0.1	0.1	2.23	2.99
WS10	000	000	0.0	0.0	0.9	0.9	20.7	20.7	0.1	0.1	2.04	4.40
BH1	1720	1720	86.0	86.0	8.0	8.0	1.1	1.1	10.0	10.0	1.56	5.23
BH2	150	150	7.5	7.5	5.8	5.8	13.0	13.0	0.1	0.1	2.37	9.95
BH3	130	130	6.5	6.5	11.3	11.3	11.6	11.6	0.1	0.1	2.07	19.51
BH4	000	000	0.0	0.0	0.9	0.9	20.6	20.6	0.0	0.0	1.42	18.06

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	AMT
Date of Visit:	06/10/2021
Equipment Used:	GA2000 – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Sunny
Pressure at Start & End (mb):	999

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
WS1	022	022	1.1	1.1	2.6	2.6	16.7	16.7	0.0	0.0	2.25	3.10
WS2	012	012	0.6	0.6	1.2	1.2	19.2	19.2	0.1	0.1	2.37	4.59
WS3	000	000	0.0	0.0	3.4	3.4	18.7	18.6	0.1	0.1	2.64	3.11
WS4	000	000	0.0	0.0	2.2	2.1	18.9	18.9	0.1	0.1	2.10	4.66
WS5	002	002	0.1	0.1	6.2	6.2	14.2	14.2	0.0	0.0	1.95	3.00
WS6	000	000	0.0	0.0	4.4	4.3	16.1	16.1	0.1	0.1	1.92	4.54
WS7	000	000	0.0	0.0	2.2	2.2	19.4	19.4	0.0	0.0	2.13	3.00
WS8	000	002	0.1	0.1	0.6	0.6	20.1	20.1	0.1	0.1	1.54	3.80
WS9	000	000	0.0	0.0	3.7	3.7	16.3	16.3	0.1	0.1	2.21	2.99
WS10	002	002	0.1	0.1	0.4	0.3	19.8	19.8	0.1	0.1	2.08	4.40
BH1	304	304	15.2	15.2	5.1	5.1	14.5	14.5	0.0	0.0	1.87	5.23
BH2	080	080	4.0	4.0	6.2	6.2	13.4	13.3	0.0	0.0	2.36	9.95
BH3	138	138	6.9	6.9	10.2	10.2	11.1	11.1	0.1	0.1	1.95	19.51
BH4	002	002	0.1	0.1	0.9	0.9	18.7	18.6	0.0	0.0	1.42	18.06

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes:

Monitoring of Soil Gas and Groundwater

Site Name & Project Code:	York Gardens, Gosberton – GML21156
Technician / Engineer:	PD
Date of Visit:	13/10/2021
Equipment Used:	GFM – Infrared Gas Analyser and Electronic Dip Meter
Specifications:	BS:5930 (2015), BS8485:2015+A1:2019, CL:AIRE RB17
Site Observations:	Overcast
Pressure at Start & End (mb):	1026

Borehole No. / Ref:	LEL % by vol		Methane % by vol		Carbon Dioxide % by vol		Oxygen % by vol*		Gas Flow (l/hr)		Groundwater (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Depth to Water	Depth to Base
WS1	030	030	1.5	1.5	5.3	5.3	12.3	12.3	0.1	0.1	1.90	3.10
WS2	010	010	0.5	0.5	2.2	2.2	18.0	18.0	0.1	0.1	1.87	4.59
WS3	000	000	0.0	0.0	2.3	2.3	18.4	18.4	0.3	0.3	2.15	3.11
WS4	000	000	0.0	0.0	2.8	2.8	16.8	16.8	0.0	0.0	1.63	4.66
WS5	000	000	0.0	0.0	6.1	6.1	12.0	12.0	0.6	0.6	1.71	3.00
WS6	000	000	0.0	0.0	2.1	2.1	18.4	18.4	0.3	0.3	1.81	4.54
WS7	002	002	0.1	0.1	4.2	4.2	16.2	16.2	0.0	0.0	1.46	3.00
WS8	004	004	0.2	0.2	0.2	0.2	21.1	21.1	0.1	0.1	0.89	3.80
WS9	004	004	0.2	0.2	4.2	4.2	15.7	15.7	0.3	0.3	1.12	2.99
WS10	002	002	0.1	0.1	0.7	0.7	20.5	20.5	0.1	0.1	1.33	4.40
BH1	1718	1718	85.9	85.9	7.7	7.7	1.0	1.0	15.3	15.3	0.98	5.23
BH2	114	114	5.7	5.7	8.9	8.9	15.0	15.0	0.1	0.1	2.00	9.95
BH3	404	404	20.2	20.2	14.5	14.5	7.8	7.8	7.1	7.1	1.75	19.51
BH4	000	000	0.0	0.0	1.0	1.0	19.8	19.8	0.0	0.0	1.27	18.06

Key

- Text shown in bold indicates either steady carbon dioxide $\geq 5.00\%$ by volume or steady methane $\geq 1.00\%$ by volume.
- * The 'Peak' oxygen reading is taken as the lowest recorded.
- L.E.L. Lower Explosive Limit (100% L.E.L. = 5% flammable gas).
- NR = Not Recorded

Site Notes: