

APPENDIX A

JPG REPORTS AND DRAWINGS



SITE SPECIFICATION – EARTHWORKS CONSTRUCTION OF SURCHARGE MOUNDS

Phase 3 Rockingham

Reference

4652-2-JPG-XX-XX-SP-G-0402-S4-P03

Date

May 2020

Author

P03

5 John Charles Way
LEEDS
LS12 6QA

Tel: 0113 263 1155
admin@jpg.group
www.jpg.group





CONTENTS

Confidentiality Statement

Document History

1.0	Introduction	1
1.1	Location	1
1.2	Site Description and Topography	1
1.3	Proposed Enabling Works	1
1.4	Previous Reports	2
2.0	General	4
3.0	Standard Acceptance	5
4.0	Site Information	6
5.0	Definition of Materials	8
6.0	Method of Working	9
7.0	Excavation	10
8.0	Formations	11
9.0	Filling	12
10.0	Supervision	14
11.0	Disposal of Materials	15
12.0	Validation and Reporting	16
13.0	General Site Requirements	17
13.1	Introduction	17
13.2	Adjacent Carriageways and Properties	17
13.3	Services	17
13.4	Health and Safety	18
13.5	Mobile Plant	19
13.6	Dust	19
13.7	Odour	20
13.8	Noise	20
13.9	Surface Waters	20
13.10	General	21



APPENDICES

Appendix A Figures & Plans

JPG. Rockingham Phases 2 and 3. Location Plan. 4652-2-JPG-SW-00-DR-D-1450-S2-P01. Dated December 2019.

JPG. Rockingham Phase 3, Hoyland. Earthworks Strategy Stage 01. Drawing ref. 4652-2-JPG-P3-ZZ-DR-Z-1202 S2 P01, dated 14/07/2021.

JPG. Rockingham Phase 3, Hoyland. Earthworks Strategy Stage 02. Drawing ref. 4652-2-JPG-P3-ZZ-DR-C-1203 S2 P01, dated 14/07/2021.

UMC Architects. Dearne Valley Parkway, Barnsley. Site layout – Option 3. Drawing No. 20149 F0004 Rev C, dated 27/01/2021.



CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Harworth Group
Advantage House
Poplar Way
ROTHERHAM
S60 5TR

This report has been prepared for the sole use and reliance of the above named parties. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

Rev	Date	Revision Details	Status	Author(s)	Approved
P01	15/04/2020	First Issue	Final	JBW	RJM
P02	18/05/2020	Second Issue	Final	JBW	OLT
P03	28/07/2021	Third Issue	Final	JBW	RJM



1.0 INTRODUCTION

JPG (Leeds) Limited has been instructed by the Harworth Group to prepare an earthworks specification for the construction of the surcharge mounds which are required as part of the site preparation works for a proposed commercial development on land immediately to the north of Dearne Valley Parkway (Phase 3).

This earthworks specification relates to the compaction of materials on site in order to create the surcharge mounds. It does not address other geotechnical / geoenvironmental constraints, including self-weight settlement of opencast backfill and potential issues relating to coal mining legacy. It is understood that a methodology and design for surcharging of the deep made ground to reduce future settlement is to be specified by RSK Environmental Limited (RSK).

1.1 Location

The site is located approximately 1km to the north east of Junction 36 of the M1 motorway, on the northern side of the Dearne Valley Parkway (A6195). The approximate centre of the site is located at NGR E435425, N401190.

1.2 Site Description and Topography

Phase 3 Development Area

The site is located to the north of Dearne Valley Parkway and is an irregular shape covering an area of approximately 9.72ha.

The site comprises restored former opencast working and currently is a mixture of fields interspersed with woodland areas.

The site is bounded by Dearne Valley Parkway to the south, open agricultural land to the north, an existing business park to the east and to the west is a watercourse/ditch, pond and further over an existing business park.

The site generally falls from south to north in the order of 21.0m.

A Site Location Plan is included in Appendix A.

1.3 Proposed Enabling Works

It is proposed to prepare the site for a future commercial development. A drawing showing the proposed development has been provided, which is referenced below, and a copy is provided in Appendix A.

- UMC Architects. Dearne Valley Parkway, Barnsley. Site layout – Option 3. Drawing No. 20149, F0004, Rev C, dated 27/01/2021.

In order to develop the site, it will be necessary to carry out surcharging (pre-loading) to limit future settlement including self-weight settlement of opencast backfill.



The design of the surcharging, which includes the specification for the extent and dimensions of the surcharge mounds, is to be provided by RSK.

This Specification details the methodology to be adopted in order to create the surcharge mounds.

The surcharging is proposed to be carried out in stages. Earthworks strategy drawings showing the proposed works for stage 01 and stage 02 are referenced below and provided in Appendix A.

- JPG. Rockingham Phase 3, Hoyland. Earthworks Strategy Stage 01. Drawing ref. 4652-2-JPG-P3-ZZ-DR-Z-1202 S2 P01, dated 14/07/2021.
- JPG. Rockingham Phase 3, Hoyland. Earthworks Strategy Stage 02. Drawing ref. 4652-2-JPG-P3-ZZ-DR-C-1203 S2 P01, dated 14/07/2021.

1.4 Previous Reports

A combined desk study and coal mining risk assessment report for the site has been prepared by RSK. This report is referenced below and should be read in conjunction with this specification.

- RSK. J36 Phase 2A, Phase 2B and Phase 3, Rockingham. Preliminary Risk Assessment and Coal Mining Risk Assessment. Report No. 322638-R01(01). Dated December 2019. For Harworth Estates Investments Limited.

RSK subsequently prepared a separate Phase 2 geoenvironmental and geotechnical site investigation report for both the Phase 2 and Phase 3 development areas. This report is referenced below and should be read in conjunction with this specification.

- RSK. J36 Phase 2A, Phase 2 and Phase 3 Rockingham. Phase 2 Geo-environmental and Geotechnical Site Investigation. Report No. 322368-R02. Dated March 2020. For Harworth Estates Investments Limited.

Pertinent information included in the aforementioned report is summarised below.

- Two maximum dry density (MDD) / moisture content relationship tests (Test 1 and Test 2) indicate that the colliery spoil is too wet to achieve sufficient compaction, i.e. >95% MDD and <5% air voids (heavy compaction – 4.5kg rammer).
- However, other samples (BH206 & TP211, TP303 & TP304 and TP401) indicate that the materials are suitable to be compacted and can achieve >95% MDD and <5% air voids.
- The made ground is thus deemed variable and some may require improvement in order to achieve sufficient compaction.
- The opencast backfill may contain significant quantities of oversized materials (cobbles and boulders) which will require processing (i.e. breaking up) if they are to be incorporated into the earthworks.



- The opencast backfill is susceptible to significant load-induced settlement – ground treatment by surcharging is required. To the west of the Elsecar Fault, further monitoring is required. Additional (treatment) surcharging may be required in this area dependent on the results.
- No shallow worked coal seams have been encountered other than those encountered during the opencast workings.
- Two mineshafts may require treatment. These mineshafts are located within the Phase 3 development area. One mineshaft (Coal Authority ref. 435401-003) has been located. It has been capped but below the cap, the shaft is voided. The other mineshaft has yet to be located.
- Buildings should not straddle the opencast highwalls, in particular the Elsecar Fault. The report states: 'it is recommended that the location of Unit 3 and Unit 4 in Phase 2 are switched in order to avoid the now better-defined constraint of the former opencast pits highwall / fault.'
- Buried concrete has been assessed as ACEC AC-2s / DS-2.
- Based on four ground gas monitoring visits, the sites have been assessed as Characteristic Situation (CS) 2, as defined by BS8485. Further ground gas monitoring is required to confirm the CS. On completion of monitoring the wells will require grouting or full removal to prevent them from acting as preferential pathways.
- A further six months of settlement monitoring is recommended.

RSK have provided a ground treatment specification report which details the proposed methodology for carrying out the surcharging works. This report is referenced below and should be read in conjunction with this specification.

- RSK. J36 Phase 2A, Phase 2 and Phase 3 Rockingham. Phase 3 Ground Treatment Specification. Report Ref. 325389-R04(00). Dated July 2021. For Harworth Estates Investments Limited.



2.0 GENERAL

The Engineer referred to in this specification shall mean the Consulting Geoenvironmental / Geotechnical Engineer.

The expressions approved and approval shall mean the written approval of the Engineer.

All British standards, specifications and British Standard Codes of Practice or any other standards referred to in this specification shall be the latest standards including all amendments published before the last day of returning tenders, unless otherwise stated.

The works described in this specification shall be carried out to the entire satisfaction of the Engineer.



3.0 STANDARD ACCEPTANCE

The earthworks shall be carried out in accordance with the Engineer's drawings and the Manual of Contract Documents for Highways Works, Volume 1 Specification for Highway Works, Series 600 Earthworks (hereinafter referred to as the HA Specification for Highway Works).

Except where otherwise specified, work shall be in accordance with the British Standards and other references referred to in the HA Specification for Highway Works. The latest editions shall be used, including all current amendments and additions.



4.0 SITE INFORMATION

Ground Conditions

The Contractor shall visit the site, inspect the subsoil information and ascertain for himself the nature of the ground, obtain all necessary information in respect of overhead and underground services, obstructions, site access, position of adjacent properties and any other features that may affect the cost or programme of the work. No claim shall be considered arising from lack of knowledge in this respect.

It is the responsibility of the Contractor to satisfy himself as to the suitability of his equipment and methods based on the recorded soil and ground conditions existing on the site. Information on soil and ground conditions is provided in the RSK Phase 2 Geo-environmental and Geotechnical Site Investigation report, which is referenced in Section 1.4 of this specification.

Should the Contractor feel that he requires additional information in order to finalise his design, he is at liberty to carry out further site investigation work at his own expense. The Engineer shall however be notified of this requirement so that any necessary permissions may be obtained, and the Engineer shall also be given the opportunity of attending the site during this additional investigation.

Ground Water Levels

The Contractor shall make all necessary enquiries concerning ground water level and allow for variations from this level when working on any part of the site.

Site Features

Before starting work the Contractor shall verify with the Engineer and/or Architect which existing fences, gates, walls, roads, paved areas and other site features are to be removed. Materials arising shall be removed from site subject to approval by the Engineer and/or Architect.

Trees and Undergrowth

Before starting work the Contractor shall verify with the Engineer and/or Architect those trees, shrubs and hedges that are to be removed.

As required, the Contractor shall clear the site of all trees, bushes, scrub and undergrowth. The Contractor shall grub up main roots and fill voids with suitable material. The Contractor shall dispose of all vegetation, roots, etc.

Schedule of Dilapidations

Prior to commencement on site the Contractor shall prepare and agree a Schedule of Dilapidations supported by photographs of all existing buildings, roads, footpaths, walls, fences, etc., adjacent to the site with the Engineer, the Architect and statutory authorities. The Contractor shall include for all costs in respect of this schedule and allow for providing two additional copies of all written information together with the photographs for the exclusive use of the employer.



Existing Levels

The Contractor shall satisfy himself that the existing levels of the ground shown on the drawings are correct and bring to the notice of the Engineer any discrepancies before any excavation is commenced. The drawings shall be deemed to be correct if no such notice is given to the Engineer.

Consideration will need to be given to a reduction in the volume of materials as a result of surcharging to avoid any shortfall of materials.



5.0 DEFINITION OF MATERIALS

Suitable Materials

Suitable materials shall comprise all that which is acceptable for the contract.

Unsuitable Materials

A summary of unsuitable materials is provided below:

- Material from swamps, marshes, etc., all organic or part organic material including topsoil.
- Material susceptible to spontaneous combustion.
- Frozen materials - Such material may be re-defined as suitable when thawing has occurred at the discretion of the Engineer.
- Clay if the liquid limit exceeds 80% and/or the plasticity index exceeds 55%.
- Materials having a moisture content greater than the maximum permitted for such materials as defined by the Engineer. The Engineer may redefine such materials when sufficient drying has occurred.
- Oversized materials, including cobbles and boulders, which will require breaking down if they are to be incorporated into the earthworks.

Topsoil

Topsoil shall be the top layer of soil that can support vegetation and shall include turf.



6.0 METHOD OF WORKING

The Contractor shall employ only that plant which is suitable for the soils to be handled. He shall not use plant that damages or reduces the natural strength of the soil either in its in situ state or during handling, placing and compacting.

Where excavation reveals a combination of suitable and unsuitable materials the Contractor shall, unless otherwise agreed by the Engineer, carry out the excavation in such a manner that the suitable materials are excavated separately for use in the works without contamination by the unsuitable materials.

The Contractor shall not use explosives.

Excavation from a cutting shall not proceed unless sufficient plant is available in the fill area to comply with the compaction requirements.

The gradient of slopes formed by cutting and filling areas shall be defined in the contract and shall be well graded, trimmed and free of loose material.

The Contractor shall be deemed to have included for temporarily supporting as necessary any services, drains or ducts encountered.

Before starting work the Contractor shall submit a detailed methodology containing how the works will be undertaken, phasing of the works and disposal and/or temporary storage of spoil and other arisings from the works.

The Contractor shall be deemed to have allowed for the deterioration of material as a result of inclement weather and the replacement with suitable material as appropriate.

Throughout the works the Contractor shall maintain the whole area of his operations in a clean, tidy and safe condition by arranging his materials in an orderly manner. All rubbish, waste, material, debris etc. shall be systematically cleared from the working areas as it accumulates.



7.0 EXCAVATION

Topsoil

As specified in Section 11, topsoil is to be used for surcharging development areas. This will comprise the moving of topsoil by the contractor to act as surcharge. The volumes to be used in the surcharging are to be specified by RSK.

Earthwork Support

The Contractor shall be entirely responsible for the sufficiency of all temporary earthwork support to excavations. Should a fall occur in any excavation, or excessive material be excavated, the Contractor shall carry out at his own expense any reinstatement or repairs which may become necessary as the result of such fall and excess. Any void caused by a fall shall be filled and compacted by the Contractor at his own expense, to the requirement of the Engineer.

Watercourses

The Contractor shall temporarily divert as necessary all field drains and other watercourses not shown on the drawings and encountered during the excavations, and if possible, reinstate on completion or if it is not possible to reinstate, obtain instructions from the Engineer.

Existing watercourses that have been diverted and are to be filled shall be cleared of all vegetation growth and soft deposits before filling.

Excess Excavation

The Contractor shall backfill any excavations taken wider than required with approved material.



8.0 FORMATIONS

It is the responsibility of the Contractor to satisfy himself as to the suitability of his equipment and methods based on the recorded soil and ground conditions existing on the site. Information on soil and ground conditions is provided in the RSK Phase 2 Geo-environmental and Geotechnical Site Investigation report and the Phase 3 Ground Treatment Specification which are referenced in Section 1.4 of this specification.

The Contractor shall proof roll the resulting formation to give the compactive effort of 4No. passes of a 'Bomag BW6 vibratory roller', or similar approved method.



9.0 FILLING

General

For approval to be given for filling the Contractor shall be required to demonstrate that the material is suitable and that the placing of the material conforms to the compaction requirements of the HA Specification for Highway Works.

The filling shall consist of materials that are selected to be free from deleterious materials. The material shall **NOT** contain the following:

- Materials containing sulphates.
- Materials susceptible to frost damage, weathering or mechanical damage
Material in fill areas which has deteriorated due to the ingress of surface water, or the trafficking of the Contractor's plant shall be removed and replaced at the Contractor's expense.

Fill areas shall be built up evenly over the full area, unless the contract requires otherwise, and sufficient camber shall be maintained at all times to enable surface water to drain from them. The containment or disposal of surface water, during the construction period shall be the Contractor's responsibility.

The Contractor shall ensure that excavations and areas to be filled are free from organic material, loose soil, rubbish and standing water.

Plant employed for transporting, laying and compacting shall be suited to the type of material being handled.

The Contractor shall lay differing materials separately so that only one type of material occurs in each layer.

Benching In Fill

Where during the progress of the work the difference in level between adjacent areas of filling exceeds 600mm, the Contractor shall cut into the edge of the higher filling to form benches having a minimum width of 600mm and a height equivalent to the depth of a layer of compacted filling. New filling shall be spread and compacted to ensure maximum continuity with the previous filling.

Cold Weather Working

Frozen material or materials containing ice shall not be used. Fill material shall not be placed on a frozen surface.

Imported Material

It is not anticipated that any materials will require to be imported onto site in order to complete the works.

Sources, types of suitable material and the moisture content at which they may be placed and compacted shall be those approved by the Engineer and agreed at tender stage.



The Contractor shall have delivered to site sample loads of any imported material proposed for use for the approval of the Engineer before any filling material is placed in position. A minimum of 48 hours' notice shall be provided for inspection with a further 24 hours for approval. Grading analyses, aggregate crushing value or 10% fines test and Atterberg limits plus natural moisture content details, as appropriate, shall accompany all samples.

Materials shall be properly protected from snow, frost and inclement weather and any materials damaged shall be removed from the site immediately and replaced with sound materials.

The movement of material across the site will be subject to the requirements of a Materials Management Plan (MMP), which will make reference to a site-specific remedial strategy report or design statement.

Laboratory chemical testing results should be provided to confirm that any materials to be imported comply with the requirements of the MMP and remedial strategy report or design statement.

Topsoil

The topsoil shall be reduced to a fine tilth with no stone or other debris with any dimension greater than two thirds of the thickness of the topsoil layer and not upstanding more than 50mm above the upper surface of the topsoil. Topsoil should be kept separate from and not allowed to 'contaminate' suitable fill materials.

Specification for Compaction - Granular (Class 1A and 1B) and Cohesive (Class 2B and 2C)

Materials should be placed and compacted in accordance with the requirements of the HA Specification for Highway Works.

It is understood that the surcharge mounds will be temporary and on completion of surcharging they will be excavated and will not form part of the final development platform. On this basis it is recommended that both Class 1 and Class 2 materials are compacted in accordance with the method specification as prescribed in the HA Specification for Highway Works.

Any materials placed and compacted as part of the permanent works should be placed and compacted in accordance with an earthworks specification provided by the final design engineers.

General Filling

All cobbles or boulders of a size not compliant with the earthwork's specification shall require to be removed or broken down to an acceptable size.



10.0 SUPERVISION

The Contractor shall ensure that a competent supervisor is on the site during all working hours.

The Contractor shall allow the Engineer access to the works at any reasonable time and shall afford the Engineer reasonable facilities to enable him to check the adequacy of the works.

In the event of ground or other conditions changing such that the Contractor feels that a change in his plant or his method of working is required, he shall give the Engineer 36 hours' notice for approval of the proposed plant and working method.

It is the Contractor's responsibility to ensure that the materials are placed and compacted in accordance with the HA Specification for Highway Works.



11.0 DISPOSAL OF MATERIALS

All materials arising from the excavations and not used on the works shall be disposed of as directed by the Engineer.

Topsoil

The Contractor shall remove surplus topsoil from site, subject to approval by the Engineer.

Surplus and/or Unsuitable Materials

The Contractor shall comply with the requirements of the Environment Protection Act 1990 with particular reference to the duty of care for the disposal of waste.

The Contractor shall provide the Engineer with copies of all necessary licences, approvals, delivery notes and receipts relating to the discharge of the duty of care for the disposal of waste.

The Contractor shall remove all suitable materials surplus to the contract requirements and unsuitable materials to an appropriately licensed landfill unless other provisions are specifically made in the contract, subject to approval by the Engineer.

Water

The permanent drainage system shall not to be used for disposal of water from excavations without approval by the Engineer and the local authority.

The Contractor shall keep all excavations free from water.

The Contractor shall not disturb material in or around excavations by pumping operations.

The Contractor shall obtain approval of the location of any sumps and fill with approved materials when no longer required.



12.0 VALIDATION AND REPORTING

The Contractor will maintain records of the works to include the following:

- Daily record sheets to include a summary of the day's activities.
- Weather conditions.
- Plant, personnel and visitors present.
- Aspects relating to Health and Safety, environmental control or non-compliance with the Specifications or the Contractors Method Statement.
- As built surveys, including final level survey, base of excavation survey, base (where proven) and top of made ground, and as-built drainage survey.

The Engineer (JPG and RSK) shall ensure that the requirements of this strategy are complied with. On satisfactory completion of all of the works, the Engineer will provide an initial report, comprising relevant site records that will act as confirmation that the earthworks have been carried out in accordance with this specification.

The report shall include the following:

- A description of the works undertaken.
- Records of the works.
- Progress photographs.
- Waste transfer notes.
- Any chemical and geotechnical test results.
- As built surveys, including base of excavation and final level survey, base (where proven) and top of made ground as supplied by the Contractor.
- A statement that the works have been undertaken in accordance with the agreed specification.



13.0 GENERAL SITE REQUIREMENTS

13.1 Introduction

The Contractor shall comply at all times with this Strategy, the Conditions of Contract and all relevant health and safety requirements. Site works will be supervised periodically by a GE appointed by the client.

The Contractor shall prepare and submit a programme for the works to the client prior to commencement on site.

Site cabins, stores and welfare facilities shall be established at a convenient location to be agreed between the Contractor and the Client.

Prior to commencement of works, the Contractor shall establish the boundaries of the site and working areas and shall make adequate provision to secure the site boundary and prevent unauthorised access to the site during the course of the works.

If works are anticipated to extend beyond the hours of 08.00 to 17.00 Monday to Friday and 08.00 to 13.00 Saturday, then the site working hours shall be discussed and agreed with the Local Authority prior to commencement. No works shall take place on Sundays or Bank Holidays.

13.2 Adjacent Carriageways and Properties

The Contractor is to undertake a dilapidation survey of site boundaries, adjacent properties and highways prior to starting works on site. Such a survey shall include roads, footpaths, street lighting and road signs. A copy of the survey, including a record of photographs shall be provided to the client within seven days of commencement of site works.

An appropriate traffic management system should be agreed with the Local Authority Highways Section and employed for traffic entering/exiting the site.

13.3 Services

The Client shall be responsible for obtaining all relevant service records for the site and undertake any consultation with the statutory undertakers in relation to identifying the location of live services, including those to any adjacent properties and electrical substations within the site. The Client shall ensure the safe disconnection of all existing services entering the site, except for those which are to remain operational.



Prior to site works commencing, the position and depth of all services shall be determined and clearly identified on site by the contractor. The locations should be confirmed on site by appropriate investigation and observations. The following should be undertaken:

- Copies of a consolidated services location drawing should be retained and displayed in the contractor's office.
- Cable Avoidance Tool (CAT) scanning of areas where works are to be carried out.
- Hand dug holes to expose service location shall be undertaken (where possible).
- Physical marking out on the site of service routes on the ground and appropriate lay-offs/easements using paint, pegging, bunting etc.
- Retaining on the site, drawings showing locations of all services.
- Where services are being re-routed during the works both the drawings and site markings must be kept up to date.
- When works commence on a new area of the site the site manager or relevant foreman must brief all operatives on the location of services in this area.
- Method statements/risk assessments must be read by all relevant personnel and their understanding of them confirmed in writing.
- If coloured sands, service ductwork or services are exposed during operations then work must cease until the site manager has confirmed it is safe to continue.

All manholes to remain should be located and clearly identified on site to prevent damage. The location, overall depth and diameter of each manhole, and the size and depth of all connections, shall be recorded.

Service providers shall be contacted by the contractor to determine any precautions, safe working distances etc. relating to services, both underground and overhead.

13.4 Health and Safety

The earthworks shall be undertaken in accordance with all relevant legislation including, but not limited to:

- The Health and Safety at Work etc. Act, 1974.
- The most current Construction (Design and Management) Regulations.
- Construction (Health Safety and Welfare) Regulations, 1996.
- The Control of Substances Hazardous to Health Regulations, 2002, and
- The Control of Asbestos at Work Regulations, 2012.

Before site operations are commenced the necessary COSHH Assessment, Method Statements and Health and Safety Plans should be completed and issued by the contractor in accordance with the current CDM Regulations.



All site personnel shall undergo a site-specific health and safety induction prior to commencement of work on site.

The contractor shall provide details of emergency procedures. Emergency Services shall be informed of the site operations prior to commencement.

13.5 Mobile Plant

Mobile plant shall be operated by competent personnel for each item of plant. When not in use all plant shall be locked to prevent unauthorised access.

All traffic entering or working on site shall obey a maximum 10mph speed limit.

Fuelling of any plant shall be undertaken in a designated area and all above ground fuel storage tanks shall comply with the requirements of the Pollution Prevention Guidelines PPG2 (August 2011).

Specifically, any fuel storage tanks should:

- Be situated within an oil-tight secondary containment system such as an impermeable bund.
- The secondary containment must provide storage of at least 110% of the tank's maximum capacity.
- Be located within a secured area.
- All taps and valves should be fitted with a lock and be adequately secured when not in use.

Waste oil, hydraulic fluid etc. should not be tipped directly or otherwise discharged onto site. Such materials shall be stored separately, in a secure bunded area, for off-site disposal. Waste oil is a Hazardous Waste, and disposal shall be undertaken by a registered carrier in accordance with the Duty of Care (DoC) Regulations (2006) and the Waste (England and Wales) Regulations (2011).

Contractors shall provide a fuel spill kit, to be kept on site in an accessible place near to the designated refuelling area.

13.6 Dust

Appropriate measures shall be implemented at all times during the earthworks, to minimise any dust emissions.

During all operations, the risk of dust release will be continually assessed, and appropriate mitigation measures will be put in place. This will typically be a bowser with hose attachment to wet down and suppress dust, although other alternative techniques may be considered as necessary.



Any haul roads shall, where practical to do so, be constructed of crushed hardcore products. These haul roads shall be maintained for the duration of their use to minimise any build-up of mud, loose spoil etc. Mobile water bowsers and sprayers shall be made available to dampen unpaved haul roads and working areas. An adequate supply of clean water shall be maintained on site at all times to allow dust suppression activities to be carried out at short notice.

Traffic both entering and working on the site shall obey a maximum speed limit of 10 mph.

Regular inspections of the public highway adjacent to the site entrance shall be carried out by the contractor. If deemed necessary, the highway shall be swept regularly to remove any mud, slurry or dust deposited by vehicles entering or departing the site, and a wheel wash provided for exiting vehicles if required. If the contractor considers that significant amounts of any detritus have been deposited on the public highway then operations shall be temporarily suspended until appropriate cleaning operations have been undertaken.

Any wagons that are to be used for the haulage of potentially contaminated material from the site shall be sheeted to prevent the release of fugitive dust.

13.7 Odour

It is unknown whether the earthworks will give rise to odours. Where this gives rise to nuisance to neighbouring properties, odour control measures should be considered, and an appropriate method statement supplied by the contractor.

Any odorous materials shall be covered at the end of each working day and any stockpiles will be located away from any residential properties. This shall be continually assessed through the programmed works.

13.8 Noise

The requirements of BS 5228:2009 'Noise and vibration control on construction sites' shall be adhered to at all times.

All machinery shall be fitted with effective silencers and shall be serviced at regular intervals. No items of plant shall be operated with engine covers raised.

The location of any crushing plant shall take into consideration the location of neighbouring properties and other noise sensitive receptors and shall be located away from these areas and located adjacent to proposed stockpile locations, where possible and practicable.

13.9 Surface Waters

A surface watercourse is shown to extend along the southern section of the eastern boundary.



Any surface watercourses should be suitably protected against contamination or spillages.

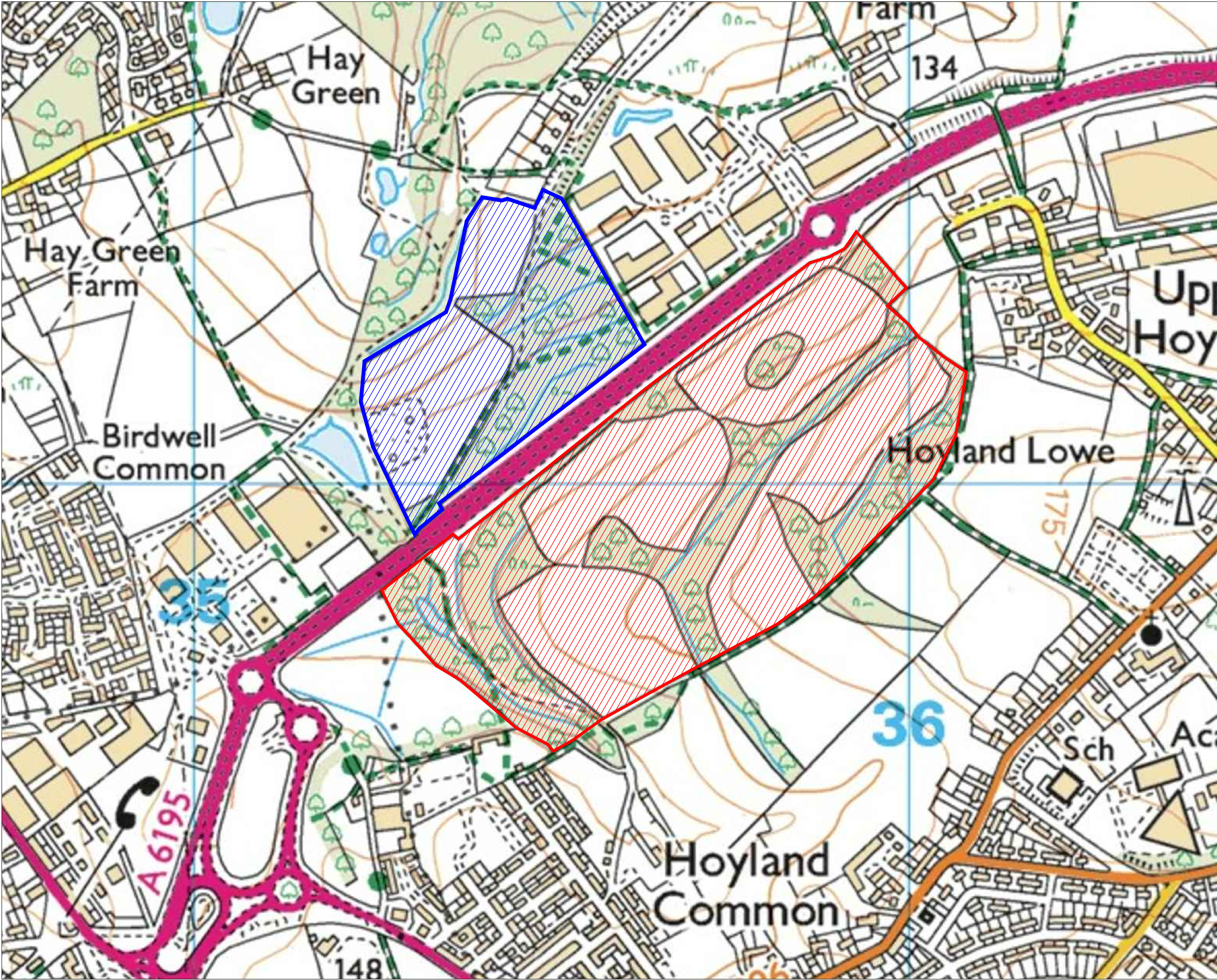
13.10 General

No fires shall be permitted on site, unless previously agreed with the local authority.

Details of all monitoring will be retained on site by the contractor and made available to the Local Authority Environmental Health Department on request.



Appendix A Figures & Plans



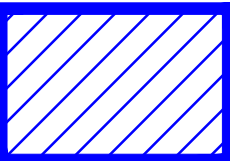
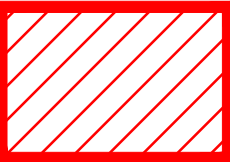
DO NOT SCALE

NOTES

- GENERAL NOTES**
1. ALL MATERIALS AND WORKMANSHIP IS TO COMPLY WITH JPG CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS.
 3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.

SITE INFORMATION

SITE ADDRESS
ADDRESS - DEARNE VALLEY PARKWAY
NEAREST POSTCODE - S74 9LH
OS SHEET/TILE - SE354010
OS CO-ORDINATES - E435470, N401042



SITE LOCATION PHASE 2

SITE LOCATION PHASE 3

REV	DESCRIPTION	DATE	BY
-----	-------------	------	----

Project
ROCKINGHAM PHASES 2 AND 3

Drawing Title
LOCATION PLAN

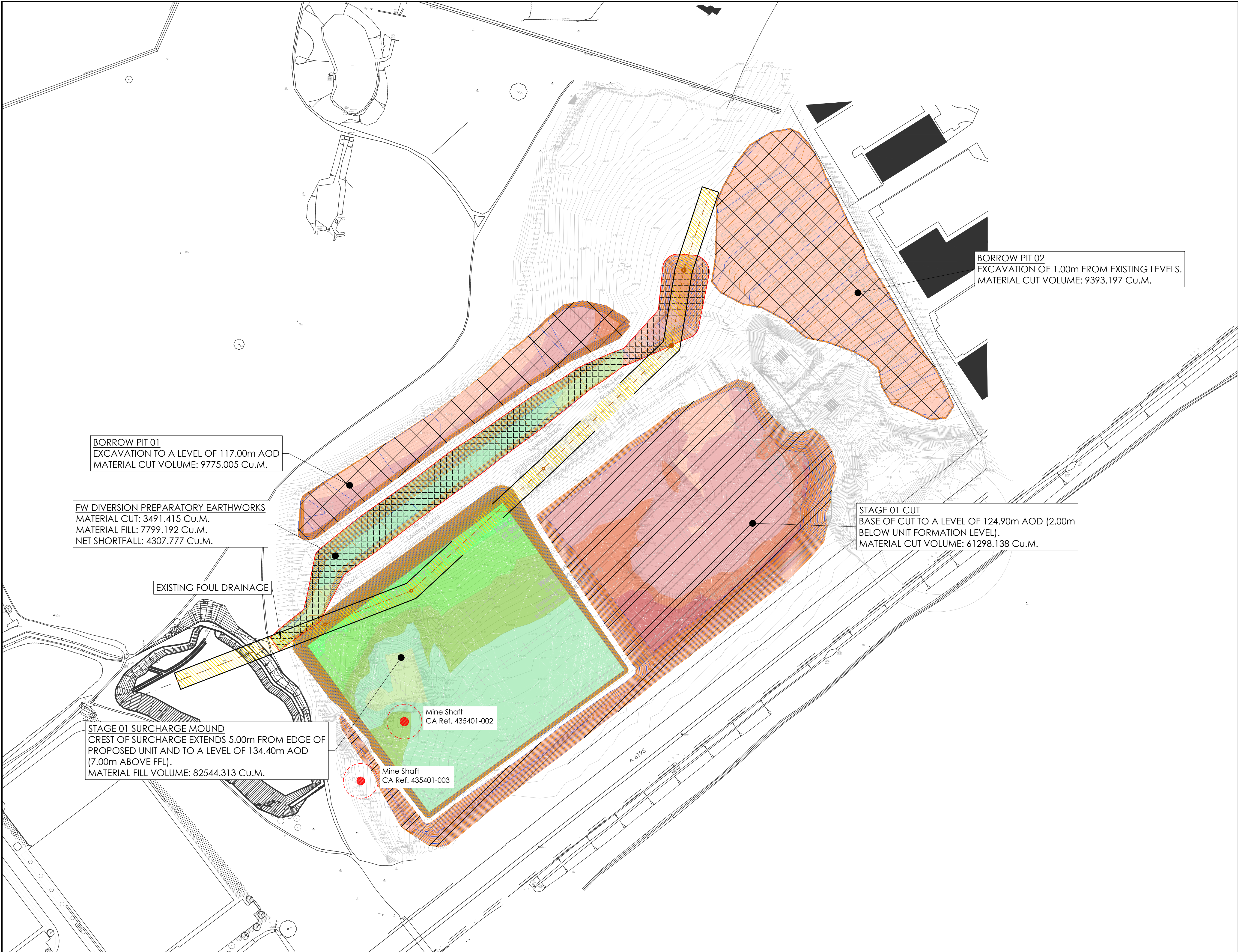
INFORMATION ISSUE

Architect
THE HARRIS PARTNERSHIP

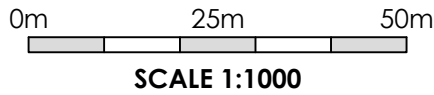


www.jpg.group
Leeds London Birmingham 0113 263 1155

JPG Project Ref	Scale at A1	Date	Checked	Drawn
4652-2	1:2500	DEC 2019	JDM	JDM



JPG-PROPOSED EARTHWORKS - STAGE 01
SCALE 1:1000



THIS DRAWING IS THE PROPERTY OF JPG (LEEDS) LIMITED
REGISTERED IN ENGLAND No 4274608. COPYRIGHT RESERVED

DO NOT SCALE (A1)

NOTES

GENERAL NOTES

- EXTENTS OF SURCHARGE REQUIREMENT BASED ON UMC ARCHITECT DRAWING NO. '21049-F0004-REV' AND SHOULD BE IN LINE WITH RSK GROUND TREATMENT SPECIFICATION '325389-R04(00) PHASE 3 GROUND TREATMENT SPECIFICATION'.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS & SPECIFICATIONS.

REV	DESCRIPTION	DATE	CHK	BY
P01	FIRST ISSUE	14.07.21	OLT	OLT

Project
ROCKINGHAM PHASE 3
HOYLAND

Drawing Title
EARTHWORKS STRATEGY
STAGE 01

INFORMATION ISSUE

JPG
www.jpg.group
Leeds - 0113 263 1155 | London - 0207 947 4148

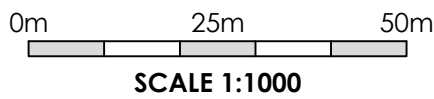
4652-2-JPG-P3-ZZ-DR-Z-1202

S2

P01



JPG-PROPOSED EARTHWORKS - STAGE 02
SCALE 1:1000



© THIS DRAWING IS THE PROPERTY OF JPG (LEEDS) LIMITED
REGISTERED IN ENGLAND No 4274608. COPYRIGHT RESERVED

DO NOT SCALE (A1)

NOTES

GENERAL NOTES

1.

EXTENTS OF SURCHARGE REQUIREMENT BASED ON UMC ARCHITECT DRAWING NO. '21049-F0004-REV.C' AND SHOULD BE IN LINE WITH RSK GROUND TREATMENT SPECIFICATION '325389-R04(00) PHASE 3 GROUND TREATMENT SPECIFICATION'.

2.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS & SPECIFICATIONS.

P01	FIRST ISSUE	14.07.21	OLT	OLT
REV	DESCRIPTION	DATE	CHK	BY

Project
ROCKINGHAM PHASE 3
HOYLAND

Drawing Title
EARTHWORKS STRATEGY
STAGE 02

INFORMATION ISSUE

JPG

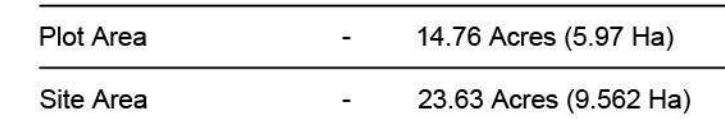
www.jpg.group

Leeds 0113 263 1155 | London 0207 947 4148

4652-2-JPG-P3-ZZ-DR-C-1203

S2

P01



Drawing Status:	Feasibility
Drawn / Checked:	JB /GMc
Date:	27/01/2021
Scale:	1:1000 A1
Drawing no:	Revision:
21049 F0004	C

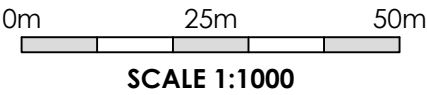
5 John Charles Way
LEEDS
LS12 6QA

Tel: 0113 263 1155
admin@jpg.group
www.jpg.group





JPG-PROPOSED EARTHWORKS - STAGE 01
SCALE 1:1000



© THIS DRAWING IS THE PROPERTY OF JPG (LEEDS) LIMITED
REGISTERED IN ENGLAND No 4274608. COPYRIGHT RESERVED

DO NOT SCALE (A1)

NOTES

GENERAL NOTES

- EXTENTS OF SURCHARGE REQUIREMENT BASED ON UMC ARCHITECT DRAWING NO. '21049-F0004-REV.C' AND SHOULD BE IN LINE WITH RSK GROUND TREATMENT SPECIFICATION '325389-R04(00) PHASE 3 GROUND TREATMENT SPECIFICATION'.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS & SPECIFICATIONS.

P03	BORROW PIT ADDED.	22.07.21	OLT	OLT
P02	SURCHARGE HEIGHT REDUCED TO 6.00m ABOVE FFL.	21.07.21	OLT	OLT
P01	FIRST ISSUE.	14.07.21	OLT	OLT
REV	DESCRIPTION	DATE	CHK	BY

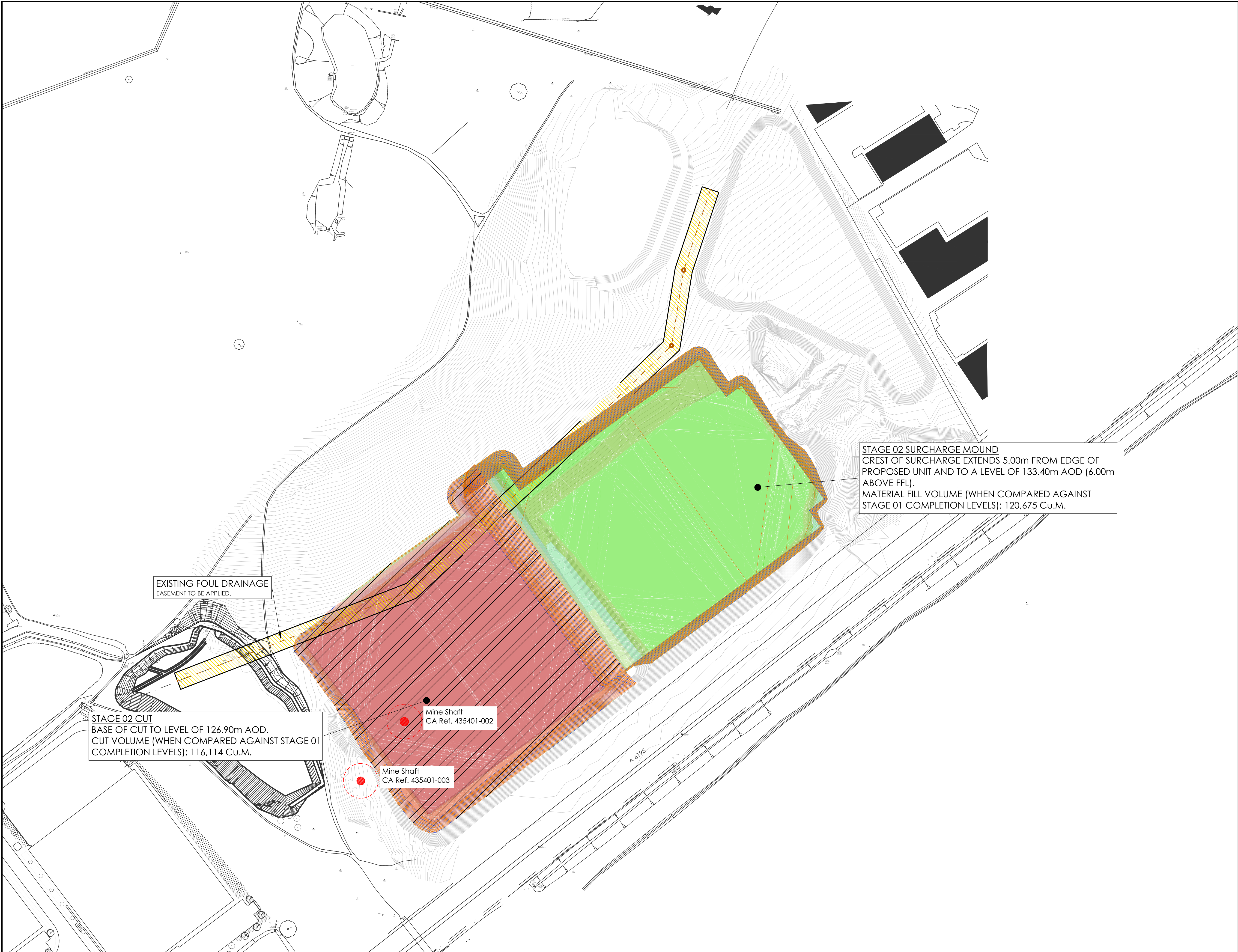
Project
ROCKINGHAM PHASE 3
HOYLAND

Drawing Title
EARTHWORKS STRATEGY
STAGE 01

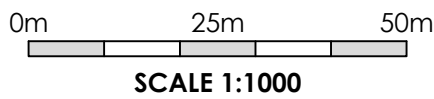
INFORMATION ISSUE

JPG
www.jpg.group
Leeds · 0113 263 1155 | London · 0207 947 4148

4652-2-JPG-P3-ZZ-DR-Z-1202 S2 P03



JPG-PROPOSED EARTHWORKS - STAGE 02
SCALE 1:1000



© THIS DRAWING IS THE PROPERTY OF JPG (LEEDS) LIMITED
REGISTERED IN ENGLAND No 4274608. COPYRIGHT RESERVED

DO NOT SCALE (A1)

NOTES

GENERAL NOTES

1.

EXTENTS OF SURCHARGE REQUIREMENT BASED ON UMC ARCHITECT DRAWING NO. '21049-F0004-REV.C' AND SHOULD BE IN LINE WITH RSK GROUND TREATMENT SPECIFICATION '325389-R04(00) PHASE 3 GROUND TREATMENT SPECIFICATION'.

2.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS & SPECIFICATIONS.

STAGE 02 SURCHARGE MOUND
CREST OF SURCHARGE EXTENDS 5.00m FROM EDGE OF PROPOSED UNIT AND TO A LEVEL OF 133.40m AOD (6.00m ABOVE FFL).
MATERIAL FILL VOLUME (WHEN COMPARED AGAINST STAGE 01 COMPLETION LEVELS): 120,675 Cu.M.

EXISTING FOUL DRAINAGE
EASEMENT TO BE APPLIED.

STAGE 02 CUT
BASE OF CUT TO LEVEL OF 126.90m AOD.
CUT VOLUME (WHEN COMPARED AGAINST STAGE 01 COMPLETION LEVELS): 116,114 Cu.M.

Mine Shaft
CA Ref. 435401-002

Mine Shaft
CA Ref. 435401-003

P03	AMENDMENT TO CUT LEVEL.	22.07.21	OLT	OLT
P02	SURCHARGE HEIGHT REDUCED TO 6.00m ABOVE FFL.	21.07.21	OLT	OLT
P01	FIRST ISSUE.	14.07.21	OLT	OLT
REV	DESCRIPTION	DATE	CHK	BY

Project
ROCKINGHAM PHASE 3
HOYLAND

Drawing Title
EARTHWORKS STRATEGY
STAGE 02

INFORMATION ISSUE

JPG

www.jpg.group

Leeds - 0113 263 1155 | London - 0207 947 4148

4652-2-JPG-P3-ZZ-DR-C-1203

S2

P03

APPENDIX B

GEOTECHNICAL MODELLING

29th July 2021

Our reference: 372079-L02 (00)

EOS Inc Limited
Advantage House
Poplar Way
Rotherham
South Yorkshire
S60 5TR

For the attention of Mr Robert Cole

Dear Sir,

RE: PHASE 3 UNIT 1, ROCKINGHAM - GROUND SETTLEMENT ASSESSMENT

1. INTRODUCTION

RSK Environment Limited (RSK) was commissioned by EOS Inc Limited to carry out a geo-environmental assessment work of the land at the Rockingham Phase 3 development site in South Yorkshire. This site forms part of the larger former Rockingham opencast coal mining site and is anticipated to be redeveloped with a number of commercial/industrial units. An area to the northwest, Rockingham 1 has already been developed and ground treatment and earthworks are ongoing in the Phase 2 area to the south.

The Phase 3 area is proposed for development with a single large building (Unit 1) as indicated in UMC Architects Site Layout Option 3, drawing reference 21049 F0004 Revision C.

The comments given in this report and the opinions expressed are based on the ground conditions indicated by previous investigation carried out by RSK. However, there may be conditions pertaining to the site that have not been disclosed by these investigations and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the thickness and quality of made ground including groundwater levels may at variance to that reported.

The settlement calculations undertaken in this work assumes that the un-engineered made ground placed within the former open cast mine has ceased settling and so does not account for further self-weight settlement of the backfill material.

This report is subject to the RSK service constraints given in **Appendix A**.

2. PROPOSED SITE USE

It is understood that the site is being considered for redevelopment for commercial purposes (see UMC Architects Site Layout Option 3, drawing reference 21049 F0004 Revision C).

The proposed development is to include cut and fill exercise to provide a level development platform for Unit 1. The following loadings for the commercial unit have been considered in the settlement modelling:

- i. Floor slab loading of 50kPa acting at the ground level, 127.4mAOD;
- ii. Column pad foundations (1m x 1m) loading of 100kPa acting at 1.0mbgl; and
- iii. Possible 1.0m thickness of engineered fill.

A cross section from the latest layout is provided in **Appendix B**.

3. GROUND CONDITIONS AND GROUND MODEL

The ground conditions have been obtained from previous RSK reports including report reference 372079-L01 (00), dated July 2020. This letter report should read conjunction with this previous report.

The previous investigations included borehole drilling with in situ standard penetration testing (SPT). The results of the SPTs and the results of the previous large load test on the Phase 3 area have been used to prepare a ground stiffness model. The ground conditions vary along the length of the proposed Unit 1 building with opencast backfill varying from a thickness of approximately 25m beneath the western end to around 50m beneath the eastern end. This variation in ground conditions is included within the ground model. Information on ground stiffnesses used in the model are included in Table 1.

Table 1 PDISP Model input stiffness - Phase 3 Unit 1

Strata	BH Extensometer Magnet Level (Top of Strata)	Depth	PDISP back calculated Lower Bound Stiffness	Possion Ratio
	(mAOD)	(mBGL)	(kN/m ²)	
MG2	127.4	0	6250	0.2
MG3	125.7	5.3	7500	0.2
MG4	123.7	6.7	14500	0.2
MG5	121.2	8.6	18500	0.2
MG6	119.6	10.6	25000	0.2
MG7	116.6	13.1	33500	0.2
MG8	113.6	14.7	40000	0.2
MG9	109.8	17.7	47750	0.2
BR	93.4 to 77.4	34.0 to 50.0	75000 – 100,000	0.2

4. RESULTS AND DISCUSSIONS

The settlement modelling carried out by RSK has used specialist software prepared by Ove Arup – OASYS PDISP 20.0.0.2 software package. This software allows estimates of settlement from applied loads and can also be used for back calculations.

Detailed PDISP modelling results are presented in **Appendix C**. A summary of the settlement modelling is presented in Table 2.

Table 2 Calculated PDISP settlements using estimated building loads (Pads = 100kPa, Slab = 50kPa) and possible 1.0m engineered fill (20kPa) and three surcharge scenarios

Phase	Unit	Pad & Slab Loading (kPa)	Max settlement of units without treatment $S_{U_{max}}$ (mm)	Max. Settlement S_{max} (mm)
3	Unit 1 with 1.0m Engineered Fill	100 & 50	105	
3	Unit 1 area -with 1.0m Engineered Fill & 5.0m Surcharge		-	142
3	Unit 1 area -with 1.0m Engineered Fill & 6.0m Surcharge		-	165
3	Unit 1 area - with 1.0m Engineered Fill & 7.0m Surcharge		-	225

Table 2 summarises the estimated maximum and net settlement for a number of surcharge treatment heights based on the back-calculated average ground stiffness profile (i.e. from the recorded ground conditions, in situ SPT tests and the large scale Load Test, given in report ref 372079-L01 (00)).

The measured settlement during the large scale Load Test and initial results of the ongoing settlement monitoring work being carried out for the Phase 2 area, demonstrate that almost all of the recorded long term settlement was measured during or shortly after construction/ placement of the surcharge. It is conservatively assumed that the surcharge, in place for 3 months, will induce 75% of the predicted long-term settlement.

Following the above, it is assumed that of 75% of S_{max} is likely to be induced in a relatively short period. Therefore, the estimated net settlement for the corresponding surcharges (in place for a short period) would be $0.75 \times S_{max}$. Table 3 summarises the estimated maximum and net settlement for a number of surcharge treatment heights.

Table 3 Surcharge heights and net settlements achieved

Surcharge height (m)	Surcharge (kPa)	Max. Settlement S_{max} (mm)	Net Settlement within short period $0.75 \times S_{max}$ (mm)
5.0	100	142	107
6.0	120	165	124
7.0	140	225	169

Table 2 summarised the maximum expected settlement under the proposed Unit 1 ($S_{U_{max}}$) when there was no surcharging prior to constructing the building. At the time of this assessment, it has been assumed that the requirement is to limit the maximum residual (post construction) settlement under the Unit to 25mm. Therefore, in order to achieve a final settlement of less than 25mm after surcharge treatment, we would require a surcharge height that would satisfy the following criteria:

$$S_{U_{max}} - 0.7S_{max} \leq 25 \text{ mm}$$

Table 4 summarises the required surcharge height for different $S_{U_{max}}$ based on the above criteria.

Table 4 Surcharge heights and net settlements achieved

Surcharge height (m)	Surcharge (kPa)	Max. Settlement S_{max} (mm)	Net Settlement $0.75 \times S_{max}$ (mm)	Max settlement of Unit 1 without treatment $S_{U_{max}}$ (mm)	$S_{U_{max}} - 0.5S_{max}$
5.0	100	142	107	105	-2 (<25)
6.0	120	165	124	105	-19 (<25)
7.0	140	225	169	105	-31 (<25)

Based upon the above assumptions, it is indicated that 5.0m surcharge may be adequate to achieve the settlement required. However, it is expected that a small amount of rebound settlement will occur, and consequently it is recommended that a 6.0m high surcharge load be adopted on site.

From the previous Load Test settlement monitoring data, it was demonstrated that the majority of the settlement would take place within approximately 3 months of construction. A practical minimum timescale, for placement and monitoring of the surcharge load would likely be of the order of 3 months.

5. CONCLUSIONS AND RECOMMENDATIONS

The settlement calculations presented make the assumption that the self-weight settlement of the made ground is already complete due to its placement over a relatively long period of time (approximately 25 years).

It should be noted that where new engineered fill is to be placed the material has been considered as a separate competent stratum and the analyses does not account for any self-weight settlement within the engineered fill. The settlement calculations presented in this report are based on assumed building loads and 1.0m thickness of engineered fill load only and make no allowance for any ongoing long-term settlement or creep.

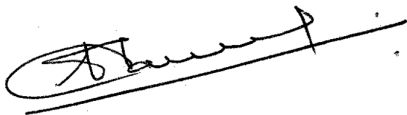
The modelling presented above indicates that surcharge treatment will be required for the proposed Unit 1 on Rockingham, Phase 3. Information is also provided on the height of surcharge required and the likely duration of the treatment. Given the available volumes of material and required timescales it is recommended that an accelerated programme of ground treatment works is adopted using a 6.0m high surcharge in place for at least 3 months (but timescales subject to confirmation by on site monitoring).

As previously stated, the made ground present on site is opencast backfill and understood to be un-engineered and hence variation in ground conditions highly likely. Therefore, it will be necessary that each of the surcharging operations should be fitted with reliable settlement monitoring instrumentation (at existing level and top of the engineered fill) and be monitored on a regular basis to make sure that the expected settlements are induced within the expected timescales. This monitoring will be critical in determining when sufficient settlement has been induced and the surcharge can be removed.

We trust our services and report are satisfactory and meet with your expectations, if however you have any comments or require additional assistance then please do not hesitate to contact the undersigned.

Yours faithfully

For **RSK Environmental Ltd**

A handwritten signature in black ink, appearing to read 'T Navaneethan', written over a horizontal line.

Dr T Navaneethan

Technical Director

Encl.

Appendix A	Service Constraints
Appendix B	Site Cross Sections
Appendix C	PDISP Results

APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Harworth Estate Limited (the "Client") in accordance with the terms of a contract between RSK and the Client. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS/ PFOS) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
 - a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
 - b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

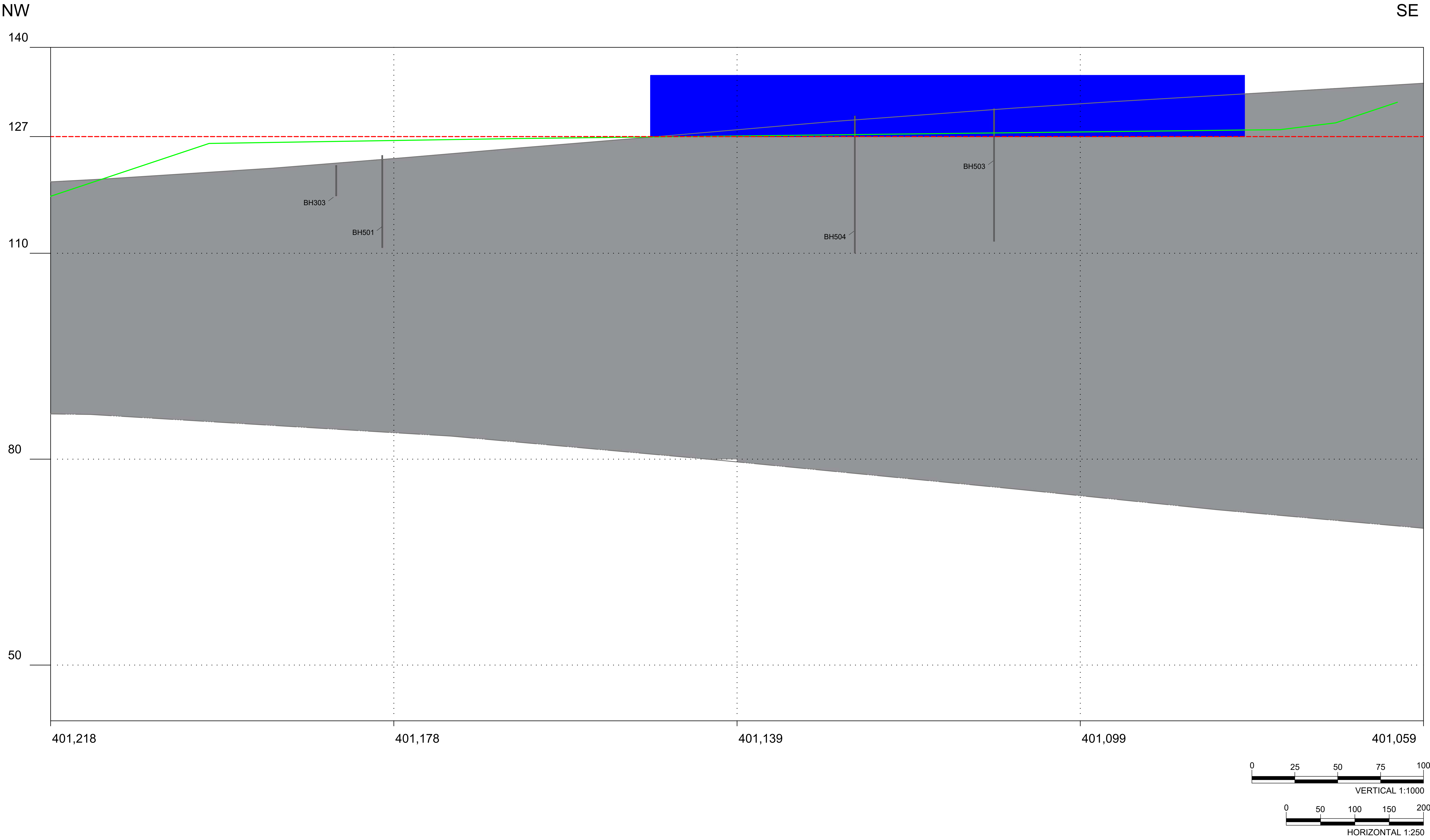
RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B

SITE CROSS SECTION

SECTION D-D'



LEGEND:

- GROUND MATERIAL - HR
- GROUND MATERIAL - MG
- BUILDING
- BUILDING PLATFORM
- AOD
- BH BORE HOLE

01	16.07.21	FIRST ISSUE	FP	SR	SR
REV	DATE	DESCRIPTION	BY	CHD.	APR.
Dimensions		Projection	Scale	Orig Size	
m			-	A0	



Spring Lodge
172 Chester road
Helsby
Cheshire
WA6 0AR

Tel: +44 1928 726006
Fax: +44 1928 725633
Web: www.rsk.co.uk

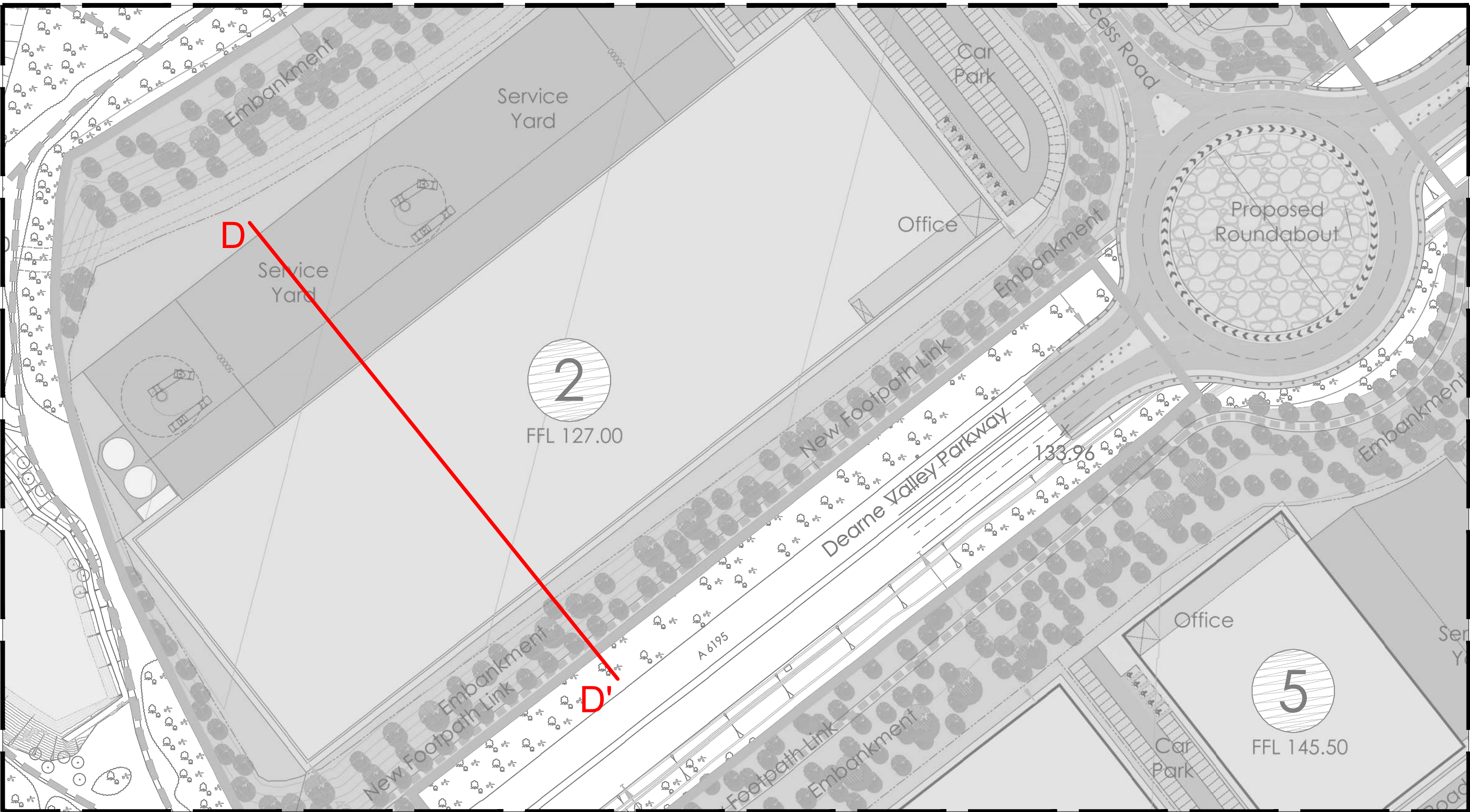
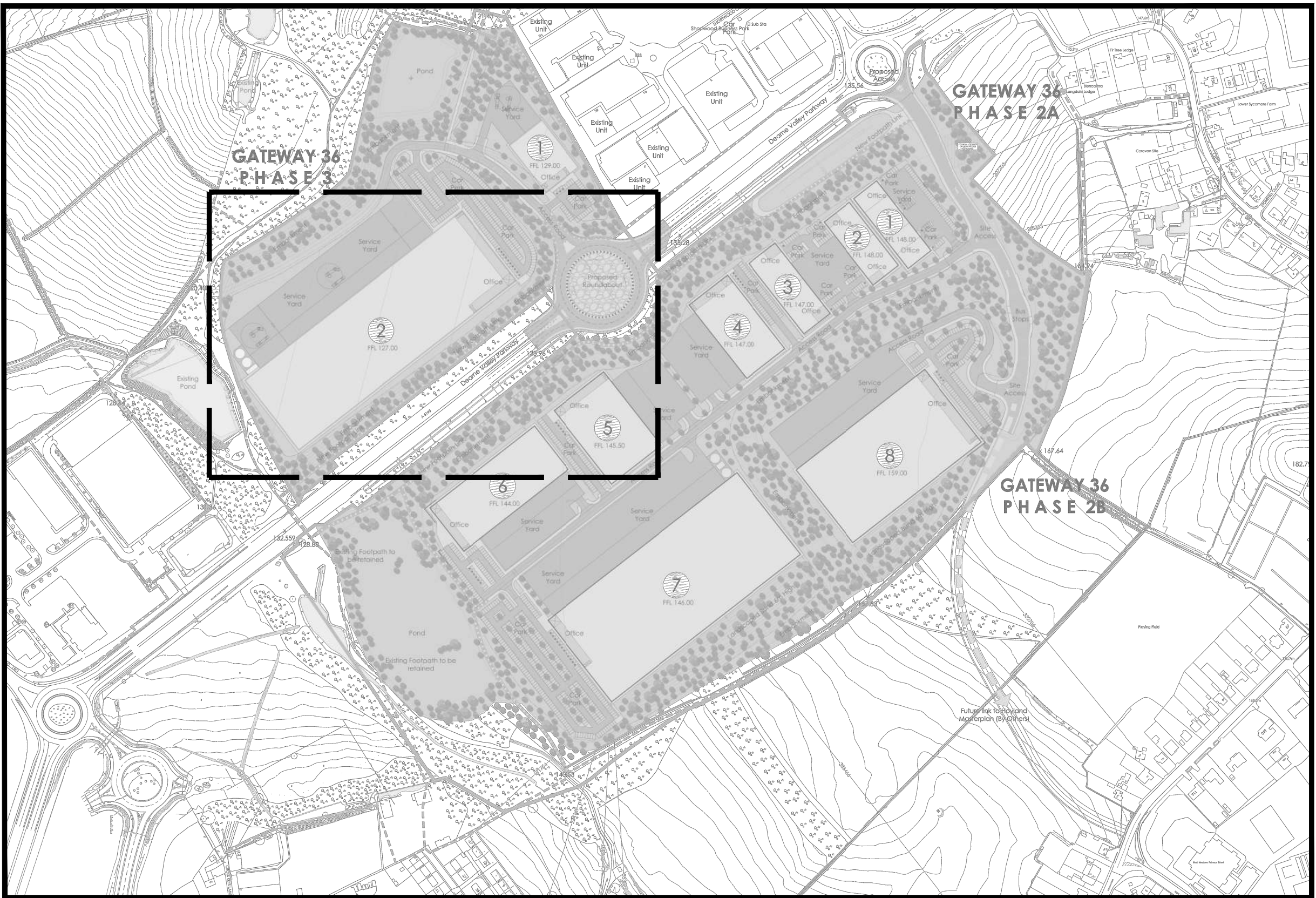
CLIENT
HARWORTH ESTATES INVESTMENTS LTD

PROJECT
ROCKINGHAM PHASE 3

TITLE
GEOLOGICAL SECTIONS

JOB NO: 322638
DRAWING FILE: CROSS SECTION

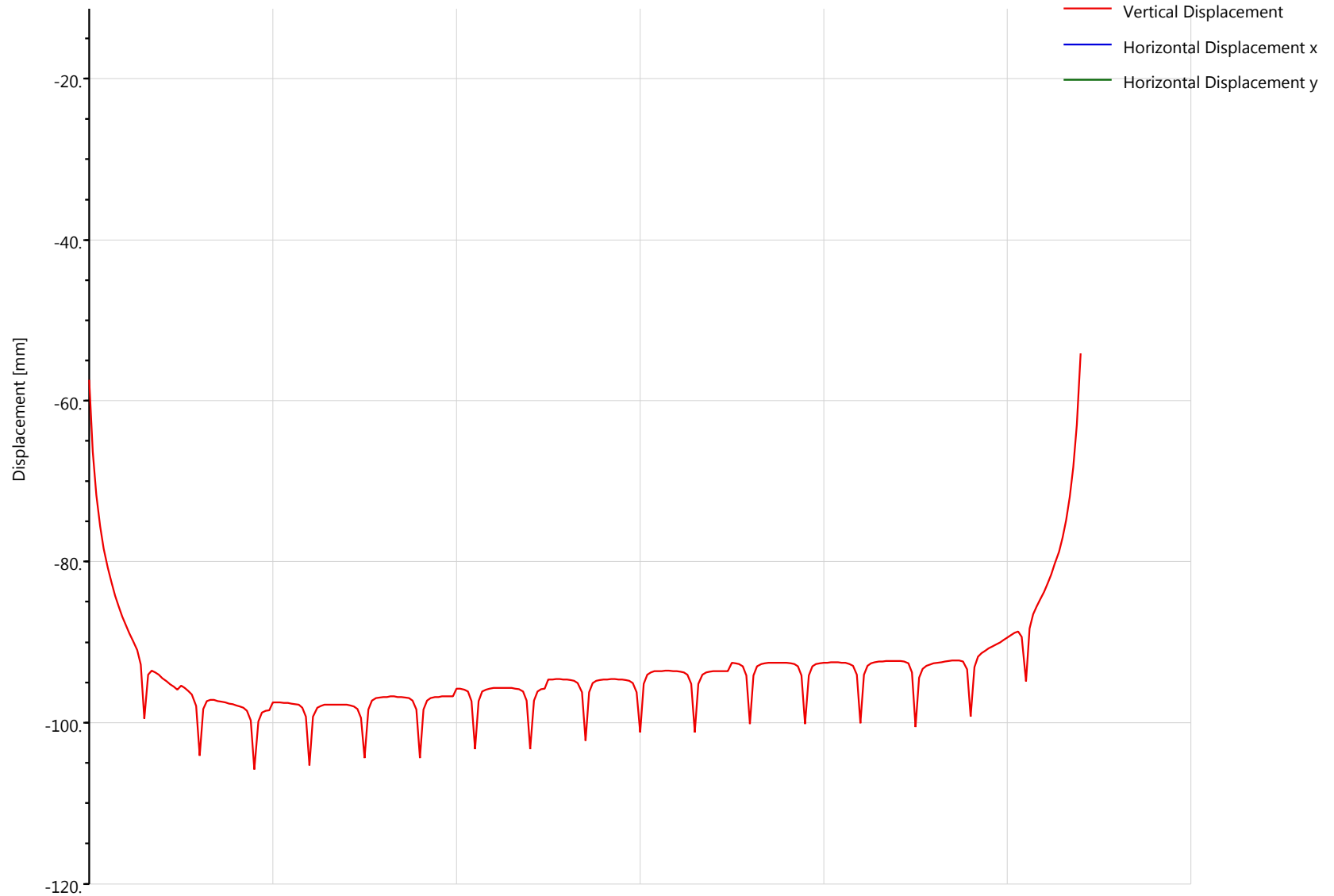
BY:	DATE:	CONTRACT NO.	REV:
FP	16.07.21		01



APPENDIX C
PDISP RESULTS - UNIT 1, PHASE 3

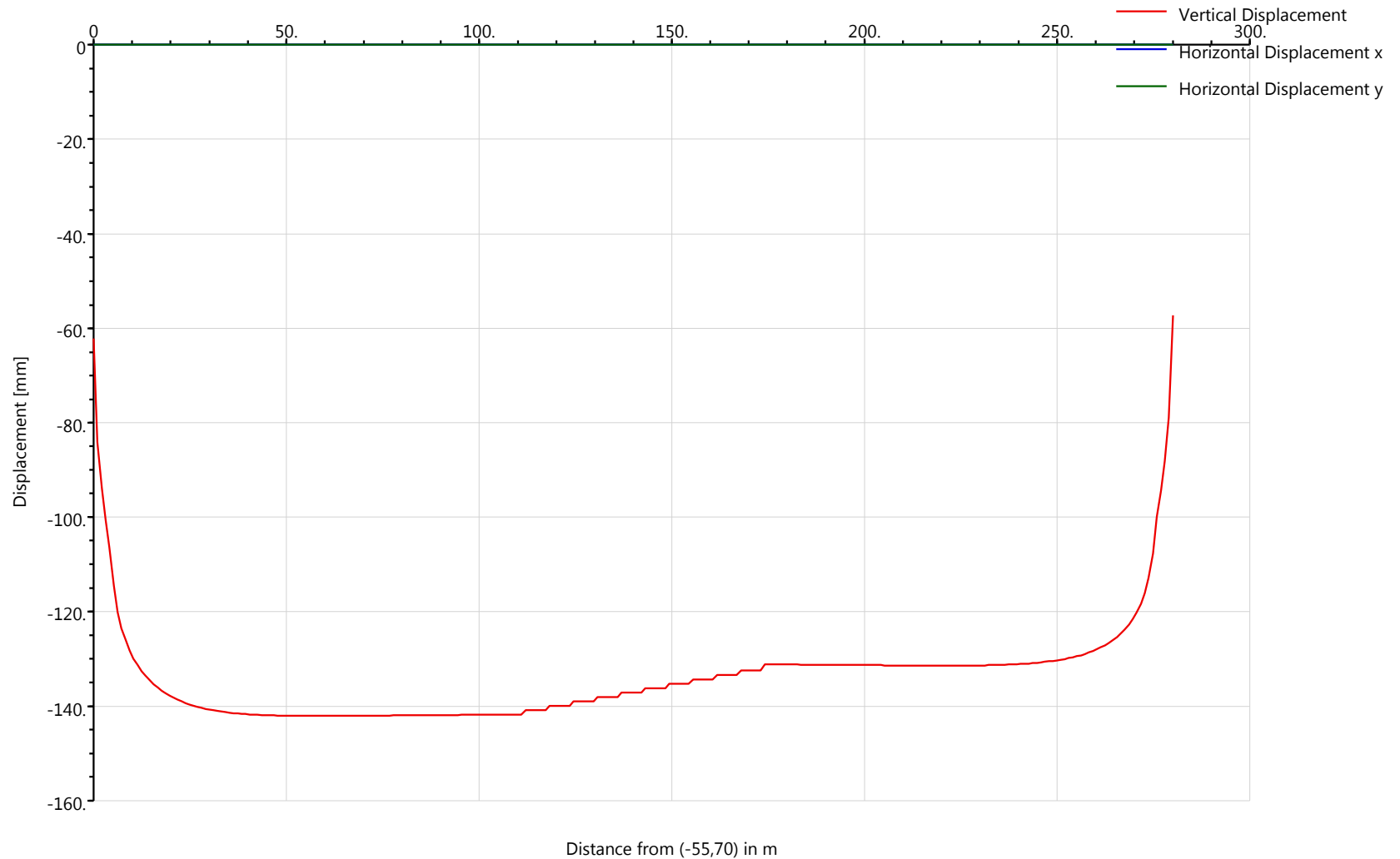
Job No.	Sheet No.	Rev.
372079		
Drg. Ref.		
Made by GS	Date	Checked

Displacement for L1



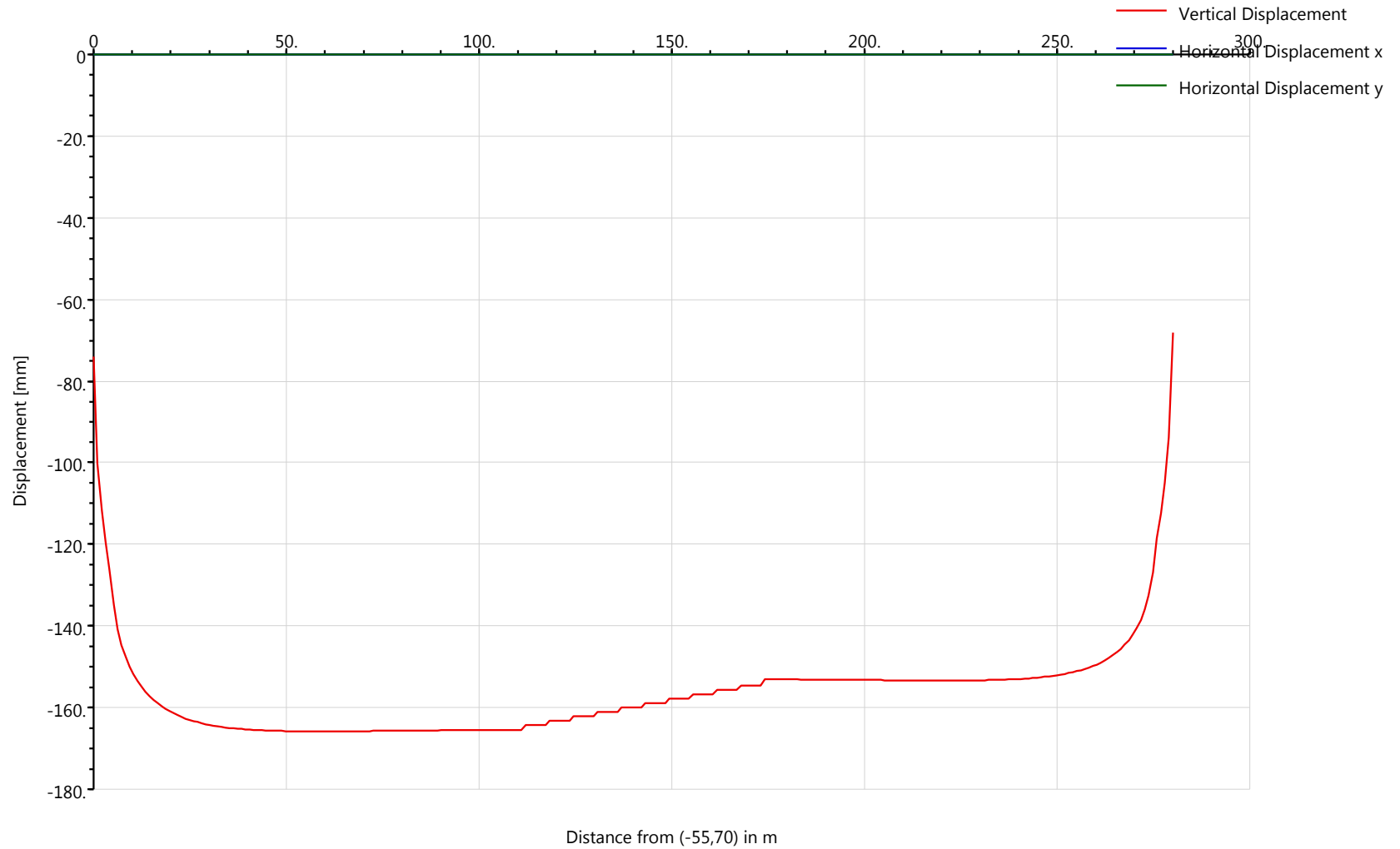
Job No.	Sheet No.	Rev.
372079		
Drg. Ref.		
Made by GS	Date	Checked

Displacement for L1



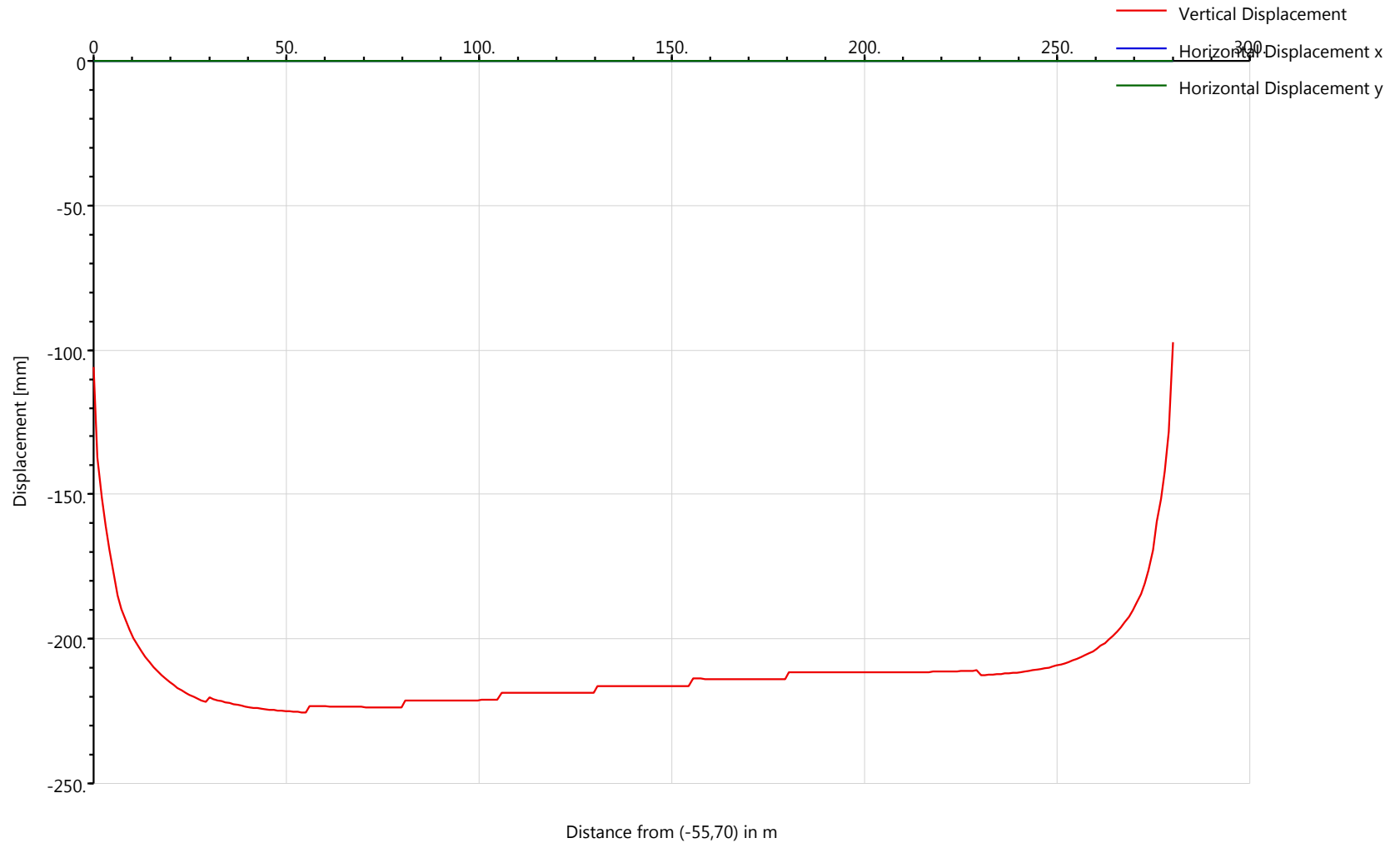
Job No.	Sheet No.	Rev.
372079		
Drg. Ref.		
Made by GS	Date	Checked

Displacement for L1

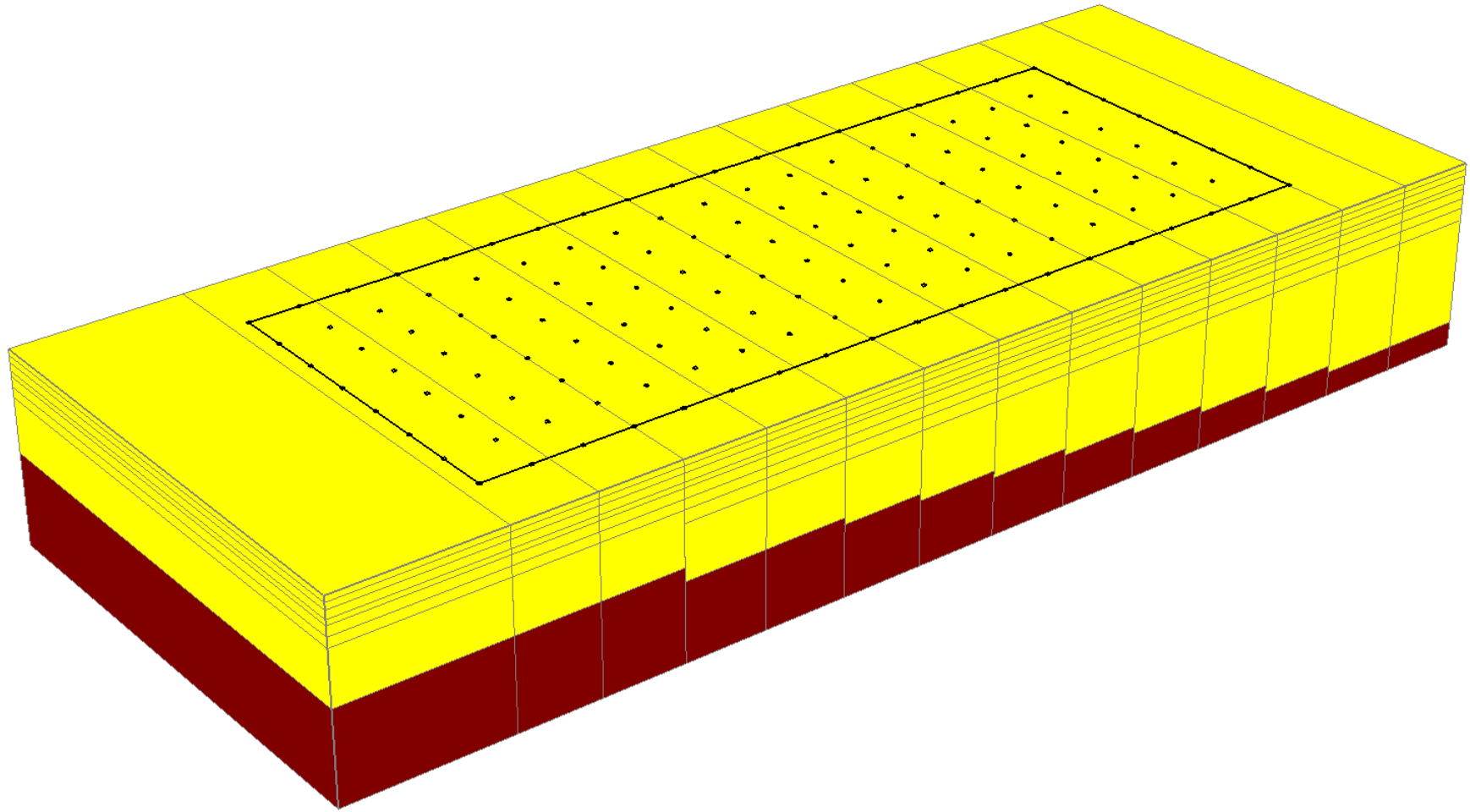


Job No.	Sheet No.	Rev.
372079		
Drg. Ref.		
Made by GS	Date	Checked

Displacement for L1



Job No.	Sheet No.	Rev.
372079		
Drg. Ref.		
Made by GS	Date	Checked



APPENDIX C

SCHEDULE OF TESTING

Appendix C Testing schedule

The testing requirements are detailed below. The Principal Contractor shall note that additional testing may be required at the discretion of the Supervisor.

Test	Frequency	Comment
Classification* of general fill materials	1 per 10,000m ³	Scheduling to include (but not limited to): - natural moisture content determination - loss on ignition - particle size distribution - plastic limit - compaction tests (dry density/moisture content relationship) using the 4.5kg rammer method - any other testing necessary to permit a classification in accordance with SHW
Soil chemical testing	1 per 10,000m ³ .	Broad suite of chemical determinands including: - pH - loss on ignition - metals - speciated TPH (CWG) - speciated PAH - BRE sulphate suite (pyritic ground)
Note: * Testing of materials that are to be used as fill materials are to allow classification of materials in accordance with Series 600 Earthworks' of the Specification for Highway Works published by the Stationary Office in February 2016 as Volume 1 of the Manual of Contract Documents for Highway Works including all subsequent published amendments		

APPENDIX B

PHOTOGRAPHIC LOG

Photograph No 1: Taken on 12 November 2021 – Mound 1 Surcharge in background and Mound 2 plateau in foreground.



Photograph No 2: Taken on 17 November 2021 – Mound 2 PGMs being protected before being buried by surcharge material.



Photograph No 3: Photograph taken on 24 November 2021 – Beginning of surcharge material movement from Mound 1 to Mound 2 position.



Photograph No 4: Photograph taken on 9 December 2021 – Progress of surcharge material movement from Mound 1 to Mound 2 Position.



Photograph No 5: Photograph taken on 20 January 2022 – Progress of Mound 2 Surcharge.

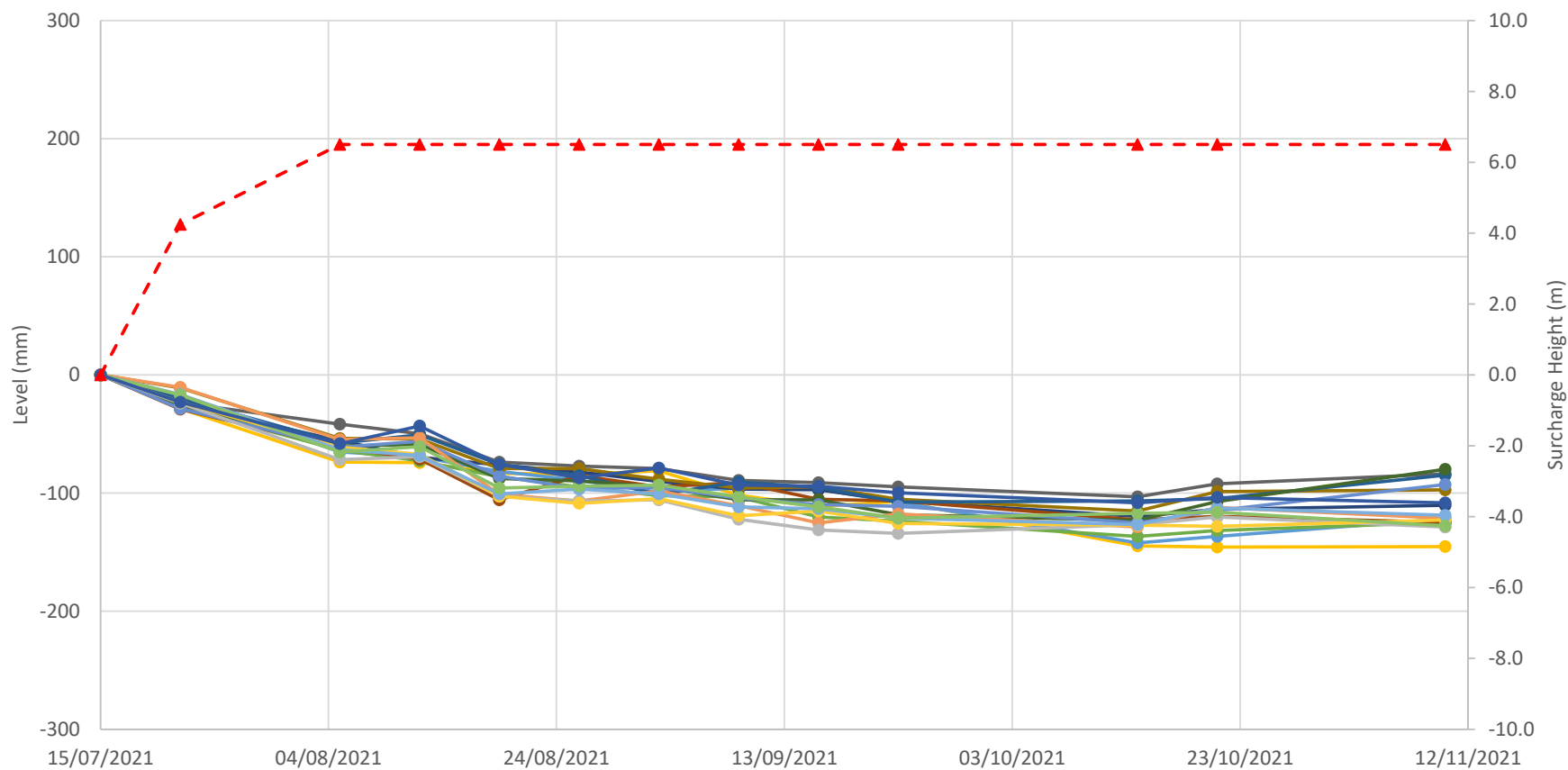


APPENDIX C

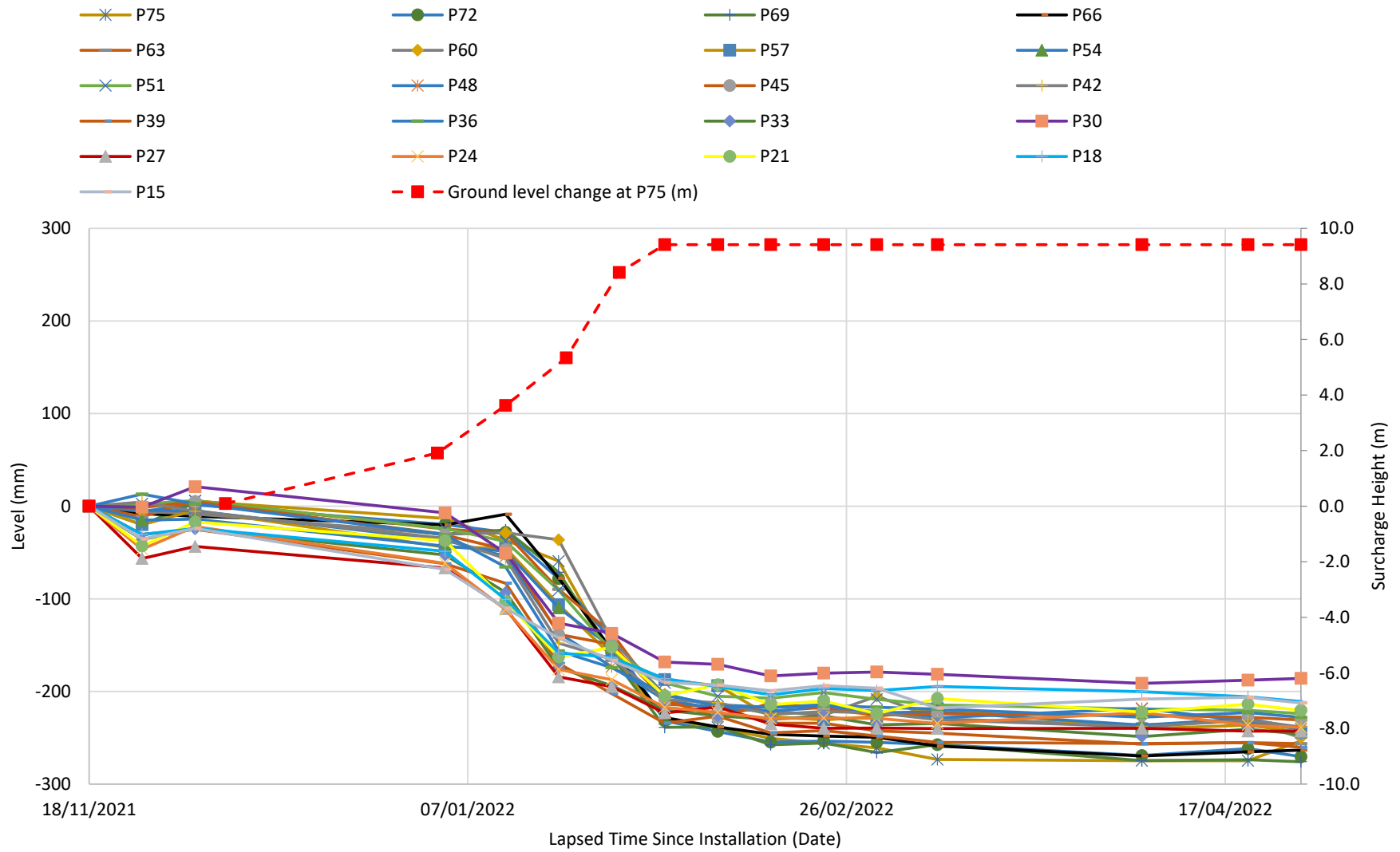
HPG MONITORING RESULTS

HPG3-1 (Phase 3 Mound 1)

- P60
- P48
- P36
- P24
- P57
- P45
- P33
- P21
- P54
- P42
- P30
- P18
- P51
- P39
- P27
- P15
- Ground level change at P60 (m)



HPG3-3 (Phase 3 Mound 2)



APPENDIX D

PGM MONITORING RESULTS

Table A: PGM data for Phase 3 mound 1 PGMs

PGM I.D	Dates PGMs were measured			
	05/07/2021		06/12/2021	
	Original Elevation (m)	Difference in Elevation from Initial Reading (mm)	Elevation Measured (m)	Difference in Elevation from Initial Reading (mm)
PGM1	130.7	NA	131.3	Damaged
PGM2	129.3	NA	129.8	Damaged
PGM3	128.0	NA	129.0	Damaged
PGM4	127.4	NA	128.7	Damaged
PGM5	129.8	NA	130.6	Damaged
PGM6	131.1	NA	133.3	Damaged
PGM7	131.9	NA	132.7	Damaged
PGM8	129.6	NA	131.7	Damaged
PGM9	127.1	NA	129.5	Damaged
PGM10	130.7	NA	133.2	Damaged
PGM11	129.5	NA	128.0	Damaged
PGM12	126.6	NA	126.5	Damaged
Average	-	-	-	-
Minimum Settlement	-	-	-	-
Maximum Settlement	-	-	-	-

Table B: PGM data for Phase 3 mound 2 PGMs

PGM I.D	PGM Elevation upon installation (mAOD)	Elevation Measured once re-exposed (mAOD)	Difference in Elevation from Initial Reading (mm)
PGM01	126.2	126.0	-218.2
PGM02	126.8	Damaged	NA
PGM03	127.3	Damaged	NA
PGM04	127.1	Damaged	NA
PGM05	125.5	125.3	-248.9
PGM06	126.8	126.6	-208.9
PGM07	126.8	126.7	-149.8
PGM08	127.0	126.9	-72.9
PGM09	126.7	126.5	-200.4
PGM10	125.2	124.9	-329.8
PGM11	126.9	126.7	-159.8
PGM12	126.9	126.7	-134.4
PGM13	126.7	126.6	-91.6
PGM14	125.4	125.1	-316.4
PGM15	126.8	126.7	-166.1
PGM16	126.9	126.8	-55.4
PGM17	126.9	126.8	-101.3
Average	-	-	-175.3
Minimum Settlement	-	-	-55.4
Maximum Settlement	-	-	-329.4

APPENDIX E

GEOTECHNICAL LABORATORY CERTIFICATES

Laboratory Report	DNR-92929	Contract Sample No	DN2474/206	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	17/01/2021	Clients Reference	DN2474/206		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	13/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Overcast/Moist		
		Sample Type	Bulk		
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Received	13/12/2021
		Sample Location	Phase 3-Mound 2	Date Tests Completed	12/01/2022
				TEST REPORT	

Determination of moisture content

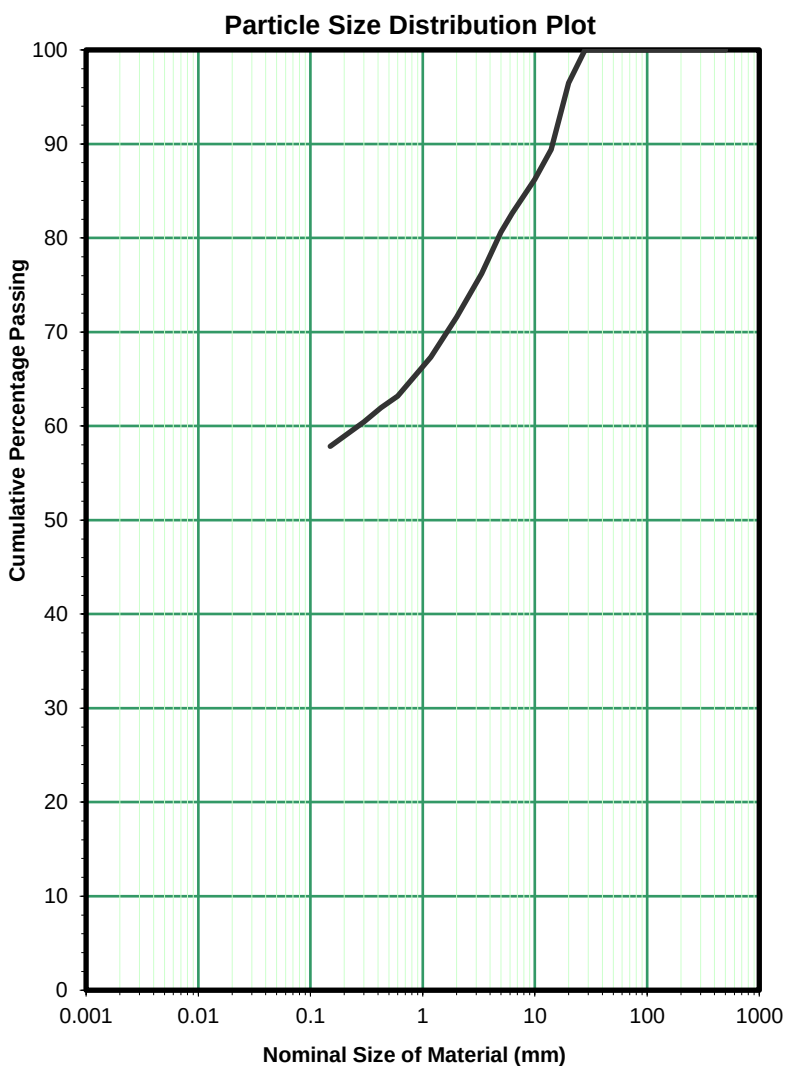
Prepared and tested in Accordance with BS 1377: Part 2: 1990 Clause 3.2 - Oven drying

Moisture Content

15 %

Particle size distribution (wet sieving method) - Tested in accordance with BS 1377: Part 2: 1990 Clause 9.2

Sample prepared in Accordance with BS 1377: Part 1: 2016 clause 8.3.4(a)

[illegible]

Specification
MCHW SHW Vol 1 Series 600 Table 6/2 Class 2C
100
15 - 80
15 - 80

Laboratory Report	DNR-92929	Contract Sample No	DN2474/206	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU 	
Report Date	17/01/2021	Clients Reference	DN2474/206		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay	Tel: (01302) 352652 Web: www.constructiontesting.co.uk		
	Date Sampled	13/12/2021			Email: enquiries@constructiontesting.co.uk
	Sampling Plan	Client Specification	Date Received		
	Source	Ex-Site	Date Tests Completed		12/01/2022
	Supplier	Ex-Site	TEST REPORT		
	Sampled By	CTS			
	Sampling Environment	Overcast/Moist			
	Sample Type	Bulk			
Location in sample	N/A				
Sample Location	Phase 3-Mound 2				

Determination of Plastic Limit, Liquid Limit and Plasticity Index - Tested in Accordance with BS 1377: Part2: 1990 The sample was prepared from a natural soil specimen and in accordance with BS1377: Part 1: 2016: Clause 8.3.4(b)		% Passing Sieve taken from Particle Size Distribution test.
Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4 - One Point)	38 %	
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	20 %	
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	18 %	
Material Passing 425 µm test sieve	62 %	
Material Retained on 425 µm test sieve	38 %	
Determination of Moisture Condition Value (MCV) at Natural Moisture Content Prepared and Tested on a Single Sample in Accordance with BS 1377: Part 4: 1990: Clause 5.4		
MCV - interpreted from the steepest straight line of the plot.	7.4	
Moisture Content in Accordance with BS 1377: Part 2: 1990: Clause 3.2	16 %	
Percentage of material retained on 20mm test sieve	4 %	
Determination of Particle Density Tested in Accordance with BS 1377: Part 2: 1990. Clause 8.2 (Gas Jar Method)		Sample prepared in Accordance with BS 1377-1:2016, clause 8.4
Average Particle Density	2.63 Mg/m³	

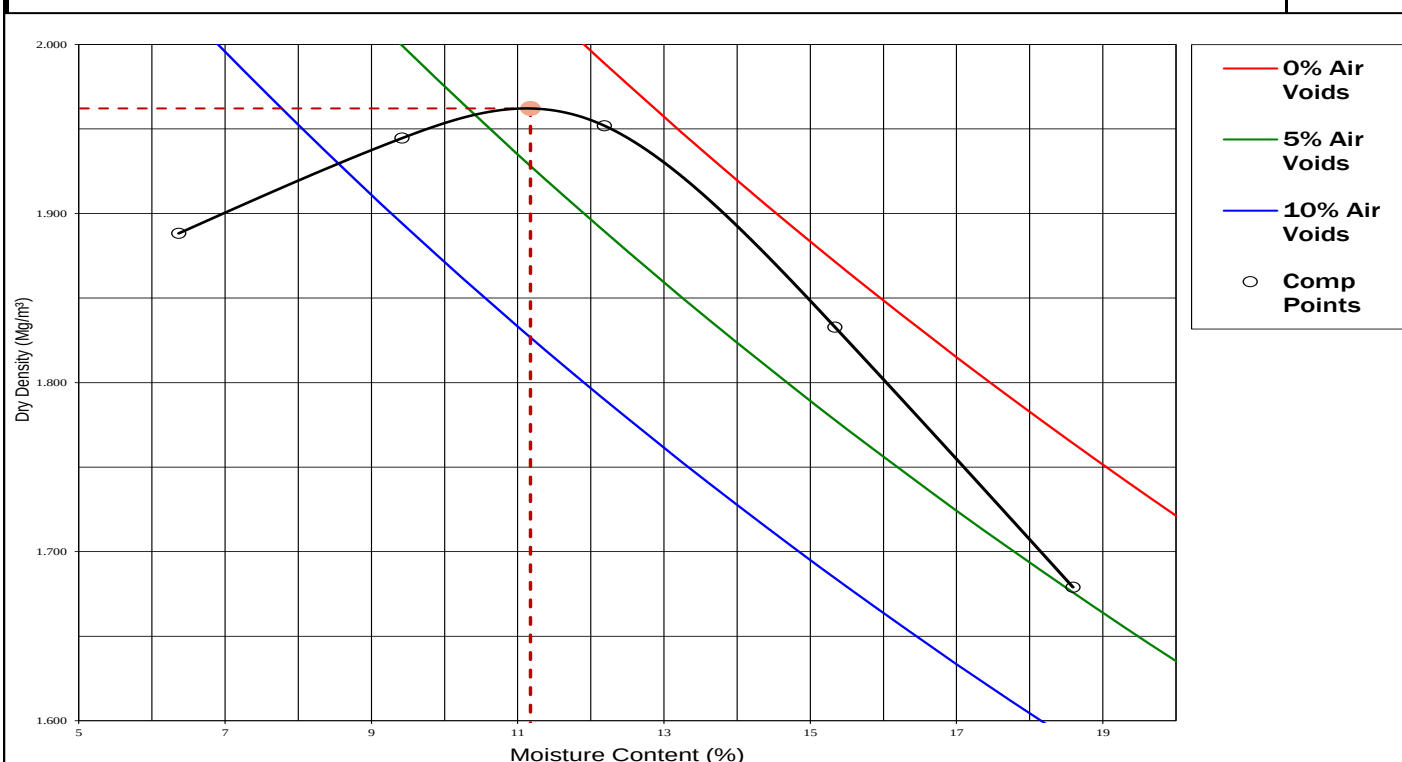
Laboratory Report	DNR-92929	Contract Sample No	DN2474/206	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk	
Report Date	17/01/2021	Clients Reference	DN2474/206		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay			
	Date Sampled	13/12/2021			
	Sampling Plan	Client Specification			
	Source	Ex-Site			
	Supplier	Ex-Site			
	Sampled By	CTS			
	Sampling Environment	Overcast/Moist			
	Sample Type	Bulk			
Location in sample	N/A	Date Received	13/12/2021		
Sample Location	Phase 3-Mound 2	Date Tests Completed	12/01/2022		
				TEST REPORT	

Determination of Dry Density / Moisture Content Relationship

Tested In Accordance with BS 1377: Part 4: 1990 Clause 3.6.4.2 (4.5kg Rammer, CBR mould)

The test was carried out using separate samples, each prepared in Accordance with BS1377: Part 1: 2016 Clause 8.3.4(b)

Sample particle size adjustment: +20mm particles removed



Optimum Moisture Content (%)	11 %
Maximum Dry Density	1.96 Mg/m³
Material Retained on 37.5mm test sieve	0 %
Material Retained on 20.0mm test sieve	4 %
Particle Density (Measured) Determined by BS1377:Part 2:1990 Clause 8.2	2.63 Mg/m³

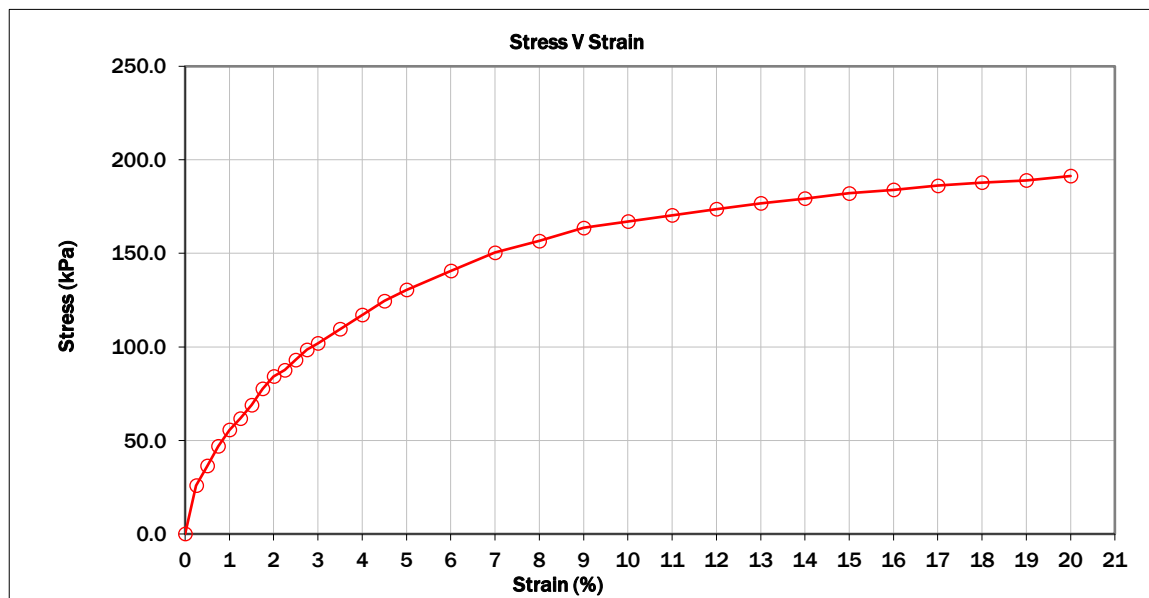
Laboratory Report	DNR-92929	Contract Sample No	DN2474/206	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk	
Report Date	17/01/2021	Clients Reference	DN2474/206		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description		Gravelly Clay		
	Date Sampled		13/12/2021		
	Sampling Plan		Client Specification		
	Source		Ex-Site		
	Supplier		Ex-Site		
	Sampled By		CTS		
	Sampling Environment		Overcast/Moist		
	Sample Type		Bulk	Date Received	13/12/2021
	Location in sample		N/A	Date Tests Completed	12/01/2022
	Sample Location		Phase 3-Mound 2	TEST REPORT	

Determination of Undrained Shear Strength in Triaxial Compression Without Pore Pressure Measurement
Tested in Accordance with BS 1377: Part 7: 1990 Clause 8

Tests were conducted on a disturbed sample, recompacted using a 2.5kg rammer at as received moisture content.

Initial specimen height	200	mm
Initial specimen diameter	99.07	mm
Initial bulk density	2.11	Mg/m ³
Initial moisture content	16	%
Initial dry density	1.81	Mg/m ³
Rate of strain applied	1.00	%/min
Membrane thickness (latex)	0.33	mm
Membrane correction	1.3	kPa
Cell pressure	200	kPa
Corrected maximum deviator stress at failure	190	kPa
Strain at failure	20.0	%
Time at Failure	20 Minutes, 0 Seconds	
Mode of failure	Plastic	

Laboratory Temperature
18-22 °C



Undrained Shear Strength, c_u
95 kPa

Tested at rate of strain of 1%/minute as required by Specification for Highway Works Series 600, clause 633

Time to failure was outside the BS1377, 5 to 15 minute requirement for this test when carried out at the SHW required rate of 1%/minute.

Template Version: 1.6

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 Results relate only to the sample(s) as received.

Authorised Signatory

This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the customer.

**** END OF REPORT ****

Construction Testing Solutions is a trading division of Construction Testing Solutions Ltd - Company No. 05998333

Laboratory Report	ARC-92929-92931	Contract Sample No	DN2474/206-208
Report Date	07 January 2022	Clients Reference	DN2474/206-208
Howard Civil Engineering Unit 11, Acom Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham		Material Description	Gravelly Clay
		Source	Ex-Site
		Supplier	Ex-Site
		Date Sampled	13/12/2021
		Date Received	13/12/2021
		Date Completed	06/01/2022
		Sample Location	Phase 3 Mound 2



Construction Testing Solutions Ltd

Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk

BS1377 pH, BS 1377 LOI, 2 Stage WAC, ENV1, Asbestos & Bre Sulte

Please find enclosed test certificate (L21/04785/CTS-21-22883) supplied by our approved Sub-contract Laboratory, Nicholls Colton

Authorised Signatory



M O'Hara – Laboratory Manager



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

Construction Testing Solutions
Bootham Lane Industrial Estate
Dunscoft
Doncaster
DN7 4JU

Analytical Test Report: L21/04785/CTS - 21-22883

Your Project Reference: **21185 Upper Hoyland Road Rockingham**

Your Order Number: 21185 Samples Received / Instructed: 15/12/2021 / 15/12/2021

Report Issue Number: 1 Sample Tested: 15/12 to 06/01/2022

Samples Analysed: 3 soil samples Report issued: 06/01/2022

Signed

James Gane
Data Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and these results are not covered by our accreditation

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

WAC Testing

Samples were leached in accordance with BS EN 12457-3: 2002.

Eluate Results are reported as the cumulative release at L/S 10 from eluates of L/S 2 and L/S 8. These results have been calculated in accordance with BS EN 12457-3:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 10/12/2020

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

L:\DATA\REPORTS\CTS\777\ (L21-04785-CTS - 21-22883.XLSX)\TPH Codes

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Analytical Test Results - Soil

NC Reference			207814	207815	207816
Client Sample ID			DN2474/206	DN2474/207	DN2474/208
Client Sample Location			Phase 3 Mound 2	Phase 3 Mound 2	Phase 3 Mound 2
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			-	-	-
Depth - Bottom (m)			-	-	-
Date of Sampling			13/12/2021	13/12/2021	13/12/2021
Time of Sampling			-	-	-
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10
Boron (w/s)	(mg/kg)	u	< 2.5	< 2.5	< 2.5
Cadmium	(mg/kg)	MCERTS	0.6	0.5	0.5
Chromium (Total)	(mg/kg)	UKAS	15	16	15
Copper	(mg/kg)	MCERTS	38	34	34
Lead	(mg/kg)	MCERTS	23	23	23
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	32	32	32
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	90	75	76
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Cyanide (Free)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate	(%)	u	0.30	0.25	0.19
pH	pH Units	MCERTS	7.9	7.3	7.7
Sulphate (Water soluble)	(mg/l)	u	500	670	730
Sulphide	(mg/kg)	u	< 15	84	42
Thiocyanate	(mg/kg)	u	< 5.0	< 5.0	< 5.0
Acenaphthene	(mg/kg)	MCERTS	0.02	0.03	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	0.03	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	0.03	0.07	0.06
Benzo (a) pyrene	(mg/kg)	MCERTS	0.02	0.07	0.05
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.04	0.12	0.08
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.03	0.08	0.05
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	0.04	0.03
Chrysene	(mg/kg)	MCERTS	0.04	0.10	0.08
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.06	0.11	0.12
Fluorene	(mg/kg)	MCERTS	0.03	0.04	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	0.06	0.04
Naphthalene	(mg/kg)	MCERTS	0.18	0.30	0.16
Phenanthrene	(mg/kg)	MCERTS	0.14	0.25	0.18
Pyrene	(mg/kg)	MCERTS	0.06	0.12	0.12
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.77	1.5	1.1
Gasoline Range Organics (>C ₈ to C ₁₀) [EH_1D_Total]	(mg/kg)	UKAS	8.1	13	11
Diesel Range Organics (>C ₁₀ to C ₂₁) [EH_1D_Total]	(mg/kg)	MCERTS	27	37	33
Mineral Range Organics (>C ₂₁ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	49	68	60
Total TPH (>C ₈ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	84	120	100
SOM (via TOC)	(%)	UKAS	3.8	5.1	4.8

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Analytical Test Results - Soil

NC Reference		207814	207815	207816
Client Sample ID		DN2474/206	DN2474/207	DN2474/208
Client Sample Location		Phase 3 Mound 2	Phase 3 Mound 2	Phase 3 Mound 2
Client Sample Type		-	-	-
Client Sample Number		-	-	-
Depth - Top (m)		-	-	-
Depth - Bottom (m)		-	-	-
Date of Sampling		13/12/2021	13/12/2021	13/12/2021
Time of Sampling		-	-	-
Sample Matrix		Clay	Clay	Clay
Determinant	Units	Accreditation		
Asbestos	-	UKAS	No asbestos detected	No asbestos detected

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Analytical Test Results - Chemical Analysis

NC Reference			207814	207815	207816
Client Sample ID			DN2474/206	DN2474/207	DN2474/208
Client Sample Location			Phase 3 Mound 2	Phase 3 Mound 2	Phase 3 Mound 2
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			-	-	-
Depth - Bottom (m)			-	-	-
Date of Sampling			13/12/2021	13/12/2021	13/12/2021
Time of Sampling			-	-	-
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Water soluble sulphate	(mg/l)	u	500	670	730
Acid Soluble Sulphate	(%)	u	0.30	0.25	0.19
Total Sulphur	(%)	UKAS	0.15	0.19	0.22
pH Value	pH Units	MCERTS	7.9	7.3	7.7
pH Value (BS 1377)	(pH Units)	UKAS	8.0	8.0	8.6
Loss on Ignition (BS 1377)	(%)	UKAS	6.2	8.8	8.7

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference	207814
--------------	--------

Client Sample ID	DN2474/206
Client Sample Location	Phase 3 Mound 2
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	-
Depth - Bottom (m)	-
Date of Sampling	13/12/2021
Time of Sampling	-
Sample Description	Grey slightly sandy slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	13
Stone content (%)	34

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
--	-------------------	----------------------	---	--------------------------

Solid Analysis

Total Organic Carbon	%	MCERTS	2.2	3.0	5.0	6.0
Loss on Ignition	%	UKAS	6.2	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) (EH_1D_Total)	mg/kg	u	75	500	-	-
PAH	mg/kg	u	0.8	100	-	-
pH	units	MCERTS	7.9	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	13	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	550	1000	20000	50000
Total Dissolved Solids	mg/kg	u	700	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	21.0	500	800	1000

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference	207815
--------------	--------

Client Sample ID	DN2474/207
Client Sample Location	Phase 3 Mound 2
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	-
Depth - Bottom (m)	-
Date of Sampling	13/12/2021
Time of Sampling	-
Sample Description	Grey slightly sandy slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	12
Stone content (%)	0

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
--	-------------------	----------------------	---	--------------------------

Solid Analysis

Total Organic Carbon	%	MCERTS	2.9	3.0	5.0	6.0
Loss on Ignition	%	UKAS	8.8	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) (EH_1D_Total)	mg/kg	u	105	500	-	-
PAH	mg/kg	u	1.5	100	-	-
pH	units	MCERTS	7.3	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	9	800	15000	25000
Fluoride	mg/kg	u	2	10	150	500
Sulphate (as SO ₄)	mg/kg	u	800	1000	20000	50000
Total Dissolved Solids	mg/kg	u	820	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference	207816
--------------	--------

Client Sample ID	DN2474/208
Client Sample Location	Phase 3 Mound 2
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	-
Depth - Bottom (m)	-
Date of Sampling	13/12/2021
Time of Sampling	-
Sample Description	Grey slightly sandy slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	11
Stone content (%)	23

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
--	-------------------	----------------------	---	--------------------------

Solid Analysis

Total Organic Carbon	%	MCERTS	2.8	3.0	5.0	6.0
Loss on Ignition	%	UKAS	8.7	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) (EH_1D_Total)	mg/kg	u	94	500	-	-
PAH	mg/kg	u	1.1	100	-	-
pH	units	MCERTS	7.7	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	12	800	15000	25000
Fluoride	mg/kg	u	2	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1000	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1000	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	23.0	500	800	1000

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
207814	DN2474/206	Phase 3 Mound 2	-	-	Grey slightly sandy slightly gravelly silty clay	13	34	90
207815	DN2474/207	Phase 3 Mound 2	-	-	Grey slightly sandy slightly gravelly silty clay	12	0.0	100
207816	DN2474/208	Phase 3 Mound 2	-	-	Grey slightly sandy slightly gravelly silty clay	11	23	97

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
207814	DN2474/206	Phase 3 Mound 2	-	-	VOC/BTEX - Sample taken from container with headspace.
207815	DN2474/207	Phase 3 Mound 2	-	-	VOC/BTEX - Sample taken from container with headspace.
207816	DN2474/208	Phase 3 Mound 2	-	-	VOC/BTEX - Sample taken from container with headspace.

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
TOCL	MS - CL - DOC	As received	BSEN:12457 Leaching	Determination of Dissolved Organic Carbon in leachates
ANIONSL	MS - CL - Anions by Aquakem	As received	-	Determination of Anions (inc Sulphate, chloride etc.) in leachate samples by Aquakem
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
BTEXS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of BTEX in soils via Headspace-GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
WSBORONS	MS-CL- WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP -Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETL	MS - CL - ICP -Metals in Waters	As received	BSEN:12457 Leaching	Determination of metals in leachates via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
SULPHIDES	MS - CL - Sulphide in Soils	As received	Passing 10mm test sieve	Determination of sulphide in soil via titration
TDSL	MS - CL - TDS (Leachate)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates
SKALARPHL	MS - CL - Phenols by Skalar	As received	BSEN:12457 Leaching	Determination of total phenols in leachates using Skalar segmented flow analyser
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ENLEACHP2	BS EN 12457-3	As Received	-	Leaching in accordance with BSEN 12457-3
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 Lol	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)
1377PH	BS1377 pH	Oven dried	Passing 2mm test sieve	pH testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 12

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
207814	DN2474/206	Phase 3 Mound 2	-	-		A

L21/04785/CTS - 21-22883

Project Reference - 21185 Upper Hoyland Road Rockingham

HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Laboratory Report	DNR-92930	Contract Sample No	DN2474/207	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161
Report Date	17/01/2021	Clients Reference	DN2474/207	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF	Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay	
		Date Sampled	13/12/2021	
		Sampling Plan	Client Specification	
		Source	Ex-Site	
		Supplier	Ex-Site	
		Sampled By	CTS	
		Sampling Environment	Overcast/Moist	
		Sample Type	Bulk	
Location in sample	N/A	Date Received	13/12/2021	
Sample Location	Phase 3-Mound 2	Date Tests Completed	12/01/2022	
TEST REPORT				

Determination of moisture content

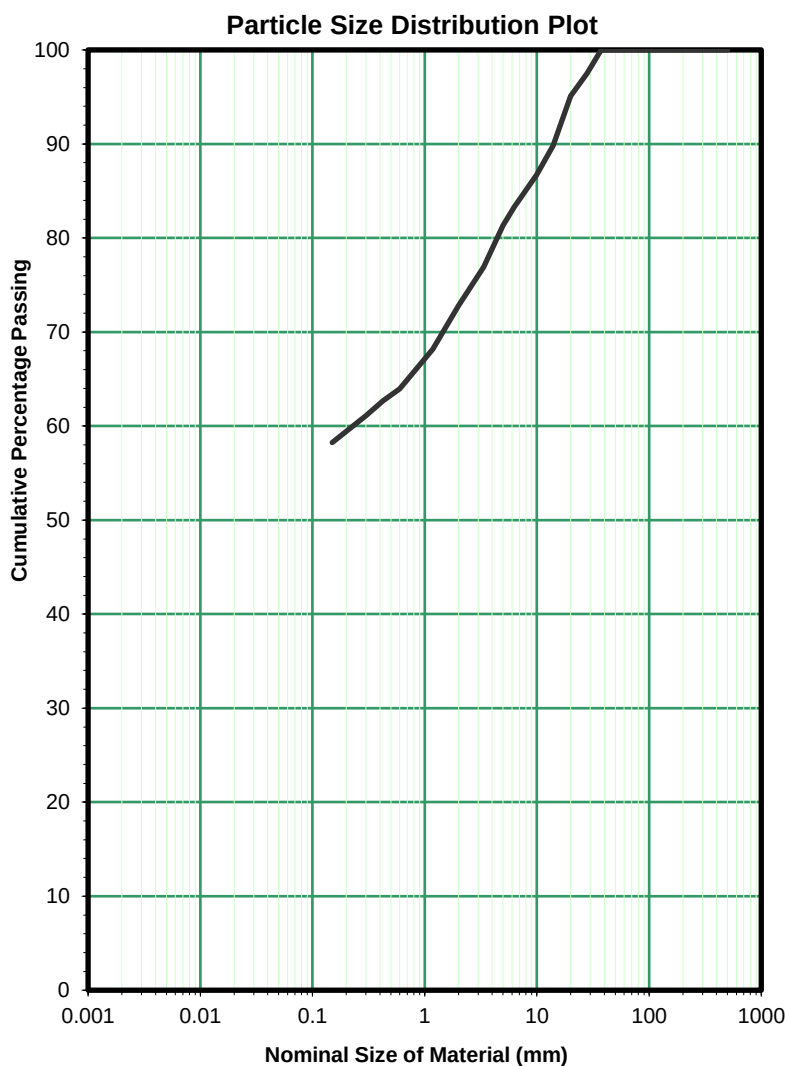
Prepared and tested in Accordance with BS 1377: Part 2: 1990 Clause 3.2 - Oven drying

Moisture Content

15 %

Particle size distribution (wet sieving method) - Tested in accordance with BS 1377: Part 2: 1990 Clause 9.2

Sample prepared in Accordance with BS 1377: Part 1: 2016 clause 8.3.4(a)

[illegible]

Specification
MCHW SHW Vol 1 Series 600 Table 6/2 Class 2C
100
15 - 80
15 - 80

Laboratory Report	DNR-92930	Contract Sample No	DN2474/207	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU 
Report Date	17/01/2021	Clients Reference	DN2474/207	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay		
	Date Sampled	13/12/2021		
	Sampling Plan	Client Specification		
	Source	Ex-Site		
	Supplier	Ex-Site		
	Sampled By	CTS		
	Sampling Environment	Overcast/Moist		
	Sample Type	Bulk		
Location in sample	N/A	Date Received	13/12/2021	
Sample Location	Phase 3-Mound 2	Date Tests Completed	12/01/2022	
TEST REPORT				
Determination of Plastic Limit, Liquid Limit and Plasticity Index - Tested in Accordance with BS 1377: Part2: 1990 The sample was prepared from a natural soil specimen and in accordance with BS1377: Part 1: 2016: Clause 8.3.4(b)				% Passing Sieve taken from Particle Size Distribution test.
Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4 - One Point)			38 %	
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)			21 %	
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)			17 %	
Material Passing 425 µm test sieve			63 %	
Material Retained on 425 µm test sieve			37 %	
Determination of Moisture Condition Value (MCV) at Natural Moisture Content Prepared and Tested on a Single Sample in Accordance with BS 1377: Part 4: 1990: Clause 5.4				
MCV - interpreted from the steepest straight line of the plot.			8.7	
Moisture Content in Accordance with BS 1377: Part 2: 1990: Clause 3.2			15 %	
Percentage of material retained on 20mm test sieve			5 %	
Determination of Particle Density Tested in Accordance with BS 1377: Part 2: 1990. Clause 8.2 (Gas Jar Method)				Sample prepared in Accordance with BS 1377-1:2016, clause 8.4
Average Particle Density			2.58 Mg/m³	

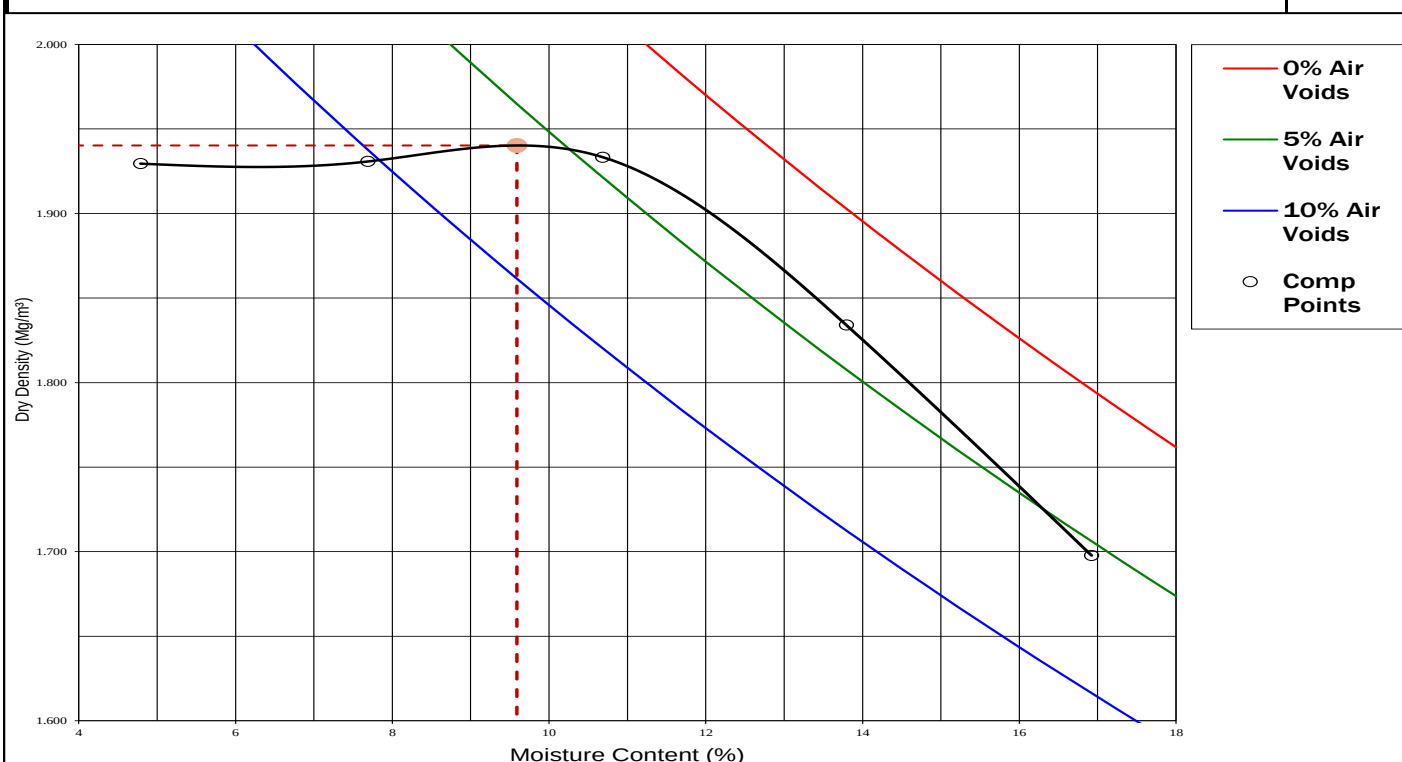
Laboratory Report	DNR-92930	Contract Sample No	DN2474/207	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk	
Report Date	17/01/2021	Clients Reference	DN2474/207		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay			
	Date Sampled	13/12/2021			
	Sampling Plan	Client Specification			
	Source	Ex-Site			
	Supplier	Ex-Site			
	Sampled By	CTS			
	Sampling Environment	Overcast/Moist			
	Sample Type	Bulk			
Location in sample	N/A	Date Received	13/12/2021		
Sample Location	Phase 3-Mound 2	Date Tests Completed	12/01/2022		
TEST REPORT					

Determination of Dry Density / Moisture Content Relationship

Tested In Accordance with BS 1377: Part 4: 1990 Clause 3.6.4.2 (4.5kg Rammer, CBR mould)

The test was carried out using separate samples, each prepared in Accordance with BS1377: Part 1: 2016 Clause 8.3.4(b)

Sample particle size adjustment: None



Optimum Moisture Content (%)	9.6 %
Maximum Dry Density	1.94 Mg/m³
Material Retained on 37.5mm test sieve	0 %
Material Retained on 20.0mm test sieve	5 %
Particle Density (Measured) Determined by BS1377:Part 2:1990 Clause 8.2	2.58 Mg/m³

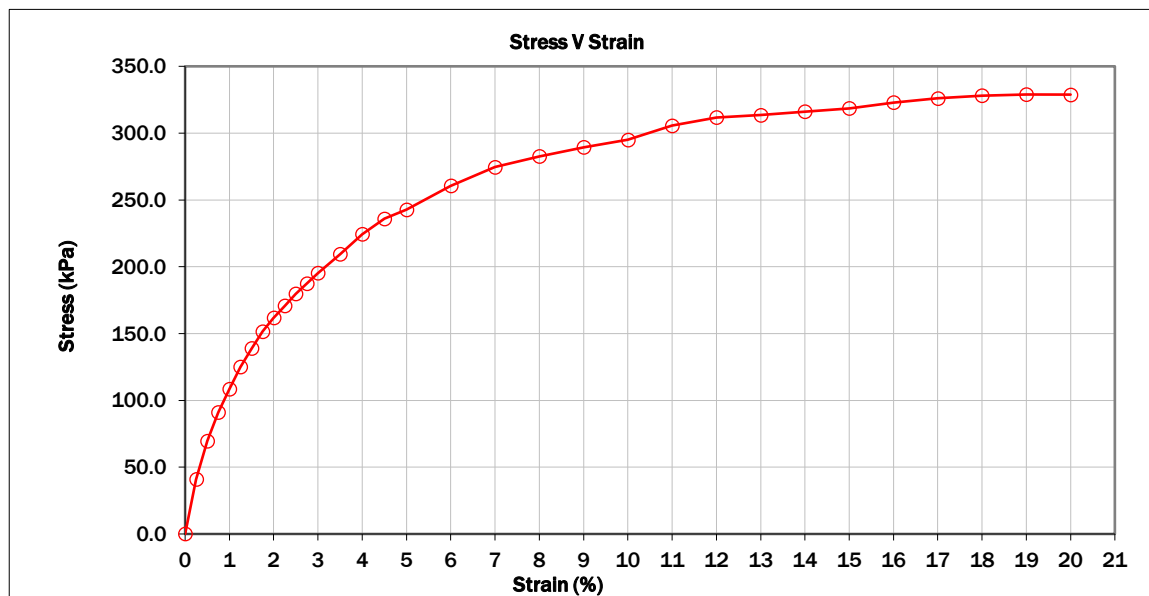
Laboratory Report	DNR-92930	Contract Sample No	DN2474/207	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161
Report Date	17/01/2021	Clients Reference	DN2474/207	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description		Gravelly Clay	
	Date Sampled		13/12/2021	
	Sampling Plan		Client Specification	
	Source		Ex-Site	
	Supplier		Ex-Site	
	Sampled By		CTS	
	Sampling Environment		Overcast/Moist	
	Sample Type		Bulk	
Location in sample		N/A	Date Received	13/12/2021
Sample Location		Phase 3-Mound 2	Date Tests Completed	12/01/2022
TEST REPORT				

Determination of Undrained Shear Strength in Triaxial Compression Without Pore Pressure Measurement
Tested in Accordance with BS 1377: Part 7: 1990 Clause 8

Tests were conducted on a disturbed sample, recompacted using a 2.5kg rammer at as received moisture content.

Initial specimen height	200	mm
Initial specimen diameter	99.07	mm
Initial bulk density	2.01	Mg/m ³
Initial moisture content	16	%
Initial dry density	1.74	Mg/m ³
Rate of strain applied	1.00	%/min
Membrane thickness (latex)	0.33	mm
Membrane correction	1.2	kPa
Cell pressure	200	kPa
Corrected maximum deviator stress at failure	328	kPa
Strain at failure	19.0	%
Time at Failure	19 Minutes, 0 Seconds	
Mode of failure	Plastic	

Laboratory Temperature
18-22 °C



Undrained Shear Strength, c_u
164 kPa

Tested at rate of strain of 1%/minute as required by Specification for Highway Works Series 600, clause 633

Time to failure was outside the BS1377, 5 to 15 minute requirement for this test when carried out at the SHW required rate of 1%/minute.

Template Version: 1.6

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 Results relate only to the sample(s) as received.

Authorised Signatory

This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the customer.

**** END OF REPORT ****

Construction Testing Solutions is a trading division of Construction Testing Solutions Ltd - Company No. 05998333

Laboratory Report	DNR-92931	Contract Sample No	DN2474/208	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	17/01/2021	Clients Reference	DN2474/208		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	13/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Not Stated		
		Sample Type	Bulk		
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Received	13/12/2021
		Sample Location	Phase 3-Mound 2	Date Tests Completed	12/01/2022
	TEST REPORT				

Determination of moisture content

Particle size distribution (wet sieving method) - Tested In accordance with BS 1377: Part 2: 1990 Clause 9.2

[illegible]

Nominal Size of Material (mm)

15 - 80

15 - 80

Laboratory Report	DNR-92931	Contract Sample No	DN2474/208	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU 	
Report Date	17/01/2021	Clients Reference	DN2474/208		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay	Tel: (01302) 352652 Web: www.constructiontesting.co.uk		
	Date Sampled	13/12/2021			Email: enquiries@constructiontesting.co.uk
	Sampling Plan	Client Specification	Date Received		
	Source	Ex-Site	Date Tests Completed		12/01/2022
	Supplier	Ex-Site	TEST REPORT		
	Sampled By	CTS			
	Sampling Environment	Not Stated			
	Sample Type	Bulk			
Location in sample	N/A				
Sample Location	Phase 3-Mound 2				

Determination of Plastic Limit, Liquid Limit and Plasticity Index - Tested in Accordance with BS 1377: Part2: 1990 The sample was prepared from a natural soil specimen and in accordance with BS1377: Part 1: 2016: Clause 8.3.4(b)		% Passing Sieve taken from Particle Size Distribution test.
Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4 - One Point)	39 %	
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	19 %	
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	20 %	
Material Passing 425 µm test sieve	63 %	
Material Retained on 425 µm test sieve	37 %	

Determination of Moisture Condition Value (MCV) at Natural Moisture Content Prepared and Tested on a Single Sample in Accordance with BS 1377: Part 4: 1990: Clause 5.4		
MCV - interpreted from the steepest straight line of the plot.	9.0	
Moisture Content in Accordance with BS 1377: Part 2: 1990: Clause 3.2	14 %	
Percentage of material retained on 20mm test sieve	2 %	

Determination of Particle Density Tested in Accordance with BS 1377: Part 2: 1990. Clause 8.2 (Gas Jar Method)		Sample prepared in Accordance with BS 1377-1:2016, clause 8.4
Average Particle Density	2.59 Mg/m³	

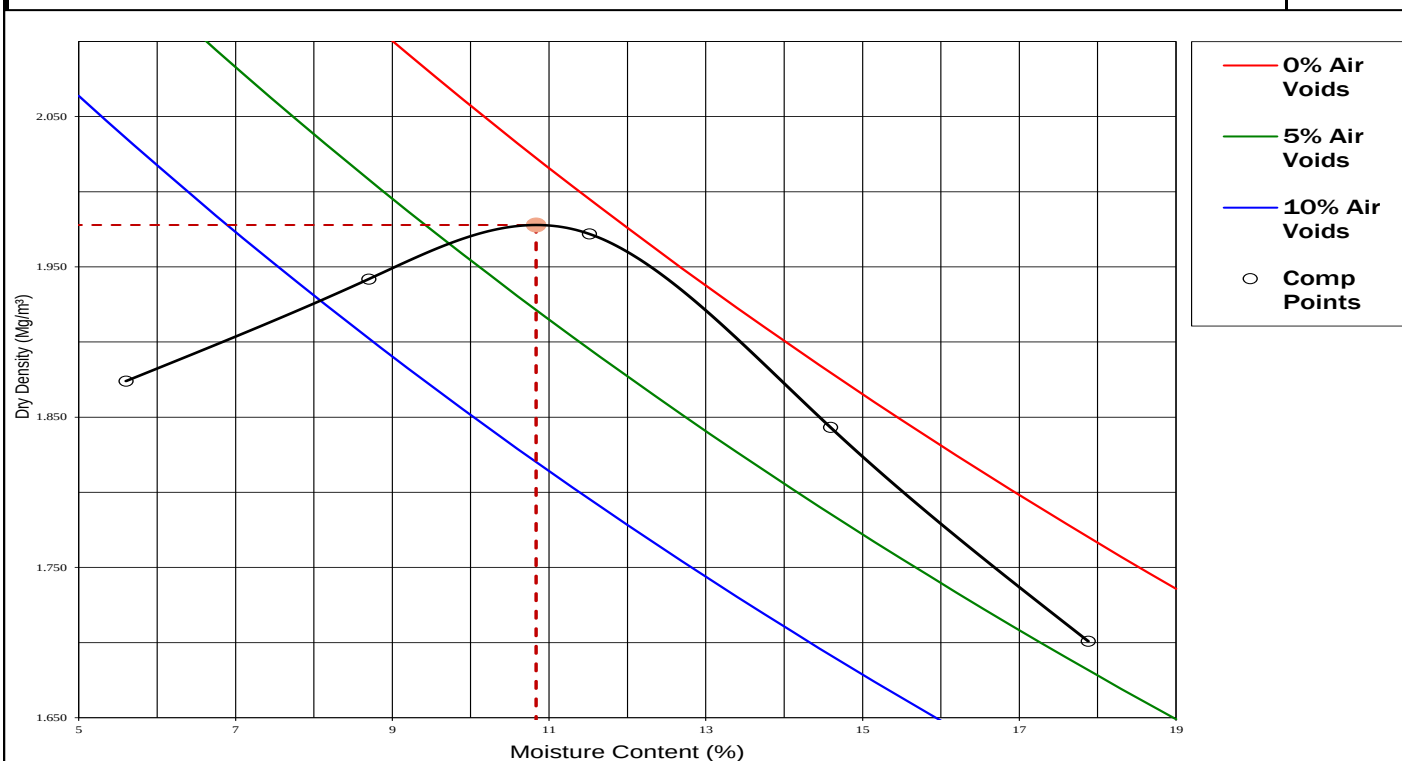
Laboratory Report	DNR-92931	Contract Sample No	DN2474/208	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk	
Report Date	17/01/2021	Clients Reference	DN2474/208		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description		Gravelly Clay		
	Date Sampled		13/12/2021		
	Sampling Plan		Client Specification		
	Source		Ex-Site		
	Supplier		Ex-Site		
	Sampled By		CTS		
	Sampling Environment		Not Stated		
	Sample Type		Bulk	Date Received	13/12/2021
	Location in sample		N/A	Date Tests Completed	12/01/2022
	Sample Location		Phase 3-Mound 2	TEST REPORT	

Determination of Dry Density / Moisture Content Relationship

Tested In Accordance with BS 1377: Part 4: 1990 Clause 3.6.4.2 (4.5kg Rammer, CBR mould)

The test was carried out using separate samples, each prepared in Accordance with BS1377: Part 1: 2016 Clause 8.3.4(b)

Sample particle size adjustment: None



Optimum Moisture Content (%)	11 %
Maximum Dry Density	1.98 Mg/m³
Material Retained on 37.5mm test sieve	0 %
Material Retained on 20.0mm test sieve	2 %
Particle Density (Measured) Determined by BS1377:Part 2:1990 Clause 8.2	2.59 Mg/m³

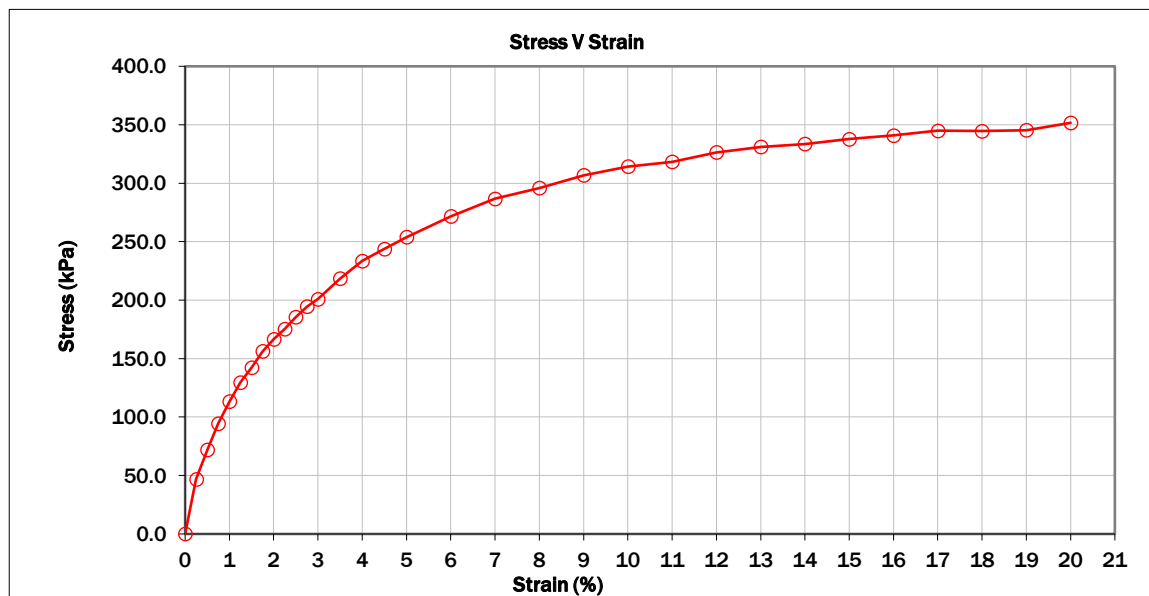
Laboratory Report	DNR-92931	Contract Sample No	DN2474/208	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	17/01/2021	Clients Reference	DN2474/208		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	13/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Not Stated		
		Sample Type	Bulk		Date Received
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Tests Completed	12/01/2022
		Sample Location	Phase 3-Mound 2	TEST REPORT	

Determination of Undrained Shear Strength in Triaxial Compression Without Pore Pressure Measurement
Tested in Accordance with BS 1377: Part 7: 1990 Clause 8

Tests were conducted on a disturbed sample, recompacted using a 2.5kg rammer at as received moisture content.

Initial specimen height	200	mm
Initial specimen diameter	99.07	mm
Initial bulk density	2.09	Mg/m ³
Initial moisture content	15	%
Initial dry density	1.82	Mg/m ³
Rate of strain applied	1.00	%/min
Membrane thickness (latex)	0.33	mm
Membrane correction	1.3	kPa
Cell pressure	200	kPa
Corrected maximum deviator stress at failure	350	kPa
Strain at failure	20.0	%
Time at Failure	20 Minutes, 0 Seconds	
Mode of failure	Plastic	

Laboratory Temperature
18-22 °C



Undrained Shear Strength, c_u
175 kPa

Tested at rate of strain of 1%/minute as required by Specification for Highway Works Series 600, clause 633

Time to failure was outside the BS1377, 5 to 15 minute requirement for this test when carried out at the SHW required rate of 1%/minute.

Template Version: 1.6

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 Results relate only to the sample(s) as received.

Authorised Signatory

This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the customer.

**** END OF REPORT ****

Construction Testing Solutions is a trading division of Construction Testing Solutions Ltd - Company No. 05998333

Laboratory Report	DNR-93242	Contract Sample No	DN2474/209	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	24/01/2022	Clients Reference	DN2474/209		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	17/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Overcast		
		Sample Type	Bulk		Date Received
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Tests Completed	18/01/2022
		Sample Location	Phase 3-Mound 2	TEST REPORT	

Determination of moisture content

Prepared and tested in Accordance with BS 1377: Part 2: 1990 Clause 3.2 - Oven drying

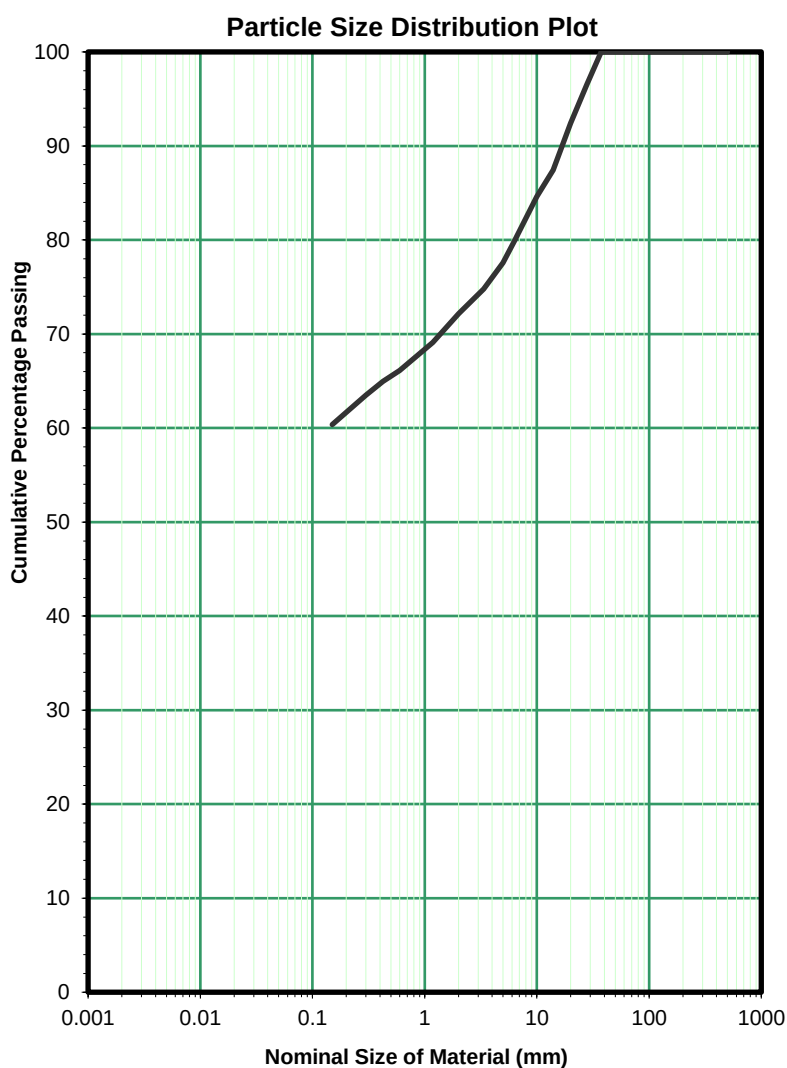
Moisture Content

16 %

Particle size distribution (wet sieving method) - Tested in accordance with BS 1377: Part 2: 1990 Clause 9.2

Sample prepared in Accordance with BS 1377: Part 1: 2016 clause 8.3.4(a)

BS Sieve Size (mm)	Passing BS Sieve (%)
500	100
300	100
125	100
100	100
90	100
75	100
63	100
50	100
37.5	100
28	97
20	92
14	87
10	85
6.3	80
5	78
3.35	75
2	72
1.18	69
0.600	66
0.425	65
0.300	63
0.150	60
0.063	53



Specification

MCHW SHW Vol 1 Series 600 Table 6/2
Class 2C

100

15 - 80

15 - 80

Laboratory Report	DNR-93242	Contract Sample No	DN2474/209	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU 
Report Date	24/01/2022	Clients Reference	DN2474/209	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay		
	Date Sampled	17/12/2021		
	Sampling Plan	Client Specification		
	Source	Ex-Site		
	Supplier	Ex-Site		
	Sampled By	CTS		
	Sampling Environment	Overcast		
	Sample Type	Bulk		
Location in sample	N/A	Date Received	17/12/2021	
Sample Location	Phase 3-Mound 2	Date Tests Completed	18/01/2022	
TEST REPORT				
Determination of Plastic Limit, Liquid Limit and Plasticity Index - Tested in Accordance with BS 1377: Part2: 1990 The sample was prepared from a natural soil specimen and in accordance with BS1377: Part 1: 2016: Clause 8.3.4(b)				% Passing Sieve taken from Particle Size Distribution test.
Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4 - One Point)			38 %	
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)			20 %	
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)			18 %	
Material Passing 425 µm test sieve			65 %	
Material Retained on 425 µm test sieve			35 %	
Determination of Moisture Condition Value (MCV) at Natural Moisture Content Prepared and Tested on a Single Sample in Accordance with BS 1377: Part 4: 1990: Clause 5.4				
MCV - interpreted from the steepest straight line of the plot.			8.6	
Moisture Content in Accordance with BS 1377: Part 2: 1990: Clause 3.2			16 %	
Percentage of material retained on 20mm test sieve			8 %	
Determination of Particle Density Tested in Accordance with BS 1377: Part 2: 1990. Clause 8.2 (Gas Jar Method)				Sample prepared in Accordance with BS 1377-1:2016, clause 8.4
Average Particle Density			2.66 Mg/m³	

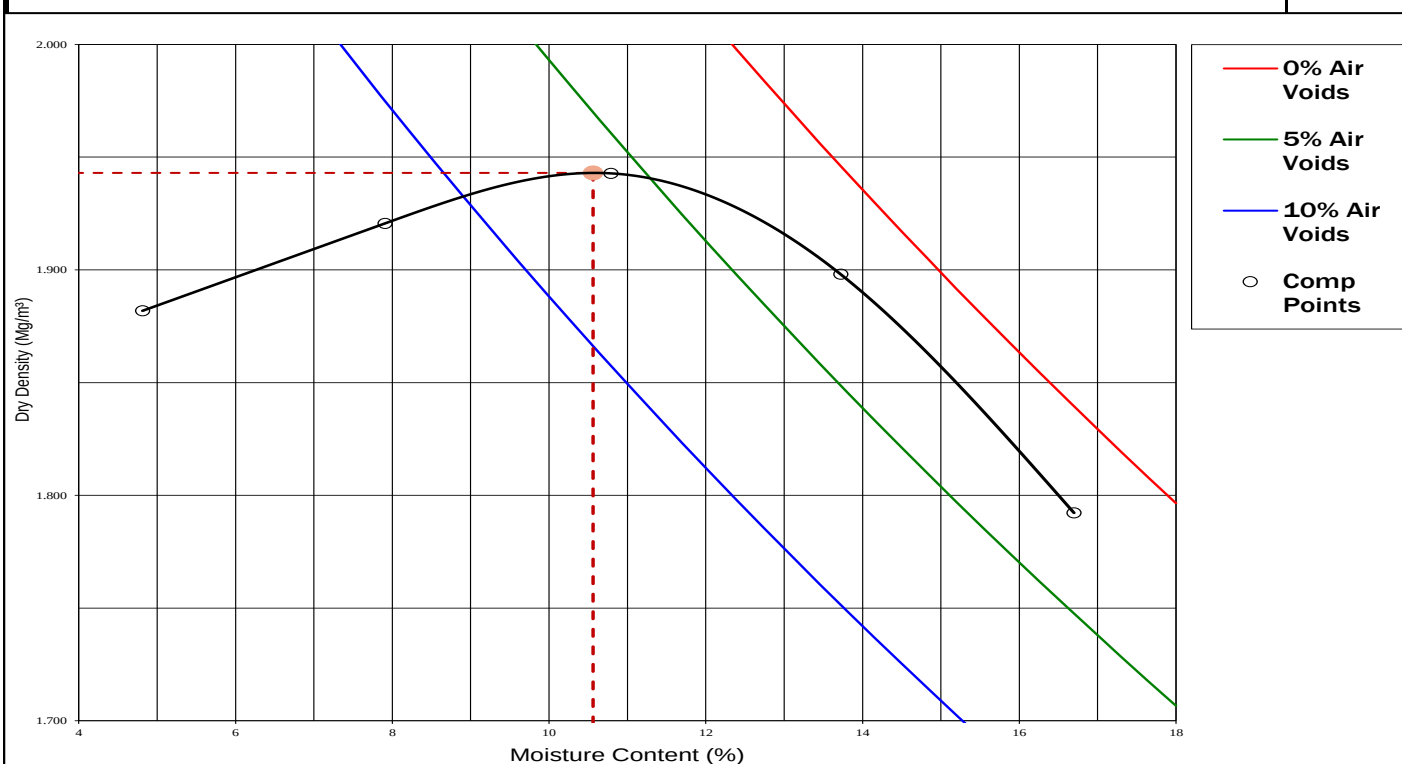
Laboratory Report	DNR-93242	Contract Sample No	DN2474/209	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk	
Report Date	24/01/2022	Clients Reference	DN2474/209		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description		Gravelly Clay		
	Date Sampled		17/12/2021		
	Sampling Plan		Client Specification		
	Source		Ex-Site		
	Supplier		Ex-Site		
	Sampled By		CTS		
	Sampling Environment		Overcast		
	Sample Type		Bulk	Date Received	17/12/2021
	Location in sample		N/A	Date Tests Completed	18/01/2022
	Sample Location		Phase 3-Mound 2	TEST REPORT	

Determination of Dry Density / Moisture Content Relationship

Tested In Accordance with BS 1377: Part 4: 1990 Clause 3.6.4.2 (4.5kg Rammer, CBR mould)

The test was carried out using separate samples, each prepared in Accordance with BS1377: Part 1: 2016 Clause 8.3.4(b)

Sample particle size adjustment: None



Optimum Moisture Content (%)	11 %
Maximum Dry Density	1.94 Mg/m³
Material Retained on 37.5mm test sieve	0 %
Material Retained on 20.0mm test sieve	8 %
Particle Density (Measured) Determined by BS1377:Part 2:1990 Clause 8.2	2.66 Mg/m³

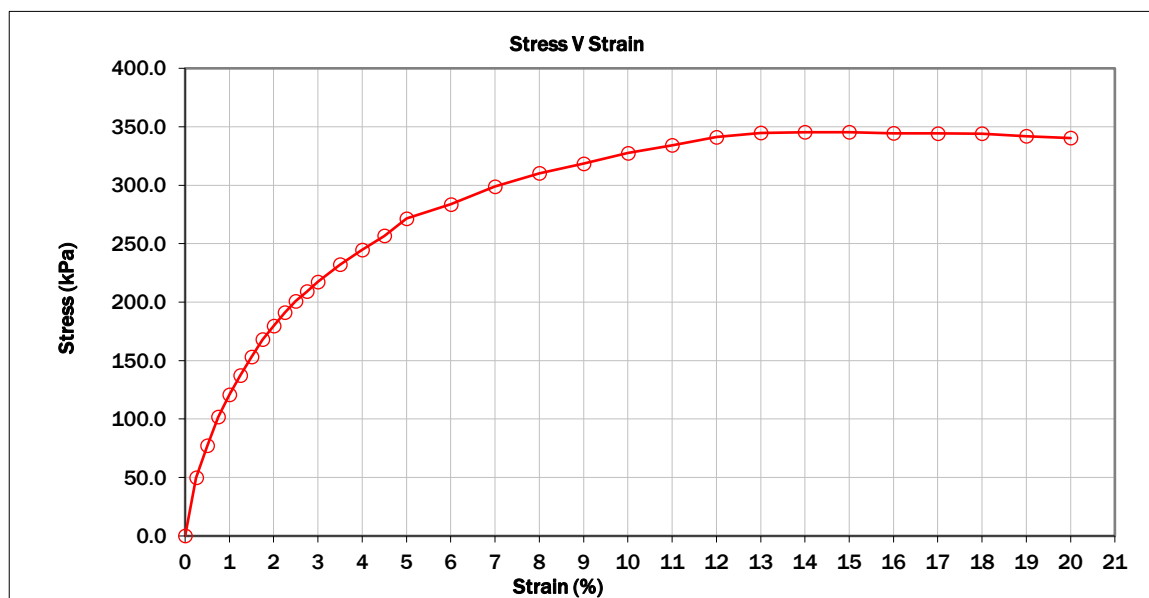
Laboratory Report	DNR-93242	Contract Sample No	DN2474/209	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	24/01/2022	Clients Reference	DN2474/209		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	17/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Overcast		
		Sample Type	Bulk		Date Received
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Tests Completed	18/01/2022
		Sample Location	Phase 3-Mound 2	TEST REPORT	

Determination of Undrained Shear Strength in Triaxial Compression Without Pore Pressure Measurement
Tested in Accordance with BS 1377: Part 7: 1990 Clause 8

Tests were conducted on a disturbed sample, recompacted using a 2.5kg rammer at as received moisture content.

Initial specimen height	200	mm
Initial specimen diameter	99	mm
Initial bulk density	2.14	Mg/m ³
Initial moisture content	15	%
Initial dry density	1.87	Mg/m ³
Rate of strain applied	1.00	%/min
Membrane thickness (latex)	0.33	mm
Membrane correction	1.0	kPa
Cell pressure	200	kPa
Corrected maximum deviator stress at failure	344	kPa
Strain at failure	15.0	%
Time at Failure	15 Minutes, 0 Seconds	
Mode of failure	Compound	

Laboratory Temperature
18-22 °C



Undrained Shear Strength, c_u
172 kPa

Tested at rate of strain of 1%/minute as required by Specification for Highway Works Series 600, clause 633

Template Version: 1.6

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 Results relate only to the sample(s) as received.

Authorised Signatory

This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the customer.

**** END OF REPORT ****

Construction Testing Solutions is a trading division of Construction Testing Solutions Ltd - Company No. 05998333

Laboratory Report	DNR-93242-93244	Contract Sample No	DN2747/209-211
Report Date	20 January 2022	Clients Reference	DN2747/209-211
Howard Civil Engineering Unit 11, Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham		Material Description	Gravelly Clay
		Source	Ex Site
		Supplier	Ex Site
		Date Sampled	17/12/2021
		Date Received	17/12/2021
		Date Completed	18/01/2022
		Sample Location	Phase 3 Mound 2



Construction Testing Solutions

Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk

BS1377 PH, BS1377 LOI, 2 Stage WAC, ENV1, Asbestos & BRE Suite

Please find enclosed test certificate (L22/0108/CTS-22-23193) supplied by our approved Sub-contract Laboratory, Nicholls Colton

Authorised Signatory



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

Construction Testing Solutions
Bootham Lane Industrial Estate
Dunscoft
Doncaster
DN7 4JU

Analytical Test Report: L22/0108/CTS - 22-23193

Your Project Reference: **21267 Upper Hoyland Road Rockingham**

Your Order Number: 21267 Samples Received / Instructed: 10/01/2022 / 10/01/2022

Report Issue Number: 1 Sample Tested: 10/01 to 18/01/2022

Samples Analysed: 3 soil samples Report issued: 18/01/2022

Signed

James Gane
Data Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and these results are not covered by our accreditation

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

WAC Testing

Samples were leached in accordance with BS EN 12457-3: 2002.

Eluate Results are reported as the cumulative release at L/S 10 from eluates of L/S 2 and L/S 8. These results have been calculated in accordance with BS EN 12457-3:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 10/12/2020

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

J:\Public\Projects\2022\L22\CTS - Construction Testing Solutions\L22-0108-CTS\L22-0108-CTS 22-23193.xml Cover Sheet

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Analytical Test Results - Soil

NC Reference			209963	209964	209965
Client Sample ID			DN2474/209	DN2474/210	DN2474/211
Client Sample Location			Phase 3 Mound 2	Phase 3 Mound 2	Phase 3 Mound 2
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			-	-	-
Depth - Bottom (m)			-	-	-
Date of Sampling			17/12/2021	17/12/2021	17/12/2021
Time of Sampling			-	-	-
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10
Boron (w/s)	(mg/kg)	u	< 2.5	< 2.5	< 2.5
Cadmium	(mg/kg)	MCERTS	0.5	0.6	0.5
Chromium (Total)	(mg/kg)	UKAS	15	16	15
Copper	(mg/kg)	MCERTS	31	34	40
Lead	(mg/kg)	MCERTS	28	21	20
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	30	30	30
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	81	90	88
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Cyanide (Free)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate	(%)	u	0.10	0.10	0.07
pH	pH Units	MCERTS	7.6	7.7	7.8
Sulphate (Water soluble)	(mg/l)	u	330	350	240
Sulphide	(mg/kg)	u	< 15	< 15	< 15
Thiocyanate	(mg/kg)	u	< 5.0	< 5.0	< 5.0
Acenaphthene	(mg/kg)	MCERTS	0.02	0.11	0.05
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	0.08	0.05
Benzo (a) anthracene	(mg/kg)	MCERTS	0.04	0.16	0.11
Benzo (a) pyrene	(mg/kg)	MCERTS	0.04	0.14	0.09
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.05	0.17	0.11
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.04	0.09	0.07
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	0.05	0.03
Chrysene	(mg/kg)	MCERTS	0.06	0.17	0.12
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.07	0.41	0.23
Fluorene	(mg/kg)	MCERTS	< 0.02	0.07	0.05
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.02	0.08	0.05
Naphthalene	(mg/kg)	MCERTS	0.12	0.27	0.14
Phenanthrene	(mg/kg)	MCERTS	0.15	0.48	0.28
Pyrene	(mg/kg)	MCERTS	0.07	0.36	0.22
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.79	2.7	1.6
Gasoline Range Organics (>C ₈ to C ₁₀) [EH_1D_Total]	(mg/kg)	UKAS	< 5.0	< 5.0	6.1
Diesel Range Organics (>C ₁₀ to C ₂₁) [EH_1D_Total]	(mg/kg)	MCERTS	21	16	25
Mineral Range Organics (>C ₂₁ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	55	64	67
Total TPH (>C ₈ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	81	84	99
SOM (via TOC)	(%)	UKAS	2.4	2.2	2.8

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Analytical Test Results - Soil

NC Reference		209963	209964	209965
Client Sample ID		DN2474/209	DN2474/210	DN2474/211
Client Sample Location		Phase 3 Mound 2	Phase 3 Mound 2	Phase 3 Mound 2
Client Sample Type		-	-	-
Client Sample Number		-	-	-
Depth - Top (m)		-	-	-
Depth - Bottom (m)		-	-	-
Date of Sampling		17/12/2021	17/12/2021	17/12/2021
Time of Sampling		-	-	-
Sample Matrix		Clay	Clay	Clay
Determinant	Units	Accreditation		
Asbestos	-	UKAS	No asbestos detected	No asbestos detected

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Analytical Test Results - Chemical Analysis

NC Reference			209963	209964	209965
Client Sample ID			DN2474/209	DN2474/210	DN2474/211
Client Sample Location			Phase 3 Mound 2	Phase 3 Mound 2	Phase 3 Mound 2
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			-	-	-
Depth - Bottom (m)			-	-	-
Date of Sampling			17/12/2021	17/12/2021	17/12/2021
Time of Sampling			-	-	-
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Water soluble sulphate	(mg/l)	u	330	350	240
Acid Soluble Sulphate	(%)	u	0.10	0.10	0.07
Total Sulphur	(%)	UKAS	0.14	0.08	0.06
pH Value	pH Units	MCERTS	7.6	7.7	7.8
pH Value (BS 1377)	(pH Units)	UKAS	7.6	7.7	7.3
Loss on Ignition (BS 1377)	(%)	UKAS	5.0	4.6	4.7

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference	209963
--------------	--------

Client Sample ID	DN2474/209
Client Sample Location	Phase 3 Mound 2
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	-
Depth - Bottom (m)	-
Date of Sampling	17/12/2021
Time of Sampling	-
Sample Description	Grey slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	15
Stone content (%)	3.7

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
--	-------------------	----------------------	---	--------------------------

Solid Analysis

Total Organic Carbon	%	MCERTS	1.4	3.0	5.0	6.0
Loss on Ignition	%	UKAS	5.0	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) (EH_1D_Total)	mg/kg	u	76	500	-	-
PAH	mg/kg	u	0.8	100	-	-
pH	units	MCERTS	7.6	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	15	800	15000	25000
Fluoride	mg/kg	u	3	10	150	500
Sulphate (as SO ₄)	mg/kg	u	250	1000	20000	50000
Total Dissolved Solids	mg/kg	u	480	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	21.0	500	800	1000

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference	209964
--------------	--------

Client Sample ID	DN2474/210
Client Sample Location	Phase 3 Mound 2
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	-
Depth - Bottom (m)	-
Date of Sampling	17/12/2021
Time of Sampling	-
Sample Description	Grey slightly gravelly silty clay
Sample Matrix	Clay
Moisture Content (%)	16
Stone content (%)	8.7

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
--	-------------------	----------------------	---	--------------------------

Solid Analysis

Total Organic Carbon	%	MCERTS	1.3	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.6	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) (EH_1D_Total)	mg/kg	u	80	500	-	-
PAH	mg/kg	u	< 0.34	100	-	-
pH	units	MCERTS	7.7	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	19	800	15000	25000
Fluoride	mg/kg	u	3	10	150	500
Sulphate (as SO ₄)	mg/kg	u	290	1000	20000	50000
Total Dissolved Solids	mg/kg	u	490	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	22.0	500	800	1000

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference	209965
--------------	--------

Client Sample ID	DN2474/211
Client Sample Location	Phase 3 Mound 2
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	-
Depth - Bottom (m)	-
Date of Sampling	17/12/2021
Time of Sampling	-
Sample Description	Grey slightly gravelly silty clay with rare rootlets
Sample Matrix	Clay
Moisture Content (%)	15
Stone content (%)	21

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
--	-------------------	----------------------	---	--------------------------

Solid Analysis

Total Organic Carbon	%	MCERTS	1.6	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.7	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) (EH_1D_Total)	mg/kg	u	93	500	-	-
PAH	mg/kg	u	< 0.34	100	-	-
pH	units	MCERTS	7.8	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	25	800	15000	25000
Fluoride	mg/kg	u	3	10	150	500
Sulphate (as SO ₄)	mg/kg	u	270	1000	20000	50000
Total Dissolved Solids	mg/kg	u	510	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
209963	DN2474/209	Phase 3 Mound 2	-	-	Grey slightly gravelly silty clay	15	3.7	29
209964	DN2474/210	Phase 3 Mound 2	-	-	Grey slightly gravelly silty clay	16	8.7	41
209965	DN2474/211	Phase 3 Mound 2	-	-	Grey slightly gravelly silty clay with rare rootlets	15	21	42



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
209963	DN2474/209	Phase 3 Mound 2	-	-	VOC/BTEX - Sample taken from container with headspace.
209964	DN2474/210	Phase 3 Mound 2	-	-	VOC/BTEX - Sample taken from container with headspace.
209965	DN2474/211	Phase 3 Mound 2	-	-	VOC/BTEX - Sample taken from container with headspace.

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
TOCL	MS - CL - DOC	As received	BSEN:12457 Leaching	Determination of Dissolved Organic Carbon in leachates
ANIONSL	MS - CL - Anions by Aquakem	As received	-	Determination of Anions (inc Sulphate, chloride etc.) in leachate samples by Aquakem
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
BTEXS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of BTEX in soils via Headspace-GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
WSBORONS	MS-CL- WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP -Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETL	MS - CL - ICP -Metals in Waters	As received	BSEN:12457 Leaching	Determination of metals in leachates via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
SULPHIDES	MS - CL - Sulphide in Soils	As received	Passing 10mm test sieve	Determination of sulphide in soil via titration
TDSL	MS - CL - TDS (Leachate)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates
SKALARPHL	MS - CL - Phenols by Skalar	As received	BSEN:12457 Leaching	Determination of total phenols in leachates using Skalar segmented flow analyser
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ENLEACHP2	BS EN 12457-3	As Received	-	Leaching in accordance with BSEN 12457-3
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 Lol	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)
1377PH	BS1377 pH	Oven dried	Passing 2mm test sieve	pH testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 12

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
209963	DN2474/209	Phase 3 Mound 2	-	-	BS1377 LoI	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - Anions by Aquakem (2:1Extract)	R
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - Cyanide by Skalar	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - Hexavalent Chromium by Skalar	R
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - ICP Metals	R
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - PAH (As Received)	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - PCB Soils	R
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - Phenols by Skalar	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - TOC Eltra	R
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - TOC Eltra (WAC)	R
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - TPH (GC-FID)	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - VOC and MBTEX	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - pH in Soils	RX
209963	DN2474/209	Phase 3 Mound 2	-	-	MS - CL - pH in Soils (WAC)	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	BS1377 LoI	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - Anions by Aquakem (2:1Extract)	R
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - Cyanide by Skalar	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - Hexavalent Chromium by Skalar	R
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - ICP Metals	R
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - PAH (As Received)	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - PCB Soils	R
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - Phenols by Skalar	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - TOC Eltra	R
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - TOC Eltra (WAC)	R
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - TPH (GC-FID)	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - VOC and MBTEX	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - pH in Soils	RX
209964	DN2474/210	Phase 3 Mound 2	-	-	MS - CL - pH in Soils (WAC)	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	BS1377 LoI	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - Anions by Aquakem (2:1Extract)	R
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - Cyanide by Skalar	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - Hexavalent Chromium by Skalar	R
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - ICP Metals	R
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - PAH (As Received)	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - PCB Soils	R
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - Phenols by Skalar	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - TOC Eltra	R
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - TOC Eltra (WAC)	R

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - TPH (GC-FID)	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - VOC and MBTEX	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - pH in Soils	RX
209965	DN2474/211	Phase 3 Mound 2	-	-	MS - CL - pH in Soils (WAC)	RX



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/0108/CTS - 22-23193

Project Reference - 21267 Upper Hoyland Road Rockingham

HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Laboratory Report	DNR-93243	Contract Sample No	DN2474/210	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161
Report Date	24/01/2022	Clients Reference	DN2474/210	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham		Material Description	Gravelly Clay	
		Date Sampled	17/12/2021	
		Sampling Plan	Client Specification	
		Source	Ex-Site	
		Supplier	Ex-Site	
		Sampled By	CTS	
		Sampling Environment	Overcast	
		Sample Type	Bulk	
Location in sample	N/A	Date Received	17/12/2021	
Sample Location	Phase 3-Mound 2	Date Tests Completed	18/01/2022	
TEST REPORT				

Determination of moisture content																																																																																																		
Prepared and tested In Accordance with BS 1377: Part 2: 1990 Clause 3.2 - Oven drying																																																																																																		
Moisture Content	15 %																																																																																																	
Particle size distribution (wet sieving method) - Tested In accordance with BS 1377: Part 2: 1990 Clause 9.2		Specification																																																																																																
Sample prepared in Accordance with BS 1377: Part 1: 2016 clause 8.3.4(a)		MCHW SHW Vol 1 Series 600 Table 6/2																																																																																																
<table><thead><tr><th>BS Sieve Size (mm)</th><th>Passing BS Sieve (%)</th></tr></thead><tbody><tr><td>500</td><td>100</td></tr><tr><td>300</td><td>100</td></tr><tr><td>125</td><td>100</td></tr><tr><td>100</td><td>100</td></tr><tr><td>90</td><td>100</td></tr><tr><td>75</td><td>100</td></tr><tr><td>63</td><td>100</td></tr><tr><td>50</td><td>100</td></tr><tr><td>37.5</td><td>88</td></tr><tr><td>28</td><td>80</td></tr><tr><td>20</td><td>74</td></tr><tr><td>14</td><td>71</td></tr><tr><td>10</td><td>67</td></tr><tr><td>6.3</td><td>63</td></tr><tr><td>5</td><td>61</td></tr><tr><td>3.35</td><td>59</td></tr><tr><td>2</td><td>57</td></tr><tr><td>1.18</td><td>54</td></tr><tr><td>0.600</td><td>52</td></tr><tr><td>0.425</td><td>51</td></tr><tr><td>0.300</td><td>51</td></tr><tr><td>0.150</td><td>48</td></tr><tr><td>0.063</td><td>43</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table>	BS Sieve Size (mm)	Passing BS Sieve (%)	500	100	300	100	125	100	100	100	90	100	75	100	63	100	50	100	37.5	88	28	80	20	74	14	71	10	67	6.3	63	5	61	3.35	59	2	57	1.18	54	0.600	52	0.425	51	0.300	51	0.150	48	0.063	43																	Particle Size Distribution Plot <table><thead><tr><th>Nominal Size of Material (mm)</th><th>Cumulative Percentage Passing (%)</th></tr></thead><tbody><tr><td>0.075</td><td>48</td></tr><tr><td>0.150</td><td>48</td></tr><tr><td>0.300</td><td>51</td></tr><tr><td>0.600</td><td>52</td></tr><tr><td>1.18</td><td>54</td></tr><tr><td>2</td><td>57</td></tr><tr><td>3.35</td><td>59</td></tr><tr><td>5</td><td>61</td></tr><tr><td>6.3</td><td>63</td></tr><tr><td>10</td><td>67</td></tr><tr><td>14</td><td>71</td></tr><tr><td>20</td><td>74</td></tr><tr><td>28</td><td>80</td></tr><tr><td>37.5</td><td>88</td></tr><tr><td>50</td><td>100</td></tr></tbody></table>	Nominal Size of Material (mm)	Cumulative Percentage Passing (%)	0.075	48	0.150	48	0.300	51	0.600	52	1.18	54	2	57	3.35	59	5	61	6.3	63	10	67	14	71	20	74	28	80	37.5	88	50	100	Class 2C
BS Sieve Size (mm)	Passing BS Sieve (%)																																																																																																	
500	100																																																																																																	
300	100																																																																																																	
125	100																																																																																																	
100	100																																																																																																	
90	100																																																																																																	
75	100																																																																																																	
63	100																																																																																																	
50	100																																																																																																	
37.5	88																																																																																																	
28	80																																																																																																	
20	74																																																																																																	
14	71																																																																																																	
10	67																																																																																																	
6.3	63																																																																																																	
5	61																																																																																																	
3.35	59																																																																																																	
2	57																																																																																																	
1.18	54																																																																																																	
0.600	52																																																																																																	
0.425	51																																																																																																	
0.300	51																																																																																																	
0.150	48																																																																																																	
0.063	43																																																																																																	
Nominal Size of Material (mm)	Cumulative Percentage Passing (%)																																																																																																	
0.075	48																																																																																																	
0.150	48																																																																																																	
0.300	51																																																																																																	
0.600	52																																																																																																	
1.18	54																																																																																																	
2	57																																																																																																	
3.35	59																																																																																																	
5	61																																																																																																	
6.3	63																																																																																																	
10	67																																																																																																	
14	71																																																																																																	
20	74																																																																																																	
28	80																																																																																																	
37.5	88																																																																																																	
50	100																																																																																																	
		100																																																																																																
		15 - 80																																																																																																
		15 - 80																																																																																																

Laboratory Report	DNR-93243	Contract Sample No	DN2474/210	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU 	
Report Date	24/01/2022	Clients Reference	DN2474/210		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay	Tel: (01302) 352652 Web: www.constructiontesting.co.uk		
	Date Sampled	17/12/2021			Email: enquiries@constructiontesting.co.uk
	Sampling Plan	Client Specification	Date Received		
	Source	Ex-Site	Date Tests Completed		18/01/2022
	Supplier	Ex-Site	TEST REPORT		
	Sampled By	CTS			
	Sampling Environment	Overcast			
	Sample Type	Bulk			
Location in sample	N/A				
Sample Location	Phase 3-Mound 2				

Determination of Plastic Limit, Liquid Limit and Plasticity Index - Tested in Accordance with BS 1377: Part2: 1990 The sample was prepared from a natural soil specimen and in accordance with BS1377: Part 1: 2016: Clause 8.3.4(b)		% Passing Sieve taken from Particle Size Distribution test.
Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4 - One Point)	40 %	
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	18 %	
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	22 %	
Material Passing 425 µm test sieve	51 %	
Material Retained on 425 µm test sieve	49 %	
Determination of Moisture Condition Value (MCV) at Natural Moisture Content Prepared and Tested on a Single Sample in Accordance with BS 1377: Part 4: 1990: Clause 5.4		
MCV - interpreted from the steepest straight line of the plot.	7.9	
Moisture Content in Accordance with BS 1377: Part 2: 1990: Clause 3.2	18 %	
Percentage of material retained on 20mm test sieve	26 %	
Determination of Particle Density Tested in Accordance with BS 1377: Part 2: 1990. Clause 8.2 (Gas Jar Method)		Sample prepared in Accordance with BS 1377-1:2016, clause 8.4
Average Particle Density	2.67 Mg/m³	

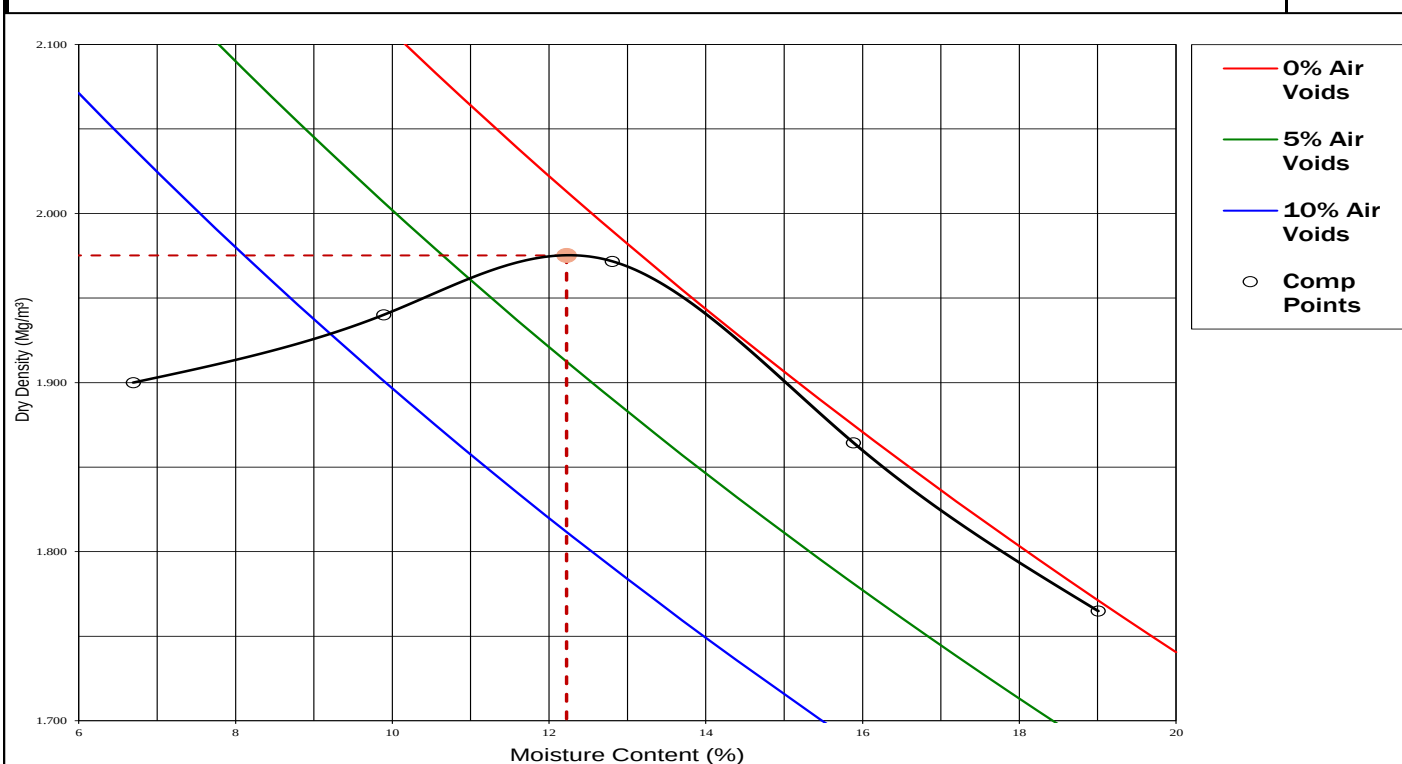
Laboratory Report	DNR-93243	Contract Sample No	DN2474/210	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161
Report Date	24/01/2022	Clients Reference	DN2474/210	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham		Material Description	Gravelly Clay	
		Date Sampled	17/12/2021	
		Sampling Plan	Client Specification	
		Source	Ex-Site	
		Supplier	Ex-Site	
		Sampled By	CTS	
		Sampling Environment	Overcast	
		Sample Type	Bulk	
		Date Tests Completed	18/01/2022	
		Sample Location	Phase 3-Mound 2	TEST REPORT

Determination of Dry Density / Moisture Content Relationship

Tested In Accordance with BS 1377: Part 4: 1990 Clause 3.6.4.2 (4.5kg Rammer, CBR mould)

The test was carried out using separate samples, each prepared in Accordance with BS1377: Part 1: 2016 Clause 8.3.4(b)

Sample particle size adjustment: +37.5mm particles removed



Optimum Moisture Content (%)

12 %

Maximum Dry Density

1.98 Mg/m³

Material Retained on 37.5mm test sieve

12 %

Material Retained on 20.0mm test sieve

26 %

Particle Density (Measured) Determined by BS1377:Part 2:1990 Clause 8.2

2.67 Mg/m³

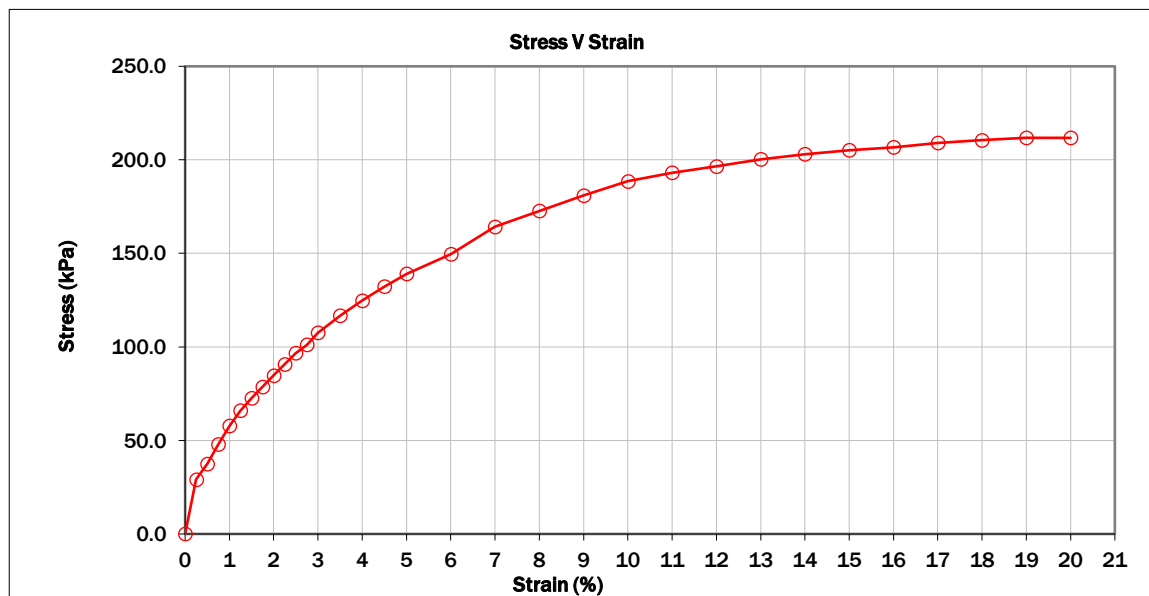
Laboratory Report	DNR-93243	Contract Sample No	DN2474/210	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	24/01/2022	Clients Reference	DN2474/210		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	17/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Overcast		
		Sample Type	Bulk		Date Received
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Tests Completed	18/01/2022
		Sample Location	Phase 3-Mound 2	TEST REPORT	

Determination of Undrained Shear Strength in Triaxial Compression Without Pore Pressure Measurement
Tested in Accordance with BS 1377: Part 7: 1990 Clause 8

Tests were conducted on a disturbed sample, recompacted using a 2.5kg rammer at as received moisture content.

Initial specimen height	200	mm
Initial specimen diameter	99.07	mm
Initial bulk density	2.17	Mg/m ³
Initial moisture content	9.9	%
Initial dry density	1.98	Mg/m ³
Rate of strain applied	1.00	%/min
Membrane thickness (latex)	0.33	mm
Membrane correction	1.2	kPa
Cell pressure	200	kPa
Corrected maximum deviator stress at failure	211	kPa
Strain at failure	19.0	%
Time at Failure	19 Minutes, 0 Seconds	
Mode of failure	Plastic	

Laboratory Temperature
18-22 °C



Undrained Shear Strength, c_u
105 kPa

Tested at rate of strain of 1%/minute as required by Specification for Highway Works Series 600, clause 633

Time to failure was outside the BS1377, 5 to 15 minute requirement for this test when carried out at the SHW required rate of 1%/minute.

Template Version: 1.6

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 Results relate only to the sample(s) as received.

Authorised Signatory

This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the customer.

**** END OF REPORT ****

Construction Testing Solutions is a trading division of Construction Testing Solutions Ltd - Company No. 05998333

Laboratory Report	DNR-93244	Contract Sample No	DN2474/211	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161	
Report Date	24/01/2022	Clients Reference	DN2474/211		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF		Material Description	Gravelly Clay		
		Date Sampled	17/12/2021		
		Sampling Plan	Client Specification		
		Source	Ex-Site		
		Supplier	Ex-Site		
		Sampled By	CTS		
		Sampling Environment	Overcast		
		Sample Type	Bulk		Date Received
Upper Hoyland Road, Rockingham		Location in sample	N/A	Date Tests Completed	18/01/2022
		Sample Location	Phase 3-Mound 2	TEST REPORT	

Determination of moisture content

Prepared and tested in Accordance with BS 1377: Part 2: 1990 Clause 3.2 - Oven drying

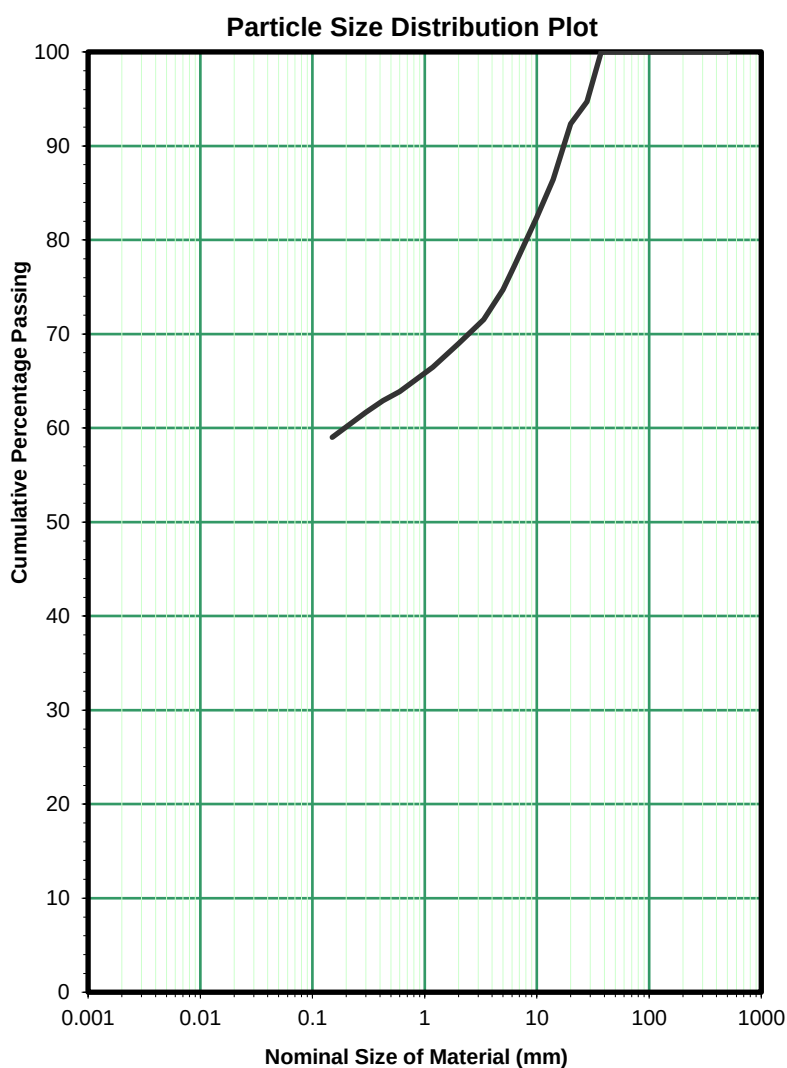
Moisture Content

16 %

Particle size distribution (wet sieving method) - Tested in accordance with BS 1377: Part 2: 1990 Clause 9.2

Sample prepared in Accordance with BS 1377: Part 1: 2016 clause 8.3.4(a)

BS Sieve Size (mm)	Passing BS Sieve (%)
500	100
300	100
125	100
100	100
90	100
75	100
63	100
50	100
37.5	100
28	95
20	92
14	86
10	82
6.3	77
5	75
3.35	72
2	69
1.18	66
0.600	64
0.425	63
0.300	62
0.150	59
0.063	53



Specification

MCHW SHW Vol 1 Series 600 Table 6/2
Class 2C

100

15 - 80

15 - 80

Laboratory Report	DNR-93244	Contract Sample No	DN2474/211	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU 	
Report Date	24/01/2022	Clients Reference	DN2474/211		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description	Gravelly Clay	Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk		
	Date Sampled	17/12/2021			
	Sampling Plan	Client Specification	Date Received		17/12/2021
	Source	Ex-Site	Date Tests Completed		18/01/2022
	Supplier	Ex-Site	TEST REPORT		
	Sampled By	CTS			
	Sampling Environment	Overcast			
	Sample Type	Bulk			
Location in sample	N/A				
Sample Location	Phase 3-Mound 2				

Determination of Plastic Limit, Liquid Limit and Plasticity Index - Tested in Accordance with BS 1377: Part2: 1990 The sample was prepared from a natural soil specimen and in accordance with BS1377: Part 1: 2016: Clause 8.3.4(b)		% Passing Sieve taken from Particle Size Distribution test.
Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4 - One Point)	39 %	
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	20 %	
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	19 %	
Material Passing 425 µm test sieve	63 %	
Material Retained on 425 µm test sieve	37 %	
Determination of Moisture Condition Value (MCV) at Natural Moisture Content Prepared and Tested on a Single Sample in Accordance with BS 1377: Part 4: 1990: Clause 5.4		
MCV - interpreted from the steepest straight line of the plot.	8.0	
Moisture Content in Accordance with BS 1377: Part 2: 1990: Clause 3.2	18 %	
Percentage of material retained on 20mm test sieve	8 %	
Determination of Particle Density Tested in Accordance with BS 1377: Part 2: 1990. Clause 8.2 (Gas Jar Method)		Sample prepared in Accordance with BS 1377-1:2016, clause 8.4
Average Particle Density	2.68 Mg/m³	

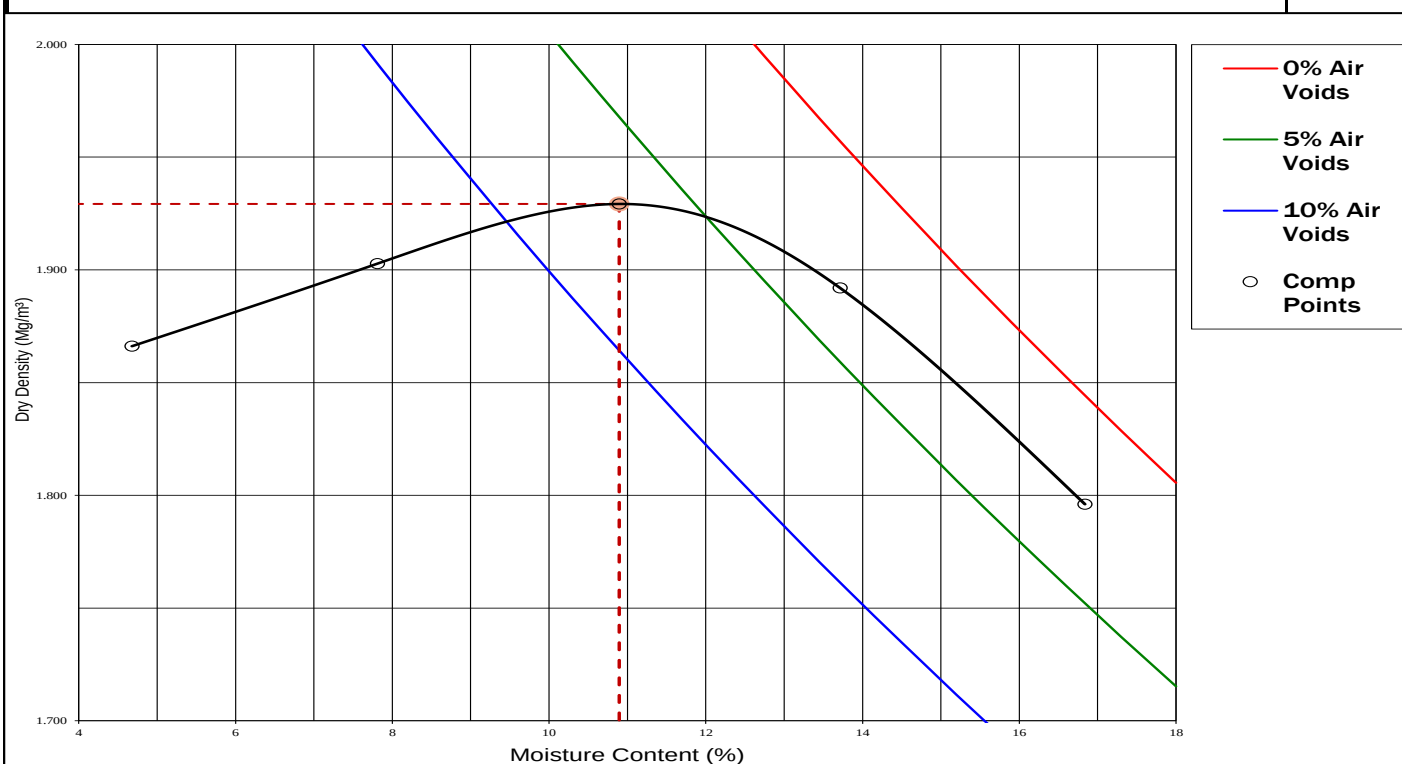
Laboratory Report	DNR-93244	Contract Sample No	DN2474/211	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk	
Report Date	24/01/2022	Clients Reference	DN2474/211		
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham	Material Description		Gravelly Clay		
	Date Sampled		17/12/2021		
	Sampling Plan		Client Specification		
	Source		Ex-Site		
	Supplier		Ex-Site		
	Sampled By		CTS		
	Sampling Environment		Overcast		
	Sample Type		Bulk	Date Received	17/12/2021
	Location in sample		N/A	Date Tests Completed	18/01/2022
	Sample Location		Phase 3-Mound 2	TEST REPORT	

Determination of Dry Density / Moisture Content Relationship

Tested In Accordance with BS 1377: Part 4: 1990 Clause 3.6.4.2 (4.5kg Rammer, CBR mould)

The test was carried out using separate samples, each prepared in Accordance with BS1377: Part 1: 2016 Clause 8.3.4(b)

Sample particle size adjustment: None



Optimum Moisture Content (%)	11 %
Maximum Dry Density	1.93 Mg/m³
Material Retained on 37.5mm test sieve	0 %
Material Retained on 20.0mm test sieve	8 %
Particle Density (Measured) Determined by BS1377:Part 2:1990 Clause 8.2	2.68 Mg/m³

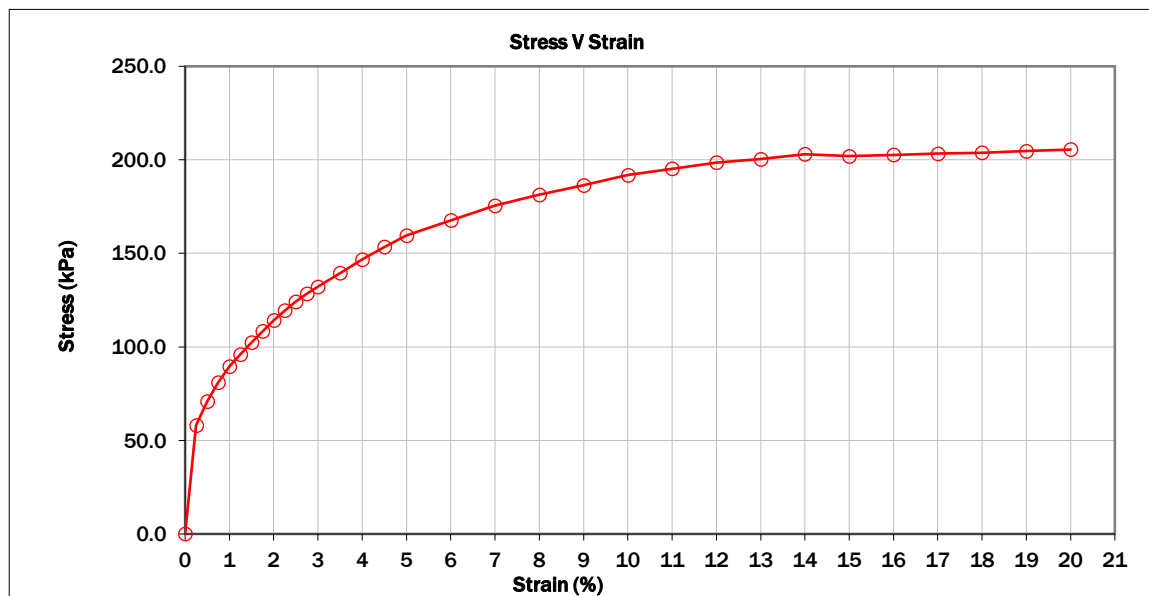
Laboratory Report	DNR-93244	Contract Sample No	DN2474/211	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU Tel: (01302) 352652 Web: www.constructiontesting.co.uk Email: enquiries@constructiontesting.co.uk  4161
Report Date	24/01/2022	Clients Reference	DN2474/211	
Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham		Material Description	Gravelly Clay	
		Date Sampled	17/12/2021	
		Sampling Plan	Client Specification	
		Source	Ex-Site	
		Supplier	Ex-Site	
		Sampled By	CTS	
		Sampling Environment	Overcast	
		Sample Type	Bulk	
Location in sample	N/A	Date Received	17/12/2021	
Sample Location	Phase 3-Mound 2	Date Tests Completed	18/01/2022	
TEST REPORT				

Determination of Undrained Shear Strength in Triaxial Compression Without Pore Pressure Measurement
Tested in Accordance with BS 1377: Part 7: 1990 Clause 8

Tests were conducted on a disturbed sample, recompacted using a 2.5kg rammer at as received moisture content.

Initial specimen height	200	mm
Initial specimen diameter	99.07	mm
Initial bulk density	2.16	Mg/m ³
Initial moisture content	16	%
Initial dry density	1.86	Mg/m ³
Rate of strain applied	1.00	%/min
Membrane thickness (latex)	0.33	mm
Membrane correction	1.3	kPa
Cell pressure	200	kPa
Corrected maximum deviator stress at failure	204	kPa
Strain at failure	20.0	%
Time at Failure	20 Minutes, 0 Seconds	
Mode of failure	Plastic	

Laboratory Temperature
18-22 °C



Undrained Shear Strength, c_u
102 kPa

Tested at rate of strain of 1%/minute as required by Specification for Highway Works Series 600, clause 633

Time to failure was outside the BS1377, 5 to 15 minute requirement for this test when carried out at the SHW required rate of 1%/minute.

Template Version: 1.6

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
 Results relate only to the sample(s) as received.

Authorised Signatory

This report may not be reproduced other than in full without the prior written approval of the issuing laboratory.
 The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the customer.

**** END OF REPORT ****

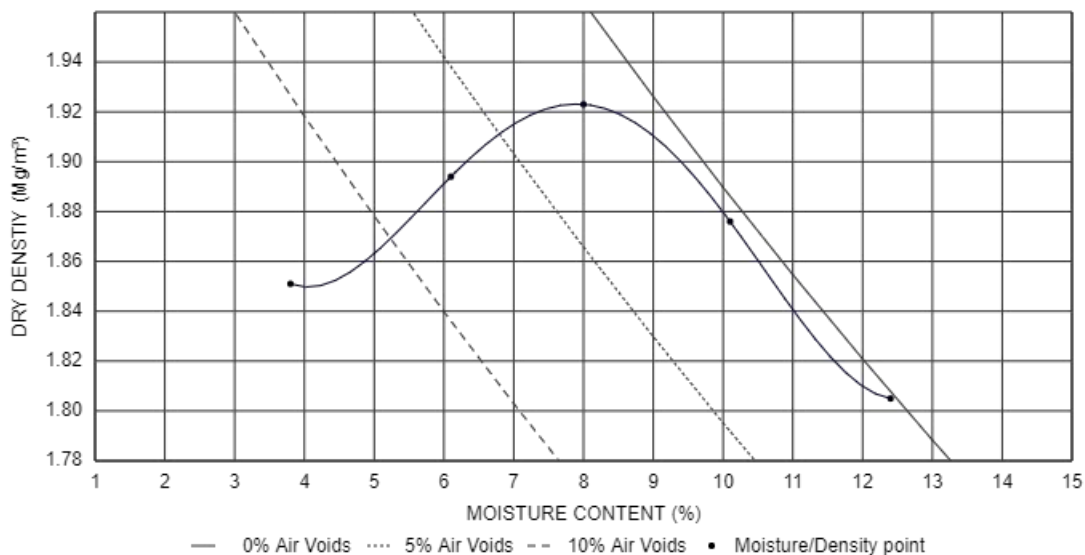
Construction Testing Solutions is a trading division of Construction Testing Solutions Ltd - Company No. 05998333

TEST REPORT:	DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP		
	BS 1377:Part 4:1990 clause 3.5 4.5kg Rammer method		
REPORT NUMBER:	C1054158 / 170797.4.1.1		
SAMPLE NUMBER:	265326	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/213	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	25/02/2022	LOCATION:	Surcharge
TESTED BY:	JS, CL	PREPARATION METHOD:	1 Ltr Mould (BS1377:Pt1:1990 Cl7.6.2) : Material chopped to <20mm, for cohesive soil.
TYPE OF SAMPLE:	Disturbed	COMPACTION SAMPLE:	Separate samples
VARIATIONS:	None	SAMPLING PLAN:	Client Provided

RESULT Test Location: CTS Doncaster

MAXIMUM DRY DENSITY: 1.92 Mg/m³
OPTIMUM MOISTURE CONTENT: 7.9 %
AMOUNT (By Dry Mass) RETAINED ON >20mm TEST SIEVE: 12 %
AMOUNT (By Dry Mass) RETAINED ON >37.5mm TEST SIEVE: 4 %
MEASURED PARTICLE DENSITY USED TO PLOT AIR VOIDS: 2.33 Mg/m³
 (measured in accordance with BS 1377: 1990:part 2)

MOISTURE CONTENT / DRY DENSITY RELATIONSHIP



Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 07-Mar-22



4161

Report Format: L/Rep S11-S14a/Rev 9

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1

Page 1 of 1

Howard Civil Engineering Ltd Unit 11 Acorn Business Park Killingbeck Drive Leeds LS14 6UF Site : DN2474 - Upper Hoyland Road, Rockingham	Chemistry Report Reference : A8725 Report Date : 28/02/2022	 Construction Testing Solutions Bootham Lane Industrial Estate Dunscroft Doncaster DN7 4JU T (01302) 352652 E enquiries@constructiontesting.co.uk W www.constructiontesting.co.uk 4161
	Date Received : 16/02/2022 Test Date : 24/02/2022	
	Laboratory Report No : DNR/96002-96007	
	Tests Carried out at: Doncaster Laboratory	
The test results included in this certificate relate only to the samples as tested. Every care should be taken to ensure samples are representative of the material to ensure test results are meaningful. Testing was performed in a temperature controlled laboratory at 20±5°C		

CERTIFICATE OF ANALYSIS

No. of Samples:	6	Sampling Plan Used:	Not Known					Samples prepared to methods stated in relevant test standards.				
No. of Determinands	7	Sampling Environment:	Not Known					* - test not included in the UKAS schedule for this laboratory				

Sample Reference	A8725-1	A8725-2	A8725-3	A8725-4	A8725-5	A8725-6				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil				
CTS Reference	DN2474/213	DN2474/214	DN2474/215	DN2474/216	DN2474/217	DN2474/218				
Lab Reference	DNR/96002	DNR/96003	DNR/96004	DNR/96005	DNR/96006	DNR/96007				
Sampling Location	Surcharge	Surcharge	Surcharge	Surcharge	Surcharge	Surcharge				
Material Description	Brown Clay/Soil	Brown Clay/Soil	Brown Clay/Soil	Brown Clay/Soil	Brown Clay/Soil	Brown Clay/Soil				
Date Sampled	02/02/2022	02/02/2022	02/02/2022	02/02/2022	02/02/2022	02/02/2022				

Test	Units									
1. pH	pH Units	7.5	7.5	7.3	7.4	7.7	7.6			
2. Loss on Ignition	%	12	14	16	17	21	14			
3. Passing 2mm Sieve	%	56	64	78	75	91	88			
4. Water Soluble Sulphate	mg/l SO4	720	840	1490	850	900	1140			
5. Acid Soluble Sulphate	% SO4	0.16	0.18	0.28	0.17	0.18	0.24			
6. Total Sulphur	%	0.89	1.22	1.07	11.78**	1.21	1.28			
7. Total Potential Sulphate	% SO4	2.7	3.7	3.2	35.4**	3.6	3.8			
		-	-	-	-	-	-			
		-	-	-	-	-	-			
		-	-	-	-	-	-			
		-	-	-	-	-	-			
		-	-	-	-	-	-			

Test Methods :	1. pH - BS 1377 : Part 3 : 2018 + A1 2021, clause 12 2. Loss on Ignition - BS 1377 : Part 3 : 2018 + A1 2021, clause 6 3. Passing 2mm Sieve - BS 1377 : Part 3 : 2018 + A1 2021 4. Water Soluble Sulphate - BS 1377 : Part 3 : 2018 + A1 2021, clause 7.5 (ICP-OES) 5. Acid Soluble Sulphate - BS 1377 : Part 3 : 2018 + A1 2021, clause 7.5 (ICP-OES) 6. Total Sulphur - BS 1377 : Part 3 : 2018 + A1 2021, clause 7.10 by Eltra CS800 Sulphur Analyser 7. Total Potential Sulphate - BS 1377 : Part 3 : 2018 + A1 2021, clause 7.10
----------------	---

Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. The laboratory does not apply a conformity statement to test reports as standard, unless specifically requested by the client.

This test report may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Comments : ** Results above the allowable range of our UKAS accredited procedure.	Signature :
--	-------------

Laboratory Report	DNR-96002-96007	Contract Sample No	DN2747/213-218
Report Date	03 March 2022	Clients Reference	DN2747/213-218
Howard Civil Engineering Unit 11, Acorn Business Park Killingbeck Drive Leeds LS14 6UF Upper Hoyland Road, Rockingham		Material Description	Brown Clay Soil
		Source	Ex Site
		Supplier	Ex Site
		Date Sampled	02/02/2022
		Date Received	02/02/2022
		Date Completed	03/03/2022
		Sample Location	Surcharge Won



Construction Testing Solutions

Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk

2 Stage WAC & ENV1

Please find enclosed test certificate (L22/00978/CTS-22-24332) supplied by our approved Sub-contract Laboratory, Nicholls Colton

Authorised Signatory



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

Construction Testing Solutions
Bootham Lane Industrial Estate
Dunscroft
Doncaster
DN7 4JU

Analytical Test Report: L22/00978/CTS - 22-24332

Your Project Reference: **21767 Upper Hoyland Road Rockingham**

Your Order Number: 21767 Samples Received / Instructed: 18/02/2022 / 18/02/2022

Report Issue Number: 1 Sample Tested: 18/02 to 03/03/2022

Samples Analysed: 6 soil samples Report issued: 03/03/2022

Signed

James Gane
Data Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

WAC Testing

Samples were leached in accordance with BS EN 12457-3: 2002.

Eluate Results are reported as the cumulative release at L/S 10 from eluates of L/S 2 and L/S 8. These results have been calculated in accordance with BS EN 12457-3:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 10/12/2020

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

L:\DATA\REPORTS\CTS\777\L22-00978-CTS - 22-24332.XLSM\TPH Codes

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Analytical Test Results - Soil

NC Reference			218138	218139	218140	218141	218142	218143
Client Sample ID			DN2474/213	DN2474/214	DN2474/215	DN2474/216	DN2474/217	DN2474/218
Client Sample Location			Surcharge	Surcharge	Surcharge	Surcharge	Surcharge	Surcharge
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			-	-	-	-	-	-
Depth - Bottom (m)			-	-	-	-	-	-
Date of Sampling			02/02/2022	02/02/2022	02/02/2022	02/02/2022	02/02/2022	02/02/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Arsenic	(mg/kg)	MCERTS	12	12	12	11	13	13
Boron (w/s)	(mg/kg)	u	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Cadmium	(mg/kg)	MCERTS	0.7	0.7	0.7	0.8	0.6	0.7
Chromium (Total)	(mg/kg)	UKAS	8.4	8.5	9.2	8.9	7.4	7.7
Copper	(mg/kg)	MCERTS	43	42	41	50	41	39
Lead	(mg/kg)	MCERTS	26	25	25	32	26	25
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	29	29	30	33	26	28
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	52	51	57	63	44	48
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Free)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate	(%)	u	0.54	0.71	0.52	0.48	0.56	0.50
pH	pH Units	MCERTS	7.3	7.4	7.3	7.4	7.7	7.7
Sulphate (Water soluble)	(mg/l)	u	2200	2500	2100	2000	2300	2000
Sulphide	(mg/kg)	u	26	97	36	31	28	33
Thiocyanate	(mg/kg)	u	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acenaphthene	(mg/kg)	MCERTS	0.14	0.13	0.11	0.12	0.13	0.07
Acenaphthylene	(mg/kg)	UKAS	< 0.02	0.03	0.03	0.03	0.03	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	0.07	0.06	0.07	0.07	0.07	0.05
Benzo (a) pyrene	(mg/kg)	MCERTS	0.06	0.05	0.05	0.05	0.05	0.04
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.07	0.06	0.07	0.07	0.07	0.04
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.09	0.09	0.09	0.09	0.10	0.07
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	0.12	0.11	0.11	0.12	0.13	0.07
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.12	0.13	0.11	0.12	0.12	0.07
Fluorene	(mg/kg)	MCERTS	0.14	0.12	0.13	0.14	0.15	0.08
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02
Naphthalene	(mg/kg)	MCERTS	1.1	1.0	0.92	1.1	1.2	0.70
Phenanthrene	(mg/kg)	MCERTS	0.71	0.67	0.66	0.69	0.76	0.47
Pyrene	(mg/kg)	MCERTS	0.12	0.12	0.12	0.12	0.12	0.08
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	2.8	2.7	2.5	2.8	3.1	1.9
Gasoline Range Organics (>C ₈ to C ₁₀) [EH_1D_Total]	(mg/kg)	UKAS	14	14	17	15	16	15
Diesel Range Organics (>C ₁₀ to C ₂₁) [EH_1D_Total]	(mg/kg)	MCERTS	66	66	78	65	69	64
Mineral Range Organics (>C ₂₁ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	72	78	89	79	80	80
Total TPH (>C ₈ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	150	160	180	160	170	160
SOM (via TOC)	(%)	UKAS	13	13	12	15	14	13

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference			218138			
Client Sample ID			DN2474/213			
Client Sample Location			Surcharge			
Client Sample Type			-			
Client Sample Number			-			
Depth - Top (m)			-			
Depth - Bottom (m)			-			
Date of Sampling			02/02/2022			
Time of Sampling			-			
Sample Description			Grey clayey sandy silt			
Sample Matrix			Sand			
Moisture Content (%)			5.3			
Stone content (%)			< 0.1			
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	7.3	3.0	5.0	6.0
Loss on Ignition	%	UKAS	17	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_10_Total]	mg/kg	u	137	500	-	-
PAH	mg/kg	u	2.9	100	-	-
pH	units	MCERTS	7.3	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.07	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.02	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	11	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	2100	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1900	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference			218139			
Client Sample ID			DN2474/214			
Client Sample Location			Surcharge			
Client Sample Type			-			
Client Sample Number			-			
Depth - Top (m)			-			
Depth - Bottom (m)			-			
Date of Sampling			02/02/2022			
Time of Sampling			-			
Sample Description			Grey clayey sandy silt			
Sample Matrix			Sand			
Moisture Content (%)			6.3			
Stone content (%)			< 0.1			
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	7.5	3.0	5.0	6.0
Loss on Ignition	%	UKAS	14	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH _{1D} _Total]	mg/kg	u	138	500	-	-
PAH	mg/kg	u	2.7	100	-	-
pH	units	MCERTS	7.4	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.11	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.04	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	6	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1900	1000	20000	50000
Total Dissolved Solids	mg/kg	u	2000	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference			218140			
Client Sample ID			DN2474/215			
Client Sample Location			Surcharge			
Client Sample Type			-			
Client Sample Number			-			
Depth - Top (m)			-			
Depth - Bottom (m)			-			
Date of Sampling			02/02/2022			
Time of Sampling			-			
Sample Description			Grey clayey sandy silt			
Sample Matrix			Sand			
Moisture Content (%)			6.2			
Stone content (%)			< 0.1			
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	7.2	3.0	5.0	6.0
Loss on Ignition	%	UKAS	14	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_10_Total]	mg/kg	u	170	500	-	-
PAH	mg/kg	u	2.6	100	-	-
pH	units	MCERTS	7.3	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.09	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.02	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	6	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1900	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1900	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference			218141			
Client Sample ID			DN2474/216			
Client Sample Location			Surcharge			
Client Sample Type			-			
Client Sample Number			-			
Depth - Top (m)			-			
Depth - Bottom (m)			-			
Date of Sampling			02/02/2022			
Time of Sampling			-			
Sample Description			Grey clayey sandy silt			
Sample Matrix			Sand			
Moisture Content (%)			7.1			
Stone content (%)			< 0.1			
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	8.7	3.0	5.0	6.0
Loss on Ignition	%	UKAS	14	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_10_Total]	mg/kg	u	139	500	-	-
PAH	mg/kg	u	2.8	100	-	-
pH	units	MCERTS	7.4	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.03	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	9	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1400	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1600	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference			218142			
Client Sample ID			DN2474/217			
Client Sample Location			Surcharge			
Client Sample Type			-			
Client Sample Number			-			
Depth - Top (m)			-			
Depth - Bottom (m)			-			
Date of Sampling			02/02/2022			
Time of Sampling			-			
Sample Description			Grey clayey sandy silt			
Sample Matrix			Sand			
Moisture Content (%)			5.4			
Stone content (%)			< 0.1			
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	8.3	3.0	5.0	6.0
Loss on Ignition	%	UKAS	14	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_10_Total]	mg/kg	u	148	500	-	-
PAH	mg/kg	u	3.1	100	-	-
pH	units	MCERTS	7.7	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.03	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	11	800	15000	25000
Fluoride	mg/kg	u	2	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1600	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1700	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	20.0	500	800	1000

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Certificate Of Analysis - WAC Suite

NC Reference			218143			
Client Sample ID			DN2474/218			
Client Sample Location			Surcharge			
Client Sample Type			-			
Client Sample Number			-			
Depth - Top (m)			-			
Depth - Bottom (m)			-			
Date of Sampling			02/02/2022			
Time of Sampling			-			
Sample Description			Grey clayey sandy silt			
Sample Matrix			Sand			
Moisture Content (%)			5.1			
Stone content (%)			< 0.1			
			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	7.8	3.0	5.0	6.0
Loss on Ignition	%	UKAS	14	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_10_Total]	mg/kg	u	147	500	-	-
PAH	mg/kg	u	1.9	100	-	-
pH	units	MCERTS	7.7	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.06	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.10	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.10	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.03	0.1	0.5	7
Zinc	mg/kg	u	< 0.10	4	50	200
Chloride	mg/kg	u	7	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	2100	1000	20000	50000
Total Dissolved Solids	mg/kg	u	2100	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	< 20	500	800	1000

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
218138	DN2474/213	Surcharge	-	-	Grey clayey sandy silt	5.3	< 0.1	100
218139	DN2474/214	Surcharge	-	-	Grey clayey sandy silt	6.3	< 0.1	100
218140	DN2474/215	Surcharge	-	-	Grey clayey sandy silt	6.2	< 0.1	100
218141	DN2474/216	Surcharge	-	-	Grey clayey sandy silt	7.1	< 0.1	100
218142	DN2474/217	Surcharge	-	-	Grey clayey sandy silt	5.4	< 0.1	100
218143	DN2474/218	Surcharge	-	-	Grey clayey sandy silt	5.1	< 0.1	100

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
218138	DN2474/213	Surcharge	-	-	VOC/BTEX - Sample taken from container with head space.
218139	DN2474/214	Surcharge	-	-	VOC/BTEX - Sample taken from container with head space.
218140	DN2474/215	Surcharge	-	-	VOC/BTEX - Sample taken from container with head space.
218141	DN2474/216	Surcharge	-	-	VOC/BTEX - Sample taken from container with head space.
218142	DN2474/217	Surcharge	-	-	VOC/BTEX - Sample taken from container with head space.
218143	DN2474/218	Surcharge	-	-	VOC/BTEX - Sample taken from container with head space.

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
TOCL	MS - CL - DOC	As received	BSEN:12457 Leaching	Determination of Dissolved Organic Carbon in leachates
ANIONSL	MS - CL - Anions by Aquakem	As received	-	Determination of Anions (inc Sulphate, chloride etc.) in leachate samples by Aquakem
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
BTEXS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of BTEX in soils via Headspace-GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
WSBORONS	MS - CL - WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP - Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
SULPHIDES	MS - CL - Sulphide in Soils	As received	Passing 10mm test sieve	Determination of sulphide in soil via titration
TDSL	MS - CL - TDS (Leachate)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates
SKALARPHL	MS - CL - Phenols by Skalar	As received	BSEN:12457 Leaching	Determination of total phenols in leachates using Skalar segmented flow analyser
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
ENLEACHP2	BS EN 12457-3	As Received	-	Leaching in accordance with BSEN 12457-3
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 LoI	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
218138	DN2474/213	Surcharge	-	-	BS1377 Lol	X
218138	DN2474/213	Surcharge	-	-	MS - CL - Cyanide by Skalar	RX
218138	DN2474/213	Surcharge	-	-	MS - CL - PAH (As Received)	RX
218138	DN2474/213	Surcharge	-	-	MS - CL - Phenols by Skalar	RX
218138	DN2474/213	Surcharge	-	-	MS - CL - TPH (GC-FID)	RX
218138	DN2474/213	Surcharge	-	-	MS - CL - VOC and MBTEX	RX
218138	DN2474/213	Surcharge	-	-	MS - CL - pH in Soils	RX
218138	DN2474/213	Surcharge	-	-	MS - CL - pH in Soils (WAC)	RX
218139	DN2474/214	Surcharge	-	-	BS1377 Lol	X
218139	DN2474/214	Surcharge	-	-	MS - CL - Cyanide by Skalar	RX
218139	DN2474/214	Surcharge	-	-	MS - CL - PAH (As Received)	RX
218139	DN2474/214	Surcharge	-	-	MS - CL - Phenols by Skalar	RX
218139	DN2474/214	Surcharge	-	-	MS - CL - TPH (GC-FID)	RX
218139	DN2474/214	Surcharge	-	-	MS - CL - VOC and MBTEX	RX
218139	DN2474/214	Surcharge	-	-	MS - CL - pH in Soils	RX
218139	DN2474/214	Surcharge	-	-	MS - CL - pH in Soils (WAC)	RX
218140	DN2474/215	Surcharge	-	-	BS1377 Lol	X
218140	DN2474/215	Surcharge	-	-	MS - CL - Cyanide by Skalar	RX
218140	DN2474/215	Surcharge	-	-	MS - CL - PAH (As Received)	RX
218140	DN2474/215	Surcharge	-	-	MS - CL - Phenols by Skalar	RX
218140	DN2474/215	Surcharge	-	-	MS - CL - TPH (GC-FID)	RX
218140	DN2474/215	Surcharge	-	-	MS - CL - VOC and MBTEX	RX
218140	DN2474/215	Surcharge	-	-	MS - CL - pH in Soils	RX
218140	DN2474/215	Surcharge	-	-	MS - CL - pH in Soils (WAC)	RX
218141	DN2474/216	Surcharge	-	-	BS1377 Lol	X
218141	DN2474/216	Surcharge	-	-	MS - CL - Cyanide by Skalar	RX
218141	DN2474/216	Surcharge	-	-	MS - CL - PAH (As Received)	RX
218141	DN2474/216	Surcharge	-	-	MS - CL - Phenols by Skalar	RX
218141	DN2474/216	Surcharge	-	-	MS - CL - TPH (GC-FID)	RX
218141	DN2474/216	Surcharge	-	-	MS - CL - VOC and MBTEX	RX
218141	DN2474/216	Surcharge	-	-	MS - CL - pH in Soils	RX
218141	DN2474/216	Surcharge	-	-	MS - CL - pH in Soils (WAC)	RX
218142	DN2474/217	Surcharge	-	-	BS1377 Lol	X
218142	DN2474/217	Surcharge	-	-	MS - CL - Cyanide by Skalar	RX
218142	DN2474/217	Surcharge	-	-	MS - CL - PAH (As Received)	RX
218142	DN2474/217	Surcharge	-	-	MS - CL - Phenols by Skalar	RX
218142	DN2474/217	Surcharge	-	-	MS - CL - TPH (GC-FID)	RX
218142	DN2474/217	Surcharge	-	-	MS - CL - VOC and MBTEX	RX
218142	DN2474/217	Surcharge	-	-	MS - CL - pH in Soils	RX
218142	DN2474/217	Surcharge	-	-	MS - CL - pH in Soils (WAC)	RX

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
218143	DN2474/218	Surcharge	-	-	BS1377 LoI	X
218143	DN2474/218	Surcharge	-	-	MS - CL - Cyanide by Skalar	RX
218143	DN2474/218	Surcharge	-	-	MS - CL - PAH (As Received)	RX
218143	DN2474/218	Surcharge	-	-	MS - CL - Phenols by Skalar	RX
218143	DN2474/218	Surcharge	-	-	MS - CL - TPH (GC-FID)	RX
218143	DN2474/218	Surcharge	-	-	MS - CL - VOC and MBTEX	RX
218143	DN2474/218	Surcharge	-	-	MS - CL - pH in Soils	RX
218143	DN2474/218	Surcharge	-	-	MS - CL - pH in Soils (WAC)	RX



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/00978/CTS - 22-24332

Project Reference - 21767 Upper Hoyland Road Rockingham

HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

TEST REPORT:

TEST REPORT: DETERMINATION OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT

BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving and BS 1377 2 : 1990, Method 3.2

REPORT NUMBER:

C1054158 / 170797.5.1.1

SAMPLE NUMBER:

265326

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/213

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Client

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

04/03/2022

CLASSIFICATION:

Class 2C

TESTED BY:

JW, CL, RF, BH

LOCATION:

Surcharge

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS 1377:Part 1:1990 clause 7.3 & 7.4.5

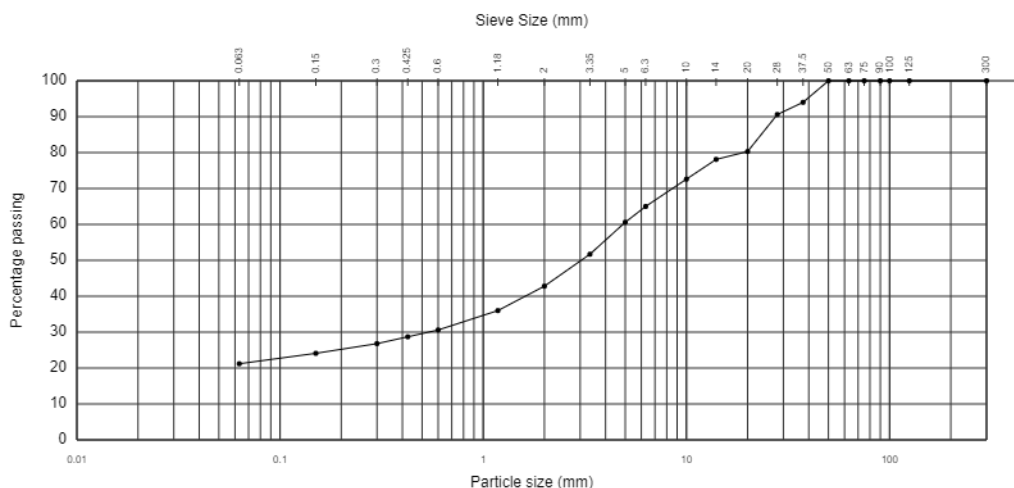
VARIATIONS:

No variations

SAMPLING PLAN:

Client Provided

RESULT Test Location: CTS Doncaster



SIEVE ANALYSIS

Particle Diameter mm	Passing %	Specification Limits
500	100	
300	100	
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	94	
28	91	
20	80	
14	78	
10	73	
6.3	65	
5	61	
3.35	52	
2	43	15 - 80
1.18	36	
0.6	31	
0.425	29	
0.3	27	
0.15	24	
0.063	21	15 - 80

Class 2C - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2C

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum.

Sample complies with the grading specification

Moisture content: 7.5%

Remarks:

Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 07-Mar-22



4161

Report Format: L/Rep S6a/Rev 10

Bootham Lane Industrial Estate,
Dunscoft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT:
DETERMINATION OF MOISTURE CONDITION VALUE (M.C.V.)

BS 1377 Part 4 : 1990 Clause 5.4 - Natural Moisture Content (Lab Test)

REPORT NUMBER:

C1054158 / 170797.2.1.1

SAMPLE NUMBER:

265326

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/213

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

24/02/2022

FILL LOCATION:

Surcharge

TESTED BY:

Ryan Firth

CERTIFICATE OF SAMPLING:

No

TYPE OF SAMPLE:

Disturbed

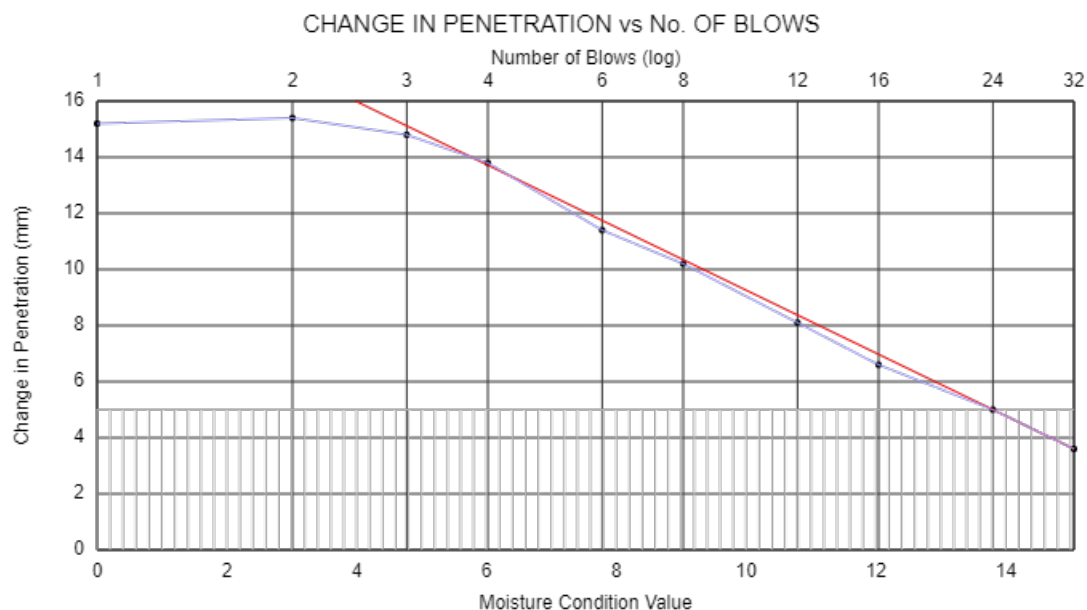
SAMPLING PLAN:

Client Provided

RESULTS

Test Location: CTS Doncaster

MOISTURE CONDITION VALUE	13.8
NATURAL MOISTURE CONTENT (%)	8.4
PERCENTAGE RETAINED 20mm (%)	145.6
INTERPRETATION OF CURVE	Steepest straight line
PREPARATION METHOD	BS 1377: Part 4: 1990 clause 5.4 (Natural and sieved through 20mm test sieve)


Remarks:

Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.
 Amended report. This test report supersedes test report version 1 -

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 24-Feb-22



4161

Report Format: L/Rep S10a/Rev 4

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
 www.constructiontesting.co.uk
 END OF REPORT

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 2

Page 1 of 1

TEST REPORT: **DETERMINATION OF THE PLASTICITY INDEX OF SOIL**
 BS 1377:Part 2:1990 clause 5.4

REPORT NUMBER: C1054158 / 170797.1.1.1

SAMPLE NUMBER: 265326 **CLIENT:** Howard Civil Engineering

CLIENT REF: DN2474/213 **ADDRESS:** Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED: 02/02/2022 **SITE:** Upper Hoyland Road, Rockingham

SAMPLED BY: Unknown **SUPPLIER:** Site Won, Site Won

DATE RECEIVED: 08/02/2022 **MATERIAL:** Brown Clay/Soil

DATE COMPLETED: 28/02/2022 **LOCATION:** Surcharge,

TESTED BY: Bethany Higgins **PREPARATION METHOD:** BS 1377:Part 1:1990 cl 7.3 & 7.4.3

TYPE OF SAMPLE: Disturbed **VARIATIONS:** None

WITHIN ORIGINAL SAMPLE: N/A

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	36%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	27%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	9%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	71%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S4/rev.6

Bootham Lane Industrial Estate,
 Dunscroft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 07-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:

DETERMINATION OF PARTICLE DENSITY

BS 1377:Part 2:1990 Gas Jar Method

REPORT NUMBER:

C1054158 / 170797.3.1.1

SAMPLE NUMBER:

See Below

CLIENT:

Howard Civil Engineering

CLIENT REF:

See Below

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

25/02/2022

LOCATION:

Surcharge

TESTED BY:

CL, MD

SAMPLING PLAN:

Client Provided

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD: :

BS1377:Part1:1990 clauses 7.3 and 7.4.2

ORIENTATION OF TEST SPECIMEN
WITHIN ORIGINAL SAMPLE:

N/A

VARIATIONS:

None

METHOD OF PREPARATION:

None

RESULT Test Location: CTS Doncaster

SAMPLE NO	CLIENT SAMPLE REF	MATERIAL	PARTICLE DENSITY Mg.m ³
265326	DN2474/213	Brown Clay/Soil	2.33

Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S7A/Rev 4

Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 07-Mar-22

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1



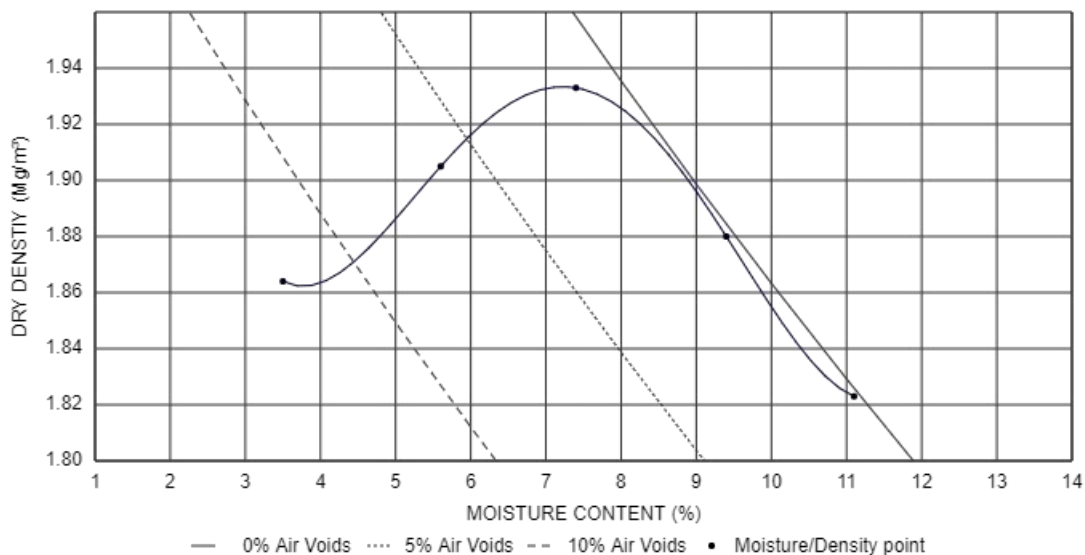
4161

TEST REPORT:	DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP		
	BS 1377:Part 4:1990 clause 3.5 4.5kg Rammer method		
REPORT NUMBER:	C1054158 / 170797.10.1.1		
SAMPLE NUMBER:	265328	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/214	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	25/02/2022	LOCATION:	Surcharge
TESTED BY:	JS, CL	PREPARATION METHOD:	1 Ltr Mould (BS1377:Pt1:1990 Cl7.6.2) : Material chopped to <20mm, for cohesive soil.
TYPE OF SAMPLE:	Disturbed	COMPACTION SAMPLE:	
VARIATIONS:	None	SAMPLING PLAN:	Client Provided

RESULT Test Location: CTS Doncaster

MAXIMUM DRY DENSITY: 1.93 Mg/m³
OPTIMUM MOISTURE CONTENT: 7.3 %
AMOUNT (By Dry Mass) RETAINED ON >20mm TEST SIEVE: 14 %
AMOUNT (By Dry Mass) RETAINED ON >37.5mm TEST SIEVE: 8 %
MEASURED PARTICLE DENSITY USED TO PLOT AIR VOIDS: 2.29 Mg/m³
 (measured in accordance with BS 1377: 1990:part 2)

MOISTURE CONTENT / DRY DENSITY RELATIONSHIP



Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 07-Mar-22



4161

Report Format: L/Rep S11-S14a/Rev 9

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT:

TEST REPORT: DETERMINATION OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT

BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving and BS 1377 2 : 1990, Method 3.2

REPORT NUMBER:

C1054158 / 170797.11.1.1

SAMPLE NUMBER:

265328

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/214

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Client

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

10/03/2022

CLASSIFICATION:

Class 2C

TESTED BY:

JW, CL, BH

LOCATION:

N/A

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS 1377:Part 1:1990 clause 7.3 & 7.4.5

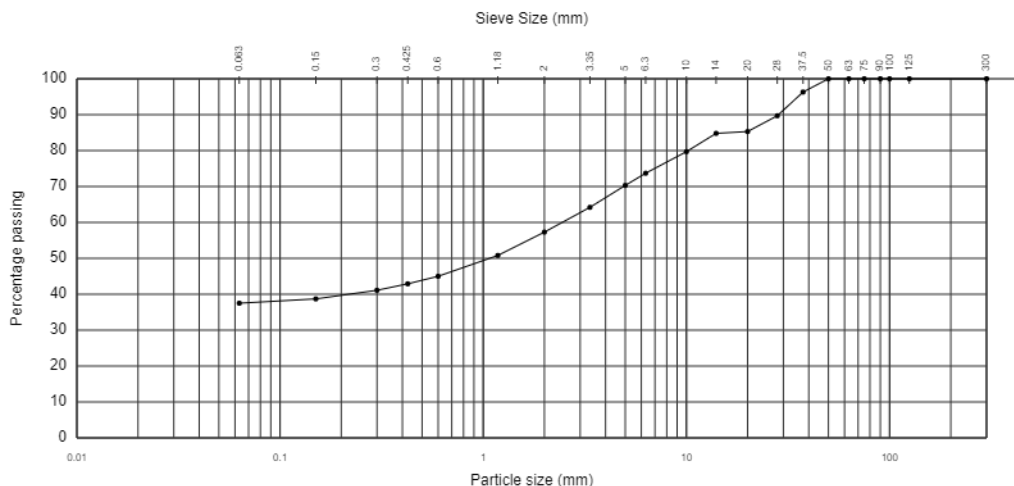
VARIATIONS:

No variations

SAMPLING PLAN:

Client Provided

RESULT Test Location: CTS Doncaster



SIEVE ANALYSIS

Particle Diameter mm	Passing %	Specification Limits
500	100	
300	100	
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	96	
28	90	
20	85	
14	85	
10	80	
6.3	74	
5	70	
3.35	64	
2	57	15 - 80
1.18	51	
0.6	45	
0.425	43	
0.3	41	
0.15	39	
0.063	38	15 - 80

Class 2C - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2C

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum.

Sample complies with the grading specification

Moisture content: 8.5%

Remarks:

Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 17-Mar-22



4161

Report Format: L/Rep S6a/Rev 10

Bootham Lane Industrial Estate,
Dunscoft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT:
DETERMINATION OF MOISTURE CONDITION VALUE (M.C.V.)

BS 1377 Part 4 : 1990 Clause 5.4 - Natural Moisture Content (Lab Test)

REPORT NUMBER:

C1054158 / 170797.8.1.1

SAMPLE NUMBER:

265328

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/214

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

24/02/2022

FILL LOCATION:

Surcharge

TESTED BY:

Ryan Firth

CERTIFICATE OF SAMPLING:

No

TYPE OF SAMPLE:

Disturbed

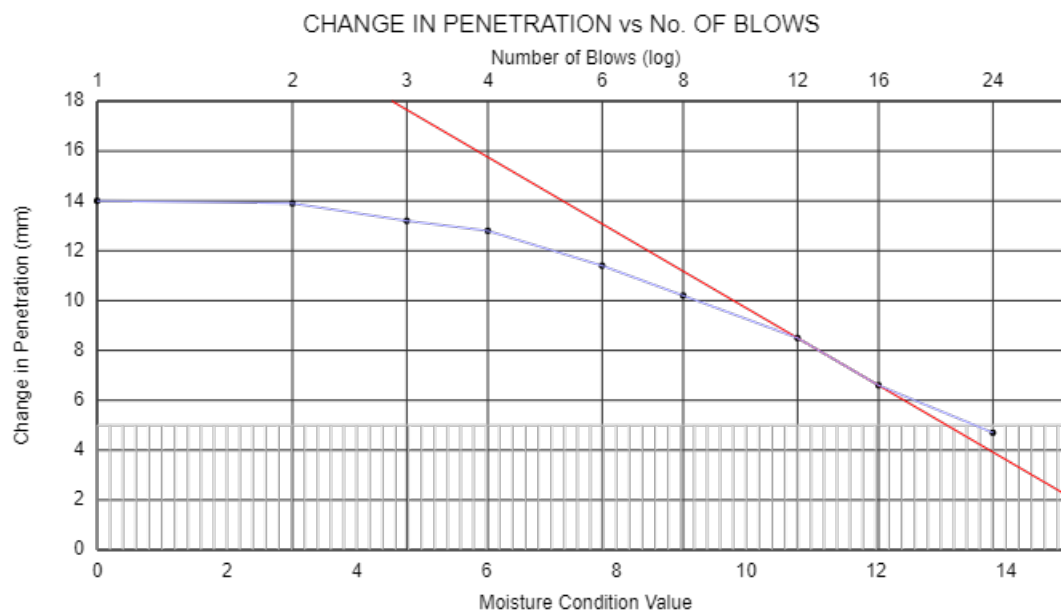
SAMPLING PLAN:

Client Provided

RESULTS

Test Location: CTS Doncaster

MOISTURE CONDITION VALUE	13.1
NATURAL MOISTURE CONTENT (%)	8.4
PERCENTAGE RETAINED 20mm (%)	144.2
INTERPRETATION OF CURVE	Steepest straight line
PREPARATION METHOD	BS 1377: Part 4: 1990 clause 5.4 (Natural and sieved through 20mm test sieve)


Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 24-Feb-22



4161

Report Format: L/Rep S10a/Rev 4

 Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

 0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

 Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT:	DETERMINATION OF THE PLASTICITY INDEX OF SOIL		
	BS 1377:Part 2:1990 clause 5.4		
REPORT NUMBER:	C1054158 / 170797.7.1.1		
SAMPLE NUMBER:	265328	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/214	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	28/02/2022	LOCATION:	Surcharge,
TESTED BY:	Bethany Higgins	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	37%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	20%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	17%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	82%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S4/rev.6

Bootham Lane Industrial Estate,
 Dunscroft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 07-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:

DETERMINATION OF PARTICLE DENSITY

BS 1377:Part 2:1990 Gas Jar Method

REPORT NUMBER:

C1054158 / 170797.9.1.1

SAMPLE NUMBER:

See Below

CLIENT:

Howard Civil Engineering

CLIENT REF:

See Below

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

25/02/2022

LOCATION:

Surcharge

TESTED BY:

CL, MD

SAMPLING PLAN:

Client Provided

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD: :

BS1377:Part1:1990 clauses 7.3 and 7.4.2

ORIENTATION OF TEST SPECIMEN
WITHIN ORIGINAL SAMPLE:

N/A

VARIATIONS:

None

METHOD OF PREPARATION:

None

RESULT Test Location: CTS Doncaster

SAMPLE NO	CLIENT SAMPLE REF	MATERIAL	PARTICLE DENSITY Mg.m ³
265328	DN2474/214	Brown Clay/Soil	2.29

Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S7A/Rev 4

Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 07-Mar-22

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1



4161

TEST REPORT:

TEST REPORT: DETERMINATION OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT

BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving and BS 1377 2 : 1990, Method 3.2

REPORT NUMBER:

C1054158 / 170797.17.1.1

SAMPLE NUMBER:

265330

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/215

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham - SITE

SAMPLED BY:

Client

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

10/03/2022

CLASSIFICATION:

Class 2C

TESTED BY:

JW, CL, BH

LOCATION:

Surcharge

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS 1377:Part 1:1990 clause 7.3 & 7.4.5

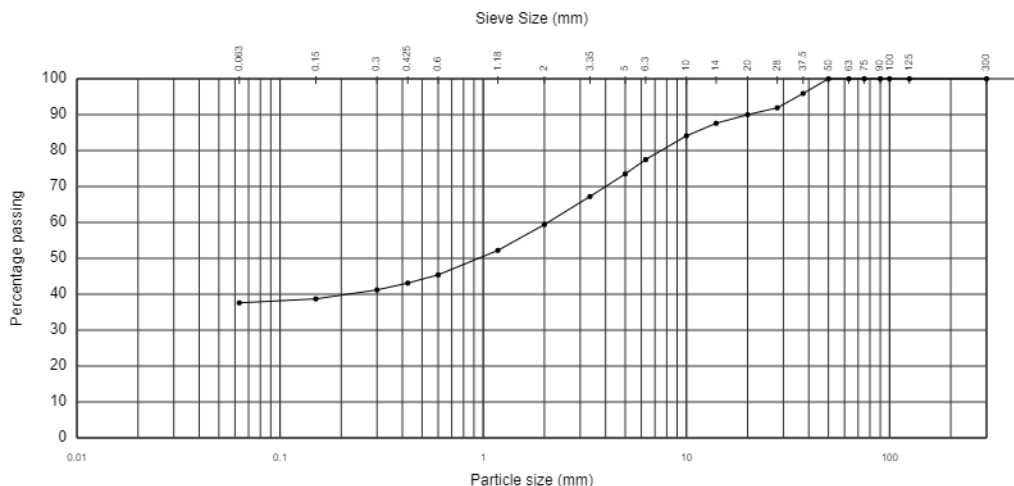
VARIATIONS:

No variations

SAMPLING PLAN:

Client Provided

RESULT Test Location: CTS Doncaster



SIEVE ANALYSIS

Particle Diameter mm	Passing %	Specification Limits
500	100	
300	100	
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	96	
28	92	
20	90	
14	88	
10	84	
6.3	78	
5	74	
3.35	67	
2	59	15 - 80
1.18	52	
0.6	45	
0.425	43	
0.3	41	
0.15	39	
0.063	38	15 - 80

Class 2C - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2C

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum.

Sample complies with the grading specification

Moisture content: 8.7%

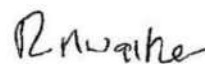
Remarks:

Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Reece Walker - Senior Technician



Approved Signatory

Report date 25-Mar-22

Construction Testing Solutions Ltd.

Registered in England No. 05998333



4161

Report Format: L/Rep S6a/Rev 10

Bootham Lane Industrial Estate,
Dunscoft,
Doncaster,
South Yorkshire DN7 4JU

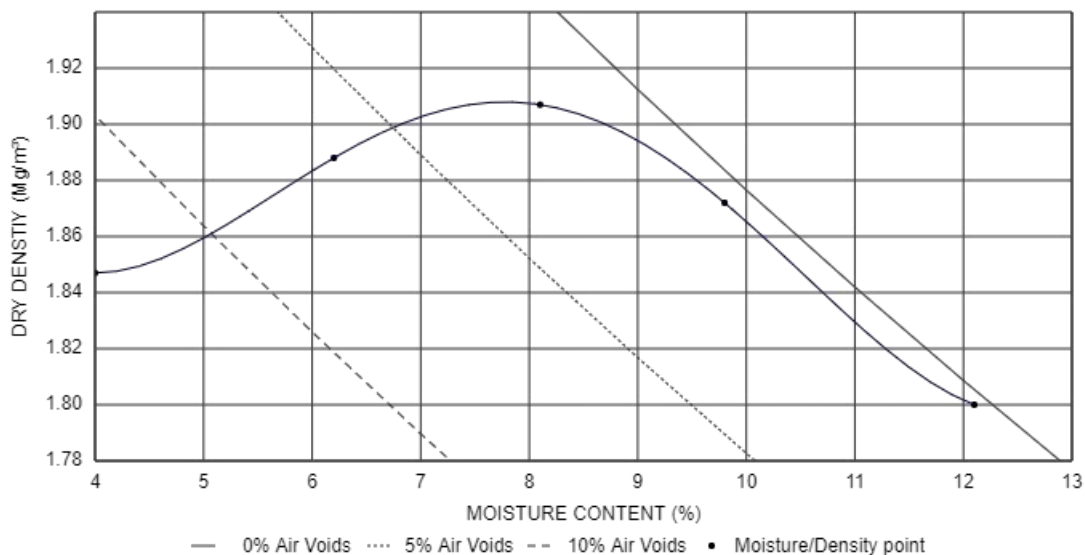
0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

TEST REPORT:	DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP		
	BS 1377:Part 4:1990 clause 3.5 4.5kg Rammer method		
REPORT NUMBER:	C1054158 / 170797.16.1.1		
SAMPLE NUMBER:	265330	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/215	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	25/02/2022	LOCATION:	Surcharge
TESTED BY:	JS, CL	PREPARATION METHOD:	1 Ltr Mould (BS1377:Pt1:1990 Cl7.6.2) : Material chopped to <20mm, for cohesive soil.
TYPE OF SAMPLE:	Disturbed	COMPACTION SAMPLE:	Separate samples
VARIATIONS:	None	SAMPLING PLAN:	Client Provided

RESULT Test Location: CTS Doncaster

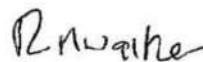
MAXIMUM DRY DENSITY: 1.91 Mg/m³
OPTIMUM MOISTURE CONTENT: 7.8 %
AMOUNT (By Dry Mass) RETAINED ON >20mm TEST SIEVE: 13 %
AMOUNT (By Dry Mass) RETAINED ON >37.5mm TEST SIEVE: 6 %
MEASURED PARTICLE DENSITY USED TO PLOT AIR VOIDS: 2.31 Mg/m³
 (measured in accordance with BS 1377: 1990:part 2)

MOISTURE CONTENT / DRY DENSITY RELATIONSHIP



Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS
 Reece Walker - Senior Technician



Approved Signatory
 Report date 01-Mar-22



4161

Report Format: L/Rep S11-S14a/Rev 9

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT: **DETERMINATION OF THE PLASTICITY INDEX OF SOIL**
 BS 1377:Part 2:1990 clause 5.4

REPORT NUMBER: C1054158 / 170797.13.1.1

SAMPLE NUMBER: 265330 **CLIENT:** Howard Civil Engineering

CLIENT REF: DN2474/215 **ADDRESS:** Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED: 02/02/2022 **SITE:** Upper Hoyland Road, Rockingham

SAMPLED BY: Unknown **SUPPLIER:** Site Won, Site Won

DATE RECEIVED: 08/02/2022 **MATERIAL:** Brown Clay/Soil

DATE COMPLETED: 28/02/2022 **LOCATION:** Surcharge,

TESTED BY: Bethany Higgins **PREPARATION METHOD:** BS 1377:Part 1:1990 cl 7.3 & 7.4.3

TYPE OF SAMPLE: Disturbed **VARIATIONS:** None

WITHIN ORIGINAL SAMPLE: N/A

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	36%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	22%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	14%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	77%		
Sample History:	The material was tested after washing through a 425µm test sieve		

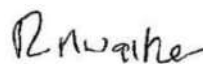
Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S4/rev.6

Bootham Lane Industrial Estate,
 Dunscroft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Reece Walker - Senior Technician



Approved Signatory
 Report date 01-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:

DETERMINATION OF PARTICLE DENSITY

BS 1377:Part 2:1990 Gas Jar Method

REPORT NUMBER:

C1054158 / 170797.15.1.1

SAMPLE NUMBER:

See Below

CLIENT:

Howard Civil Engineering

CLIENT REF:

See Below

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

24/02/2022

LOCATION:

Surcharge

TESTED BY:

CL, MD

SAMPLING PLAN:

Client Provided

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD: :

BS1377:Part1:1990 clauses 7.3 and 7.4.2

ORIENTATION OF TEST SPECIMEN
WITHIN ORIGINAL SAMPLE:

N/A

VARIATIONS:

None

METHOD OF PREPARATION:

None

RESULT Test Location: CTS Doncaster

SAMPLE NO	CLIENT SAMPLE REF	MATERIAL	PARTICLE DENSITY Mg.m ³
265330	DN2474/215	Brown Clay/Soil	2.31

Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

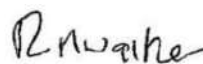
Report Format: L/Rep S7A/Rev 4

Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

For and on behalf of CTS

Reece Walker - Senior Technician



Approved Signatory

Report date 01-Mar-22

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1



4161

TEST REPORT: **DETERMINATION OF MOISTURE CONDITION VALUE (M.C.V.)**
 BS 1377 Part 4 : 1990 Clause 5.4 - Natural Moisture Content (Lab Test)

REPORT NUMBER: C1054158 / 170797.14.1.1

SAMPLE NUMBER: 265330 **CLIENT:** Howard Civil Engineering

CLIENT REF: DN2474/215 **ADDRESS:** Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED: 02/02/2022 **SITE:** Upper Hoyland Road, Rockingham

SAMPLED BY: Unknown **SUPPLIER:** Site Won, Site Won

DATE RECEIVED: 08/02/2022 **MATERIAL:** Brown Clay/Soil

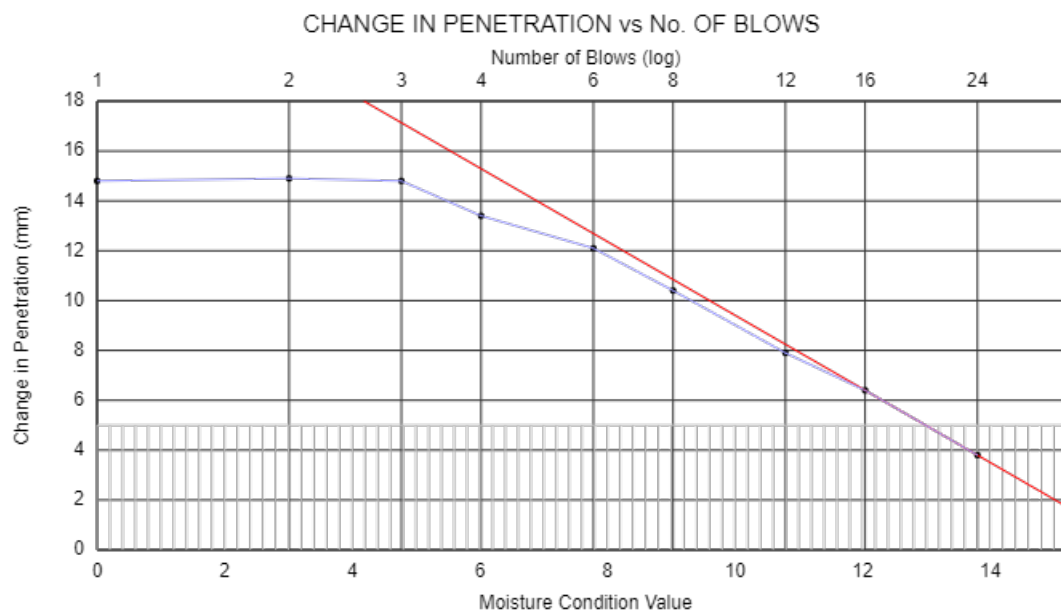
DATE COMPLETED: 24/02/2022 **FILL LOCATION:** Surcharge

TESTED BY: Ryan Firth **CERTIFICATE OF SAMPLING:** No

TYPE OF SAMPLE: Disturbed **SAMPLING PLAN:** Client Provided

RESULTS Test Location: CTS Doncaster

MOISTURE CONDITION VALUE	13.0
NATURAL MOISTURE CONTENT (%)	8.9
PERCENTAGE RETAINED 20mm (%)	94.1
INTERPRETATION OF CURVE	Steepest straight line
PREPARATION METHOD	BS 1377: Part 4: 1990 clause 5.4 (Natural and sieved through 20mm test sieve)



Remarks:
 Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S10a/Rev 4

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 24-Feb-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:

TEST REPORT: DETERMINATION OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT

BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving and BS 1377 2 : 1990, Method 3.2

REPORT NUMBER:

C1054158 / 170797.23.1.1

SAMPLE NUMBER:

265333

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/216

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham - SITE

SAMPLED BY:

Client

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

10/03/2022

CLASSIFICATION:

Class 2C

TESTED BY:

JW, CL, BH

LOCATION:

Surcharge

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS 1377:Part 1:1990 clause 7.3 & 7.4.5

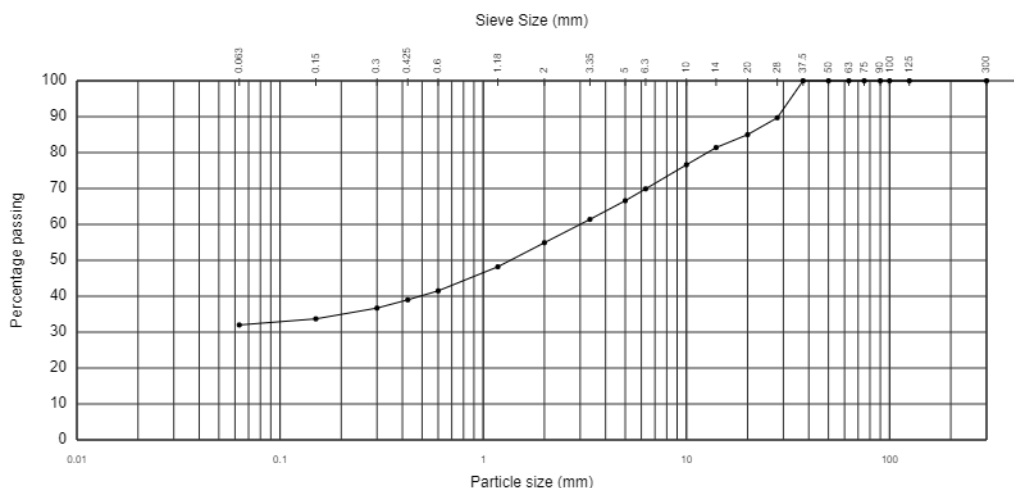
VARIATIONS:

No variations

SAMPLING PLAN:

Client Provided

RESULT Test Location: CTS Doncaster



SIEVE ANALYSIS

Particle Diameter mm	Passing %	Specification Limits
500	100	
300	100	
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	100	
28	90	
20	85	
14	81	
10	77	
6.3	70	
5	67	
3.35	61	
2	55	15 - 80
1.18	48	
0.6	42	
0.425	39	
0.3	37	
0.15	34	
0.063	32	15 - 80

Class 2C - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2C

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum.

Sample complies with the grading specification

Moisture content: 8.0%

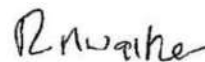
Remarks:

Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Reece Walker - Senior Technician



Approved Signatory

Report date 25-Mar-22

Construction Testing Solutions Ltd.

Registered in England No. 05998333



4161

Report Format: L/Rep S6a/Rev 10

Bootham Lane Industrial Estate,
Dunscoft,
Doncaster,
South Yorkshire DN7 4JU

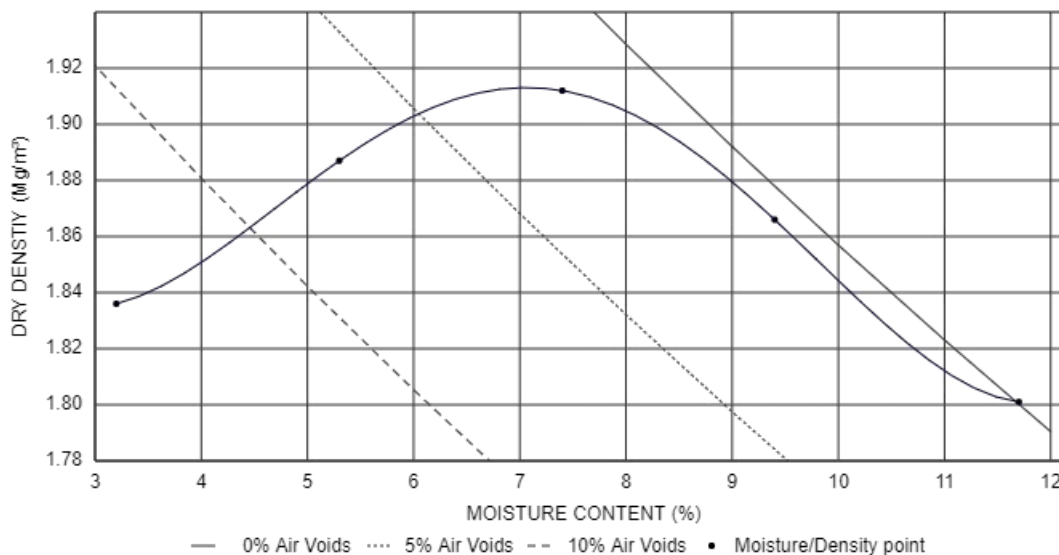
0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

TEST REPORT:	DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP		
	BS 1377:Part 4:1990 clause 3.5 4.5kg Rammer method		
REPORT NUMBER:	C1054158 / 170797.22.1.1		
SAMPLE NUMBER:	265333	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/216	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	25/02/2022	LOCATION:	Surcharge
TESTED BY:	JS, CL	PREPARATION METHOD:	1 Ltr Mould (BS1377:Pt1:1990 Cl7.6.2) : Material chopped to <20mm, for cohesive soil.
TYPE OF SAMPLE:	Disturbed	COMPACTION SAMPLE:	Separate samples
VARIATIONS:	None	SAMPLING PLAN:	Client Provided

RESULT Test Location: CTS Doncaster

MAXIMUM DRY DENSITY: 1.91 Mg/m³
OPTIMUM MOISTURE CONTENT: 6.9 %
AMOUNT (By Dry Mass) RETAINED ON >20mm TEST SIEVE: 11 %
AMOUNT (By Dry Mass) RETAINED ON >37.5mm TEST SIEVE: 5 %
MEASURED PARTICLE DENSITY USED TO PLOT AIR VOIDS: 2.27 Mg/m³
 (measured in accordance with BS 1377: 1990:part 2)

MOISTURE CONTENT / DRY DENSITY RELATIONSHIP



Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S11-S14a/Rev 9

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Reece Walker - Senior Technician

Reece Walker

Approved Signatory
 Report date 01-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:	DETERMINATION OF THE PLASTICITY INDEX OF SOIL		
	BS 1377:Part 2:1990 clause 5.4		
REPORT NUMBER:	C1054158 / 170797.19.1.1		
SAMPLE NUMBER:	265333	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/216	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	28/02/2022	LOCATION:	Surcharge,
TESTED BY:	Bethany Higgins	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	38%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	23%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	15%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	77%		
Sample History:	The material was tested after washing through a 425µm test sieve		

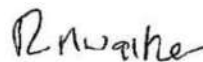
Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S4/rev.6

Bootham Lane Industrial Estate,
 Dunscroft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Reece Walker - Senior Technician



Approved Signatory
 Report date 01-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:

DETERMINATION OF PARTICLE DENSITY

BS 1377:Part 2:1990 Gas Jar Method

REPORT NUMBER:

C1054158 / 170797.21.1.1

SAMPLE NUMBER:

See Below

CLIENT:

Howard Civil Engineering

CLIENT REF:

See Below

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

25/02/2022

LOCATION:

Surcharge

TESTED BY:

CL, MD

SAMPLING PLAN:

Client Provided

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD: :

BS1377:Part1:1990 clauses 7.3 and 7.4.2

ORIENTATION OF TEST SPECIMEN
WITHIN ORIGINAL SAMPLE:

N/A

VARIATIONS:

None

METHOD OF PREPARATION:

None

RESULT Test Location: CTS Doncaster

SAMPLE NO	CLIENT SAMPLE REF	MATERIAL	PARTICLE DENSITY Mg.m ³
265333	DN2474/216	Brown Clay/Soil	2.27

Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

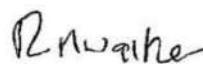
Report Format: L/Rep S7A/Rev 4

Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

For and on behalf of CTS

Reece Walker - Senior Technician



Approved Signatory

Report date 01-Mar-22

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1



4161

TEST REPORT:
DETERMINATION OF MOISTURE CONDITION VALUE (M.C.V.)

BS 1377 Part 4 : 1990 Clause 5.4 - Natural Moisture Content (Lab Test)

REPORT NUMBER:

C1054158 / 170797.20.1.1

SAMPLE NUMBER:

265333

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/216

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

24/02/2022

FILL LOCATION:

Surcharge

TESTED BY:

Ryan Firth

CERTIFICATE OF SAMPLING:

No

TYPE OF SAMPLE:

Disturbed

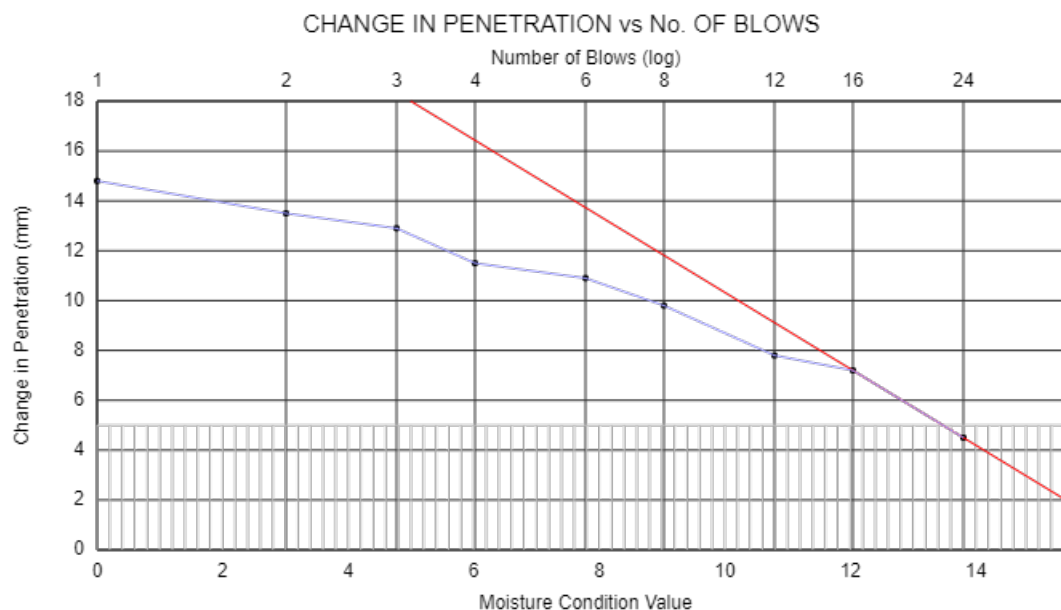
SAMPLING PLAN:

Client Provided

RESULTS

Test Location: CTS Doncaster

MOISTURE CONDITION VALUE	13.5
NATURAL MOISTURE CONTENT (%)	8.2
PERCENTAGE RETAINED 20mm (%)	45.2
INTERPRETATION OF CURVE	Steepest straight line
PREPARATION METHOD	BS 1377: Part 4: 1990 clause 5.4 (Natural and sieved through 20mm test sieve)


Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 24-Feb-22



4161

Report Format: L/Rep S10a/Rev 4

 Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

 0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

 Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

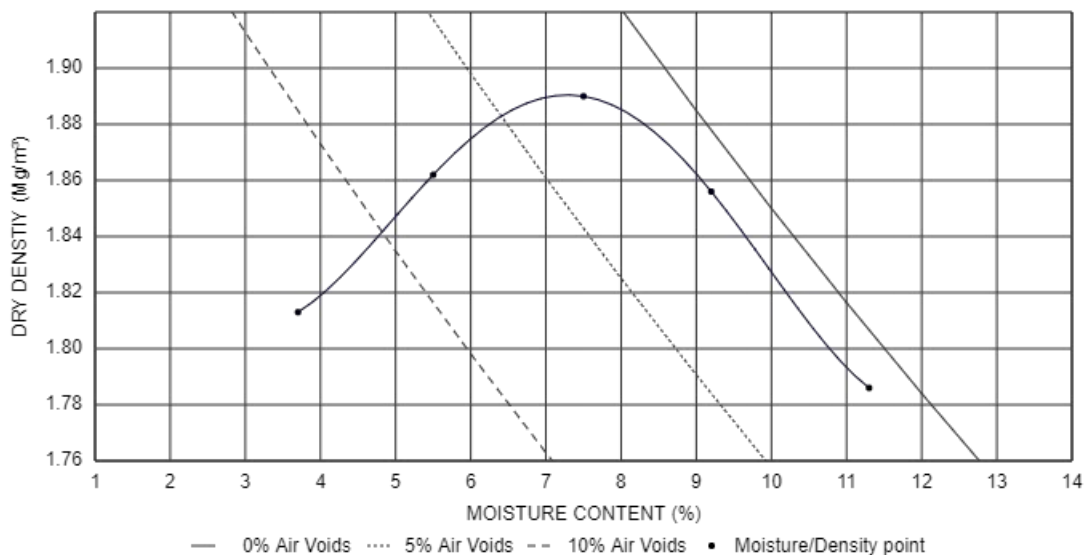
Page 1 of 1

TEST REPORT:	DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP		
	BS 1377:Part 4:1990 clause 3.5 4.5kg Rammer method		
REPORT NUMBER:	C1054158 / 170797.28.1.1		
SAMPLE NUMBER:	265335	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/217	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	24/02/2022	LOCATION:	Surcharge
TESTED BY:	JS, CL	PREPARATION METHOD:	1 Ltr Mould (BS1377:Pt1:1990 Cl7.6.2) : Material chopped to <20mm, for cohesive soil.
TYPE OF SAMPLE:	Disturbed	COMPACTION SAMPLE:	Separate samples
VARIATIONS:	None	SAMPLING PLAN:	Client Provided

RESULT Test Location: CTS Doncaster

MAXIMUM DRY DENSITY: 1.93 Mg/m³
OPTIMUM MOISTURE CONTENT: 7.3 %
AMOUNT (By Dry Mass) RETAINED ON >20mm TEST SIEVE: 10 %
AMOUNT (By Dry Mass) RETAINED ON >37.5mm TEST SIEVE: 3 %
MEASURED PARTICLE DENSITY USED TO PLOT AIR VOIDS: 2.27 Mg/m³
 (measured in accordance with BS 1377: 1990:part 2)

MOISTURE CONTENT / DRY DENSITY RELATIONSHIP



Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 07-Mar-22



4161

Report Format: L/Rep S11-S14a/Rev 9

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT:

TEST REPORT: DETERMINATION OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT

BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving and BS 1377 2 : 1990, Method 3.2

REPORT NUMBER:

C1054158 / 170797.29.1.1

SAMPLE NUMBER:

265335

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/217

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Client

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

04/03/2022

CLASSIFICATION:

Class 2C

TESTED BY:

JW, CL, RF, BH

LOCATION:

Surcharge

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS 1377:Part 1:1990 clause 7.3 & 7.4.5

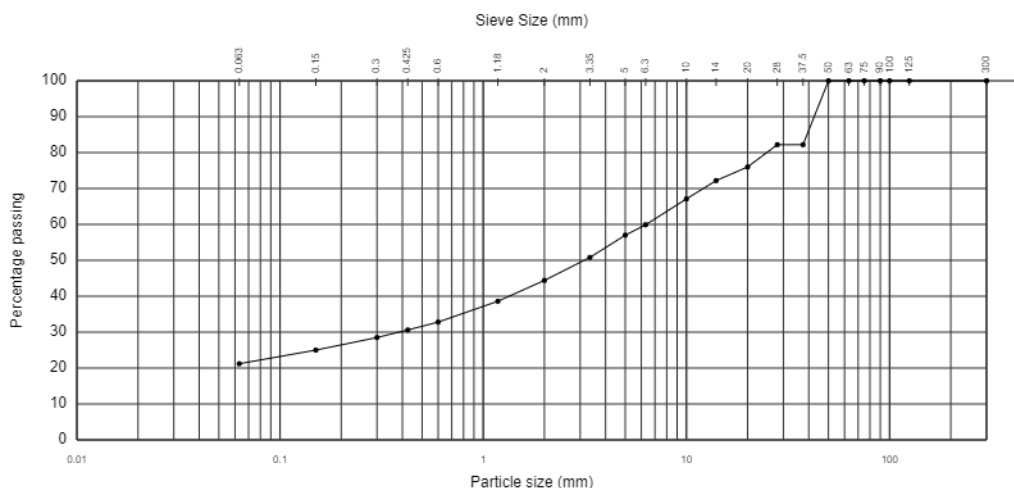
VARIATIONS:

No variations

SAMPLING PLAN:

Client Provided

RESULT Test Location: CTS Doncaster



SIEVE ANALYSIS

Particle Diameter mm	Passing %	Specification Limits
500	100	
300	100	
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	82	
28	82	
20	76	
14	72	
10	67	
6.3	60	
5	57	
3.35	51	
2	44	15 - 80
1.18	39	
0.6	33	
0.425	31	
0.3	29	
0.15	25	
0.063	21	15 - 80

Class 2C - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2C

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum.

Sample complies with the grading specification

Moisture content: 6.3%

Remarks:

Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 07-Mar-22



4161

Report Format: L/Rep S6a/Rev 10

Bootham Lane Industrial Estate,
Dunscoft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT: **DETERMINATION OF MOISTURE CONDITION VALUE (M.C.V.)**
 BS 1377 Part 4 : 1990 Clause 5.4 - Natural Moisture Content (Lab Test)

REPORT NUMBER: C1054158 / 170797.26.1.1

SAMPLE NUMBER: 265335 **CLIENT:** Howard Civil Engineering

CLIENT REF: DN2474/217 **ADDRESS:** Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED: 02/02/2022 **SITE:** Upper Hoyland Road, Rockingham

SAMPLED BY: Unknown **SUPPLIER:** Site Won, Site Won

DATE RECEIVED: 08/02/2022 **MATERIAL:** Brown Clay/Soil

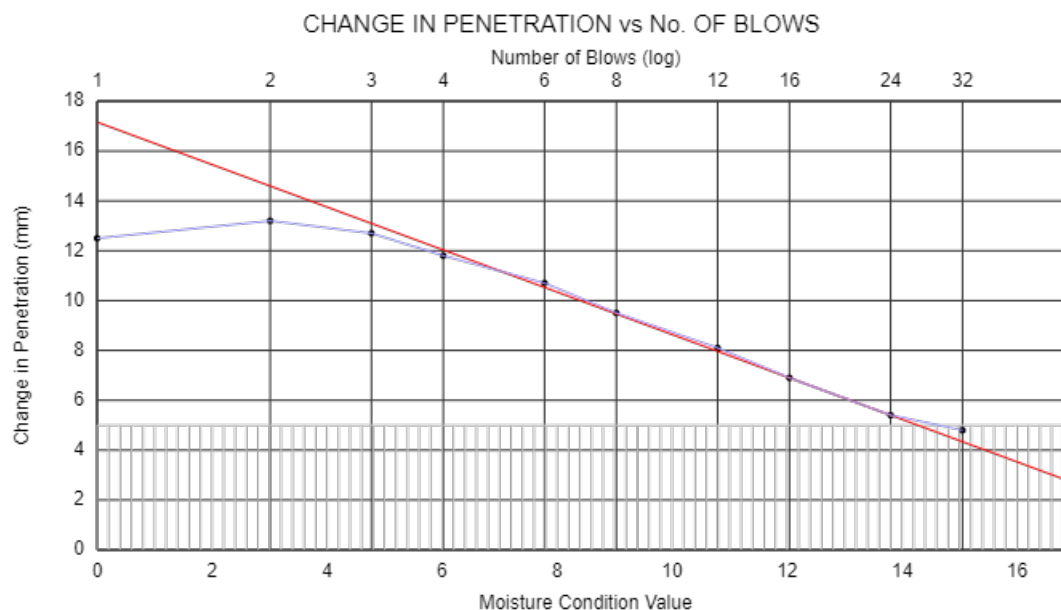
DATE COMPLETED: 24/02/2022 **FILL LOCATION:** Surcharge

TESTED BY: Ryan Firth **CERTIFICATE OF SAMPLING:** No

TYPE OF SAMPLE: Disturbed **SAMPLING PLAN:** Client Provided

RESULTS Test Location: CTS Doncaster

MOISTURE CONDITION VALUE	14.3
NATURAL MOISTURE CONTENT (%)	6.8
PERCENTAGE RETAINED 20mm (%)	52.0
INTERPRETATION OF CURVE	Steepest straight line
PREPARATION METHOD	BS 1377: Part 4: 1990 clause 5.4 (Natural and sieved through 20mm test sieve)



Remarks:
 Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S10a/Rev 4

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 24-Feb-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:	DETERMINATION OF THE PLASTICITY INDEX OF SOIL		
	BS 1377:Part 2:1990 clause 5.4		
REPORT NUMBER:	C1054158 / 170797.25.1.1		
SAMPLE NUMBER:	265335	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/217	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	Unknown	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	01/03/2022	LOCATION:	Surcharge,
TESTED BY:	Diane Weighell	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	36%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	17%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	19%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	32%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S4/rev.6

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 07-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:
DETERMINATION OF PARTICLE DENSITY

BS 1377:Part 2:1990 Gas Jar Method

REPORT NUMBER:

C1054158 / 170797.27.1.1

SAMPLE NUMBER:

See Below

CLIENT:

Howard Civil Engineering

CLIENT REF:

See Below

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

Unknown

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

28/02/2022

LOCATION:

Surcharge

TESTED BY:

CL, MD

SAMPLING PLAN:

Client Provided

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS1377:Part1:1990 clauses 7.3 and 7.4.2

 ORIENTATION OF TEST SPECIMEN
WITHIN ORIGINAL SAMPLE:

N/A

VARIATIONS:

None

METHOD OF PREPARATION:

None

RESULT Test Location: CTS Doncaster

SAMPLE NO	CLIENT SAMPLE REF	MATERIAL	PARTICLE DENSITY Mg.m ³
265335	DN2474/217	Brown Clay/Soil	2.27

Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S7A/Rev 4

 Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

 0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 07-Mar-22

 Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1



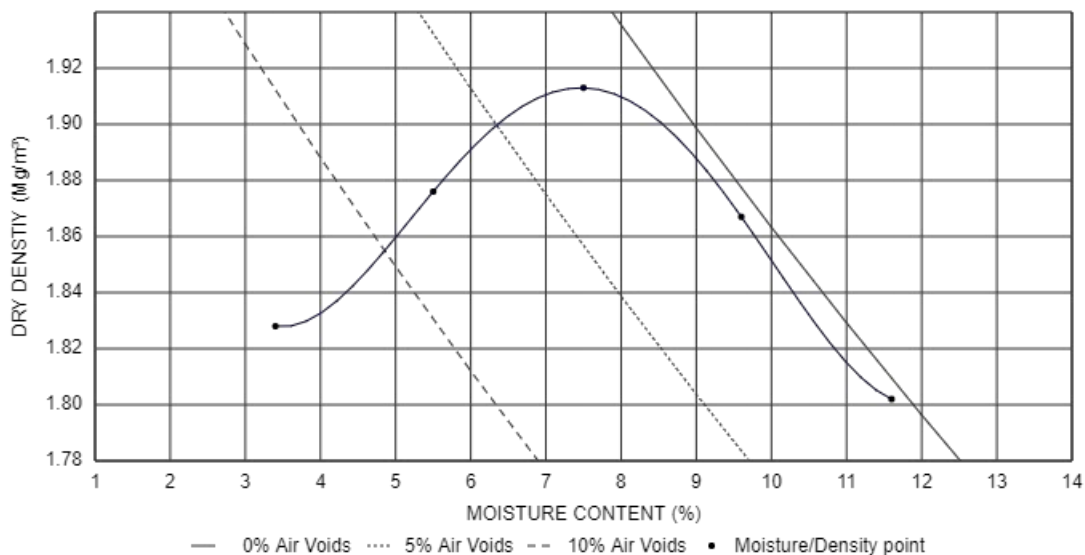
4161

TEST REPORT:	DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP		
	BS 1377:Part 4:2016 clause 3.6 4.5kg Rammer method		
REPORT NUMBER:	C1054158 / 170797.34.1.1		
SAMPLE NUMBER:	265338	CLIENT:	Howard Civil Engineering
CLIENT REF:	DN2474/218	ADDRESS:	Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF
DATE SAMPLED:	02/02/2022	SITE:	Upper Hoyland Road, Rockingham
SAMPLED BY:	CTS	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	08/02/2022	MATERIAL:	Brown Clay/Soil
DATE COMPLETED:	24/02/2022	LOCATION:	Q21 Layer 13
TESTED BY:	JS, CL	PREPARATION METHOD:	CBR Mould (BS1377:Pt1:2016 Cl7.6.3) : Material chopped to <20mm, for cohesive soil.
TYPE OF SAMPLE:	Disturbed	COMPACTION SAMPLE:	Separate samples
VARIATIONS:	None	SAMPLING PLAN:	Client Specification

RESULT Test Location: CTS Doncaster

MAXIMUM DRY DENSITY: 1.91 Mg/m³
OPTIMUM MOISTURE CONTENT: 7.5 %
AMOUNT (By Dry Mass) RETAINED ON >20mm TEST SIEVE: 10 %
AMOUNT (By Dry Mass) RETAINED ON >37.5mm TEST SIEVE: 3 %
MEASURED PARTICLE DENSITY USED TO PLOT AIR VOIDS: 2.29 Mg/m³
 (measured in accordance with BS 1377: 2016:part 2)

MOISTURE CONTENT / DRY DENSITY RELATIONSHIP



Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 17-Mar-22



4161

Report Format: L/Rep S11-S14a/Rev 10

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT:

TEST REPORT: DETERMINATION OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT

BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving and BS 1377 2 : 1990, Method 3.2

REPORT NUMBER:

C1054158 / 170797.35.1.1

SAMPLE NUMBER:

265338

CLIENT:

Howard Civil Engineering

CLIENT REF:

DN2474/218

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

CTS

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

04/03/2022

CLASSIFICATION:

Class 2C

TESTED BY:

JW, CL, RF, BH

LOCATION:

Surcharge

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS 1377:Part 1:1990 clause 7.3 & 7.4.5

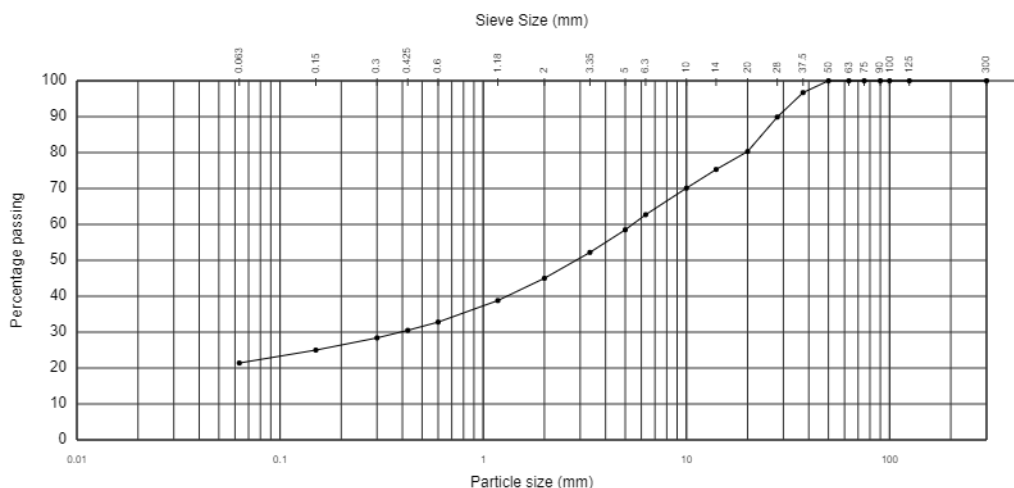
VARIATIONS:

No variations

SAMPLING PLAN:

Client Specification

RESULT Test Location: CTS Doncaster



SIEVE ANALYSIS

Particle Diameter mm	Passing %	Specification Limits
500	100	
300	100	
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	97	
28	90	
20	80	
14	75	
10	70	
6.3	63	
5	59	
3.35	52	
2	45	15 - 80
1.18	39	
0.6	33	
0.425	31	
0.3	28	
0.15	25	
0.063	21	15 - 80

Class 2C - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2C

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum.

Sample complies with the grading specification

Moisture content: 7.0%

Remarks:

Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 17-Mar-22



4161

Report Format: L/Rep S6a/Rev 10

Bootham Lane Industrial Estate,
Dunscoft,
Doncaster,
South Yorkshire DN7 4JU

0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

Page 1 of 1

TEST REPORT: **DETERMINATION OF MOISTURE CONDITION VALUE (M.C.V.)**
 BS 1377 Part 4 : 1990 Clause 5.4 - Natural Moisture Content (Lab Test)

REPORT NUMBER: C1054158 / 170797.32.1.1

SAMPLE NUMBER: 265338 **CLIENT:** Howard Civil Engineering

CLIENT REF: DN2474/218 **ADDRESS:** Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED: 02/02/2022 **SITE:** Upper Hoyland Road, Rockingham

SAMPLED BY: Unknown **SUPPLIER:** Site Won, Site Won

DATE RECEIVED: 08/02/2022 **MATERIAL:** Brown Clay/Soil

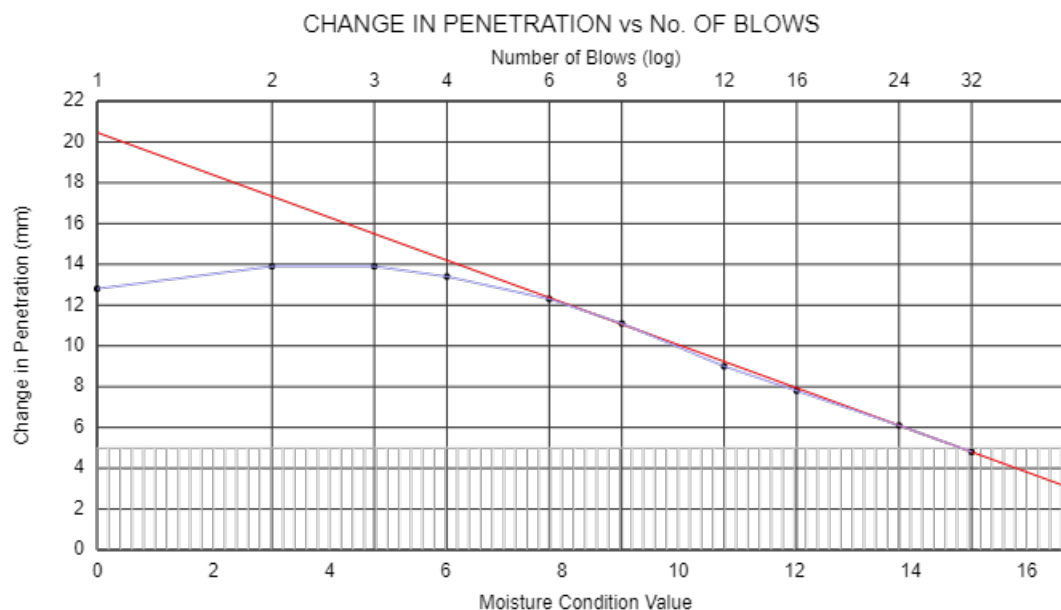
DATE COMPLETED: 24/02/2022 **FILL LOCATION:** Surcharge

TESTED BY: Ryan Firth **CERTIFICATE OF SAMPLING:** No

TYPE OF SAMPLE: Disturbed **SAMPLING PLAN:** Client Provided

RESULTS Test Location: CTS Doncaster

MOISTURE CONDITION VALUE	14.9
NATURAL MOISTURE CONTENT (%)	7.9
PERCENTAGE RETAINED 20mm (%)	120.7
INTERPRETATION OF CURVE	Steepest straight line
PREPARATION METHOD	BS 1377: Part 4: 1990 clause 5.4 (Natural and sieved through 20mm test sieve)



Remarks:
 Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S10a/Rev 4

Bootham Lane Industrial Estate,
 Dunscoft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 24-Feb-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT: **DETERMINATION OF THE PLASTICITY INDEX OF SOIL**
 BS 1377:Part 2:1990 clause 5.4

REPORT NUMBER: C1054158 / 170797.31.1.1

SAMPLE NUMBER: 265338 **CLIENT:** Howard Civil Engineering

CLIENT REF: DN2474/218 **ADDRESS:** Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED: 02/02/2022 **SITE:** Upper Hoyland Road, Rockingham

SAMPLED BY: CTS **SUPPLIER:** Site Won, Site Won

DATE RECEIVED: 08/02/2022 **MATERIAL:** Brown Clay/Soil

DATE COMPLETED: 17/03/2022 **LOCATION:** Q21 Layer 13 ,

TESTED BY: AE, DW **PREPARATION METHOD:** BS 1377:Part 1:1990 cl 7.3 & 7.4.3

TYPE OF SAMPLE: Disturbed **VARIATIONS:** None

WITHIN ORIGINAL SAMPLE: N/A

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	39%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	20%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	19%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	50%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
 Remaining sample will be retained for a minimum of 28 days from date of report. Test results reported relate only to the items tested.
 This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: L/Rep S4/rev.6

Bootham Lane Industrial Estate,
 Dunscroft,
 Doncaster,
 South Yorkshire DN7 4JU

0343 227 8545
 enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
 END OF REPORT

For and on behalf of CTS
 Alex Edgar - Senior Laboratory Technician



Approved Signatory
 Report date 17-Mar-22

Construction Testing Solutions Ltd.
 Registered in England No. 05998333

Report version 1



4161

TEST REPORT:
DETERMINATION OF PARTICLE DENSITY

BS 1377:Part 2:1990 Gas Jar Method

REPORT NUMBER:

C1054158 / 170797.33.1.1

SAMPLE NUMBER:

See Below

CLIENT:

Howard Civil Engineering

CLIENT REF:

See Below

ADDRESS:

Unit 11 Acorn Business Park, Killingbeck Drive , Leeds, LS14 6UF

DATE SAMPLED:

02/02/2022

SITE:

Upper Hoyland Road, Rockingham

SAMPLED BY:

CTS

SUPPLIER:

Site Won, Site Won

DATE RECEIVED:

08/02/2022

MATERIAL:

Brown Clay/Soil

DATE COMPLETED:

25/02/2022

LOCATION:

Q21 Layer 13

TESTED BY:

CL, MD

SAMPLING PLAN:

Client Specification

TYPE OF SAMPLE:

Disturbed

PREPARATION METHOD:

BS1377:Part1:2016 clauses 8.3 and 8.4.2

 ORIENTATION OF TEST SPECIMEN
WITHIN ORIGINAL SAMPLE:

N/A

VARIATIONS:

None

METHOD OF PREPARATION:

None

RESULT Test Location: CTS Doncaster

SAMPLE NO	CLIENT SAMPLE REF	MATERIAL	PARTICLE DENSITY Mg.m ³
265338	DN2474/218	Brown Clay/Soil	2.29

Remarks:

Test results reported relate only to the items tested.

This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CTS

Alex Edgar - Senior Laboratory Technician



Approved Signatory

Report date 17-Mar-22



4161

Report Format: L/Rep S7A/Rev 5

 Bootham Lane Industrial Estate,
Dunscroft,
Doncaster,
South Yorkshire DN7 4JU

 0343 227 8545
enquiries@constructiontesting.co.uk
www.constructiontesting.co.uk
END OF REPORT

 Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 1

Page 1 of 1