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## **GROUND INVESTIGATION REPORT**

**PREPARED FOR ADEPT CIVIL & STRUCTURAL CONSULTING ENGINEERS**

**PROPOSED NEW BUILDING WITH SERVICE YARD & MODIFICATIONS TO**

**EXISITING UNITS**

**SOVERIGN BUSINESS PARK**

**LIVERPOOL**

**Project No: 23-795**

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The information and / or advice contained in this Ground Investigation Report is based solely on, and is limited to, the boundaries of the site, the immediate area around the site, and the historical use(s) unless otherwise stated. This 'Report' has been prepared in order to collate information relating to the physical, environmental and industrial setting of the site, and to highlight, where possible, the likely problems that might be encountered when considering the future development of this site for the proposed end use. All comments, opinions, diagrams, cross sections and / or sketches contained within the report, and / or any configuration of the findings is conjectural and given for guidance only and confirmation of the anticipated ground conditions should be considered before development proceeds. Agreement for the use or copying of this report by any Third Party must be obtained in writing from Arc Environmental Limited (ARC). If a change in the proposed land use is envisaged, then a reassessment of the site should be carried out.

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## 1.0 Introduction

February 2024

As requested by Adept Civil & Structural Consulting Engineers, on behalf of RS UK Associates Ltd, Ground Investigation works have been carried out at the Sovereign Business Park, Huyton, Liverpool, where it is proposed to construct a new building and service yard as well as undertake some reconfiguration works to the existing buildings.

The intrusive investigation works comprised sinking of 15 no. windowless sampling boreholes (WS01 – WS15), installation of 3 no. combined ground gas and groundwater monitoring wells (WS01, WS02 & WS13) and 5 no. manually excavated trial pits (TP01 – TP05) to expose the existing foundations.

The positions of the exploratory holes can be seen on the Exploratory Hole Location Plan, a copy of which can be seen in Appendix I. It should be noted that this plan is for orientating purposes only, as the positions shown are approximate and the plan is not to a standard scale.

## 2.0 Physical Setting

### 2.1 Site Details

Table 2.1

|                                 |                                                                                                                                                                                                                                                                                                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site Name &amp; Address:</b> | Sovereign Business Park , Huyton, Liverpool, L36 6AD                                                                                                                                                                                                                                                         |
| <b>Description of Location:</b> | The site is located c.14km to the east of Liverpool city centre and c.2.7km to the south of Huyton village. The site currently comprises areas of soft landscaping, areas of hardstanding and existing industrial buildings with associated office space and areas of peripheral localised soft landscaping. |
| <b>Site Boundaries:</b>         | N=Wilson Road with commercial / industrial buildings beyond, S= Dense vegetation with commercial / industrial buildings beyond , E= Cronton Road with commercial building beyond, W=Mix of industrial units with residential units beyond.                                                                   |
| <b>Site Shape:</b>              | The site is irregular in layout, occupying a total area of c.2.172 Hectares (Ha).                                                                                                                                                                                                                            |
| <b>General Topography:</b>      | The site is generally level at between c.22m AOD and c.24m AOD.                                                                                                                                                                                                                                              |
| <b>Site surfacing:</b>          | Majority of the site surface comprised Asphalt surfacing.                                                                                                                                                                                                                                                    |
| <b>Above Ground Structures:</b> | Currently the site is occupied by 3 warehouse units.                                                                                                                                                                                                                                                         |

## 3.0 Scope of Works

Table 3.1

|                                     |                                                                                                                                                                                        |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Client:</b>                      | RS UK Associates Ltd                                                                                                                                                                   |
| <b>Consultant:</b>                  | Adept Civil & Structural Consulting Engineers                                                                                                                                          |
| <b>Project type:</b>                | Proposed new building and service yard and some reconfiguration works to the existing buildings.                                                                                       |
| <b>Layout plans (existing):</b>     | See Appendix I.                                                                                                                                                                        |
| <b>Layout plans (proposed):</b>     | See Appendix I.                                                                                                                                                                        |
| <b>Investigation Works:</b>         | 15 no. windowless sampling borehole (WS01 to WS15).<br>3 no. ground gas / groundwater monitoring standpipes (WS01, WS02, WS13).<br>5 no. manually excavated trial pits (TP01 to TP05). |
| <b>Laboratory Testing:</b>          | Geotechnical & Ground Contamination.                                                                                                                                                   |
| <b>CLEA End-Use Classification:</b> | Level 1 GQRA – <i>Commercial</i> .                                                                                                                                                     |

The information contained in this report is limited to the area of the proposed development, as indicated on the Existing Site Layout Plan shown in Appendix I, and to those areas accessible during the ground investigation. When considering the full scope of the development any features and / or issues not specifically mentioned in this report cannot be assumed to have been covered.

## 4.0 Investigation Rationale

This ground investigation has been designed to provide information on the general ground and groundwater conditions where access would allow, across the area of the proposed development. The boreholes were created primarily for geotechnical purposes to assist in the design of new foundations for the proposed development with contamination screening undertaken on representative samples to assess the risks to Human Health and assist with waste classification for possible off-site disposal.

The rationale behind the location of each exploratory hole is summarised in Table 4.1 below.

**Table 4.1**

| <u>Potential issue</u>                                                                                                                                                                  | <u>Exploratory Hole</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Determine the nature of the underlying ground conditions, including shallow groundwater.                                                                                                | WS01-WS02, & WS11-WS13  |
| Determine the levels of contamination present within the initial deposits with a view to determining the risks posed towards Human Health and to assist with possible off-site removal. | WS01-WS02, & WS11-WS13  |
| Determine the thickness of the existing concrete slab and nature of the underlying ground conditions, including shallow groundwater.                                                    | WS03-WS10               |
| Determine the dimensions of the existing foundations around unit D                                                                                                                      | TP01-TP05               |
| Determine the suitability of insitu shallow soils as a sub-grade material.                                                                                                              | WS12, WS14 & WS15       |
| Determine the groundwater and ground gas characteristics.                                                                                                                               | WS01, WS02 & WS13       |

### 4.1 Sampling & Site Protocols:-

All works associated with this ground contamination assessment and investigations have generally been completed in accordance with BS10175: British Standard Code of Practice for the Investigation of Potentially Contaminated Sites (2011+A2:2017): Investigation of potentially contaminated sites – Code of practice & Land Contamination Risk Management (LCRM: October 2020).

#### 4.1.1 Contamination Sampling:-

Samples were recovered by a representative of ARC Environmental Ltd. during the intrusive investigation works. All samples were stored at approximately 4°C using cool boxes and ice packs prior to delivery to a UKAS / MCERTS accredited laboratory. Sampling was carried out in accordance with 'Technical Policy Statement 63: UKAS Policy on Deviating Samples'.

#### 4.1.2 Onsite Health & Safety Requirements:-

All site representatives wore relevant and appropriate PPE including (where appropriate) safety footwear, high visibility jacket / vest, hard hat, eye protection and overalls. In addition, disposable latex gloves were used when handling any potentially contaminated materials and when rinsing all sampling tools. Each site vehicle contained a suitable First Aid kit with hand wash station / cleansing products (i.e. sanitary wipes).

#### 4.1.3 Avoiding Cross-Contamination between Sample Locations:-

To avoid cross-contamination of materials between soil horizons, drill casing was used to seal off the made ground. In addition, disposable plastic liners were used to collect samples from the windowless sampling boreholes carried out.

## 5.0 Ground Conditions

For an accurate description of the ground conditions encountered at each investigation position, reference should be made to the borehole record sheets in Appendix II. It should be noted that there is always the possibility of variation in the ground conditions around and between the exploratory hole locations.

### 5.1 Soil Profiles:-

A summary of the soil profile for this site for each element of development can be found in Table 5.1A to 5.1C on the following pages.

#### 5.1.1 Proposed Building & Service Yard (encompassing WS01, WS02 & WS11 to WS14):-

**Table 5.1A**

begl = below current ground level

| Type of Strata                              | Depths Recorded (bcgl)                                       | Description & General Comments                                                                                                                                                                                                                                                                      |
|---------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MADE GROUND:<br>(WS01, WS02 & WS11 to WS14) | From 0.00m up to c.0.60m and c.2.30m.                        | Initial surfacing of dark brown sandy clayey topsoil with brick fragments (WS01 & WS02) & asphalt (WS11 to WS14) overlying both cohesive and granular made ground including fragmented brick, rubble and concrete, grey sandy stone sub-base and dark grey clay with mudstone and brick fragments*. |
| DRIFT GEOLOGY:                              | From c.0.60m and c.2.30m up to c.4.00m and at least c.5.32m. | Generally stiff becoming firm, locally stiff, medium brown sandy locally gravelly CLAY with occasional sand lenses.                                                                                                                                                                                 |
| SOLID GEOLOGY<br>(WS02 only)                | From c.4.00m up to at least c.4.60m.                         | Comprising very weak weathered grey MUDSTONE.                                                                                                                                                                                                                                                       |

\* = There was no visual evidence of significant ground contamination (i.e., fuel-derived contaminants, solvents, insulating oils, asbestos, etc.) present within any of the exploratory positions undertaken across this area.

#### 5.1.2 Units A & B (encompassing WS03 to WS07):-

**Table 5.1B**

bcll = below current floor levels

| Type of Strata                      | Depths Recorded (bcll)                                       | Description & General Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FLOOR SLAB:                         | From 0.00m up to c.0.10m and c.0.20m.                        | Fine to medium aggregate, reasonable to good quality concrete with c.6mm up to c.12mm dia reinforcement recorded between c.40mm to c.130mm from the top of the slab.<br>A basal membrane (plastic) was noted at the locations of WS06 & WS07.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| MADE GROUND:                        | From 0.10m and c.0.20m up to c.0.60m and c.2.00m.            | Initially comprising various thin bands / layers of granular sub-base materials including reddish brown very gravelly slightly clayey sand, grey angular limestone and black sandy gravel. A layer (up to to c.250mm thick) of poor quality asphalt was recorded within WS03 to WS05.<br>WS05 was terminated within the made ground materials at a doeth of c.1.05m due to encountering an obstruction which prevented further penetration.<br>In WS03 & WS04, below the layers of sub-base materials further made ground deposits were evident comprising black and reddish brown fragmented brick, rubble and concrete to c.1.80m. In WS04 the brick, rubble and concrete was underlain by a thin band of dark grey very sandy silty clay (possibly original ground level / surface)*. |
| DRIFT GEOLOGY:                      | From c.0.60m and c.2.30m up to c.3.70m and at least c.6.45m. | Initially comprising soft, firm and stiff slightly sandy to sandy silty locally gravelly CLAY to depths of between c.2.00m to c.4.50m.<br>The clay encountered in WS03 was initially described as being slightly 'organic'.<br>In WS06 & WS07, below the clay deposits, at depths of between c.2.00m and c.4.00m, very loose to medium dense light brown saturated SAND was present and was recorded to the terminal depths of the boreholes between c.5.45m and c.6.45m.                                                                                                                                                                                                                                                                                                                |
| SOLID GEOLOGY<br>(WS03 & WS04 only) | From c.3.70m to c.4.50m up to at least c.4.99m.              | Comprising very weak weathered grey MUDSTONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

\* = There was no visual evidence of significant ground contamination (i.e., fuel-derived contaminants, solvents, insulating oils, asbestos, etc.) present within any of the exploratory positions undertaken across this area.

## 5.0 Ground Conditions (Cont'd)

### 5.1 Soil Profiles (Cont'd):-

#### 5.1.3 Unit D (encompassing WS08 to WS10 & WS15):-

**Table 5.1C**

b.cfl - below current floor levels

| Type of Strata                       | Depths Recorded (b.cfl)                                    | Description & General Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FLOOR SLAB:<br>(WS08 to WS10)        | From 0.00m to c.0.20m.                                     | Fine to medium aggregate, reasonable to good quality concrete with c.10mm dia reinforcement recorded between c.120mm to c.130mm from the top of the slab.<br>A basal membrane (plastic) was noted at each location.                                                                                                                                                                                                                                                                      |
| MADE GROUND<br>(WS15 only)           | From 0.00m to c.0.10m.                                     | Grass on a dark brown / grey gravelly made ground                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| MADE GROUND:                         | From 0.10m and c.0.20m up to c.0.43m and c.2.20m.          | Comprising various bands of granular and cohesive made ground including reddish brown slightly clayey sandy gravel with concrete fragments, fragmented brick, rubble and concrete, black / dark grey / dark brown clay with mudstone and brick fragments and grey gravelly clay with mudstone fragments.<br>WS08 & WS10 were terminated within the made ground materials at depths of between c.0.43m and c.0.52m due to encountering obstructions which prevented further penetration.* |
| DRIFT GEOLOGY:<br>(WS09 & WS15 only) | From c.2.10m and c.2.20m up to 3.00m and at least c.5.00m. | WS09 - initially comprising a medium dense grey silty clayey SAND from c.2.10m to c.3.80m, underlain by a stiff medium brown slightly silty sandy CLAY.<br>WS15 - comprising a stiff medium brown sandy CLAY with occasional fine sand lenses.                                                                                                                                                                                                                                           |
| SOLID GEOLOGY:                       | Not encountered                                            | ~                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

\* = There was no visual evidence of significant ground contamination (i.e., fuel-derived contaminants, solvents, insulating oils, asbestos, etc.) present within any of the exploratory positions undertaken across this area.

### 5.2 Existing Foundations (Unit D):-

Five locations (4 no. external and 1 no. internal) around the existing Unit D were investigated by a combination of manually excavated trials and / or probe drilling and coring, to try and determine the details / dimensions of the existing pad foundations and the immediate underlying strata. For a description of the foundation details and ground conditions encountered at these positions, reference should be made to the Foundation Detail Record Sheets attached in Appendix II. The foundation details identified are also summarised in Table 5.2 below

**Table 5.2**

| Trial Pit Location     | Description & General Comments                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TP01 (External)        | Top of concrete pad foundation is recorded at c.0.70m below current ground level (bcgl). Excavation and probe drilling indicates that the pad has an overall width of c.2.00m and is at least 0.90m thick. Due to the depth (at least c.1.60m bcgl) and the presence of possible relict foundations / structures within the excavation the base of the foundation could not be proven.                                                   |
| TP02 (External)        | Top of concrete pad foundation is recorded at c.1.50m below current ground level (bcgl). Excavation and probe drilling indicates that the pad has an overall width of c.2.00m and is at least 0.75m thick. Due to the depth (>2.00m bcgl) the base of the foundation could not be proven.                                                                                                                                                |
| TP03 (Internal)        | Top of concrete pad foundation is recorded at c.0.90m below current ground level (bcgl). Probe drilling and coring indicates pad dimensions of c.2.40m x c.2.40m and at least 0.75m thick. Due to the depth (at least c.1.65m bcgl) and the compact nature of the sub-base / sub-grade materials the base of the foundation could not be proven.                                                                                         |
| TP04 & TP05 (External) | Foundation details for TP04 & TP05 are similar. Top of concrete pad foundation is recorded at c.0.40m (bcgl) with a projection of c.1.20m from the existing column (total width c.2.40m?) and at least 1.00m thick. Due to the depth (>1.40m bcgl) the base of the foundation could not be proven. Due to the depth of the trial pit the compact nature of the materials being excavated the base of the foundation could not be proven. |

bcgl - below current ground levels, b.cfl - below current floor levels

## **5.0 Ground Conditions (Cont'd)**

### **5.3 Groundwater:-**

#### **5.3.1 Proposed Building & Service Yard (encompassing WS01, WS02 & WS11 to WS14):-**

Groundwater ingress was noted within WS01 and WS11 at depths of 2.10m and 2.00m bcgl respectively, with WS12 and WS13 recorded as being damp below c.1.30m bcgl. Consequently, shallow water ingress may occur within construction related excavations associated with the proposed new building and service yard and therefore it would be prudent to allow for the introduction of suitable groundwater control measures to take care of ingresses of groundwater, especially during the wetter periods of the year.

#### **5.3.2 Units A & B (encompassing WS03 to WS07):-**

Groundwater ingress was noted within WS04, WS06 and WS07 at depths between 2.00m and 3.00m bcgl. If any excavations are envisaged as part of the redevelopment / reconfiguration works, i.e. proposed new foundations, services etc., then allowance should be made for the introduction of groundwater control measures, in order to take care of localised ingresses of groundwater which may occur, especially during the wetter periods of the year.

#### **5.3.3 Unit D (encompassing WS08 to WS10 & WS15):-**

Groundwater ingress was noted within WS09 and WS15 at depths of 2.40m and 1.20m bcgl respectively (WS08 & WS10 were terminated at shallow depths in made ground). If any excavations are envisaged as part of the redevelopment / reconfiguration works, i.e. proposed new foundations, services etc., then allowance should be made for the introduction of groundwater control measures, in order to take care of localised ingresses of groundwater which may occur, especially during the wetter periods of the year.

### **5.4 Stability:-**

For future site works, adequate lateral trench support will be required for excavations, to prevent trench wall collapse or over excavations, as well as to create a safe working environment, and any excavations on this site should remain open for as short a period as possible, since some of these materials may be susceptible to deterioration, if left open to the natural elements for any significant period of time.

Any support will also need to take into account the compact / dense nature of some the sub-base / made ground materials notably below existing floor slabs.

## **6.0 Insitu Testing**

### **6.1 Insitu Standard Penetration Tests:-**

Standard penetration tests (SPT's) were carried out with the use of a normal split spoon sampler on the made ground, natural drift and solid geological deposits to determine the relative density / strength of the materials tested. The results are shown as 'N' values on the borehole record sheets, adjacent to the appropriate sample level. A summary of the results of the tests undertaken can be seen in Tables 6.1 & 6.2 on the following page.

## 6.0 Insitu Testing (Cont'd)

### 6.1 Insitu Standard Penetration Tests (Cont'd):-

#### 6.1.1 Proposed Building & Service Yard (encompassing WS01, WS02 & WS11 to WS14):-

**Table 6.1**

| Type of Strata                           | Range of SPT 'N' Values                          | Result details                                     |
|------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| Made Ground:<br>(Granular)               | 13 - 35                                          | Indicative of medium dense and dense deposits.     |
| Made Ground:<br>(Cohesive)               | 6 & 11                                           | Indicative of soft and firm deposits.              |
| Drift Deposits:<br>(Sandy gravelly clay) | 6 & 19 and then 62 blows for limited penetration | Indicative of soft, stiff and very stiff deposits. |
| Solid Geology:<br>(Weathered Mudstone)   | 75 blows for limited penetration                 | Weak to moderately strong deposits.                |

#### 6.1.2 Existing Units A, B & D (encompassing WS03-WS10 & WS15):-

**Table 6.2**

| Type of Strata                         | Range of SPT 'N' Values                                  | Result details                                             |
|----------------------------------------|----------------------------------------------------------|------------------------------------------------------------|
| Made Ground:<br>(Granular)*            | 11 to 41 and then 75 to 82 blows for limited penetration | Indicative of medium dense, dense and very dense deposits. |
| Drift Deposits:<br>(Clay)              | 3 to 13                                                  | Indicative of very soft and firm deposits.                 |
| Drift Deposits:<br>(Sand)              | 1 to 24                                                  | Indicative of very loose, loose and medium dense deposits. |
| Solid Geology:<br>(Weathered Mudstone) | 75 blows for limited penetration                         | Weak to moderately strong deposits.                        |

\* - WS05, WS08 & terminated within made ground.

### 6.2 Insitu Hand Shear Vane Tests:-

Insitu hand vane tests were carried out using portable insitu hand vane tester on the natural drift deposits. The insitu hand vane tester takes direct readings of shear strength, three vane sizes allow for the direct determination of undrained shear strength of extremely low to high strength clays. The peak vane value is determined by a calibrated scale ring built into the head assembly. The cross handle is used both to push the vane to the desired test depth and apply the shearing torque.

The results are summarised in Table 6.3 & 6.4 below and can also be found adjacent to the appropriate sample level, on the graphic borehole and trial pit record sheets.

#### 6.2.1 Proposed Building & Service Yard (encompassing WS01, WS02 & WS11 to WS14):-

**Table 6.3**

| Type of Strata                           | Range of Shear Strength Values              | Result details                    |
|------------------------------------------|---------------------------------------------|-----------------------------------|
| Drift Deposits:<br>(Sandy gravelly clay) | 45kN/m <sup>2</sup> to 104kN/m <sup>2</sup> | Medium to high strength deposits. |
| Solid Geology:<br>(Weathered Mudstone)   | 80kN/m <sup>2</sup>                         | High strength deposits.           |

## 6.0 Insitu Testing (Cont'd)

### 6.2 Insitu Hand Shear Vane Tests (Cont'd):-

#### 6.2.2 Existing Units A, B & D (encompassing WS03-WS10 & WS15):-

**Table 6.4**

| Type of Strata            | Range of Shear Strength Values             | Result details                    |
|---------------------------|--------------------------------------------|-----------------------------------|
| Drift Deposits:<br>(Clay) | 50kN/m <sup>2</sup> to 82kN/m <sup>2</sup> | Medium to high strength deposits. |

### 6.3 Insitu Gas & Water Monitoring:-

Ground gas & water monitoring standpipes were installed within WS01, WS02 and WS13 (associated with proposed new building and service yard) primarily to check for the possible presence of hazardous ground gases, and to monitor any shallow water levels.

A standard 50mm diameter HDPE standpipe, with gravel and geo-wrap surround, bentonite seal, gas valve cap and security cover, was installed within each borehole, and ground gas and water levels were allowed to reach equilibrium, prior to the first monitoring visit. Monitoring was undertaken using a Gas Data GFM series soil gas analysers, with integral flow meter, and a Geotechnical Instruments electronic dipmeter. The response zones were designed to target any ground gas from on and off site sources.

Based on the findings of the intrusive investigation works, in accordance with CIRIA Report C665, November 2007, Report Edition No. 04, March 2007 and BS8485:2015+A1 2019 – Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, it is felt that an adequate risk assessment can be undertaken based on the following limiting factors:

- The development has been considered as **low sensitivity** i.e. commercial development (Tables 5.5a & 5.5b – Typical/Idealised frequency and period of monitoring, after Wilson et al, 2005).
- The risk associated with the generation potential of a source is considered as **very low** (Based on the findings of intrusive works).
- Monitoring over a **minimum** of **one month** with **four recorded** readings (Tables 5.5a & 5.5b – Typical /idealised frequency and period of monitoring after Wilson et al, 2005).
- **Negligible** flow rates are recorded during the monitoring period (Table 8.5 – Modified Wilson & Card classification).
- A targeted and phased programme of gas monitoring will be completed, which will obtain gas monitoring readings during varying atmospheric conditions, which covers the ‘worst case’ scenario for ground gas emissions to occur, particularly during rapid falls in atmospheric pressure (i.e. from c.1020mb and c.1010mb), and also during low atmospheric pressure events (i.e. c.1000mb and below).

Monitoring of the weather conditions and predicated atmospheric pressures (Met Office Surface Pressure Charts) are carried out up to 72 hours in advance of proposed monitoring visits, in order that a reasonable period of data is obtained to determine atmospheric trends, and also to target the ‘worst case’ scenario. The monitoring visits undertaken were taken during rising and falling atmospheric pressure trends.

A summary of the results for the visits undertaken, compared with the ‘inert’ background gas levels is presented in Table 6.5 below, whilst a copy of the monitoring certificate is attached in Appendix III.

## 6.0 Insitu Testing (Cont'd)

### 6.3 Insitu Gas & Water Monitoring (Cont'd):-

**Table 6.5**

\* Note – Atmospheric trend taken from www.weatheronline.co.uk for Huyton

| Position   | Date     | Atmospheric Pressure (mbar) | Water (m bgl) | CH <sub>4</sub> (%v/v) | LEL (%v/v) | CO (%v/v) | CO <sub>2</sub> (%v/v) | O <sub>2</sub> (%v/v) | Flow Rate (l/hr) |
|------------|----------|-----------------------------|---------------|------------------------|------------|-----------|------------------------|-----------------------|------------------|
| Background |          | ~                           | ~             | 0                      | 0          | 0         | 0                      | 21.0                  | <0.1             |
| WS01       | 01/11/23 | 977 (rising)                | 1.59          | 0.0                    | 0.0        | 0.0       | 0.5                    | 18.4                  | <0.1             |
| WS02       |          |                             | 1.25          | 0.0                    | 0.0        | 0.0       | 0.4                    | 19.3                  | <0.1             |
| WS13       |          |                             | 1.12          | 0.0                    | 0.0        | 0.0       | 2.4                    | 17.1                  | <0.1             |
| WS01       | 15/11/23 | 1008 (falling)              | 1.67          | 0.0                    | 0.0        | 0.0       | 0.6                    | 19.4                  | <0.1             |
| WS02       |          |                             | 1.19          | 0.0                    | 0.0        | 0.0       | 0.5                    | 19.4                  | <0.1             |
| WS13       |          |                             | 1.20          | 0.0                    | 0.0        | 0.0       | 0.5                    | 20.0                  | <0.1             |
| WS01       | 29/11/23 | 1000 (falling)              | 1.90          | 0.0                    | 0.0        | 0.0       | 0.3                    | 19.7                  | <0.1             |
| WS02       |          |                             | 1.90          | 0.0                    | 0.0        | 0.0       | 0.3                    | 19.8                  | <0.1             |
| WS13       |          |                             | 1.20          | 0.0                    | 0.0        | 0.0       | 0.6                    | 19.6                  | <0.1             |
| WS01       | 12/12/24 | 1000 (falling)              | 1.70          | 0.0                    | 0.0        | 0.0       | 0.2                    | 20.2                  | <0.1             |
| WS02       |          |                             | 1.10          | 0.0                    | 0.0        | 0.0       | 1.9                    | 19.3                  | <0.1             |
| WS13       |          |                             | 1.10          | 0.0                    | 0.0        | 0.0       | 0.6                    | 20.2                  | <0.1             |

From the results, no levels of Methane (CH<sub>4</sub>) have been recorded during the monitoring period. However, detectible concentrations of Carbon Dioxide (CO<sub>2</sub>) have been recorded, up to a maximum recorded level of 2.4% v/v with associated oxygen (O<sub>2</sub>) concentrations (minimum 17.1% v/v). A negligible flow rate of <0.1l/hr has been recorded during the monitoring period undertaken.

Based on the results undertaken to date, in accordance with CIRIA Report C665, an initial risk assessment has been completed for this site, by converting the results in Table 6.5 above to a gas screening value (GSV), calculated by multiplying the typical maximum gas concentrations with the recorded maximum positive flow rates (after Wilson & Card). Using the maximum values recorded, as no increased levels of CH<sub>4</sub> have been recorded, the GSV for CO<sub>2</sub> only has been calculated, the results of which are shown below:

$$\text{Carbon Dioxide GSV} = 0.024 (2.4\%) \times 0.1 \text{ l/hr} = 0.0024 \text{ l/hr}$$

When considering these results, in accordance with CIRIA C665, the GSV for CO<sub>2</sub> would fall below the lower target concentration of 0.07l/hr and would equate to a Characteristic Situation 1 (CS1) site classification, resulting in no gas protective measures being required for the proposed development.

From the water monitoring undertaken water levels have been recorded at depths of between c.1.10m and c.1.90m bgl. It is considered that this probably represents trapped / perched surface water filtration within the upper superficial deposits and not representative of a continuous shallow groundwater surface below the site.

However, shallow water ingress may be experienced during future construction related excavations, especially within the more granular deposits noted, and allowance should be made for the introduction of groundwater control measures, in order to take care of any ingresses of groundwater which may occur, especially during the wetter periods of the year.

For future site works, adequate lateral trench support will be required for excavations, to prevent trench wall collapse or over excavations, as well as to create a safe working environment, and any excavations on this site should remain open for as short a period as possible, since some of these materials may be susceptible to deterioration, if left open to the natural elements for any significant period of time. Reference to CIRIA 97 'Trenching Practice' would be beneficial to establish a suitable means of support or battering of excavation sides during construction.

## **6.0 Insitu Testing (Cont'd)**

### **6.4 Insitu Dynamic Cone Penetrometer (DCP) Tests:-**

Dynamic Cone Penetrometer (DCP) tests were carried out at WS11, WS14 & WS15 to determine the insitu density of the shallow soils (future sub-grade materials), to assess their suitability. A summary of the results of the tests undertaken can be seen in Table 6.6 below, whilst the full results including a graphical representation can be seen in Appendix III.

The DCP uses an 8kg hammer dropping through a height of 575mm to penetrate a 60° cone (20mm Ø) in to the underlying ground. Readings are taken following a set number of blows or change in strength / density to determine the penetration of the cone. The DCP field results are analysed using the UK DCP 3.1 software package to calculate the thickness and strength / density of differing layers. The calculated results provided comprise penetration rates (mm/blow) and CBR values (%).

**Table 6.6**

| <b><u>Position</u></b> | <b><u>Soil Type</u></b>          | <b><u>Depth to Base (mm)</u></b> | <b><u>Range of Penetration Indices (mm/blow)</u></b> | <b><u>Interpolated CBR Value (%)</u></b> |
|------------------------|----------------------------------|----------------------------------|------------------------------------------------------|------------------------------------------|
| WS14 / DCP01           | Made ground deposits:<br>Subbase | 600                              | 19.52 to 26.36                                       | 10                                       |
|                        | Natural Drift Deposits           | 970                              | 12.35                                                | 21                                       |
| WS15 / DCP02           | Made ground deposits             | 960                              | 29.59                                                | 8                                        |
| WS11 / DCP03           | Made ground deposits             | 850                              | 52.14                                                | 5                                        |

From the results of tests completed, CBR values of between 5% to 10% were recorded for the made ground deposits and 21% for the natural drift deposits. Therefore, where the initial made ground deposits are to be used as an undisturbed subgrade, it is a conservative characteristic design CBR value of 5.0% could be adopted.

Similarly, where the initial natural drift deposits tested (stiff sandy gravelly clay) are to be used as an undisturbed subgrade a characteristic design CBR value of 5% should also be taken. The formation level should be proof rolled with additional stone emplaced to take care of any soft spots, as required.

It is recommended that all sub-grade materials are 'proof rolled' to identify any potential 'loose spots' below the development area, and these can be dealt with by excavation, processing and re-compaction or by introducing an increased thickness of compacted sub-base and/or a geogrid reinforcement.

## **7.0 Laboratory Testing**

All geotechnical testing was carried out in accordance with BS1377-1:2016 by Professional Soils Laboratory Limited (PSL) of Doncaster, South Yorkshire (UKAS accredited), and Chemtech Environmental of Stanley, Co. Durham (UKAS & MCERTS accredited). Ground contamination was undertaken by Chemtech Environmental of Stanley, Co. Durham (UKAS & MCERTS accredited).

### **7.1 Determination of Liquid & Plastic Limits:-**

Representative samples of the natural superficial deposits recovered from the site were tested to determine their moisture contents as well as to determine their liquid and plastic limits, so that these materials could be classified.

## 7.0 Laboratory Testing (Cont'd)

### 7.1 Determination of Liquid & Plastic Limits (Cont'd):-

The results are summarised in Table 7.1 below are also contained in the Professional Soils Laboratory (PSL) Analytical Report (Ref. 23/9121), a copy of which is contained in Appendix IV.

**Table 7.1**

| Position | Depth(m)  | M/C (%) | LL | PL | PI | Class | % Passing 425µm Sieve |
|----------|-----------|---------|----|----|----|-------|-----------------------|
| WS01     | 3.40-3.60 | 16      | 33 | 15 | 18 | CL    | 99                    |
| WS03     | 2.40-2.60 | 26      | 45 | 22 | 23 | CI    | 97                    |
| WS04     | 3.60-3.80 | 18      | 35 | 16 | 19 | CI    | 93                    |
| WS06     | 1.40-1.60 | 15      | 31 | 15 | 16 | CL    | 92                    |
| WS07     | 1.40-1.60 | 16      | 34 | 15 | 19 | CL    | 96                    |
| WS09     | 4.60-4.80 | 14      | 29 | 14 | 15 | CL    | 90                    |
| WS11     | 4.40-4.60 | 8.7     | 28 | 14 | 14 | CL    | 91                    |
| WS14     | 1.40-1.60 | 14      | 38 | 18 | 20 | CI    | 91                    |
| WS15     | 2.40-2.60 | 22      | 44 | 22 | 22 | CI    | 93                    |

M/C = Moisture Content, LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index, CL=Clay Low, CI = Clay Intermediate

From these results, the samples tested are inorganic in nature, and when plotted on the plasticity chart, fall within the low and intermediate plasticity ranges, and from the resulting plasticity indices are of low to moderate volume change potential, when taking into account the amount passing the 425µm sieve. Consequently, some of materials tested may undergo significant changes in volume, if large changes in their natural moisture content were to occur due to seasonal variations or the like and if new foundations were to be based within these materials, they would need to be taken down to a minimum depth of 0.90m below finished ground levels.

An increase in founding depth may be required to reach competent strata and also if the proposed development is within close proximity to existing or envisaged vegetation. An increase in the minimum foundation depth may also be required, even if trees are to be removed to avoid the effects of volume change potential. Reference should be made to BS5837:2012, "Trees in relation to design, demolition and construction" along with the NHBC Standards, Chapter 4.2 'Building near trees.

### 7.2 Determination of pH & SO<sub>4</sub>:-

Representative samples of the made ground & natural strata recovered during the investigation were tested in order to determine their acidic (pH) and soluble sulphate (SO<sub>4</sub>) levels. The results are shown in Table 7.2 below and are also contained within the Chemtech Environmental Limited Analytical Report (Ref. 127658 & 127942), a copy of which can be seen in Appendix IV.

**Table 7.2**

| Position | Depth (m) | Strata      | pH  | SO <sub>4</sub> (mg/l) | Design SO <sub>4</sub> Class | ACEC Class |
|----------|-----------|-------------|-----|------------------------|------------------------------|------------|
| WS01     | 2.60-2.80 | Natural     | 8.0 | 21                     | DS-1                         | AC-1       |
| WS01     | 0.40-0.60 | Made Ground | 8.6 | 262                    | DS-1                         | AC-1       |
| WS02     | 0.20-0.40 | Made Ground | 8.3 | 46                     | DS-1                         | AC-1       |
| WS03     | 3.60-3.80 | Natural     | 7.9 | 31                     | DS-1                         | AC-1       |
| WS04     | 2.40-2.60 | Natural     | 7.9 | 79                     | DS-1                         | AC-1       |
| WS06     | 2.60-2.80 | Natural     | 8.5 | 41                     | DS-1                         | AC-1       |
| WS06     | 5.80-6.00 | Natural     | 8.9 | 23                     | DS-1                         | AC-1       |
| WS07     | 3.60-3.80 | Natural     | 8.1 | 33                     | DS-1                         | AC-1       |
| WS09     | 2.80-3.00 | Natural     | 8.9 | 37                     | DS-1                         | AC-1       |
| WS11     | 1.80-2.00 | Made Ground | 7.5 | 22                     | DS-1                         | AC-1       |
| WS11     | 0.20-0.40 | Made Ground | 8.5 | 47                     | DS-1                         | AC-1       |
| WS12     | 1.00-1.20 | Made Ground | 8.7 | 55                     | DS-1                         | AC-1       |
| WS13     | 0.80-1.00 | Made Ground | 8.7 | 90                     | DS-1                         | AC-1       |
| WS14     | 0.80-1.00 | Natural     | 8.4 | 82                     | DS-1                         | AC-1       |

ACEC = Aggressive Chemical Environment for Concrete site classification

Report Type:- Ground Investigation Report

Project:- 23-795 – Proposed Retail Park, Sovereign Business Park, Liverpool

Prepared For:- Adept Civil & Structural Consulting Engineers

## **7.0 Laboratory Testing (Cont'd)**

### **7.2 Determination of pH & SO<sub>4</sub> (Cont'd):-**

From these results it can be seen that the pH values for the samples tested range from 7.5 to 8.9 and the amount of soluble sulphate present ranges from 21mg/l to 262mg/l. Therefore, in accordance with BRE Special Digest 1: 2005, the site can be given a classification of Class DS-1. For the proposed building / service yard and for any new internal foundations for the existing units A, B & D considering the pH values of the materials tested, and assuming natural ground conditions with potentially mobile groundwater, the assessment of the Aggressive Chemical Environment for Concrete (ACEC) classification for this site is AC-1.

### **7.3 Determination of Compressive Strength:-**

Compressive Strength tests (cylinder strength) were carried out on representative concrete cores, and the results of which can be seen in the PSL analytical report (Ref. 23/9121), a copy of which is attached.

The results the concrete cores returned compressive strengths values of 32.6N/mm<sup>2</sup> up to 50.6N/mm<sup>2</sup>. When considering the compressive strength results of the concrete cores, these have been reported as cylinder strength and although there is no current documentation that allows a direct conversion of these results to cubic strength, with the Concrete Society Technical Report 11 (TR11) 'Concrete core testing for strength' withdrawn, research indicates relatively vague correlations between cylinder and cubic strengths (i.e., for normal weight aggregates the concrete cylinder strength is c.80% of the corresponding cube strength and for lightweight aggregates it is about 90%). Therefore, assuming normal weight aggregates, the equivalent cubic strength of the concrete cores recovered would range from c.26.08N/mm<sup>2</sup> and 40.48N/mm<sup>2</sup>.

### **7.4 Contamination Testing / Screening Strategy:-**

Five representative samples of the made ground materials recovered from the boreholes within the area of the proposed new building and service yard were passed onto Chemtech Ltd of Stanley, so that soil contamination screening could be carried out to primarily assess any potential risk to Human Health and controlled waters and to also assist with off-site disposal.

There was no evidence of hydrocarbon contamination (fuel or waste oil) or ACMs noted within any of the exploratory positions. However, for completeness and to aid with off-site disposal, samples were tested for Speciated PAH (Polycyclic Aromatic Hydrocarbons), Speciated TPH (Total Petroleum Hydrocarbons) & Asbestos.

The catalogue of testing results can be found in the Chemtech Analytical Report (Ref. 127658), attached in Appendix IV, with the total analysis carried out is summarised on below.

- 5 no. soil samples screened for a generic (metals and non-organics) soil suite including Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide and Total Organic Carbon (TOC).
- 5 no. soil samples screened for Speciated Polycyclic Aromatic Hydrocarbons (PAH's).
- 5 no. soil samples screened for Speciated Total Petroleum Hydrocarbons (based on full Aliphatic / Aromatic Split & BTEX).
- 5 no. samples screened for the presence of asbestos.

The results of the contamination screening are discussed further in Section 8.0 below.

## 8.0 Ground Contamination

The soil screening results have been assessed by comparing the maximum values ( $C_M$ ) recorded for each analyte to the critical concentration values ( $C_C$ ) adopted for this site i.e. based on a commercial end use. The results of the testing are contained in Appendix IV, has been summarised in Table 8.1 below.

**Table 8.1**

| Analyte                   | Critical Conc. ( $C_C$ ) | No. of Samples Screened | Max. Conc. ( $C_M$ ) Recorded | No. of Samples > $C_C$ |
|---------------------------|--------------------------|-------------------------|-------------------------------|------------------------|
| Arsenic                   | 640 <sup>(1)</sup>       | 5                       | 9.5                           | 0                      |
| Cadmium                   | 190 <sup>(1)</sup>       | 5                       | <2                            | 0                      |
| Chromium III              | 8600 <sup>(1)</sup>      | 5                       | 49                            | 0                      |
| Chromium VI               | 33 <sup>(1)</sup>        | 5                       | <0.04                         | 0                      |
| Copper                    | 68000 <sup>(1)</sup>     | 5                       | 40                            | 0                      |
| Lead                      | 2330 <sup>(2)</sup>      | 5                       | 136                           | 0                      |
| Mercury                   | 1100 <sup>(1)</sup>      | 5                       | <2                            | 0                      |
| Nickel                    | 980 <sup>(1)</sup>       | 5                       | 34                            | 0                      |
| Selenium                  | 12000 <sup>(1)</sup>     | 5                       | <3                            | 0                      |
| Zinc                      | 730000 <sup>(1)</sup>    | 5                       | 158                           | 0                      |
| Cyanide                   | 34 <sup>(3)</sup>        | 5                       | <1                            | 0                      |
| Acenaphthene              | 84000 <sup>(1)</sup>     | 5                       | 0.11                          | 0                      |
| Acenaphthylene            | 83000 <sup>(1)</sup>     | 5                       | <0.02                         | 0                      |
| Anthracene                | 520000 <sup>(1)</sup>    | 5                       | 0.33                          | 0                      |
| Benzo(a)anthracene        | 170 <sup>(1)</sup>       | 5                       | 0.54                          | 0                      |
| Benzo(a)pyrene            | 35 <sup>(1)</sup>        | 5                       | 0.53                          | 0                      |
| Benzo(b)fluoranthene      | 44 <sup>(1)</sup>        | 5                       | 0.57                          | 0                      |
| Benzo(ghi)perylene        | 3900 <sup>(1)</sup>      | 5                       | 0.38                          | 0                      |
| Benzo(k)fluoranthene      | 1200 <sup>(1)</sup>      | 5                       | 0.21                          | 0                      |
| Chrysene                  | 350 <sup>(1)</sup>       | 5                       | 0.68                          | 0                      |
| Dibenz(ah)anthracene      | 3.5 <sup>(1)</sup>       | 5                       | 0.06                          | 0                      |
| Fluoranthene              | 23000 <sup>(1)</sup>     | 5                       | 1.17                          | 0                      |
| Fluorene                  | 63000 <sup>(1)</sup>     | 5                       | 0.08                          | 0                      |
| Indeno(123cd)pyrene       | 500 <sup>(1)</sup>       | 5                       | 0.33                          | 0                      |
| Naphthalene               | 190 <sup>(1)</sup>       | 5                       | 0.18                          | 0                      |
| Phenanthrene              | 22000 <sup>(1)</sup>     | 5                       | 1.05                          | 0                      |
| Pyrene                    | 54000 <sup>(1)</sup>     | 5                       | 1.12                          | 0                      |
| VPH Aliphatic (>C5-C6)    | 3200 <sup>(1)</sup>      | 5                       | <0.05                         | 0                      |
| VPH Aliphatic (>C6-C8)    | 7800 <sup>(1)</sup>      | 5                       | <0.05                         | 0                      |
| VPH Aliphatic (>C8-C10)   | 2000 <sup>(1)</sup>      | 5                       | <0.05                         | 0                      |
| EPH Aliphatic (>C10-C12)  | 9700 <sup>(1)</sup>      | 5                       | <6                            | 0                      |
| EPH Aliphatic (>C12-C16)  | 59000 <sup>(1)</sup>     | 5                       | <6                            | 0                      |
| EPH Aliphatic (>C16-C35)  | 1600000 <sup>(1)</sup>   | 5                       | <15                           | 0                      |
| EPH Aliphatic (>C35-C44)  | 1600000 <sup>(1)</sup>   | 5                       | <10                           | 0                      |
| VPH Aromatic (>EC5-EC7)   | 26000 <sup>(1)</sup>     | 5                       | <0.05                         | 0                      |
| VPH Aromatic (>EC7-EC8)   | 56000 <sup>(1)</sup>     | 5                       | <0.05                         | 0                      |
| VPH Aromatic (>EC8-EC10)  | 3500 <sup>(1)</sup>      | 5                       | <0.05                         | 0                      |
| EPH Aromatic (>EC10-EC12) | 16000 <sup>(1)</sup>     | 5                       | <10                           | 0                      |
| EPH Aromatic (>EC12-EC16) | 36000 <sup>(1)</sup>     | 5                       | <10                           | 0                      |
| EPH Aromatic (>EC16-EC21) | 28000 <sup>(1)</sup>     | 5                       | <1                            | 0                      |
| EPH Aromatic (>EC21-EC35) | 28000 <sup>(1)</sup>     | 5                       | <1                            | 0                      |
| EPH Aromatic (>EC35-EC44) | 28000 <sup>(1)</sup>     | 5                       | <1                            | 0                      |
| Benzene                   | 27 <sup>(1)</sup>        | 5                       | <0.001                        | 0                      |
| Toluene                   | 56000 <sup>(1)</sup>     | 5                       | <0.001                        | 0                      |
| Ethylbenzene              | 5700 <sup>(1)</sup>      | 5                       | <0.001                        | 0                      |
| m & p-Xylene              | 5900 <sup>(1)</sup>      | 5                       | <0.001                        | 0                      |
| o-Xylene                  | 6600 <sup>(1)</sup>      | 5                       | <0.001                        | 0                      |
| Asbestos                  | Presence                 | 5                       | NAD                           | 0                      |

<sup>(1)</sup> = LQM CIEH Suitable 4 Use Levels (S4UL Nov 2014 (Revised August 2015) – Commercial 1.0% SOM, <sup>(2)</sup> = C4SL Values (Commercial), <sup>(3)</sup> = ATRISK<sup>SOIL</sup> SSV, Note = All units are mg/kg. NAD = No Asbestos Detected.

## **8.0 Ground Contamination (Cont'd)**

The results have identified the following:

- None of the maximum concentrations ( $C_M$ ) values exceed the critical concentrations ( $C_C$ ) values taken for the site.
- No asbestos was detected within any of the soil samples tested.

Consequently, these materials are not considered to pose a significant risk to Human Health where exposure pathways are available and no further assessment and / or remedial works are deemed necessary with this regard.

When taking into account the previous current and proposed use of the site (commercial / industrial units), the overall environmental setting of site i.e. situated within a predominantly commercial / industrial area, and given that the proposed development works will result in 100% hardcover with new drainage (therefore minimising surface infiltration), the risk to Controlled Waters from on-site contamination is considered to be low and no further assessment / works are considered necessary.

When considering the risks to the construction workforce, the results can be used by the Main Contractor / Project Coordinator, when devising an adequate Site Health & Safety Plan, in accordance with current CDM Regulations. For further guidance reference should be made to the Health and Safety Executive (HSE) document EH40/2005 Workplace exposure limits.

## **9.0 Conclusions & Recommendations**

### **9.1 Ground Conditions:-**

#### **9.1.1 Proposed Building & Service Yard (encompassing WS01, WS02 & WS11 to WS14):-**

Ground conditions comprised an initial surfacing of dark brown sandy clayey topsoil with brick fragments (WS01 & WS02) and asphalt (WS11 to WS14) overlying both cohesive and granular made ground including fragmented brick, rubble and concrete, grey sandy stone sub-base and dark grey clay with mudstone and brick fragments recorded to depths of between c.0.60m up to c.2.30m below current ground levels (bcgl).

Natural drift deposits underlying the made ground generally comprised stiff becoming firm, locally stiff, medium brown sandy locally gravelly clay with occasional sand lenses. WS01 and WS11 to WS14 were terminated within these clay deposits at depths of between c.2.00m and c.5.32m bcgl.

The solid geological deposits were only encountered only in WS02 at a depth of c.4.00m bcgl and comprised very weak weathered grey mudstone. The borehole was terminated within the weathered mudstone at a doeth of c.4.60m bcgl due to refusal of the sampling equipment.

#### **9.1.2 Units A & B (encompassing WS03 to WS07)**

Within Units A & B, the existing concrete slab within units composed fine to medium aggregate, reasonable to good quality concrete with c.6mm up to c.12mm dia reinforcement recorded between c.40mm to c.130mm from the top of the slab.

## **9.0 Conclusions & Recommendations (Cont'd)**

### **9.1 Ground Conditions (Cont'd):-**

Underlying the concrete slab, made ground was present initially comprising various thin bands / layers of granular sub-base materials including reddish brown very gravelly slightly clayey sand, grey angular limestone and black sandy gravel. A layer (up to c.250mm thick) of poor quality asphalt was recorded within WS03 to WS05.

WS05 was terminated within the made ground materials at a depth of c.1.05m below current floor levels (bcfl) due to encountering an obstruction which prevented further penetration.

In WS03 and WS04, below the layers of sub-base materials further made ground deposits were evident comprising black and reddish brown fragmented brick, rubble and concrete to c.1.80m bcfl. In WS04 the brick, rubble and concrete was underlain by a thin band of dark grey very sandy silty clay (possibly original ground level / surface).

Natural drift deposits, where encountered, initially comprised soft, firm and stiff slightly sandy to sandy silty locally gravelly clay, recorded to depths of between c.2.00m to c.4.50m bcfl. The clay encountered in WS03 was initially described as being slightly 'organic'. In WS06 and WS07, below the clay deposits, at depths of between c.2.00m and c.4.00m, very loose to medium dense light brown saturated sand was present and was recorded to the terminal depths of the boreholes between c.5.45m and c.6.45m bcfl.

Solid geological deposits comprising very weathered grey mudstone were encountered within WS03 and WS04, at depths of between 3.70m to c.4.50m bcfl and both boreholes were itemed within these deposits at depths of between c.4.50m and c.4.99m bcfl, upon refusal of the sampling equipment.

#### **9.1.3 Unit D (encompassing WS08 to WS10 & WS15):-**

The existing concrete slab within Unit D comprised fine to medium aggregate, reasonable to good quality concrete with c.10mm dia reinforcement recorded between c.120mm to c.130mm from the top of the slab.

Ground conditions in WS15 carried out externally to the east of Unit D, initially comprised a layer of gravelly topsoil (c.0.10m thickness).

Below the existing slab (WS08 to WS10) and gravelly topsoil (WS15), made ground was present comprising various bands of granular and cohesive made ground including reddish brown slightly clayey sandy gravel with concrete fragments, fragmented brick, rubble and concrete, black / dark grey / dark brown clay with mudstone and brick fragments and grey gravelly clay with mudstone fragment and recorded to depths of up to c.2.20m bcgl (WS15).

WS08 and WS10 were terminated within the made ground at depths of between c.0.43m and c.0.52m bcfl due to encountering obstructions which prevented further penetration

Natural drift deposits encountered in WS09 initially comprised a medium dense grey silty clayey sand from c.2.10m to c.3.80m, in turn underlain by a stiff medium brown slightly silty sandy clay which was recorded to the terminal depth of the borehole at c.5.00m bcfl.

In WS15, the natural drift below the made ground comprised a stiff medium brown sandy clay with occasional fine sand lenses, recorded to a depth of a least c.3.00m bcgl.

## **9.0 Conclusions & Recommendations (Cont'd)**

### **9.2 Groundwater & Stability**

#### **9.2.1 Proposed Building & Service Yard (encompassing WS01, WS02 & WS11 to WS14)**

Groundwater ingress was noted within WS01 and WS11 at depths of 2.10m and 2.00m bcgl respectively, with WS12 and WS13 recorded as being damp below c.1.30m bcgl. Consequently, shallow water ingress may occur within construction related excavations associated with the proposed new building and service yard and therefore it would be prudent to allow for the introduction of suitable groundwater control measures to take care of ingresses of groundwater, especially during the wetter periods of the year.

From the water monitoring undertaken water levels have been recorded at depths of between c.1.10m and c.1.90m bcgl. It is considered that this probably represents trapped / perched surface water filtration within the upper superficial deposits and not representative of a continuous shallow groundwater surface below the site.

However, shallow water ingress may be experienced during future construction related excavations, especially within the more granular deposits noted, and allowance should be made for the introduction of groundwater control measures, in order to take care of any ingresses of groundwater which may occur, especially during the wetter periods of the year.

#### **9.2.2 Units A & B (encompassing WS03 to WS07):-**

Groundwater ingress was noted within WS04, WS06 and WS07 at depths between 2.00m and 3.00m bcgl. If any excavations are envisaged as part of the redevelopment / reconfiguration works, i.e. proposed new foundations, services etc., then allowance should be made for the introduction of groundwater control measures, in order to take care of localised ingresses of groundwater which may occur, especially during the wetter periods of the year.

#### **9.2.3 Unit D (encompassing WS08 to WS10 & WS15):-**

Groundwater ingress was noted within WS09 and WS15 at depths at depths of 2.40m and 1.20m bcgl respectively (WS08 & WS10 were terminated at shallow depths in made ground). If any excavations are envisaged as part of the redevelopment / reconfiguration works, i.e. proposed new foundations, services etc., then allowance should be made for the introduction of groundwater control measures, in order to take care of localised ingresses of groundwater which may occur, especially during the wetter periods of the year.

### **9.3 Existing Foundations (Unit D):-**

Details of the existing foundations within / around Unit D are summarised below.

TP01 (external) - top of concrete pad foundation is recorded at c.0.70m below current ground level (bcgl). Excavation and probe drilling indicates that the pad has an overall width of c.2.00m and is at least 0.90m thick. Due to the depth (at least c.1.60m bcgl) and the presence of possible relict foundations / structures within the excavation the base of the foundation could not be proven.

TP02 (external) - top of concrete pad foundation is recorded at c.1.50m below current ground level (bcgl). Excavation and probe drilling indicates that the pad has an overall width of c.2.00m and is at least 0.75m thick.

## **9.0 Conclusions & Recommendations (Cont'd)**

### **9.3 Existing Foundations (Unit D) (Cont'd):-**

Due to the depth (>2.00m bcgl) the base of the foundation could not be proven.

TP03 (internal) - top of concrete pad foundation is recorded at c.0.90m below current ground level (bcgl). Probe drilling and coring indicates pad dimensions of c.2.40m by c.2.40m and at least 0.75m thick. Due to the depth (at least c.1.65m bcfl) and the compact nature of the sub-base / sub-grade materials the base of the foundation could not be proven.

TP04 & TP05 - top of concrete pad foundation at c.0.40m (bcgl) with a projection from the column of c.1.20m (total width c.2.40m<sup>2</sup>) and at least 1.00m thick. Due to the depth of the trial pit the compact nature of the materials being excavated the base of the foundation could not be proven.

### **9.4 Foundation Options (proposed new building and service yard):-**

When considering the foundation options available for the proposed building and service yard, it is felt that traditional strip & pad foundations should be acceptable, taken down through the made ground materials and based wholly within the natural firm to stiff clays, at a minimum depth of c.0.90m below finished ground levels, where a maximum allowable bearing pressure of 100kN/m<sup>2</sup> is available. This could result in foundation depths of up to c.2.40m bcgl (WS11).

An increase in this minimum depth may also be required if the proposed development is close to existing trees and vegetation, even if trees are to be removed. Reference should be made to BS5837:2012, "Trees in relation to design, demolition and construction" along with the NHBC Standards, Chapter 4.2 'Building near trees.

From the results of tests completed, where the initial made ground deposits are to be used as an undisturbed subgrade, it is a conservative characteristic design CBR value of 5.0% could be adopted. Similarly, where the initial natural drift deposits tested (stiff sandy gravelly clay) are to be used as an undisturbed subgrade a characteristic design CBR value of 5% should also be taken.

It is recommended that all sub-grade materials are 'proof rolled' to identify any potential 'loose spots' below this development area, and these can be dealt with by excavation, processing and re-compaction or by introducing an increased thickness of compacted sub-base and/or a geogrid reinforcement. In addition, it may also be prudent to allow for an engineer to attend site during the development works, to confirm the design CBR value of the materials to be utilised prior to construction (e.g. plate bearing tests or similar).

When considering the results of the pH and soluble sulphate testing, future foundations and buried concrete on the site can be constructed utilising a concrete design class of DS-1 and ACEC class of AC-1.

### **9.5 Gas Protection Measures (proposed new building):-**

From the results of the gas monitoring undertaken, no levels of Methane (CH<sub>4</sub>) have been recorded during the monitoring period. However, detectable concentrations of Carbon Dioxide (CO<sub>2</sub>) have been recorded, up to a maximum recorded level of 2.4% v/v, with associated depleted oxygen (O<sub>2</sub>) concentrations (17.1% v/v). In addition, negligible flow rates of <0.1/hr have been recorded during the monitoring visits.

Based on the results, in accordance with CIRIA Report C665, the GSV for Carbon Dioxide has been calculated at 0.0024 l/hr, which equates to a Characteristic Situation 1 (CS1), indicating that no gas protection measures being required for the proposed development.

---

## **9.0 Conclusions & Recommendations (Cont'd)**

### **9.5 Gas Protection Measures (proposed new building) (Cont'd):-**

The BGS radon map for Great Britain dated December 2022, indicates that the site falls in a 1km grid square, where all parts are in the low band of radon potential. Less than 1% of homes are at or above the Action Level. As a result, no radon protective measures are required for the site.

### **9.6 Ground Contamination (proposed new building and service yard):-**

The results of the contamination screening carried out on the made ground deposits across the area of the proposed new building and service yard did not return any concentrations above the critical concentration values taken for the site. In addition, no asbestos was detected within any of the soil samples tested. Consequently, these materials are not considered to pose a significant risk to Human Health where exposure pathways are available and no further assessment and / or remodel works are deemed necessary with this regard.

When taking into account the results of the contamination screening, current and proposed use of the site (commercial / industrial units), the overall environmental setting of site i.e. situated within a predominantly commercial / industrial area, and given that the proposed development works will result in 100% hardcover with new drainage (therefore minimising surface infiltration), the risk to Controlled Waters from on-site contamination is considered to be low and no further assessment / works are considered necessary.

When considering the risks to the construction workforce, the results can be used by the Main Contractor / Project Coordinator, when devising an adequate Site Health & Safety Plan, in accordance with current CDM Regulations. For further guidance reference should be made to the Health and Safety Executive (HSE) document EH40/2005 Workplace exposure limits.

### **9.7 Waste Classification:-**

The materials encountered from below the area of the proposed new building and service yard which may have to be discarded as a waste to landfill, have been assessed using Technical Guidance WM3 'Guidance on the classification and assessment of Waste', in conjunction with the on-line waste classification software tool HazWasteOnline™.

Each sample has been assessed separately to determine whether all the soils can be considered as a single waste stream or whether the different sources (brick rubble, sandy ash and reworked clay) represent separate waste streams.

Based on the physical (visual and olfactory) inspection of the samples recovered from the boreholes, representative samples have been assessed as either 17 05 03 (waste soil and stones containing hazardous substances) or 17 05 04 (waste soil and stones other than those mentioned in 17 05 03) from the WM3 List of Waste (LoW). In order to determine which waste code applies to each sample, the results of the laboratory testing have been assessed using the HazWasteOnline™ software. The results are summarised in Table 9.1 on the following page and the full Waste Classification Report can be found in Appendix V.

## 9.0 Conclusions & Recommendations (Cont'd)

### 9.7 Waste Classification (Cont'd):-

**Table 9.1**

| Position | Depth (m) | WM3 Waste Classification | Waste Code |
|----------|-----------|--------------------------|------------|
| WS01     | 0.40-0.60 | Non-hazardous            | 17 05 04   |
| WS02     | 0.20-0.40 | Non-hazardous            | 17 05 04   |
| WS11     | 0.20-0.40 | Non-hazardous            | 17 05 04   |
| WS12     | 1.00-2.00 | Non-hazardous            | 17 05 04   |
| WS13     | 0.80-1.00 | Non-hazardous            | 17 05 04   |

The results of this assessment are included within the Waste Classification Report attached and have identified that all five samples tested have been classified as Non-Hazardous waste (waste code 17 05 04).

The results indicate that the samples tested would be classified as Non-Hazardous waste (waste code 17 05 04) and consequently should be subject to the 'lower rated' tax. It should be noted that the sample from WS02 0.20m-0.40m, is a sample of topsoil which is not listed within the Landfill Tax (Qualifying Material) Order 2011, and therefore this would be subject to standard rated tax if disposed of site to landfill.

Given all of the samples have been classified as Non-Hazardous waste (waste code 17 05 04) and taking into account that all of the TOC values are below 3%, confirmatory Waste Acceptance Criteria (WAC) testing has been carried out to determine if some of the materials tested would meet the waste criteria for Inert Waste disposal. The results can be found in the Chemtech Analytical Report (Ref No. 127658 (1)) in Appendix IV and indicate that all the samples tested would meet the waste criteria for Inert Waste and may be able to be disposed of at an inert landfill.

The waste classification report and results of the contamination screening should be forwarded on to the chosen landfill for their comment and assessment.

It should be noted that this Waste Classification Report is only applicable to those made ground materials which have been sampled and screened as part of the assessment. If materials, other than those covered by this report, are to be discarded from site as a waste to landfill or there is a significant increase in the volume of materials to be discarded, then these additional materials will also need to be assessed using Technical Guidance WM3: Guidance on the classification and assessment of Waste.

Where possible, removal of materials from site as a 'waste' should be kept to a minimum and ideally excavated materials should all be reused on site. However, if excavated materials have to be discarded to accommodate finished ground levels etc., additional analysis and screening should be undertaken once each specific waste stream has been identified and the volume of material to be disposed of has been calculated, since the amount of screening required, including any pre-disposal WAC screening, will be dependent upon the final volume of material to be disposed of.

---

## **9.0 Conclusions & Recommendations (Cont'd)**

### **9.8 General Comments:-**

When considering the proposed configuration / modification works to the existing units, then it is recommended that this report and any other pertinent information relating to the site is forwarded on to an experienced structural engineer for their comment and assessment.

With regard to asbestos in soil, where we have sampled and tested for asbestos this is discussed in the report. However, there is always the possibility, along with other contamination, that undiscovered asbestos exists between sample locations and the possibility of unknown asbestos exists on all sites, particularly brownfield sites where previous buildings have been demolished, there were previous features that were infilled (old hollows, pits etc) or where significant quantities of materials such as demolition and brick rubble exist.

It is not uncommon for historical asbestos wastes to be deliberately buried on derelict sites or imported old demolition rubble which could contain asbestos to be imported for use as hardstanding/hardcore. Unless otherwise stated we have not assessed any above or below ground features such as existing buildings, service ducts, basements, culverts, partly demolished or dilapidated structures, spoil heaps, fly tipped materials, security bunds, etc.

For all future site works, adequate lateral trench support will be required for excavations, in order to prevent trench wall collapse or over excavations, as well as to create a safe working environment below a depth of 1.20m, and any excavations on this site should remain open for as short a period as possible, since some of these materials may be susceptible to deterioration, if left open to the natural elements for any significant period of time.

It is also recommended that adequate surface drainage should be designed and installed by a competent contractor, in order to prevent surface water 'ponding' or collection, during and post construction, particularly since any existing surface drainage systems have been/will be disrupted or damaged.

In addition, for deeper excavations, drainage, service runs or the like that may pass close to or beneath any proposed new foundations, these should be undertaken with care and completed prior to the preparation of any new foundations, so as not to allow any loose or granular material to move or 'flow', thus causing settlement to occur to any new foundations based at a higher level.

An "observational technique" can also be applied to the design and construction of this development, and where ground conditions seem to vary from those identified from the works to date, then advice should be sought from Arc Environmental Ltd.

**END OF REPORT**

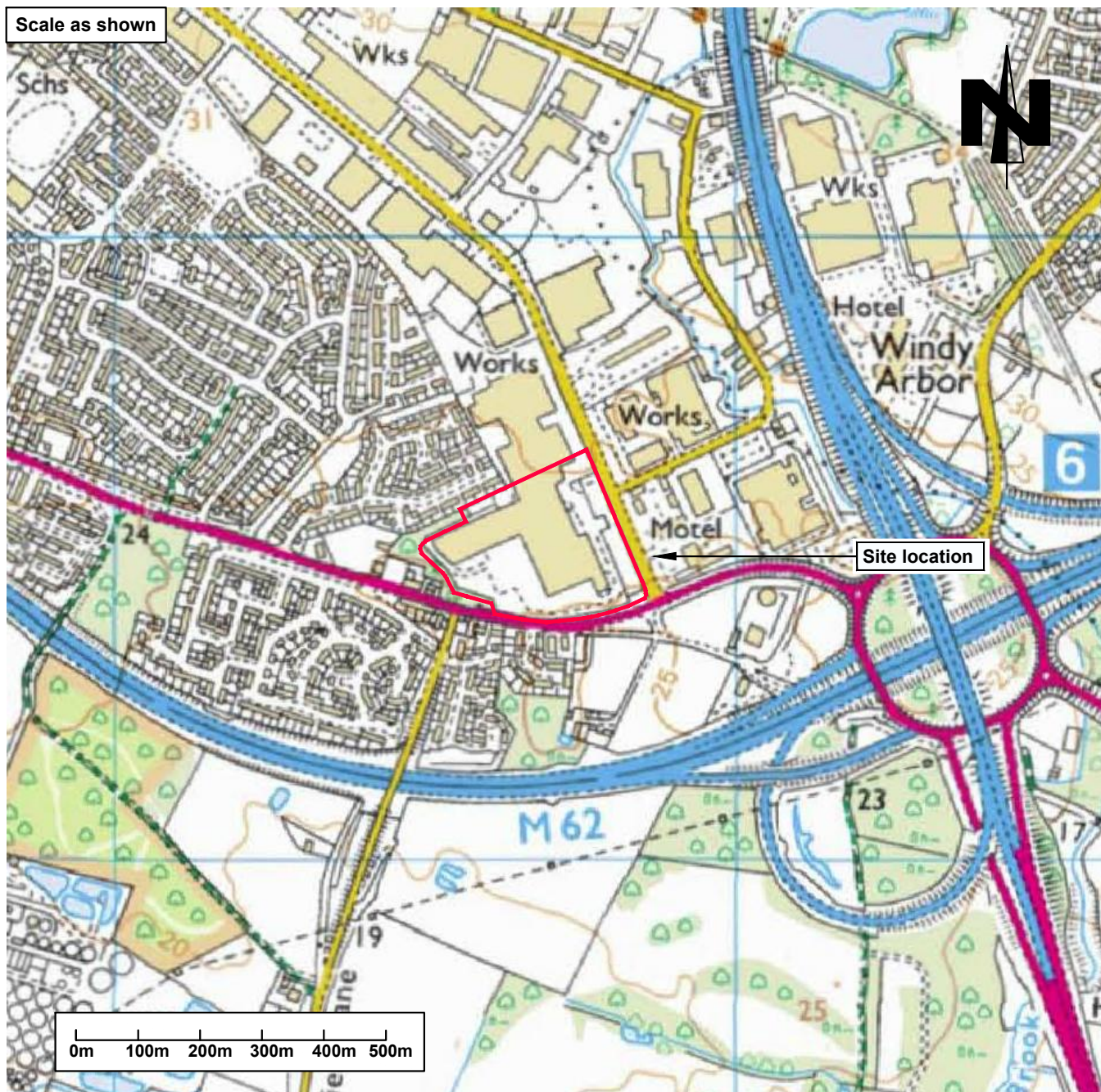
# **APPENDIX I**

**Location Plan**

**Aerial Photograph**

**Existing Site Layout Plan**

Scale as shown



Client:

**ADEPT CSCE**

Project Title:

Halewood Wines & Spirits

The Sovereign Distillery, Wilson Road

Huyton, Merseyside, L36 6AD

Drawing Title:

Location Plan

Job Reference:

23-795

Drawing Number:

-

Revision:

-

Drawn by:

P.D

Date:

05.02.24

Scale at A4:

As Shown

Checked by:

S.T

Approved by:

S.T

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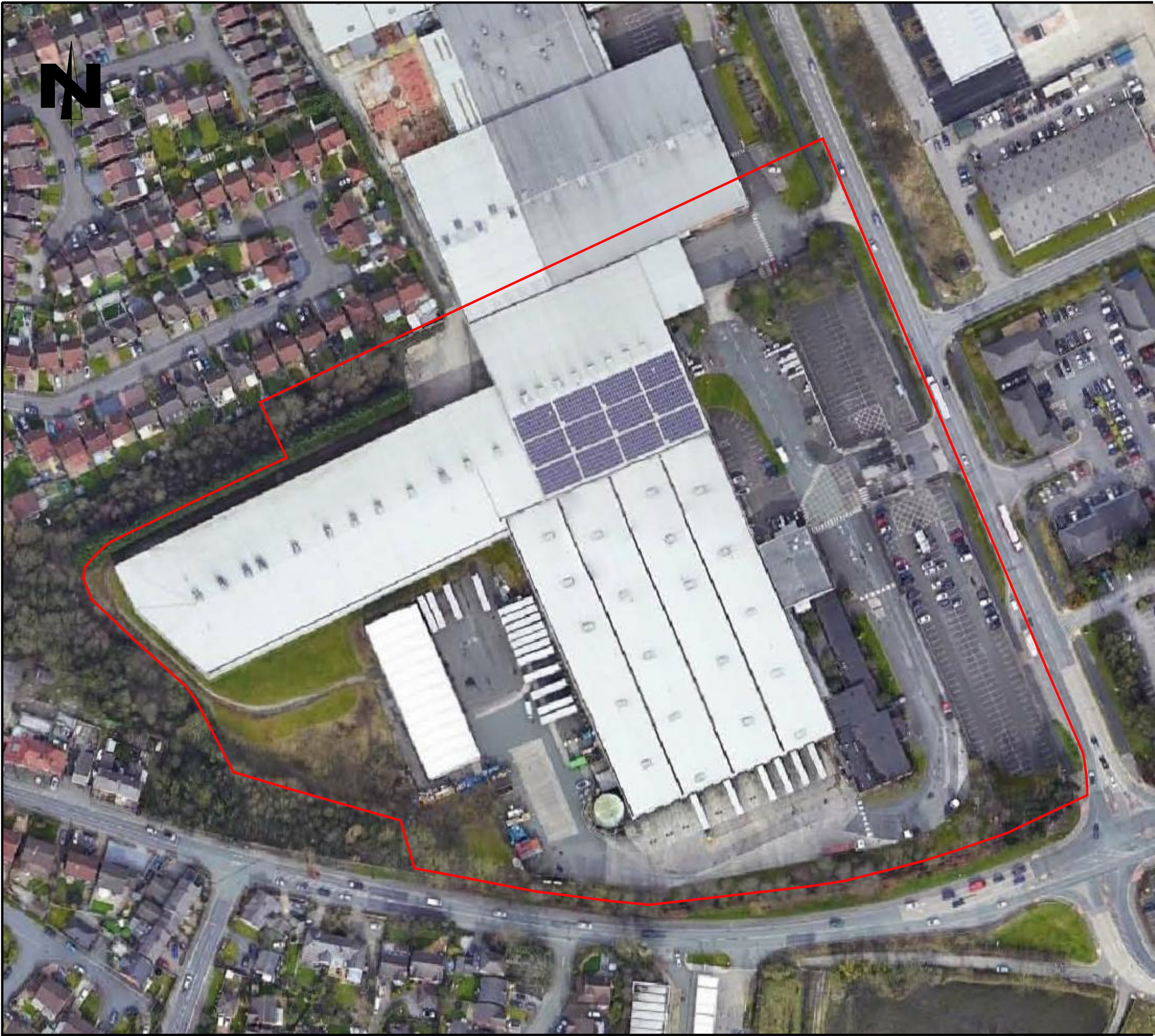
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| LEGEND |                             |
|--------|-----------------------------|
|        | AREA OF INVESTIGATION WORKS |

|      |      |            |  |       |       |
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|      |      |            |  |       |       |
| rev. | date | amendments |  | drawn | chckd |

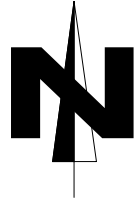
|         |                   |
|---------|-------------------|
| Client: | <b>ADEPT CSCE</b> |
|---------|-------------------|

|                |                                               |
|----------------|-----------------------------------------------|
| Project Title: | Halewood Wines & Spirits                      |
|                | The Sovereign Distillery, Wilson Road, Huyton |
|                | Merseyside, L36 6AD                           |

|                |                   |
|----------------|-------------------|
| Drawing Title: | Aerial Photograph |
|----------------|-------------------|

|              |          |           |              |
|--------------|----------|-----------|--------------|
| Scale at A3: | Date:    | Drawn by: | Approved by: |
| NTS @ A3     | 10.11.23 | P.D       | S.T          |

|          |         |      |
|----------|---------|------|
| Job Ref: | Drg no: | Rev: |
| 23-795   | —       | —    |



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**LEGEND**

 AREA OF INVESTIGATION WORKS

| rev. | date | amendments | drawn | chckd |
|------|------|------------|-------|-------|
|      |      |            |       |       |

Client:

**ADEPT CSCE**

**Project Title:**

Halewood Wines & Spirits  
The Sovereign Distillery, Wilson Road, Huyton  
Merseyside, L36 6AD

**Drawing Title:**

Existing Site Layout Plan

|                          |                   |                  |                     |
|--------------------------|-------------------|------------------|---------------------|
| Scale at A3:<br>NTS @ A3 | Date:<br>10.11.23 | Drawn by:<br>P.D | Approved by:<br>S.T |
|--------------------------|-------------------|------------------|---------------------|

|                    |              |           |
|--------------------|--------------|-----------|
| Job Ref:<br>23-795 | Drg no:<br>— | Rev:<br>— |
|--------------------|--------------|-----------|

## **APPENDIX II**

**Borehole & Trial Pit Location plan**

**Borehole & Trial Pit Record Sheets**

**Foundation Detail Record Sheets**



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### LEGEND

|  |                                          |
|--|------------------------------------------|
|  | AREA OF INVESTIGATION WORKS              |
|  | WINDOWLESS SAMPLING<br>BOREHOLE LOCATION |
|  | MANUALLY EXCAVATED<br>TRIAL PIT POSITION |

|      |      |            |       |       |
|------|------|------------|-------|-------|
| rev. | date | amendments | drawn | chckd |
|------|------|------------|-------|-------|

Client:

## ADEPT CSCE

### Project Title:

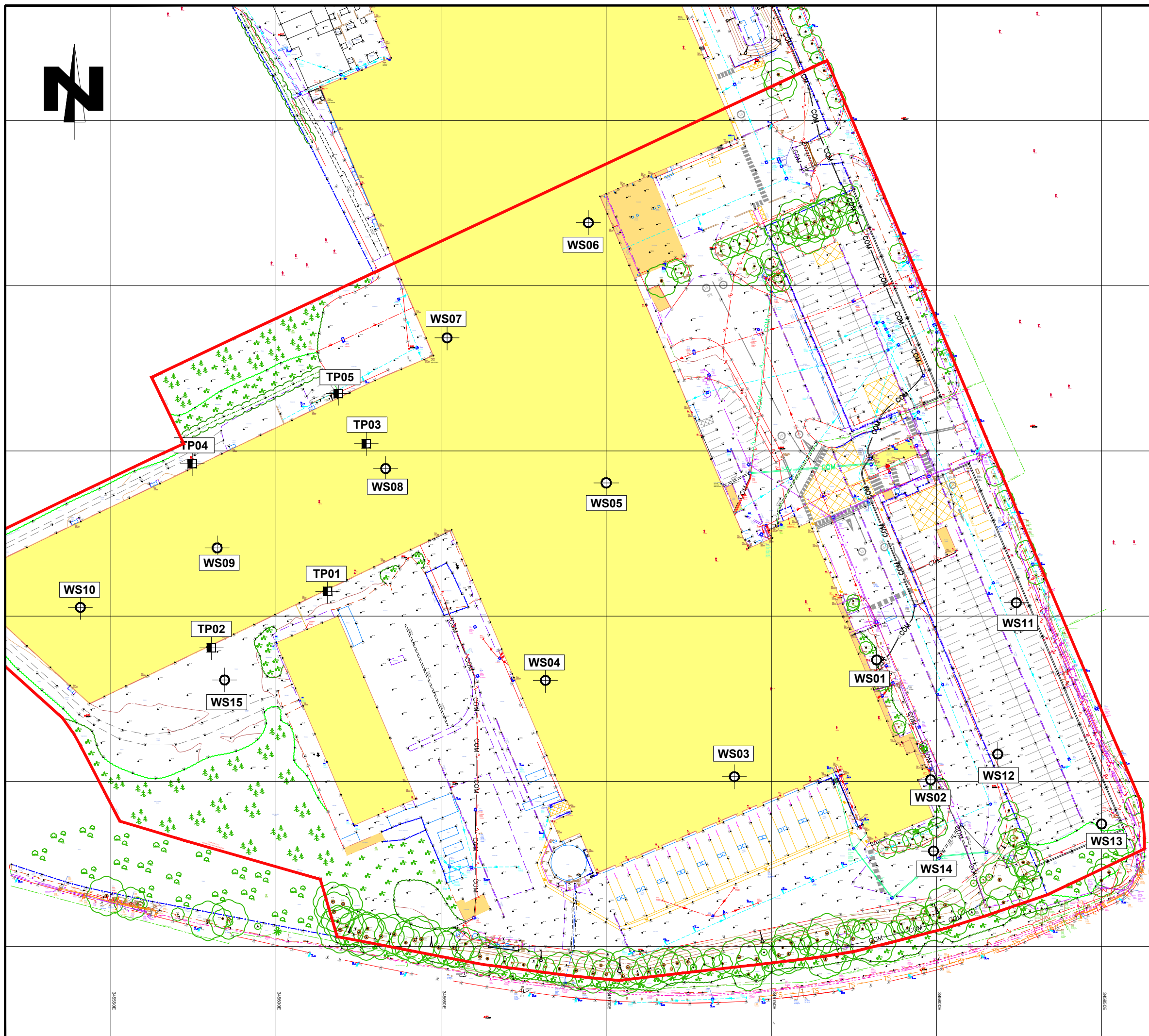
Halewood Wines & Spirits  
The Sovereign Distillery, Wilson Road, Huyton  
Merseyside, L36 6AD

### Drawing Title:

Borehole and Trial Pit Location Plan

|                          |                   |                  |                     |
|--------------------------|-------------------|------------------|---------------------|
| Scale at A3:<br>NTS @ A3 | Date:<br>10.11.23 | Drawn by:<br>P.D | Approved by:<br>S.T |
|--------------------------|-------------------|------------------|---------------------|

|                    |              |           |
|--------------------|--------------|-----------|
| Job Ref:<br>23-795 | Drg no:<br>— | Rev:<br>— |
|--------------------|--------------|-----------|





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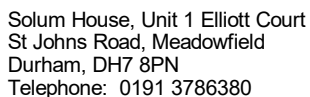
## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS01</b> |  |
| Job No<br>23-795                           | Date<br>02-10-23<br>02-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                   |                                                                                                 | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|-------------------|-------------------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness) | DESCRIPTION                                                                                     |         |                         |
| 0.20-0.40       | J/D     | N=11        |       |               |        | (0.40)<br>0.40    | Grass overlying dark brown topsoil (MADE GROUND)                                                |         |                         |
| 0.40-0.60       | J/D     |             |       |               |        | 0.60              | Brick rubble (MADE GROUND)                                                                      |         |                         |
| 0.80-1.00       | J/D     |             |       |               |        | (1.20)            | Dark grey clay with mudstone and bricks (MADE GROUND)                                           |         |                         |
| 1.00-1.45       | SPT     |             |       |               |        |                   |                                                                                                 |         |                         |
| 1.20-1.40       | J/D     |             |       |               |        |                   |                                                                                                 |         |                         |
| 1.80-2.00       | B       | N=6         |       |               |        | 1.80              | Grey silty claybound gravel possible made ground (MADE GROUND)                                  |         |                         |
| 2.00-2.45       | SPT     |             |       |               |        | 2.10              |                                                                                                 |         |                         |
| 2.60-2.80       | B       | 45kN/m2     |       |               |        | (3.22)            | Firm becoming stiff to very stiff light to medium brown sandy CLAY with occasional sand lenses. |         |                         |
| 3.00            | HSV     |             |       |               |        |                   |                                                                                                 |         |                         |
| 3.40-3.60       | B       |             |       |               |        |                   |                                                                                                 |         |                         |
| 4.00            | HSV     |             |       |               |        |                   |                                                                                                 |         |                         |
| 4.60-4.80       | B       | 48kN/m2     |       |               |        |                   |                                                                                                 |         |                         |
| 5.00-5.32       | SPT     |             |       |               |        | 5.32              |                                                                                                 |         |                         |

| Boring Progress and Water Observations    |      |       |                         |         |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                |
|-------------------------------------------|------|-------|-------------------------|---------|-----------|-----------------------------------------------|----|-------|-----------------|----|--------------------------------|
| Date                                      | Time | Depth | Casing Depth            | Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                |
|                                           |      |       |                         |         |           |                                               |    |       |                 |    | WATER: Stuck water at c.2.10m. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |         |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                |

AGS3 UK BH LIVERPOOL GINT FILE.GPJ AGS3 ALL GDT 10/24/23



# BOREHOLE LOG

|                                            |                              |                  |                 |                                |
|--------------------------------------------|------------------------------|------------------|-----------------|--------------------------------|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><br><b>WS02</b> |
| Job No<br>23-795                           | Date<br>02-10-23<br>02-10-23 | Ground Level (m) | Co-Ordinates () |                                |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1                |

[illegible]

| Boring Progress and Water Observations |      |       |              |         |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                                    |
|----------------------------------------|------|-------|--------------|---------|-----------|------------|----|-------|-------------|----|--------------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                                    |
|                                        |      |       |              |         |           |            |    |       |             |    | WATER: Borehole remained dry and stable during exploratory period. |

|                                           |                            |                                                  |                 |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|
| All dimensions in metres<br>Scale 1:43.75 | Client    Adept Consulting | Method/<br>Plant Used    Windowless sampling rig | Logged By<br>ST |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|

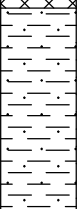
AGS3 UK BH LIVERPOOL GINT FILE.GPJ AGS3 ALL.GDT 10/24/23



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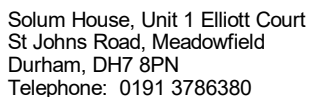
## BOREHOLE LOG

|                                            |                              |                  |                  |                                |
|--------------------------------------------|------------------------------|------------------|------------------|--------------------------------|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><br><b>WS03</b> |
| Job No<br>23-795                           | Date<br>02-10-23<br>02-10-23 | Ground Level (m) | Co-Ordinates ( ) |                                |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1                |

| SAMPLES & TESTS |         |             | Water | STRATA        |                                                                                     |                                                                                    |                                                                                    | Geology | Instrument/<br>Backfill                                                              |                                                                                               |  |
|-----------------|---------|-------------|-------|---------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|
| Depth           | Type No | Test Result |       | Reduced Level | Legend                                                                              | Depth (Thick-<br>ness)                                                             | DESCRIPTION                                                                        |         |                                                                                      |                                                                                               |  |
| 0.10-0.20       | J/D     | N=28        |       |               |    | 0.10                                                                               | Concrete: Reinforced with a 6mm rebar at c.40mm from top of the slab (MADE GROUND) |         |  |                                                                                               |  |
|                 |         |             |       |               |                                                                                     |                                                                                    |                                                                                    |         |                                                                                      | 0.20                                                                                          |  |
|                 |         |             |       |               |                                                                                     |                                                                                    |                                                                                    |         |                                                                                      | 0.45                                                                                          |  |
| 0.50-0.95       | SPT     |             |       |               |                                                                                     |   | (0.35)                                                                             |         |                                                                                      | Subbase comprised of compacted reddish brown very gravelly slightly clayey sand (MADE GROUND) |  |
| 0.60-0.80       | J/D     |             |       |               |                                                                                     |                                                                                    | 0.80                                                                               |         |                                                                                      |                                                                                               |  |
| 0.80-1.00       | J/D     | N=16        |       |               |                                                                                     |                                                                                    | Subbase comprised of greyish limestone (MADE GROUND)                               |         |                                                                                      |                                                                                               |  |
| 1.00-1.45       | SPT     |             |       |               |                                                                                     |                                                                                    |                                                                                    |         |                                                                                      | Black and reddish brown brick and concrete rubble fill (MADE GROUND).                         |  |
|                 |         |             |       |               |                                                                                     |                                                                                    |                                                                                    |         |                                                                                      |                                                                                               |  |
| 1.40-1.60       | J/D     |             |       |               |                                                                                     |   | (1.00)                                                                             |         |                                                                                      |                                                                                               |  |
|                 |         |             |       |               |                                                                                     |                                                                                    | 1.80                                                                               |         |                                                                                      |                                                                                               |  |
| 1.80-2.00       | J/D     | N=13        |       |               |                                                                                     |                                                                                    | Firm dark brown to black slightly organic slightly sandy CLAY.                     |         |                                                                                      |                                                                                               |  |
| 2.00-2.45       | SPT     |             |       |               |                                                                                     |  |                                                                                    |         |                                                                                      | (1.20)                                                                                        |  |
| 2.40-2.60       | B       |             |       |               |                                                                                     |                                                                                    |                                                                                    |         |                                                                                      | 3.00                                                                                          |  |
|                 |         |             |       |               |                                                                                     |                                                                                    | (0.70)                                                                             |         |                                                                                      | Firm medium brown sandy slightly silty CLAY.                                                  |  |
| 3.00-3.45       | SPT     |             |       | N=8           |                                                                                     |                                                                                    | 3.70                                                                               |         |                                                                                      |                                                                                               |  |
| 3.50-3.70       | B       | 65<br>Blows |       |               |                                                                                     | Weak weathered grey MUDSTONE                                                       |                                                                                    |         |                                                                                      |                                                                                               |  |
| 3.80-4.00       | B       |             |       |               |  |                                                                                    | (0.68)                                                                             |         |                                                                                      |                                                                                               |  |
| 4.00-4.38       | SPT     |             |       |               |                                                                                     |                                                                                    | 4.38                                                                               |         |                                                                                      |                                                                                               |  |
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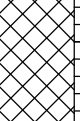
| Boring Progress and Water Observations    |      |       |                            |                   |              | Chiselling                                       |    |       | Water Added |    | GENERAL<br>REMARKS                                                       |
|-------------------------------------------|------|-------|----------------------------|-------------------|--------------|--------------------------------------------------|----|-------|-------------|----|--------------------------------------------------------------------------|
| Date                                      | Time | Depth | Depth                      | Casing<br>Dia. mm | Water<br>Dpt | From                                             | To | Hours | From        | To |                                                                          |
|                                           |      |       |                            |                   |              |                                                  |    |       |             |    |                                                                          |
|                                           |      |       |                            |                   |              |                                                  |    |       |             |    | WATER: Borehole<br>remained dry and stable<br>during exploratory period. |
|                                           |      |       |                            |                   |              |                                                  |    |       |             |    |                                                                          |
|                                           |      |       |                            |                   |              |                                                  |    |       |             |    |                                                                          |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client    Adept Consulting |                   |              | Method/<br>Plant Used    Windowless sampling rig |    |       |             |    | Logged By<br>ST                                                          |

AGS3 UK BH LIVERPOOL GINT FILE.GPJ AGS3 ALL GDT 10/24/23



# BOREHOLE LOG

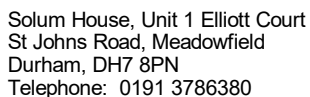
|                                            |                              |                  |                 |                                |
|--------------------------------------------|------------------------------|------------------|-----------------|--------------------------------|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><br><b>WS04</b> |
| Job No<br>23-795                           | Date<br>02-10-23<br>02-10-23 | Ground Level (m) | Co-Ordinates () |                                |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1                |

| SAMPLES & TESTS |         |             | Water | STRATA                                                                              |        |                                                                                                     | Geology                                                                               | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|-------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level                                                                       | Legend | Depth (Thick-ness)                                                                                  |                                                                                       |                         |
| 0.40-0.60       | J/D     | N=29        |       |    | 0.10   | Concrete: Reinforced with a 6mm rebar at c.40mm from top of the slab (MADE GROUND)                  |    |                         |
| 0.50-0.95       | SPT     |             |       |                                                                                     | 0.20   |                                                                                                     |                                                                                       |                         |
|                 |         |             |       |                                                                                     | 0.40   | Subbase comprised of compacted reddish brown very gravelly slightly clayey sand (MADE GROUND)       |                                                                                       |                         |
|                 |         |             |       |                                                                                     | 0.70   | Tarmac appears to be as poor quality (MADE GROUND)                                                  |                                                                                       |                         |
| 0.80-1.00       | J/D     | N=14        |       |    | (1.10) | Subbase comprised of greyish limestone (MADE GROUND)                                                |                                                                                       |                         |
| 1.00-1.45       | SPT     |             |       |                                                                                     |        | Black and reddish brown brick and concrete rubble fill (MADE GROUND).                               |                                                                                       |                         |
| 1.40-1.60       | J/D     |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
|                 |         |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
| 1.80-2.00       | J/D     | N=8         |       |    | 2.00   | Dark grey very sandy clay appears to be as made ground (MADE GROUND??)                              |    |                         |
| 2.00-2.45       | SPT     |             |       |                                                                                     |        | Firm to stiff light to medium brown sandy slightly silty gravelly CLAY with occasional sand lenses. |                                                                                       |                         |
| 2.40-2.60       | B       |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
|                 |         |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
| 3.00            | HSV     | 56kN/m2     |       |   | (2.50) |                                                                                                     |   |                         |
| 3.60-3.80       | B       |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
| 4.00            | HSV     | 50kN/m2     |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
| 4.30-4.50       | B       |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |
| 4.60-4.80       | B       | 73<br>Blows |       |  | (0.49) | Weak weathered grey MUDSTONE                                                                        |  |                         |
| 4.80-4.99       | SPT     |             |       |                                                                                     |        | 4.99                                                                                                |                                                                                       |                         |
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|                 |         |             |       |                                                                                     |        |                                                                                                     |                                                                                       |                         |

| Boring Progress and Water Observations |      |       |              |         |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                |
|----------------------------------------|------|-------|--------------|---------|-----------|------------|----|-------|-------------|----|--------------------------------|
| Date                                   | Time | Depth | Casing Depth | Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                |
|                                        |      |       |              |         |           |            |    |       |             |    | WATER: Stuck water at c.3.00m. |

|                                           |                            |                                                  |                 |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|
| All dimensions in metres<br>Scale 1:43.75 | Client    Adept Consulting | Method/<br>Plant Used    Windowless sampling rig | Logged By<br>ST |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|

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# BOREHOLE LOG

|                                            |                              |                  |                 |                                |
|--------------------------------------------|------------------------------|------------------|-----------------|--------------------------------|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><br><b>WS05</b> |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates () |                                |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1                |

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| Boring Progress and Water Observations |      |       |              |         |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                                    |
|----------------------------------------|------|-------|--------------|---------|-----------|------------|----|-------|-------------|----|--------------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                                    |
|                                        |      |       |              |         |           |            |    |       |             |    | WATER: Borehole remained dry and stable during exploratory period. |

|                                           |                            |                                                  |                 |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|
| All dimensions in metres<br>Scale 1:43.75 | Client    Adept Consulting | Method/<br>Plant Used    Windowless sampling rig | Logged By<br>ST |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|

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Durham, DH7 8PN  
Telephone: 0191 3786380

## BOREHOLE LOG

|                                            |                              |                  |                 |                            |  |
|--------------------------------------------|------------------------------|------------------|-----------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><b>WS06</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates () |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                   |                                                                                                                                            | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness) | DESCRIPTION                                                                                                                                |         |                         |
| 0.40-0.60       | J/D     | N=5         |       |               |        | 0.18              | Concrete: Reinforced with a 8mm rebar at c.110mm from top of the slab with a membrane noted at the base of the concrete slab (MADE GROUND) |         |                         |
| 0.40-0.85       | SPT     |             |       |               |        | 0.40              |                                                                                                                                            |         |                         |
| 0.80-1.00       | B       |             |       |               |        | 0.60              | Concrete appears to be as poor quality (MADE GROUND)                                                                                       |         |                         |
| 1.00-1.45       | SPT     | N=3         |       |               |        |                   | Subbase comprised of black sandy gravel (MADE GROUND)                                                                                      |         |                         |
| 1.40-1.60       | B       |             |       |               |        | (1.40)            | Soft light brown sandy silty CLAY with sand lenses.                                                                                        |         |                         |
| 2.00-2.45       | SPT     | N=5         |       |               |        | 2.00              |                                                                                                                                            |         |                         |
| 2.60-2.80       | B       |             |       |               |        |                   | Very loose becoming medium dense at c.6.00m light brown saturated fine SAND                                                                |         |                         |
| 3.00-3.45       | SPT     | N=2         |       |               |        |                   |                                                                                                                                            |         |                         |
| 3.40-3.60       | B       |             |       |               |        |                   |                                                                                                                                            |         |                         |
| 4.00-4.45       | SPT     | N=2         |       |               |        | (4.45)            |                                                                                                                                            |         |                         |
| 4.60-4.80       | B       |             |       |               |        |                   |                                                                                                                                            |         |                         |
| 5.00-5.45       | SPT     | N=0         |       |               |        |                   |                                                                                                                                            |         |                         |
| 5.80-6.00       | B       |             |       |               |        |                   |                                                                                                                                            |         |                         |
| 6.00-6.45       | SPT     | N=14        |       |               |        | 6.45              |                                                                                                                                            |         |                         |

| Boring Progress and Water Observations    |      |       |                         |         |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                |
|-------------------------------------------|------|-------|-------------------------|---------|-----------|-----------------------------------------------|----|-------|-----------------|----|--------------------------------|
| Date                                      | Time | Depth | Casing Depth            | Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                |
|                                           |      |       |                         |         |           |                                               |    |       |                 |    | WATER: Stuck water at c.2.00m. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |         |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                |

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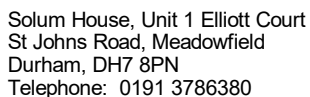
## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS07</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                    |                                                                                                                                             | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION                                                                                                                                 |         |                         |
| 0.20-0.65       | SPT     | N=9         |       |               |        | 0.20               | Concrete: Reinforced with a 10mm rebar at c.130mm from top of the slab with a membrane noted at the base of the concrete slab (MADE GROUND) |         |                         |
| 0.40-0.60       | J/D     |             |       |               |        | (0.60)             | Subbase comprised of reddish brown slightly clayey sandy gravel (MADE GROUND)                                                               |         |                         |
| 0.80-1.00       | B       |             |       |               |        | 0.80               |                                                                                                                                             |         |                         |
| 1.00            | HSV     | 82kN/m2     |       |               |        |                    | Firm to stiff light brown sandy slightly silty CLAY with occasional sand lenses.                                                            |         |                         |
| 1.40-1.60       | B       |             |       |               |        |                    |                                                                                                                                             |         |                         |
| 2.00            | HSV     | 70kN/m2     |       |               |        | (3.20)             |                                                                                                                                             |         |                         |
| 2.60-2.80       | B       |             |       |               |        |                    |                                                                                                                                             |         |                         |
| 3.00            | HSV     | 70kN/m2     |       |               |        | 4.00               |                                                                                                                                             |         |                         |
| 3.60-3.80       | B       |             |       |               |        |                    |                                                                                                                                             |         |                         |
| 4.00            | HSV     | 40kN/m2     |       |               |        |                    | Medium dense to dense light brown saturated fine SAND.                                                                                      |         |                         |
| 4.00-4.45       | SPT     | N=13        |       |               |        | (1.45)             |                                                                                                                                             |         |                         |
| 4.40-4.60       | B       |             |       |               |        |                    |                                                                                                                                             |         |                         |
| 5.00-5.45       | SPT     | N=24        |       |               |        | 5.45               |                                                                                                                                             |         |                         |
| 5.80-6.00       | B       |             |       |               |        |                    |                                                                                                                                             |         |                         |

| Boring Progress and Water Observations    |      |       |                         |         |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                |
|-------------------------------------------|------|-------|-------------------------|---------|-----------|-----------------------------------------------|----|-------|-----------------|----|--------------------------------|
| Date                                      | Time | Depth | Casing Depth            | Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                |
|                                           |      |       |                         |         |           |                                               |    |       |                 |    | WATER: Stuck water at c.2.20m. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |         |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                |

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# BOREHOLE LOG

|                                            |                              |                  |                 |                                |
|--------------------------------------------|------------------------------|------------------|-----------------|--------------------------------|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><br><b>WS08</b> |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates () |                                |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1                |

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| Boring Progress and Water Observations    |      |                            |                 |                   |              | Chiselling                                       |    |       | Water Added |    | GENERAL<br>REMARKS |                                                                    |
|-------------------------------------------|------|----------------------------|-----------------|-------------------|--------------|--------------------------------------------------|----|-------|-------------|----|--------------------|--------------------------------------------------------------------|
| Date                                      | Time | Depth                      | Casing<br>Depth | Casing<br>Dia. mm | Water<br>Dpt | From                                             | To | Hours | From        | To |                    |                                                                    |
|                                           |      |                            |                 |                   |              |                                                  |    |       |             |    |                    | WATER: Borehole remained dry and stable during exploratory period. |
| All dimensions in metres<br>Scale 1:43.75 |      | Client    Adept Consulting |                 |                   |              | Method/<br>Plant Used    Windowless sampling rig |    |       |             |    | Logged By<br>ST    |                                                                    |

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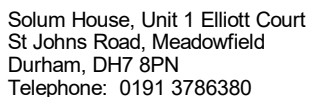
## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS09</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                   |                                                                                                                                             | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness) | DESCRIPTION                                                                                                                                 |         |                         |
| 0.00-0.20       | C       |             |       |               |        | 0.20              | Concrete: Reinforced with a 10mm rebar at c.120mm from top of the slab with a membrane noted at the base of the concrete slab (MADE GROUND) |         |                         |
| 0.20-0.40       | J/D     |             |       |               |        | 0.40              |                                                                                                                                             |         |                         |
| 0.20-0.38       | SPT     | 75 Blows    |       |               |        | (0.60)            | Subbase comprised of reddish brown slightly clayey sandy gravel and concrete fragments (MADE GROUND)                                        |         |                         |
| 0.40-0.44       | SPT     | 75 Blows    |       |               |        | 1.00              | Dark brown sandy gravel with brick and concrete fragments (MADE GROUND)                                                                     |         |                         |
| 0.70-0.90       | J/D     |             |       |               |        | (0.80)            |                                                                                                                                             |         |                         |
| 0.70-1.15       | SPT     | N=13        |       |               |        | 1.80              | Loose black to dark brown grey clay with bricks and mudstone fragments (MADE GROUND)                                                        |         |                         |
| 1.00-1.45       | SPT     | N=11        |       |               |        | 2.10              |                                                                                                                                             |         |                         |
| 1.40-1.60       | J/D     |             |       |               |        |                   | Loose dark greyish reworked mudstone (MADE GROUND)                                                                                          |         |                         |
| 1.80-2.00       | B       |             |       |               |        |                   |                                                                                                                                             |         |                         |
| 2.00-2.45       | SPT     | N=16        |       |               |        |                   | Medium dense fine to medium grained greyish slightly clayey SAND                                                                            |         |                         |
| 2.20-2.40       | B       |             |       |               |        |                   |                                                                                                                                             |         |                         |
| 2.80-3.00       | B       |             |       |               |        | (1.70)            |                                                                                                                                             |         |                         |
| 3.00            | HSV     | 54kN/m2     |       |               |        | 3.80              |                                                                                                                                             |         |                         |
| 3.40-3.60       | B       |             |       |               |        |                   |                                                                                                                                             |         |                         |
| 3.80-4.00       | B       |             |       |               |        | (1.20)            | Stiff medium brown slightly silty sandy CLAY                                                                                                |         |                         |
| 4.00            | HSV     | 52kN/m2     |       |               |        | 5.00              |                                                                                                                                             |         |                         |
| 4.60-4.80       | B       |             |       |               |        |                   |                                                                                                                                             |         |                         |

| Boring Progress and Water Observations    |      |       |                         |                |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                |
|-------------------------------------------|------|-------|-------------------------|----------------|-----------|-----------------------------------------------|----|-------|-----------------|----|--------------------------------|
| Date                                      | Time | Depth | Casing Depth            | Casing Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                |
|                                           |      |       |                         |                |           |                                               |    |       |                 |    | WATER: Stuck water at c.2.40m. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |                |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                |

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# BOREHOLE LOG

|                                            |                              |                  |                 |                                |
|--------------------------------------------|------------------------------|------------------|-----------------|--------------------------------|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><br><b>WS10</b> |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates () |                                |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1                |

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| Boring Progress and Water Observations |      |       |              |         |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                                    |
|----------------------------------------|------|-------|--------------|---------|-----------|------------|----|-------|-------------|----|--------------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                                    |
|                                        |      |       |              |         |           |            |    |       |             |    | WATER: Borehole remained dry and stable during exploratory period. |

|                                           |                            |                                                  |                 |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|
| All dimensions in metres<br>Scale 1:43.75 | Client    Adept Consulting | Method/<br>Plant Used    Windowless sampling rig | Logged By<br>ST |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|

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## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS11</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                   |                                                                     | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|-------------------|---------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness) | DESCRIPTION                                                         |         |                         |
| 0.00-0.20       | C       |             |       |               |        | 0.10              | Tarmac (MADE GROUND)                                                |         |                         |
| 0.20-0.40       | J/D     |             |       |               |        | (0.60)            | Subbase comprised of sandy gravel (MADE GROUND)                     |         |                         |
| 0.70-0.90       | J/D     |             |       |               |        | 0.70              |                                                                     |         |                         |
| 1.00-1.45       | SPT     | N=21        |       |               |        |                   | Medium dense brick and concrete rubble fill (MADE GROUND)           |         |                         |
| 1.40-1.60       | J/D     |             |       |               |        | (1.60)            |                                                                     |         |                         |
| 2.00-2.45       | SPT     | N=13        |       |               |        | 2.30              |                                                                     |         |                         |
| 3.00            | HSV     | 80kN/m2     |       |               |        | (2.70)            | Stiff becoming very stiff medium brown sandy CLAY with sand lenses. |         |                         |
| 4.00            | HSV     | 70kN/m2     |       |               |        | 5.00              |                                                                     |         |                         |
| 5.00            | HSV     | 66kN/m2     |       |               |        |                   |                                                                     |         |                         |

| Boring Progress and Water Observations |      |       |              |         |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                |
|----------------------------------------|------|-------|--------------|---------|-----------|------------|----|-------|-------------|----|--------------------------------|
| Date                                   | Time | Depth | Casing Depth | Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                |
|                                        |      |       |              |         |           |            |    |       |             |    | WATER: Stuck water at c.2.00m. |

|                                           |                            |                                                  |                 |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|
| All dimensions in metres<br>Scale 1:43.75 | Client<br>Adept Consulting | Method/<br>Plant Used<br>Windowless sampling rig | Logged By<br>ST |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|

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## BOREHOLE LOG

|                                            |                              |                  |                 |                            |  |
|--------------------------------------------|------------------------------|------------------|-----------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                 | BOREHOLE No<br><b>WS12</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates () |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                 | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                        |                                                                                         | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|------------------------|-----------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness)      | DESCRIPTION                                                                             |         |                         |
| 0.40-0.60       | J/D     | N=20        |       |               |        | 0.10<br>(0.60)<br>0.70 | Tarmac (MADE GROUND)<br>Subbase comprised of sandy gravel (MADE GROUND)                 |         |                         |
| 1.00-1.20       | J/D     |             |       |               |        | (0.60)                 | Medium dense brick and concrete rubble fill (MADE GROUND)                               |         |                         |
| 1.00-1.45       | SPT     |             |       |               |        | 1.30                   | Dark brown becoming black sandy clay appears to be as reworked (POSSIBLE MADE GROUND??) |         |                         |
| 1.40-1.60       | J/D     |             |       |               |        | (0.40)<br>1.70         | Firm to stiff medium brown sandy CLAY with sand lenses.                                 |         |                         |
| 1.80-2.00       | B       | 104kN/m2    |       |               |        |                        |                                                                                         |         |                         |
| 2.00            | HSV     |             |       |               |        |                        |                                                                                         |         |                         |
| 2.40-2.60       | B       | 84kN/m2     |       |               |        |                        |                                                                                         |         |                         |
| 3.00            | HSV     |             |       |               |        | (3.30)                 |                                                                                         |         |                         |
| 3.60-3.80       | B       |             |       |               |        |                        |                                                                                         |         |                         |
| 4.00            | HSV     | 78kN/m2     |       |               |        |                        |                                                                                         |         |                         |
| 4.40-4.60       | B       |             |       |               |        |                        |                                                                                         |         |                         |
| 5.00            | HSV     | 70kN/m2     |       |               |        | 5.00                   |                                                                                         |         |                         |

| Boring Progress and Water Observations |      |       |       |                |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS         |
|----------------------------------------|------|-------|-------|----------------|-----------|------------|----|-------|-------------|----|-------------------------|
| Date                                   | Time | Depth | Depth | Casing Dia. mm | Water Dpt | From       | To | Hours | From        | To |                         |
|                                        |      |       |       |                |           |            |    |       |             |    | WATER: Damp at c.1.30m. |

|                                           |                            |                                                  |                 |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|
| All dimensions in metres<br>Scale 1:43.75 | Client<br>Adept Consulting | Method/<br>Plant Used<br>Windowless sampling rig | Logged By<br>ST |
|-------------------------------------------|----------------------------|--------------------------------------------------|-----------------|

AGS3 UK BH LIVERPOOL GINT FILE.GPJ AGS3 ALL GDT 10/24/23



Solum House, Unit 1 Elliott Court  
St Johns Road, Meadowfield  
Durham, DH7 8PN  
Telephone: 0191 3786380

## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS13</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                        |                                                                                         | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|------------------------|-----------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness)      | DESCRIPTION                                                                             |         |                         |
| 0.20-0.40       | J/D     | N=21        |       |               |        | 0.10<br>(0.50)<br>0.60 | Tarmac (MADE GROUND)<br>Subbase comprised of sandy gravel (MADE GROUND)                 |         |                         |
| 0.80-1.00       | J/D     |             |       |               |        | (0.70)                 | Medium dense brick and concrete rubble (MADE GROUND)                                    |         |                         |
| 1.00-1.45       | SPT     |             |       |               |        | 1.30                   |                                                                                         |         |                         |
| 1.10-1.30       | J/D     |             |       |               |        | 1.50                   | Dark brown becoming black sandy clay appears to be as reworked (POSSIBLE MADE GROUND??) |         |                         |
| 1.30-1.50       | J/D     |             |       |               |        |                        | Stiff medium brown sandy CLAY with sand lenses.                                         |         |                         |
| 1.60-1.80       | B       |             |       |               |        |                        |                                                                                         |         |                         |
| 2.00            | HSV     | 100kN/m2    |       |               |        |                        |                                                                                         |         |                         |
| 2.40-2.60       | B       |             |       |               |        |                        |                                                                                         |         |                         |
| 3.00            | HSV     | 82kN/m2     |       |               |        | (3.50)                 |                                                                                         |         |                         |
| 3.60-3.80       | B       |             |       |               |        |                        |                                                                                         |         |                         |
| 4.00            | HSV     | 70kN/m2     |       |               |        |                        |                                                                                         |         |                         |
| 4.40-4.60       | B       |             |       |               |        |                        |                                                                                         |         |                         |
| 5.00            | HSV     | 70kN/m2     |       |               |        | 5.00                   |                                                                                         |         |                         |

| Boring Progress and Water Observations    |      |       |                         |         |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                     |
|-------------------------------------------|------|-------|-------------------------|---------|-----------|-----------------------------------------------|----|-------|-----------------|----|-------------------------------------|
| Date                                      | Time | Depth | Casing Depth            | Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                     |
|                                           |      |       |                         |         |           |                                               |    |       |                 |    | WATER: Damp at c.1.30m and c.2.00m. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |         |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                     |

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Solum House, Unit 1 Elliott Court  
St Johns Road, Meadowfield  
Durham, DH7 8PN  
Telephone: 0191 3786380

## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS14</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                   |                                                                                        | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|-------------------|----------------------------------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness) | DESCRIPTION                                                                            |         |                         |
| 0.10-0.55       | SPT     | N=35        |       |               |        | 0.10              | Tarmac (MADE GROUND)                                                                   |         |                         |
| 0.20-0.40       | J/D     |             |       |               |        | 0.40              | Medium dense subbase comprised of sand with light brown limestone gravel (MADE GROUND) |         |                         |
| 0.40-0.60       | J/D     |             |       |               |        | 0.60              | Medium dense medium brown sandy gravelly clay with bricks.(MADE GROUND)                |         |                         |
| 0.80-1.00       | B       |             |       |               |        |                   | Stiff medium brown sandy gravelly CLAY.                                                |         |                         |
| 1.00-1.45       | SPT     | N=19        |       |               |        | (1.40)            |                                                                                        |         |                         |
| 1.40-1.60       | B       |             |       |               |        |                   |                                                                                        |         |                         |
| 2.00            | HSV     | 62kN/m2     |       |               |        | 2.00              |                                                                                        |         |                         |

| Boring Progress and Water Observations    |      |       |                         |                |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                                                    |
|-------------------------------------------|------|-------|-------------------------|----------------|-----------|-----------------------------------------------|----|-------|-----------------|----|--------------------------------------------------------------------|
| Date                                      | Time | Depth | Depth                   | Casing Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                                                    |
|                                           |      |       |                         |                |           |                                               |    |       |                 |    | WATER: Borehole remained dry and stable during exploratory period. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |                |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                                                    |

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Solum House, Unit 1 Elliott Court  
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Durham, DH7 8PN  
Telephone: 0191 3786380

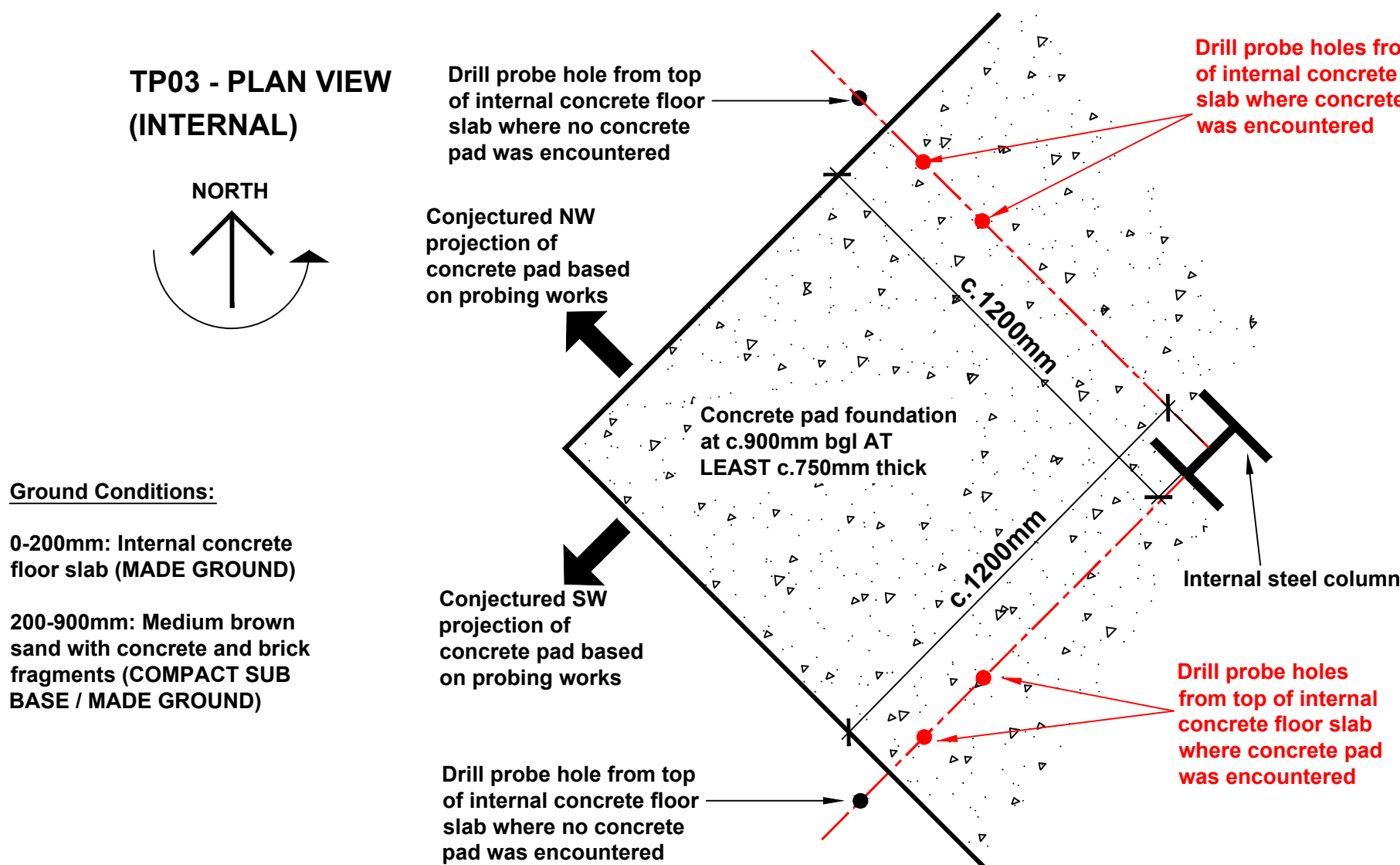
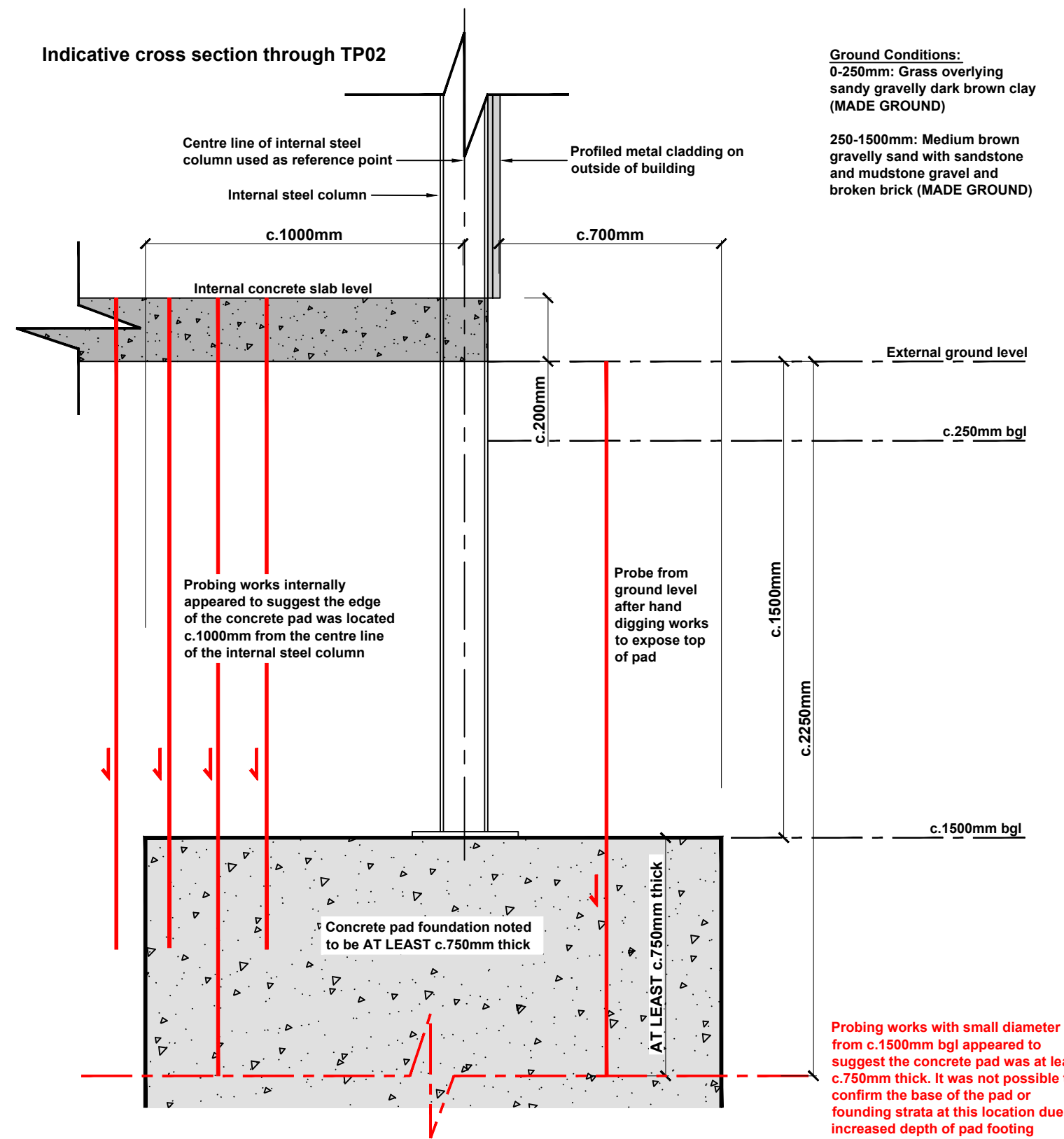
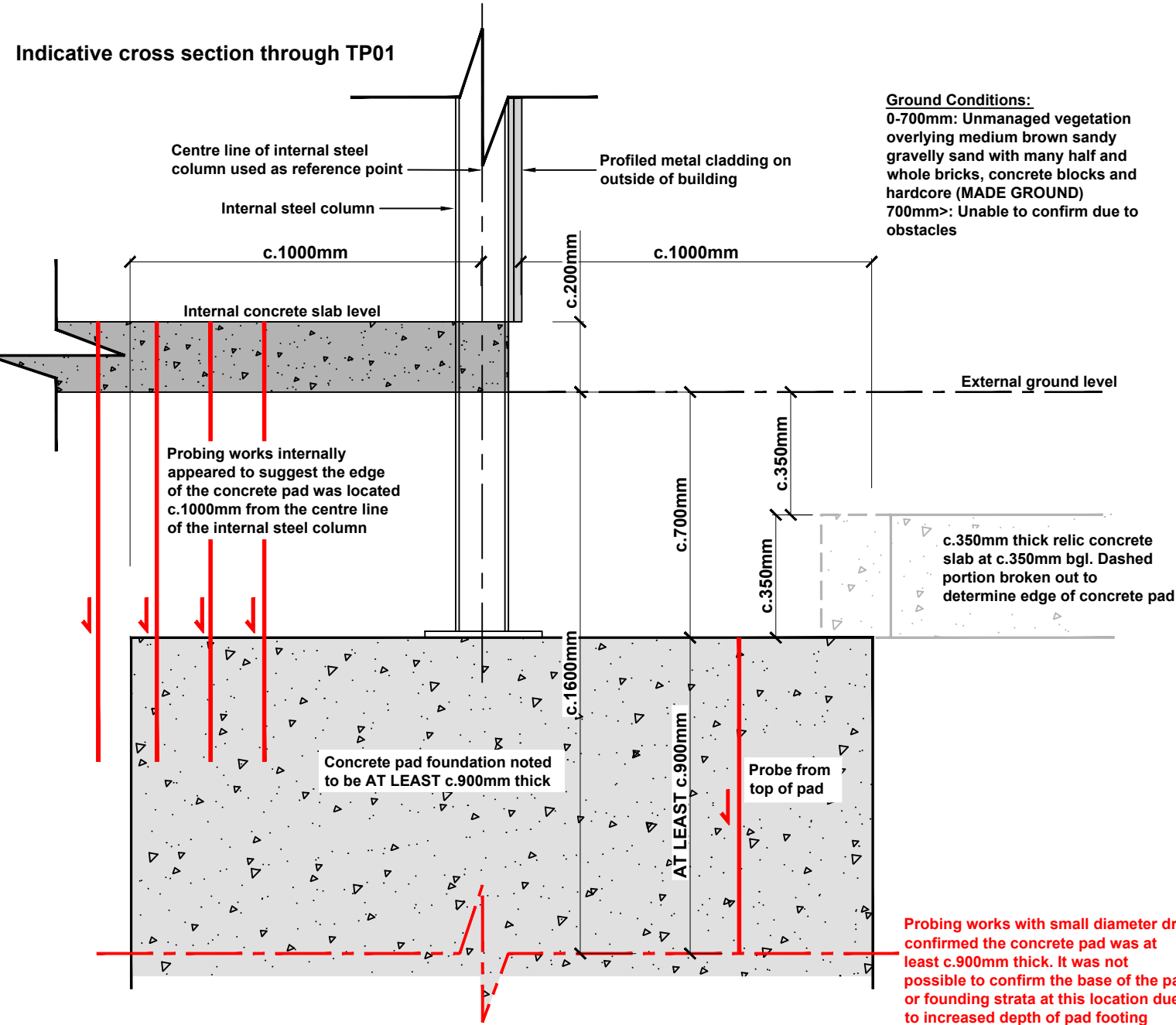
## BOREHOLE LOG

|                                            |                              |                  |                  |                            |  |
|--------------------------------------------|------------------------------|------------------|------------------|----------------------------|--|
| Project<br>Sovereign Business Park, Huyton |                              |                  |                  | BOREHOLE No<br><b>WS15</b> |  |
| Job No<br>23-795                           | Date<br>03-10-23<br>03-10-23 | Ground Level (m) | Co-Ordinates ( ) |                            |  |
| Contractor<br>Arc Environmental Ltd        |                              |                  |                  | Sheet<br>1 of 1            |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                   |                                                               | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|-------------------|---------------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness) | DESCRIPTION                                                   |         |                         |
| 0.10-0.35       | SPT     | 75 Blows    |       |               |        | 0.10              | Grass overlying a gravelly topsoil (MADE GROUND)              |         |                         |
| 0.20-0.40       | J/D     |             |       |               |        | (0.70)            | Very dense subbase comprised of brick, concrete (MADE GROUND) |         |                         |
| 0.40-0.55       | SPT     | 82 Blows    |       |               |        | 0.80              |                                                               |         |                         |
| 0.80-1.00       | J/D     |             |       |               |        | (0.40)            | Grey gravelly shaley clayey (MADE GROUND)                     |         |                         |
| 1.00-1.45       | SPT     | N=15        |       |               |        | 1.20              |                                                               |         |                         |
| 1.40-1.60       | D/B     |             |       |               |        | (1.00)            | Medium dense brick and concrete rubble (MADE GROUND)          |         |                         |
| 2.00-2.45       | SPT     | N=9         |       |               |        | 2.20              |                                                               |         |                         |
| 2.40-2.60       | B       |             |       |               |        | (0.80)            | Stiff medium brown sandy CLAY with sand lenses.               |         |                         |
| 3.00            | HSV     | 62kN/m2     |       |               |        | 3.00              |                                                               |         |                         |

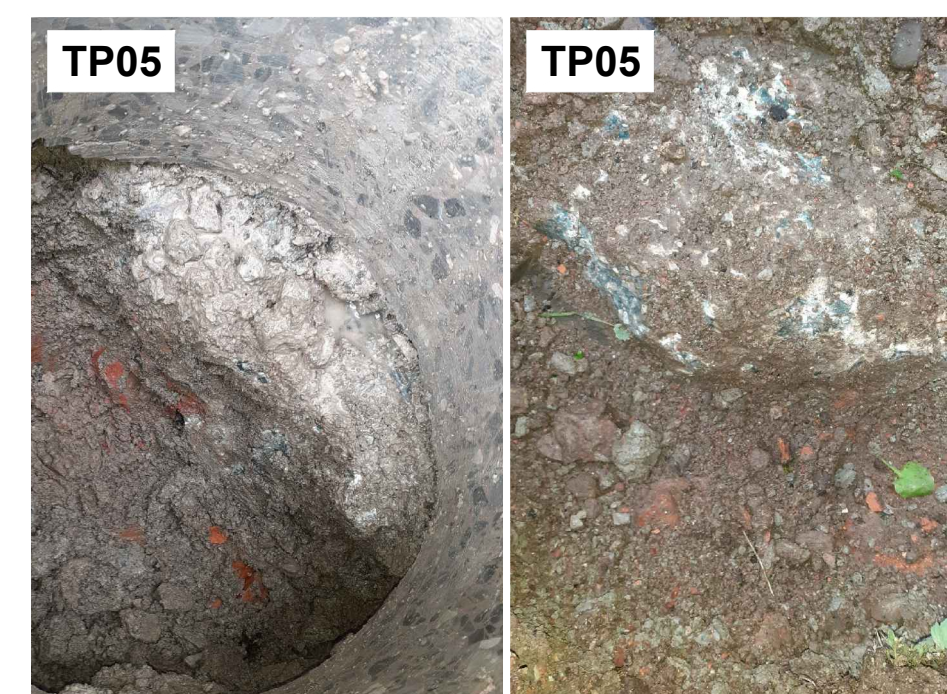
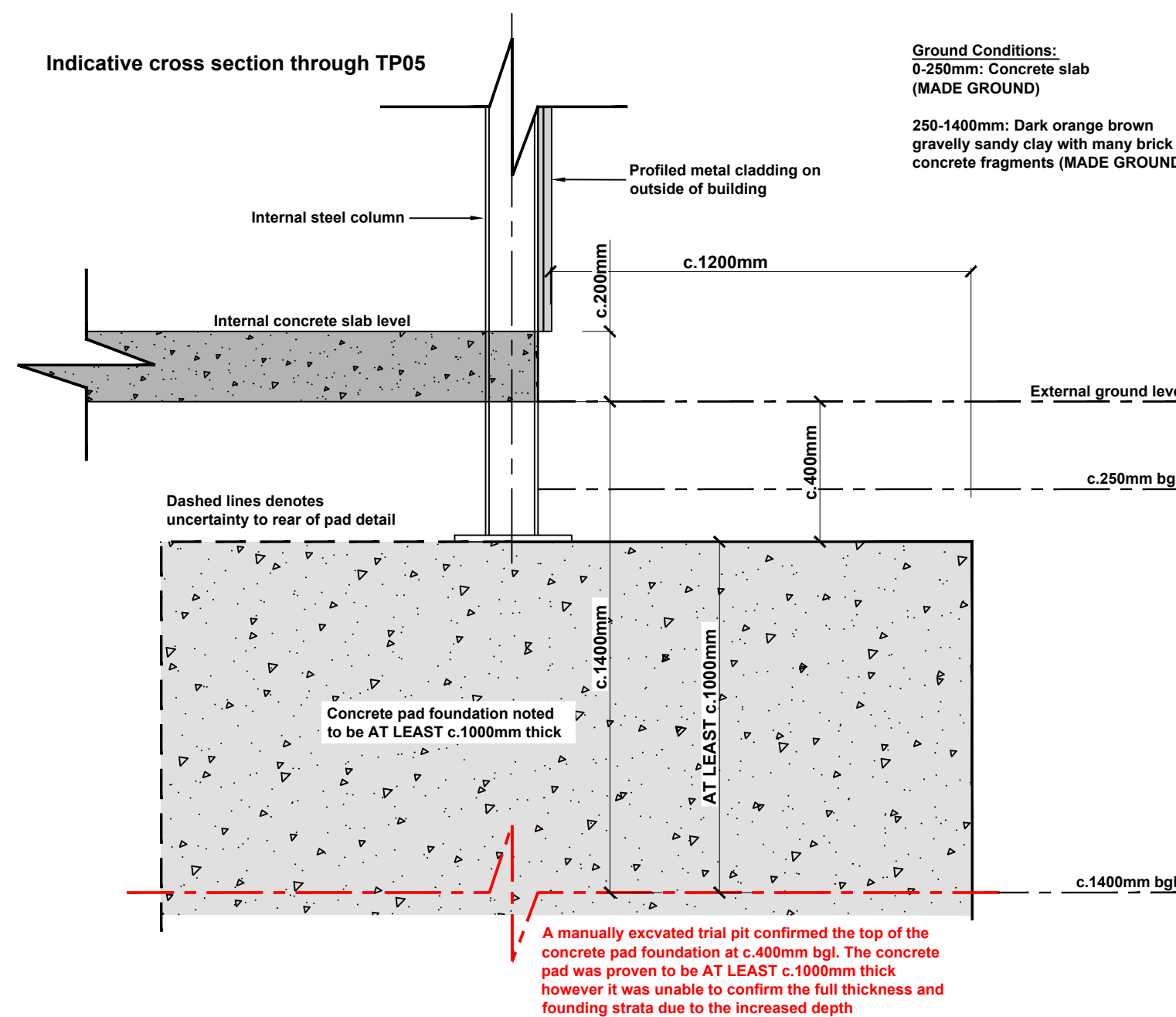
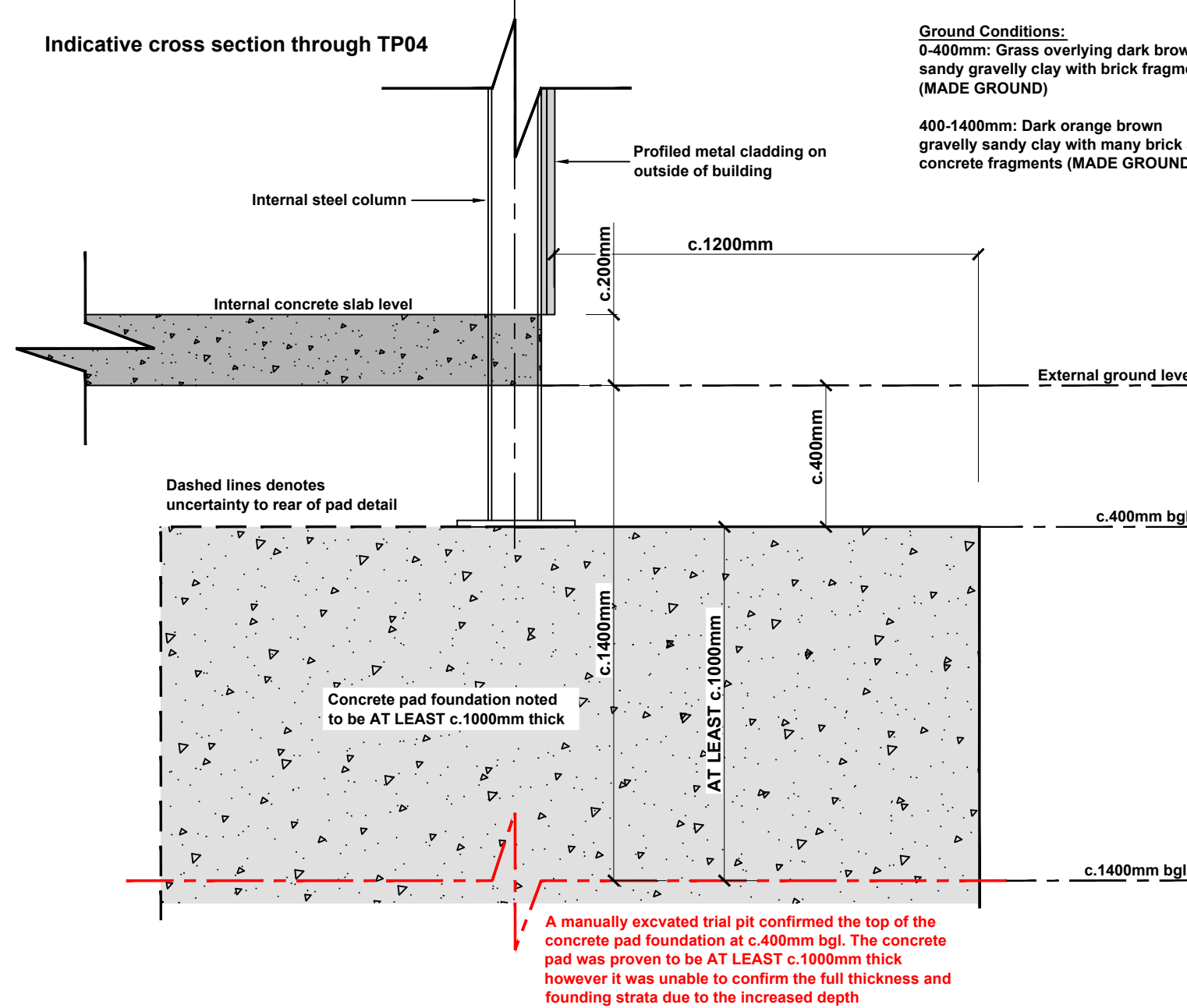
| Boring Progress and Water Observations    |      |       |                         |                |           | Chiselling                                    |    |       | Water Added     |    | GENERAL REMARKS                |
|-------------------------------------------|------|-------|-------------------------|----------------|-----------|-----------------------------------------------|----|-------|-----------------|----|--------------------------------|
| Date                                      | Time | Depth | Casing Depth            | Casing Dia. mm | Water Dpt | From                                          | To | Hours | From            | To |                                |
|                                           |      |       |                         |                |           |                                               |    |       |                 |    | WATER: Stuck water at c.1.20m. |
| All dimensions in metres<br>Scale 1:43.75 |      |       | Client Adept Consulting |                |           | Method/<br>Plant Used Windowless sampling rig |    |       | Logged By<br>ST |    |                                |

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Notes:

1. The top of the concrete pad foundation was noted at c.900mm below the level of the internal concrete floor slab during a series of small diameter drill probe holes
2. The approximate projection of the concrete pad was confirmed via the series of small diameter drill probe holes to the NW and SW of the concrete pad (c.1200mm from the centre of the steel column)
3. Probe hole drilling was extended into the slab from its upper limit (c.900mm below slab level) and confirmed the slab was **AT LEAST c.750mm THICK**. It was not possible to extend the probe hole drilling due to increased depth
4. It was not possible to confirm the founding strata due to the very compact nature of the sub base underneath the concrete slab (hard digging)



ARC ENVIRONMENTAL LTD

Solum House  
Unit 1 Elliott Court  
St. John's Road  
Meadowfield  
Durham, DH7 8PN  
Tel: (0191) 378 6380  
e-mail: admin@arc-environmental.com  
web: www.arc-environmental.com

The contractor shall check all dimensions on site prior to commencement of works. No dimensions to be scaled off this drawing  
© Copyright Reserved

| rev. | date | amendments | drawn | checked |
|------|------|------------|-------|---------|
|      |      |            |       |         |

Client:  
**ADEPT CSCE**

Project Title:  
Halewood Wines & Spirits  
The Sovereign Distillery, Wilson Road, Huyton  
Merseyside, L36 6AD

Drawing Title:  
Foundation Detail Record Sheet

Scale: at A1: As Shown | Date: 01.12.23 | Drawn by: P.D | Approved by: S.T

Job Ref: 23-795 | Drg no: - | Rev: -

### **APPENDIX III**

#### **Dynamic Cone Penetration Test Results Gas & Ground Water Monitoring Certificate**

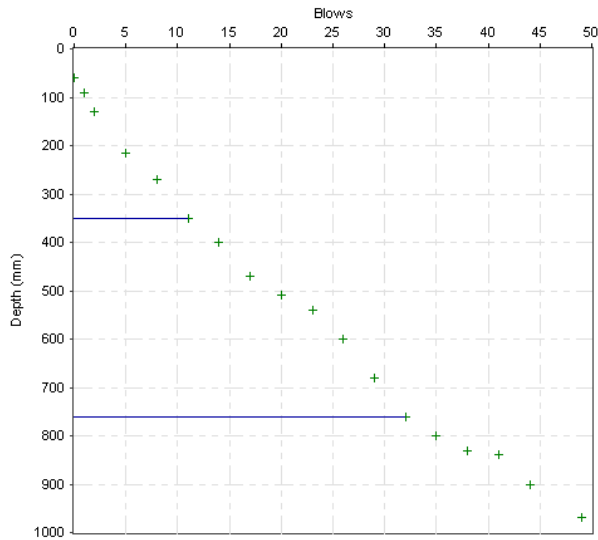
# DCP Layer Strength Analysis Report

Project Name: 23-795 DCP's

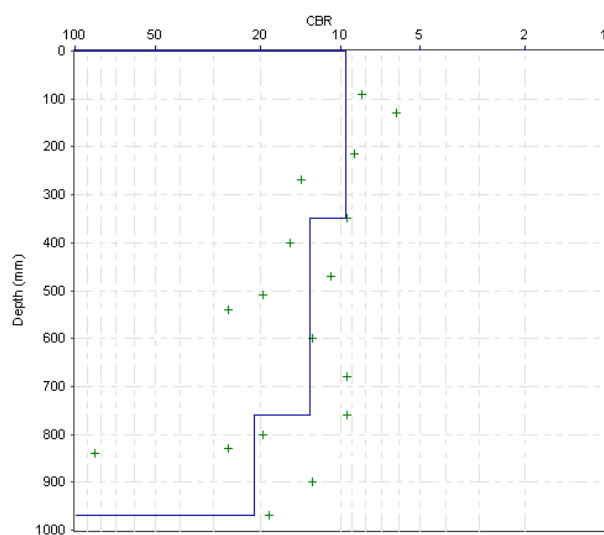
Chainage (km): 1.000  
 Direction:  
 Location/Offset: Lay-by / other  
 Cone Angle: 60 degrees  
 Zero Error (mm): 0  
 Test Date: 03/10/2023

Surface Type: Unpaved  
 Thickness (mm): 0  
 Base Type:  
 Thickness (mm):  
 Surface Moisture: Unknown  
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 1.000



Layer Boundaries Chart



CBR Chart

## Layer Properties

| No. | Penetration Rate<br>(mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|-----|-------------------------------|---------|----------------|----------------------------|
| 1   | 26.36                         | 10      | 350            | 350                        |
| 2   | 19.52                         | 13      | 410            | 760                        |
| 3   | 12.35                         | 21      | 210            | 970                        |

## CBR Relationship:

TRL equation:  $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by .....

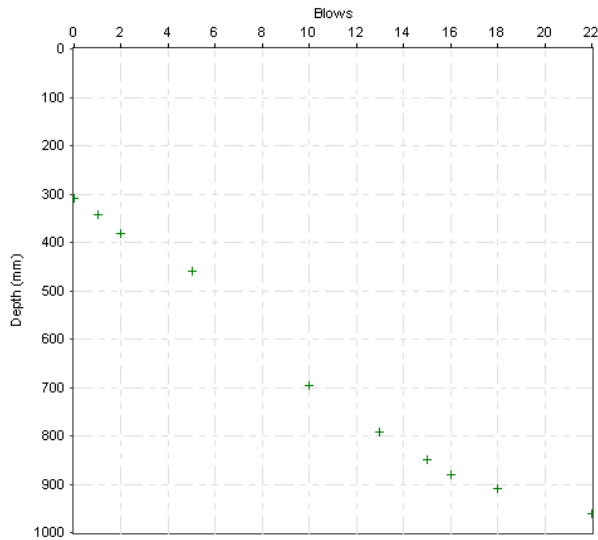
# DCP Layer Strength Analysis Report

Project Name: 23-795 DCP's

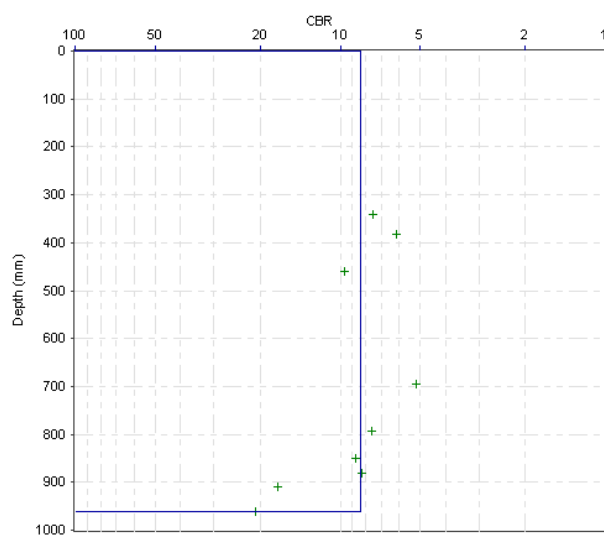
Chainage (km): 2.000  
 Direction:  
 Location/Offset: Lay-by / other  
 Cone Angle: 60 degrees  
 Zero Error (mm): 0  
 Test Date: 03/10/2023

Surface Type: Unpaved  
 Thickness (mm): 0  
 Base Type:  
 Thickness (mm):  
 Surface Moisture: Unknown  
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 2.000



Layer Boundaries Chart



CBR Chart

## Layer Properties

| No. | Penetration Rate<br>(mm/blow) | CBR (%) | Thickness (mm) | Depth to layer bottom (mm) |
|-----|-------------------------------|---------|----------------|----------------------------|
| 1   | 29.59                         | 8       | 960            | 960                        |

## CBR Relationship:

TRL equation:  $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by .....

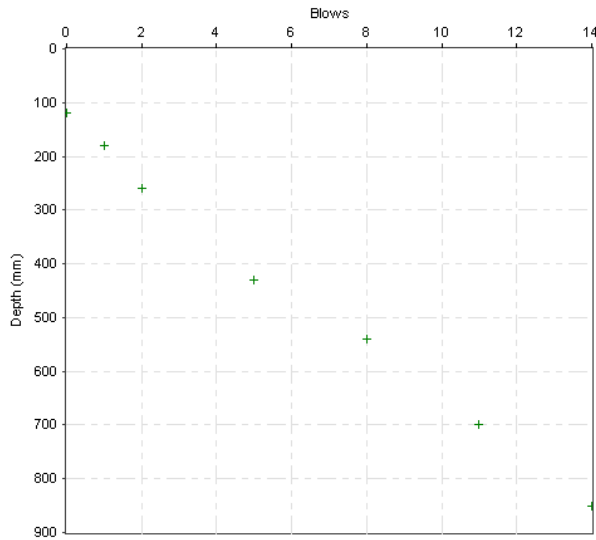
# DCP Layer Strength Analysis Report

Project Name: 23-795 DCP's

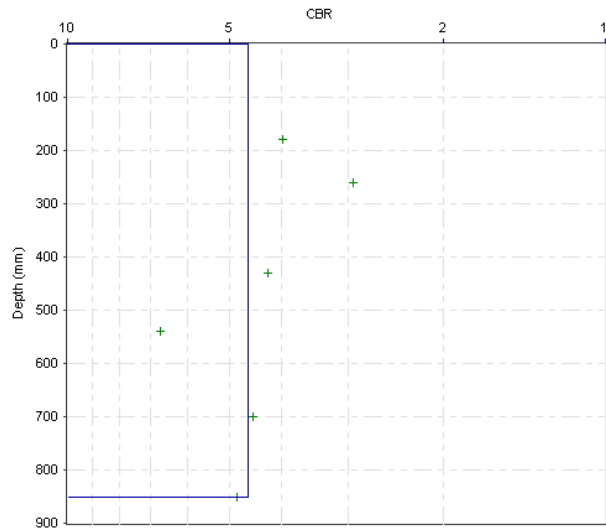
Chainage (km): 3.000  
Direction:  
Location/Offset: Lay-by / other  
Cone Angle: 60 degrees  
Zero Error (mm): 0  
Test Date: 03/10/2023

Surface Type: Unpaved  
Thickness (mm): 0  
Base Type:  
Thickness (mm):  
Surface Moisture: Unknown  
Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 3.000



Layer Boundaries Chart



CBR Chart

## Layer Properties

| No. | Penetration<br>Rate<br>(mm/blow) | CBR<br>(%) | Thickness<br>(mm) | Depth to<br>layer bottom<br>(mm) |
|-----|----------------------------------|------------|-------------------|----------------------------------|
| 1   | 52.14                            | 5          | 850               | 850                              |

## CBR Relationship:

TRL equation:  $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$ 

Report produced by .....

# Penetration Data Report

Project Name: 23-795 DCP's

Chainage (km): 1.000

Direction:

Location/Offset: Lay-by / other

Cone Angle: 60 degrees

Zero Error (mm): 0

Test Date: 03/10/2023

Surface Type:

Unpaved

Thickness (mm):

0

Base Type:

Thickness (mm):

Surface Moisture:

Unknown

Moisture adjustment factor:

Not adjusted

| No. | Blows | Cumulative Blows | Penetration Depth (mm) | Penetration Rate (mm/blow) | No. | Blows | Cumulative Blows | Penetration Depth (mm) | Penetration Rate (mm/blow) |
|-----|-------|------------------|------------------------|----------------------------|-----|-------|------------------|------------------------|----------------------------|
| 1   | 0     | 0                | 60                     | 0.00                       |     |       |                  |                        |                            |
| 2   | 1     | 1                | 90                     | 30.00                      |     |       |                  |                        |                            |
| 3   | 1     | 2                | 130                    | 40.00                      |     |       |                  |                        |                            |
| 4   | 3     | 5                | 215                    | 28.33                      |     |       |                  |                        |                            |
| 5   | 3     | 8                | 270                    | 18.33                      |     |       |                  |                        |                            |
| 6   | 3     | 11               | 350                    | 26.67                      |     |       |                  |                        |                            |
| 7   | 3     | 14               | 400                    | 16.67                      |     |       |                  |                        |                            |
| 8   | 3     | 17               | 470                    | 23.33                      |     |       |                  |                        |                            |
| 9   | 3     | 20               | 510                    | 13.33                      |     |       |                  |                        |                            |
| 10  | 3     | 23               | 540                    | 10.00                      |     |       |                  |                        |                            |
| 11  | 3     | 26               | 600                    | 20.00                      |     |       |                  |                        |                            |
| 12  | 3     | 29               | 680                    | 26.67                      |     |       |                  |                        |                            |
| 13  | 3     | 32               | 760                    | 26.67                      |     |       |                  |                        |                            |
| 14  | 3     | 35               | 800                    | 13.33                      |     |       |                  |                        |                            |
| 15  | 3     | 38               | 830                    | 10.00                      |     |       |                  |                        |                            |
| 16  | 3     | 41               | 840                    | 3.33                       |     |       |                  |                        |                            |
| 17  | 3     | 44               | 900                    | 20.00                      |     |       |                  |                        |                            |
| 18  | 5     | 49               | 970                    | 14.00                      |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |
|     |       |                  |                        |                            |     |       |                  |                        |                            |

Remarks: DCP01 / WS14







|              |           |
|--------------|-----------|
| <b>Site:</b> | Sovereign |
| <b>Ref:</b>  | 23-795    |

[illegible]

Notes:

Detection limits - Methane = 0.0%, Carbon Dioxide = 0.0%, LEL = 0.0%, Oxygen = 0.0%, Flow = 0.1l/hr

Monitoring order is from **Left to Right** across table

Monitoring should be for **Not Less** than 3 minutes. However, if high concentrations of gasses initially recorded, monitoring should be for up to 10 minutes

N/A = Not applicable

= Off the scale

Cf = PID compensation Factor (1-10) - Must be used to multiply the PID reading to give an accurate measure of the total hydrocarbons in the borehole when methane is present

Hex = Hexane (Valid and in range up to 2.000%) - Recorded when abnormally high methane is present.

PID = Photo Ionisation Detector (Calibrated to Isobutylene)

# **APPENDIX IV**

## **Laboratory Test Results (Geotechnical & Ground Contamination)**



## ANALYTICAL TEST REPORT

**Contract no:** 127942

**Contract name:** Sovereign Park, Liverpool

**Client reference:** 23-795

**Clients name:** ARC Environmental

**Clients address:** Solum House, Unit 1 Elliott Court  
St Johns Road  
Meadowfield  
DH7 8PN

**Samples received:** 30 October 2023

**Analysis started:** 30 October 2023

**Analysis completed:** 03 November 2023

**Report issued:** 03 November 2023

**Key**

|     |                                               |
|-----|-----------------------------------------------|
| U   | UKAS accredited test                          |
| M   | MCERTS & UKAS accredited test                 |
| \$  | Test carried out by an approved subcontractor |
| I/S | Insufficient sample to carry out test         |
| N/S | Sample not suitable for testing               |
| NAD | No Asbestos Detected                          |

**Approved by:**

Abbie Neasham-Bourn  
Senior Reporting Administrator

# Chemtech Environmental Limited

## SAMPLE INFORMATION

### MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

| Lab ref  | Sample id | Depth (m) | Sample description     | Material removed | % Removed | % Moisture |
|----------|-----------|-----------|------------------------|------------------|-----------|------------|
| 127942-1 | WS01      | 2.60-2.80 | Sandy Clay with Gravel | -                | -         | 13.9       |
| 127942-2 | WS03      | 3.60-3.80 | Sandy Clay with Gravel | -                | -         | 12.8       |
| 127942-3 | WS04      | 2.40-2.60 | Sandy Clay with Gravel | -                | -         | 14.4       |
| 127942-4 | WS06      | 2.60-2.80 | Sandy Clay             | -                | -         | 16.4       |
| 127942-5 | WS06      | 5.80-6.00 | Sand                   | -                | -         | 16.4       |
| 127942-6 | WS07      | 3.60-3.80 | Sandy Clay with Gravel | -                | -         | 12.9       |
| 127942-7 | WS09      | 2.80-3.00 | Sandy Clay with Gravel | -                | -         | 12.4       |
| 127942-8 | WS11      | 1.80-2.00 | Sandy Clay with Gravel | -                | -         | 12.2       |
| 127942-9 | WS14      | 0.80-1.00 | Sandy Clay with Gravel | -                | -         | 11.2       |

# Chemtech Environmental Limited

## SOILS

|                              |                    |                      |            |            |            |            |            |            |
|------------------------------|--------------------|----------------------|------------|------------|------------|------------|------------|------------|
| <b>Lab number</b>            |                    |                      | 127942-1   | 127942-2   | 127942-3   | 127942-4   | 127942-5   | 127942-6   |
| <b>Sample id</b>             |                    |                      | WS01       | WS03       | WS04       | WS06       | WS06       | WS07       |
| <b>Depth (m)</b>             |                    |                      | 2.60-2.80  | 3.60-3.80  | 2.40-2.60  | 2.60-2.80  | 5.80-6.00  | 3.60-3.80  |
| <b>Date sampled</b>          |                    |                      | 06/10/2023 | 06/10/2023 | 06/10/2023 | 06/10/2023 | 06/10/2023 | 06/10/2023 |
| <b>Test</b>                  | <b>Method</b>      | <b>Units</b>         |            |            |            |            |            |            |
| pH                           | CE004 <sup>M</sup> | units                | 8.0        | 7.9        | 7.9        | 8.5        | 8.9        | 8.1        |
| Sulphate (2:1 water soluble) | CE061 <sup>U</sup> | mg/l SO <sub>4</sub> | 21         | 31         | 79         | 41         | 23         | 33         |

# Chemtech Environmental Limited

## SOILS

|                              |                    |                      |            |            |            |
|------------------------------|--------------------|----------------------|------------|------------|------------|
| <b>Lab number</b>            |                    |                      | 127942-7   | 127942-8   | 127942-9   |
| <b>Sample id</b>             |                    |                      | WS09       | WS11       | WS14       |
| <b>Depth (m)</b>             |                    |                      | 2.80-3.00  | 1.80-2.00  | 0.80-1.00  |
| <b>Date sampled</b>          |                    |                      | 06/10/2023 | 06/10/2023 | 06/10/2023 |
| <b>Test</b>                  | <b>Method</b>      | <b>Units</b>         |            |            |            |
| pH                           | CE004 <sup>M</sup> | units                | 8.9        | 7.5        | 8.4        |
| Sulphate (2:1 water soluble) | CE061 <sup>U</sup> | mg/l SO <sub>4</sub> | 37         | 22         | 82         |

# Chemtech Environmental Limited

## METHOD DETAILS

| METHOD | SOILS                        | METHOD SUMMARY              | SAMPLE      | STATUS | LOD | UNITS                |
|--------|------------------------------|-----------------------------|-------------|--------|-----|----------------------|
| CE004  | pH                           | Based on BS 1377, pH Meter  | As received | M      | -   | units                |
| CE061  | Sulphate (2:1 water soluble) | Aqueous extraction, ICP-OES | Dry         | U      | 10  | mg/l SO <sub>4</sub> |

# Chemtech Environmental Limited

## DEVIATING SAMPLE INFORMATION

### Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

### Key

|     |                                                 |
|-----|-------------------------------------------------|
| N   | No (not deviating sample)                       |
| Y   | Yes (deviating sample)                          |
| NSD | Sampling date not provided                      |
| NST | Sampling time not provided (waters only)        |
| EHT | Sample exceeded holding time(s)                 |
| IC  | Sample not received in appropriate containers   |
| HP  | Headspace present in sample container           |
| NCF | Sample not chemically fixed (where appropriate) |
| OR  | Other (specify)                                 |

| Lab ref  | Sample id | Depth (m) | Deviating | Tests (Reason for deviation) |
|----------|-----------|-----------|-----------|------------------------------|
| 127942-1 | WS01      | 2.60-2.80 | Y         | pH (EHT)                     |
| 127942-2 | WS03      | 3.60-3.80 | Y         | pH (EHT)                     |
| 127942-3 | WS04      | 2.40-2.60 | Y         | pH (EHT)                     |
| 127942-4 | WS06      | 2.60-2.80 | Y         | pH (EHT)                     |
| 127942-5 | WS06      | 5.80-6.00 | Y         | pH (EHT)                     |
| 127942-6 | WS07      | 3.60-3.80 | Y         | pH (EHT)                     |
| 127942-7 | WS09      | 2.80-3.00 | Y         | pH (EHT)                     |
| 127942-8 | WS11      | 1.80-2.00 | Y         | pH (EHT)                     |
| 127942-9 | WS14      | 0.80-1.00 | Y         | pH (EHT)                     |

# Chemtech Environmental Limited

## ADDITIONAL INFORMATION

### Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

# SAMPLE ACKNOWLEDGEMENT

|                     |                          |
|---------------------|--------------------------|
| Contact             | Sai Turlapati            |
| Client              | ARC Environmental        |
| Quotation reference | Q120104-01               |
| Contract number     | 127658                   |
| Contract name       | Soverign Park, Liverpool |
| Client reference    | 23-795                   |

|                        |                |
|------------------------|----------------|
| Start date             | 19/10/23       |
| Agreed turnaround time | 7 Working Days |
| Estimated deadline     | 30/10/23       |

| Type of sample <small>notes 1&amp;2</small> | No of samples received | No of samples scheduled |
|---------------------------------------------|------------------------|-------------------------|
| Soil                                        | 5                      | 5                       |
| Prepared leachate                           |                        |                         |
| Groundwater                                 |                        |                         |
| Surface water                               |                        |                         |
| Landfill leachate                           |                        |                         |
| Effluent                                    |                        |                         |
| Road core                                   |                        |                         |
| Other (specify)                             |                        |                         |

|                                     |                                                         |
|-------------------------------------|---------------------------------------------------------|
| <input checked="" type="checkbox"/> | Test schedule has been received and testing is underway |
|-------------------------------------|---------------------------------------------------------|

|                          |                                                                                  |
|--------------------------|----------------------------------------------------------------------------------|
| <input type="checkbox"/> | A test schedule has not been received, testing cannot begin until it is received |
|--------------------------|----------------------------------------------------------------------------------|

|                          |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| <input type="checkbox"/> | There are anomalies between sample(s) and test schedule, testing cannot begin |
|--------------------------|-------------------------------------------------------------------------------|

|                          |                                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Insufficient / unsuitable sample(s) to undertake testing required, testing cannot begin |
|--------------------------|-----------------------------------------------------------------------------------------|

|                                             |     |
|---------------------------------------------|-----|
| The following tests have been subcontracted | N/A |
| Asbestos                                    |     |

|          |
|----------|
| Comments |
|          |

|        |                                                                                                                                                                                                                                   |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1 | MCERTS (Soils) accreditation applies to sand, clay and loam/topsoil, or combinations of these as long as these materials constitute the major part of the sample.                                                                 |
| Note 2 | UKAS accreditation for waters applies to effluents, groundwaters and wastewaters. Other water matrices are outside the scope of accreditation. Refer to current schedule of accreditation for details. Copy available on request. |
| Note 3 | All samples for this contract will be disposed of 4 weeks from initial receipt unless written instructions are received and further storage is agreed.                                                                            |

## SAMPLE ACKNOWLEDGEMENT

|                  |                          |
|------------------|--------------------------|
| Contract number  | 127658                   |
| Contract name    | Soverign Park, Liverpool |
| Client reference | 23-795                   |

### Deviating sample information

Sample deviation is determined in accordance with the UKAS Technical Policy Statement 63 'Policy on Deviating Samples' and based on reference standards and laboratory trials. For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling. Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

The following assessment has been made in regard to samples received from the above mentioned contract. In the event of samples deviating, testing will proceed as originally instructed unless you contact us to instruct us otherwise.

#### Key

**N** No (not deviating)

**Y** Yes (deviating)

**NSD** Sampling date not provided

**NST** Sampling time not provided (waters)

**EHT** Sample exceeded holding time(s)

**IC** Received in an inappropriate container

**HP** Headspace present in sample container

**NCF** Sample not chemically fixed

**OR** Other (specify)

| Lab ref  | Sample id | Depth (m) | Deviating | Tests (Reason for deviation) |
|----------|-----------|-----------|-----------|------------------------------|
| 127658-1 | WS01      | 0.4-0.6   | N         |                              |
| 127658-2 | WS02      | 0.2-0.4   | N         |                              |
| 127658-3 | WS11      | 0.2-0.4   | N         |                              |
| 127658-4 | WS12      | 1-1.2     | N         |                              |
| 127658-5 | WS13      | 0.8-1     | N         |                              |
|          |           |           |           |                              |
|          |           |           |           |                              |
|          |           |           |           |                              |
|          |           |           |           |                              |
|          |           |           |           |                              |



# LABORATORY REPORT



**Contract Number: PSL23/9121**

Report Date: 10 November 2023

Client's Reference: 23-795

Client Name: Arc Environmental

Solum House  
Unit 1 Elliott Court  
St Johns Road, Meadowfield  
Durham  
DH7 8PN

**For the attention of: Sai Turlapati**

Project Name: Sovereign Park, Liverpool

Date Received: 26/10/2023

Date Commenced: 26/10/2023

Date Completed: 09/11/2023

**Notes: Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins  
(Director)

R Berriman  
(Quality Manager)

S Royle  
(Laboratory Manager)

L Knight  
(Assistant Laboratory Manager)

S Eyre  
(Senior Technician)

  
M Fennell  
(Senior Technician)

5 – 7 Hexthorpe Road,  
Hexthorpe,  
Doncaster,  
DN4 0AR  
Tel: 01302 768098  
Email: [rberriman@prosoils.co.uk](mailto:rberriman@prosoils.co.uk)  
[awatkins@prosoils.co.uk](mailto:awatkins@prosoils.co.uk)

Page 1 of

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

## Sovereign Park, Liverpool

**Contract No:**

PSL23/9121

**Client Ref:**

**23-795**

# SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

| Hole Number | Sample Number | Sample Type | Top Depth m | Base Depth m | Moisture Content %<br>Clause 3.2 | Linear Shrinkage %<br>Clause 6.5 | Particle Density Mg/m <sup>3</sup><br>Clause 8.2 | Liquid Limit %<br>Clause 4.3/4 | Plastic Limit %<br>Clause 5.3 | Plasticity Index %<br>Clause 5.4 | Passing .425mm % | Remarks                    |
|-------------|---------------|-------------|-------------|--------------|----------------------------------|----------------------------------|--------------------------------------------------|--------------------------------|-------------------------------|----------------------------------|------------------|----------------------------|
| WS01        |               | B           | 3.40        | 3.60         | 16                               |                                  |                                                  | 33                             | 15                            | 18                               | 99               | Low Plasticity CL          |
| WS03        |               | B           | 2.40        | 2.60         | 26                               |                                  |                                                  | 45                             | 22                            | 23                               | 97               | Intermediate Plasticity CI |
| WS04        |               | B           | 3.60        | 3.80         | 18                               |                                  |                                                  | 35                             | 16                            | 19                               | 93               | Intermediate Plasticity CI |
| WS06        |               | B           | 1.40        | 1.60         | 15                               |                                  |                                                  | 31                             | 15                            | 16                               | 92               | Low Plasticity CL          |
| WS07        |               | B           | 1.40        | 1.60         | 16                               |                                  |                                                  | 34                             | 15                            | 19                               | 96               | Low Plasticity CL          |
| WS09        |               | B           | 4.60        | 4.80         | 14                               |                                  |                                                  | 29                             | 14                            | 15                               | 90               | Low Plasticity CL          |
| WS11        |               | B           | 4.40        | 4.60         | 8.7                              |                                  |                                                  | 28                             | 14                            | 14                               | 91               | Low Plasticity CL          |
| WS14        |               | B           | 1.40        | 1.60         | 14                               |                                  |                                                  | 38                             | 18                            | 20                               | 91               | Intermediate Plasticity CI |
| WS15        |               | B           | 2.40        | 2.60         | 22                               |                                  |                                                  | 44                             | 22                            | 22                               | 93               | Intermediate Plasticity CI |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |
|             |               |             |             |              |                                  |                                  |                                                  |                                |                               |                                  |                  |                            |

SYMBOLS : NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.



Sovereign Park, Liverpool

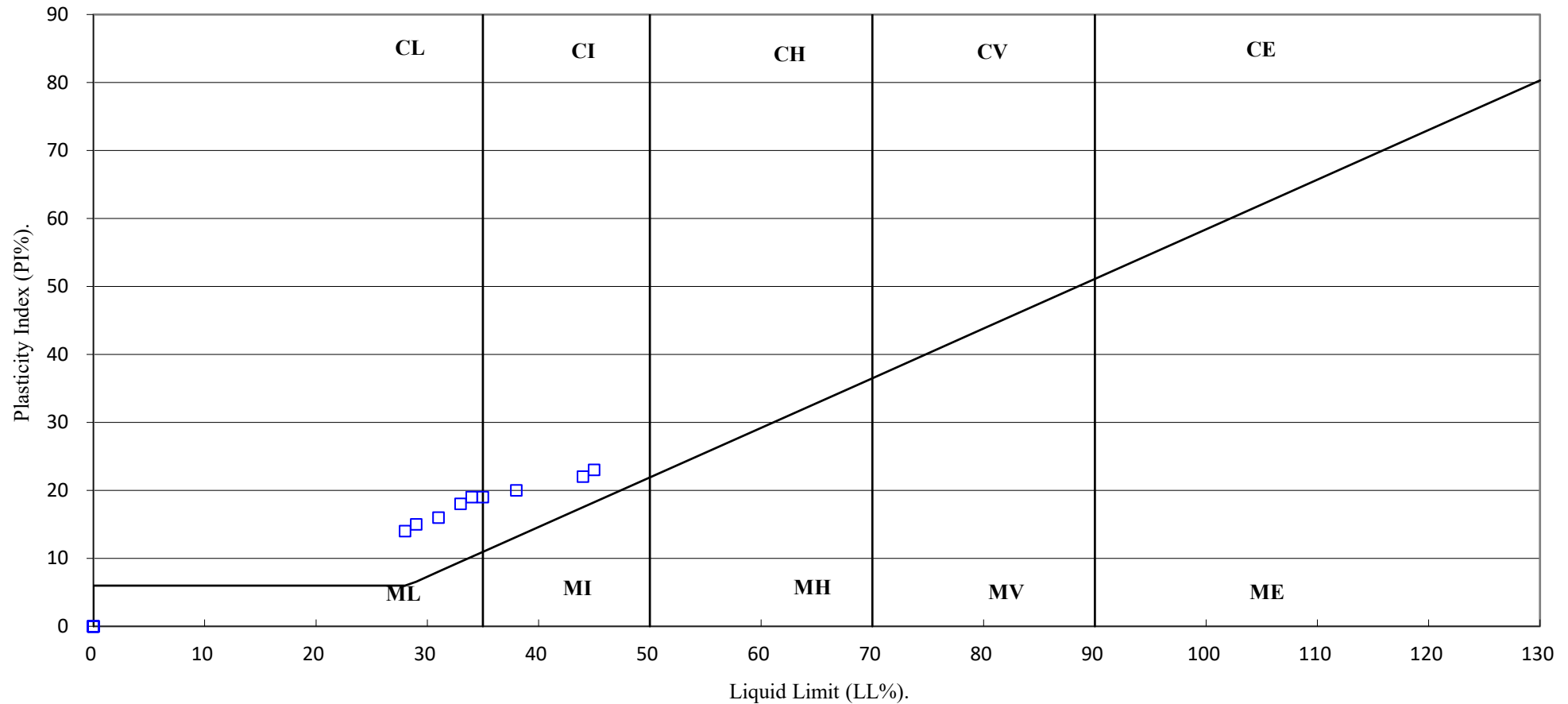
Contract No:

PSL23/9121

Client Ref:

23-795

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Sovereign Park, Liverpool

Contract No:

PSL23/9121

Client Ref:

23-795

### Determination of Unconfined Compressive Strength.

**BS EN-12504-1:2009**

[illegible]

## Sovereign Park, Liverpool

**Contract No:**

PSL23/9121

**Client Ref:**

23/795

# **APPENDIX V**

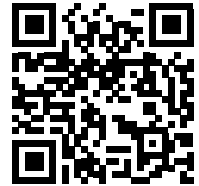
## **HazWasteOnline™ Report**



## Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



S12AR-SCVEO-YWU20

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

### Job name

Sovereign Distillery, Huyton Business Park

### Description/Comments

Waste classification for made ground materials which may be excavated and discarded from site as a waste to landfill. Classification based on the chemical screening results contained in the Arc Environmental Ltd. Ground Investigation Report, December 2023 ref. 23-795.

### Project

23-795

### Site

Sovereign Distillery, Huyton Business Park, Liverpool

### Classified by

Name:  
**Mark Berriman**  
Date:  
**13 Dec 2023 10:19 GMT**  
Telephone:  
**0191 378 6380**

Company:  
**Arc Environmental Ltd**  
**Solum House, Unit 1, Elliott Court, St.**  
**Johns Road**  
**Meadowfield**  
**DH7 8PN**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

### HazWasteOnline™ Certification:

**Course**  
Hazardous Waste Classification  
3 year Refresher overdue

**Date**  
08 Jun 2017

### Purpose of classification

2 - Material Characterisation

### Address of the waste

Sovereign Distillery, Huyton Business Park, Liverpool

Post Code N/A

### SIC for the process giving rise to the waste

41201 Construction of commercial buildings

### Description of industry/producer giving rise to the waste

Further commercial development on the existing distillery site.

### Description of the specific process, sub-process and/or activity that created the waste

Waste created through excavation works for new foundations, services, etc.

### Description of the waste

Made ground comprising a mixture of disturbed natural strata and anthropogenic debris.



### Job summary

| # | Sample name | Depth [m] | Classification Result | Hazard properties | Page |
|---|-------------|-----------|-----------------------|-------------------|------|
| 1 | WS01        | 0.40-0.60 | Non Hazardous         |                   | 3    |
| 2 | WS02        | 0.20-0.40 | Non Hazardous         |                   | 5    |
| 3 | WS11        | 0.20-0.40 | Non Hazardous         |                   | 7    |
| 4 | WS12        | 1.00-1.20 | Non Hazardous         |                   | 9    |
| 5 | WS13        | 0.80-1.00 | Non Hazardous         |                   | 11   |

### Related documents

| # | Name     | Description                                   |
|---|----------|-----------------------------------------------|
| 1 | Arc 2021 | waste stream template used to create this Job |

### Report

Created by: Mark Berriman

Created date: 13 Dec 2023 10:19 GMT

| Appendices                                                                 | Page |
|----------------------------------------------------------------------------|------|
| <a href="#">Appendix A: Classifier defined and non GB MCL determinands</a> | 13   |
| <a href="#">Appendix B: Rationale for selection of metal species</a>       | 14   |
| <a href="#">Appendix C: Version</a>                                        | 15   |

Classification of sample: WS01

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

**Sample details**

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Sample name:            | LoW Code:                                                                                 |
| <b>WS01</b>             | Chapter:                                                                                  |
| Sample Depth:           | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| <b>0.40-0.60 m</b>      | Entry:                                                                                    |
| Moisture content:       | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>10.5%</b>            |                                                                                           |
| (wet weight correction) |                                                                                           |

**Hazard properties**

None identified

**Determinands**

Moisture content: 10.5% Wet Weight Moisture Correction applied (MC)

| #  |                                                                                     | Determinand                                                                                                                                                                                                                                                                |           |            | CLP Note | User entered data | Conv. Factor | Compound conc. |               | Classification value | MC Applied | Conc. Not Used |
|----|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|--------------|----------------|---------------|----------------------|------------|----------------|
|    |                                                                                     | EU CLP index number                                                                                                                                                                                                                                                        | EC Number | CAS Number |          |                   |              |                |               |                      |            |                |
| 1  |  | arsenic { <b>arsenic trioxide</b> }                                                                                                                                                                                                                                        |           |            |          | 9.5 mg/kg         | 1.32         | 11.226 mg/kg   | 0.00112 %     | ✓                    |            |                |
|    |                                                                                     | 033-003-00-0                                                                                                                                                                                                                                                               | 215-481-4 | 1327-53-3  |          |                   |              |                |               |                      |            |                |
| 2  |  | cadmium { <b>cadmium oxide</b> }                                                                                                                                                                                                                                           |           |            |          | <2 mg/kg          | 1.142        | <2.285 mg/kg   | <0.000228 %   |                      | <LOD       |                |
|    |                                                                                     | 048-002-00-0                                                                                                                                                                                                                                                               | 215-146-2 | 1306-19-0  |          |                   |              |                |               |                      |            |                |
| 3  |  | chromium in chromium(III) compounds {  <b>chromium(III) oxide (worst case)</b> }                                                                                                        |           |            |          | 48.7 mg/kg        | 1.462        | 63.704 mg/kg   | 0.00637 %     | ✓                    |            |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            | 215-160-9 | 1308-38-9  |          |                   |              |                |               |                      |            |                |
| 4  |  | chromium in chromium(VI) compounds { <b>chromium(VI) oxide</b> }                                                                                                                                                                                                           |           |            |          | <0.04 mg/kg       | 1.923        | <0.0769 mg/kg  | <0.00000769 % |                      | <LOD       |                |
|    |                                                                                     | 024-001-00-0                                                                                                                                                                                                                                                               | 215-607-8 | 1333-82-0  |          |                   |              |                |               |                      |            |                |
| 5  |  | copper { <b>dicopper oxide</b> ; <b>copper (I) oxide</b> }                                                                                                                                                                                                                 |           |            |          | 40.5 mg/kg        | 1.126        | 40.811 mg/kg   | 0.00408 %     | ✓                    |            |                |
|    |                                                                                     | 029-002-00-X                                                                                                                                                                                                                                                               | 215-270-7 | 1317-39-1  |          |                   |              |                |               |                      |            |                |
| 6  |  | lead { <b>lead chromate</b> }                                                                                                                                                                                                                                              |           |            | 1        | 74.5 mg/kg        | 1.56         | 104.005 mg/kg  | 0.00667 %     | ✓                    |            |                |
|    |                                                                                     | 082-004-00-2                                                                                                                                                                                                                                                               | 231-846-0 | 7758-97-6  |          |                   |              |                |               |                      |            |                |
| 7  |  | mercury { <b>mercury dichloride</b> }                                                                                                                                                                                                                                      |           |            |          | <2 mg/kg          | 1.353        | <2.707 mg/kg   | <0.000271 %   |                      | <LOD       |                |
|    |                                                                                     | 080-010-00-X                                                                                                                                                                                                                                                               | 231-299-8 | 7487-94-7  |          |                   |              |                |               |                      |            |                |
| 8  |  | nickel { <b>nickel chromate</b> }                                                                                                                                                                                                                                          |           |            |          | 33.4 mg/kg        | 2.976        | 88.969 mg/kg   | 0.0089 %      | ✓                    |            |                |
|    |                                                                                     | 028-035-00-7                                                                                                                                                                                                                                                               | 238-766-5 | 14721-18-7 |          |                   |              |                |               |                      |            |                |
| 9  |  | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }                                                                                                                                                   |           |            |          | <3 mg/kg          | 1.405        | <4.215 mg/kg   | <0.000422 %   |                      | <LOD       |                |
|    |                                                                                     | 034-002-00-8                                                                                                                                                                                                                                                               |           |            |          |                   |              |                |               |                      |            |                |
| 10 |  | zinc { <b>zinc chromate</b> }                                                                                                                                                                                                                                              |           |            |          | 158 mg/kg         | 2.774        | 392.292 mg/kg  | 0.0392 %      | ✓                    |            |                |
|    |                                                                                     | 024-007-00-3                                                                                                                                                                                                                                                               | 236-878-9 | 13530-65-9 |          |                   |              |                |               |                      |            |                |
| 11 |  | pH                                                                                                                                                                                                                                                                         |           |            |          | 8.6 pH            |              | 8.6 pH         | 8.6 pH        |                      |            |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            |           | PH         |          |                   |              |                |               |                      |            |                |
| 12 |  | cyanides {  salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } |           |            |          | <1 mg/kg          | 1.884        | <1.884 mg/kg   | <0.000188 %   |                      | <LOD       |                |
|    |                                                                                     | 006-007-00-5                                                                                                                                                                                                                                                               |           |            |          |                   |              |                |               |                      |            |                |
| 13 |  | acenaphthene                                                                                                                                                                                                                                                               |           |            |          | 0.11 mg/kg        |              | 0.0985 mg/kg   | 0.00000985 %  | ✓                    |            |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            | 201-469-6 | 83-32-9    |          |                   |              |                |               |                      |            |                |
| 14 |  | acenaphthylene                                                                                                                                                                                                                                                             |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      | <LOD       |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            | 205-917-1 | 208-96-8   |          |                   |              |                |               |                      |            |                |

| #      | Determinand                                      |              |                                                                                                 | CLP Note                                                     | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|--------|--------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------|--------------|----------------|----------------------|------------|----------------|
|        | EU CLP index number                              | EC Number    | CAS Number                                                                                      |                                                              |                   |              |                |                      |            |                |
| 15     | anthracene                                       | 204-371-1    | 120-12-7                                                                                        |                                                              | 0.33 mg/kg        |              | 0.295 mg/kg    | 0.0000295 %          | ✓          |                |
| 16     | benzo[a]anthracene                               | 601-033-00-9 | 200-280-6                                                                                       | 56-55-3                                                      | 0.54 mg/kg        |              | 0.483 mg/kg    | 0.0000483 %          | ✓          |                |
| 17     | benzo[a]pyrene; benzo[def]chrysene               | 601-032-00-3 | 200-028-5                                                                                       | 50-32-8                                                      | 0.53 mg/kg        |              | 0.474 mg/kg    | 0.0000474 %          | ✓          |                |
| 18     | benzo[b]fluoranthene                             | 601-034-00-4 | 205-911-9                                                                                       | 205-99-2                                                     | 0.57 mg/kg        |              | 0.51 mg/kg     | 0.000051 %           | ✓          |                |
| 19     | benzo[ghi]perylene                               | 205-883-8    | 191-24-2                                                                                        |                                                              | 0.38 mg/kg        |              | 0.34 mg/kg     | 0.000034 %           | ✓          |                |
| 20     | benzo[k]fluoranthene                             | 601-036-00-5 | 205-916-6                                                                                       | 207-08-9                                                     | 0.21 mg/kg        |              | 0.188 mg/kg    | 0.0000188 %          | ✓          |                |
| 21     | chrysene                                         | 601-048-00-0 | 205-923-4                                                                                       | 218-01-9                                                     | 0.68 mg/kg        |              | 0.609 mg/kg    | 0.0000609 %          | ✓          |                |
| 22     | dibenz[a,h]anthracene                            | 601-041-00-2 | 200-181-8                                                                                       | 53-70-3                                                      | 0.06 mg/kg        |              | 0.0537 mg/kg   | 0.00000537 %         | ✓          |                |
| 23     | fluoranthene                                     | 205-912-4    | 206-44-0                                                                                        |                                                              | 1.17 mg/kg        |              | 1.047 mg/kg    | 0.000105 %           | ✓          |                |
| 24     | fluorene                                         | 201-695-5    | 86-73-7                                                                                         |                                                              | 0.08 mg/kg        |              | 0.0716 mg/kg   | 0.00000716 %         | ✓          |                |
| 25     | indeno[123-cd]pyrene                             | 205-893-2    | 193-39-5                                                                                        |                                                              | 0.33 mg/kg        |              | 0.295 mg/kg    | 0.0000295 %          | ✓          |                |
| 26     | naphthalene                                      | 601-052-00-2 | 202-049-5                                                                                       | 91-20-3                                                      | 0.11 mg/kg        |              | 0.0985 mg/kg   | 0.00000985 %         | ✓          |                |
| 27     | phenanthrene                                     | 201-581-5    | 85-01-8                                                                                         |                                                              | 1.05 mg/kg        |              | 0.94 mg/kg     | 0.000094 %           | ✓          |                |
| 28     | pyrene                                           | 204-927-3    | 129-00-0                                                                                        |                                                              | 1.12 mg/kg        |              | 1.002 mg/kg    | 0.0001 %             | ✓          |                |
| 29     | benzene                                          | 601-020-00-8 | 200-753-7                                                                                       | 71-43-2                                                      | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 30     | toluene                                          | 601-021-00-3 | 203-625-9                                                                                       | 108-88-3                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 31     | ethylbenzene                                     | 601-023-00-4 | 202-849-4                                                                                       | 100-41-4                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 32     | xylene                                           | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4]                                | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 33     | TPH (C6 to C40) petroleum group                  |              | TPH                                                                                             |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| 34     | confirm TPH has NOT arisen from diesel or petrol |              |                                                                                                 |                                                              | ☑                 |              |                |                      |            |                |
| 35     | asbestos                                         | 650-013-00-6 | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| Total: |                                                  |              |                                                                                                 |                                                              |                   |              |                | 0.0701 %             |            |                |

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
| Key         | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| •           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| •           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |

Classification of sample: WS02

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

**Sample details**

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Sample name:            | LoW Code:                                                                                 |
| <b>WS02</b>             | Chapter:                                                                                  |
| Sample Depth:           | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| <b>0.20-0.40 m</b>      | Entry:                                                                                    |
| Moisture content:       | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>12.5%</b>            |                                                                                           |
| (wet weight correction) |                                                                                           |

**Hazard properties**

None identified

**Determinands**

Moisture content: 12.5% Wet Weight Moisture Correction applied (MC)

| #  |                                                                                     | Determinand                                                                                                                                                                                                                                                                |           |            | CLP Note | User entered data | Conv. Factor | Compound conc. |               | Classification value | MC Applied | Conc. Not Used |
|----|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|--------------|----------------|---------------|----------------------|------------|----------------|
|    |                                                                                     | EU CLP index number                                                                                                                                                                                                                                                        | EC Number | CAS Number |          |                   |              |                |               |                      |            |                |
| 1  |  | arsenic { <b>arsenic trioxide</b> }                                                                                                                                                                                                                                        |           |            |          | 6.8 mg/kg         | 1.32         | 7.856 mg/kg    | 0.000786 %    | ✓                    |            |                |
|    |                                                                                     | 033-003-00-0                                                                                                                                                                                                                                                               | 215-481-4 | 1327-53-3  |          |                   |              |                |               |                      |            |                |
| 2  |  | cadmium { <b>cadmium oxide</b> }                                                                                                                                                                                                                                           |           |            |          | <2 mg/kg          | 1.142        | <2.285 mg/kg   | <0.000228 %   |                      | <LOD       |                |
|    |                                                                                     | 048-002-00-0                                                                                                                                                                                                                                                               | 215-146-2 | 1306-19-0  |          |                   |              |                |               |                      |            |                |
| 3  |  | chromium in chromium(III) compounds {  <b>chromium(III) oxide (worst case)</b> }                                                                                                        |           |            |          | 39.5 mg/kg        | 1.462        | 50.515 mg/kg   | 0.00505 %     | ✓                    |            |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            | 215-160-9 | 1308-38-9  |          |                   |              |                |               |                      |            |                |
| 4  |  | chromium in chromium(VI) compounds { <b>chromium(VI) oxide</b> }                                                                                                                                                                                                           |           |            |          | <0.04 mg/kg       | 1.923        | <0.0769 mg/kg  | <0.00000769 % |                      | <LOD       |                |
|    |                                                                                     | 024-001-00-0                                                                                                                                                                                                                                                               | 215-607-8 | 1333-82-0  |          |                   |              |                |               |                      |            |                |
| 5  |  | copper { <b>dicopper oxide</b> ; <b>copper (I) oxide</b> }                                                                                                                                                                                                                 |           |            |          | 32.1 mg/kg        | 1.126        | 31.623 mg/kg   | 0.00316 %     | ✓                    |            |                |
|    |                                                                                     | 029-002-00-X                                                                                                                                                                                                                                                               | 215-270-7 | 1317-39-1  |          |                   |              |                |               |                      |            |                |
| 6  |  | lead { <b>lead chromate</b> }                                                                                                                                                                                                                                              |           |            | 1        | 40.7 mg/kg        | 1.56         | 55.549 mg/kg   | 0.00356 %     | ✓                    |            |                |
|    |                                                                                     | 082-004-00-2                                                                                                                                                                                                                                                               | 231-846-0 | 7758-97-6  |          |                   |              |                |               |                      |            |                |
| 7  |  | mercury { <b>mercury dichloride</b> }                                                                                                                                                                                                                                      |           |            |          | <2 mg/kg          | 1.353        | <2.707 mg/kg   | <0.000271 %   |                      | <LOD       |                |
|    |                                                                                     | 080-010-00-X                                                                                                                                                                                                                                                               | 231-299-8 | 7487-94-7  |          |                   |              |                |               |                      |            |                |
| 8  |  | nickel { <b>nickel chromate</b> }                                                                                                                                                                                                                                          |           |            |          | 28.4 mg/kg        | 2.976        | 73.96 mg/kg    | 0.0074 %      | ✓                    |            |                |
|    |                                                                                     | 028-035-00-7                                                                                                                                                                                                                                                               | 238-766-5 | 14721-18-7 |          |                   |              |                |               |                      |            |                |
| 9  |  | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }                                                                                                                                                   |           |            |          | <3 mg/kg          | 1.405        | <4.215 mg/kg   | <0.000422 %   |                      | <LOD       |                |
|    |                                                                                     | 034-002-00-8                                                                                                                                                                                                                                                               |           |            |          |                   |              |                |               |                      |            |                |
| 10 |  | zinc { <b>zinc chromate</b> }                                                                                                                                                                                                                                              |           |            |          | 93.4 mg/kg        | 2.774        | 226.717 mg/kg  | 0.0227 %      | ✓                    |            |                |
|    |                                                                                     | 024-007-00-3                                                                                                                                                                                                                                                               | 236-878-9 | 13530-65-9 |          |                   |              |                |               |                      |            |                |
| 11 |  | pH                                                                                                                                                                                                                                                                         |           |            |          | 8.3 pH            |              | 8.3 pH         | 8.3 pH        |                      |            |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            |           | PH         |          |                   |              |                |               |                      |            |                |
| 12 |  | cyanides {  salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } |           |            |          | <1 mg/kg          | 1.884        | <1.884 mg/kg   | <0.000188 %   |                      | <LOD       |                |
|    |                                                                                     | 006-007-00-5                                                                                                                                                                                                                                                               |           |            |          |                   |              |                |               |                      |            |                |
| 13 |  | acenaphthene                                                                                                                                                                                                                                                               |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      | <LOD       |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            | 201-469-6 | 83-32-9    |          |                   |              |                |               |                      |            |                |
| 14 |  | acenaphthylene                                                                                                                                                                                                                                                             |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      | <LOD       |                |
|    |                                                                                     |                                                                                                                                                                                                                                                                            | 205-917-1 | 208-96-8   |          |                   |              |                |               |                      |            |                |

| #      | Determinand                                      |              |                                                                                                 | CLP Note                                                     | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|--------|--------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------|--------------|----------------|----------------------|------------|----------------|
|        | EU CLP index number                              | EC Number    | CAS Number                                                                                      |                                                              |                   |              |                |                      |            |                |
| 15     | anthracene                                       | 204-371-1    | 120-12-7                                                                                        |                                                              | 0.02 mg/kg        |              | 0.0175 mg/kg   | 0.00000175 %         | ✓          |                |
| 16     | benzo[a]anthracene                               | 601-033-00-9 | 200-280-6                                                                                       | 56-55-3                                                      | 0.07 mg/kg        |              | 0.0613 mg/kg   | 0.00000613 %         | ✓          |                |
| 17     | benzo[a]pyrene; benzo[def]chrysene               | 601-032-00-3 | 200-028-5                                                                                       | 50-32-8                                                      | 0.09 mg/kg        |              | 0.0788 mg/kg   | 0.00000788 %         | ✓          |                |
| 18     | benzo[b]fluoranthene                             | 601-034-00-4 | 205-911-9                                                                                       | 205-99-2                                                     | 0.13 mg/kg        |              | 0.114 mg/kg    | 0.0000114 %          | ✓          |                |
| 19     | benzo[ghi]perylene                               | 205-883-8    | 191-24-2                                                                                        |                                                              | 0.09 mg/kg        |              | 0.0788 mg/kg   | 0.00000788 %         | ✓          |                |
| 20     | benzo[k]fluoranthene                             | 601-036-00-5 | 205-916-6                                                                                       | 207-08-9                                                     | 0.05 mg/kg        |              | 0.0437 mg/kg   | 0.00000437 %         | ✓          |                |
| 21     | chrysene                                         | 601-048-00-0 | 205-923-4                                                                                       | 218-01-9                                                     | 0.12 mg/kg        |              | 0.105 mg/kg    | 0.0000105 %          | ✓          |                |
| 22     | dibenz[a,h]anthracene                            | 601-041-00-2 | 200-181-8                                                                                       | 53-70-3                                                      | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 23     | fluoranthene                                     | 205-912-4    | 206-44-0                                                                                        |                                                              | 0.16 mg/kg        |              | 0.14 mg/kg     | 0.000014 %           | ✓          |                |
| 24     | fluorene                                         | 201-695-5    | 86-73-7                                                                                         |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 25     | indeno[123-cd]pyrene                             | 205-893-2    | 193-39-5                                                                                        |                                                              | 0.07 mg/kg        |              | 0.0613 mg/kg   | 0.00000613 %         | ✓          |                |
| 26     | naphthalene                                      | 601-052-00-2 | 202-049-5                                                                                       | 91-20-3                                                      | 0.11 mg/kg        |              | 0.0963 mg/kg   | 0.00000962 %         | ✓          |                |
| 27     | phenanthrene                                     | 201-581-5    | 85-01-8                                                                                         |                                                              | 0.15 mg/kg        |              | 0.131 mg/kg    | 0.0000131 %          | ✓          |                |
| 28     | pyrene                                           | 204-927-3    | 129-00-0                                                                                        |                                                              | 0.16 mg/kg        |              | 0.14 mg/kg     | 0.000014 %           | ✓          |                |
| 29     | benzene                                          | 601-020-00-8 | 200-753-7                                                                                       | 71-43-2                                                      | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 30     | toluene                                          | 601-021-00-3 | 203-625-9                                                                                       | 108-88-3                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 31     | ethylbenzene                                     | 601-023-00-4 | 202-849-4                                                                                       | 100-41-4                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 32     | xylene                                           | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4]                                | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 33     | TPH (C6 to C40) petroleum group                  |              | TPH                                                                                             |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| 34     | confirm TPH has NOT arisen from diesel or petrol |              |                                                                                                 |                                                              | ☑                 |              |                |                      |            |                |
| 35     | asbestos                                         | 650-013-00-6 | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| Total: |                                                  |              |                                                                                                 |                                                              |                   |              |                | 0.0459 %             |            |                |

**Key**

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
|             | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| •           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| •           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |

## Classification of sample: WS11

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

## Sample details

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Sample name:            | LoW Code:                                                                                 |
| <b>WS11</b>             | Chapter:                                                                                  |
| Sample Depth:           | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| <b>0.20-0.40 m</b>      | Entry:                                                                                    |
| Moisture content:       | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>4.1%</b>             |                                                                                           |
| (wet weight correction) |                                                                                           |

## Hazard properties

None identified

## Determinands

Moisture content: 4.1% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                                                            |           |            | CLP Note | User entered data | Conv. Factor | Compound conc. |               | Classification value | MC Applied | Conc. Not Used |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|--------------|----------------|---------------|----------------------|------------|----------------|
|    | EU CLP index number                                                                                                                                                                    | EC Number | CAS Number |          |                   |              |                |               |                      |            |                |
| 1  | arsenic { arsenic trioxide }                                                                                                                                                           |           |            |          | <3 mg/kg          | 1.32         | <3.961 mg/kg   | <0.000396 %   |                      |            | <LOD           |
|    | 033-003-00-0                                                                                                                                                                           | 215-481-4 | 1327-53-3  |          |                   |              |                |               |                      |            |                |
| 2  | cadmium { cadmium oxide }                                                                                                                                                              |           |            |          | <2 mg/kg          | 1.142        | <2.285 mg/kg   | <0.000228 %   |                      |            | <LOD           |
|    | 048-002-00-0                                                                                                                                                                           | 215-146-2 | 1306-19-0  |          |                   |              |                |               |                      |            |                |
| 3  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                                               |           |            |          | 6.1 mg/kg         | 1.462        | 8.55 mg/kg     | 0.000855 %    | ✓                    |            |                |
|    |                                                                                                                                                                                        | 215-160-9 | 1308-38-9  |          |                   |              |                |               |                      |            |                |
| 4  | chromium in chromium(VI) compounds { chromium(VI) oxide }                                                                                                                              |           |            |          | <0.04 mg/kg       | 1.923        | <0.0769 mg/kg  | <0.00000769 % |                      |            | <LOD           |
|    | 024-001-00-0                                                                                                                                                                           | 215-607-8 | 1333-82-0  |          |                   |              |                |               |                      |            |                |
| 5  | copper { dicopper oxide; copper (I) oxide }                                                                                                                                            |           |            |          | 6.3 mg/kg         | 1.126        | 6.802 mg/kg    | 0.00068 %     | ✓                    |            |                |
|    | 029-002-00-X                                                                                                                                                                           | 215-270-7 | 1317-39-1  |          |                   |              |                |               |                      |            |                |
| 6  | lead { lead chromate }                                                                                                                                                                 |           |            | 1        | 63.3 mg/kg        | 1.56         | 94.688 mg/kg   | 0.00607 %     | ✓                    |            |                |
|    | 082-004-00-2                                                                                                                                                                           | 231-846-0 | 7758-97-6  |          |                   |              |                |               |                      |            |                |
| 7  | mercury { mercury dichloride }                                                                                                                                                         |           |            |          | <2 mg/kg          | 1.353        | <2.707 mg/kg   | <0.000271 %   |                      |            | <LOD           |
|    | 080-010-00-X                                                                                                                                                                           | 231-299-8 | 7487-94-7  |          |                   |              |                |               |                      |            |                |
| 8  | nickel { nickel chromate }                                                                                                                                                             |           |            |          | <3 mg/kg          | 2.976        | <8.929 mg/kg   | <0.000893 %   |                      |            | <LOD           |
|    | 028-035-00-7                                                                                                                                                                           | 238-766-5 | 14721-18-7 |          |                   |              |                |               |                      |            |                |
| 9  | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }                                                               |           |            |          | <3 mg/kg          | 1.405        | <4.215 mg/kg   | <0.000422 %   |                      |            | <LOD           |
|    | 034-002-00-8                                                                                                                                                                           |           |            |          |                   |              |                |               |                      |            |                |
| 10 | zinc { zinc chromate }                                                                                                                                                                 |           |            |          | 34.7 mg/kg        | 2.774        | 92.316 mg/kg   | 0.00923 %     | ✓                    |            |                |
|    | 024-007-00-3                                                                                                                                                                           | 236-878-9 | 13530-65-9 |          |                   |              |                |               |                      |            |                |
| 11 | pH                                                                                                                                                                                     |           |            |          | 8.5 pH            |              | 8.5 pH         | 8.5 pH        |                      |            |                |
|    |                                                                                                                                                                                        |           |            |          |                   |              |                |               |                      |            |                |
| 12 | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } |           |            |          | <1 mg/kg          | 1.884        | <1.884 mg/kg   | <0.000188 %   |                      |            | <LOD           |
|    | 006-007-00-5                                                                                                                                                                           |           |            |          |                   |              |                |               |                      |            |                |
| 13 | acenaphthene                                                                                                                                                                           |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      |            | <LOD           |
|    |                                                                                                                                                                                        | 201-469-6 | 83-32-9    |          |                   |              |                |               |                      |            |                |
| 14 | acenaphthylene                                                                                                                                                                         |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      |            | <LOD           |
|    |                                                                                                                                                                                        | 205-917-1 | 208-96-8   |          |                   |              |                |               |                      |            |                |

| #      | Determinand                                      |              |                                                                                                          | CLP Note                                                     | User entered data                   | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|--------|--------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|--------------|----------------|----------------------|------------|----------------|
|        | EU CLP index number                              | EC Number    | CAS Number                                                                                               |                                                              |                                     |              |                |                      |            |                |
| 15     | anthracene                                       | 204-371-1    | 120-12-7                                                                                                 |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 16     | benzo[a]anthracene                               | 601-033-00-9 | 200-280-6                                                                                                | 56-55-3                                                      | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 17     | benzo[a]pyrene; benzo[def]chrysene               | 601-032-00-3 | 200-028-5                                                                                                | 50-32-8                                                      | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 18     | benzo[b]fluoranthene                             | 601-034-00-4 | 205-911-9                                                                                                | 205-99-2                                                     | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 19     | benzo[ghi]perylene                               | 205-883-8    | 191-24-2                                                                                                 |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 20     | benzo[k]fluoranthene                             | 601-036-00-5 | 205-916-6                                                                                                | 207-08-9                                                     | <0.03 mg/kg                         |              | <0.03 mg/kg    | <0.000003 %          |            | <LOD           |
| 21     | chrysene                                         | 601-048-00-0 | 205-923-4                                                                                                | 218-01-9                                                     | <0.03 mg/kg                         |              | <0.03 mg/kg    | <0.000003 %          |            | <LOD           |
| 22     | dibenz[a,h]anthracene                            | 601-041-00-2 | 200-181-8                                                                                                | 53-70-3                                                      | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 23     | fluoranthene                                     | 205-912-4    | 206-44-0                                                                                                 |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 24     | fluorene                                         | 201-695-5    | 86-73-7                                                                                                  |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 25     | indeno[123-cd]pyrene                             | 205-893-2    | 193-39-5                                                                                                 |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 26     | naphthalene                                      | 601-052-00-2 | 202-049-5                                                                                                | 91-20-3                                                      | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 27     | phenanthrene                                     | 201-581-5    | 85-01-8                                                                                                  |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 28     | pyrene                                           | 204-927-3    | 129-00-0                                                                                                 |                                                              | <0.02 mg/kg                         |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 29     | benzene                                          | 601-020-00-8 | 200-753-7                                                                                                | 71-43-2                                                      | <0.001 mg/kg                        |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 30     | toluene                                          | 601-021-00-3 | 203-625-9                                                                                                | 108-88-3                                                     | <0.001 mg/kg                        |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 31     | ethylbenzene                                     | 601-023-00-4 | 202-849-4                                                                                                | 100-41-4                                                     | <0.001 mg/kg                        |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 32     | xylene                                           | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4]                                         | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | <0.001 mg/kg                        |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 33     | TPH (C6 to C40) petroleum group                  |              | TPH                                                                                                      |                                                              | <10 mg/kg                           |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| 34     | confirm TPH has NOT arisen from diesel or petrol |              |                                                                                                          |                                                              | <input checked="" type="checkbox"/> |              |                |                      |            |                |
| 35     | asbestos                                         | 650-013-00-6 | -----<br>12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |                                                              | <10 mg/kg                           |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| Total: |                                                  |              |                                                                                                          |                                                              |                                     |              |                | 0.0213 %             |            |                |

**Key**

|                                                                                     |                                                                                                                                 |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     | User supplied data                                                                                                              |
|                                                                                     | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| •                                                                                   | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
|  | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD                                                                                | Below limit of detection                                                                                                        |
| CLP: Note 1                                                                         | Only the metal concentration has been used for classification                                                                   |

Classification of sample: WS12

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

**Sample details**

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Sample name:            | LoW Code:                                                                                 |
| <b>WS12</b>             | Chapter:                                                                                  |
| Sample Depth:           | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| <b>1.00-1.20 m</b>      | Entry:                                                                                    |
| Moisture content:       | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>14.3%</b>            |                                                                                           |
| (wet weight correction) |                                                                                           |

**Hazard properties**

None identified

**Determinands**

Moisture content: 14.3% Wet Weight Moisture Correction applied (MC)

| #  |                                                                                     | Determinand                                                                                                                                                                            |           |            | CLP Note | User entered data | Conv. Factor | Compound conc. |               | Classification value | MC Applied | Conc. Not Used |
|----|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|--------------|----------------|---------------|----------------------|------------|----------------|
|    |                                                                                     | EU CLP index number                                                                                                                                                                    | EC Number | CAS Number |          |                   |              |                |               |                      |            |                |
| 1  |  | arsenic { arsenic trioxide }                                                                                                                                                           |           |            |          | 5.4 mg/kg         | 1.32         | 6.11 mg/kg     | 0.000611 %    | ✓                    |            |                |
|    |                                                                                     | 033-003-00-0                                                                                                                                                                           | 215-481-4 | 1327-53-3  |          |                   |              |                |               |                      |            |                |
| 2  |  | cadmium { cadmium oxide }                                                                                                                                                              |           |            |          | <2 mg/kg          | 1.142        | <2.285 mg/kg   | <0.000228 %   |                      | <LOD       |                |
|    |                                                                                     | 048-002-00-0                                                                                                                                                                           | 215-146-2 | 1306-19-0  |          |                   |              |                |               |                      |            |                |
| 3  |  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                                               |           |            |          | 35.4 mg/kg        | 1.462        | 44.34 mg/kg    | 0.00443 %     | ✓                    |            |                |
|    |                                                                                     |                                                                                                                                                                                        | 215-160-9 | 1308-38-9  |          |                   |              |                |               |                      |            |                |
| 4  |  | chromium in chromium(VI) compounds { chromium(VI) oxide }                                                                                                                              |           |            |          | <0.04 mg/kg       | 1.923        | <0.0769 mg/kg  | <0.00000769 % |                      | <LOD       |                |
|    |                                                                                     | 024-001-00-0                                                                                                                                                                           | 215-607-8 | 1333-82-0  |          |                   |              |                |               |                      |            |                |
| 5  |  | copper { dicopper oxide; copper (I) oxide }                                                                                                                                            |           |            |          | 12.3 mg/kg        | 1.126        | 11.868 mg/kg   | 0.00119 %     | ✓                    |            |                |
|    |                                                                                     | 029-002-00-X                                                                                                                                                                           | 215-270-7 | 1317-39-1  |          |                   |              |                |               |                      |            |                |
| 6  |  | lead { lead chromate }                                                                                                                                                                 |           |            | 1        | 135.9 mg/kg       | 1.56         | 181.666 mg/kg  | 0.0116 %      | ✓                    |            |                |
|    |                                                                                     | 082-004-00-2                                                                                                                                                                           | 231-846-0 | 7758-97-6  |          |                   |              |                |               |                      |            |                |
| 7  |  | mercury { mercury dichloride }                                                                                                                                                         |           |            |          | <2 mg/kg          | 1.353        | <2.707 mg/kg   | <0.000271 %   |                      | <LOD       |                |
|    |                                                                                     | 080-010-00-X                                                                                                                                                                           | 231-299-8 | 7487-94-7  |          |                   |              |                |               |                      |            |                |
| 8  |  | nickel { nickel chromate }                                                                                                                                                             |           |            |          | 17 mg/kg          | 2.976        | 43.361 mg/kg   | 0.00434 %     | ✓                    |            |                |
|    |                                                                                     | 028-035-00-7                                                                                                                                                                           | 238-766-5 | 14721-18-7 |          |                   |              |                |               |                      |            |                |
| 9  |  | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }                                                               |           |            |          | <3 mg/kg          | 1.405        | <4.215 mg/kg   | <0.000422 %   |                      | <LOD       |                |
|    |                                                                                     | 034-002-00-8                                                                                                                                                                           |           |            |          |                   |              |                |               |                      |            |                |
| 10 |  | zinc { zinc chromate }                                                                                                                                                                 |           |            |          | 71.4 mg/kg        | 2.774        | 169.749 mg/kg  | 0.017 %       | ✓                    |            |                |
|    |                                                                                     | 024-007-00-3                                                                                                                                                                           | 236-878-9 | 13530-65-9 |          |                   |              |                |               |                      |            |                |
| 11 |  | pH                                                                                                                                                                                     |           |            |          | 8.7 pH            |              | 8.7 pH         | 8.7 pH        |                      |            |                |
|    |                                                                                     |                                                                                                                                                                                        |           | PH         |          |                   |              |                |               |                      |            |                |
| 12 |  | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } |           |            |          | <1 mg/kg          | 1.884        | <1.884 mg/kg   | <0.000188 %   |                      | <LOD       |                |
|    |                                                                                     | 006-007-00-5                                                                                                                                                                           |           |            |          |                   |              |                |               |                      |            |                |
| 13 |  | acenaphthene                                                                                                                                                                           |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      | <LOD       |                |
|    |                                                                                     |                                                                                                                                                                                        | 201-469-6 | 83-32-9    |          |                   |              |                |               |                      |            |                |
| 14 |  | acenaphthylene                                                                                                                                                                         |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      | <LOD       |                |
|    |                                                                                     |                                                                                                                                                                                        | 205-917-1 | 208-96-8   |          |                   |              |                |               |                      |            |                |

| #      | Determinand                                      |              |                                                                                                          | CLP Note                                                     | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|--------|--------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------|--------------|----------------|----------------------|------------|----------------|
|        | EU CLP index number                              | EC Number    | CAS Number                                                                                               |                                                              |                   |              |                |                      |            |                |
| 15     | anthracene                                       | 204-371-1    | 120-12-7                                                                                                 |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 16     | benzo[a]anthracene                               | 601-033-00-9 | 200-280-6                                                                                                | 56-55-3                                                      | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 17     | benzo[a]pyrene; benzo[def]chrysene               | 601-032-00-3 | 200-028-5                                                                                                | 50-32-8                                                      | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 18     | benzo[b]fluoranthene                             | 601-034-00-4 | 205-911-9                                                                                                | 205-99-2                                                     | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 19     | benzo[ghi]perylene                               | 205-883-8    | 191-24-2                                                                                                 |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 20     | benzo[k]fluoranthene                             | 601-036-00-5 | 205-916-6                                                                                                | 207-08-9                                                     | <0.03 mg/kg       |              | <0.03 mg/kg    | <0.000003 %          |            | <LOD           |
| 21     | chrysene                                         | 601-048-00-0 | 205-923-4                                                                                                | 218-01-9                                                     | <0.03 mg/kg       |              | <0.03 mg/kg    | <0.000003 %          |            | <LOD           |
| 22     | dibenz[a,h]anthracene                            | 601-041-00-2 | 200-181-8                                                                                                | 53-70-3                                                      | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 23     | fluoranthene                                     | 205-912-4    | 206-44-0                                                                                                 |                                                              | 0.04 mg/kg        |              | 0.0343 mg/kg   | 0.00000343 %         | ✓          |                |
| 24     | fluorene                                         | 201-695-5    | 86-73-7                                                                                                  |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 25     | indeno[123-cd]pyrene                             | 205-893-2    | 193-39-5                                                                                                 |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 26     | naphthalene                                      | 601-052-00-2 | 202-049-5                                                                                                | 91-20-3                                                      | 0.02 mg/kg        |              | 0.0171 mg/kg   | 0.00000171 %         | ✓          |                |
| 27     | phenanthrene                                     | 201-581-5    | 85-01-8                                                                                                  |                                                              | 0.05 mg/kg        |              | 0.0429 mg/kg   | 0.00000428 %         | ✓          |                |
| 28     | pyrene                                           | 204-927-3    | 129-00-0                                                                                                 |                                                              | 0.05 mg/kg        |              | 0.0429 mg/kg   | 0.00000428 %         | ✓          |                |
| 29     | benzene                                          | 601-020-00-8 | 200-753-7                                                                                                | 71-43-2                                                      | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 30     | toluene                                          | 601-021-00-3 | 203-625-9                                                                                                | 108-88-3                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 31     | ethylbenzene                                     | 601-023-00-4 | 202-849-4                                                                                                | 100-41-4                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 32     | xylene                                           | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4]                                         | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 33     | TPH (C6 to C40) petroleum group                  |              | TPH                                                                                                      |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| 34     | confirm TPH has NOT arisen from diesel or petrol |              |                                                                                                          |                                                              | ☑                 |              |                |                      |            |                |
| 35     | asbestos                                         | 650-013-00-6 | -----<br>12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| Total: |                                                  |              |                                                                                                          |                                                              |                   |              |                | 0.0423 %             |            |                |

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
| Key         | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| •           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| •           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |

## Classification of sample: WS13

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

## Sample details

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Sample name:            | LoW Code:                                                                                 |
| <b>WS13</b>             | Chapter:                                                                                  |
| Sample Depth:           | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| <b>0.80-1.00 m</b>      | Entry:                                                                                    |
| Moisture content:       | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>13.6%</b>            |                                                                                           |
| (wet weight correction) |                                                                                           |

## Hazard properties

None identified

## Determinands

Moisture content: 13.6% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                                                            |           |            | CLP Note | User entered data | Conv. Factor | Compound conc. |               | Classification value | MC Applied | Conc. Not Used |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|--------------|----------------|---------------|----------------------|------------|----------------|
|    | EU CLP index number                                                                                                                                                                    | EC Number | CAS Number |          |                   |              |                |               |                      |            |                |
| 1  | arsenic { arsenic trioxide }                                                                                                                                                           |           |            |          | <3 mg/kg          | 1.32         | <3.961 mg/kg   | <0.000396 %   |                      |            | <LOD           |
|    | 033-003-00-0                                                                                                                                                                           | 215-481-4 | 1327-53-3  |          |                   |              |                |               |                      |            |                |
| 2  | cadmium { cadmium oxide }                                                                                                                                                              |           |            |          | <2 mg/kg          | 1.142        | <2.285 mg/kg   | <0.000228 %   |                      |            | <LOD           |
|    | 048-002-00-0                                                                                                                                                                           | 215-146-2 | 1306-19-0  |          |                   |              |                |               |                      |            |                |
| 3  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                                               |           |            |          | 49.1 mg/kg        | 1.462        | 62.003 mg/kg   | 0.0062 %      | ✓                    |            |                |
|    |                                                                                                                                                                                        | 215-160-9 | 1308-38-9  |          |                   |              |                |               |                      |            |                |
| 4  | chromium in chromium(VI) compounds { chromium(VI) oxide }                                                                                                                              |           |            |          | <0.04 mg/kg       | 1.923        | <0.0769 mg/kg  | <0.00000769 % |                      |            | <LOD           |
|    | 024-001-00-0                                                                                                                                                                           | 215-607-8 | 1333-82-0  |          |                   |              |                |               |                      |            |                |
| 5  | copper { dicopper oxide; copper (I) oxide }                                                                                                                                            |           |            |          | 21.9 mg/kg        | 1.126        | 21.304 mg/kg   | 0.00213 %     | ✓                    |            |                |
|    | 029-002-00-X                                                                                                                                                                           | 215-270-7 | 1317-39-1  |          |                   |              |                |               |                      |            |                |
| 6  | lead { lead chromate }                                                                                                                                                                 |           |            | 1        | 21.9 mg/kg        | 1.56         | 29.514 mg/kg   | 0.00189 %     | ✓                    |            |                |
|    | 082-004-00-2                                                                                                                                                                           | 231-846-0 | 7758-97-6  |          |                   |              |                |               |                      |            |                |
| 7  | mercury { mercury dichloride }                                                                                                                                                         |           |            |          | <2 mg/kg          | 1.353        | <2.707 mg/kg   | <0.000271 %   |                      |            | <LOD           |
|    | 080-010-00-X                                                                                                                                                                           | 231-299-8 | 7487-94-7  |          |                   |              |                |               |                      |            |                |
| 8  | nickel { nickel chromate }                                                                                                                                                             |           |            |          | 33.6 mg/kg        | 2.976        | 86.402 mg/kg   | 0.00864 %     | ✓                    |            |                |
|    | 028-035-00-7                                                                                                                                                                           | 238-766-5 | 14721-18-7 |          |                   |              |                |               |                      |            |                |
| 9  | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }                                                               |           |            |          | <3 mg/kg          | 1.405        | <4.215 mg/kg   | <0.000422 %   |                      |            | <LOD           |
|    | 034-002-00-8                                                                                                                                                                           |           |            |          |                   |              |                |               |                      |            |                |
| 10 | zinc { zinc chromate }                                                                                                                                                                 |           |            |          | 82.5 mg/kg        | 2.774        | 197.741 mg/kg  | 0.0198 %      | ✓                    |            |                |
|    | 024-007-00-3                                                                                                                                                                           | 236-878-9 | 13530-65-9 |          |                   |              |                |               |                      |            |                |
| 11 | pH                                                                                                                                                                                     |           |            |          | 8.7 pH            |              | 8.7 pH         | 8.7 pH        |                      |            |                |
|    |                                                                                                                                                                                        |           |            |          |                   |              |                |               |                      |            |                |
| 12 | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } |           |            |          | <1 mg/kg          | 1.884        | <1.884 mg/kg   | <0.000188 %   |                      |            | <LOD           |
|    | 006-007-00-5                                                                                                                                                                           |           |            |          |                   |              |                |               |                      |            |                |
| 13 | acenaphthene                                                                                                                                                                           |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      |            | <LOD           |
|    |                                                                                                                                                                                        | 201-469-6 | 83-32-9    |          |                   |              |                |               |                      |            |                |
| 14 | acenaphthylene                                                                                                                                                                         |           |            |          | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %   |                      |            | <LOD           |
|    |                                                                                                                                                                                        | 205-917-1 | 208-96-8   |          |                   |              |                |               |                      |            |                |

| #      | Determinand                                      |              |                                                                                                 | CLP Note                                                     | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|--------|--------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------|--------------|----------------|----------------------|------------|----------------|
|        | EU CLP index number                              | EC Number    | CAS Number                                                                                      |                                                              |                   |              |                |                      |            |                |
| 15     | anthracene                                       | 204-371-1    | 120-12-7                                                                                        |                                                              | 0.04 mg/kg        |              | 0.0346 mg/kg   | 0.00000346 %         | ✓          |                |
| 16     | benzo[a]anthracene                               | 601-033-00-9 | 200-280-6                                                                                       | 56-55-3                                                      | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 17     | benzo[a]pyrene; benzo[def]chrysene               | 601-032-00-3 | 200-028-5                                                                                       | 50-32-8                                                      | 0.02 mg/kg        |              | 0.0173 mg/kg   | 0.00000173 %         | ✓          |                |
| 18     | benzo[b]fluoranthene                             | 601-034-00-4 | 205-911-9                                                                                       | 205-99-2                                                     | 0.03 mg/kg        |              | 0.0259 mg/kg   | 0.00000259 %         | ✓          |                |
| 19     | benzo[ghi]perylene                               | 205-883-8    | 191-24-2                                                                                        |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 20     | benzo[k]fluoranthene                             | 601-036-00-5 | 205-916-6                                                                                       | 207-08-9                                                     | <0.03 mg/kg       |              | <0.03 mg/kg    | <0.000003 %          |            | <LOD           |
| 21     | chrysene                                         | 601-048-00-0 | 205-923-4                                                                                       | 218-01-9                                                     | <0.03 mg/kg       |              | <0.03 mg/kg    | <0.000003 %          |            | <LOD           |
| 22     | dibenz[a,h]anthracene                            | 601-041-00-2 | 200-181-8                                                                                       | 53-70-3                                                      | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 23     | fluoranthene                                     | 205-912-4    | 206-44-0                                                                                        |                                                              | 0.04 mg/kg        |              | 0.0346 mg/kg   | 0.00000346 %         | ✓          |                |
| 24     | fluorene                                         | 201-695-5    | 86-73-7                                                                                         |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 25     | indeno[123-cd]pyrene                             | 205-893-2    | 193-39-5                                                                                        |                                                              | <0.02 mg/kg       |              | <0.02 mg/kg    | <0.000002 %          |            | <LOD           |
| 26     | naphthalene                                      | 601-052-00-2 | 202-049-5                                                                                       | 91-20-3                                                      | 0.18 mg/kg        |              | 0.156 mg/kg    | 0.0000156 %          | ✓          |                |
| 27     | phenanthrene                                     | 201-581-5    | 85-01-8                                                                                         |                                                              | 0.12 mg/kg        |              | 0.104 mg/kg    | 0.0000104 %          | ✓          |                |
| 28     | pyrene                                           | 204-927-3    | 129-00-0                                                                                        |                                                              | 0.05 mg/kg        |              | 0.0432 mg/kg   | 0.00000432 %         | ✓          |                |
| 29     | benzene                                          | 601-020-00-8 | 200-753-7                                                                                       | 71-43-2                                                      | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 30     | toluene                                          | 601-021-00-3 | 203-625-9                                                                                       | 108-88-3                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 31     | ethylbenzene                                     | 601-023-00-4 | 202-849-4                                                                                       | 100-41-4                                                     | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 32     | xylene                                           | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4]                                | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
| 33     | TPH (C6 to C40) petroleum group                  |              | TPH                                                                                             |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| 34     | confirm TPH has NOT arisen from diesel or petrol |              |                                                                                                 |                                                              | ☑                 |              |                |                      |            |                |
| 35     | asbestos                                         | 650-013-00-6 | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |                                                              | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
| Total: |                                                  |              |                                                                                                 |                                                              |                   |              |                | 0.0422 %             |            |                |

#### Key

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
|             | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| •           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| •           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |

## Appendix A: Classifier defined and non GB MCL determinands

### • **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

### • **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

### • **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

### • **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

### • **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

### • **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

### • **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

### • **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

### • **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

### • **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

■ **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

## Appendix B: Rationale for selection of metal species

### arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

### cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

### chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

### chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

### copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

### lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)



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**selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}**

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

**zinc {zinc chromate}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

**cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}**

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

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**Appendix C: Version**

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2023.341.5847.10836 (07 Dec 2023)

HazWasteOnline Database: 2023.341.5847.10836 (07 Dec 2023)

This classification utilises the following guidance and legislation:

**WM3 v1.2.GB - Waste Classification** - 1st Edition v1.2.GB - Oct 2021

**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008

**1st ATP** - Regulation 790/2009/EC of 10 August 2009

**2nd ATP** - Regulation 286/2011/EC of 10 March 2011

**3rd ATP** - Regulation 618/2012/EU of 10 July 2012

**4th ATP** - Regulation 487/2013/EU of 8 May 2013

**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013

**5th ATP** - Regulation 944/2013/EU of 2 October 2013

**6th ATP** - Regulation 605/2014/EU of 5 June 2014

**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014

**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014

**7th ATP** - Regulation 2015/1221/EU of 24 July 2015

**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016

**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016

**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017

**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017

**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018

**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019

**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020

**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)**

**Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020

**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1540 of 16th December 2020

**GB MCL List** - version 1.1 of 09 June 2021

**GB MCL List v2.0** - version 2.0 of 20th October 2023