Docksway Disposal Site, Newport

Area 2, Cell 4a Basal Clay Lining – CQA Validation Report

On behalf of **Newport City Council**

Project Ref: 14739/3544 | Rev: AA | Date: March 2020

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For and on behalf of Stantec UK Limited				

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1 Introduction

1.1 Background

1.1.1 Docksway Disposal Site is an active licensed waste disposal site located approximately 3km south of Newport City Centre, Gwent, and is centred on National Grid Reference ST 305 853. The site is operated by Newport City Council, referred to hereafter as NCC. The location of the site is shown on **Figure 1**.

1.1.2 The site is approximately split into a northern half (Area 1) and a southern half (Area 2). Area 1 is an unlined ('dilute and disperse') landfill that was operated under waste management licence (WML) number EAWML30058 and is now closed and in the aftercare phase, whilst Area 2 is an engineered containment landfill that is active and operated under Pollution Prevention Control (PPC) Permit No. DP3733BK.

1.1.3 Area 2 comprises five engineered landfill cells (Cells 1-5), as shown on **Figure 2**. Cells 1 to 3 have previously been constructed and are receiving waste. Cell 4 has been split into two halves (Cell 4a and Cell 4b) for phasing reasons and to enable the two halves to be constructed in different financial years. Works on Cell 4b were completed in 2018 and a separate CQA Validation report (PBA, 2019a) has been produced for this Cell and it is now receiving waste. Cell 4a (the subject of this CQA Validation report has been constructed but is yet to receive waste and construction of Cell 5 has not currently started.

1.1.4 The Area 2 Engineering Design Philosophy for the site describes the Area 2 design concept (PBA, 2005b) and this includes the construction of a basal Engineered Barrier System (EBS) above a natural geological barrier. Part of the EBS is a 1.2m thick engineered basal clay barrier with a hydraulic conductivity of no greater than $1x10^{-9}$ m/s, and this is created from imported clay material that is engineered on site. This maximum permeability is based on the conservative value of vertical hydraulic conductivity used for LandSim modelling work, as described in the Conceptual Model and Hydrogeological Risk Assessment for Area 2 – Landfill Extension (PBA 2005a).

1.1.5 This Construction Quality Assurance (CQA) Validation report describes the works in Cell 4a carried out to construct and validate the engineered clay barrier part of the EBS as described above, and in general accordance with Environment Agency (EA) guidance document LFE4 – 'Earthworks in landfill engineering' (EA, 2014). The work was carried out in accordance with the CQA Plan and Performance Specification (PBA, 2019b) that was submitted to Natural Resources Wales (NRW) prior to commencement of the clay lining works. A copy of the CQA Plan is presented as **Appendix 2.**

1.2 Parties

1.2.1 The following parties were involved in the undertaking of this project as described below, and with duties as defined in the CQA Plan for the works, presented as **Appendix 2**.

1.2.2 **Client/Employer:** Newport City Council - responsible for preparing contract documents, drawings and specifications, reviewing Contractors (and Sub-Contractors) information, reviewing and agreeing amendments to contract documents, drawings and specifications, overseeing budgetary and contractual matters, provide day to day management of the works, surveying services, liaise with all parties.

1.2.3 **Contractor:** Jim Davis Civil Engineering Ltd (Contractor) – responsible for the preparation and construction of the works in accordance with the contract documents, drawings and specifications and to meet the requirements of the Employer and CQA Engineer.

1.2.4 **CQA Inspector:** Mr William Watt – Capita Infrastructure and Property Consulting Engineers and engaged by Newport City Council. Responsible for the day to day management of the works in accordance with the CQA Plan and the contract documents, drawings and specifications, under the direction of the CQA Engineer.

1.2.5 **CQA Engineer:** Peter Brett Associates LLP (PBA), now part of Stantec UK Limited (Stantec) – responsible for: reviewing the CQA Inspectors site diary; for preparing the CQA Plan; dealing with technical queries during the works; and preparation of this CQA Validation Report.

1.3 Scope of Works

1.3.1 The clay lining phase of work for Cell 4a follows on from base stabilisation works of the alluvial clays in the former river channels within the wider Cells 3 and 4 areas. The stabilisation works have been the subject of separate CQA validation and a separate CQA Validation Report (PBA, 2019a) previously submitted to and approved by Natural Resources Wales (NRW).

1.3.2 The area of Cell 4 has been split into two halves, with both Cells permitted for the disposal of non-hazardous waste. The cells are formed into shallow bowl shapes following and enhancing the natural topography of the site area.

1.3.3 Cell 4a is designed with a minimum gradient (for drainage) of 1(vertical):50 (horizontal) across the basal area towards a sump location at the lowest point within the cell area. The minimum thickness of engineered clay liner will be 1.2m across the base and up the sides of the bowl-shaped cell to the level of the surrounding ground level (where the cell edges are against side slopes). However, where the cell edges lie within the wider Area 2 and are not against existing side slopes, new engineered bunds will be created to a height of approximately 2m above the surface of the liner.

1.3.4 Internal engineered bunds have been previously constructed on; the northern edge of Cell 3a, as separation between Cell 3a and Cell 4a; and, the eastern edge of Cell 4b, as a separation between Cell 4b and Cell 4a. These cell division bunds are shown on Drawing Number 14739/155/001 in **Appendix 3**.

1.3.5 A new internal engineered bund has been constructed on the northern edge of Cell 4a, separating Cell 4a from the future Cell 5 (cell division bund on Drawing Number 14739/155/001 in **Appendix 3**).

1.4 Clay Source and Suitability Testing

1.4.1 The clay used for the Cell 4A lining works described herein was imported from Wingmoor Farm, located at Bishops Cleeve in Gloucestershire.

1.4.2 The imported clay excavated from the source site comprises material from the Blue Lias Clay Formation. The clay used in this contract was from the same source as the clay used in Area 2 Cells 2, 3 and 4b construction and therefore its suitability was fully demonstrated in the earlier PBA report “Lias Clay Compaction Trial, Stage 2, Cell 2” (PBA, 2008).

1.4.3 Notwithstanding the previous suitability testing, additional material suitability testing was undertaken on samples of the source clay, and the results are presented in the CQA Plan (**Appendix 2**). The additional source testing identified that the Optimum Moisture Content of the imported clay material for compaction purposes was 20% (based on compaction testing using the 2.5 kg standard Proctor compaction method), with an equivalent average maximum dry density (MDD) of 1.65 mg/m$^{3.}$ In addition, the average plastic limit was 24%, with an associated plasticity index ranging between 10% and 65%, and that the liquid limit of each of the samples was <90%.

1.4.4 The additional source testing results were used to define the ranges of acceptable limits for the clay. On the basis of the OMC and average plastic limit obtained during the source testing, the lower acceptable moisture content was set at 21%. The upper acceptable moisture content of 26%. was set at being the maximum moisture content for the material to achieve the minimum undrained shear strength of 50kPa.

1.4.5 Previous use of the source material on this site indicated that the material when, compacted within the range of acceptable moisture contents, could achieve permeability values well below the maximum allowable value (1 x 10^{-9} m/s) if the material was sufficiently compacted to have <5% air voids, i.e. in accordance with the requirements given in LFE4 (EA, 2014). In addition to this, permeability test results from remoulded samples taken from the source material confirmed the source clay was capable of achieving the permeability requirements of the engineered clay liner. These are presented in **Appendix 2.**

1.5 Methodology and Plant

1.5.1 The works were carried out in general accordance with the CQA Plan (PBA, 2019b) and using the methodology and plant described in the CQA Inspectors' CQA Weekly Reports, presented in **Appendix 1**, and summarised below. This methodology was developed following a field compaction trial, as described later in Section 2.2.

1.5.2 The imported clay was stockpiled (in part) on site, to facilitate progress once the works started.

1.5.3 Previous experience of working the imported clay from Bishop's Cleeve indicated that it sometimes contains clods of material. The source evaluation also indicated that some of the material was too dry to be efficiently worked and remoulded. Therefore, the adopted methodology required the material to be conditioned by the addition of water to the material in the stockpile and the working of the material within the stockpile area to break down the clods before the material was transported to the cell area being lined.

1.5.4 The conditioned material was then placed in layers and further worked during spreading by a 5-tonne bulldozer. Samples of the material were taken for confirmatory acceptability testing and the material was compacted with a CAT CS-573E padfoot roller which was found to be equivalent to the plant requirements within the specification and following satisfactorily meeting the objectives of the site compaction trial (see Section 2.2).

1.5.5 Following compaction, samples of the compacted material were obtained using the core cutter method (BS 1377-9:1990) and transported to the UKAS accredited laboratory for compliance testing for moisture content / dry density testing and determination of equivalent Air Voids content (see Sections 2.3 and 2.4).

1.5.6 The methodology that was developed for dealing with compliance failures was generally as described herein and the CQA Plan in **Appendix 2** and is specific to the reason for failure.

- Any areas of the cell base with sample test results outside the specified moisture content range were ripped through and re-conditioned before being recompacted and retested.

- Where in situ density test results indicated greater than 5% air voids, a second core from the test cell area was submitted to the laboratory for testing. If the second in situ density test indicated air voids less than 5%, the area was accepted without the requirement for remediation and the failed test result was accepted as being within the total allowance for failures. If the re-sample also indicated greater than 5% air voids, then the affected area was ripped through, reconditioned as appropriate, recompacted and retested.

- Areas of the cell with in-situ density results indicating less than 0% air voids were accepted on the basis of the variations in Particle Density, and in accordance with guidance in LFE 4.

2 CQA Requirements

2.1 CQA Plan

2.1.1 A CQA Plan, describing the works to be carried out, defining the roles and responsibilities of the parties involved and the quality procedures to be adopted during the construction works was produced by the CQA Engineer and submitted to NRW for approval prior to commencement of the works. A copy of the CQA Plan (PBA, 2019b) is presented as **Appendix 2**.

2.2 Compaction Trial

2.2.1 A compaction trial was carried out prior to commencement of the clay lining works, in accordance with the CQA Plan. The objective of the compaction trial was to determine the optimum working methods and material acceptability requirements to achieve the minimum requirements of the engineered clay barrier part of the EBS, described in Section 1.1.4.

2.2.2 The results of the compaction trial informed the proposed methodology that was adopted by the Contractor. The adopted methodology required the imported clay to be placed in 300mm thick (pre compaction) layers, each receiving 12 passes of a CAT CS-573D vibrating padfoot roller to achieve the maximum allowable permeability and to provide satisfactory remoulding of any clods within the imported clay (individual clod sizes to be <2/3 layer thickness).

2.3 Acceptability and Compliance

2.3.1 The engineered clay barrier must achieve a permeability no greater than $1x10^{-9}$ m/s and this has been determined through laboratory testing of samples of the compacted clay material, taken systematically during the lining works at a minimum frequency of 1 per 2,000m^3, in accordance with the CQA Plan.

2.3.2 To provide further evidence that the engineered basal clay barrier has achieved the maximum permeability requirements, the Contractor is also required to demonstrate that the compacted clay contains less than 5% air voids, determined through determination of moisture content and dry density laboratory testing of the compacted clay material. As such core cutter samples are taken systematically during the lining works at a frequency of 1 per layer on a 25m x 25m grid cell (the works were set out using a 25m by 25m grid cell system, as described in the CQA Inspector's weekly progress reports, presented in **Appendix 1**).

2.3.3 The minimum thickness of the engineered clay barrier is 1.2m, and this is demonstrated through on site checks as work progresses, and through direct comparison of pre-commencement and post construction surveys.

2.3.4 Operational controls on moisture content during the basal clay lining works, provided the Contractor with a framework to enable the consistency of the condition of the imported clay material to be controlled. The operational moisture content range (21% to 26%) was determined from the additional source testing and confirmation during the compaction trial. This optimised the workability of the material to ensure the overall engineering objectives and compliance requirements were met.

2.4 Laboratory Accreditation

2.4.1 The initial suitability testing was completed by Geolabs Ltd, acceptability and compliance (in situ density) testing was completed by CJ Associates Ltd and subsequent permeability testing was subcontracted by CJ Associates to Geolabs. These labs are UKAS accredited laboratories, for testing in accordance with BS 1377 Part 9: 1990, BS 1377 Clause 2.4 – Core

cutter method for cohesive soils free from coarse grained material (CJ Associates) and Part 6: 1990 Clause 6 – Determination of Permeability in a triaxial cell (Geolabs). The Geolabs UKAS accreditation number is 1982 and the CJ Associates UKAS accreditation number is 1429.

2.5 CQA Records

2.5.1 The CQA records of relevance to this CQA Validation Report are the laboratory certificates for the permeability testing and the in-situ density testing, the drawings showing the cell locations, and the CQA Inspector's weekly progress records. These CQA records are all presented within the appendices.

3 Work Progress

3.1 General

CQA Inspector's Weekly Report

3.1.1 The Contractor commenced the basal clay lining works in Cell 4a on 03rd June 2019 and completed the basal clay lining works in Cell 4a on 18th September 2019.

3.1.2 The CQA Inspector has recorded progress over the 16-week period in weekly reports that are presented in **Appendix 1**. The CQA Inspector was present on site during the works and recorded the weather, progress, technical issues, sampling and testing for each week and relevant photographs within the weekly reports.

Progress

3.1.3 As described in the CQA Inspector's Reports, approximately 31,600 tonnes of imported clay material (approximately 15,800m^3) was placed under the direction of the CQA Inspector, and in accordance with the CQA Plan, across Cell 4a during the 16-week period. There are a total of 23 full and partial grid cells that cover the plan area of Cell 4a, and with a pre compacted layer thickness of 300mm, a total of 5 layers of material has been placed under CQA to achieve the overall minimum 1.2m thickness for the engineered basal clay barrier part of the EBS.

3.1.4 In areas of engineered bunds, additional layers were placed under CQA to achieve the design levels. As the bund construction progressed, and levels increased, the plan areas of the bunds decreased and therefore CQA sampling and testing per layer decreased on a pro rata basis whilst maintaining the minimum equivalent testing requirements of at least one test per 250m^3 of emplaced material, being the guidance frequency provided in LFE4 (EA, 2014)

3.1.5 Weekly and daily progress involving earthworks of this nature are entirely dependent on favourable weather conditions and the speed of compliance testing, and therefore the weekly reports show variations in progress on a week by week basis.

4 Acceptability Testing

4.1 Moisture Content and Atterberg Limits

4.1.1 In general accordance with the CQA Plan, bulk samples of the conditioned material were taken from within the grid cells following placement and spreading but prior to compaction. The bulk samples were submitted to the laboratory for moisture content and Atterberg limit testing.

4.1.2 The CQA Inspector indicates that there is a total of 117 laboratory tests completed for moisture content and Atterberg limits. The results are in accordance with typical clay liner properties provided in LFE4 (EA, 2014), and predominantly in accordance with the specified acceptability limits (except for four exceptions, see Section 6).

- Moisture Content Range - 16.5% – 29.5%
- Moisture Content Average – 23.8%
- Liquid Limit Range - 45% - 51%
- Liquid Limit Average – 48.4%
- Plastic Limit Range – 19% - 29%
- Plastic Limit Average – 20.1%
- Plastic Index Range – 91% - 31%
- Plastic Index Average – 28.2%

4.1.3 The number of test results provides a test frequency of 1/135m^3, and this is significantly greater frequency than the minimum acceptability testing frequency of 1/250m^3 required within LFE4 (EA, 2014).

5 Compliance Testing

5.1 Compaction Testing

5.1.1 The results of compaction related testing undertaken under direction of the CQA inspector have been determined and graphically presented in **Appendix 7** on the following basis:

- Diamond black results are samples with moisture contents within specification range and with less than or equal to 5% air voids;
- Diamond grey results are samples with moisture contents within specification range and which plot above the 0% air voids line;
- Diamond white results are samples with moisture contents within specification range and with greater than 5% air voids; and,
- Square blue results are those with moisture contents outside the acceptance range.

5.1.2 The CQA Inspector indicates that there are a total of 130 laboratory tests for moisture content testing of core cutter samples following completion of compaction in the grid cells across Cell 4a. The results indicate a range of results predominantly within the specification requirements (except for seven exceptions/failures, see Section 6) and an average moisture content of 23% (excluding the failures).

5.1.3 Excluding retests and duplicates, the total number of laboratory testing for field dry density is 126, and this indicates a test frequency of 1/125m^3 which is a greater frequency than the guidance frequency of 1/250m^3 provided in LFE4 (EA, 2014)

5.1.4 The CQA Inspector records show that there are a total of 123 diamond black and diamond grey results and three square blue results (in accordance with LFE4 (EA, 2014)) for Cell 4a, there were no diamond white results recorded.

5.1.5 Therefore, 98% of the total compaction related tests results are diamond black or diamond grey, and the results are compliant with LFE4 (EA, 2014) and meet the acceptability criteria in relation to acceptable moisture content, dry density and equivalent air void percentage.

5.2 Permeability

5.2.1 There are a total of 11 laboratory tests for permeability testing of core samples obtained following completion of compaction across Cell 4a. The samples were obtained at a frequency of approximately 1/1,450m^3 which is a greater frequency of testing than the CQA Plan (PBA, 2019b) requirement of 1/2,000m^3. The results indicate that all of the permeability results are below the maximum allowable value of 1 x 10^{-9} m/s, as shown in the table below. The lab certificates for the permeability testing are presented in **Appendix 4.**

Table 5-1 Cell 4a Permeability Results

Cell Reference	Permeability Value (m/s)
A4 L-1	4.0 X 10^{-11}
B2 L1	1.0 x 10^{-11}

D2 L-1	$7.5x10^{-11}$
B2 L3	$6.2x10^{-11}$
A4 L2	$1.4x10^{-11}$
E3 L1	$7.2x10^{-11}$
B4 L4	$7.8x10^{-11}$
D4 L4	$1.7x10^{-10}$
D4 L5	$1.6x10^{-10}$
A3 B1	$8.3x10^{-11}$
C3 L5	$6.6x10^{-10}$

5.3 Undrained Shear Strength

5.3.1 A total of 399 readings of undrained shear strength were taken using a Hand Shear Vane during the clay lining works in Cell 4a. These indicate shear strengths between 50kPa and +150kPa which are all higher than the minimum 50kPa set out within the CQA Plan.

5.4 Survey

5.4.1 NCC has undertaken pre and post clay lining surveys to demonstrate the basal liner thickness across Cell 4a. The as built drawings and cross sections, contained in **Appendix 5,** indicate that the minimum required thickness of basal liner of 1.2m has been constructed across Cell 4a, and that the minimum gradients have been achieved..

6 Non-Conformities

6.1 General

6.1.1 Non-conformities in terms of acceptability and compliance failures have generally been dealt with during the progress of the work, as described in the CQA Inspector's weekly progress reports. Where there have been failures due to moisture content or percentage air voids, the grid cells where these failures were located have generally been rejected and reworked. The reworking comprised the non-compliant layer being ripped, reconditioned, recompacted and retested. Where this has been completed and subsequently recompacted the retested material has passed and been accepted, and as such the original failures are no longer considered to be non-conformities.

6.1.2 There are twenty-four moisture content results from the bulk samples, that were part of the source acceptability testing, which were noted to be marginally outside of the specification range for moisture content. These results were correlated with the corresponding core cutter results and if the moisture contents were within the specification range and the air voids percentage was <5%, then the results for the emplaced material were accepted.

6.1.3 Nine moisture content exceedances were found within the bunds, which were discussed with the CQA Inspector who confirmed that water was added, and the material mixed after the acceptability testing sample was taken and before the material was compacted into the bund. A technical note completed by the CQA Inspector discussing these results is presented within **Appendix 6**.

6.1.4 It is considered that these results have not adversely affected the ability of the material to be compacted and to achieve the density and permeability requirements. It is not considered that any remedial action is required or appropriate.

6.1.5 There are seven moisture content results from the core cutter samples that were part of the compliance testing and were outside of the specification range. These grid cell locations are E3L2, E2L2, and C5L3, with moisture contents of 27% (above the maximum of 26%) and E4L4, D4L5, D3L5 and D3L5 (retest), all with moisture contents of 20% (below the minimum of 21%).

6.1.6 All the locations which were below the minimum moisture content were reworked as explained in paragraph 6.1.1 above and subsequently retested. Therefore, these locations are no longer considered non-conformities, and it is not considered that any remedial action is required or appropriate.

6.1.7 The three locations that exceeded the maximum moisture content were accepted as the air voids were <5%, and that the shear strengths were similarly above 50kPa.

7 Conclusions

7.1 General

7.1.1 The CQA Inspector's reports and the results of the laboratory testing indicate that the Cell 4a basal clay lining works have been completed successfully and in accordance with the CQA Plan (PBA, 2019b) and LFE4 (EA, 2014).

7.1.2 As built drawings and cross sections supplied by NCC indicate that the minimum thickness of the engineered basal clay liner is at, or exceeds, 1.2m which is the minimum thickness required, and that the minimum design gradients have been achieved.

7.1.3 The in-situ density and moisture content results indicate that 98% of samples were recorded as having moisture contents within specification range and with less than or equal to 5% air voids/0% air voids and hence meet the minimum requirements of 90% of the total samples comprising diamond black and diamond grey results, as set out in guidance document LFE4 (EA, 2014).

7.1.4 The permeability results indicate that the recorded laboratory permeability values obtained from samples taken from the emplaced liner are all significantly below the maximum allowable value (1×10^{-9} m/sec) .

7.1.5 It is considered that the basal clay lining works have been completed in accordance with the requirements of both the CQA Plan (PBA, 2019b), guidance provided in LFE4 (EA, 2014) and the engineering design philosophy for the Site.

References

PBA (2005a) Conceptual Model and Hydrogeological Risk Assessment for Area 2 – Landfill Extension, Docksway Landfill Site, ref 14739/014/A2/002-CBH/DA/RHT, dated April 2005. Peter Brett Associates

PBA (2005b) Area 2 Engineering Design Philosophy, Docksway Landfill Site, ref 14739/005, dated 21 October 2004. Peter Brett Associates

PBA (2008) Report on Lias Clay Compaction Trial Stage 2, Cell 2, Docksway Landfill, Newport City Council, ref: 14739/086/PL/DA, dated May 2008. Peter Brett Associates.

PBA (2019a) Area 2, Cell 4b Basal Clay Lining – CQA Validation Report, Docksway Disposal Site, Newport, ref: 14739/35538/CQA/Rev00, dated February 2019. Peter Brett Associates.

PBA (2019b) Construction Quality Assurance Plan & Performance Specification for Cell 4a Basal Clay Lining, Area 2 Docksway Disposal Site, Newport, ref: 14739/3544/CQA_4_rev01, dated 14th May 2019. Peter Brett Associates.

EA (2014) Earthworks in Landfill Engineering: LFE4, ref: LIT 5305, dated 23 June 2014. Environment Agency.

BS 1377-9:1990 (1990) Methods of test for Soils for civil engineering purposes. Part 9:In-situ tests. British Standard.

Site Grid Ref: ST 309 852

DOCKSWAY DISPOSAL SITE
NEWPORT

SITE LOCATION PLAN

Client
NEWPORT CITY COUNCIL

Date of 1st Issue	Drawn by
20.01.2020	davco
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Figure Number
1

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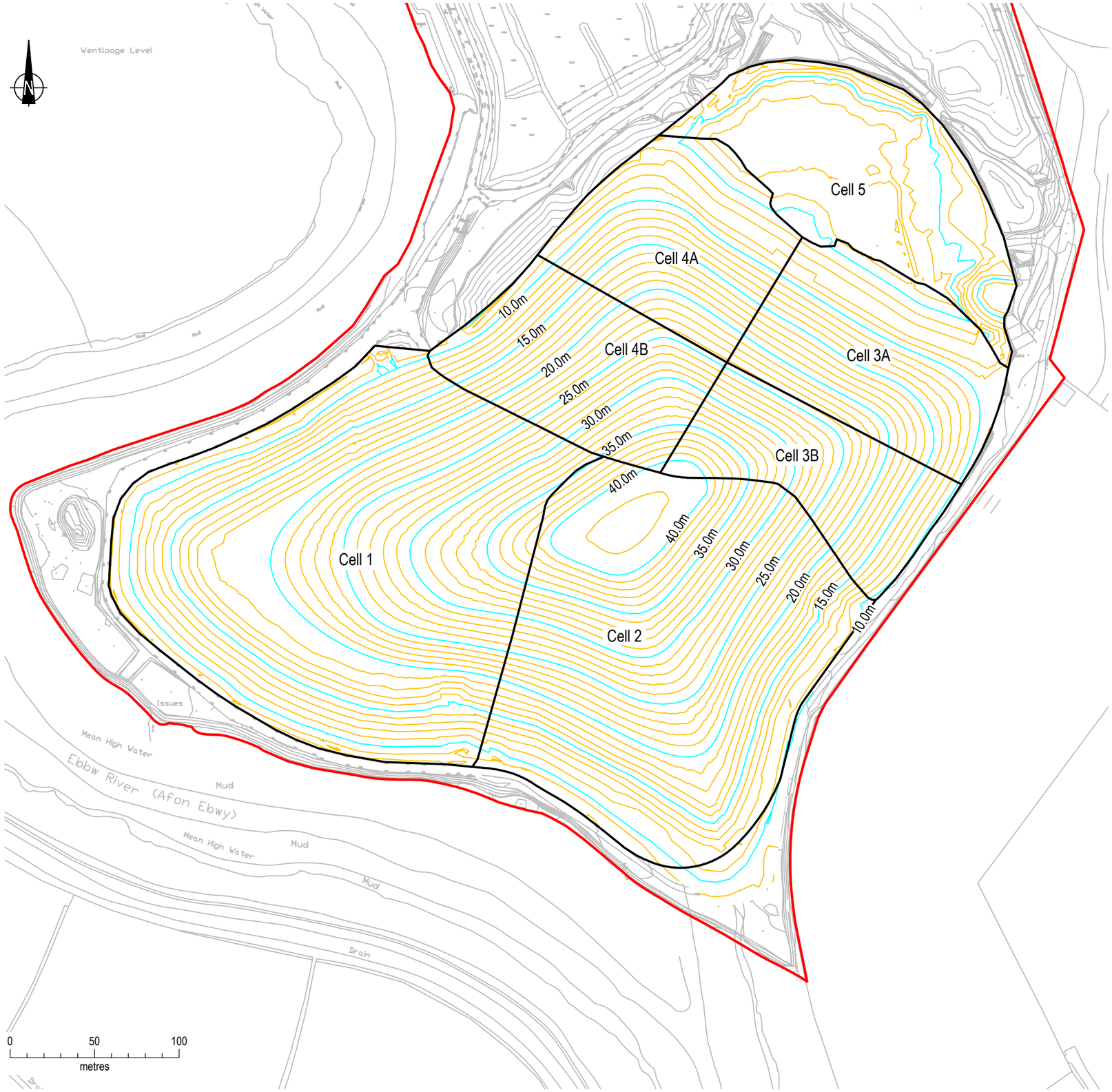
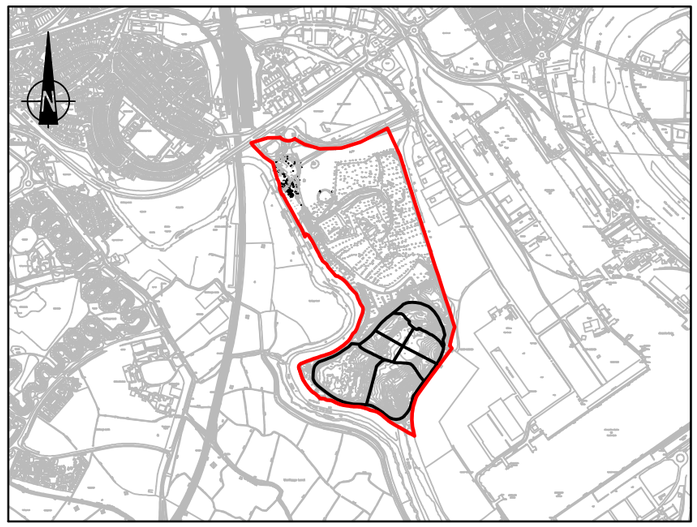
Notes

1. This drawing is to be read in conjunction with all other drawings.
2. Do not scale this drawing.
3. All levels are in metres above Ordnance Datum (AOD).





Location Plan

Scale 1:25,000

DOCKSWAY DISPOSAL SITE
AREA 2
PRE SETTLEMENT RESTORATION CONTOURS

Client
NEWPORT CITY COUNCIL

Date of 1st Issue	Drawn by
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A3 Scale	Checked by
1:2000	NC

Figure Number
2

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Appendix 1 CQA Inspector's Weekly Reports

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport
CITY COUNCIL
CYNGOR DINAS
Casnewydd

Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No -01 WE 26/05/19

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS
Casnewydd

Project Ref: 2506
Date: 21-10-18

Document Control Sheet

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Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		26-05-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved
02	13 June 19	text	William Watt		

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS
Casnewydd

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2. Test Results
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4. Moisture content/dry density for Compaction
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Streetscene
Y-Strydynun

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Light rain over the weekend, sunny Monday, overcast Tuesday, Wednesday and Thursday light rain Friday.

3.0 Progress for the week

3.1 Stockpile

Clay material delivered to site since May 2019 total 9004 tons
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Work was undertaken grids A4 and B4 in maximum of 300mm layers compacting to a nominal 250mm layer with 12 passes of 15,900kg padfoot vibrating roller.

Low spots and software areas work worked on in A4 and B4

Additional rolling was undertaken on Cell B4L-1 where hand shear was unacceptable and repeat testing was acceptable.

The material was installed in accordance with the construction specification and tested in accordance with the CQA plan as per the testing log for areas of 125m^2.

Leachate from the existing land fill west of the site was captured within a grip at A4 and pumped for disposal.

Testing by CJ Associates was undertaken Wednesday and Thursday 22 and 23 May 2019.

Plant on site One 5-ton front loader, dozer, 1 excavators, roller (CAT CS-573E) and bowser.

3.3a Additional Layers
No work undertaken

3.3b Levelling the Area
A4L-1 to A4L-2, B4L-1 to B4L-2 and B3L-1

3.3 Layer 1
No work undertaken

3.4 Layer 2
No work undertaken

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3.5 Layer 3
No work undertaken

3.6 Layer 4
No work undertaken

3.7 Layer 5
No work undertaken

3.8 Layer +6
No work undertaken

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 meter grid square per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

5 core cutter samples at each location were taken this week.
5 results core tests received as per the Appendix 1 and 2.
Cores are gathered and tested by the CJ associates and tested.

4.2 Permeability Samples

A4L-1 sample was taken this week.
No Results have been received and are shown in the appendices.

4.3 MC and PI,

Details received for PI and PL and included within the appendix and recorded within Appendix 1.

4.4 Particle Distribution and Particle Density

Details received all within tolerance and included within the appendix and recorded within Appendix 1

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They predominantly remained above >70Kn/m^2, with a minimum reading was 38 KN/ m^2 recorded and area treated.

5.0 Results Summary

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No Core test results this week were outside the tolerance. One hand shear vane test was outside tolerance, additional rolling provided a suitable test.

6.0 Problems Encountered

Subgrade remediation works were undertaken in cells A4L-1 an area 21mx4mx450mm excavation, installing large stones into the substrate, then a plastic triaxial geogrid on top of the stones with 450mm single size granular material placed on the geogrid and 2nd layer of geotextile on top. Stabalised area covered and tested on 23 May 2019 successful treatment.

Appendix 1 - Progression Plan
Next week

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3224**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**22/05/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Incorrectly labeled are B4L-1 and A4L-1 respectivey

Location Reference	Core 1 B4-L1-C1	Core 2 A4-L1-C1			
Bulk Density	2.03	2.07			
Moisture Content	23	21			
Dry Density	1.65	1.71			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.6	1.3			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 23/05/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3241**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**23/05/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Incorrectly labeled A4L-1 C1 should be labeled A4L-2-C1

Location Reference	Core 1 A4-L-1-C1	Core 2 B4-L-2-C1	Core 3 B3-L-1-C1		
Bulk Density	2.05	2.04	2.05		
Moisture Content	23	24	23		
Dry Density	1.67	1.64	1.67		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	0.8	0.4	0.9		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 24/05/2019
			R Anstee, Materials and Field Testing Director	Fig

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Incorrectly labeled should be B4L-1 and A4L-1 respectively

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3225	B4-L1 22.05.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	54	58	38	50	HSV 1
3226	A4-L1 22.05.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	>150	>150	>150	>150	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	23/05/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3242	A4-L-2 23.05.19	Layer -2	Grey slightly sandy slightly gravelly CLAY	92	84	75	84	HSV 1
3243	B4-L-2 23.05.19	Layer -2	Grey slightly sandy slightly gravelly CLAY	78	60	145	94	HSV 2
3244	B3-L-1 23.05.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	55	95	75	75	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	24/05/2019	**HV1**

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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

Streetscene
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Tuesday 22 May 2019 view from Grid A1

22 May 2019 Grid B4 foundation stabilisation 21x4x450mm – large stones to base prior to geotextile and 450mm single size stone 2 layers of triaxial geogrid

22 May 2019

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22 May 2019 triaxial Geogrid used in B4	22 May 2019 biaxial Geogrid used in D4, C2 and going forward

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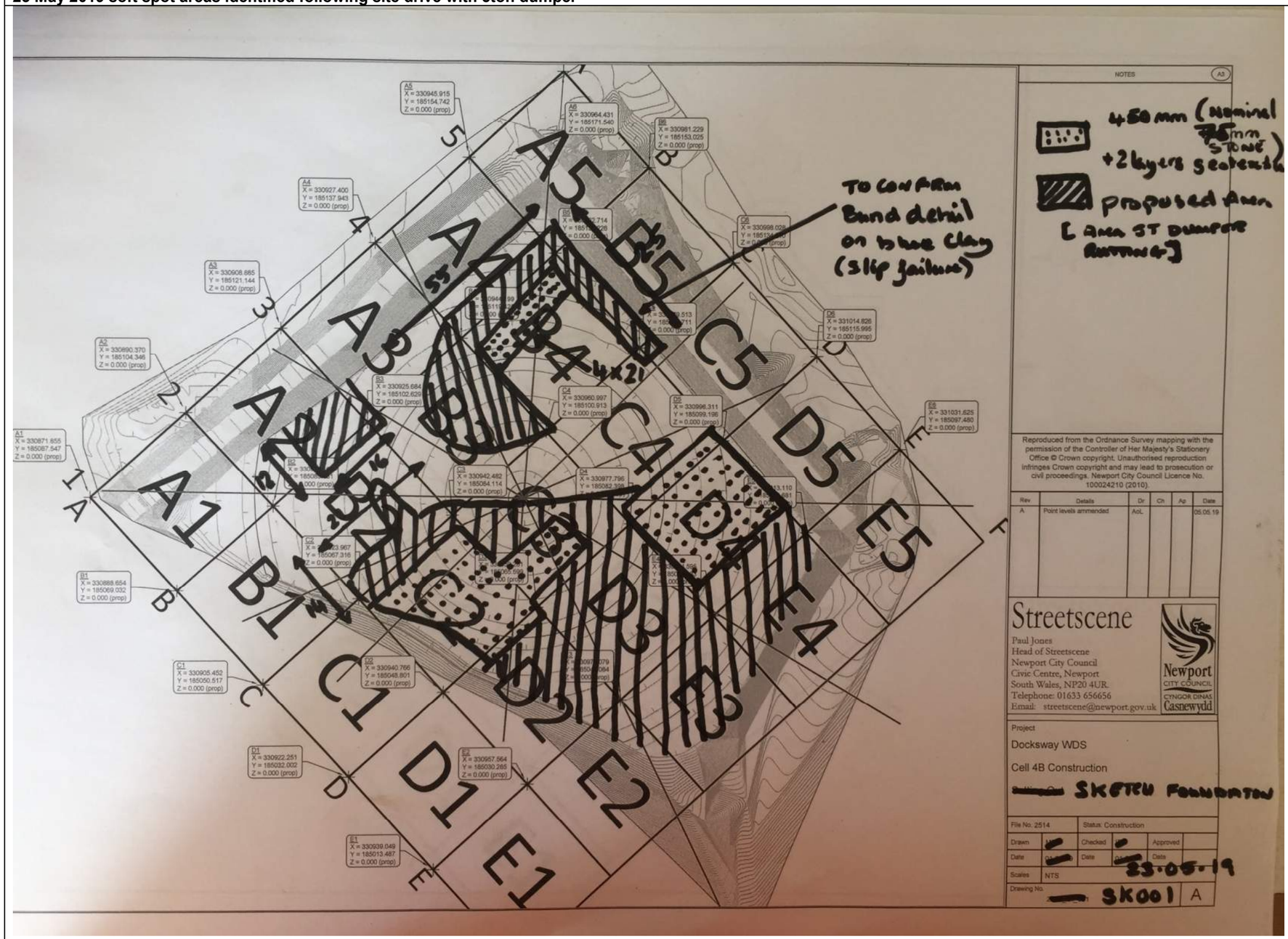
23 May 2019 soft spot areas identified following site drive with 5ton dumper



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22 May 2019 Grid E2 connection detail for Asbestos Bund and phase 2 Cell 4 bund required. *(note discussed with PDA 10 June 2019)*	**22 May 2019 Grid C2 and D4 450mm stone on biaxial geogrid**

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 01 WE 09/06/19

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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		09-06-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved
02	13 June 19	text	William Watt		

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Light rain over the weekend, Monday dry, Tuesday light rain am heavy pm, Wednesday & Thursday dry, heavy rain Friday.

3.0 Progress for the week

3.1 Stockpile

Clay material delivered to site since May 2019, none delivered this week. Material is acceptable with limited large particles.

Up to the 26 May 2019, 9,004 tonnes of material was delivered to site.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Work was undertaken in grids A2, A4, B3, B2 in maximum of 300mm layers with 12 passes of 15,900kg padfoot vibrating roller.

Low spots and software areas work worked on in A2, B2 & B3
No Rework or repeat testing was undertaken. All test results were in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the testing log for areas of 125m^2.

Leachate from the existing land fill west of the site was captured within a grip at A3 and pumped for disposal.

Testing by CJ Associates was undertaken Tuesday, Wednesday and Thursday 04, 05 & 06 June 2019.

Plant on site two 5-ton front loaders, 2 excavators, dozer, roller and bowser.

3.3a Additional Layers
B3L-2
3.3b Levelling the Area
A4, B3
3.3 Layer 1
A4L1, A2L1, B2L1

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3.4 Layer 2
No work undertaken

3.5 Layer 3
No work undertaken

3.6 Layer 4
No work undertaken

3.7 Layer 5
No work undertaken

3.8 Layer +6
No work undertaken

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

6 core cutter samples were taken this week.
6 results core tests received as per the Appendix 1 and 2.
Cores are gathered and tested by the CJ associates and tested.

4.2 Permeability Samples

1 sample was taken this week in Grid B2L1.
No Results have been received.

4.3 MC and PI,

No results received for MC and PI for the areas recorded within Appendix 1.

4.4 Particle Distribution and Particle Density

No results received for PS or PD for the areas recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

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5.0 Results Summary

All test results this week were within the tolerance for the moisture content and compaction.

6.0 Problems Encountered

Foundation level remediation works were undertaken in cells where soft spots was identified.

- 03.06.19, 7:30am to 10:30am B4L-1 an area 18x5m with 450mm excavation, a plastic geogrid (only 5x5m geotextile used as none on site) with 450mm single size granular material placed and no 2nd layer of geotextile on top.
- 04.06.19 7:30am to 10:30am B3 an area 15x5m with 450mm excavation, a textile geogrid with 450mm single size granular material placed and 2nd layer of geotextile on top.
- 05.06.19 7:30am to 10:00am B3/B2 an area 6x9m with 450mm excavation, large stones at base reset, textile geogrid with 450mm single size granular material placed and 2nd layer of geotextile on top. 1-layer geotextile extended 12x10m
- 05.06.19 below A2L1 area 25x15m install geotextile to foundation layer.
- 05.06.19, 1300 to 1600 B3L-1 an area 7x3m with 450mm excavation, a textile geogrid with 450mm single size granular material placed and 2nd layer of geotextile on top. 1-layer geotextile extended 13x14.5m.
- 06.06.19 below B2 area 16x8.5m install geotextile to foundation layer and lay clay.
- 06.06.19 below B3 area 8x4.5m install geotextile to foundation layer and lay clay.

Appendix 1 - Progression Plan

Streetscene
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Core Cutter
Make-up Layers

Grid Ref	-L1		-L1		-L2				-L3		-L4	
	Orig	Orig	Orig	Orig	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A4	D&MC	P Sh-150			D&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	D&MC	P Sh-55	MC&PI/DS&D/ D&MC	P Sh-82 T-PI T- DS&D								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	D&MC	*F Sh-38*		P Sh-52	D&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						

Liner Layer 1.2m

Grid Ref	L1		L2				L3		L4				L5		L5A	
	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A1																
Date																
A2	MC&PI/DS&D/ D&MC	P Sh-50 T-PI T- DS&D														
Date	T--05/06/19	P-06/06/19														
A3																
Date																
A4	MC&PI/DS&D/ D&MC	P Sh-80 T-PI T- DS&D														
Date	T-04/06/19	P-05/06/19														
A5																
Date																
B1																
Date																
B2	MC&PI/DS&D/ D&MC	P Sh-52 T-PI T- DS&D														
Date	T-06/06/19	P-07/06/19														
B3																
Date																
B4																
Date																

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T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
D&S -	Particle Density & Particle Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3	(3 per Cells/layer)	Record
D&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Testing complete***
A4L-1		22/05/19		
B2L1		06/06/19		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3316**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**04/06/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

B3L-2 where 200mm of material placed on foundation compacted to below formation

Location Reference	Core 1 B3-L1-C1	Core 2 A4-L1-C1			
Bulk Density	2.07	2.05			
Moisture Content	21	24			
Dry Density	1.71	1.65			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.7	0.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 05/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3319**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/06/2019**	Material Source:	**Unknown**
Tested By:	**R Anstee**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A2-L1-C1	Core 2 A2-L1-C1			
Bulk Density	2.04	2.07			
Moisture Content	21	21			
Dry Density	1.69	1.71			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	3.3	2.3			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 06/06/2019
			R Anstee, Materials and Field Testing Director	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3358**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**06/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B2-L1-C1	Core 2 B2-L1-C1			
Bulk Density	2.01	2.03			
Moisture Content	25	24			
Dry Density	1.61	1.64			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.1	1.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 07/06/2019	Fig

Streetscene
Y-Strydynun

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Appendix 4 – Field Logs

Available on request

Streetscene
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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3317	B3-L1 04.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	98	82	115	98	HSV 1
3318	A4-L1 04.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	100	90	80	90	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	05/06/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3320	A2-L1 05.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	95	90	52	79	HSV 1
3321	A2-L1 05.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	70	50	108	76	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	06/06/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3359	B2-L1 06.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	90	75	57	74	HSV 1
3360	B2-L1 06.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	58	52	150	87	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee	Date 07/06/2019	Fig. **HV1**
Rev 1.0		R Anstee, Materials and Field Testing Director		

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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

Streetscene
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Monday 03 June 2019 from Grid A1 Ramp

Treatment are A4 18x5m *(only 4x5m geotextile available on site)03.06.19 7:30am to 10:30am*

Treatment are A4 18x5m *(only 4x5m geotextile available on site)03.06.19 7:30am to 10:30am*

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Treatment are B3 15x5m *(geotextile top and bottom) 04.06.19 7:30am to 10:30am*	**Treatment are B3 15x5m *(geotextile top and bottom) 04.06.19 7:30am to 10:30am***
Treatment are B3 6x9m *(geotextile top and bottom- bottom geotextile extended 12x14m) 05.06.19 7:30am to 10:00am*	**Treatment are B3 6x9m *(geotextile top and bottom- bottom geotextile extended 12x14m) 05.06.19 7:30am to 10:00am***

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Treatment are B3 7x3m *(geotextile top and bottom- bottom) 05.06.19 1300pm to 1600pm*	**Treatment are B3 7x3m *(geotextile top and bottom- bottom) 05.06.19 1300pm to 1600pm***
A2L1 (25x12m) 05.06.19 and B2L1 (16x8.5m) 06.06.19 (geotextile only used above formation)	**B3L1 (8x4.5m) 06.06.19 (geotextile only used above formation)**
Note: where only geotextile used at northern corner of grid B2/B3, movement shown in subsequent layer Testing undertaken showed suitably compacted. To continue to monitor in Layer 2.	

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B3 level of top geotextile to formation layer app. 150mm and final depth of clay nominally 190mm to formation layer	
A2L1 layer 290mm thick from formation level with nominally 170mm above formation (Survey level taken 06/06/19 to show L1 above formation and level of formation following compaction.)	

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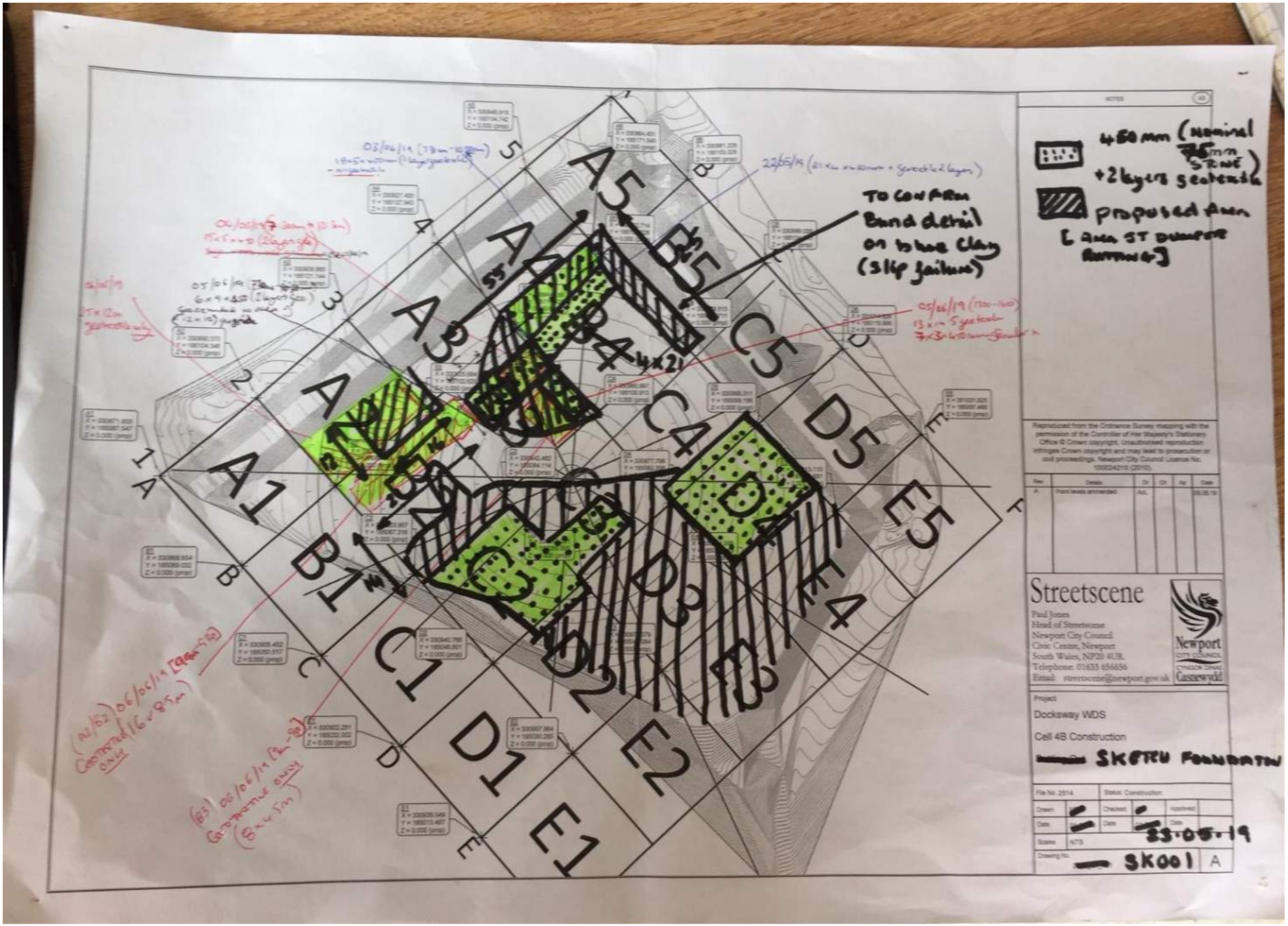
06.06.19 Works complete at end of Thursday prior to heavy rain on Friday


450 mm (Nominal 375mm Stone)
+2 layers geotextile
proposed area
[area ST dumper running]
TO CONFIRM Bund detail on blue clay (slip failure)
Streetscene
Paul Jones
Head of Streetscene
Newport City Council
Civic Centre, Newport
South Wales, NP20 4UR.
Telephone: 01633 656656
Email: streetscene@newport.gov.uk
Project
Docksway WDS
Cell 4B Construction
SKETCH FOUNDATION
File No. 2514
Status: Construction
Scale: NTS
23.05.19
SK001
A

Streetscene
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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 02 WE 16/06/19

Streetscene
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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		16-06-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

Streetscene
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South Wales/De Cymru
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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Heavy rain over the weekend, Monday dry am rain pm, Tuesday light rain am pm, Wednesday & Thursday light rain am, heavy rain Friday.

3.0 Progress for the week

3.1 Stockpile

Clay material delivered to site this week. Material is acceptable with limited large particles.

9,004 tonnes of material was delivered to site with material delivered in March and April 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

CQA work was undertaken grids A2, A3, A4, B2
Software areas work worked on in D2, D3 and D4
No Rework or repeat testing was undertaken. All test results were in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the testing log for areas of 125m^2.

Leachate from the existing land fill west of the site was captured within a grip at A3 and pumped for disposal.

Testing by CJ Associates was undertaken Monday 10 June 2019.

Plant on site two 5-ton front loaders, 2 excavators, dozer, roller and bowser.

3.3a Additional Layers
Additional 450mm well graded stone with some fines was installed on grids D2, D3 and D4 raising the level from formation and the final level of clay material.

3.3b Levelling the Area
No work undertaken

3.3 Layer 1
A3L1

3.4 Layer 2
A4L2, A2L2, B2L2

3.5 Layer 3

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No work undertaken

3.6 Layer 4

No work undertaken

3.7 Layer 5

No work undertaken

3.8 Layer +6

No work undertaken

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

2 core cutter samples were taken this week.
2 results core tests received as per the Appendix 1 and 2.
Cores are gathered and tested by the CJ associates and tested.

4.2 Permeability Samples

0 sample was taken this week.
No Results have been received and are shown in the appendices.

4.3 MC and PI,

No results received for MC and PI for the areas recorded within Appendix 1.

4.4 Particle Distribution and Particle Density

No results received for PS or PD for the areas recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 62 KN/ m^2 recorded.

5.0 Results Summary

All test results this week were within the tolerance for the moisture content and compaction.

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6.0 Problems Encountered

Foundation remediation undertaken in cells where soft spots was identified.

- 12.06.19 1330pm to 1600pm a ramp was installed into D4 using a geogrid and granular material.
- 13&14. 06.19 7:30am to 1600pm D2, D3, a biaxial geogrid was installed on the subgrade with 450mm granular material with some fines installed on top. A second layer of geogrod is to be installed on top and the final layer of clay raised accordingly.

Appendix 1 - Progression Plan

Streetscene
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Core Cutter
Make-up Layers

Grid Ref	-L1		-L1		-L2				-L3		-L4	
	Orig	Orig	Orig	Orig	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A4	D&MC	P Sh-150			D&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	D&MC	P Sh-55	MC&PI/DS&D/ D&MC	P Sh-82 T-PI T- DS&D								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	D&MC	*F Sh-38*		P Sh-52	D&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						

Liner Layer 1.2m

Grid Ref	L1		L2				L3		L4				L5		L5A	
	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A1																
Date																
A2	MC&PI/DS&D/ D&MC	P Sh-50 T-PI T- DS&D	MC&PI/ D&MC	P Sh-62 T-PI												
Date	T--05/06/19	P-06/06/19	T--10/06/19	P-11/06/19												
A3	MC&PI/DS&D/ D&MC	P Sh-70 T-PI T- DS&D														
Date	T--10/06/19	P-11/06/19														
A4	MC&PI/DS&D/ D&MC	P Sh-80 T-PI T- DS&D	As A3L1	As A3L1												
Date	T-04/06/19	P-05/06/19	As A3L1	As A3L1												
A5																
Date																
B1																
Date																
B2	MC&PI/DS&D/ D&MC	P Sh-52 T-PI T- DS&D	MC&PI / D&MC to be done	P Sh-to be done T-PI												
Date	T-06/06/19	P-07/06/19	T-10/06/19	P-core to be done												
B3																
Date																

T- Test P- Pass F- Fail

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MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
D&S -	Particle Density & Particle Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3	(3 per Cells/layer)	Record
D&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Testing complete***
A4L-1		22/05/19		
B2L1		06/06/19		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3375**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**10/06/2019**	Material Source:	**Unknown**
Tested By:	**R Anstee**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-L1-C1	Core 2 A2-L2-C1			
Bulk Density	2.01	1.99			
Moisture Content	24	26			
Dry Density	1.63	1.58			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	2.1	1.5			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 11/06/2019	Fig

Streetscene
Y-Strydynun

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Appendix 4 – Field Logs

Available on request

Streetscene
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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3376	A3-L1 10.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	80	62	62	68	HSV 1
3377	A2-L2 10.06.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	70	72	72	71	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	11/06/2019	**HV1**

Streetscene
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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

Streetscene
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Monday 10 June 2019 from Grid A1

Monday 10 June 2019 from Grid E1 – Asbestos tip & Cell 4a & 4b

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10 June 2019 Grid A3L1 material	10 June 2019 Grid A1
Tuesday 11 June 2019 from Grid A1 – rain prevents access to Clay	

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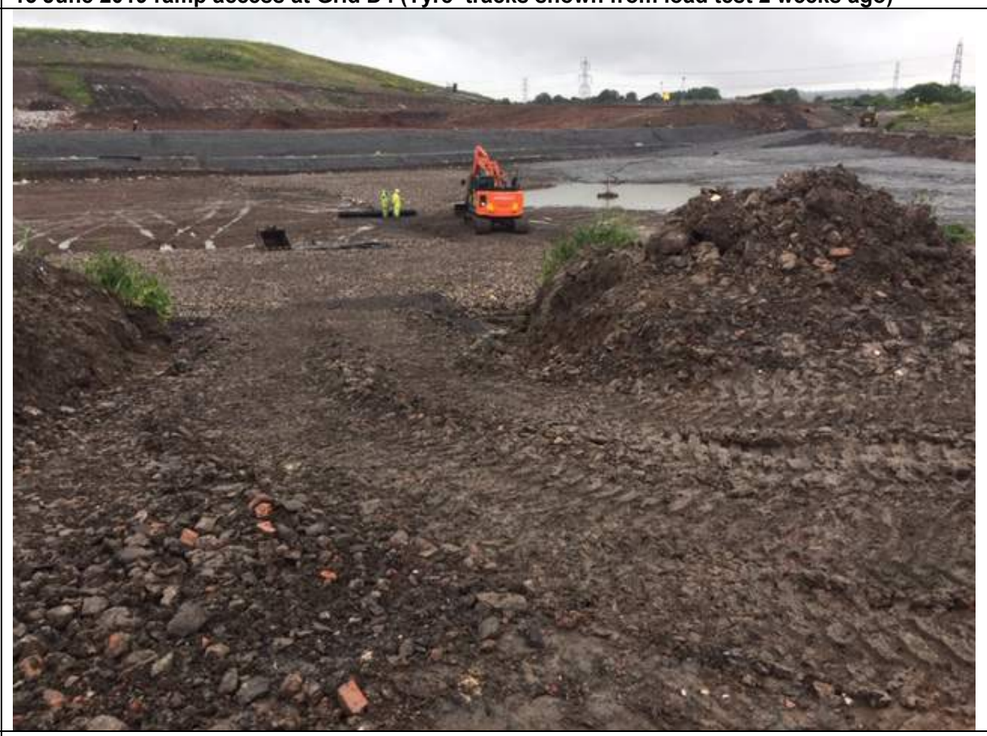
13 June 2019 8am rain prevents access to clay laying stabilisation in Grid D3	13 June 2019 ramp access at Grid D4 (Tyre tracks shown from load test 2 weeks ago)
	

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 03 WE 23/06/19

Streetscene
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South Wales/De Cymru
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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		23-06-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

Streetscene
Y-Strydynun

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Streetscene
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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Rain over the weekend, Monday dry too wet to access site until 10:50am, Tuesday dry am showers pm, Wednesday, Thursday & Friday dry with occasional showers.

3.0 Progress for the week

3.1 Stockpile

No Clay material delivered to site this week. Material is acceptable with limited large particles.

9,004 tonnes of material was delivered to site in March and April 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

CQA work was undertaken grids A1, B1, B2, B3, B4, C2, C3, D2,
Geotextile arrived on site for 19 June 2019, software areas work worked on in C3, and C2 trial soft area using geotextile only installed in D2.
No Rework or repeat testing was undertaken. All test results were in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the testing log for areas of 125m^2.

Leachate from the existing land fill west of the site was captured within a grip at A3 and pumped for disposal.

Testing by CJ Associates was undertaken Tuesday 19 June 2019, Thursday 20 June 2019 and Friday 21 June 2019.

Plant on site two 5-ton front loaders, 2 excavators, dozer, roller and bowser.

3.3a Additional Layers
Additional 450mm well graded stone with some fines was installed in grids C2 with geotextile top and bottom Area was resurveyed 19 June 2019.
D2L-1 geotextile to Formation layer with clay.

3.3b Levelling the Area
No work undertaken

3.3 Layer 1
A1L1, B1L1, B3L1, B4L1, C2L1, C3L1

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3.4 Layer 2
No work undertaken
3.5 Layer 3
No work undertaken
3.6 Layer 4
No work undertaken
3.7 Layer 5
No work undertaken
3.8 Layer +6
No work undertaken

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

7 core cutter samples were taken this week B1L1, B2L2, B3L2, B4L1, C2L1, C3L1, D2L-1.
7 results core tests received as per the Appendix 1 and 2.
Cores are gathered and tested by the CJ associates and tested.

4.2 Permeability Samples

0 sample was taken this week.
1 Results was received and is shown in the appendices.

4.3 MC and PI,

No results received for MC and PI for the areas recorded within Appendix 1.

4.4 Particle Distribution and Particle Density

No results received for PS or PD for the areas recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

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5.0 Results Summary

All test results this week were within the tolerance for the moisture content and compaction.

6.0 Problems Encountered

Foundation remediation undertaken in cells where soft spots was identified.

- 19.06.19 7:30 to 10:30 laying geotextile onto foundation with clay laid on top, trial area 13x8m in D2.
- 19.06.19 7:30 to 10:30 450mm rock with geotextile top and bottom laid in C3 and C2 resurveyed in pm 19 June 2019.
- 21.06.19, 10am to 11:38am, Kate Riley & Natasha Caton (PBA CQA Engineer) attended site. A lapse in the Asbestos cell operation procedure was identified by PBA consultants and actions were put in place by Council.

Appendix 1 - Progression Plan

Streetscene
Y-Strydynun

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Core Cutter
Make-up Layers

Grid Ref	-L1		-L1		-L2				-L3		-L4	
	Orig	Orig	Orig	Orig	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A4	D&MC	P Sh-150			D&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	D&MC	P Sh-55	MC&PI/DS&D/ D&MC	P Sh-82 T-PI T- DS&D								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	D&MC	*F Sh-38*		P Sh-52	D&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	D&MC	P Sh-56										
	T-20/06/19	P-21/06/19										

Liner Layer 1.2m

Grid Ref	L1		L2				L3		L4				L5		L5A	
	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A1	As B2L1	As B2L1														
Date	T-21/06/19	P-24/06/19														
A2	MC&PI/DS&D/ D&MC	P Sh-50 T-PI T- DS&D	MC&PI/ D&MC	P Sh-62 T-PI												
Date	T--05/06/19	P-06/06/19	T--10/06/19	P-11/06/19												
A3	MC&PI/DS&D/ D&MC	P Sh-70 T-PI T- DS&D														
Date	T--10/06/19	P-11/06/19														
A4	MC&PI/DS&D/ D&MC	P Sh-80 T-PI T- DS&D	As A3L1	As A3L1												
Date	T-04/06/19	P-05/06/19	As A3L1	As A3L1												
A5																
Date																
B1	MC&PI/DS&D/ D&MC	P Sh-62 T-PI T- DS&D														
Date	T-21/06/19	P-24/06/19														
B2	MC&PI/DS&D/ D&MC	P Sh-52 T-PI	MC&PI / D&MC	P Sh-58 T-PI												

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		T- DS&D														
Date	T-06/06/19	P-07/06/19	T-19/06/19	P-21/06/19												
B3	MC&PI /D&MC	P Sh 84 T-PI														
Date	T-18/06/19	P-19/06/19														
B4	MC&PI /D&MC	P Sh-67 T-PI														
Date	T-18/06/19	P-19/06/19														
B5																
Date																
C1																
Date																
C2	MC&PI/D S&D/ D&MC	P Sh-50 T-PI T- DS&D														
Date	T-19/06/19	P-21/06/19														
C3	MC&PI/D S&D/ D&MC	P Sh-82 T-PI T- DS&D														
Date	T-19/06/19	P-21/06/19														
C4																
Date																
C5																
Date																
D1																
Date																
D2																
Date																
D3																
Date																
D4																
Date																
D5																
Date																
E1																
Date																
E2																
Date																
E3																
Date																
E4																
Date																
E5																
Date																

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
D&S -	Particle Density & Particle Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3	(3 per Cells/layer)	Record
D&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

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Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Testing complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labelled B4L-1	17/06/19
B2L1		06/06/19		
D2L-1		21/06/19	Test area for laying clay onto geotextile only	

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

Laboratory Test Certificate

Site	Docksway Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG

cjassociates

Order Number	Andrew Miles
Job Number	AG0390
Lab Number	L13711

Number of samples submitted for testing:	1	sample (s)
Triaxial Permeability test duration up to 4 days	1	test(s)
e/o above item additional days	tbc	dayt(s)

Date (s) samples received at laboratory:	22	May-19
Date of receipt of testing instructions	22	May-19
Date testing started:	22	May-19
Date of issue:	17	Jun-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lorna Logan

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT3
Sample Ref.:	B4 L-1
Mis-Labelled should be A4L-1	
Sample Type:	C

Description:
Stiff dark grey slightly gravelly CLAY with occasional shell fragments. Gravel is fine to medium weathered mudstone.

SPECIMEN DETAILS

Depth within original sample	10 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.67	101.60
Height	*mm*	100.62	100.55
Moisture Content	*%*	21.3	25.1
Bulk Density	*Mg/m³*	2.00	2.06
Dry Density	*Mg/m³*	1.65	1.65

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.26	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	1.7

PERMEABILITY STAGE

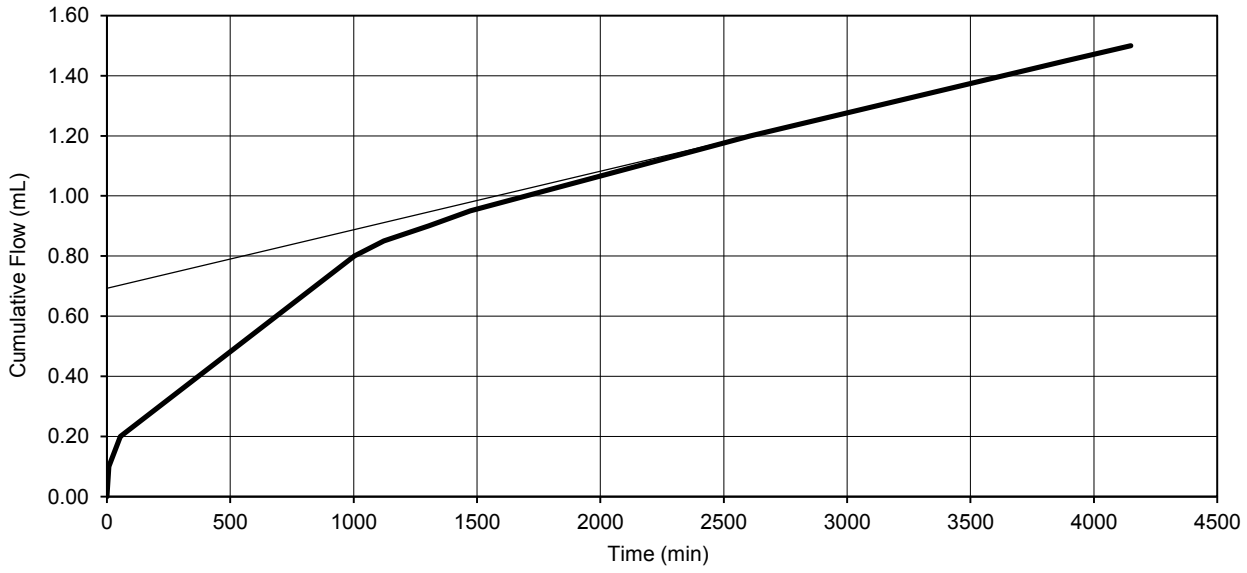
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.1
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	6
Consolidation	*days*	1
Flow	*days*	3

Coefficient of Permeability
k_v at 20 °C = 4.0×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
17/06/2019

Project Number: **GEO / 29332**

Project Name: **DOCKSWAY CELL 4 AG0390**

GEOLABS

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3435**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**18/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B3-L1-C1	Core 2 B4-L1-C1			
Bulk Density	2.03	2.04			
Moisture Content	24	24			
Dry Density	1.64	1.64			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	0.7	0.3			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 19/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3440**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**20/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C2-L1-C1	Core 2 B2-L2-C1	Core 3 D2-L-1-C1		
Bulk Density	2.01	2.03	2.05		
Moisture Content	23	24	23		
Dry Density	1.63	1.63	1.67		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	2.6	1.2	1.3		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 21/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3464**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**21/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B1-L1-C1	Core 2 C3-L1-C1			
Bulk Density	1.99	1.98			
Moisture Content	26	24			
Dry Density	1.59	1.59			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.5	3.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 22/06/2019
			R Anstee, Materials and Field Testing Director	Fig

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3436	B3-L1 18.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	90	80	90	87	HSV 1
3437	B4-L1 18.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	60	65	70	65	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	18/06/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3441	C2-L1 20.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	50	52	112	71	HSV 1
3442	B2-L2 20.06.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	84	58	78	73	HSV 2
3443	D2-L-1 20.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	58	56	82	65	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	21/06/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3465	B1-L1 21.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	62	72	74	69	HSV 1
3466	C3-L1 21.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	118	92	82	97	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	22/06/2019	HV1

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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

Streetscene
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Monday 24 June 2019 from Grid A1

Wednesday 19 June 2019 from Grid A1 too wet to lay clay on the previous areas due to holding surface water in sheep's foot roller holes

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D2L-1 Thursday 20 June 2019 Area for trial laying clay over soft area with geotextile only	D2L-1 20/06/19 ensuring that maximum 300mm layer installed
D2L-1 20/06/19 testing undertaken and identification of minor surface rutting in area	A3L1 – 21 June 2019 Area bladed out to assist drying of clay. Localised areas of over wet clay where rain water held in sheep's foot roller holes have combined on blading to be removed.

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A1 21 June 2019 Mister being taken to asbestos site	C2 19 June 2019 geotextile placed over area prior to laying clay Not Geotextile to edge of cell.

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 04 WE 30/06/19

Streetscene
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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		30-06-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

Streetscene
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4.2 Permeability Samples
4.3 MDD and OMC
4.4 LL, PL, PI, MC
4.5 Hand Shear Vane

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5.2 Permeability

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Appendix

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3. Permeability Tests
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6. Hand Shear Vane Logs
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8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Rain over the weekend, Monday, Wednesday, Thursday and Friday dry, overcast and some wind.
Tuesday rain in am unable to lay clay, dry pm.

3.0 Progress for the week

3.1 Stockpile

Clay material delivered to site this week from Thursday 27 June 2019 and stockpiled in Grid A2.
Material is acceptable with limited large particles and those exceeding the CQA specification broken down or removed.
9,004 tonnes of material was delivered to site in March and April 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

CQA work was undertaken grids A1, A2, B1, B2, B3, B4, C3, C4, E2, E3, E4 refer to section 3.3 for layers installed.
Rework and repeat testing was undertaken in A3L1 and A4L1. Additional testing where partial grid previously installed at C3L1
All testing and results were in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material is placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller 15,900kg padfoot vibrating roller.

Leachate from the existing land fill west of the site was captured within a grip at A3, A1 and B4 was pumped for disposal.

Testing by CJ Associates was undertaken Monday, Wednesday, Thursday and Friday 24 to 28th June 2019

Plant on site two 5-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E) and bowser.

3.3a Additional Layers
E2L-1, E3L-1, E4L-1

3.3b Levelling the Area
No work undertaken

3.3 Layer 1
A3L1(retesting), C3L1(additional), C4L1

3.4 Layer 2
A1L2, B1L2, B3L2, B4L2

3.5 Layer 3
A1L3, A2L3, B1L3, B2L3

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3.6 Layer 4
No work undertaken

3.7 Layer 5
No work undertaken

3.8 Layer +6
No work undertaken

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

12 core cutter samples were taken this week
12 results core tests received as per the Appendix 1 and 2.
Cores are gathered and tested by the CJ associates and tested.

4.2 Permeability Samples

1 sample was taken this week.
0 Results was received and is shown in the appendices.

4.3 MC and PI,

Test material taken in accordance with CQA, no results received for MC and PI for the areas recorded within Appendix 1.

4.4 Particle Distribution and Particle Density

Test material taken in accordance with CQA, no results received for PS or PD for the areas recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

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All test results this week were within the tolerance for the moisture content and compaction.

6.0 Problems Encountered

Foundation remediation undertaken in cells where soft spots was identified.

24.06.19 :7:30 -8am laying geotextile onto foundation with clay laid on top Geotextile to E2, E3 and E4.

27.06.19 Retest for area A2 to A3 for area excessively wetted by rain. The excessively wet clay was removed and replaced as necessary, the layer was allowed to dry out before being recompacted once moisture was within the range allowed for in the CQA Plan and Specification. The area was retested in accordance with the CQA Plan/Specification.

- The asbestos operation in the adjacent cell continued this week. Council have informed the CQA inspector that their procedure is being followed and where a lapse identified last week had occurred this was being addressed.
- Litter entering the site from the adjacent cell 4a remains and issue. Litter pickers have attended the site on only one occasion to date.

Appendix 1 - Progression Plan

Streetscene
Y-Strydynun

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Core Cutter
Make-up Layers

Grid Ref	-L1		-L1		-L2				-L3		-L4	
	Orig	Orig	Orig	Orig	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A4	D&MC	P Sh-150			D&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	D&MC	P Sh-55	MC&PI/DS&D/ D&MC	P Sh-82 T-PI T- DS&D								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	D&MC	*F Sh-38*		P Sh-52	D&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	D&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI D&MC	P Sh-58 T-PI										
	T-24/06/19	P-25/06/19										
E3	MC&PI/DS&D/ D&MC	P Sh-75 T-PI T- DS&D										
	T-24/06/19	P-25/06/19										
E4	MC&PI/ D&MC	P Sh-75 T-PI										
	T-25/06/19	P-27/06/19										

Liner Layer 1.2m

Grid Ref	L1				L2				L3		L4				L5		L5A	
	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19								
A2	MC&PI/DS&D/ D&MC	P Sh-50 T-PI T- DS&D			MC&PI/ D&MC	P Sh-62 T-PI			MC&PI/DS&D/ D&MC	P Sh-78 T-PI T-DS&D								
Date	T--05/06/19	P-06/06/19			T--10/06/19	P-11/06/19			T—26/06/19	P-27/06/19								
A3	MC&PI/DS&D/ D&MC	P Sh-70 T-PI T- DS&D	D&MC	P SH-64														
Date	T--10/06/19	P-11/06/19	T--27/06/19	P-28/06/19														
A4	MC&PI/DS&D/ D&MC	P Sh-80 T-PI T- DS&D	As A3L1	As A3L1														

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Date	T-04/06/19	P-05/06/19	T--27/06/19	P-28/06/19														
A5																		
Date																		
B1	MC&PI/DS&D/D&MC	P Sh-62 T-PI T- DS&D			MC&PI/D&MC	P Sh-85 T-PI			MC&PI/D&MC	P Sh-64 T-PI								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19								
B2	MC&PI/DS&D/D&MC	P Sh-52 T-PI T- DS&D			MC&PI / D&MC	P Sh-58 T-PI			MC&PI /DS&D/ D&MC	P Sh-74 T-PI T- DS&D								
Date	T-06/06/19	P-07/06/19			T-19/06/19	P-21/06/19			T-26/06/19	P-27/06/19								
B3	MC&PI /D&MC	P Sh 84 T-PI			MC&PI /DS&D/D&MC	P Sh 64 T-PI T-DS&D												
Date	T-18/06/19	P-19/06/19			T-18/06/19	P-28/06/19												
B4	MC&PI /D&MC	P Sh-67 T-PI			MC&PI /D&MC	P Sh-66 T-PI												
Date	T-18/06/19	P-19/06/19			T-27/06/19	P-28/06/19												
B5																		
Date																		
C1																		
Date																		
C2	MC&PI/DS&D/D&MC	P Sh-50 T-PI T- DS&D																
Date	T-19/06/19	P-21/06/19																
C3	MC&PI/DS&D/D&MC	P Sh-82 T-PI T- DS&D	MC&PI/DS&D/D&MC	P Sh-55 T-PI T- DS&D														
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19														
C4	MC&PI / D&MC	P Sh-95 T-PI																
Date	T-28/06/19	P-01/07/19																

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
D&S -	Particle Density & Particle Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3	(3 per Cells/layer)	Record
D&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

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Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Testing complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1		06/06/19		
D2L-1		*21/06/19*	*Test area for laying clay onto geotextile only*	
B2L3		*26/06/19*		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3521**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**24/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B1-L2-C1	Core 2 E2-L-1-C1	Core 3 E3-L-1-C1		
Bulk Density	2.08	2.02	2.04		
Moisture Content	21	23	23		
Dry Density	1.72	1.64	1.66		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	1.1	1.9	1.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 25/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3553**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**26/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A2-L3-C1	Core 2 E4-L-1-C1	Core 3 B1-L3-C1	Core 4 B2-L3-C1	
Bulk Density	2.04	2.05	2.01	2.04	
Moisture Content	24	23	24	24	
Dry Density	1.64	1.67	1.62	1.64	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	0.7	1.2	1.7	0.4	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 27/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3560**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**27/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B4-L2-C1	Core 2 B3-L2-C1	Core 3 A3-L1-C1 Retest		
Bulk Density	2.01	1.99	2.06		
Moisture Content	26	23	23		
Dry Density	1.60	1.62	1.67		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	0.6	3.4	0.3		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref.		Approver	Date	Fig
BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473 UKAS TESTING 1429	R. Anstee	28/06/2019	
		R Anstee, Materials and Field Testing Director		

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3571**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**28/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C3-L1-C1	Core 2 C4-L1-C1			
Bulk Density	2.02	2.02			
Moisture Content	24	25			
Dry Density	1.63	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.5	0.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 30/06/2019	Fig

Streetscene
Y-Strydynun

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Appendix 4 – Field Logs

Available on request

Streetscene
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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3522	B1-L2 24.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	125	>150	78	>118	HSV 1
3523	E2-L-1 24.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	96	81	58	78	HSV 2
3524	E3-L-1 24.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	75	85	100	87	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	25/06/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3554	A2-L3 26.06.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	91	90	78	86	HSV 1
3555	E4-L-1 26.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	75	85	90	83	HSV 2
3556	B1-L3 26.06.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	134	89	64	96	HSV 3
3557	B2-L3 26.06.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	120	74	76	90	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	27/06/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3561	B4-L2 27.06.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	70	68	66	68	HSV 1
3562	B3-L2 27.06.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	75	88	64	76	HSV 2
3563	A3-L1 Retest 27.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	100	100	68	89	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	28/06/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3572	C3-L1 28.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	97	135	55	96	HSV 1
3573	C4-L1 28.06.20	Layer 1	Grey slightly sandy slightly gravelly CLAY	95	110	110	105	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	30/06/2019	HV1

Streetscene
Y-Strydynun

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Appendix 6 – PI, PL, MC, LL Results

Streetscene
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Appendix 7 – Photographs

Streetscene
Y-Strydynun

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Monday 24 June 2019 from Grid A1

Monday 01 July 2019 from Grid A1 (Stockpile area at Grid A1)

Streetscene
Y-Strydynun

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Monday 24/06/19 Stockpile area adjacent to access road.	**E4L-1 Monday 24/06/19 Geotextile to foundation**
D4 Monday 24/06/19 Foundation blue clay squeezing through 450mm granular material.	**Tuesday 25/06/19 rain over night and am no work on clay**

Streetscene
Y-Strydynun

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Checking layer thickness tab	A2L3 26/06/19 checking layer thickness
A3L1 Repeat Testing 27/06/19 retreated and rerolled.	**C4L1 28/06/19 excessive rutting in layer 1 to investigate on Monday to confirm if treatment required.**

Streetscene
Y-Strydynun

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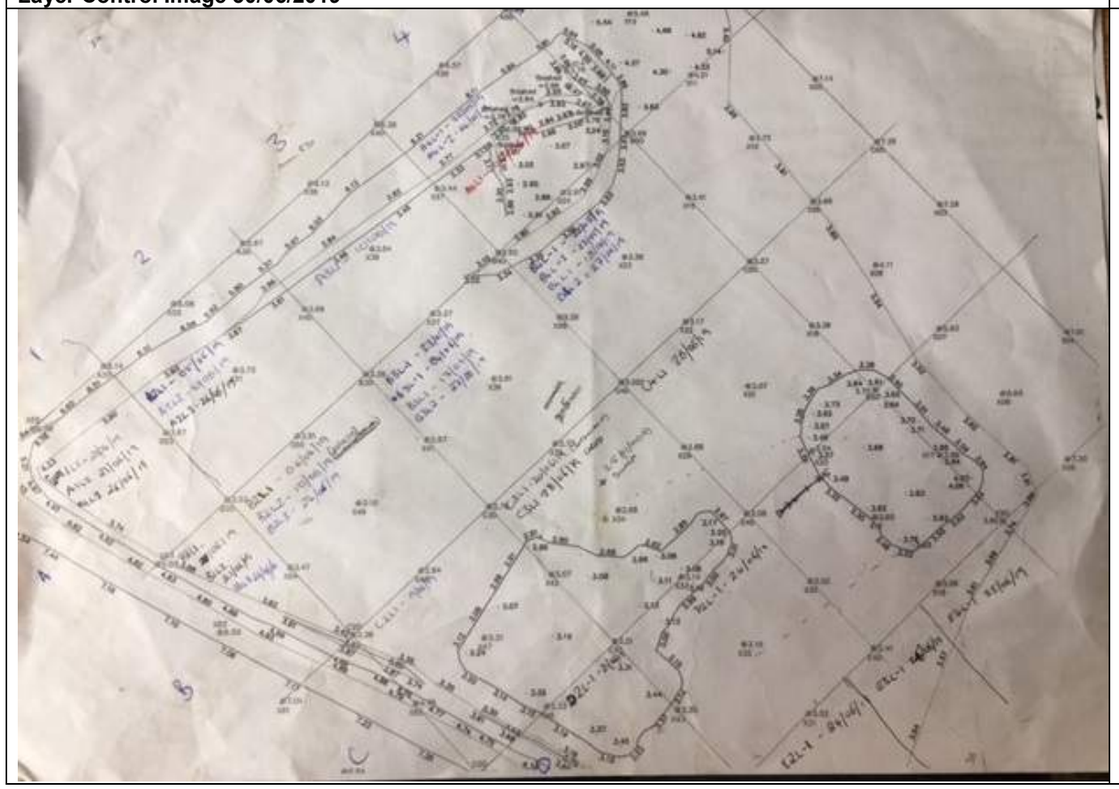
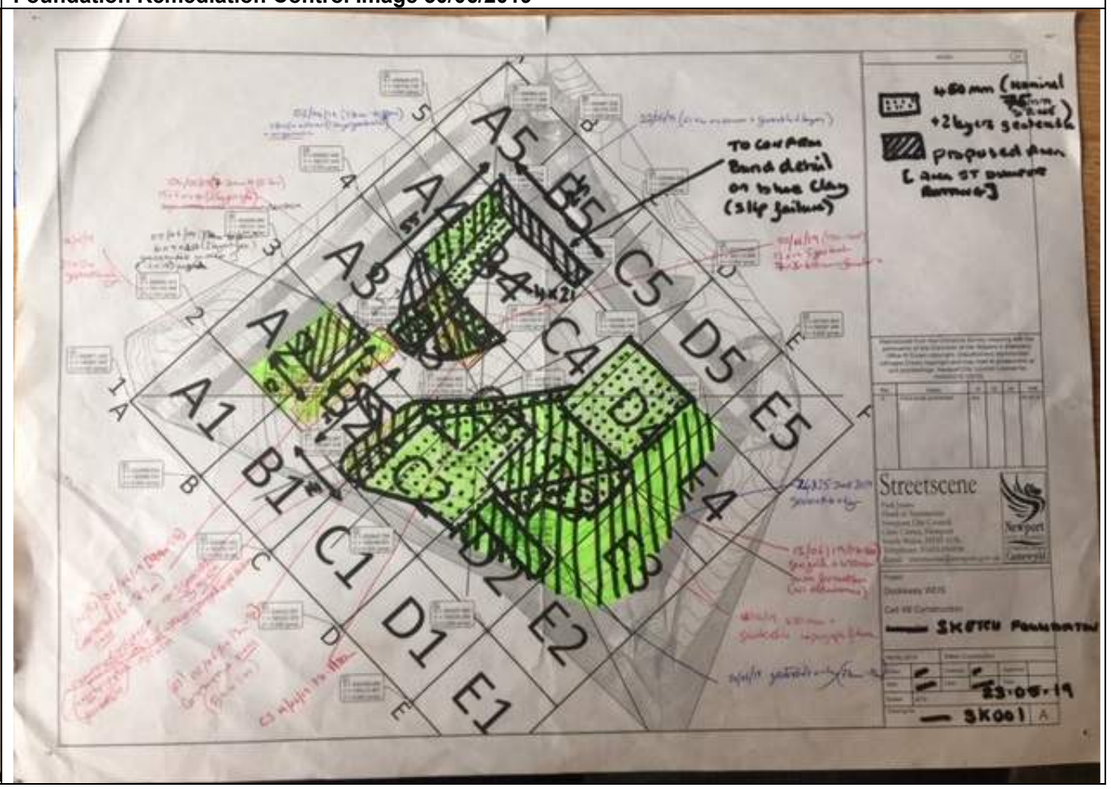
Layer Control Image 30/06/2019	Foundation Remediation Control Image 30/06/2019
	

Streetscene
Y-Strydynun

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 05 WE 07/07/19

Streetscene
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Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		07-07-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

Streetscene
Y-Strydynun

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5.2 Permeability

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Appendix

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5. Field Logs
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Streetscene
Y-Strydynun

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Sunny & dry over the weekend and Monday to Friday.

3.0 Progress for the week

3.1 Stockpile

Clay material delivered to site this week and stockpiled in Grid A2. Material is acceptable with limited large particles and those exceeding the CQA specification broken down or removed.
Work commenced from the new stockpile in Grid A2 on Wednesday 03 July 2019.
11,602 tonnes of material was delivered to site up to 03 July 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

CQA work was undertaken grids A3, A4, B4, C2, C3, C4, C5, D2, D3, E2, E3, E4, E5 refer to section 3.3 for layers installed.
All testing and results were in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material is placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller 15,900kg padfoot vibrating roller.

Leachate from the existing land fill west of the site was captured within a grip at A3, A1 and B4 was pumped for disposal.

Testing by CJ Associates was undertaken Monday, Tuesday, Wednesday, Thursday and Friday

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E) and bowser.

3.3a Additional Layers
No work undertaken

3.3b Levelling the Area
No work undertaken

3.3 Layer 1
C5L1, D2L1, D3L1, E2L1, E3L1, E4L1, E5L1

3.4 Layer 2
A3L2, A4L2, C2L2, C3L2, C4L2, C5L2,

3.5 Layer 3
No work undertaken

3.6 Layer 4
No work undertaken

3.7 Layer 5
No work undertaken

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3.8 Layer +6

No work undertaken

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

13 core cutter samples were taken this week
13 results core tests received as per the Appendix 1 and 2.
Cores are gathered and tested by the CJ associates and tested.

4.2 Permeability Samples

2 sample was taken this week.
0 Results was received and is shown in the appendices.

4.3 MC and PI,

Test material taken in accordance with CQA, no results received for MC and PI for the areas recorded within Appendix 1.

4.4 Particle Distribution and Particle Density

Test material taken in accordance with CQA, no results received for PS or PD for the areas recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

All test results this week were within the tolerance for the moisture content and compaction.

6.0 Problems Encountered

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Foundation remediation undertaken in cells where soft spot was identified.
02/07/19: 13:30 -1600pm remove layer 1 clay, laying geotextile onto foundation and on top of 300mm of stone to match adjacent level on rock in grid D3, area 15x3m with clay laid on top
04/07/19: Geotextile to E5 onto existing foundation no rock 3x5m area.

- Litter entering the site from the adjacent cell 4a remains and issue. Litter pickers have attended the site on only one occasion to date.

Appendix 1 - Progression Plan

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Core Cutter
Make-up Layers

Grid Ref	-L1		-L1		-L2				-L3		-L4	
	Orig	Orig	Orig	Orig	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A4	D&MC	P Sh-150			D&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	D&MC	P Sh-55	MC&PI/DS &D/ D&MC	P Sh-82 T-PI T- DS&D								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	D&MC	*F Sh-38*		P Sh-52	D&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	D&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI D&MC	P Sh-58 T-PI										
	T-24/06/19	P- 25/06/19										
E3	MC&PI/D S&D/ D&MC	P Sh-75 T-PI T- DS&D										
	T-24/06/19	P- 25/06/19										
E4	MC&PI/ D&MC	P Sh-75 T-PI										
	T-25/06/19	P- 27/06/19										

Liner Layer 1.2m

Grid Ref	L1				L2				L3		L4				L5		L5A	
	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result	Rework and Retest	Rework and Retest	Orig	Result	Orig	Result
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19								
A2	MC&PI/D S&D/ D&MC	P Sh-50 T-PI T- DS&D			MC&PI/ D&MC	P Sh-62 T-PI			MC&PI/D S&D/ D&MC	P Sh-78 T-PI T-DS&D								
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19								
A3	MC&PI/D S&D/ D&MC	P Sh-70 T-PI T- DS&D	D&MC	P SH-64	MC&PI/DS &D/ D&MC	P Sh-68 T-PI T- DS&D												
Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19												
A4	MC&PI/D S&D/ D&MC	P Sh-80 T-PI T- DS&D	As A3L1	As A3L1	MC&PI / D&MC	P Sh-85 T-PI												
Date	T-04/06/19	P-05/06/19	T-27/06/19	P-28/06/19	T-01/07/19	P-02/07/19												
A5																		
Date																		
B1	MC&PI/D S&D/ D&MC	P Sh-62 T-PI T- DS&D			MC&PI/ D&MC	P Sh-85 T-PI			MC&PI/ D&MC	P Sh-64 T-PI								

Streetscene
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Date	T- 21/06/19	P-24/06/19			T- 24/06/19	P- 25/06/19			T- 26/06/19	P- 27/06/19								
B2	MC&PI/DS&D/ D&MC	P Sh-52 T-PI T- DS&D			MC&PI / D&MC	P Sh-58 T-PI			MC&PI /DS&D/ D&MC	P Sh-74 T-PI T- DS&D								
Date	T- 06/06/19	P-07/06/19			T- 19/06/19	P-21/06/19			T- 26/06/19	P-27/06/19								
B3	MC&PI /D&MC	P Sh 84 T-PI			MC&PI /DS&D/D&MC	P Sh 64 T-PI T-DS&D												
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19												
B4	MC&PI /D&MC	P Sh-67 T-PI			MC&PI /D&MC	P Sh-66 T-PI												
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19												
B5																		
Date																		
C1																		
Date																		
C2	MC&PI/DS&D/ D&MC	P Sh-50 T-PI T- DS&D			MC&PI/DS&D/ D&MC	P Sh-50 T-PI T- DS&D												
Date	T- 19/06/19	P-21/06/19			T- 05/07/19	P-08/07/19												
C3	MC&PI/DS&D/ D&MC	P Sh-82 T-PI T- DS&D	MC&PI/DS&D/ D&MC	P Sh-55 T-PI T- DS&D	MC&PI / D&MC	P Sh-57 T-PI												
Date	T- 19/06/19	P-21/06/19	T- 28/06/19	P-01/07/19	T- 03/07/19	P-04/07/19												
C4	MC&PI / D&MC	P Sh-95 T-PI			MC&PI / /DS&DD&MC	P Sh-68 T-PI T-DS&D												
Date	T- 28/06/19	P-01/07/19			T- 03/07/19	P-04/07/19												
C5	MC&PI/DS&D/ D&MC	P Sh-62 T-PI T- DS&D			MC&PI/DS&D/ D&MC	P Sh-78 T-PI T- DS&D												
Date	T- 01/07/19	P-02/07/19			T- 02/07/19	P-03/07/19												
D1																		
Date																		
D2	MC&PI / D&MC	P Sh-50 T-PI																
Date	T- 05/07/19	P-08/07/19																
D3	MC&PI / D&MC	P Sh-62 T-PI																
Date	T- 05/07/19	P-08/07/19																
D4																		
Date																		
D5																		
Date																		
E1																		
Date																		
E2	DS&D As E3L1	T- DS&D As E3L1																
Date	T- 04/07/19	P-05/07/19																
E3	MC&PI/ D&MC	P Sh-55 T-PI																
Date	T- 04/07/19	P-05/07/19																
E4	MC&PI/D &MC	P Sh-52 T-PI																
Date	T- 04/07/19	P-05/07/19																
E5	As E4L1	As E4L1																
Date	T- 04/07/19	P-05/07/19																

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
D&S -	Particle Density & Particle Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3	(3 per Cells/layer)	Record
D&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

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Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Testing complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1		06/06/19		
D2L-1		*21/06/19*	*Test area for laying clay onto geotextile only*	
B2L3		*26/06/19*		
A4L2		*01/07/19*		
E3L1		*04/07/19*		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3583**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**01/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C5-L1-C1	Core 2 A4-L2-C1			
Bulk Density	2.04	2.01			
Moisture Content	23	25			
Dry Density	1.66	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.0	1.6			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 02/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3589**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**02/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C5-L2-C1	Core 2 A3-L2-C1			
Bulk Density	2.04	2.02			
Moisture Content	23	26			
Dry Density	1.66	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.4	0.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 03/07/2019
			R Anstee, Materials and Field Testing Director	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3594**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**03/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C4-L2-C1	Core 2 C3-L2-C1			
Bulk Density	2.03	2.00			
Moisture Content	23	26			
Dry Density	1.65	1.59			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.7	0.6			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 04/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3601**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**04/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-L1-C1	Core 2 E4-L1-C1			
Bulk Density	2.00	2.02			
Moisture Content	24	25			
Dry Density	1.61	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.9	0.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 05/07/2019 Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3612**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L1-C1	Core 2 C2-L2-C1	Core 3 D2-L1-C1		
Bulk Density	2.02	2.00	2.00		
Moisture Content	24	25	25		
Dry Density	1.62	1.60	1.60		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	1.1	2.0	1.5		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 06/07/2019	Fig

Streetscene
Y-Strydynun

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Appendix 4 – Field Logs

Available on request

Streetscene
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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3584	C5-L1 01.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	62	82	102	82	HSV 1
3585	A4-L2 01.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	110	110	85	102	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	02/07/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3590	C5-L2 02.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	78	105	105	96	HSV 1
3591	A3-L2 02.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	68	68	79	72	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	03/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3595	C4-L2 03.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	92	78	68	79	HSV 1
3596	C3-L2 03.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	58	57	85	67	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	04/07/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3602	E3-L1 04.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	55	65	72	64	HSV 1
3603	E4-L1 04.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	52	62	74	63	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	05/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3613	D3-L1 05.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	74	62	100	79	HSV 1
3614	C2-L2 05.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	114	50	50	71	HSV 2
3615	D2-L1 05.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	60	50	50	53	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	06/07/2019	HV1

Streetscene
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Appendix 6 – PI, PL, MC, LL Results

Streetscene
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Appendix 7 – Photographs

Streetscene
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Monday 01 July 2019 from Grid A1 (Stockpile area at Grid A1)

Friday 05 July 2019 from Grid A1

Streetscene
Y-Strydynun

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Grid D3L1 02 July 2019 layer one removed and geotextile top and bottom of 300mm of rock installed	D3L1 area of treatment prior to top layer of geotextile.
Stockpile exhausted start stockpile at A2 03 July 2019	**Grid B5 Soft spot identified 02 July 2019**

Streetscene
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Grid D3 soft spot and surrounding area geotextile to top of rock	

Streetscene
Y-Strydynun

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South Wales/De Cymru
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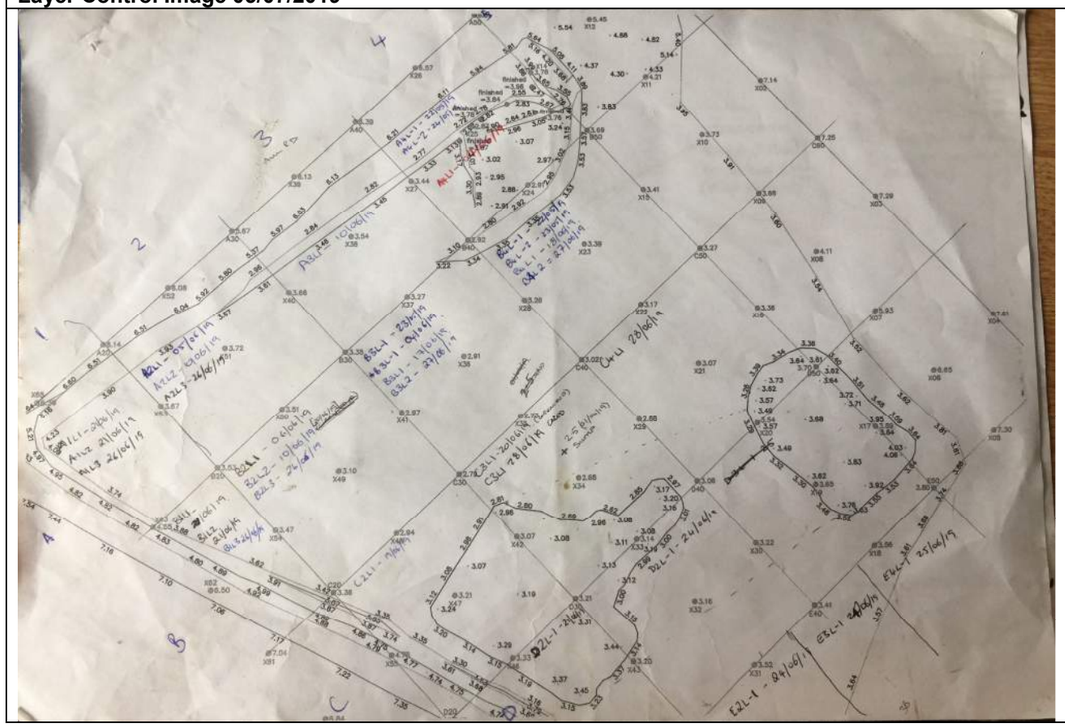
Layer Control Image 05/07/2019	Foundation Remediation Control Image 05/07/2019
	

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 06 WE 14/07/19

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		14-07-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved
02	17/07/19	Text	William Watt		

Streetscene
Y-Strydynun

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4.0 Testing

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4.2 Permeability Samples
4.3 MC and PI
4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

5.0 Summary of results

5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
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5. Field Logs
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7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
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Streetscene
Y-Strydynun

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South Wales/De Cymru
NP20 4UR

1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Sunny & dry over the weekend and Monday to Friday.

3.0 Progress for the week

3.1 Stockpile

Clay material was delivered to site this week and stockpiled in Grid A2 and the pad outside the cell. Material is acceptable with limited large particles and those exceeding the CQA specification broken down or removed.
From Thursday 11/07/19, the clay lorries stopped depositing material in Grid A2 and deposited material on the pad outside the cell.
We are waiting for an update to the tonnage delivered this week, 11,602 tonnes of material was delivered to site up to 03 July 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  No work undertaken
- **Layer 1**
  D5L1, D4L1
- **Layer 2**
  D2L2, D3L2, D4L2, D5L2, E2L2, E3L2, E4L2, E5L2,
- **Layer 3**
  A3L3, A4L3, C2L3, C5L3
- **Layer 4**
  No work undertaken
- **Layer 5**
  No work undertaken
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

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Leachate from the existing land fill west of the site was captured within a grip at A3, A1 and B4 was pumped for disposal.

Sampling and testing by CJ Associates was undertaken Monday, Tuesday, Wednesday, Thursday and Friday

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

16 core cutter samples were taken this week
16 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

0 sample was taken this week.
1 Results was received and is included within the appendix.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 54 KN/ m^2 recorded.

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5.0 Results Summary

5.1 Acceptability

The majority of the results received this week are in accordance with CQA Plan Table 3.1.
A2L2 and B3L1 both had moisture contents that exceeded the upper moisture content value set out in the CQA Plan. However, the core cutter for the corresponding cell produced results below the upper moisture content, therefore layers A2L2 and B3L1 are acceptable.'

5.2 Compliance

The majority of the results received this week are in accordance with CQA Plan Table 3.2.

- D4L2. Where two cores were undertaken to confirm the compaction (see Section 6) one of the cores from the lower level had a high moisture content. The CQA Engineer confirmed these were acceptable.
- E3L2, E2L2 had high moisture contents, the CQA Engineer confirmed these were acceptable and retesting confirmed compliance.

6.0 Problems Encountered

- Topographical survey levels were undertaken on Wednesday 10 July 2019. It was noted that the layers are compacting to 300mm not 250mm as anticipated. Additional cores have been undertaken by cutting back nominally 50mm of material and testing the lower layer to confirm compaction.
  The Roller CAT CS573E specification has been investigated to confirm that it is capable of compacting a 300mm layer.
- The bund to complete the asbestos Cell 3A is proposed some 20m long to connect to the bund in cell 4B. It is anticipated that the bund height will be 3m for its length dropping down sharply to tie into the 2m high Cell 4b bund.
- The sump level and location is being determined. The additional rock level installed in grids C2, C3, C4, C5, D2, D3, D4, D5 has raised the foundation layer. It is currently anticipated that the sump will be located in grid B3 at a level of approximately 4.25m, I am awaiting a hard copy of base level survey and confirmation of finish levels.
- Litter entering the site from the adjacent cell 4a remains and issue. Litter pickers have attended the site on only one occasion to date.
- The Cardiff refuse incinerator broke down on 09/07/19 and additional refuse was deposited into cell 4B this week.

Appendix 1 - Progression Plan

Streetscene
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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2				-L3		-L4	
	Sampling	Result	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	DD&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI DD&MC	P Sh-58 T-PI										
	T-24/06/19	P-25/06/19										
E3	MC&PI/PD&PSD/ DD&MC	P Sh-75 T-PI T-PD&PSD										
	T-24/06/19	P-25/06/19										
E4	MC&PI/ DD&MC	P Sh-75 T-PI										
	T-25/06/19	P-27/06/19										

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5		L5A	
	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19								
A2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/ DD&MC	P Sh-62 P-PI- 28% MC 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 T-PI T-PD&PSD								
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19								
A3	MC&PI/PD&PSD/ DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/ DD&MC	P Sh-68 T-PI T- PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-66 T-PI T-PD&PSD								
Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19								

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A4	MC&PI/PD&PSD/DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-66 T-PI								
Date	T- 04/06/19	P-05/06/19			T- 01/07/19	P-02/07/19			T - 10/07/19	P-11/07/19								
A5																		
Date																		
B1	MC&PI/PD&PSD/DD&MC	P Sh-62 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-64 T-PI								
Date	T- 21/06/19	P-24/06/19			T- 24/06/19	P- 25/06/19			T- 26/06/19	P- 27/06/19								
B2	MC&PI/PD&PSD/DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 T-PI T- PD&PSD								
Date	T- 06/06/19	P-07/06/19			T- 20/06/19	P-21/06/19			T- 26/06/19	P-27/06/19								
B3	MC&PI /DD&MC	P Sh 84 T-PI MC 26- 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 T-PI T-PD&PSD												
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19												
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 T-PI												
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19												
B5																		
Date																		
C1																		
Date																		
C2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 T-PI T- PD&PSD			MC&PI / DD&MC	P Sh-58 T-PI								
Date	T- 19/06/19	P-21/06/19			T- 05/07/19	P-08/07/19			T- 09/07/19	P-11/07/19								
C3	MC&PI/PD&PSD/DD&MC	P Sh-82 T-PI T- PD&PSD	MC&PI/PD &PSD/ DD&MC	P Sh-55 T-PI T- PD&PSD	MC&PI / DD&MC	P Sh-57 T-PI												
Date	T- 19/06/19	P-21/06/19	T- 28/06/19	P-01/07/19	T- 03/07/19	P-04/07/19												
C4	MC&PI / DD&MC	P Sh-95 T-PI			MC&PI / /PD&PSDD D&MC	P Sh-68 T-PI T-PD&PSD												
Date	T- 28/06/19	P-01/07/19			T- 03/07/19	P-04/07/19												
C5	MC&PI/PD&PSD/DD&MC	P Sh-62 T-PI T- PD&PSD			MC&PI/PD &PSD/ DD&MC	P Sh-78 T-PI T- PD&PSD			MC&PI/ DD&MC	Sh-TBA T-PI								
Date	T- 01/07/19	P-02/07/19			T- 02/07/19	P-03/07/19			T- 12/07/19	P-TBA								
D1																		
Date																		
D2	MC&PI / DD&MC	P Sh-50 T-PI			MC&PI / PD&PSD/DD D&MC	P Sh-60 T-PI T-PD&PSD												
Date	T- 05/07/19	P-08/07/19			T- 09/07/19	P-11/07/19												
D3	MC&PI / DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-80 T-PI												
Date	T- 05/07/19	P-08/07/19			T- 09/07/19	P-11/07/19												
D4	MC&PI / DD&MC	P Sh-74 T-PI T-PD&PSD			MC&PI/ PD&PSD/DD D&MC	P Sh-65 T-PI T-PD&PSD												
Date	T- 10/07/19	P-11/07/19			T- 12/07/19	14/07/19 TBA one test high MC												
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 T-PI			MC&PI/DD &MC	P Sh-79 T-PI												

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Date	T-10/07/19	P-11/07/19			T-12/07/19	P-14/07/19												
E1																		
Date																		
E2	PD&PSD As E3L1	T- PD&PSD As E3L1			MC&PI DD&MC	P Sh-68 T-PI	As E3L2	As E3L2										
Date	T-04/07/19	P-05/07/19			T-08/07/19	F-09/07/19 Acceptable	T-09/07/19	P-11/07/19										
E3	MC&PI/ DD&MC	P Sh-55 T-PI			MC&PI DD&MC	P Sh-54 T-PI	DD&MC	P Sh-72										
Date	T-04/07/19	P-05/07/19			T-08/07/19	F-09/07/19 Acceptable	T-09/07/19	P-11/07/19										
E4	MC&PI/D D&MC	P Sh-52 T-PI			MC&PI/PD &PSD/DD &MC	P Sh-78 T-PI T- PD&PSD												
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19												
E5	As E4L1	As E4L1			As E4L1	As E4L1												
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19												

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Sampling complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1		*21/06/19*	*Test area for laying clay onto geotextile only*	
B2L3		*26/06/19*		
A4L2		*01/07/19*		
E3L1		*04/07/19*		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT3
Sample Ref.:	B2L1 - Core

Description:
Firm dark grey slighty gravelly CLAY. Gravel is fine.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.12	100.99
Height	*mm*	100.13	100.01
Moisture Content	*%*	24.3	25.8
Bulk Density	*Mg/m³*	2.00	2.04
Dry Density	*Mg/m³*	1.61	1.62

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.78	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	3.0

PERMEABILITY STAGE

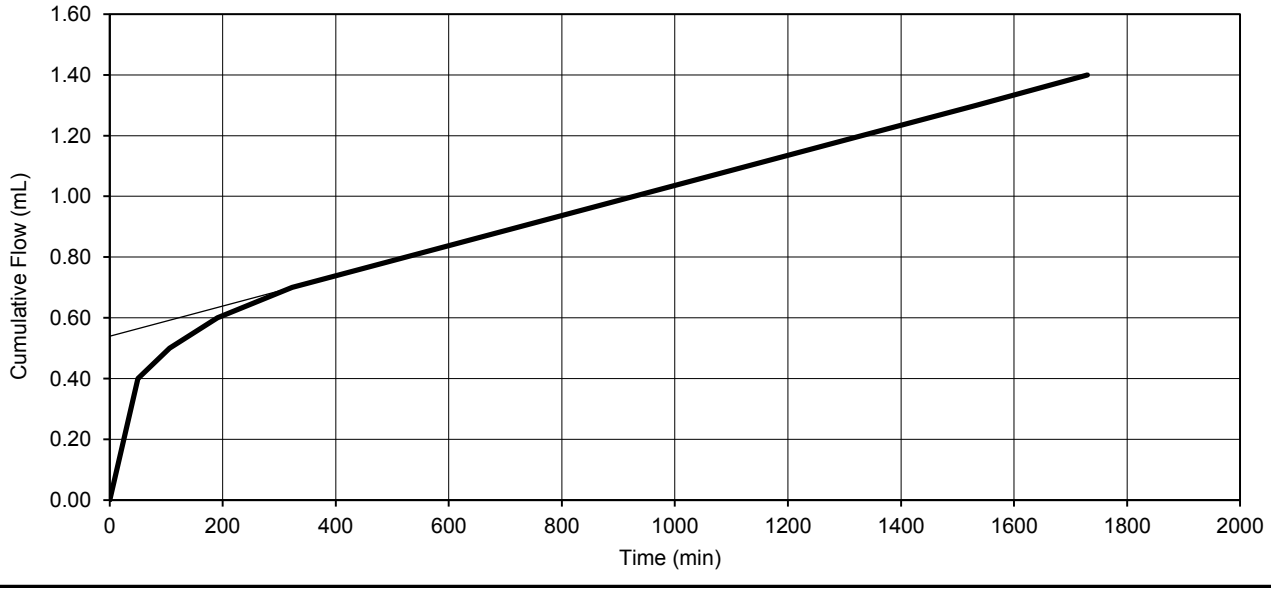
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	2
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 1.0×10^{-10} m/s



Checked and Approved by

P Heritage

P Heritage - Project Co-ordinator
25/06/2019

Project Number:

GEO / 29410

Project Name:

DOCKSWAY CELL 4
L13756

GEOLABS®

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3619**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**08/07/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E4-L2-C1	Core 2 E3-L2-C1	Core 3 E2-L2-C1		
Bulk Density	1.99	1.98	1.99		
Moisture Content	23	27	27		
Dry Density	1.61	1.57	1.56		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.6	1.1	0.4		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 09/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3639**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**09/07/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-L2-C1	Core 2 D2-L2-C1	Core 3 C2-L3-C1	Core 4 D3-L2-C1	
Bulk Density	2.03	2.03	1.99	2.01	
Moisture Content	24	22	26	24	
Dry Density	1.64	1.66	1.57	1.63	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	1.3	2.6	0.8	2.2	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 11/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3644**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**10/07/2019**	Material Source:	**Unknown**
Tested By:	**R Colamazza**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D4-L1-C1	Core 2 D5-L1-C1	Core 3 A4-L3-C1		
Bulk Density	2.00	2.00	2.02		
Moisture Content	23	25	22		
Dry Density	1.62	1.60	1.65		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.1	2.1	2.9		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 11/07/2019 Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3665**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**11/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-L3-Core1	Core 2 A3-L3-Core2			
Bulk Density	1.99	2.06			
Moisture Content	24	22			
Dry Density	1.61	1.68			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	3.1	1.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 12/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3679**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**12/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D4-L2-Core1	Core 2 D4-L2-Core2	Core 3 D5-L2-Core1	Core 4 D5-L2-Core2	
Bulk Density	1.98	1.98	2.01	2.00	
Moisture Content	24	27	24	25	
Dry Density	1.59	1.57	1.62	1.59	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	3.2	1.0	1.4	1.7	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 14/07/2019	Fig

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 4 – Field Logs

Available on request

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3620	E4-L2 08.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	100	90	78	89	HSV 1
3621	E3-L2 08.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	74	54	72	67	HSV 2
3622	E2-L2 08.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	126	78	68	91	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	09/07/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3640	E3-L2 09.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	>150	72	84	>102	HSV 1
3641	D2-L2 09.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	72	78	60	70	HSV 2
3642	C2-L3 09.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	58	64	100	74	HSV 3
3643	D3-L2 09.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	112	118	80	103	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	11/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3645	D4-L1 10.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	74	84	76	78	HSV 1
3646	D5-L1 10.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	124	60	82	89	HSV 2
3647	A4-L3 10.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	66	74	110	83	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	11/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3666	A3-L3 11.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	100	60	67	76	HSV 1

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee	Date 12/07/2019	Fig. HV1
Rev 1.0		R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3680	D4-L2 12.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	65	75	80	73	HSV 1
3681	D5-L2 12.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	90	83	79	84	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee	Date 14/07/2019	Fig. **HV1**
Rev 1.0		R Anstee, Materials and Field Testing Director		

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 6 – PI, PL, MC, LL Results

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13752

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	2	test(s)
Grading	2	test(s)

Date (s) sampled and received at laboratory:	4	Jun-19
Date of receipt of testing instructions	4	Jun-19
Date testing started:	7	Jun-19
Date of issue:	9	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A4 L1		0.00		B	Dark grey slightly sandy CLAY			25.3	100	47	20	27		
B3 L-1		0.00		B	Dark grey slightly sandy CLAY			24.9	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
A4L1			B	Dark grey CLAY and SILT with rare fine to medium pyritic fossil fragments.	2.71	2
B3L-1			B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29403

Project Name:

DOCKSWAY CELL 4
L13752

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

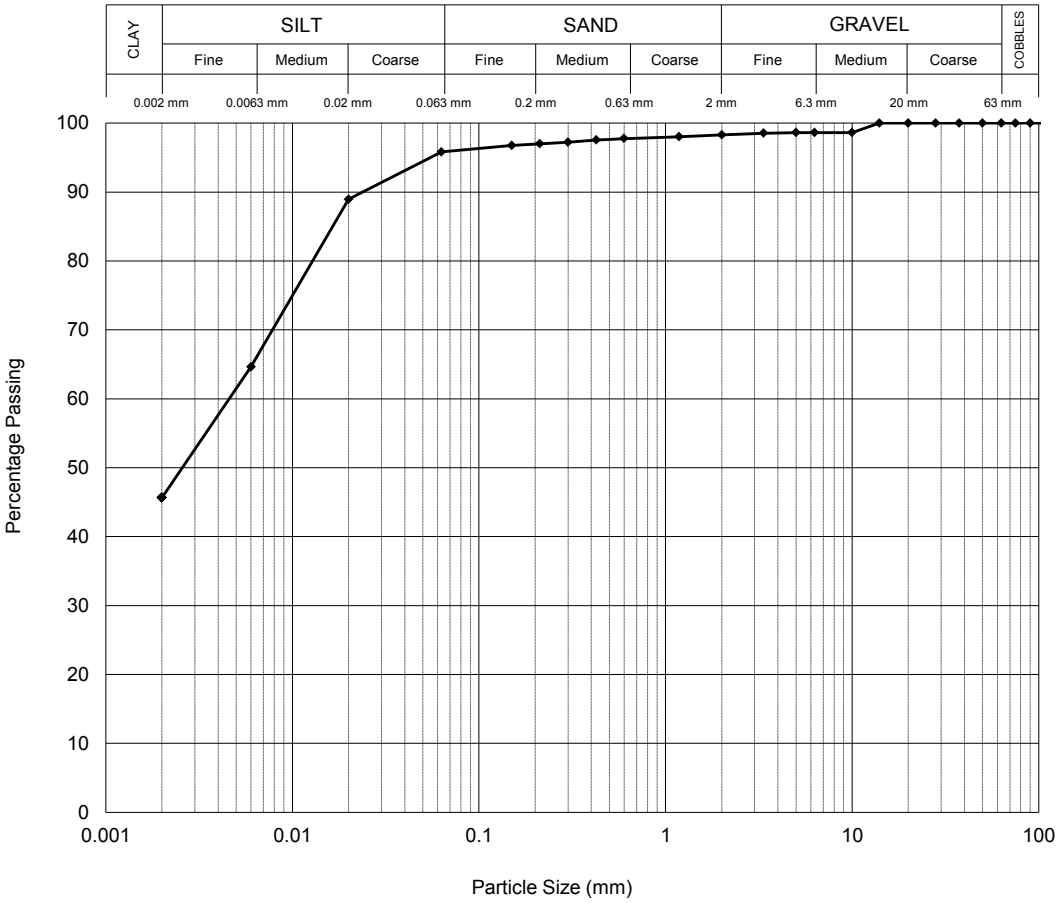
BH / TP No.	A4L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare fine to medium pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	24.9
Size	% Pass
20 µm	89
6 µm	65
2 µm	46

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	50
Clay	46

Checked and Approved by

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29403

Project Name:

DOCKSWAY CELL 4
L13752

GEOLABS

UKAS TESTING 1962

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

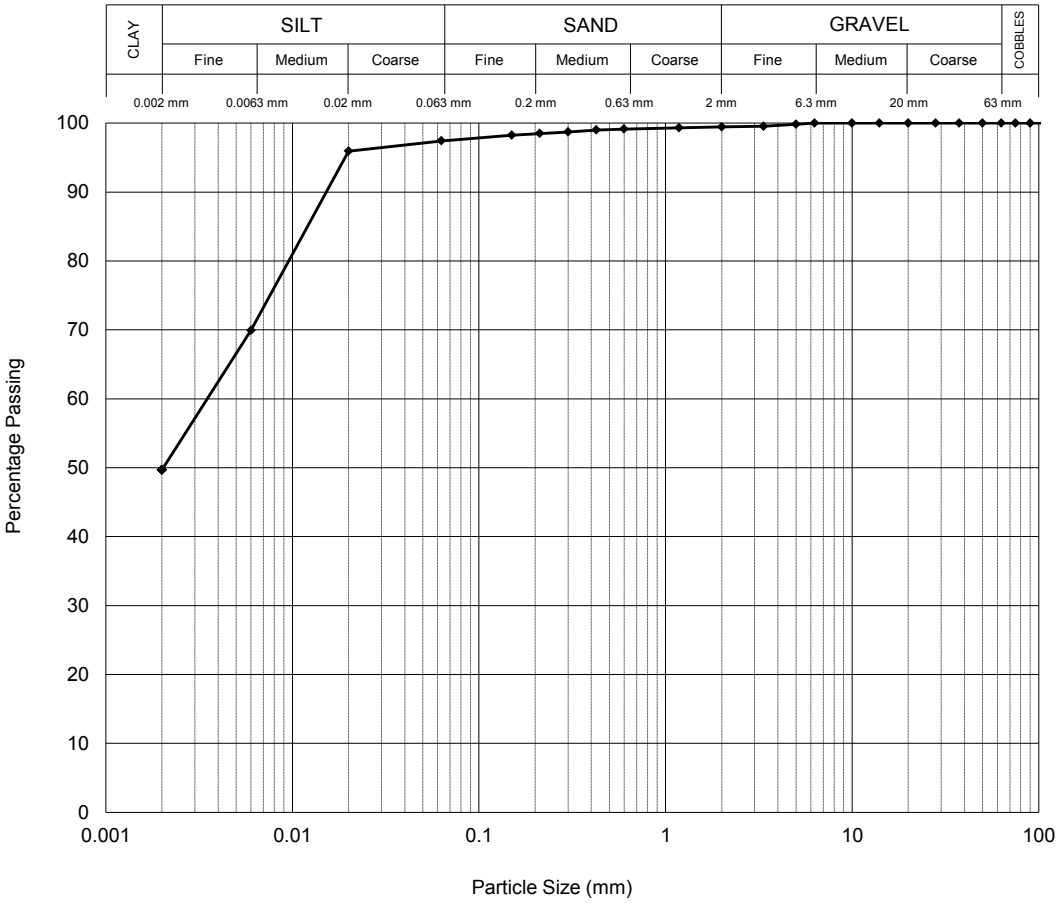
BH / TP No.	B3L-1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	24.9
Size	% Pass
20 µm	96
6 µm	70
2 µm	50

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	48
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29403

Project Name:

DOCKSWAY CELL 4
L13752

GEOLABS

UKAS TESTING 1962

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13754

Number of samples submitted for testing:	2	sample (s)
Natural Moisture Content	1	test(s)
Atterberg Limit	1	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	5	Jun-19
Date of receipt of testing instructions	5	Jun-19
Date testing started:	7	Jun-19
Date of issue:	9	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

1429

Approved by :

Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk	Density dry	w	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		Mg/m3		%	%	%	%	%	Mg/m3	
A2 L1	RA2	0.00		B	Dark grey slightly gravelly slightly sandy CLAY			24.6	99	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
A2L1			B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29404

Project Name:

DOCKSWAY CELL 4
L13754

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

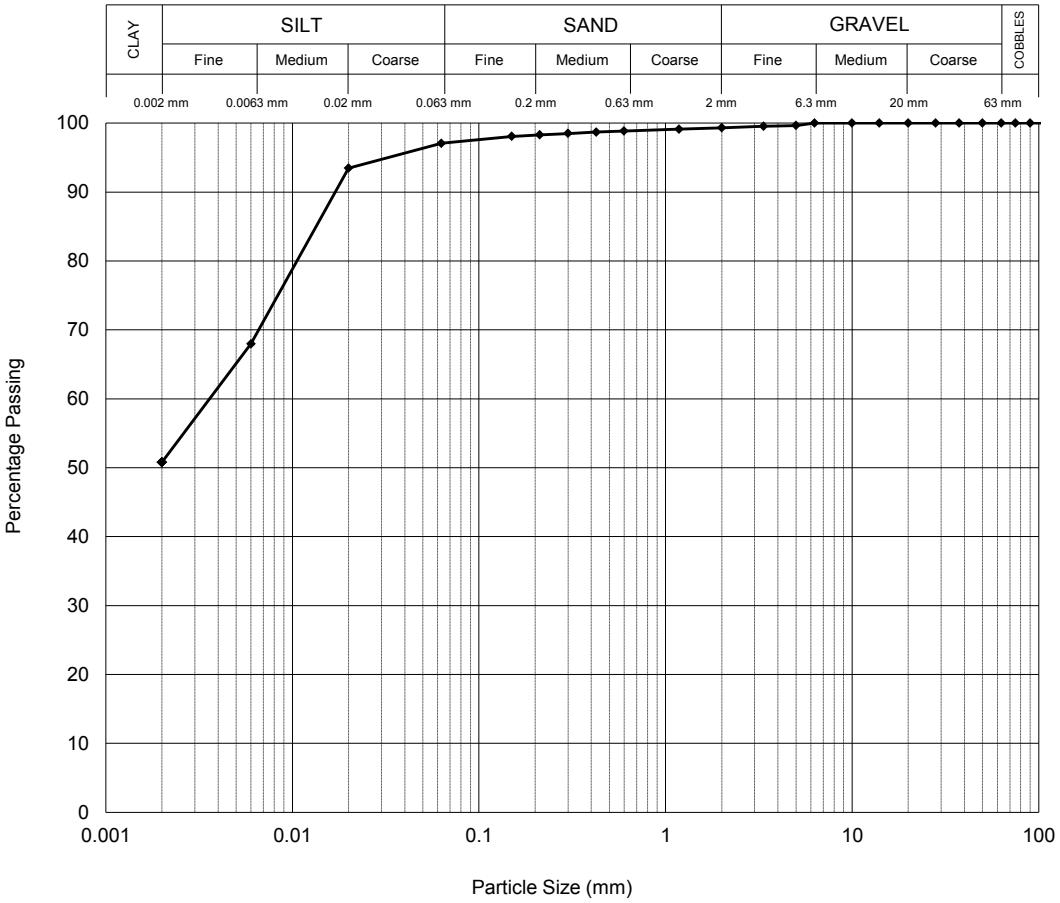
BH / TP No.	A2L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	24.9
Size	% Pass
20 µm	93
6 µm	68
2 µm	51

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	46
Clay	51

Checked and Approved by

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29404

Project Name:

DOCKSWAY CELL 4
L13754

GEOLABS

UKAS TESTING 1962

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13756

Number of samples submitted for testing:	3	sample (s)

Natural Moisture Content	1	test(s)
Atterberg Limit	1	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	6	Jun-19
Date of receipt of testing instructions	6	Jun-19
Date testing started:	7	Jun-19
Date of issue:	9	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B2 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			24.5	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29410.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		B2L1		Dark grey silty CLAY with rare pyrite.	2.61	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
28/06/2019

Project Number:

GEO / 29410

Project Name:

DOCKSWAY CELL 4
L13756

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

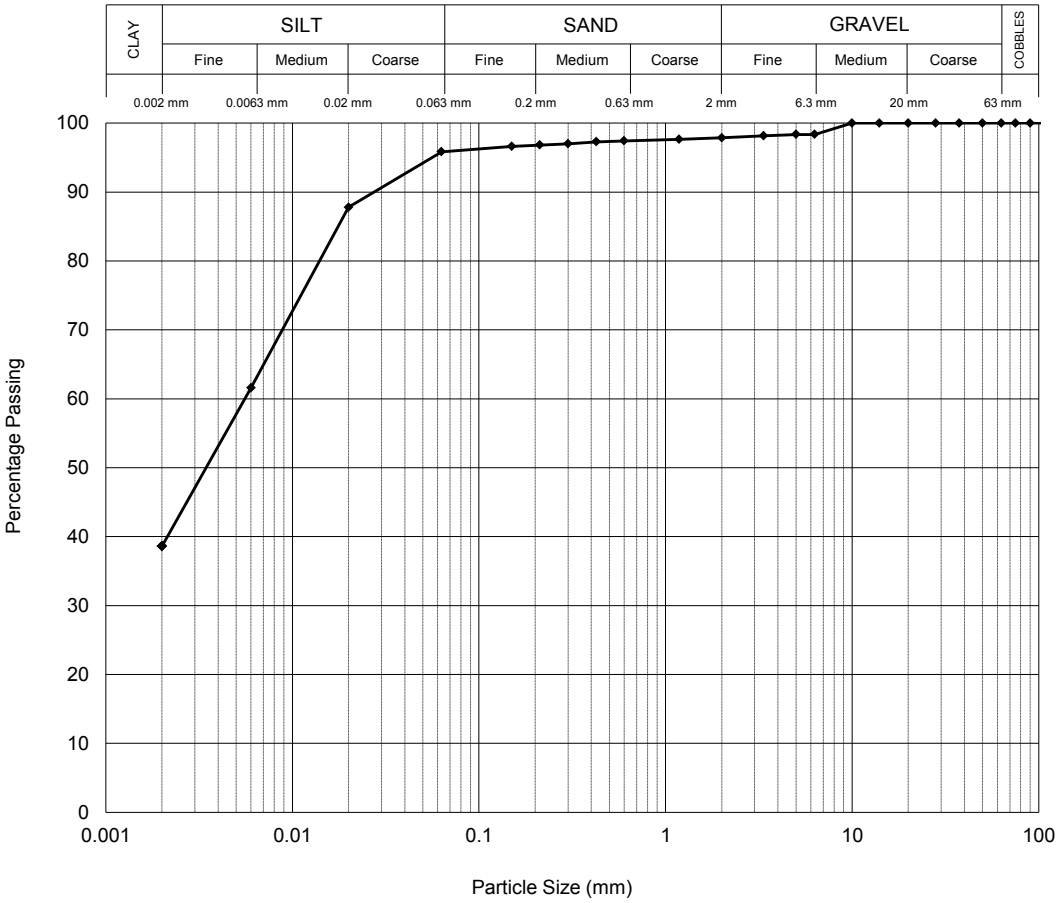
BH / TP No.	GT5
Sample Ref	B2L1

Description

Dark grey silty CLAY with rare pyrite.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	97
425 µm	97
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	88
6 µm	62
2 µm	39
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	57
Clay	39

Checked and Approved by

S Burke

S Burke - Senior Technician
28/06/2019

Project Number:

GEO / 29410

Project Name:

DOCKSWAY CELL 4
L13756

GEOLABS

UKAS TESTING 1962

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13763

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	10	Jun-19
Date of receipt of testing instructions	10	Jun-19
Date testing started:	13	Jun-19
Date of issue:	12	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L2		0.00		B	Dark grey slightly sandy CLAY			27.9	100	49	20	29		
A3 L1		0.00		B	Dark grey slightly sandy CLAY			22.3	100	47	19	28		
B2 L2		0.00		B	Dark grey slightly sandy CLAY			22.4	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
A3-L1			B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
05/07/2019

Project Number:

GEO / 29436

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

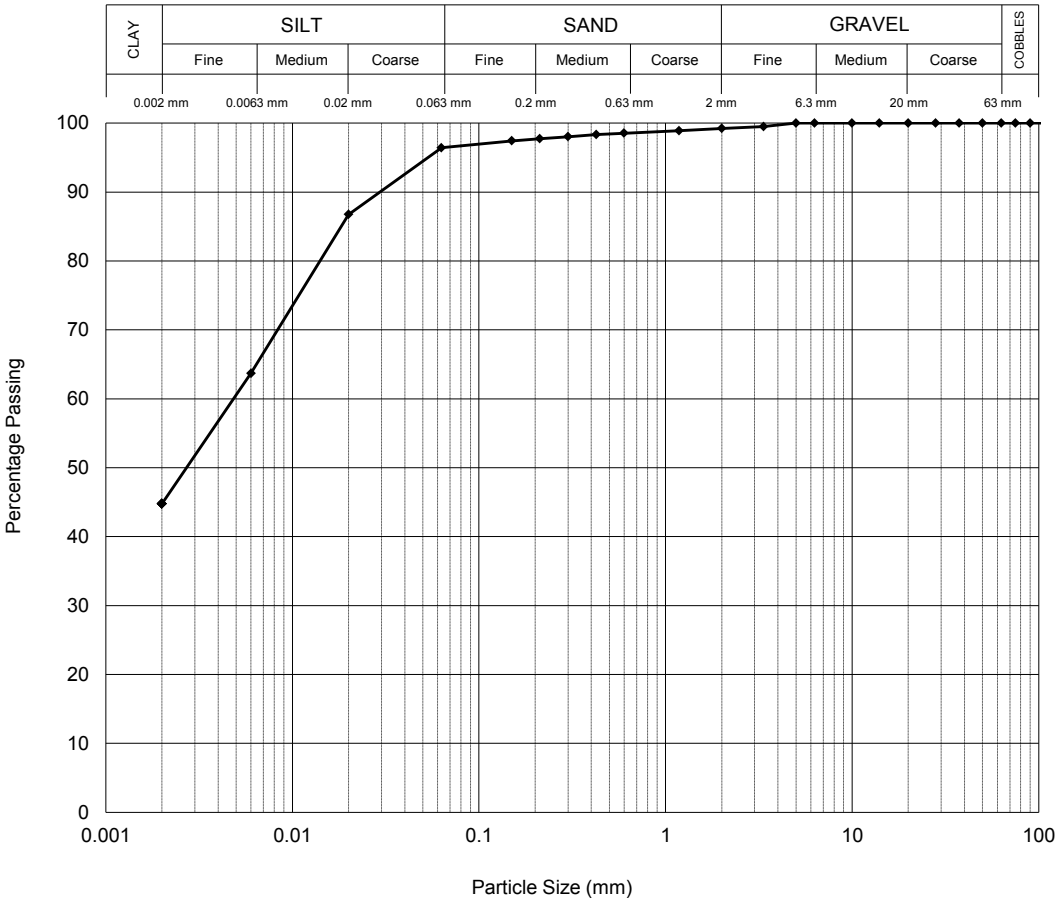
BH / TP No.	A3-L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25.3
Size	% Pass
20 µm	87
6 µm	64
2 µm	45

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	3
Silt	52
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
05/07/2019

Project Number:

GEO / 29436

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1962

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13786

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	20	Jun-19
Date of receipt of testing instructions	20	Jun-19
Date testing started:	25	Jun-19
Date of issue:	12	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B3 L1	GT7	0.00		B	Dark grey slightly sandy CLAY			26.5	100	48	20	28		
B4 L1	GT5	0.00		B	Dark grey slightly sandy CLAY			24.8	100	48	20	28		
C2 L1	GT8	0.00		B	Dark grey slightly sandy CLAY			25.0	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT6		C2-L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

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DOCKSWAY CELL 4
AG0390

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BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

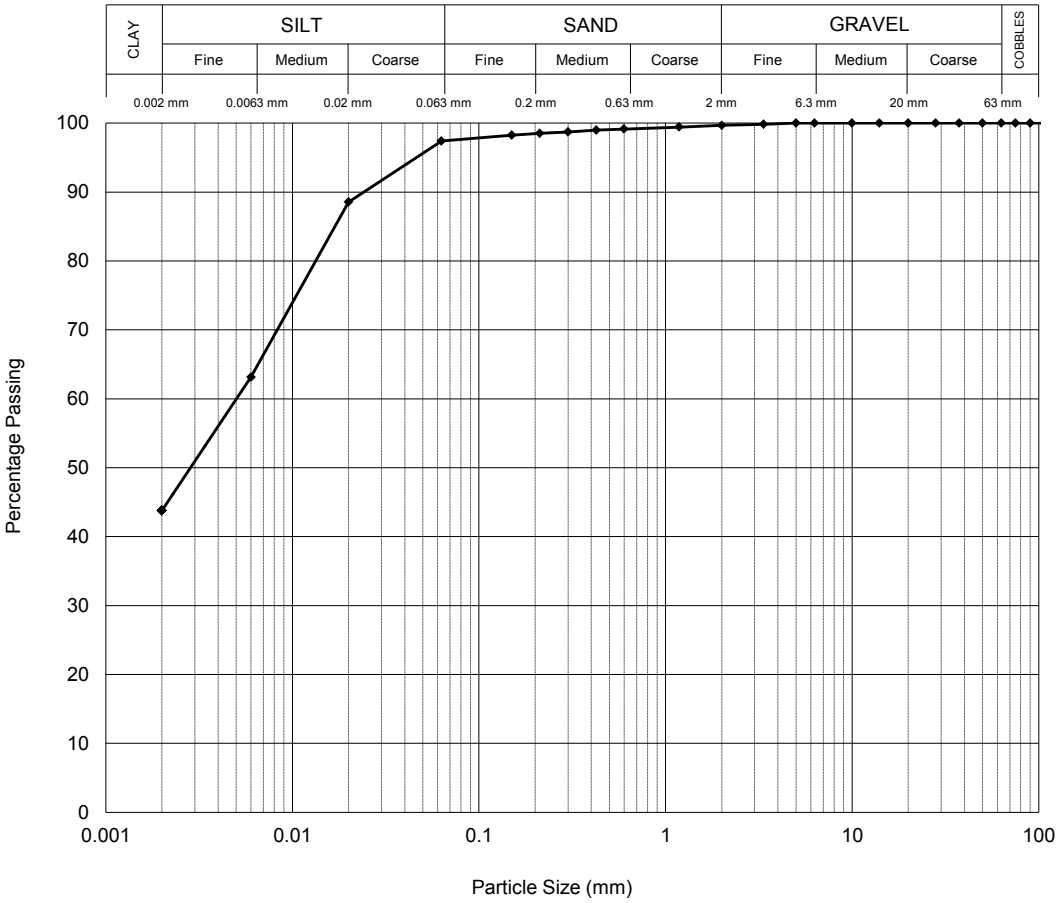
BH / TP No.	GT6
Sample Ref	C2-L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	63
2 µm	44

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	54
Clay	44

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S Burke

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05/07/2019

Project Number:

GEO / 29474

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1962

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 7 – Photographs

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Wednesday 10 July 2019 from Grid E3 (Stockpile area at Grid A1)

Friday 12 July 2019 from Grid A3

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
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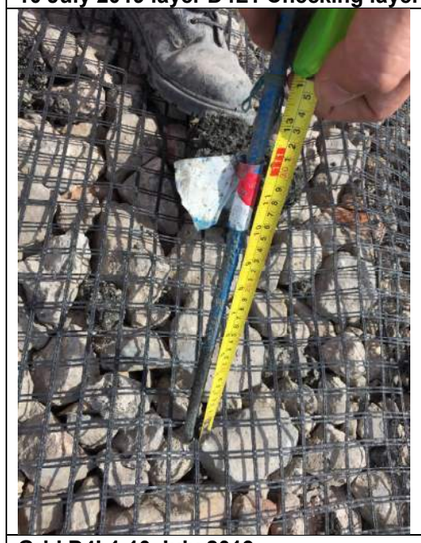
10 July 2019 layer D4L1 Checking layer thickness prior to compaction	**10 July 2019 layer D4L1 Checking layer thickness prior to compaction**
	
Grid D4L1 10 July 2019	**Grid D4L2 12 July 2019 second core checking compaction cut 60mm from surface to top of core**

Streetscene
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Streetscene
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Appendix 3 - Moisture content/dry density for Compaction

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

Streetscene
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Appendix 6 – PI, PL, MC, LL Results

Streetscene
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Appendix 7 – Photographs

Streetscene
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South Wales/De Cymru
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Wednesday 10 July 2019 from Grid E3 (Stockpile area at Grid A1)

Friday 12 July 2019 from Grid A3

Streetscene
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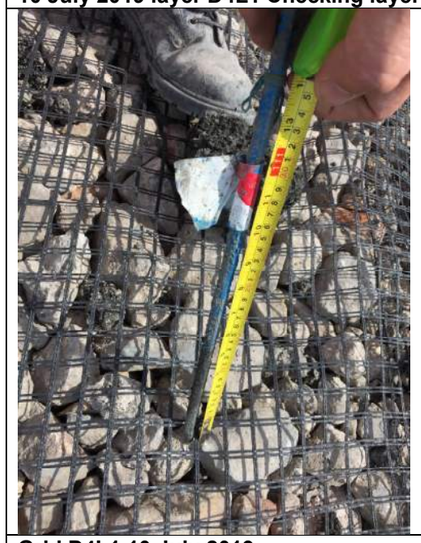
10 July 2019 layer D4L1 Checking layer thickness prior to compaction	**10 July 2019 layer D4L1 Checking layer thickness prior to compaction**
	
Grid D4L1 10 July 2019	**Grid D4L2 12 July 2019 second core checking compaction cut 60mm from surface to top of core**

Streetscene
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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 07 WE 21/07/19

Streetscene
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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		21-07-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved
02	24/07/19	Text 5.2	William Watt		

Streetscene
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Contents

1.0 Introduction

2.0 Weather

3.0 Progress For the Week

3.1 Stockpile
3.2 Work – progress

4.0 Testing

4.1 Core Cutter Samples
4.2 Permeability Samples
4.3 MC and PI
4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

5.0 Summary of results

5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

Streetscene
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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Sunny & dry over the weekend and Monday to Thursday. Heavy Rain Friday 19 July 2019

3.0 Progress for the week

3.1 Stockpile

Clay material was delivered to site this week and stockpiled on the pad outside the cell. Material is acceptable with limited large particles and those exceeding the CQA specification broken down or removed.
21,472 tonnes of material was delivered to site up to 17 July 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  A5L1 and B5L1 Soft Spot remediation
- **Layer 1**
- No work undertaken
- **Layer 2**
- No work undertaken
- **Layer 3**
  B3L3, B4L3, C3L3, C4L3, D2L3, D3L3, D4L3, D5L3, E2L3, E3L3, E4L3, E5L3
- **Layer 4**
  C2L4, C5L4, D2L4, D3L4,
- **Layer 5**
  No work undertaken
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Leachate from the existing land fill west of the site was captured within a grip at A1 and B4 was pumped for disposal.

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Sampling and testing by CJ Associates was undertaken Monday, Tuesday and Thursday.

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

16 core cutter samples were taken this week
16 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

0 sample was taken this week.
0 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

No results were received this week.

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5.2 Compliance

The majority of results received this week are in accordance with CQA Plan Table 3.2. One of the two cores at C5L3 moisture content was high, the CQA Engineer has confirmed that this layer is acceptable as the other core had a moisture content below the upper moisture content set out in the CQA Plan.

6.0 Problems Encountered

- The bund to complete the asbestos Cell 3A is proposed some 20m long to connect to the bund in cell 4B. It is anticipated that the bund height will be 3m for its length dropping down sharply to tie into the 2m high Cell 4b bund.
- The finish surface levels have been determined following a meeting at Council 18 July 2019. I am awaiting a hard copy of finish levels which are to be set out on Monday 22 July 2019.
- Litter entering the site from the adjacent cell 4a remains and issue. Litter pickers did not attend the site this week.
- One of Cardiff's two refuse incinerator broke down this week and additional refuse was deposited into cell 4B this week.
- Friday 19 July 2019 7:30 to 1300, the 12x14m soft spot in grids A5 and B5 was excavate area and 450mm of stone with two layers of geotextile install.

Appendix 1 - Progression Plan

Streetscene
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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2				-L3		-L4	
	Sampling	Result	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	DD&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI DD&MC	P Sh-58 T-PI										
	T-24/06/19	P-25/06/19										
E3	MC&PI/PD&PSD/ DD&MC	P Sh-75 T-PI T-PD&PSD										
	T-24/06/19	P-25/06/19										
E4	MC&PI/ DD&MC	P Sh-75 T-PI										
	T-25/06/19	P-27/06/19										

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5		L5A	
	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19								
A2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/ DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 T-PI T-PD&PSD								
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19								
A3	MC&PI/PD&PSD/ DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/ DD&MC	P Sh-68 T-PI T- PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-66 T-PI T-PD&PSD								
Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%								

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A4	MC&PI/PD&PSD/DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-66 T-PI								
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19								
A5																		
Date																		
B1	MC&PI/PD&PSD/DD&MC	P Sh-62 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-64 T-PI								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19								
B2	MC&PI/PD&PSD/DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 T-PI T- PD&PSD								
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19								
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 T-PI T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh-55 T-PI T- PD&PSD								
Date	T-18/06/19	P-19/06/19			T-18/06/19	P-28/06/19			T-15/07/19	P-16/07/19								
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 T-PI			MC&PI /DD&MC	P Sh-52 T-PI								
Date	T-18/06/19	P-19/06/19			T-27/06/19	P-28/06/19			T-16/07/19	P-17/07/19								
B5																		
Date																		
C1																		
Date																		
C2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 T-PI T- PD&PSD			MC&PI / DD&MC	P Sh-58 T-PI								
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19								
C3	MC&PI/PD&PSD/DD&MC	P Sh-82 T-PI T- PD&PSD	MC&PI/PD&PSD/DD&MC	P Sh-55 T-PI T- PD&PSD	MC&PI / DD&MC	P Sh-57 T-PI			MC&PI/ DD&MC	Sh-65 T-PI								
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19								
C4	MC&PI / DD&MC	P Sh-95 T-PI			MC&PI / /PD&PSDD D&MC	P Sh-68 T-PI T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh 50 T-PI T-PD&PSD	MC&PI/ DD&MC	Sh-TBA T-PI						
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T-16/07/19	P-17/07/19	T-18/07/19	P-TBA						
C5	MC&PI/PD&PSD/DD&MC	P Sh-62 T-PI T- PD&PSD			MC&PI/PD &PSD/ DD&MC	P Sh-78 T-PI T- PD&PSD			MC&PI/ DD&MC	Sh-60 T-PI	As D5L3	As D5L3						
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T-17/07/19	P-19/07/19						
D1																		
Date																		
D2	MC&PI / DD&MC	P Sh-50 T-PI			MC&PI / PD&PSD/D D&MC	P Sh-60 T-PI T-PD&PSD			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19						
D3	MC&PI / DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-80 T-PI			MC&PI / PD&PSD/ DD&MC	P Sh-55 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-62 T-PI						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19						
D4	MC&PI / DD&MC	P Sh-74 T-PI T-PD&PSD			MC&PI/ PD&PSD/D D&MC	P Sh-65 T-PI T-PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-52 T-PI T-PD&PSD								
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19								
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 T-PI			MC&PI/DD &MC	P Sh-79 T-PI			MC&PI/D D&MC	P Sh-64 T-PI								

Streetscene
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Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19								
E1																		
Date																		
E2	PD&PSD As E3L1	T- PD&PSD As E3L1			MC&PI/ DD&MC	P Sh-68 T-PI			As E3L3	As E3L3								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19								
E3	MC&PI/ DD&MC	P Sh-55 T-PI			MC&PI/ DD&MC	P Sh-54 T-PI	DD&MC	P Sh-72	MC&PI/PD&PSD/DD&MC	P Sh-52 T-PI T- PD&PSD								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19								
E4	MC&PI/DD&MC	P Sh-52 T-PI			MC&PI/PD&PSD/DD&MC	P Sh-78 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-58 T-PI								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19								
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19								

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Sampling complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1		*21/06/19*	*Test area for laying clay onto geotextile only*	
B2L3		*26/06/19*		
A4L2		*01/07/19*		
E3L1		*04/07/19*		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3693**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**15/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L3-Core1	Core 2 D3-L3-Core2	Core 3 C3-L3-Core1	Core 4 C3-L3-Core2	
Bulk Density	1.96	2.01	2.01	2.01	
Moisture Content	25	25	25	25	
Dry Density	1.57	1.60	1.61	1.62	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	3.6	1.0	0.9	1.1	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 16/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3694**		

Site Reference:	**Core 5 - Core 8**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**15/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 5 C5-L3-Core1	Core 6 C5-L3-Core2	Core 7 B3-L3-Core1	Core 8 B3-L3-Core2	
Bulk Density	1.98	1.99	1.98	2.00	
Moisture Content	27	23	24	25	
Dry Density	1.56	1.62	1.59	1.60	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	1.2	3.7	3.1	1.5	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 16/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3705**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**16/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B4-L3-Core1	Core 2 C4-L3-Core1			
Bulk Density	2.02	1.97			
Moisture Content	24	26			
Dry Density	1.63	1.56			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.0	2.0			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 17/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3717**		

Site Reference:	**Core 1 - Core 5**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**18/07/2019**	Material Source:	**Unknown**
Tested By:	**R Anstee**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E4-L3-C1	Core 2 E3-L3-C1	Core 3 D4-L3-C1	Core 4 D3-L4-C1	Core 5 D5-L3-C1
Bulk Density	2.01	2.07	2.03	1.99	2.00
Moisture Content	24	22	23	23	23
Dry Density	1.61	1.70	1.64	1.61	1.62

Relative Compaction	N/A	N/A	N/A	N/A	N/A
Air Voids % Using PD 2.74Mg/m³	1.9	0.8	1.5	3.3	2.8

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 19/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3718**		

Site Reference:	**Core 6**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**18/07/2019**	Material Source:	**Unknown**
Tested By:	**R Anstee**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 6 D2-L4-C1				
Bulk Density	2.02				
Moisture Content	23				
Dry Density	1.64				

Relative Compaction	N/A				
Air Voids % Using PD 2.74Mg/m³	2.1				

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 19/07/2019	Fig

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3695	D3-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	65	65	55	62	HSV 1
3696	C3-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	75	65	70	70	HSV 2
3697	C5-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	75	60	80	72	HSV 3
3698	B3-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	60	60	55	58	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	16/07/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3706	B4-L3 16.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	60	72	52	61	HSV 1
3707	C4-L3 16.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	50	52	52	51	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	17/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3719	E4-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	80	108	58	82	HSV 1
3720	E3-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	125	52	115	97	HSV 2
3721	D4-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	95	78	52	75	HSV 3
3722	D3-L4 18.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	62	98	92	84	HSV 4
3723	D5-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	70	78	64	71	HSV 5
3724	D2-L4 18.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	69	70	62	67	HSV 6

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	19/07/2019	**HV1**

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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

Streetscene
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Wednesday 17 July 2019 from Grid B2 (Stockpile area at Grid A1)

Friday 19 July 2019 from Grid A5 (soft spot to be removed form A5&B5)

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Wednesday 17 July 2019 Stockpile outside the Cell	18 July 2019 layer D3L4
Grid A5 &B5 19 July 2019 geotextile and 450mm granular material placed	

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 08 WE 28/07/19

Streetscene
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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		28-07-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved
02	01/08/2019	Section 6	William Watt		

Streetscene
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4.3 MC and PI
4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

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5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Heavy rain over the weekend prevented clay being laid Monday am, storm overnight Wednesday otherwise sunny and high temperatures.

3.0 Progress for the week

3.1 Stockpile

No Clay material was delivered to site this week.
22,315.95 tonnes of material was delivered to site up to 17 July 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1**
- A5L1, B5L1
- **Layer 2**
- A5L2, B5L2
- **Layer 3**
  No work undertaken
- **Layer 4**
  A4L4, A3L4, B4L4, C3L4, B3L4, C2L4, E2L4
- **Layer 5**
  No work undertaken
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Leachate from the existing land fill west of the site was captured within a grip at A1 and B4 was pumped for disposal.

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Sampling and testing by CJ Associates was undertaken Tuesday Wednesday, Thursday and Friday

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

10 core cutter samples were taken this week
10 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

2 sample was taken this week.
0 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

The majority of results received this week are in accordance with CQA Plan Table 3.1.
Grids C4L1, D2L1 and E4L-1 moisture contents were high although the associated core moisture contents were compliant, the CQA Engineer has confirmed that this layer is acceptable in email 22/07/19.

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Grid E4L2 moisture content was low although the associated core moisture content was compliant, the CQA Engineer has confirmed that this layer is acceptable in email 25/07/19.

5.2 Compliance
All of the results received this week are in accordance with CQA Plan Table 3.2.

6.0 Problems Encountered

- Finish treated level of grids A5 & B5 were surveyed Monday 22 July 2019 at 1:30pm
- The final surface levels of grids C2 to E5 were set out on Thursday 25 July 2019 at 10 to 1500pm. Additional material was identified in several areas and final level profiles were installed.
- Friday 26 July 2019 exceptionally pungent material was brought into the waste cell and deposited without cover.
- A new bund is proposed in grids E3 and E2 to reinstate the asbestos Cell 3A bund, some 20m long. It is proposed that the bund height will be 3m for its length dropping down sharply to tie into the 2m high Cell 4b bund. The bund is proposed to be full 15m width at the point where it has been compromised tying back into the existing cell 3A and 4B bunds (see drawing 14739/3532/002 section DD).
- The bund/clay liner connecting cells 4a and 4b are not at the same level and it is proposed to ramp the cell 4a and 4b liner at 1:2 and bench in the existing liner (see drawing 14739/3532/002 section EE).
- The bund along grids A5 to E5 is proposed to be installed with the toe of the bund 7.3m into the cell from the point of full 1.2m clay along the outside edge. This will maximise the cell capacity (see drawing 14739/3532/002 section CC).
- The bund along grids A1 to A5 is proposed to be installed a minimum of 1.2m thick along the existing material batter rising 2m above the adjacent grid finish clay level. This will maximise the cell capacity (see drawing 14739/3532/002 section BB).
- Litter entering the site from the adjacent cell 4a remains an issue. Litter pickers did not attend the site this week.

Appendix 1 - Progression Plan

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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2				-L3		-L4	
	Sampling	Result	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	DD&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI DD&MC	P Sh-58 T-PI										
	T-24/06/19	P- 25/06/19										
E3	MC&PI/PD&PSD/DD&MC	P Sh-75 T-PI T-PD&PSD										
	T-24/06/19	P- 25/06/19										
E4	MC&PI/DD&MC	P Sh-75 T-PI 22/07/19										
	T-25/06/19	P- 27/06/19										

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5		L5A	
	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19								
A2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/DD&MC	P Sh-78 P-PI 22/07/19 T-PD&PSD								
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19								
A3	MC&PI/PD&PSD/DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/DD&MC	P Sh-68 P-PI 22/07/19 T- PD&PSD			MC&PI/PD&PSD/DD&MC	P Sh-66 T-PI T-PD&PSD	MC&PI/DD&MC	P Sh-60 T-PI						
Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%	T--23/07/19	P-24/07/19						

Streetscene
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A4	MC&PI/PD&PSD/DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 T-PI	MC&PI/ /DD&MC	P Sh-60 T-PI						
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19	T--23/07/19	P-24/07/19						
A5	As B5	As B5			DD&MC	P Sh-50												
Date	T-22/07/19	P-24/07/19			T-25/07/19	P-26/07/19												
B1	MC&PI/PD&PSD/DD&MC	P Sh-62 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19								
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19								
B2	MC&PI/PD&PSD/DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 T- PD&PSD								
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19								
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 P-PI 22/07/19 T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh-55 T-PI T- PD&PSD	MC&PI / DD&MC	P Sh-58 T-PI						
Date	T-18/06/19	P-19/06/19			T-18/06/19	P-28/06/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19						
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 T-PI	MC&PI/P D&PSD/ /DD&MC	P Sh-50 T-PI T- PD&PSD						
Date	T-18/06/19	P-19/06/19			T-27/06/19	P-28/06/19			T-16/07/19	P-17/07/19	T-24/07/19	P-25/07/19						
B5	MC&PI /DD&MC	P Sh-52 T-PI			MC&PI /DD&MC	P Sh-61 T-PI												
Date	T-22/07/19	P-24/07/19			T-24/07/19	P-25/07/19												
C1																		
Date																		
C2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 P-PI 22/07/19 T- PD&PSD			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/ PD&PSD/ DD&MC	P Sh 54 T-PI T-PI T-PD&PSD						
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19	T-26/07/19	P-29/07/19						
C3	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 22/07/19 T- PD&PSD	MC&PI/PD&PSD/ DD&MC	P Sh-55 *P-PI 22/07/19* T- PD&PSD	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 T-PI	MC&PI /PD&PSDI DD&MC	P Sh 54 T-PI T-PD&PSD						
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19						
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDD D&MC	P Sh-68 P-PI 22/07/19 T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh 50 T-PI T-PD&PSD								
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T-16/07/19	P-17/07/19								
C5	MC&PI/PD&PSD/DD&MC	P Sh-62 P-PI 22/07/19 T- PD&PSD			MC&PI/PD &PSD/ DD&MC	P Sh-78 P-PI 22/07/19 T- PD&PSD			MC&PI/ DD&MC	Sh-60 T-PI	As D5L3	As D5L3						
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T-17/07/19	P-19/07/19						
D1																		
Date																		
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/D D&MC	P Sh-60 P-PI 25/07/19 T-PD&PSD			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19						
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/ DD&MC	P Sh-55 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-62 T-PI						

Streetscene
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Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19						
D4	MC&PI / DD&MC	P Sh-74 T-PI T-PD&PSD			MC&PI/ PD&PSD/D D&MC	P Sh-65 T-PI T-PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-52 T-PI T-PD&PSD								
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19								
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 T-PI			MC&PI/DD &MC	P Sh-79 T-PI			MC&PI/D D&MC	P Sh-64 T-PI								
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19								
E1																		
Date																		
E2	PD&PSD As E3L1	T- PD&PSD As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P-29/07/19						
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/P D&PSD/D D&MC	P Sh-52 T-PI T- PD&PSD								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19								
E4	MC&PI/D D&MC	P Sh-52 P-PI 22/07/19			MC&PI/PD &PSD/DD &MC	P Sh-78 P-PI MC-18.8% 25/07/19 T- PD&PSD			MC&PI/ DD&MC	P Sh-58 T-PI								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19								
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3								
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19								

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Sampling complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1		*21/06/19*	*Test area for laying clay onto geotextile only*	
B2L3		*26/06/19*		
A4L2		*01/07/19*		
E3L1		*04/07/19*		
A3L4		*23/07/19*		
B4L4		*24/07/19*		

Bund

Layer	**Ref**	**Date**	**Pass/Fail**

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3764**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**23/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B5-L1-C1	Core 2 A4-L4-C1	Core 3 A3-L4-C1		
Bulk Density	2.01	1.97	2.04		
Moisture Content	23	25	23		
Dry Density	1.64	1.58	1.65		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.3	2.9	0.9		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 24/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3768**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**24/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B4-L4-C1	Core 2 B5-L2-C1			
Bulk Density	2.02	2.02			
Moisture Content	24	24			
Dry Density	1.63	1.64			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.5	1.7			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 25/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3781**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**25/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A5-L2-C1	Core 2 B3-L4-C1	Core 3 C3-L4-C1		
Bulk Density	1.99	1.98	2.01		
Moisture Content	24	25	25		
Dry Density	1.60	1.59	1.61		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.2	2.3	0.7		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 26/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3804**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**26/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C2-L4-C1	Core 2 E2-L4-C1			
Bulk Density	2.02	2.02			
Moisture Content	24	24			
Dry Density	1.63	1.63			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.1	1.7			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 27/07/2019	Fig

Streetscene
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Appendix 4 – Field Logs

Available on request

Streetscene
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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3765	B5-L1 23.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	62	52	60	58	HSV 1
3766	A4-L4 23.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	68	60	102	77	HSV 2
3767	A3-L4 23.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	60	65	72	66	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	24/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3769	B4-L4 24.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	50	54	56	53	HSV 1
3770	B5-L2 24.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	65	70	61	65	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	25/07/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3782	A5-L2 25.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	58	50	72	60	HSV 1
3783	B3-L4 25.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	58	62	65	62	HSV 2
3784	C3-L4 25.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	60	55	54	56	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	26/07/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3805	C2-L4 26.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	54	82	72	69	HSV 1
3806	E2-L4 26.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	68	62	76	69	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	27/07/2019	**HV1**

Streetscene
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Appendix 6 – PI, PL, MC, LL Results

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L3	GT8	0.00		B	Dark grey slightly sandy CLAY			25.9	100	48	19	29		
B1 L3	GT11	0.00		B	Dark grey slightly sandy CLAY			25.8	100	49	20	29		
B2 L3	GT9	0.00		B	Dark grey slightly sandy CLAY			24.6	100	49	19	30		
E4 L-1	GT7	0.00		B	Dark grey slightly sandy CLAY			26.5	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
B3 L2	GT2	0.00		B	Dark grey slightly sandy CLAY			23.1	100	49	20	29		
B4 L2	GT1	0.00		B	Dark grey slightly sandy CLAY			22.3	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 22/07/2019

Approved By: Lisa Maiden

Table 1

sheet 1

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L1	GT3	0.00		B	Dark grey slightly sandy CLAY			25.7	100	48	19	29		
C4 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			26.7	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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		sheet 1

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A4 L2	GT6	0.00		B	Dark grey slightly sandy CLAY			25.3	100	48	20	28		
C5 L1	GT1	0.00		B	Dark grey slightly sandy CLAY			25.6	100	47	19	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

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		sheet 1

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			25.7	100	47	20	27		
C5 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			21.8	100	46	20	26		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
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cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L2	GT1	0.00		B	Dark grey slightly sandy CLAY			25.8	100	48	21	27		
C4 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			24.6	96	48	21	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
E3 L1	GT5	0.00		B	Dark grey slightly sandy CLAY			25.1	100	48	20	28		
E4 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			24.3	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			24.0	100	49	21	28		
D2 L1	GT6	0.00		B	Dark grey slightly sandy CLAY			29.5	100	49	20	29		
D3 L1	GT7	0.00		B	Dark grey slightly sandy CLAY			25.8	100	49	21	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

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cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
E2 L2	GT4	0.00		B	Dark grey slightly sandy CLAY			23.0	96	49	21	28		
E3 L2	GT7	0.00		B	Dark grey slightly sandy CLAY			23.4	100	49	20	29		
E4 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			18.8	100	49	21	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
C2 L3		0.00		B	Dark grey slightly sandy CLAY			23.8	100	48	20	28		
D2 L2		0.00		B	Dark grey slightly sandy CLAY			23.6	100	48	21	27		
D3 L2		0.00		B	Dark grey slightly sandy CLAY			26.0	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

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Streetscene
Y-Strydynun

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Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 7 – Photographs

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Monday 22 July 2019 from Grid A5 (Stockpile area at Grid A1)

Friday 26 July 2019 from top of closed waste disposal tip

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Monday 22 July 2019 Stockpile outside the Cell	22 July 2019 A5 and B5 Soft spot remediation
Grid C3 Wednesday 24 July 2019	**Grid C2 Thursday 25 July 2019**

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South Wales/De Cymru
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Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 09 WE 04/08/19

Streetscene
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South Wales/De Cymru
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Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		04-08-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

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4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

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5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Dry over the weekend. Rain on Tuesday otherwise sunny and high temperatures.

3.0 Progress for the week

3.1 Stockpile

The stockpile on grids A1, A2, B1, B2 was removed and the final clay layer installed.
Clay material was delivered to site from Thursday PM to the stockpile outside the cell.
22,315.95 tonnes of material was delivered to site up to 17 July 2019.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1**
  Work completed
- **Layer 2**
  Work completed
- **Layer 3**
  A5L3, B5L3
- **Layer 4**
  A1L4, A2L4, B1L4, B2L4, D5L4, D4L4, E3L4, E4L4, E5L4
- **Layer 5**
  A1L5, A2L5, B1L5, B2L5, D2L5, C2L5, C5L5
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Leachate from the existing land fill west of the site was captured within a grip at A3 was pumped for disposal.

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Sampling and testing by CJ Associates was undertaken Monday, Thursday and Friday. Testing was required Friday to enable stockpile material to be stockpiled onto the base cell on Monday 05 August 2019 subject to acceptable testing.

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

11 core cutter samples were taken this week
11 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

1 sample was taken this week.
3 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

The majority of results received this week are in accordance with CQA Plan Table 3.1.

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Grids D4L1, D4L2 and D5L2 moisture contents were outside the CQA requirements although the associated core moisture contents were compliant, the CQA Engineer has confirmed that these layers are acceptable in email 30/07/19.

5.2 Compliance

The majority of the results received this week are in accordance with CQA Plan Table 3.2. Grid E4L4 & E5L4 moisture content was 20% which is not in accordance with the requirements for the CQA Plan. The CQA Engineers email 02 August 2019 confirmed that this area was to be ripped up wetted, reinstated and retested.

6.0 Problems Encountered

- The final surface levels of grids A1 to C5 were set out on Wednesday 31 July 2019 at 10 to 1500pm. Additional material was identified in several areas and final level profiles were installed.
- The bund to reinstate the asbestos Cell 3A bund is proposed some 20m long to connect to the bund in cell 4B. It is anticipated that the bund height will be 3m for its length dropping down sharply to tie into the 2m high Cell 4b bund. A photo shows the area of the cell 4B taken by the bund to be confirmed.
- The bund/ clay liner connecting cells 4a and 4b are not at the same level and it is proposed to ramp the cell 4a liner to meet the 4b liner at 1:2 and bench in the existing liner.
- The bund grids A5 to D5 is shown in the photos with the bund completely within the cell following PBA email 31 July 2019. A photo shows the area of the cell 4B taken by the bund to be confirmed.
- The bund grids A1 to A5 is shown in the photos with the bund completely within the cell following PBA email 31 July 2019. A photo shows the area of the cell 4B taken by the bund to be confirmed.
- Litter entering the site from the adjacent cell 4a remains an issue. Litter pickers did not attend the site this week.
-

Appendix 1 - Progression Plan

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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2				-L3		-L4	
	Sampling	Result	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	DD&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19										
	T-24/06/19	P- 25/06/19										
E3	MC&PI/PD&PSD/DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19										
	T-24/06/19	P- 25/06/19										
E4	MC&PI/DD&MC	P Sh-75 P-PI 22/07/19										
	T-25/06/19	P- 27/06/19										

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5		L5A	
	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5		
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19		
A2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/DD&MC	P Sh-75 T-PI T-PD&PSD		
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19		
A3	MC&PI/PD&PSD/DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/DD&MC	P Sh-66 P-PI 30/07/19 T-PD&PSD	MC&PI/DD&MC	P Sh-60 T-PI						

Streetscene
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Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%	T--23/07/19	P-24/07/19						
A4	MC&PI/PD&PSD/DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 T-PI						
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19	T--23/07/19	P-24/07/19						
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3								
Date	T-22/07/19	P-24/07/19			T-25/07/19	P-26/07/19			T-31/07/19	P-02/08/19								
B1	MC&PI/PD&PSD/DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 T-PI			AsB2L5	AsB2L5		
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19	T-31/06/19	P-02/08/19			T-02/08/19	P-05/08/19		
B2	MC&PI/PD&PSD/DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-65 T-PI		
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19		
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 T-PI T- PD&PSD	MC&PI / DD&MC	P Sh-58 T-PI						
Date	T-18/06/19	P-19/06/19			T-18/06/19	P-28/06/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19						
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 T-PI	MC&PI/P D&PSD/ /DD&MC	P Sh-50 T-PI T- PD&PSD						
Date	T-18/06/19	P-19/06/19			T-27/06/19	P-28/06/19			T-16/07/19	P-17/07/19	T-24/07/19	P-25/07/19						
B5	MC&PI /DD&MC	P Sh-52 T-PI			MC&PI /DD&MC	P Sh-61 T-PI			MC&PI /DD&MC	P Sh-70 T-PI								
Date	T-22/07/19	P-24/07/19			T-24/07/19	P-25/07/19			T-31/07/19	P-02/08/19								
C1																		
Date																		
C2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 P-PI 22/07/19 T- PD&PSD			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/ PD&PSD/ DD&MC	P Sh 54 T-PI T-PI T-PD&PSD			MC&PI / PD&PSD/ DD&MC	P Sh-50 T-PI T-PSD&PD		
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19	T-26/07/19	P-29/07/19			T-29/07/19	P-30/07/19		
C3	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/PD&PSD/ DD&MC	P Sh-55 *P-PI 22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 T-PI	MC&PI /PD&PSD/ DD&MC	P Sh 54 T-PI T-PD&PSD						
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19						
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDD D&MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/ DD&MC	P Sh 50 T-PI T-PD&PSD								
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T-16/07/19	P-17/07/19								
C5	MC&PI/PD&PSD/DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD &PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 T-PI	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 T-PI		
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T-17/07/19	P-19/07/19			T-31/07/19	P-02/08/19		
D1																		
Date																		
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/D D&MC	P Sh-60 P-PI 25/07/19 T-PD&PSD			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-70 T-PI		

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-29/07/19	P-30/07/19		
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/ DD&MC	P Sh-55 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-62 T-PI						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19						
D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 T-PD&PSD			MC&PI/ PD&PSD/D D&MC	P Sh-65 P-PI MC26.2%30.07/19 T-PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-52 T-PI T-PD&PSD	MC&PI/D D&MC	P Sh-80 T-PI						
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19						
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD &MC	P Sh-79 P-PI MC27.5%30.07/19			MC&PI/D D&MC	P Sh-64 T-PI	As D4L4	As D4L4						
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19						
E1																		
Date																		
E2	PD&PSD As E3L1	T- PD&PSD As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4		
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P-29/07/19			T-29/07/19	P-30/07/19		
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/P D&PSD/D D&MC	P Sh-52 T-PI T- PD&PSD	MC&PI/ DD&MC	P Sh-85 T-PI						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19						
E4	MC&PI/D D&MC	P Sh-52 P-PI 22/07/19			MC&PI/PD &PSD/DD &MC	P Sh-78 P-PI MC-18.8% 25/07/19 T- PD&PSD			MC&PI/ DD&MC	P Sh-58 T-PI	MC&PI/P D&PSD/ DD&MC	P Sh-105 T-PI T-PSD&PD	DD&MC					
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T					
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4					
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T					

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
	Permeability triaxial cell – 1/2000m3	(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

Streetscene
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South Wales/De Cymru
NP20 4UR

Permeability

Grid Ref	*Result – K_y at 20°C*	*Date Sampled*	*Comments*	*Date Sampling complete*
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass- Test area for laying clay onto geotextile only	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1		*04/07/19*		
A3L4		*23/07/19*		
B4L4		*24/07/19*		
D4L4		*01/08/19*		

Bund

Layer	Ref	Date	Pass/Fail

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport
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CYNGOR DINAS
Casnewydd

Appendix 2 - Test Results - Permeability Tests

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT7
Sample Ref.:	D2-L1
Sample Type:	C

Description:
Firm dark grey gravelly CLAY. Gravel is fine to medium weakly cemented mudstone.

SPECIMEN DETAILS

Depth within original sample	10 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.03	100.86
Height	*mm*	100.59	100.42
Moisture Content	*%*	24.2	25.4
Bulk Density	*Mg/m³*	2.02	2.05
Dry Density	*Mg/m³*	1.63	1.64

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.82	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	4.1

PERMEABILITY STAGE

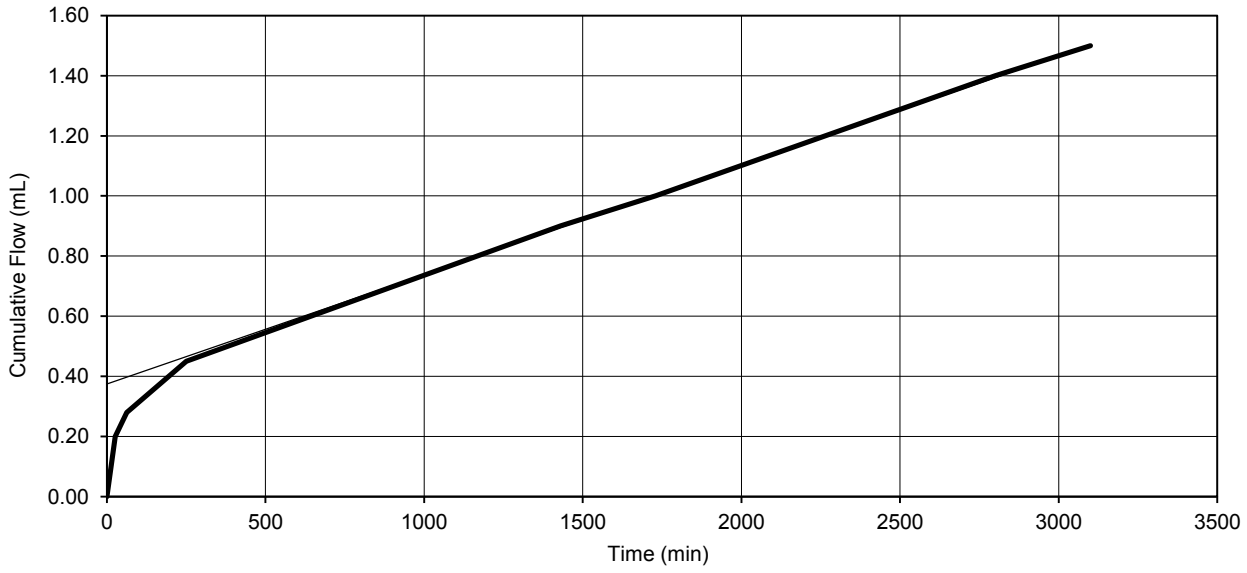
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.5×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
19/07/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT5
Sample Ref.:	B2 L3
Sample Type:	C

Description:
Firm dark grey slightly gravelly CLAY.

SPECIMEN DETAILS

Depth within original sample	10mm
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.37	101.17
Height	*mm*	100.29	100.09
Moisture Content	*%*	24.4	26.1
Bulk Density	*Mg/m³*	1.96	1.99
Dry Density	*Mg/m³*	1.57	1.58

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.69	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	4.8

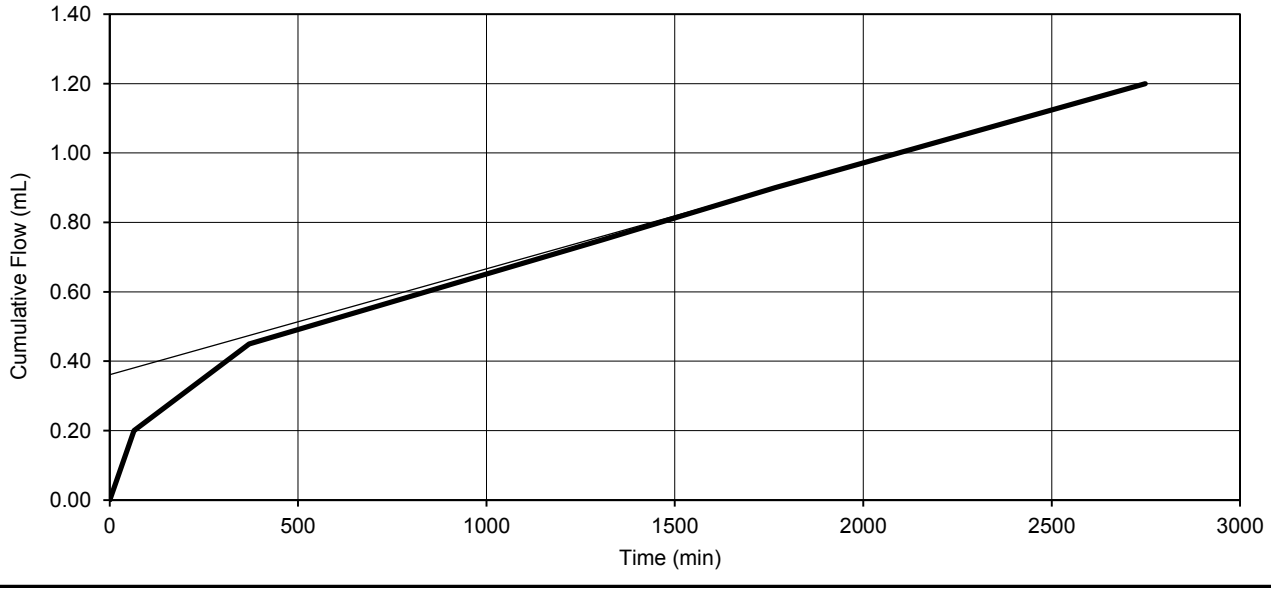
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	2
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 6.2×10^{-11} m/s



Checked and Approved by

P Heritage

P Heritage - Project Co-ordinator
22/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT5
Sample Ref.:	A4 L2
Sample Type:	C

Description:
Firm dark grey slighty gravelly CLAY. Gravel is fine.

SPECIMEN DETAILS

Depth within original sample	15 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.11	100.84
Height	*mm*	100.30	100.03
Moisture Content	*%*	25.6	27.4
Bulk Density	*Mg/m³*	1.95	2.00
Dry Density	*Mg/m³*	1.56	1.57

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.77	0.98

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	6.6

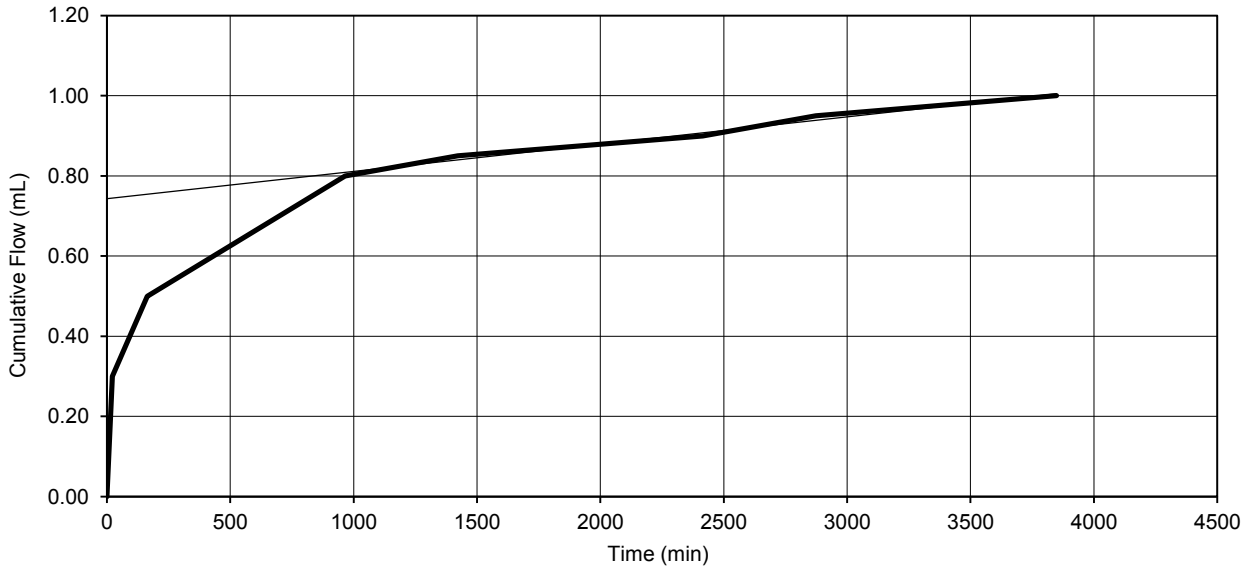
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 1.4×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
26/07/2019

Project Number:

GEO / 29532

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3807**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**29/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C2-L5-C1	Core 2 D2-L5-C1	Core 3 E3-L4-C1		
Bulk Density	2.02	2.01	1.98		
Moisture Content	23	26	26		
Dry Density	1.64	1.60	1.57		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	1.9	0.4	1.7		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 30/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3829**		

Site Reference:	**Core 1 - Core 5**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**01/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B1-L4-C1	Core 2 B2-L4-C1	Core 3 E4-L4-C1	Core 4 D4-L4-C1	Core 5 C5-L5-C1
Bulk Density	2.04	2.02	2.03	2.02	2.07
Moisture Content	22	23	20	24	22
Dry Density	1.67	1.65	1.68	1.63	1.70

Relative Compaction	N/A	N/A	N/A	N/A	N/A
Air Voids % Using PD 2.74Mg/m³	1.8	2.7	4.1	2.0	0.7

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 02/08/2019 Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3830**		

Site Reference:	**Core 6**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**01/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 6 B5-L3-C1				
Bulk Density	2.02				
Moisture Content	24				
Dry Density	1.63				

Relative Compaction	N/A				
Air Voids % Using PD 2.74Mg/m³	1.6				

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 02/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3857**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**02/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A2-L5-C1	Core 2 B2-L5-C1			
Bulk Density	2.06	2.03			
Moisture Content	22	23			
Dry Density	1.68	1.65			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	0.9	1.9			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 03/08/2019	Fig

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 4 – Field Logs

Available on request

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3808	C2-L5 29.07.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	50	118	51	73	HSV 1
3809	D2-L5 29.07.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	70	110	120	100	HSV 2
3810	E3-L4 29.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	85	90	100	92	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	30/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3831	B1-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	150	120	112	127	HSV 1
3832	B2-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	125	127	110	121	HSV 2
3833	E4-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	105	120	110	112	HSV 3
3834	D4-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	85	80	96	87	HSV 4
3835	C5-L5 01.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	89	114	150	118	HSV 5
3836	B5-L3 01.08.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	90	85	70	82	HSV 6

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	02/08/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3858	A2-L5 02.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	85	90	75	83	HSV 1
3859	B2-L5 02.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	85	90	65	80	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	03/08/2019	HV1

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport
CITY COUNCIL
CYNGOR DINAS
Casnewydd

Appendix 6 – PI, PL, MC, LL Results

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13797

Number of samples submitted for testing:	5	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	21	Jun-19
Date of receipt of testing instructions	21	Jun-19
Date testing started:	25	Jun-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B1 L1	GT2	0.00		B	Dark grey slightly sandy CLAY			25.5	100	45	20	25		
C3 L1	GT1	0.00		B	Dark grey slightly sandy CLAY			24.1	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29473.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		B1 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.71	2
GT4		C3 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.73	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

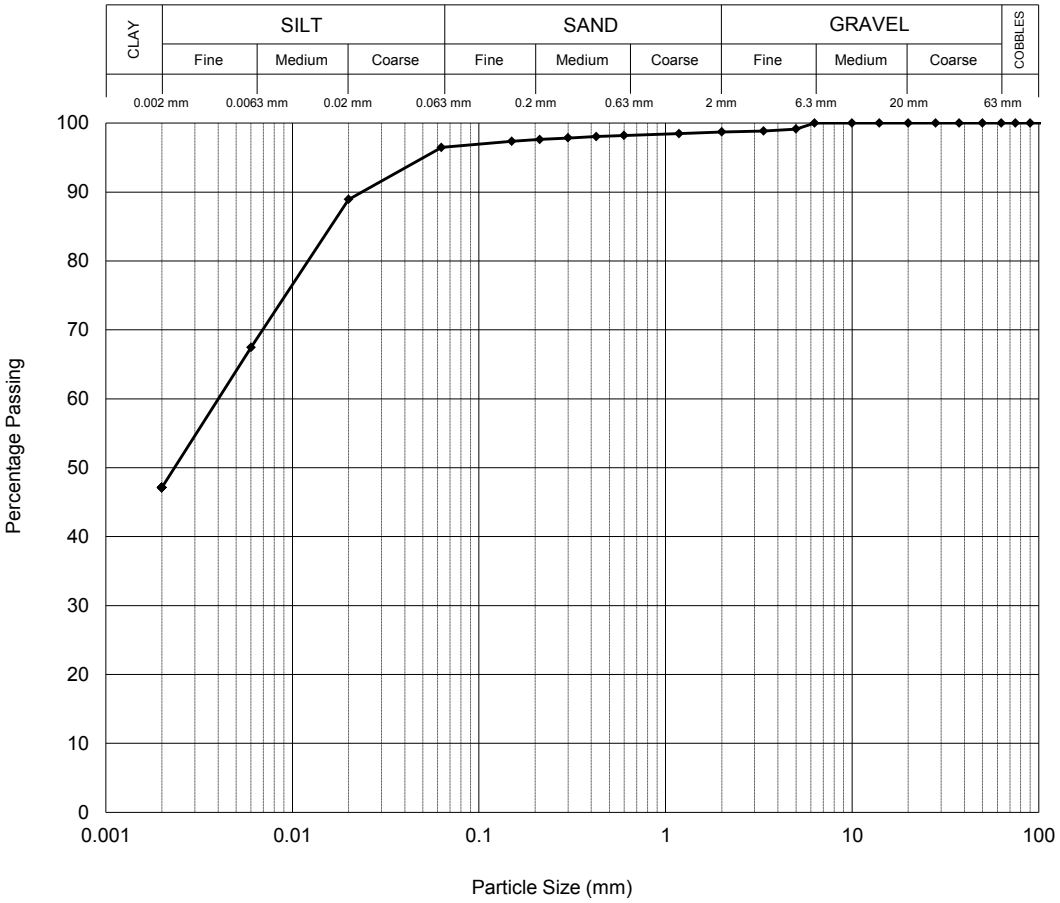
BH / TP No.	GT3
Sample Ref	B1 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	98
600 µm	98
425 µm	98
300 µm	98
212 µm	98
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	67
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

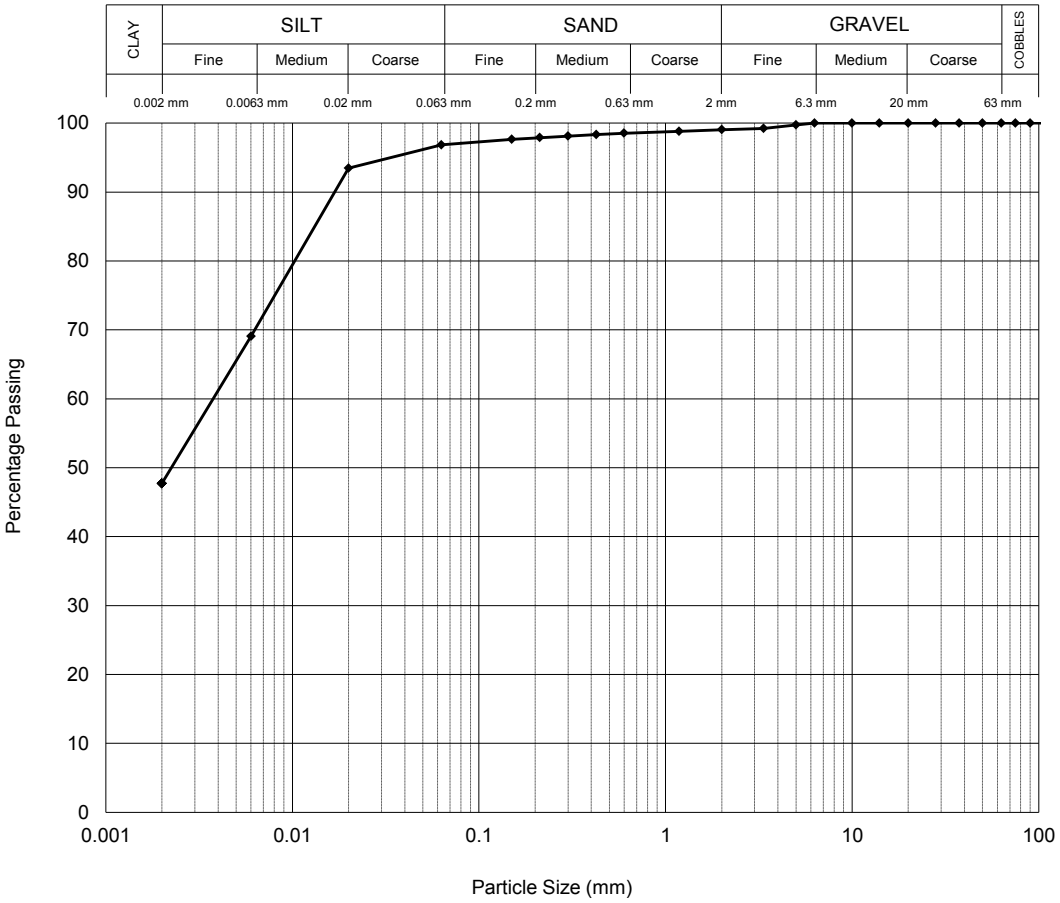
BH / TP No.	GT4
Sample Ref	C3 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	93
6 µm	69
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13801

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	24	Jun-19
Date of receipt of testing instructions	24	Jun-19
Date testing started:	27	Jun-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B1 L2	GT4	0.00		B	Dark grey slightly sandy CLAY			24.9	100	48	20	28		
E2 L-1	GT5	0.00		B	Dark grey slightly sandy CLAY			24.9	100	48	20	28		
E3 L-1	GT6	0.00		B	Dark grey slightly sandy CLAY			25.4	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
E3 L-1		GT7	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.71	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
30/07/2019

Project Number:

GEO / 29489

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

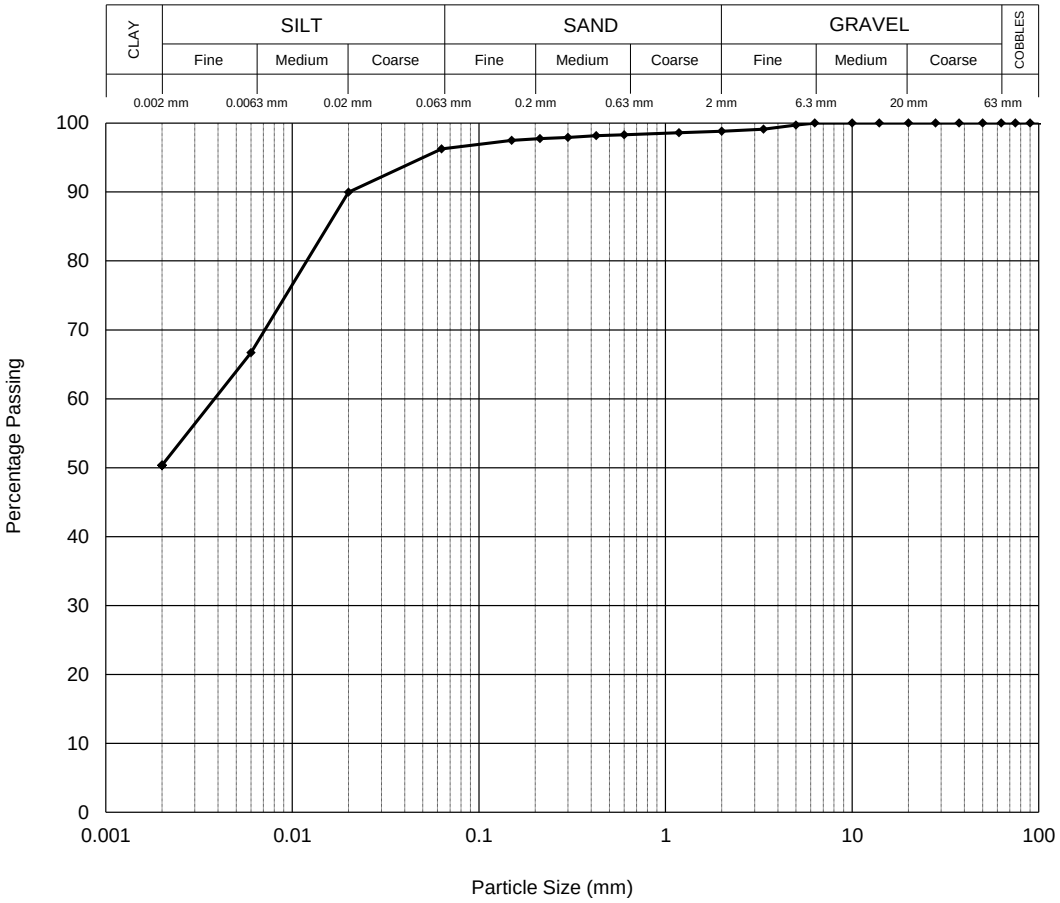
BH / TP No.	E3 L-1
Sample Ref	GT7
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	98
425 µm	98
300 µm	98
212 µm	98
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25.4
Size	% Pass
20 µm	90
6 µm	67
2 µm	50

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	3
Silt	46
Clay	50

Checked and Approved by

J Sturges - Operations Manager
30/07/2019

Project Number:

GEO / 29489

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13812

Number of samples submitted for testing:	7	sample (s)

Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	26	Jun-19
Date of receipt of testing instructions	26	Jun-19
Date testing started:	3	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L3	GT8	0.00		B	Dark grey slightly sandy CLAY			25.9	100	48	19	29		
B1 L3	GT11	0.00		B	Dark grey slightly sandy CLAY			25.8	100	49	20	29		
B2 L3	GT9	0.00		B	Dark grey slightly sandy CLAY			24.6	100	49	19	30		
E4 L-1	GT7	0.00		B	Dark grey slightly sandy CLAY			26.5	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT10		B2 L3	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.73	2
GT6		A2 L3	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.75	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

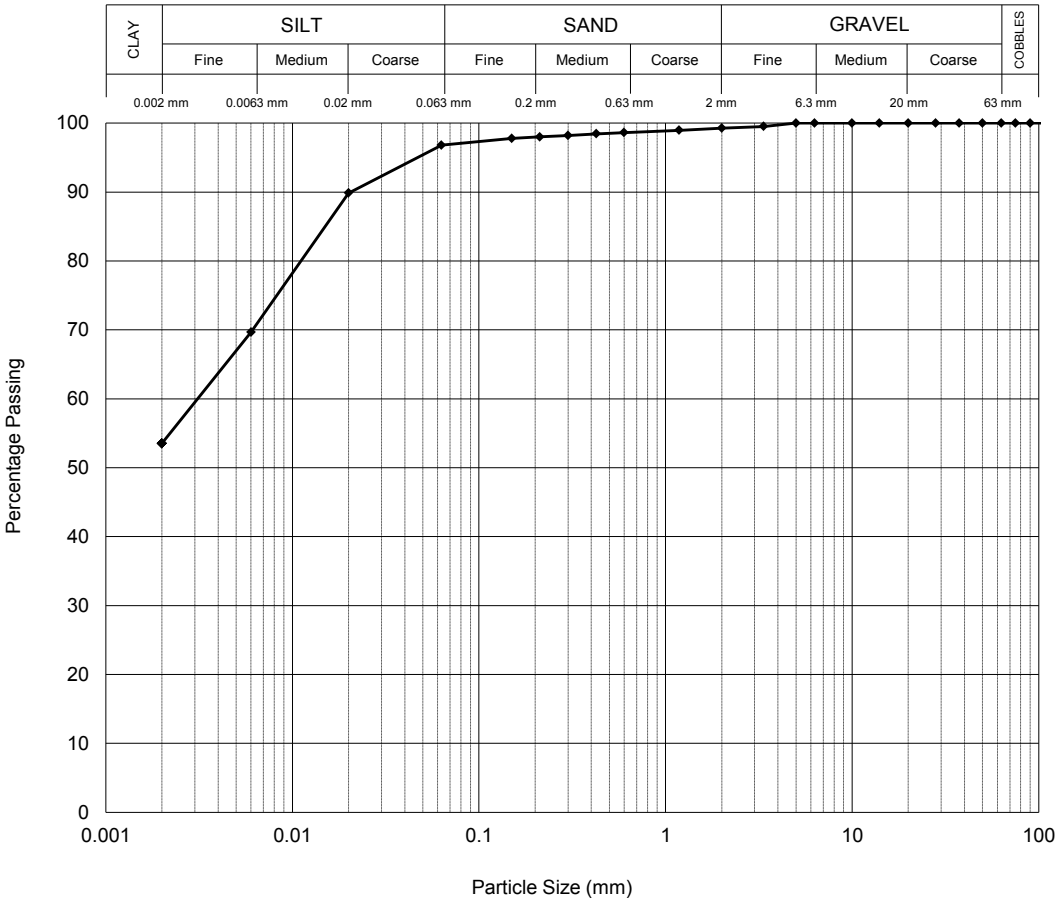
BH / TP No.	GT6
Sample Ref	A2 L3
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	90
6 µm	70
2 µm	54

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	43
Clay	54

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

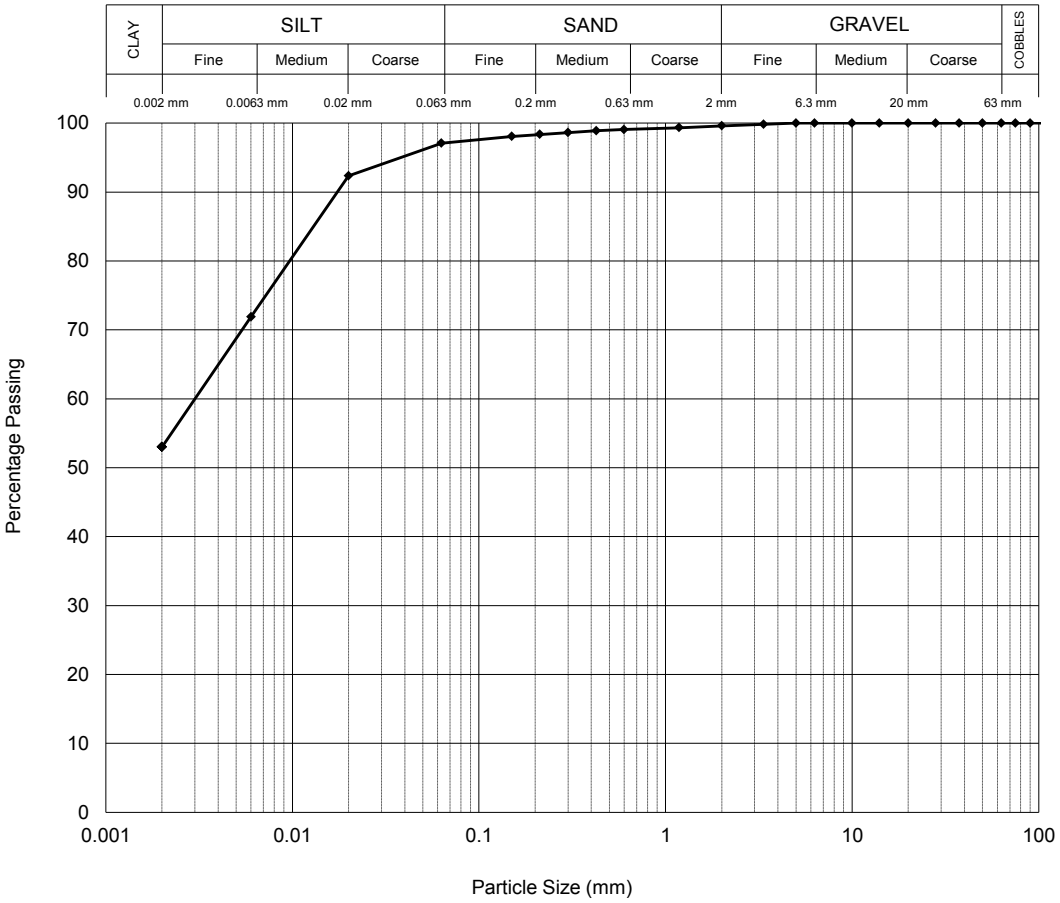
BH / TP No.	GT10
Sample Ref	B2 L3
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	92
6 µm	72
2 µm	53
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	3
Silt	44
Clay	53

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13814

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	27	Jun-19
Date of receipt of testing instructions	27	Jun-19
Date testing started:	3	Jul-19
Date of issue:	30	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
B3 L2	GT2	0.00		B	Dark grey slightly sandy CLAY			23.1	100	49	20	29		
B4 L2	GT1	0.00		B	Dark grey slightly sandy CLAY			22.3	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 22/07/2019

Approved By: Lisa Maiden

Table 1

sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		B3 L2	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29511

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

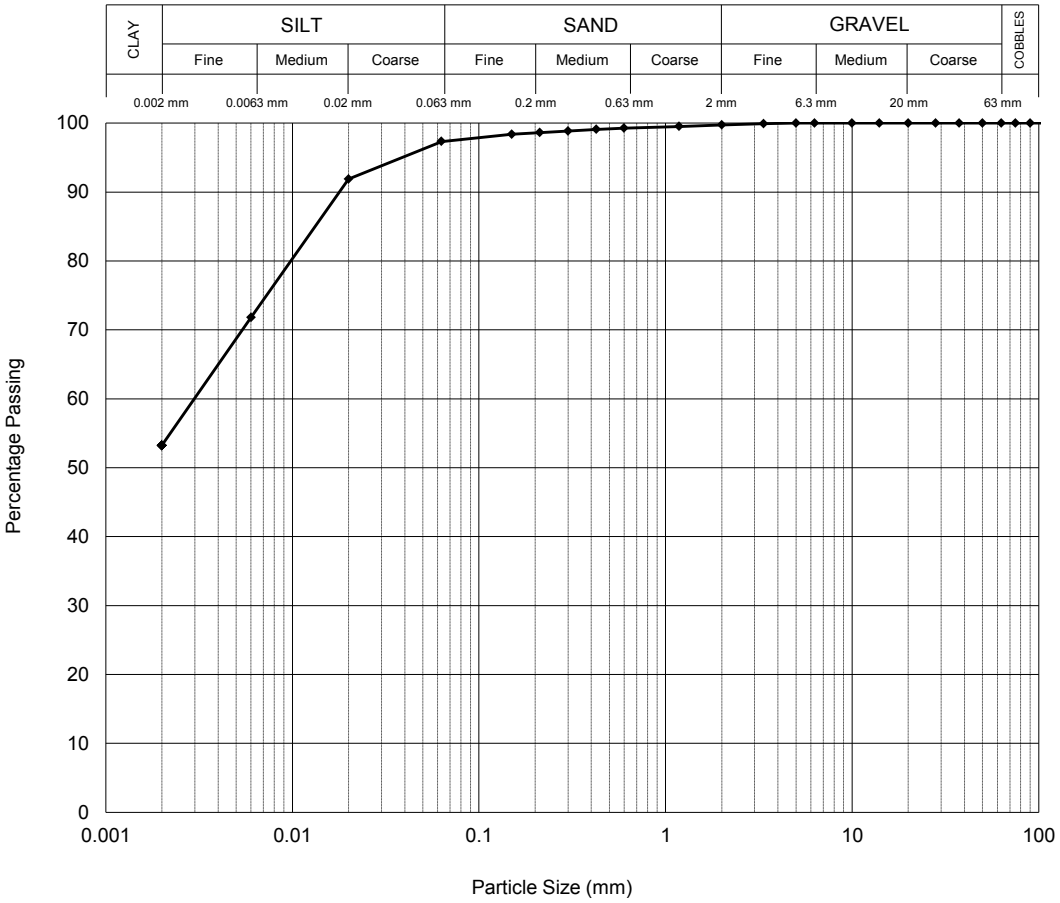
BH / TP No.	GT3
Sample Ref	B3 L2
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	92
6 µm	72
2 µm	53

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	44
Clay	54

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29511

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1962

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13816

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	28	Jun-19
Date of receipt of testing instructions	28	Jun-19
Date testing started:	3	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L1	GT3	0.00		B	Dark grey slightly sandy CLAY			25.7	100	48	19	29		
C4 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			26.7	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		C3 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29512

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

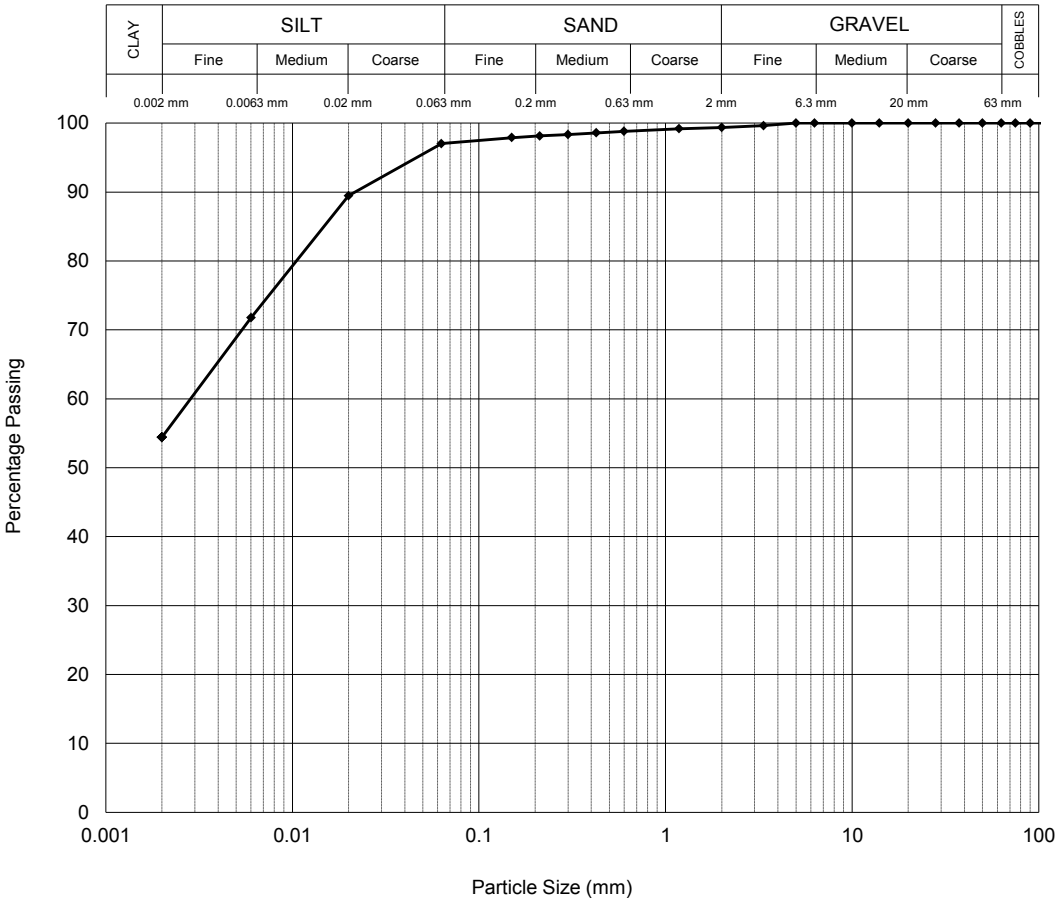
BH / TP No.	GT5
Sample Ref	C3 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	72
2 µm	54

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	43
Clay	54

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29512

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13826

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	1	Jul-19
Date of receipt of testing instructions	1	Jul-19
Date testing started:	6	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A4 L2	GT6	0.00		B	Dark grey slightly sandy CLAY			25.3	100	48	20	28		
C5 L1	GT1	0.00		B	Dark grey slightly sandy CLAY			25.6	100	47	19	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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1128 - Particle Density Summary - 29532.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C5 L1	B	Dark grey CLAY / SILT.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29532

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

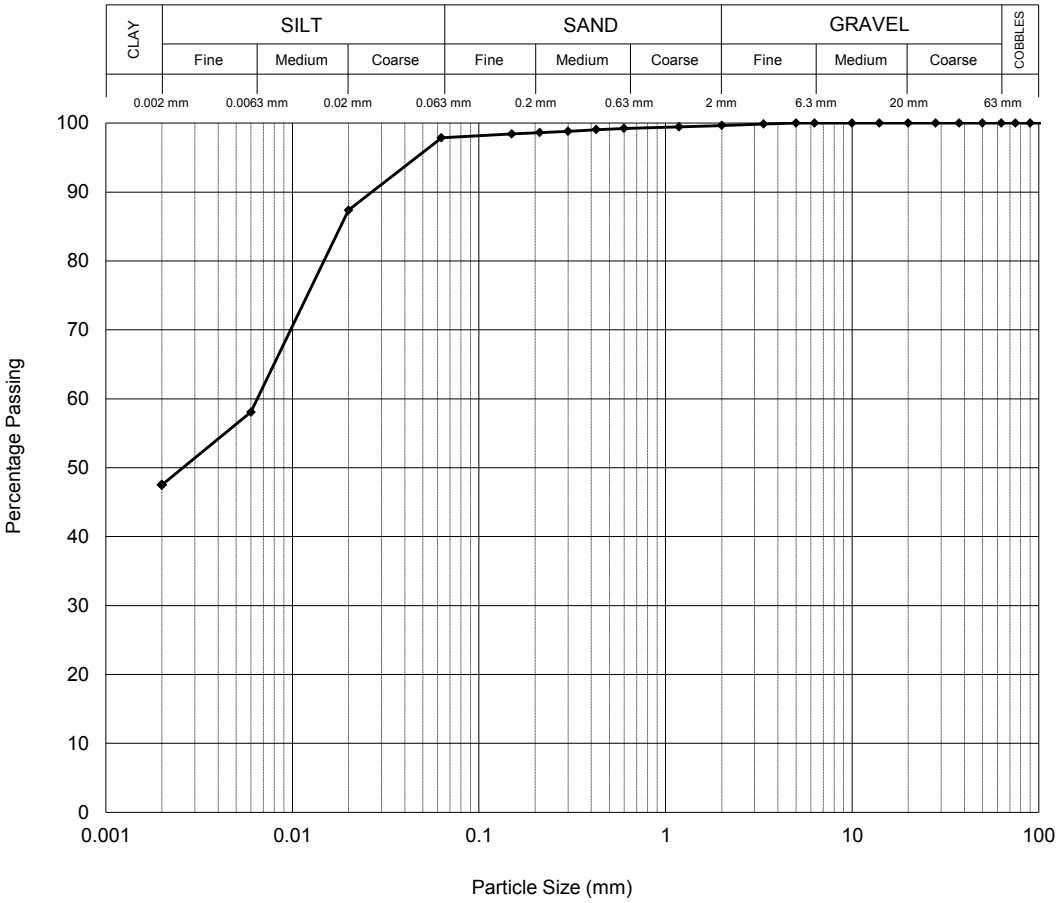
BH / TP No.	GT2
Sample Ref	C5 L1
Sample Type	B

Description

Dark grey CLAY / SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	87
6 µm	58
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	50
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29532

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13829

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	2	test(s)
Grading	2	test(s)

Date (s) sampled and received at laboratory:	2	Jul-19
Date of receipt of testing instructions	2	Jul-19
Date testing started:	9	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			25.7	100	47	20	27		
C5 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			21.8	100	46	20	26		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29533.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		C5 L2	B	Dark grey SILT and CLAY	2.68	2
GT6		A3 L2	B	Dark grey SILT and CLAY	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29533

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

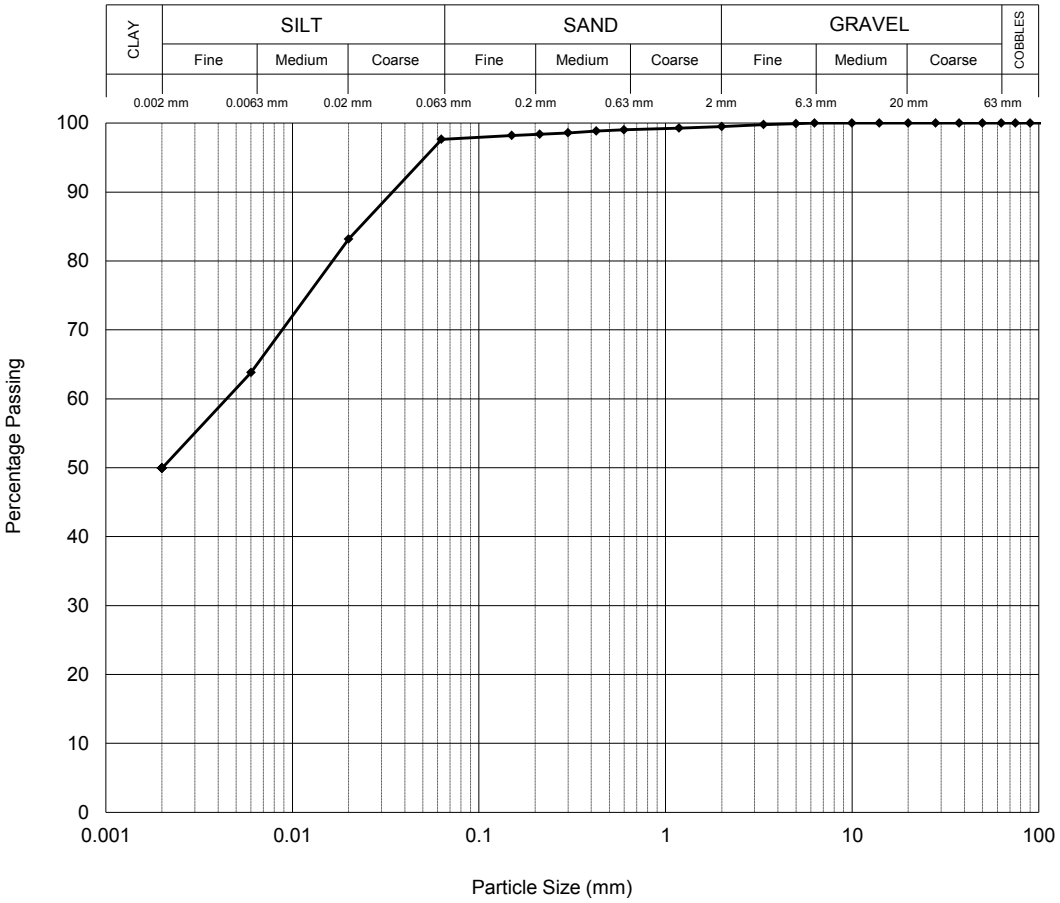
BH / TP No.	GT4
Sample Ref	C5 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	83
6 µm	64
2 µm	50
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	48
Clay	50

Checked and Approved by

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29533

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

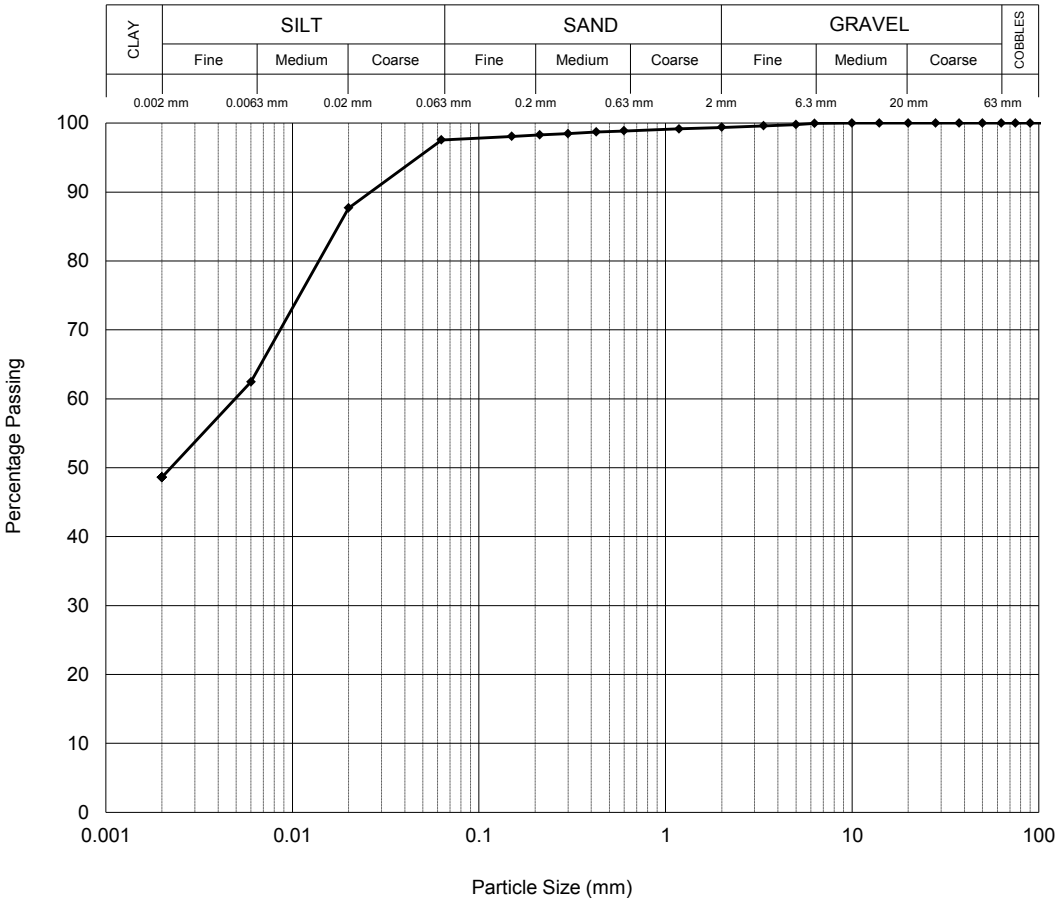
BH / TP No.	GT6
Sample Ref	A3 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	88
6 µm	62
2 µm	49
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29533

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13835

Number of samples submitted for testing:	3	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	3	Jul-19
Date of receipt of testing instructions	3	Jul-19
Date testing started:	9	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L2	GT1	0.00		B	Dark grey slightly sandy CLAY			25.8	100	48	21	27		
C4 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			24.6	96	48	21	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C4 L2		Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29559

Project Name:

DOCKSWAY CELL 4
AG0390

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BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

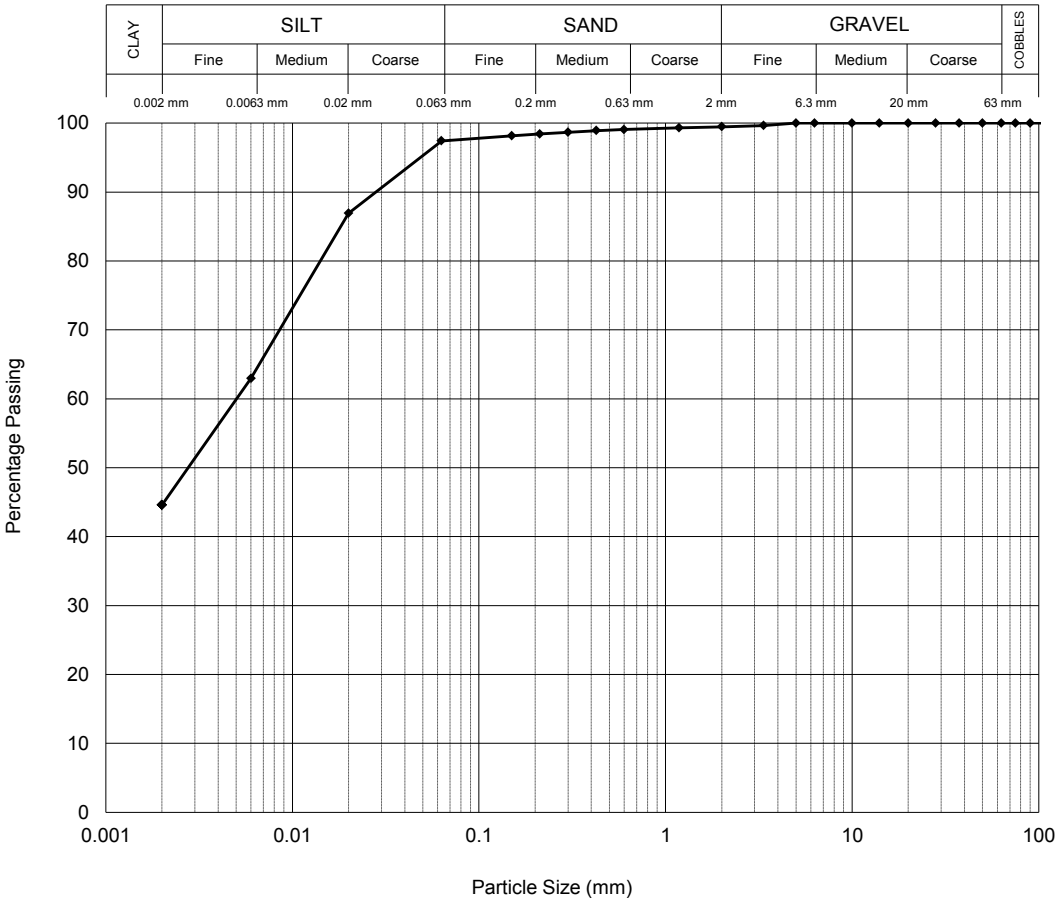
BH / TP No.	GT2
Sample Ref	C4 L2

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.1
Size	% Pass
20 µm	87
6 µm	63
2 µm	45
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	53
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29559

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
D4 L1		0.00		B	Dark grey slightly sandy CLAY			26.9	100	48	19	29		
D5 L1		0.00		B	Dark grey slightly sandy CLAY			22.2	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
29/07/2019	Lisa Maiden	1
		sheet 1

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
A3 L3	GT4	0.00		B	Dark grey slightly sandy CLAY			24.8	100	48	20	28		
A4 L3	GT6	0.00		B	Dark grey slightly sandy CLAY			24.1	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 29/07/2019

Approved By: Lisa Maiden

Table 1

sheet 1

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Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
D4 L2	GT6	0.00		B	Dark grey slightly sandy CLAY			26.2	100	48	19	29		
D5 L2	GT7	0.00		B	Dark grey slightly sandy CLAY			27.5	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test: Linear measurement unless : wd - water displacement; wi - immersion in water

Liquid Limit: 4pt cone unless : cas - Casagrande method; 1pt - single point test

Particle density: sp - small pyknometer; gj - gas jar

Date Printed: 29/07/2019

Approved By: Lisa Maiden

Table 1

sheet 1

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 7 – Photographs

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Monday 29 July 2019 from Grid A5 (Stockpile area at Grid A5)

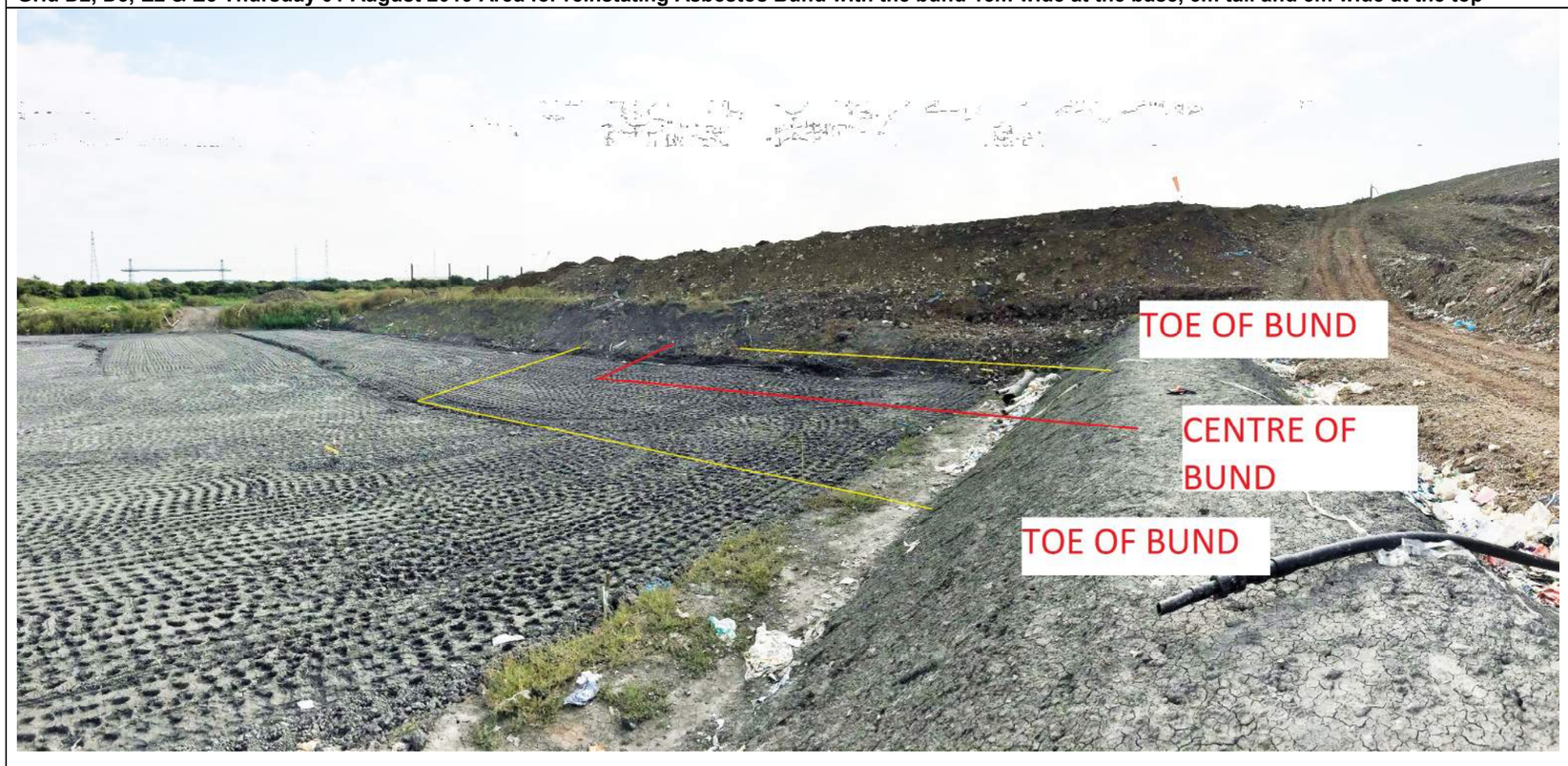
Monday 29 July 2019 from D2 area requiring 1:2 profile to join Cells 4a and 4B

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Wednesday 31 July 2019 Stockpile outside the Cell and surface rain water	Wednesday 31 July 2019 Stockpile outside the Cell and surface rain water and slurry removed

Grid D2, D3, E2 & E3 Thursday 01 August 2019 Area for reinstating Asbestos Bund with the bund 15m wide at the base, 3m tall and 3m wide at the top



Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Thursday 01 August 2019 Grid A3 sump soft spot removed	Friday 02 August 2019 Grid A1 Toe of batter in accordance with drawings.

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Friday 02 August 2019 Grid A5 Bund within cell total area required.

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 10 WE 11/08/19

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		11-08-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved
02	13 Aug 19	text	William Watt		

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Contents

1.0 Introduction

2.0 Weather

3.0 Progress For the Week

3.1 Stockpile
3.2 Work – progress

4.0 Testing

4.1 Core Cutter Samples
4.2 Permeability Samples
4.3 MC and PI
4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

5.0 Summary of results

5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL CYNGOR DINAS Casnewydd

1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Some rain over the weekend, although no impact on the clay. Rain on Friday and some rain overnight Tuesday, otherwise sunny and high temperatures.

3.0 Progress for the week

3.1 Stockpile

The stockpile on grids A1, A2, B1, B2 was reinstated Monday 05 August 2019.
22,315.95 tonnes of material was delivered to site up to 17 July 2019.
The working hours this week were 730am to 1600pm.
Clay deliveries to the site were slow and delayed progress on Tuesday and Wednesday.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1**
  Work completed
- **Layer 2**
  Work completed
- **Layer 3**
  Work completed
- **Layer 4**
  C4L4
- **Layer 5**
  A3L5, C3L5, C4L5, *D3L5*, *D4L5*, D5L5, E3L5
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

No Leachate was captured on the site. A small amount of leachate was omitting from the cell 3A within grid E3.

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Sampling and testing by CJ Associates was undertaken Monday, Tuesday and Thursday.

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

10 core cutter samples were taken this week
10 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

1 sample was taken this week.
1 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 55 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

The all results received this week were in accordance with CQA Plan Table 3.1.

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

5.2 Compliance

The majority of the results received this week are in accordance with CQA Plan Table 3.2. Grid D3L5 moisture content was 20% which is not in accordance with the requirements for the CQA Plan. The CQA Engineers email 07 August 2019 confirmed that this area was to be ripped, reconditioned, recompacted and retested.

D3L5 retest and D4L5 moisture contents were 20%which is not in accordance with the requirements for the CQA Plan. The CQA Engineers email 09 August 2019 confirmed that this area was to be ripped, reconditioned, recompacted and retested.

6.0 Problems Encountered

- The bund to reinstate the asbestos Cell 3A bund was viewed on site 06/08/19 the client proposed some 20m long to connect to the bund in cell 4B with a bund height 3m for its length dropping down sharply to tie into the 2m high Cell 4B bund, with a base of 11m wide into cell 4A connecting to and benching into the existing material along Cell 3A.
- The client proposed to add nominal additional material to the bund/ clay liner connecting cells 4a and 4b which are not at the same level ramping the cell 4a liner to meet the 4b liner at 1:2 and bench into the existing liner.
- The bund grids A5 to D5 was viewed on site 06/08/19 the client proposed to move the toe of the bund back some 2m where the 1.2m clay layer thickness would be achieved within the bund.
- The bund grids A1 to A5 was viewed on site 06/08/19 the client proposed to maintain a 1.2minimum clay thickness up the existing batter (moving the toe of batter some 2.8m back) with the 2m bund formed above the existing material.
- Litter entering the site from the adjacent cell 4a remains an issue. Litter pickers did not attend the site this week.

Appendix 1 - Progression Plan

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2				-L3		-L4	
	Sampling	Result	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	DD&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19										
	T-24/06/19	P- 25/06/19										
E3	MC&PI/PD&PSD/DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19										
	T-24/06/19	P- 25/06/19										
E4	MC&PI/DD&MC	P Sh-75 P-PI 22/07/19										
	T-25/06/19	P- 27/06/19										

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5					
	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Rework and Retest	Rework and Retest
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5				
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
A2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/DD&MC	P Sh-75 T-PI T-PD&PSD				
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
A3	MC&PI/PD&PSD/DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/DD&MC	P Sh-66 P-PI 30/07/19 T-PD&PSD	MC&PI/ /DD&MC	P Sh-60 T-PI			MC&PI/ /DD&MC	P Sh-65 T-PI				

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Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%	T--23/07/19	P-24/07/19			T--06/08/19	P-07/08/19				
A4	MC&PI/PD&PSD/DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 T-PI								
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19	T--23/07/19	P-24/07/19								
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3										
Date	T-22/07/19	P-24/07/19			T-25/07/19	P-26/07/19			T-31/07/19	P-02/08/19										
B1	MC&PI/PD&PSD/DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 T-PI			AsB2L5	AsB2L5				
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19	T-31/06/19	P-02/08/19			T-02/08/19	P-05/08/19				
B2	MC&PI/PD&PSD/DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-65 T-PI				
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 T-PI T- PD&PSD	MC&PI / DD&MC	P Sh-58 T-PI								
Date	T-18/06/19	P-19/06/19			T-18/06/19	P-28/06/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19								
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 T-PI	MC&PI/P D&PSD/ /DD&MC	P Sh-50 T-PI T- PD&PSD								
Date	T-18/06/19	P-19/06/19			T-27/06/19	P-28/06/19			T-16/07/19	P-17/07/19	T-24/07/19	P-25/07/19								
B5	MC&PI /DD&MC	P Sh-52 T-PI			MC&PI /DD&MC	P Sh-61 T-PI			MC&PI /DD&MC	P Sh-70 T-PI										
Date	T-22/07/19	P-24/07/19			T-24/07/19	P-25/07/19			T-31/07/19	P-02/08/19										
C1																				
Date																				
C2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 P-PI 22/07/19 P- PD&PSD 08/08/19			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/ PD&PSD/ DD&MC	P Sh 54 P-PI 09/08/19 T-PI T-PD&PSD			MC&PI / PD&PSD/ DD&MC	P Sh-50 T-PI T-PSD&PD				
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19	T-26/07/19	P-29/07/19			T-29/07/19	P-30/07/19				
C3	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/PD&PSD/ DD&MC	P Sh-55 *P-PI 22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 T-PI	MC&PI /PD&PSD/ DD&MC	P Sh 54 T-PI T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh 66 T-PI T-PD&PSD				
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19			T-05/08/19	P-06/08/19				
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDD D&MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/ DD&MC	P Sh 50 T-PI T-PD&PSD	MC&PI /PD&PSD/ DD&MC	P Sh 56 T-PI			MC&PI/ PDS&PD/ /DD&MC	P Sh-76 T-PI T-PSD&PD				
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T-16/07/19	P-17/07/19	T-05/08/19	P-06/08/19			T-08/08/19	P-09/08/19				
C5	MC&PI/PD&PSD/DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD &PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 T-PI	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 T-PI				
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T-17/07/19	P-19/07/19			T-31/07/19	P-02/08/19				
D1																				
Date																				
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/D D&MC	P Sh-60 P-PI 25/07/19 P-PD&PSD 09/08/19			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-70 T-PI				

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Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-29/07/19	P-30/07/19				
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/ DD&MC	P Sh-55 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /PSD&PD/ DD&MC	P Sh-56 T-PI T-PSD&PD	DD&MC	P-sh-75		
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-06/08/19	F-07/08/19	T-07/08/19	T-09/08/19		
D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 P-PD&PSD 08/08/19			MC&PI/ PD&PSD/D D&MC	P Sh-65 P-PI MC26.2%30. 07/19 T-PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-52 T-PI T-PD&PSD	MC&PI/D D&MC	P Sh-80 T-PI			MC&PI / PD&PSD/ DD&MC	P Sh-100 T-PI T-PD&PSD				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-07/08/19	F-09/08/19				
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD &MC	P Sh-79 P-PI MC27.5%30. 07/19			MC&PI/D D&MC	P Sh-64 T-PI	As D4L4	As D4L4			MC&PI /DD&MC	P Sh-83 T-PI				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-08/08/19	P-09/08/19				
E1																				
Date																				
E2	PD&PSD As E3L1	P- PD&PSD 06/08/19 As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P-29/07/19			T-29/07/19	P-30/07/19				
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/P D&PSD/D D&MC	P Sh-52 T-PI T- PD&PSD	MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-67 T-PI				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19			T-05/08/19	P-06/08/19				
E4	MC&PI/D D&MC	P Sh-52 P-PI 22/07/19			MC&PI/PD &PSD/DD &MC	P Sh-78 P-PI MC- 18.8% 25/07/19 P- PD&PSD 09/08/19			MC&PI/ DD&MC	P Sh-58 T-PI	MC&PI/P D&PSD/ DD&MC	P Sh-105 T-PI T-PSD&PD	DD&MC	P Sh-55						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19						
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4	As E4L4						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19						

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	*Result – K_y at 20°C*	*Date Sampled*	*Comments*	*Date Sampling complete*
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass- Test area for laying clay onto geotextile only	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1	$7.2x10^{-11}$ m/s	*04/07/19*	*Pass*	*06/08/19*
A3L4		*23/07/19*		
B4L4		*24/07/19*		
D4L4		*01/08/19*		
D4L5		*08/09/19*		

Bund

Layer	Ref	Date	Pass/Fail

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Casnewydd

Appendix 2 - Test Results - Permeability Tests

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT3
Sample Ref.:	E3 L1
Sample Type:	C

Description:
Firm dark grey gravelly CLAY. Gravel is fine weakly cemented mudstone.

SPECIMEN DETAILS

Depth within original sample	15 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	100.73	100.67
Height	*mm*	100.30	100.24
Moisture Content	*%*	25.7	26.4
Bulk Density	*Mg/m³*	1.96	1.98
Dry Density	*Mg/m³*	1.56	1.56

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.72	0.97

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	1.5

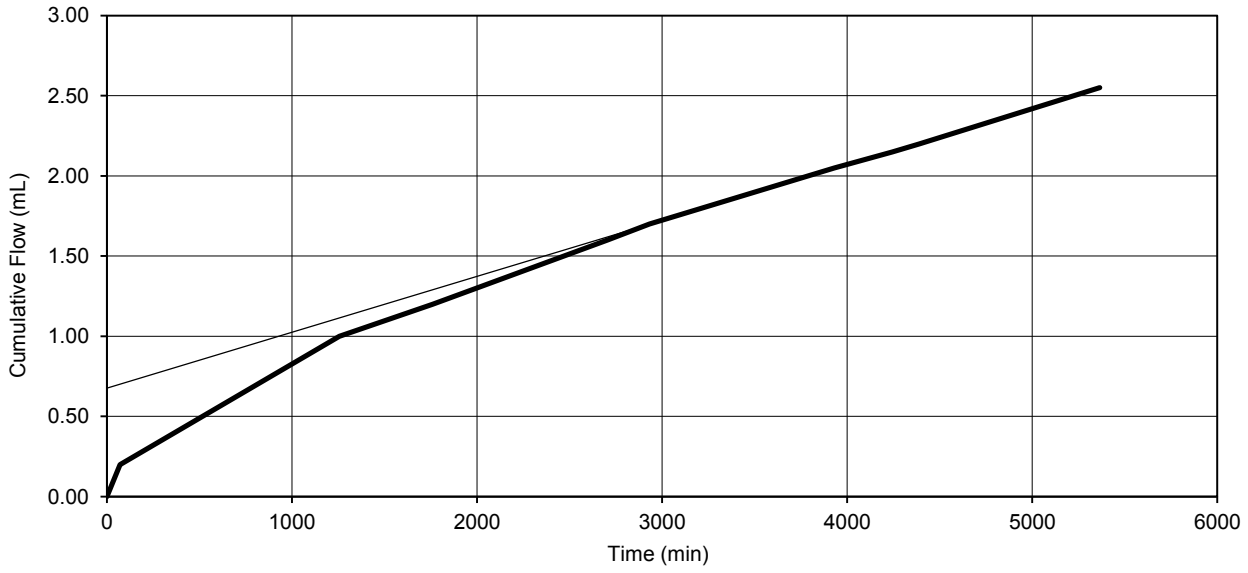
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.2×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
26/07/2019

Project Number:

GEO / 29560

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3863**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E4-L4-C1 Retest	Core 2 C3-L5-C1	Core 3 C4-L4-C1	Core 4 E3-L5-C1	
Bulk Density	2.02	2.01	2.00	2.00	
Moisture Content	22	23	23	23	
Dry Density	1.66	1.64	1.63	1.63	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	3.4	2.5	3.7	3.1	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 06/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3869**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**06/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L5-C1	Core 2 A3-L5-C1			
Bulk Density	2.06	2.05			
Moisture Content	20	21			
Dry Density	1.71	1.70			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	1.6	0.9			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 07/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3880**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**08/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L5-C1 Retest	Core 2 D4-L5-C1	Core 3 D5-L5-C1	Core 4 C4-L5-C1	
Bulk Density	2.08	2.06	2.02	2.00	
Moisture Content	20	20	23	25	
Dry Density	1.74	1.71	1.64	1.61	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.67Mg/m³	0.8	1.3	0.5	0.2	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 09/08/2019
			R Anstee, Materials and Field Testing Director	Fig

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Appendix 4 – Field Logs

Available on request

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3864	E4-L4 Retest 05.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	55	98	65	73	HSV 1
3865	C3-L5 05.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	91	75	66	77	HSV 2
3866	C4-L4 05.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	120	56	65	80	HSV 3
3867	E3-L5 05.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	89	84	67	80	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	06/08/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3870	D3-L5 06.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	64	67	56	62	HSV 1
3871	A3-L5 06.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	65	68	70	68	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee	Date 07/08/2019	Fig. **HV1**
Rev 1.0		R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3881	D3-L5 Retest 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	75	81	79	78	HSV 1
3882	D4-L5 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	100	132	100	111	HSV 2
3883	D5-L5 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	79	85	76	80	HSV 3
3884	C4-L5 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	95	83	87	88	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	09/08/2019	HV1

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 6 – PI, PL, MC, LL Results

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13838

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	4	Jul-19
Date of receipt of testing instructions	4	Jul-19
Date testing started:	9	Jul-19
Date of issue:	5	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
E3 L1	GT5	0.00		B	Dark grey slightly sandy CLAY			25.1	100	48	20	28		
E4 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			24.3	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT6		E2 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.67	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
01/08/2019

Project Number:

GEO / 29560

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

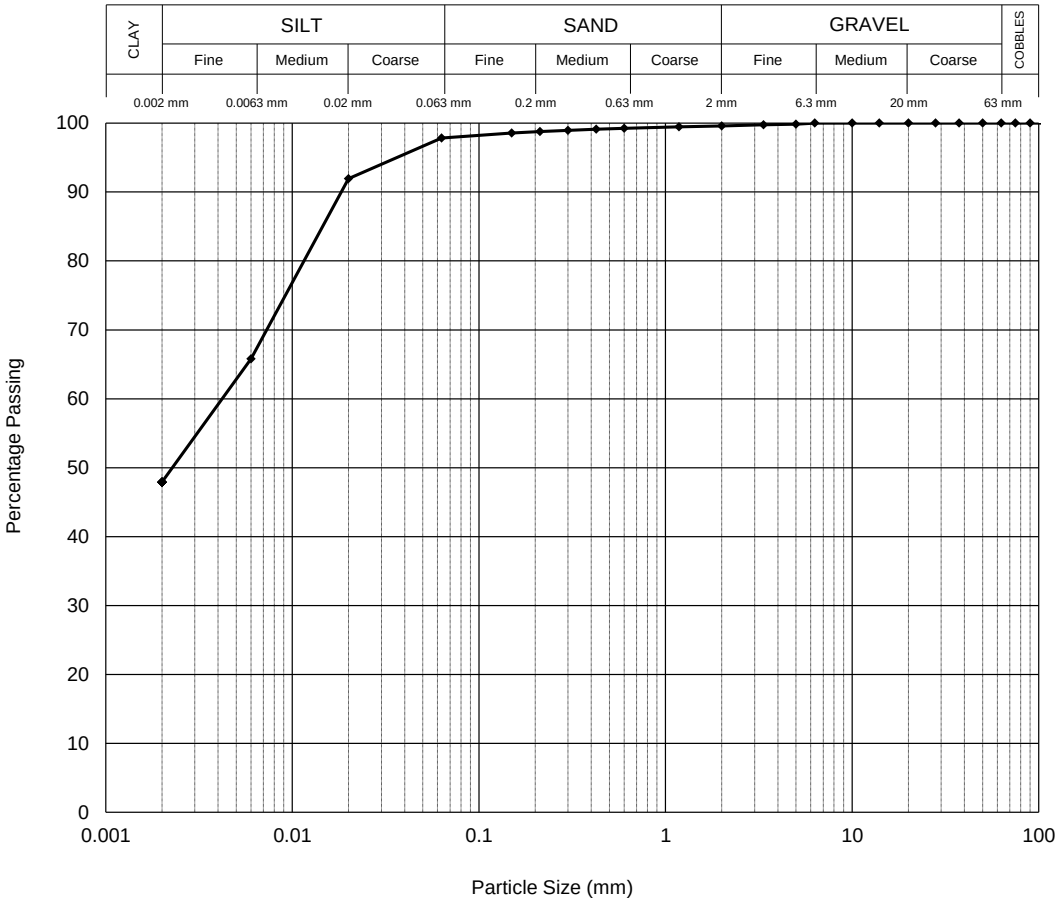
BH / TP No.	GT6
Sample Ref	E2 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.4
Size	% Pass
20 µm	92
6 µm	66
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	50
Clay	48

Checked and Approved by

J Sturges - Operations Manager
01/08/2019

Project Number:

GEO / 29560

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13840

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	5	Jul-19
Date of receipt of testing instructions	5	Jul-19
Date testing started:	9	Jul-19
Date of issue:	8	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			24.0	100	49	21	28		
D2 L1	GT6	0.00		B	Dark grey slightly sandy CLAY			29.5	100	49	20	29		
D3 L1	GT7	0.00		B	Dark grey slightly sandy CLAY			25.8	100	49	21	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		C2 L2	B	Dark grey SILT and CLAY.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29610

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

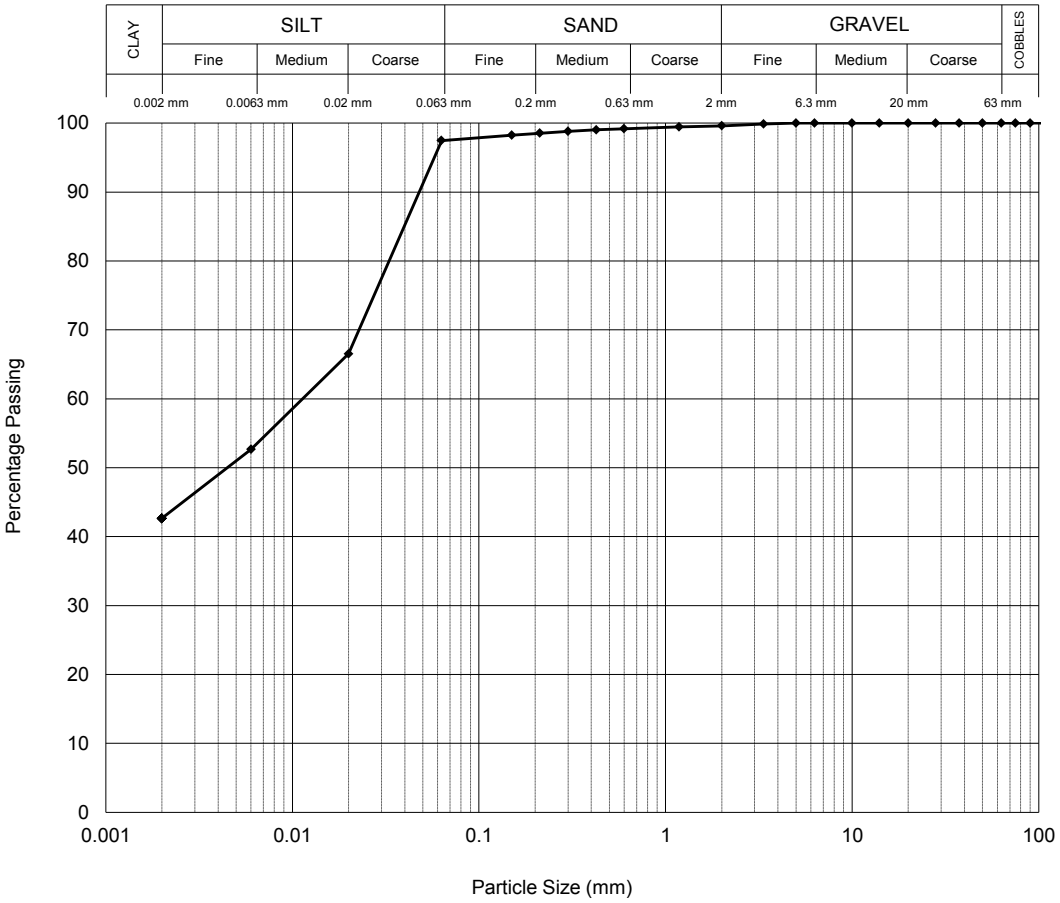
BH / TP No.	GT4
Sample Ref	C2 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	67
6 µm	53
2 µm	43

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	55
Clay	43

Checked and Approved by

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29610

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13845

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	8	Jul-19
Date of receipt of testing instructions	8	Jul-19
Date testing started:	15	Jul-19
Date of issue:	9	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
E2 L2	GT4	0.00		B	Dark grey slightly sandy CLAY			23.0	96	49	21	28		
E3 L2	GT7	0.00		B	Dark grey slightly sandy CLAY			23.4	100	49	20	29		
E4 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			18.8	100	49	21	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
24/07/2019	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29611.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT6		E4 L2	B	Dark grey SILT and CLAY	2.67	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29611

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

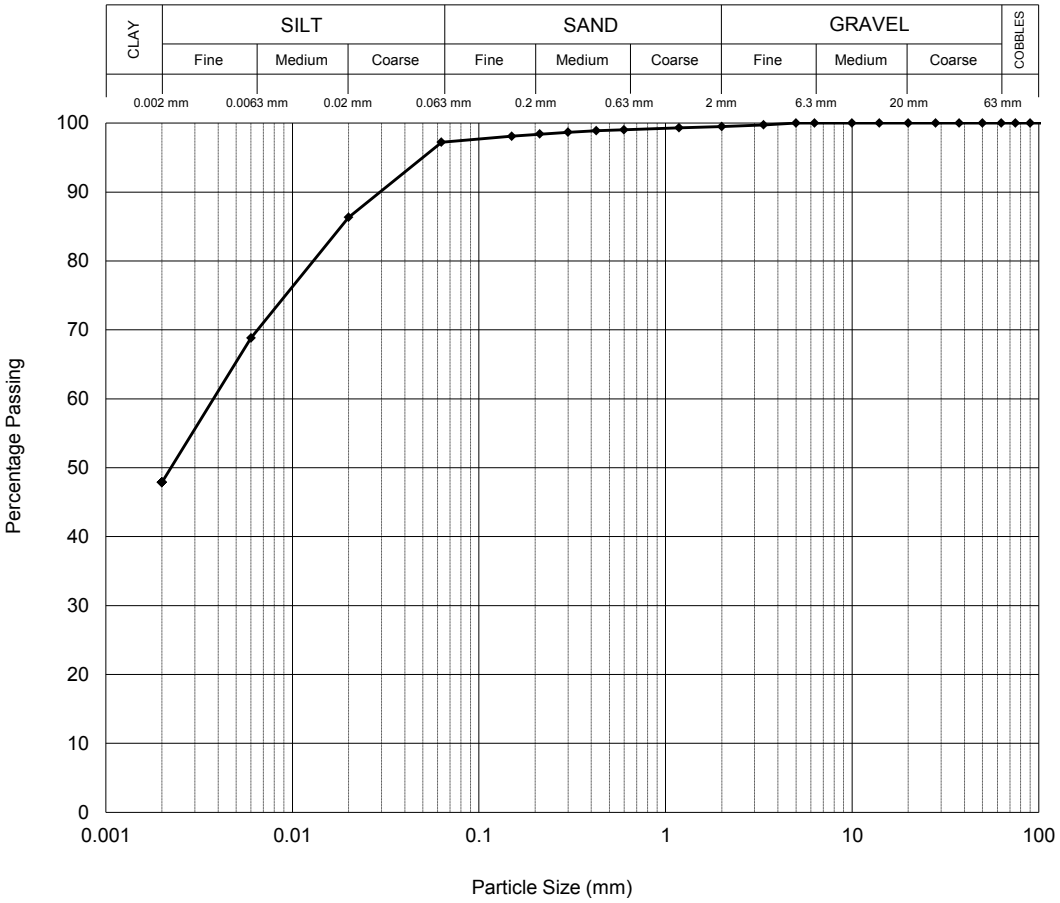
BH / TP No.	GT6
Sample Ref	E4 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	86
6 µm	69
2 µm	48
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	49
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29611

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1962

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13854

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	9	Jul-19
Date of receipt of testing instructions	9	Jul-19
Date testing started:	15	Jul-19
Date of issue:	9	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
C2 L3		0.00		B	Dark grey slightly sandy CLAY			23.8	100	48	20	28		
D2 L2		0.00		B	Dark grey slightly sandy CLAY			23.6	100	48	21	27		
D3 L2		0.00		B	Dark grey slightly sandy CLAY			26.0	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
24/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
		D2 L2	B	Dark grey SILT and CLAY	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29612

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

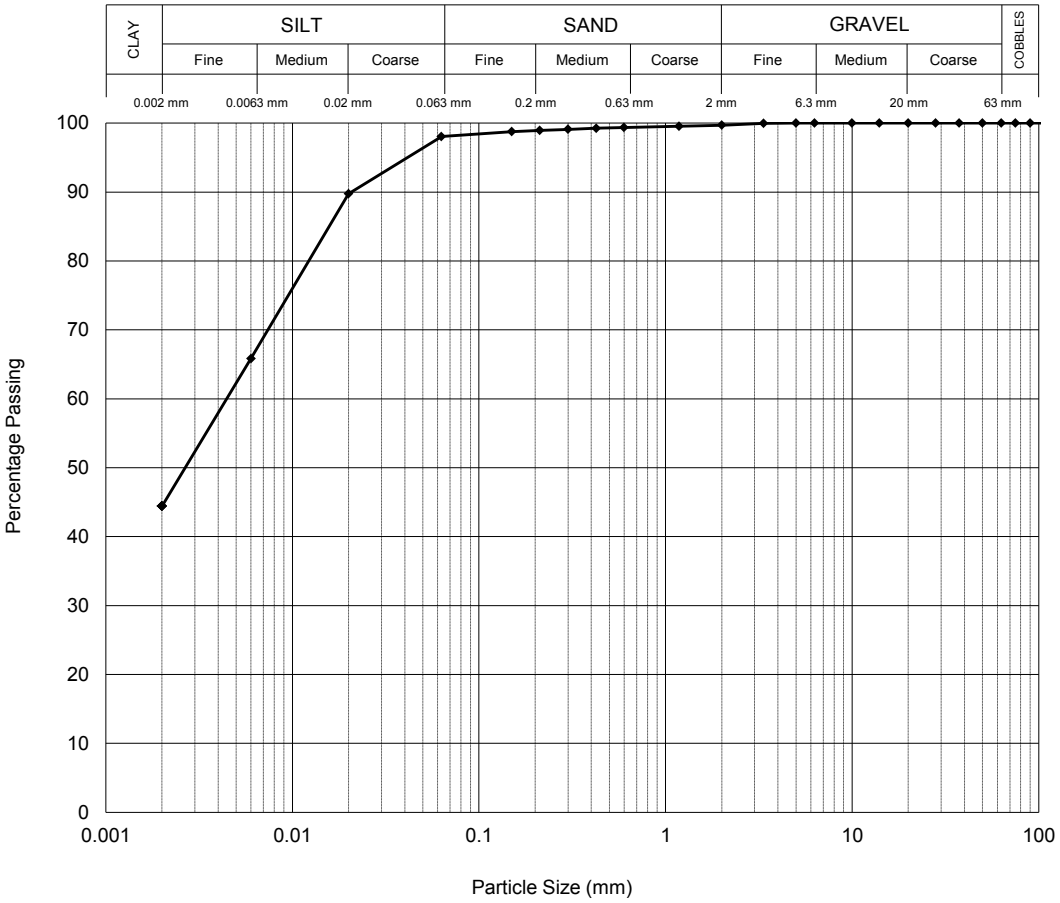
Sample Ref	D2 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	90
6 µm	66
2 µm	44
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	54
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29612

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13855

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	10	Jul-19
Date of receipt of testing instructions	10	Jul-19
Date testing started:	16	Jul-19
Date of issue:	8	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
D4 L1		0.00		B	Dark grey slightly sandy CLAY			26.9	100	48	19	29		
D5 L1		0.00		B	Dark grey slightly sandy CLAY			22.2	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
29/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
		D4 L1	B	Dark grey SILT and CLAY with rare fine gravel	2.64	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29613

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

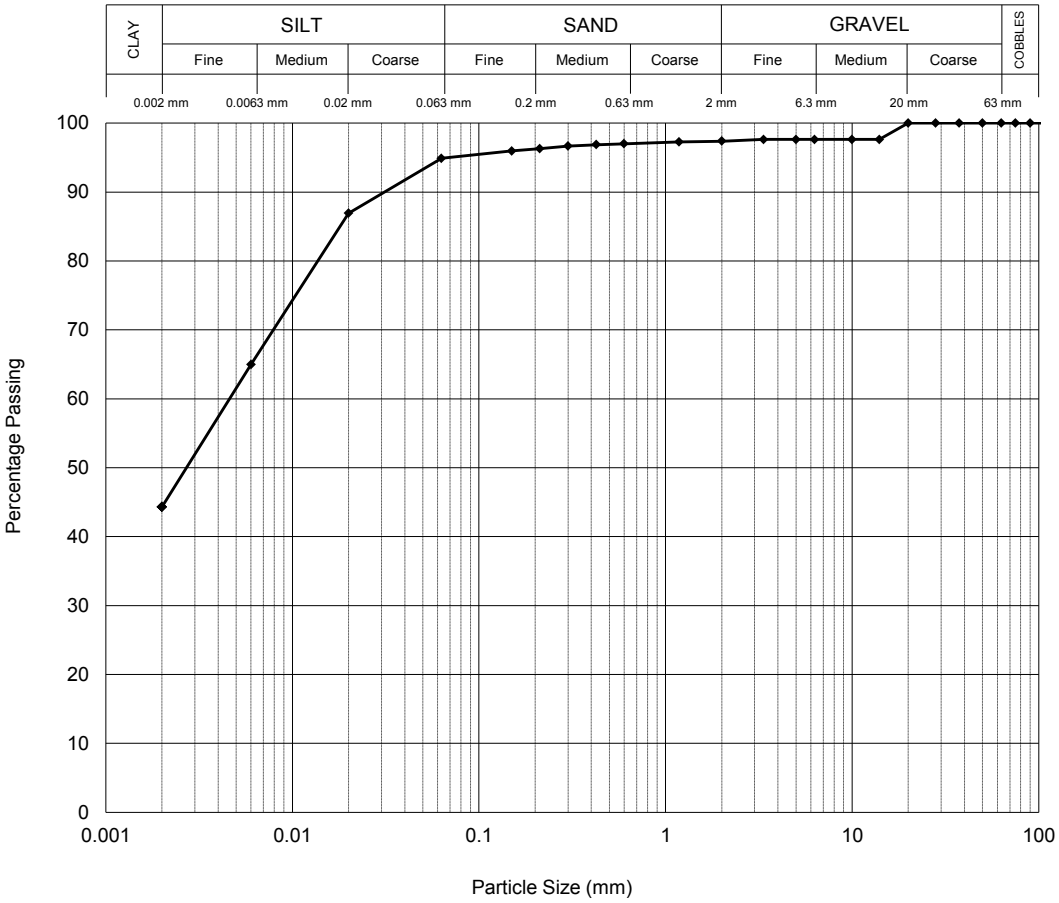
Sample Ref	D4 L1
Sample Type	B

Description

Dark grey SILT and CLAY with rare fine gravel

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	97
1.18 mm	97
600 µm	97
425 µm	97
300 µm	97
212 µm	96
150 µm	96
63 µm	95



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	87
6 µm	65
2 µm	44
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	3
Sand	2
Silt	51
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29613

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Streetscene
Y-Strydynun

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Appendix 7 – Photographs

Streetscene
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Monday 05 August 2019 from Grid A2 (Stockpile area at Grid A1)

Monday 12 August 2019 from A2 from Grid A2 (Stockpile area at Grid A1)

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Monday 05 August 2019 Stockpile outside the Cell removed	Wednesday 07 August 2019 Grid D3L5 dry material removed and replaced.
Thursday 08 August 2019 Grid A1 leachate from old tip,	**Thursday 08 August 2019 Grid A1 completion prior to heavy rain on Friday and the weekend**

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 11 WE 18/08/19

Streetscene
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Newport/Casnewydd
South Wales/De Cymru
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Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		18-08-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

Streetscene
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4.3 MC and PI
4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

5.0 Summary of results

5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Rain over the weekend and heavy rain during the week with dry days Tuesday and Thursday prevented clay being placed this week.

3.0 Progress for the week

3.1 Stockpile

The stockpile on grids A1, A2, B1, B2 was installed this week.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1**
  Work completed
- **Layer 2**
  Work completed
- **Layer 3**
  Work completed
- **Layer 4**
  No work undertaken
- **Layer 5**
  No work undertaken
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Rain water was captured on the site at the sump and grid A3. Leachate was captured at grid A1

No sampling and testing by CJ Associates was undertaken this week.

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Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

0 core cutter samples were taken this week
0 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

0 sample was taken this week.
0 Results were received.

4.3 MC and PI,

No samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

No samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

No hand Shear Vane tests were undertaken.

5.0 Results Summary

5.1 Acceptability

No results received this week.

5.2 Compliance

No results received this week.

6.0 Problems Encountered

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- The bund to reinstate the asbestos Cell 3A bund was viewed on site 06/08/19 the client proposed some 20m long to connect to the bund in cell 4B with a bund height 3m for its length dropping down sharply to tie into the 2m high Cell 4B bund, with a base of 11m wide into cell 4A connecting to and benching into the existing material along Cell 3A.
- The client proposed to add nominal additional material to the bund/ clay liner connecting cells 4a and 4b which are not at the same level ramping the cell 4a liner to meet the 4b liner at 1:2 and bench into the existing liner.
- The bund grids A5 to D5 was viewed on site 06/08/19 the client proposed to move the toe of the bund back some 2m where the 1.2m clay layer thickness would be achieved within the bund.
- The bund grids A1 to A5 was viewed on site 06/08/19 the client proposed to maintain a 1.2minimum clay thickness up the existing batter (moving the toe of batter some 2.8m back) with the 2m bund formed above the existing material.
- Litter entering the site from the adjacent cell 4a remains an issue. Litter pickers did not attend the site this week.

Appendix 1 - Progression Plan

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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2				-L3		-L4	
	Sampling	Result	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75						
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19								
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19								
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60						
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19						
D2	DD&MC	P Sh-56										
	T-20/06/19	P-21/06/19										
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19										
	T-24/06/19	P- 25/06/19										
E3	MC&PI/PD&PSD/DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19										
	T-24/06/19	P- 25/06/19										
E4	MC&PI/DD&MC	P Sh-75 P-PI 22/07/19										
	T-25/06/19	P- 27/06/19										

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5					
	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Sampling	Result	Rework and Retest	Rework and Retest	Sampling	Result	Rework and Retest	Rework and Retest	Rework and Retest	Rework and Retest
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5				
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
A2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/DD&MC	P Sh-75 T-PI T-PD&PSD				
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
A3	MC&PI/PD&PSD/DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/DD&MC	P Sh-66 P-PI 30/07/19 T-PD&PSD	MC&PI/ /DD&MC	P Sh-60 T-PI			MC&PI/ /DD&MC	P Sh-65 T-PI				

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Date	T-- 10/06/19	P-11/06/19	T- 27/06/19	P-28/06/19	T-- 02/07/19	P-03/07/19			T-- 11/07/19	P-12/07/19 MC19%	T-- 23/07/19	P-24/07/19			T-- 06/08/19	P-07/08/19				
A4	MC&PI/P D&PSD/ DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 T-PI								
Date	T- 04/06/19	P-05/06/19			T- 01/07/19	P-02/07/19			T-- 10/07/19	P-11/07/19	T-- 23/07/19	P-24/07/19								
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3										
Date	T- 22/07/19	P-24/07/19			T- 25/07/19	P-26/07/19			T-31/07/19	P-02/08/19										
B1	MC&PI/P D&PSD/ DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 T-PI			AsB2L5	AsB2L5				
Date	T- 21/06/19	P-24/06/19			T- 24/06/19	P- 25/06/19			T- 26/06/19	P- 27/06/19	T- 31/06/19	P-02/08/19			T- 02/08/19	P-05/08/19				
B2	MC&PI/P D&PSD/ DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-65 T-PI				
Date	T- 06/06/19	P-07/06/19			T- 20/06/19	P-21/06/19			T- 26/06/19	P-27/06/19	T- 31/07/19	P-02/08/19			T- 02/08/19	P-05/08/19				
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 T-PI T- PD&PSD	MC&PI / DD&MC	P Sh-58 T-PI								
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19			T- 15/07/19	P-16/07/19	T-25/07/19	P-26/07/19								
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 T-PI	MC&PI/P D&PSD/ /DD&MC	P Sh-50 T-PI T- PD&PSD								
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19			T- 16/07/19	P-17/07/19	T- 24/07/19	P-25/07/19								
B5	MC&PI /DD&MC	P Sh-52 T-PI			MC&PI /DD&MC	P Sh-61 T-PI			MC&PI /DD&MC	P Sh-70 T-PI										
Date	T- 22/07/19	P-24/07/19			T- 24/07/19	P-25/07/19			T-31/07/19	P-02/08/19										
C1																				
Date																				
C2	MC&PI/P D&PSD/ DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 P-PI 22/07/19 P- PD&PSD 08/08/19			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/ PD&PSD/ DD&MC	P Sh 54 P-PI 09/08/19 T-PI T-PD&PSD			MC&PI / PD&PSD/ DD&MC	P Sh-50 T-PI T-PSD&PD				
Date	T- 19/06/19	P-21/06/19			T- 05/07/19	P-08/07/19			T- 09/07/19	P-11/07/19	T- 26/07/19	P-29/07/19			T- 29/07/19	P-30/07/19				
C3	MC&PI/P D&PSD/ DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/P D&PSD/ DD&MC	P Sh-55 *P-PI* *22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 T-PI	MC&PI /PD&PSD/ DD&MC	P Sh 54 T-PI T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh 66 T-PI T-PD&PSD				
Date	T- 19/06/19	P-21/06/19	T- 28/06/19	P-01/07/19	T- 03/07/19	P-04/07/19			T- 15/07/19	P-16/07/19	T- 25/07/19	P-26/07/19			T- 05/08/19	P-06/08/19				
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDD D&MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/ DD&MC	P Sh 50 T-PI T-PD&PSD	MC&PI /PD&PSD/ DD&MC	P Sh 56 T-PI			MC&PI/ PDS&PD/ /DD&MC	P Sh-76 T-PI T-PSD&PD				
Date	T- 28/06/19	P-01/07/19			T- 03/07/19	P-04/07/19			T- 16/07/19	P-17/07/19	T- 05/08/19	P-06/08/19			T- 08/08/19	P- 09/08/19				
C5	MC&PI/P D&PSD/ DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD &PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 T-PI	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 T-PI				
Date	T- 01/07/19	P-02/07/19			T- 02/07/19	P-03/07/19			T- 12/07/19	P-16/07/19	T- 17/07/19	P-19/07/19			T-31/07/19	P-02/08/19				
D1																				
Date																				
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/D D&MC	P Sh-60 P-PI 25/07/19 P-PD&PSD 09/08/19			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-70 T-PI				

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Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-29/07/19	P-30/07/19				
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/ DD&MC	P Sh-55 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /PSD&PD/ DD&MC	P Sh-56 T-PI T-PSD&PD	DD&MC	P-sh-75		
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-06/08/19	F-07/08/19	T-07/08/19	T-09/08/19		
D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 P-PD&PSD 08/08/19			MC&PI/ PD&PSD/D D&MC	P Sh-65 P-PI MC26.2%30. 07/19 T-PD&PSD			MC&PI/ PD&PSD/ DD&MC	P Sh-52 T-PI T-PD&PSD	MC&PI/D D&MC	P Sh-80 T-PI			MC&PI / PD&PSD/ DD&MC	P Sh-100 T-PI T-PD&PSD				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-07/08/19	F-09/08/19				
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD &MC	P Sh-79 P-PI MC27.5%30. 07/19			MC&PI/D D&MC	P Sh-64 T-PI	As D4L4	As D4L4			MC&PI /DD&MC	P Sh-83 T-PI				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-08/08/19	P-09/08/19				
E1																				
Date																				
E2	PD&PSD As E3L1	P- PD&PSD 06/08/19 As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P-29/07/19			T-29/07/19	P-30/07/19				
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/P D&PSD/D D&MC	P Sh-52 T-PI T- PD&PSD	MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-67 T-PI				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19			T-05/08/19	P-06/08/19				
E4	MC&PI/D D&MC	P Sh-52 P-PI 22/07/19			MC&PI/PD &PSD/DD &MC	P Sh-78 P-PI MC- 18.8% 25/07/19 P- PD&PSD 09/08/19			MC&PI/ DD&MC	P Sh-58 T-PI	MC&PI/P D&PSD/ DD&MC	P Sh-105 T-PI T-PSD&PD	DD&MC	P Sh-55						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19						
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4	As E4L4						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19						

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	*Result – K_y at 20°C*	*Date Sampled*	*Comments*	*Date Sampling complete*
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass- Test area for laying clay onto geotextile only	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1	$7.2x10^{-11}$ m/s	*04/07/19*	*Pass*	*06/08/19*
A3L4		*23/07/19*		
B4L4		*24/07/19*		
D4L4		*01/08/19*		
D4L5		*08/09/19*		

Bund

Layer	Ref	Date	Pass/Fail

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

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Monday 12 August 2019 from Grid A2 (Stockpile area at Grid A1)

Monday 19 August 2019 from temp haul road near Grid A3 (Stockpile area at Grid A1)

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 12 WE 26/08/19

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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		26-08-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

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4.4 Particle Density and Particle Size Distribution Hand
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5.0 Summary of results

5.1 Acceptability
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6.0 Problems encountered

Appendix

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2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Heavy rain over the weekend. Some rain on Monday and Tuesday otherwise sunny.

3.0 Progress for the week

3.1 Stockpile

The clay material was stockpile on grids A1, A2, B1, B2. Monday and Tuesday, due to rain preventing the trucks from accessing the cell, material was stockpiled on the concrete slab of the cell and dumpers transported the material to the stockpile.
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1**
  Work completed
- **Layer 2**
  Work completed
- **Layer 3**
  Work completed
- **Layer 4**
  B5L4
- **Layer 5**
  A4L5, B3L5, B4L5, B5L5, D3L5, D4L5, E4L5, E5L5
- **Layer +6**
  No work undertaken

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Leachate was captured in grid A3 and A1 outside the cell. A small amount of leachate was omitting from the cell 3A within grid E3.

Sampling and testing by CJ Associates was undertaken Wednesday and Thursday.

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Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

9 core cutter samples were taken this week
9 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

0 sample was taken this week.
0 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

The all results received this week were in accordance with CQA Plan Table 3.1.

5.2 Compliance

The all results received this week were in accordance with CQA Plan Table 3.2. D3L5 and D4L5 retest were in accordance with the requirements for the CQA Plan.

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6.0 Problems Encountered

- The bund to reinstate the asbestos Cell 3A bund was viewed on site 06/08/19 the client and PBA email 15/08/19 identifying additional action required. Currently the bund is proposed some 28m long to connect to the bund in cell 4B with a bund height 3m for its length dropping down sharply to tie into the 2m high Cell 4B bund, with a base of 11m wide into cell 4A connecting to and benching into the existing material along Cell 3A.
- The client proposed to add nominal additional material to the bund/ clay liner connecting cells 4a and 4b which are not at the same level ramping the cell 4a liner to meet the 4b liner at 1:2 and bench into the existing liner.
- The bund grids A5 to D5 was viewed on site 06/08/19 the client proposed to move the toe of the bund back some 2m where the 1.2m clay layer thickness would be achieved within the bund.
- The bund grids A1 to A5 was viewed on site 06/08/19 the client proposed to maintain a 1.2minimum clay thickness up the existing batter (moving the toe of batter some 2.8m back) with the 2m bund formed above the existing material.
- Litter entering the site from the adjacent cell 4a remains an issue. Litter pickers attended the site Thursday 22/08/19 week.

Appendix 1 - Progression Plan

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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L3	
	Sampling	Result	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19		
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19		
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
D2	DD&MC	P Sh-56				
	T-20/06/19	P-21/06/19				
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19				
	T-24/06/19	P- 25/06/19				
E3	MC&PI/PD&PSD/DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19				
	T-24/06/19	P- 25/06/19				
E4	MC&PI/DD&MC	P Sh-75 P-PI 22/07/19				
	T-25/06/19	P- 27/06/19				

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5					
	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Rework and Retest
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5				
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
A2	MC&PI/PD&PSD/DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/DD&MC	P Sh-75 T-PI T-PD&PSD				
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19				
A3	MC&PI/PD&PSD/DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/DD&MC	P Sh-66 P-PI 30/07/19 P-PD&PSD 22/08/19	MC&PI/ /DD&MC	P Sh-60 T-PI			MC&PI/ /DD&MC	P Sh-65 T-PI				

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Date	T-- 10/06/19	P-11/06/19	T- 27/06/19	P-28/06/19	T-- 02/07/19	P-03/07/19			T-- 11/07/19	P-12/07/19 MC19%	T-- 23/07/19	P-24/07/19			T-- 06/08/19	P-07/08/19				
A4	MC&PI/P D&PSD/ DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 T-PI			MC&PI/ /DD&MC	P Sh-50 T-PI				
Date	T- 04/06/19	P-05/06/19			T- 01/07/19	P-02/07/19			T-- 10/07/19	P-11/07/19	T-- 23/07/19	P-24/07/19			T-- 20/08/19	P-22/08/19				
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3										
Date	T- 22/07/19	P-24/07/19			T- 25/07/19	P-26/07/19			T-31/07/19	P-02/08/19										
B1	MC&PI/P D&PSD/ DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 T-PI			AsB2L5	AsB2L5				
Date	T- 21/06/19	P-24/06/19			T- 24/06/19	P- 25/06/19			T- 26/06/19	P- 27/06/19	T- 31/06/19	P-02/08/19			T- 02/08/19	P-05/08/19				
B2	MC&PI/P D&PSD/ DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-65 T-PI				
Date	T- 06/06/19	P-07/06/19			T- 20/06/19	P-21/06/19			T- 26/06/19	P-27/06/19	T- 31/07/19	P-02/08/19			T- 02/08/19	P-05/08/19				
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 P-PI 22/08/19 P-PD&PSD 22/08/19	MC&PI / DD&MC	P Sh-58 T-PI			MC&PI /PD&PSD/ DD&MC	P Sh-54 T-PI T- PD&PSD				
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19			T- 15/07/19	P-16/07/19	T-25/07/19	P-26/07/19			T- 21/08/19	P-22/08/19				
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 T-PI	MC&PI/P D&PSD/ /DD&MC	P Sh-50 T-PI T- PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh-82 T-PI T- PD&PSD				
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19			T- 16/07/19	P-17/07/19	T- 24/07/19	P-25/07/19			T- 21/08/19	P-22/08/19				
B5	MC&PI /DD&MC	P Sh-52 T-PI			MC&PI /DD&MC	P Sh-61 T-PI			MC&PI /DD&MC	P Sh-70 T-PI	MC&PI /DD&MC	P Sh-74 T-PI			MC&PI /DD&MC	P Sh-80 T-PI				
Date	T- 22/07/19	P-24/07/19			T- 24/07/19	P-25/07/19			T-31/07/19	P-02/08/19	T-20/08/19	P-22/08/19			T-21/08/19	P-22/08/19				
C1																				
Date																				
C2	MC&PI/P D&PSD/ DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD &PSD/ DD&MC	P Sh-50 P-PI 22/07/19 P- PD&PSD 08/08/19			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/ PD&PSD/ DD&MC	P Sh 54 P-PI 09/08/19 T-PI T-PD&PSD			MC&PI / PD&PSD/ DD&MC	P Sh-50 T-PI T-PSD&PD				
Date	T- 19/06/19	P-21/06/19			T- 05/07/19	P-08/07/19			T- 09/07/19	P-11/07/19	T- 26/07/19	P-29/07/19			T- 29/07/19	P-30/07/19				
C3	MC&PI/P D&PSD/ DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/P D&PSD/ DD&MC	P Sh-55 *P-PI* *22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 P-PI 22/08/19	MC&PI /PD&PSD/ DD&MC	P Sh 54 T-PI T-PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh 66 T-PI T-PD&PSD				
Date	T- 19/06/19	P-21/06/19	T- 28/06/19	P-01/07/19	T- 03/07/19	P-04/07/19			T- 15/07/19	P-16/07/19	T- 25/07/19	P-26/07/19			T- 05/08/19	P-06/08/19				
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDD D&MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/ DD&MC	P Sh 50 T-PI T-PD&PSD	MC&PI /PD&PSD/ DD&MC	P Sh 56 T-PI			MC&PI/ PDS&PD/ /DD&MC	P Sh-76 T-PI T-PSD&PD				
Date	T- 28/06/19	P-01/07/19			T- 03/07/19	P-04/07/19			T- 16/07/19	P-17/07/19	T- 05/08/19	P-06/08/19			T- 08/08/19	P- 09/08/19				
C5	MC&PI/P D&PSD/ DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD &PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 P-PI 22/08/19	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 T-PI				
Date	T- 01/07/19	P-02/07/19			T- 02/07/19	P-03/07/19			T- 12/07/19	P-16/07/19	T- 17/07/19	P-19/07/19			T-31/07/19	P-02/08/19				
D1																				
Date																				
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/D D&MC	P Sh-60 P-PI 25/07/19 P-PD&PSD 09/08/19			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-70 T-PI				

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D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/ DD&MC	P Sh-55 P-PI 22/08/19 P-PD&PSD 22/08/19	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /PSD&PD/ DD&MC	P Sh-56 T-PI T-PSD&PD	DD&MC	P-sh-75	MC&PI /DD&MC	P Sh-78 T-PI
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-06/08/19	F-07/08/19	T-07/08/19	T-09/08/19	T-22/08/19	P-23/08/19
D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 P-PD&PSD 08/08/19			MC&PI/ PD&PSD/D D&MC	P Sh-65 P-PI MC26.2%30/ 07/19 P-PD&PSD 22/08/19			MC&PI/ PD&PSD/ DD&MC	P Sh-52 T-PI T-PD&PSD	MC&PI/D D&MC	P Sh-80 T-PI			MC&PI / PD&PSD/ DD&MC	P Sh-100 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-105 T-PI		
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-07/08/19	F-09/08/19	T-22/08/19	P-23/08/19		
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD &MC	P Sh-79 P-PI MC27.5%30/ 07/19			MC&PI/D D&MC	P Sh-64 T-PI	As D4L4	As D4L4			MC&PI /DD&MC	P Sh-83 T-PI				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-08/08/19	P-09/08/19				
E1																				
Date																				
E2	PD&PSD As E3L1	P- PD&PSD 06/08/19 As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P-29/07/19			T-29/07/19	P-30/07/19				
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/P D&PSD/D D&MC	P Sh-52 T-PI T- PD&PSD	MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-67 T-PI				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19			T-05/08/19	P-06/08/19				
E4	MC&PI/D D&MC	P Sh-52 P-PI 22/07/19			MC&PI/PD &PSD/DD &MC	P Sh-78 P-PI MC-18.8% 25/07/19 P- PD&PSD 09/08/19			MC&PI/ DD&MC	P Sh-58 T-PI	MC&PI/P D&PSD/ DD&MC	P Sh-105 T-PI T-PSD&PD	DD&MC	P Sh-55	MC&PI/ PSD&PD/ DD&MC	P Sh-74 T-PI T-PSD&PD				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	P-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P-23/08/19				
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4	As E4L4	MC&PI/ DD&MC	P Sh-74 T-PI				
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	P-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P-23/08/19				

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Permeability

Grid Ref	*Result – K_y at 20°C*	*Date Sampled*	*Comments*	*Date Sampling complete*
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass – Mis-labled B4L-1	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass- Test area for laying clay onto geotextile only	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1	$7.2x10^{-11}$ m/s	*04/07/19*	*Pass*	*06/08/19*
A3L4		*23/07/19*		
B4L4		*24/07/19*		
D4L4		*01/08/19*		
D4L5		*08/09/19*		

Bund

Layer	Ref	Date	Pass/Fail

Streetscene
Y-Strydynun

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South Wales/De Cymru
NP20 4UR

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Casnewydd

Appendix 2 - Test Results - Permeability Tests

Streetscene
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South Wales/De Cymru
NP20 4UR

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4007**		

Site Reference:	**Core 1 - Core 5**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**21/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B5-L4-C1	Core 2 A4-L5-C1	Core 3 B3-L5-C1	Core 4 B4-L5-C1	Core 5 B5-L5-C1
Bulk Density	2.02	2.00	2.06	2.02	2.00
Moisture Content	23	24	21	21	24
Dry Density	1.65	1.62	1.70	1.67	1.61

Relative Compaction	N/A	N/A	N/A	N/A	N/A
Air Voids % Using PD 2.67Mg/m³	1.2	1.4	0.0	1.9	1.1

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4016**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**22/08/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L5-C1 Retest	Core 2 E5-L5-C1	Core 3 D4-L5-C1 Retest	Core 4 E4-L5-C1	
Bulk Density	2.01	2.01	2.04	2.02	
Moisture Content	23	23	21	21	
Dry Density	1.64	1.64	1.69	1.67	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.67Mg/m³	1.7	1.3	1.7	2.2	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 23/08/2019	Fig

Streetscene
Y-Strydynun

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South Wales/De Cymru
NP20 4UR

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Appendix 4 – Field Logs

Available on request

Streetscene
Y-Strydynun

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Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4008	B5-L4 21.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	100	88	74	87	HSV 1
4009	A4-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	64	60	50	58	HSV 2
4010	B3-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	85	60	54	66	HSV 3
4011	B4-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	105	82	100	96	HSV 4
4012	B5-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	80	85	100	88	HSV 5

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	22/08/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4017	D3-L5 Retest 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	78	92	90	87	HSV 1
4018	E5-L5 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	98	74	98	90	HSV 2
4019	D4-L5 Retest 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	105	130	105	113	HSV 3
4020	E4-L5 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	74	80	79	78	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	23/08/2019	**HV1**

Streetscene
Y-Strydynun

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Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport
CITY COUNCIL
CYNGOR DINAS
Casnewydd

Appendix 6 – PI, PL, MC, LL Results

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13859

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	11	Jul-19
Date of receipt of testing instructions	11	Jul-19
Date testing started:	17	Jul-19
Date of issue:	21	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

1429

Approved by :

Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
A3 L3	GT4	0.00		B	Dark grey slightly sandy CLAY			24.8	100	48	20	28		
A4 L3	GT6	0.00		B	Dark grey slightly sandy CLAY			24.1	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 29/07/2019

Approved By: Lisa Maiden

Table 1

sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		A3 L3	B	Dark grey clayey SILT with rare pyritic fossil fragments.	2.65	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29614

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

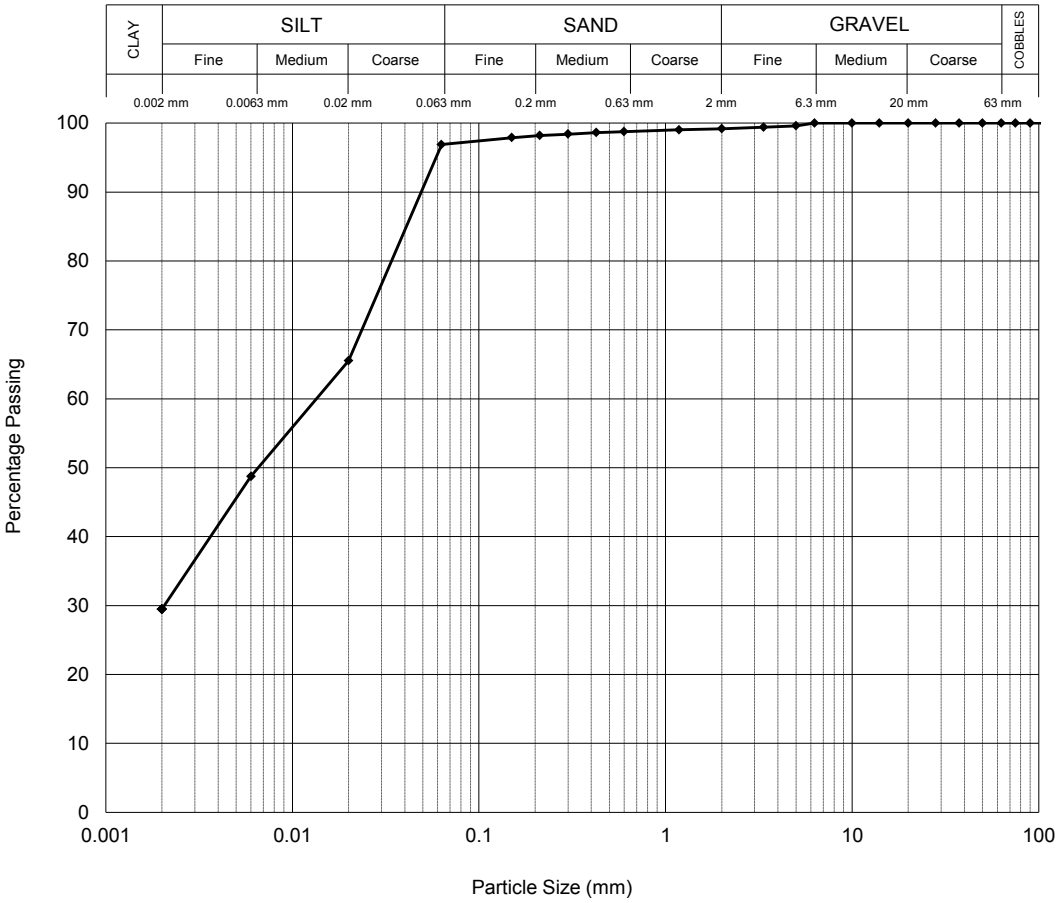
BH / TP No.	GT5
Sample Ref	A3 L3
Sample Type	B

Description

Dark grey clayey SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	66
6 µm	49
2 µm	29
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	67
Clay	30

Checked and Approved by

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29614

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13863

Number of samples submitted for testing:	3	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	12	Jul-19
Date of receipt of testing instructions	12	Jul-19
Date testing started:	19	Jul-19
Date of issue:	21	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
D4 L2	GT6	0.00		B	Dark grey slightly sandy CLAY			26.2	100	48	19	29		
D5 L2	GT7	0.00		B	Dark grey slightly sandy CLAY			27.5	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test: Linear measurement unless : wd - water displacement; wi - immersion in water

Liquid Limit: 4pt cone unless : cas - Casagrande method; 1pt - single point test

Particle density: sp - small pyknometer; gj - gas jar

Date Printed: 29/07/2019

Approved By: Lisa Maiden

Table 1

sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		D4 L2	B	Dark grey CLAY and SILT with rare fossil fragments.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29615

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

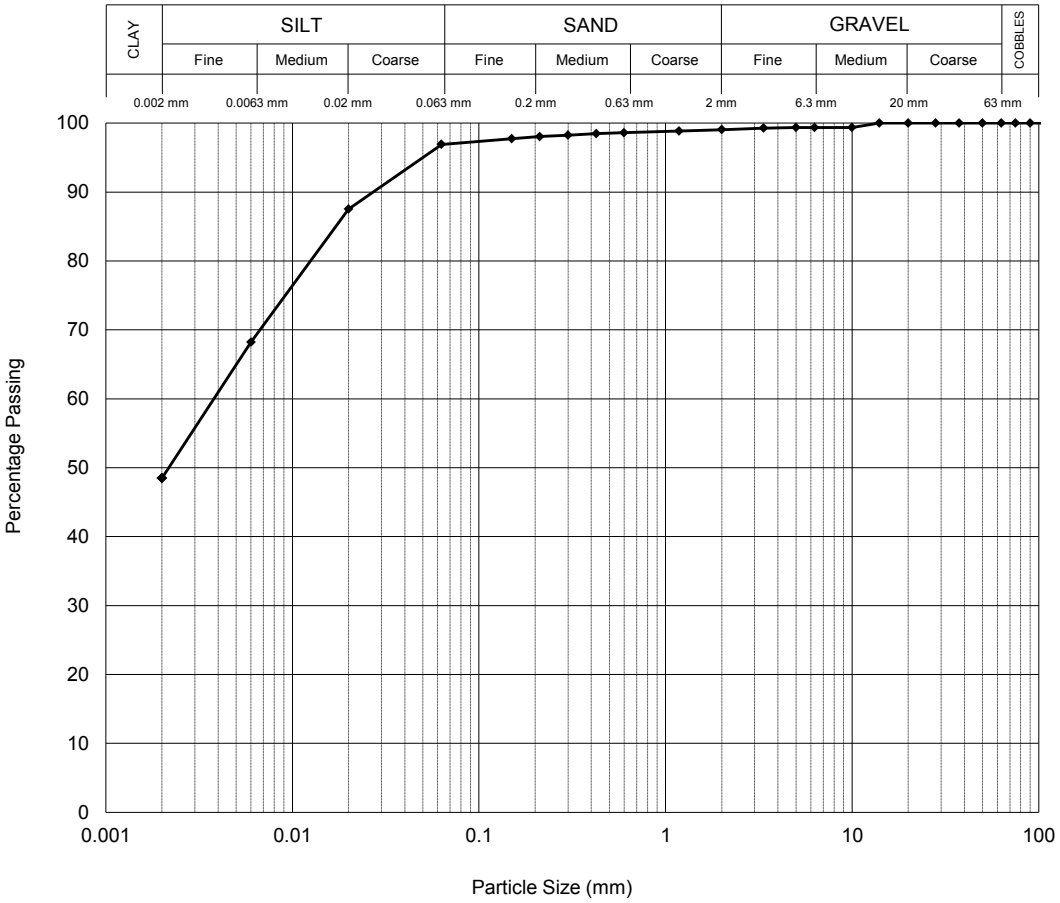
BH / TP No.	GT5
Sample Ref	D4 L2
Sample Type	B

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	88
6 µm	68
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	48
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29615

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13865

Number of samples submitted for testing:	6	sample (s)
Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Date (s) sampled and received at laboratory:	15	Jul-19
Date of receipt of testing instructions	15	Jul-19
Date testing started:	20	Jul-19
Date of issue:	21	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B3 L3	GT5	0.00		B	Dark grey slightly sandy CLAY			23.5	100	48	20	28		
C3 L3	GT4	0.00		B	Dark grey slightly sandy CLAY			25.1	100	49	20	29		
C5 L3	GT1	0.00		B	Dark grey slightly sandy CLAY			24.7	100	49	19	30		
D3 L3	GT2	0.00		B	Dark grey slightly sandy CLAY			25.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test | Liquid Limit | Particle density
Linear measurement unless : | 4pt cone unless : | sp - small pyknometer
wd - water displacement | cas - Casagrande method | gj - gas jar
wi - immersion in water | 1pt - single point test

Date Printed	Approved By	Table
08/01/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		D3 L3	B	Dark grey CLAY and SILT with rare shell fragments.	2.67	2
GT6		B3 L3	B	Dark grey CLAY and SILT.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/08/2019

Project Number:

GEO / 29650

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

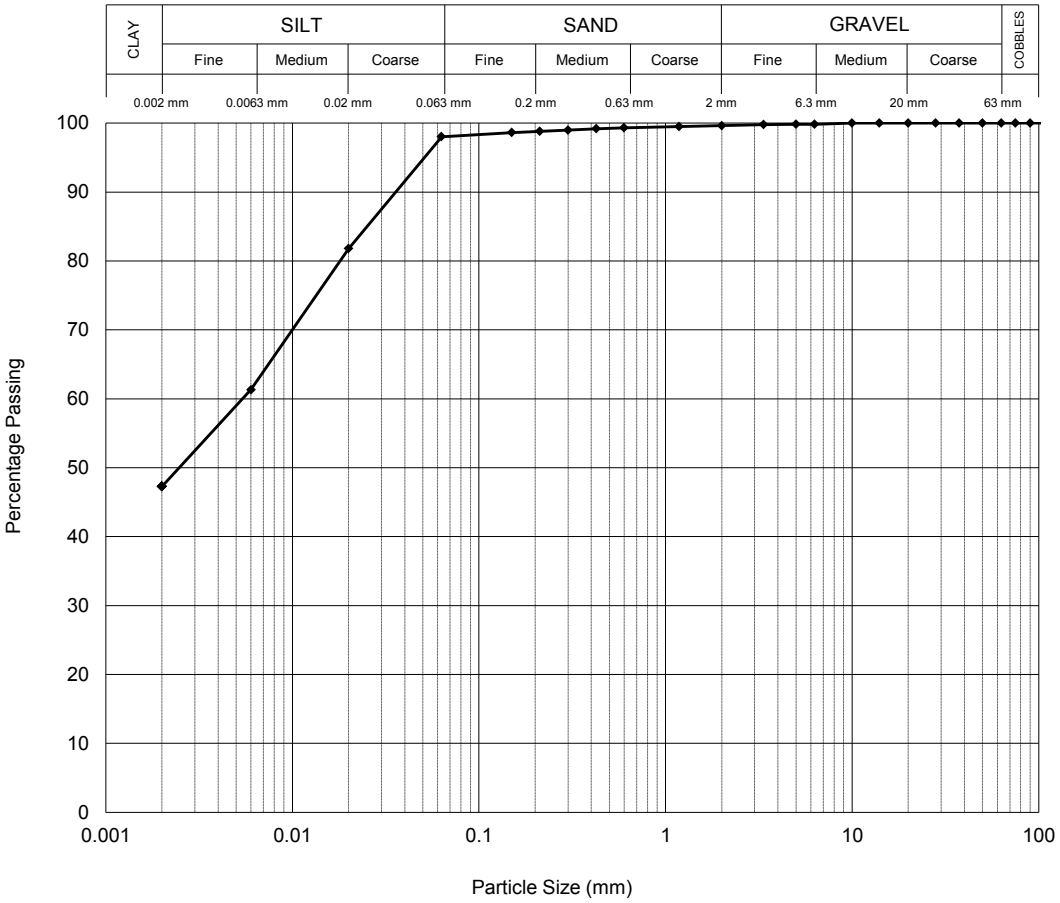
BH / TP No.	GT3
Sample Ref	D3 L3
Sample Type	B

Description

Dark grey CLAY and SILT with rare shell fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.4
Size	% Pass
20 µm	82
6 µm	61
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
16/08/2019

Project Number:

GEO / 29650

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

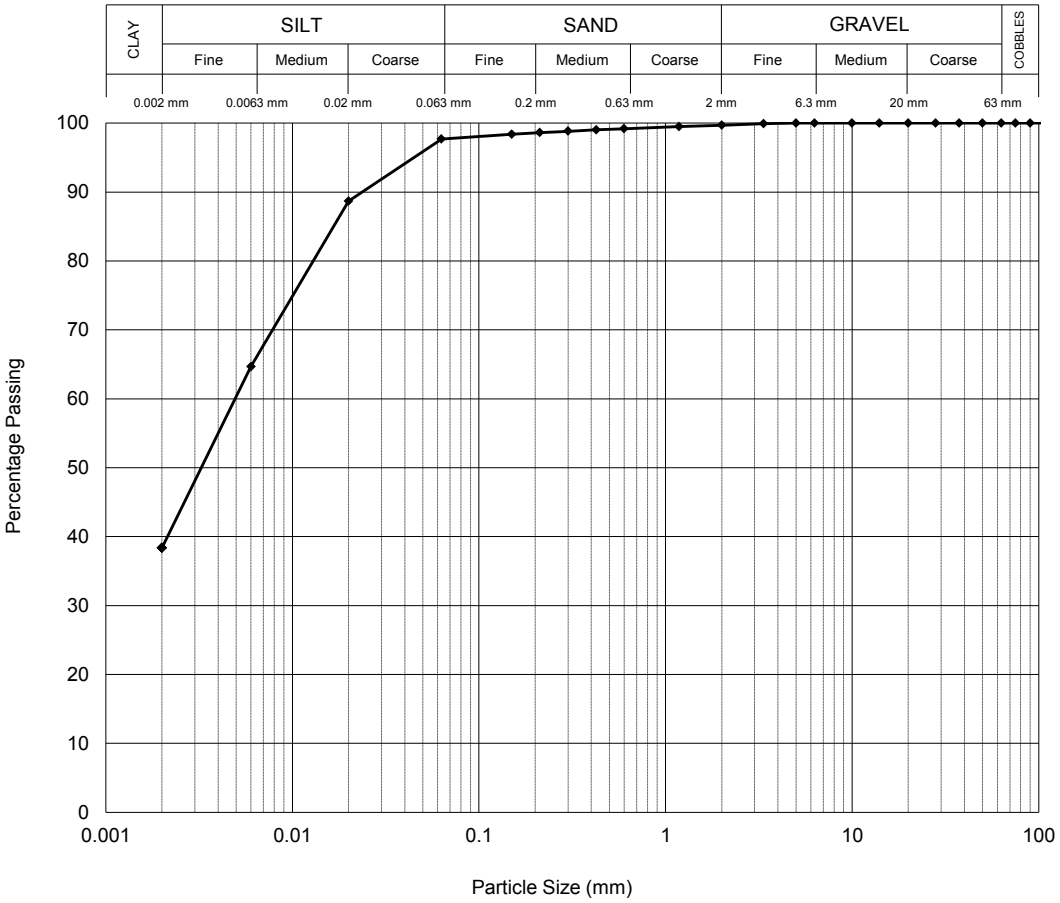
BH / TP No.	GT6
Sample Ref	B3 L3
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	65
2 µm	38

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	59
Clay	39

Checked and Approved by

S Burke

S Burke - Senior Technician
16/08/2019

Project Number:

GEO / 29650

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Streetscene
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Appendix 7 – Photographs

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Monday 20 August 2019 from Grid A2 (Stockpile area at Grid A1)

Monday 27 August 2019 from A2 from Grid A3 (Stockpile area at Grid A1)

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Monday 19 August 2019 Stockpiled material outside the Cell moved to cell	**Wednesday 21 August 2019 Grid B4L5 excessively wet material removed and replaced.**
Monday 19 August 2019 Grid A4 batter vegetation removed,	**Monday 19 August 2019 Grid A4 wet material removed for bund base and batter formed**

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Thursday 22 August 2019 Grid D4 & D3 non-compliant material removed and new material installed	

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 13 WE 01/09/19

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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		01-09-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

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4.4 Particle Density and Particle Size Distribution Hand
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2. Test Results
3. Permeability Tests
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6. Hand Shear Vane Logs
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8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Sunny and dry over the weekend and bank holiday Monday. Tuesday dry and sunny. Wednesday am occasional showers followed by rain from 1400. Dry Thursday and Friday.

3.0 Progress for the week

3.1 Stockpile

The clay material was stockpile on grids A1, A2, B1, B2. On Wednesday and Thursday, due to rain preventing the trucks from accessing the cell, material was stockpiled on the concrete slab of the cell and dumpers transported the material to the stockpile.
28,640 tonnes of material was delivered to the site up to 28 August 2019
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1 to 5**
  Work completed
- **Layer +6**
  C3L6 and C4L6

Work commenced on bunds on Tuesday 27 August 2019

- **Bund E3-E2**
  Level 1 & 2
  Level 3 & 4
  Level 5 & 6
- **Bund A5 to E5**
  Level 1
  Level 2
  Level 3
- **Bund A1 to A5**
  Level 1
- **Bund A1 to E2**
  The level of the cells 4a and 4b were joined by grading the material and rolling.

Due to removal of excessive wet clay material from girds C3&C4 additional material laid.

All sampling and testing was carried out in accordance with CQA plan.

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The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Leachate was captured in grid A3 and A1 outside the cell.

Sampling and testing by CJ Associates was undertaken Wednesday, Thursday and Friday.

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

8 core cutter samples were taken this week
8 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

1 sample was taken this week.
0 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

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Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 50 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

The all results received this week were in accordance with CQA Plan Table 3.1.

5.2 Compliance

The all results received this week were in accordance with CQA Plan Table 3.2.

6.0 Problems Encountered

- The client and JD agreed the bund to reinstate the asbestos Cell 3A on site 28/08/19 some 28m long to a height of 3m extending 9m into cell 4A to provide a minimum of 3m of clay installed and utilising the existing cell 3A material which is not to be moved. The bund is to tie into the existing Cell 3A bund over some 9m and the cell 4B bund by benching at 300mm steps.
- The client proposed to add nominal additional material to the bund/ clay liner connecting cells 4a and 4b which are not at the same level ramping the cell 4a liner to meet the 4b liner at 1:2 and bench into the existing liner.
- The client and JD agreed bund grids A5 to D5 on site 28/08/19. The location of the toe of is where the 1.2m clay layer thickness would be achieved within the bund. The area behind the bund is to be filled with clay to tie into the existing batter.
- The client and JD agreed the bund grids A1 to A5 on site 28/08/19 to maintain a 1.2minimum clay thickness up the existing batter with the 2m bund formed above the existing material.
- Litter entering the site from the adjacent cell 4a remains an issue. Litter pickers attended the site Tuesday and Wednesday this week.

Appendix 1 - Progression Plan

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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2	
	Sampling	Result	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19		
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19		
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
D2	DD&MC	P Sh-56				
	T-20/06/19	P-21/06/19				
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19				
	T-24/06/19	P- 25/06/19				
E3	MC&PI/PD&PSD/ DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19				
	T-24/06/19	P- 25/06/19				
E4	MC&PI/ DD&MC	P Sh-75 P-PI 22/07/19				
	T-25/06/19	P- 27/06/19				

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5						L6	
	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Rework and Retest		
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5						
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
A2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/ DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/ DD&MC	P Sh-75 T-PI T-PD&PSD						
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
A3	MC&PI/PD&PSD/ DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/ DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ PD&PSD/DD&MC	P Sh-66 P-PI 30/07/19 P-PD&PSD 22/08/19	MC&PI/ /DD&MC	P Sh-60 T-PI			MC&PI/ /DD&MC	P Sh-65 T-PI						

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Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%	T--23/07/19	P-24/07/19			T--06/08/19	P-07/08/19						
A4	MC&PI/PD&PSD/ DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 T-PI			MC&PI/ /DD&MC	P Sh-50 T-PI						
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19	T--23/07/19	P-24/07/19			T--20/08/19	P-22/08/19						
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3	As A4L4	As A4L4			As A4L4	As A4L4						
Date	T-22/07/19	P-24/07/19			T-25/07/19	P-26/07/19			T-31/07/19	P-02/08/19	T--23/07/19	P-24/07/19			T--20/08/19	P-22/08/19						
B1	MC&PI/PD&PSD/ DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 T-PI			AsB2L5	AsB2L5						
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19	T-31/06/19	P-02/08/19			T-02/08/19	P-05/08/19						
B2	MC&PI/PD&PSD/ DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 T-PI T- PD&PSD			MC&PI/ DD&MC	P Sh-65 T-PI						
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/DD &MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 P-PI 22/08/19 P-PD&PSD 22/08/19	MC&PI / DD&MC	P Sh-58 T-PI			MC&PI /PD&PSD/ DD&MC	P Sh-54 T-PI T- PD&PSD						
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19			T-21/08/19	P-22/08/19						
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 T-PI	MC&PI/PD&PSD/ /DD&MC	P Sh-50 T-PI T- PD&PSD			MC&PI /PD&PSD/ DD&MC	P Sh-82 T-PI T- PD&PSD						
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19			T- 16/07/19	P-17/07/19	T- 24/07/19	P-25/07/19			T-21/08/19	P-22/08/19						
B5	MC&PI /DD&MC	P Sh-52 T-PI			MC&PI /DD&MC	P Sh-61 T-PI			MC&PI /DD&MC	P Sh-70 T-PI	MC&PI /DD&MC	P Sh-74 T-PI			MC&PI /DD&MC	P Sh-80 T-PI						
Date	T- 22/07/19	P-24/07/19			T- 24/07/19	P-25/07/19			T-31/07/19	P-02/08/19	T-20/08/19	P-22/08/19			T-21/08/19	P-22/08/19						
C1																						
Date																						
C2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 22/07/19 P- PD&PSD 08/08/19			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/PD&PSD/DD&MC	P Sh 54 P-PI 09/08/19 T-PI T-PD&PSD			MC&PI / PD&PSD/ DD&MC	P Sh-50 T-PI T-PSD&PD						
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19	T- 26/07/19	P-29/07/19			T-29/07/19	P-30/07/19						
C3	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/PD&PSD/ DD&MC	P Sh-55 *P-PI 22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 P-PI 22/08/19	MC&PI /PD&PSD/DD&MC	P Sh 54 T-PI T-PD&PSD			MC&PI /PD&PSD/DD&MC	P Sh 66 T-PI T-PD&PSD					MC&PI/ PDS&PD/ /DD&MC	P Sh-80 T-PI T-PSD&PD
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19	T- 25/07/19	P-26/07/19			T- 05/08/19	P-06/08/19					T-27/08/19	P- 29/08/19
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDDD &MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/DD &MC	P Sh 50 T-PI T-PD&PSD	MC&PI /PD&PSD/DD &MC	P Sh 56 T-PI			MC&PI/ PDS&PD/ /DD&MC	P Sh-76 T-PI T-PSD&PD					As C3L6	As C3L6
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T- 16/07/19	P-17/07/19	T- 05/08/19	P-06/08/19			T-08/08/19	P- 09/08/19					T-27/08/19	P- 29/08/19
C5	MC&PI/PD&PSD/ DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 P-PI 22/08/19	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 T-PI						
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T- 17/07/19	P-19/07/19			T-31/07/19	P-02/08/19						
D1																						
Date																						
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/DD &MC	P Sh-60 P-PI 25/07/19 P-PD&PSD 09/08/19			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /DD&MC	P Sh-70 T-PI						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-29/07/19	P-30/07/19						
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/DD &MC	P Sh-55 P-PI 22/08/19 P-PD&PSD 22/08/19	MC&PI /DD&MC	P Sh-62 T-PI			MC&PI /PSD&PD/DD&MC	P Sh-56 T-PI T-PSD&PD	DD&MC	P-sh-75	MC&PI /DD&MC	P Sh-78 T-PI		

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D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 P-PD&PSD 08/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-65 P-PI MC26.2%30/07 /19 P-PD&PSD 22/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-52 T-PI T-PD&PSD	MC&PI/DD& MC	P Sh-80 T-PI			MC&PI / PD&PSD/DD& MC	P Sh-100 T-PI T-PD&PSD	MC&PI /DD&MC	P Sh-105 T-PI				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			F-07/08/19	F-09/08/19	T-22/08/19	P-23/08/19				
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD& MC	P Sh-79 P-PI MC27.5%30/07 /19			MC&PI/DD& MC	P Sh-64 T-PI	As D4L4	As D4L4			MC&PI /DD&MC	P Sh-83 T-PI						
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-08/08/19	P- 09/08/19						
E1																						
Date																						
E2	PD&PSD As E3L1	P- PD&PSD 06/08/19 As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P- 29/07/19			T-29/07/19	P-30/07/19						
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/PD&P SD/DD&MC	P Sh-52 T-PI T- PD&PSD	MC&PI/ DD&MC	P Sh-85 T-PI			MC&PI/ DD&MC	P Sh-67 T-PI						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19			T-05/08/19	P- 06/08/19						
E4	MC&PI/DD& MC	P Sh-52 P-PI 22/07/19			MC&PI/PD& PSD/DD&MC	P Sh-78 P-PI MC-18.8% 25/07/19 P- PD&PSD 09/08/19			MC&PI/ DD&MC	P Sh-58 T-PI	MC&PI/PD&P SD/ DD&MC	P Sh-105 T-PI T-PSD&PD	DD&MC	P Sh-55	MC&PI/ PSD&PD/ DD&MC	P Sh-74 T-PI T-PSD&PD						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P- 23/08/19						
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4	As E4L4	MC&PI/ DD&MC	P Sh-74 T-PI						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P-23/08/19						

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability	triaxial cell – 1/2000m3	(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	*Result – K_y at 20°C*	*Date Sampled*	*Comments*	*Date Sampling complete*
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1	$7.2x10^{-11}$ m/s	*04/07/19*	*Pass*	*06/08/19*
A3L4		*23/07/19*		
B4L4		*24/07/19*		
D4L4		*01/08/19*		
D4L5		*08/09/19*		
A3B1		*29/08/19*		

Bund

Layer	Ref	Date	Pass/Fail
E3B2	MC&PI/ DD&MC	27/08/19	P-Sh 54 P- DD&MC 29/08/19 T- MC&PI
E3B4	DD&MC	29/08/19	P-Sh 60 P- DD&MC 30/08/19
E3B6	MC&PI/PD&PSD/ DD&MC	30/08/19	P-Sh 50 P- DD&MC 02/09/19 T- MC&PI T- PD&PSD
D5B1	MC&PI/PD&PSD/ DD&MC	28/08/19	P-Sh 74 P- DD&MC 28/08/19 T- MC&PI T- PD&PSD
D5B2	MC&PI/PD&PSD/ DD&MC	29/08/19	P-Sh 80 P- DD&MC 30/08/19 T- MC&PI T- PD&PSD
D5B3	MC&PI/ DD&MC	30/08/19	P-Sh 95 P- DD&MC 02/09/19 T- MC&PI
A3B1	MC&PI/ DD&MC	29/08/19	P-Sh 80 P- DD&MC 30/08/19 T- MC&PI

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4149**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**28/08/2019**	Material Source:	**Unknown**
Tested By:	**R Anstee**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast with showers**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C3-L6-C1	Core 2 D5-B1-C1	Core 3 E3-B2-C1		
Bulk Density	2.02	2.03	2.03		
Moisture Content	22	21	23		
Dry Density	1.65	1.67	1.65		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	1.4	1.4	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 29/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4153**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**29/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-B4-C1	Core 2 A3-B1-C1	Core 3 D5-B2-C1		
Bulk Density	2.00	2.04	1.99		
Moisture Content	23	22	25		
Dry Density	1.62	1.67	1.59		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	1.3	0.4	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 30/08/2019
			R Anstee, Materials and Field Testing Director	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4163**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**30/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-B6-C1	Core 2 D5-B3-C1			
Bulk Density	2.02	2.01			
Moisture Content	23	23			
Dry Density	1.64	1.63			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	0.8	1.0			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 31/08/2019	Fig

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4150	C3-L6 28.08.19	Layer 6	Grey slightly sandy slightly gravelly CLAY	80	90	108	93	HSV 1
4151	D5-B1 28.08.19	Layer B1	Grey slightly sandy slightly gravelly CLAY	102	108	74	95	HSV 2
4152	E3-B2 28.08.19	Layer B2	Grey slightly sandy slightly gravelly CLAY	98	69	54	74	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee	29/08/2019	HV1
		R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4154	E3-B4 29.08.19	Layer B4	Grey slightly sandy slightly gravelly CLAY	70	75	60	68	HSV 1
4155	A3-B1 29.08.19	Layer B1	Grey slightly sandy slightly gravelly CLAY	150	80	108	113	HSV 2
4156	D5-B2 29.08.19	Layer B2	Grey slightly sandy slightly gravelly CLAY	80	90	100	90	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	30/08/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4164	E3-B6 30.08.19	Layer B6	Grey slightly sandy slightly gravelly CLAY	80	120	50	83	HSV 1
4165	D5-B3 30.08.19	Layer B3	Grey slightly sandy slightly gravelly CLAY	105	95	115	105	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	31/08/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

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Appendix 6 – PI, PL, MC, LL Results

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Appendix 7 – Photographs

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Tuesday 27 August 2019 from Grid A2 (Stockpile area at Grid A1)

Friday 30 August 2019 from Grid E3 benching into existing bund in layer 5

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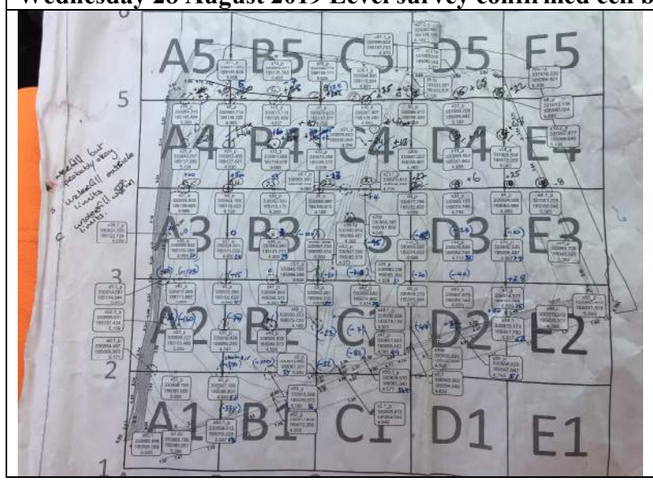
Tuesday 27 August 2019 Grid C4L6 make-up layer where wet material removed	Tuesday 27 August 2019 Grid E3 refuse material collected by litter picker removed from grid for construction of Bund
Wednesday 28 August 2019 Level survey confirmed cell base levels acceptable	**Thursday 29 August 2019 Grid A3 wet material removed and replaced**
	

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Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 14 WE 08/09/19

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Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		09-09-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

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5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs

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1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Sunny over the weekend and most of the week with showers Monday and Friday.

3.0 Progress for the week

3.1 Stockpile

The clay material was stockpile on grids A1 and A2. There was some delay in delivery of the clay this week with progress stalled for periods of approximately one hour.
31,200 tonnes of material was delivered to the site up to 06 September 2019
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1 to +6**
  Work completed

Work commenced on bunds on Tuesday 27 August 2019

- **Bund E3-E2**
  Level 7 & 8
  Level 9 & 10
  Level 11 & 12 (work complete)
- **Bund A5 to E5**
  Level 4
  Level 5
- **Bund A1 to A5**
  Level 2
  Level 3
  Level 4
  Level 5
- **Bund A1 to E2**
  Work completed

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot

attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Leachate was captured in grid A3 and A1 outside the cell.

Sampling and testing by CJ Associates was undertaken Tuesday, Wednesday, Thursday and Friday.

Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

9 core cutter samples were taken this week
9 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

0 sample was taken this week.
1 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 58 KN/ m^2 recorded.

5.0 Results Summary

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5.1 Acceptability
Some results received this week were not in accordance with the CQA Plan Table 3.1 with moisture content above and below the acceptable limits.
B4L3 MC 26.8% -13875
E2L5 MC 26.4% - 13904
C3L5 MC 16.5% - 13921
A3L5 MC 19.5% - 13923
D4L4 MC 20.7% - 13932
D5L3 MC 26.4% - 13885
B4L4 MC 18.4% - 13895

5.2 Compliance
The all results received this week were in accordance with CQA Plan Table 3.2.

6.0 Problems Encountered
- None

Appendix 1 - Progression Plan

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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2	
	Sampling	Result	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19		
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19		
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
D2	DD&MC	P Sh-56				
	T-20/06/19	P-21/06/19				
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19				
	T-24/06/19	P- 25/06/19				
E3	MC&PI/PD&PSD/ DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19				
	T-24/06/19	P- 25/06/19				
E4	MC&PI/ DD&MC	P Sh-75 P-PI 22/07/19				
	T-25/06/19	P- 27/06/19				

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5						L6	
	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Rework and Retest		
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5						
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
A2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/ DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/ DD&MC	P Sh-75 P-PI 05/09/19 P-PD&PSD 09/09/19						
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
A3	MC&PI/PD&PSD/ DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/ DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-66 P-PI 30/07/19 P-PD&PSD 22/08/19	MC&PI/ /DD&MC	P Sh-60 P-PI 05/09/19			MC&PI /DD&MC	P Sh-65 P-19.4% -PI 05/09/19						

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Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%	T--23/07/19	P-24/07/19			T--06/08/19	P-07/08/19						
A4	MC&PI/PD&PSD/ DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 P-PI 05/09/19			MC&PI/ /DD&MC	P Sh-50 P-PI 05/09/19						
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19	T--23/07/19	P-24/07/19			T--20/08/19	P-22/08/19						
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3	As A4L4	As A4L4			As A4L4	As A4L4						
Date	T-22/07/19	P-24/07/19			T-25/07/19	P-26/07/19			T-31/07/19	P-02/08/19	T--23/07/19	P-24/07/19			T--20/08/19	P-22/08/19						
B1	MC&PI/PD&PSD/ DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 P-PI 05/09/19			AsB2L5	AsB2L5						
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19	T-31/06/19	P-02/08/19			T-02/08/19	P-05/08/19						
B2	MC&PI/PD&PSD/ DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 P-PI 05/09/19 P- PD&PSD 05/09/19			MC&PI/ DD&MC	P Sh-65 P-PI 05/09/19						
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/DD &MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 P-PI 22/08/19 P-PD&PSD 22/08/19	MC&PI / DD&MC	P Sh-58 P-PI 05/09/19			MC&PI /PD&PSD/ DD&MC	P Sh-54 P-PI 05/09/19 T- PD&PSD						
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19			T-21/08/19	P-22/08/19						
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 P-PI MC 26.8% 05/09/19	MC&PI/PD&PSD/ /DD&MC	P Sh-50 P-PI 18.4% 05/09/19 P- PD&PSD 05/09/19			MC&PI /PD&PSD/ DD&MC	P Sh-82 P-PI 05/09/19 T- PD&PSD						
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19			T- 16/07/19	P-17/07/19	T- 24/07/19	P-25/07/19			T-21/08/19	P-22/08/19						
B5	MC&PI /DD&MC	P Sh-52 P-PI 05/09/19			MC&PI /DD&MC	P Sh-61 P-PI 05/09/19			MC&PI /PSD/PD/DD&MC	P Sh-70 P-PI 05/09/19 P-PSD&PD 05/09/19	MC&PI /DD&MC	P Sh-74 P-PI 05/09/19			MC&PI /DD&MC	P Sh-80 P-PI 05/09/19						
Date	T- 22/07/19	P-24/07/19			T- 24/07/19	P-25/07/19			T-31/07/19	P-02/08/19	T-20/08/19	P-22/08/19			T-21/08/19	P-22/08/19						
C1																						
Date																						
C2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 22/07/19 P- PD&PSD 08/08/19			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/PD&PSD/DD&MC	P Sh 54 P-PI 09/08/19 P-PI 05/09/19 P-PD&PSD 09/09/19			MC&PI / PD&PSD/ DD&MC	P Sh-50 P-PI 05/09/19 P-PSD&PD 09/09/19						
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19	T- 26/07/19	P-29/07/19			T-29/07/19	P-30/07/19						
C3	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/PD&PSD/ DD&MC	P Sh-55 *P-PI 22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 P-PI 22/08/19	MC&PI /PD&PSD/DD &MC	P Sh 54 P-PI 05/09/19 T-PD&PSD			MC&PI /PD&PSD/DD& MC	P Sh 66 P-PI MC16.5% 05/09/19 P-PD&PSD 09/09/19			MC&PI/ PDS&PD/ /DD&MC	P Sh-80 T-PI T-PSD&PD	
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19	T- 25/07/19	P-26/07/19			T- 05/08/19	P-06/08/19			T-27/08/19	P- 29/08/19		
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDDD &MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/DD &MC	P Sh 50 P-PI 05/09/19 T-PD&PSD	MC&PI /PD&PSD/DD &MC	P Sh 56 P-PI 05/09/19 P-PD&PSD 09/09/19			MC&PI/ PDS&PD/ /DD&MC	P Sh-76 P-PI 05/09/19 T-PSD&PD			As C3L6	As C3L6		
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T- 16/07/19	P-17/07/19	T- 05/08/19	P-06/08/19			T-08/08/19	P- 09/08/19			T-27/08/19	P- 29/08/19		
C5	MC&PI/PD&PSD/ DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 P-PI 22/08/19	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 P-PI 05/09/19						
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T- 17/07/19	P-19/07/19			T-31/07/19	P-02/08/19						
D1																						
Date																						
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/DD &MC	P Sh-60 P-PI 25/07/19 P-PD&PSD 09/08/19			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 P-PI 05/09/19			MC&PI /DD&MC	P Sh-70 P-PI 05/09/19						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-29/07/19	P-30/07/19						
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/DD &MC	P Sh-55 P-PI 22/08/19	MC&PI PD& PSD/DD&MC	P Sh-62 P-PI 05/09/19			MC&PI /PSD&PD/DD& MC	P Sh-56 P-PI 05/09/19	DD&MC	P-sh-75	MC&PI /DD&MC	P Sh-78 T-PI		

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										P-PD&PSD 22/08/19		P-PSD&PD 05/09/19				P-PD&PSD 09/09/19						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			F-06/08/19	F-07/08/19	F-07/08/19	F-09/08/19	T-22/08/19	P-23/08/19		
D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 P-PD&PSD 08/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-65 P-PI MC26.2%30/07 /19 P-PD&PSD 22/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-52 P-PI 05/09/19 P-PD&PSD 05/09/19	MC&PI/DD& MC	P Sh-80 P-PI 05/09/19			MC&PI / PD&PSD/DD& MC	P Sh-100 F-PI MC 20.7% T-PD&PSD	MC&PI /DD&MC	P Sh-105 T-PI				
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-07/08/19	F-09/08/19	T-22/08/19	P-23/08/19				
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD& MC	P Sh-79 P-PI MC27.5%30/07 /19			MC&PI/DD& MC	P Sh-64 F-PI MC 26.4% 05/09/19	As D4L4	As D4L4			MC&PI /DD&MC	P Sh-83 P-PI 05/09/19						
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-08/08/19	P- 09/08/19						
E1																						
Date																						
E2	PD&PSD As E3L1	P- PD&PSD 06/08/19 As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P- 29/07/19			T-29/07/19	P-30/07/19						
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/PD&P SD/DD&MC	P Sh-52 P-PI 05/09/19 P- PD&PSD 05/09/19	MC&PI/ DD&MC	P Sh-85 P-PI 05/09/19			MC&PI/ DD&MC	P Sh-67 P-PI 05/09/19						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19			T-05/08/19	P- 06/08/19						
E4	MC&PI/DD& MC	P Sh-52 P-PI 22/07/19			MC&PI/PD& PSD/DD&MC	P Sh-78 F-PI MC-18.8% 25/07/19 P- PD&PSD 09/08/19			MC&PI/ DD&MC	P Sh-58 P-PI 05/09/19	MC&PI/PD&P SD/ DD&MC	P Sh-105 P-PI 05/09/19 P-PSD&PD 05/09/19	DD&MC	P Sh-55	MC&PI/ PSD&PD/ DD&MC	P Sh-74 T-PI T-PSD&PD						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P- 23/08/19						
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4	As E4L4	MC&PI/ DD&MC	P Sh-74 P-PI 05/09/19						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P-23/08/19						

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)	1/4 bag at deposit
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)	1/2 bag at deposit
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)	Record
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)	Core (1No)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)	Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. ‘as B2L1’. These are within the CQA plan sampling frequency requirements within table 4.1.

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Permeability

Grid Ref	*Result – K_y at 20°C*	*Date Sampled*	*Comments*	*Date Sampling complete*
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1	$7.2x10^{-11}$ m/s	*04/07/19*	*Pass*	*06/08/19*
A3L4		*23/07/19*		
B4L4	$7.8x10^{-11}$ m/s	*24/07/19*	*Pass*	*05/09/19*
D4L4		*01/08/19*		
D4L5		*08/09/19*		
A3B1		*29/08/19*		

Bund

Layer	Ref	Date	Pass/Fail
E3B2	MC&PI/ DD&MC	27/08/19	P-Sh 54 P- DD&MC 29/08/19 T- MC&PI
E3B4	DD&MC	29/08/19	P-Sh 60 P- DD&MC 30/08/19
E3B6	MC&PI/PD&PSD/ DD&MC	30/08/19	P-Sh 50 P- DD&MC 02/09/19 T- MC&PI T- PD&PSD
E3B8	MC&PI/ DD&MC	02/09/19	P-Sh 68 P- DD&MC 04/09/19 T- MC&PI
E3B10	MC&PI/ DD&MC	03/09/19	P-Sh TBA P- DD&MC 06/09/19 T- MC&PI
E3B12	MC&PI/ DD&MC	05/09/12	P-Sh 100 P- DD&MC 06/09/19 T- MC&PI
D5B1	MC&PI/PD&PSD/ DD&MC	28/08/19	P-Sh 74 P- DD&MC 28/08/19 T- MC&PI T- PD&PSD
D5B2	MC&PI/PD&PSD/ DD&MC	29/08/19	P-Sh 80 P- DD&MC 30/08/19 T- MC&PI T- PD&PSD
D5B3	MC&PI/ DD&MC	30/08/19	P-Sh 95
			P- DD&MC 02/09/19 T- MC&PI
D5B4	MC&PI/ DD&MC	03/09/19	P-Sh 65 P- DD&MC 06/09/19 T- MC&PI
D5B5	MC&PI/ PD&PSD/ DD&MC	06/09/19	P-Sh 120 P- DD&MC 09/09/19 T- MC&PI T- PD&PSD
A3B1	MC&PI/ DD&MC	29/08/19	P-Sh 80 P- DD&MC 30/08/19 T- MC&PI
A3B2	MC&PI/ PD&PSD/ DD&MC	02/09/19	P-Sh 68 P- DD&MC 04/09/19 T- MC&PI T- PD&PSD
A3B3	MC&PI/ DD&MC	03/09/19	P-Sh 74 P- DD&MC 04/09/19 T- MC&PI
A3B4	MC&PI/ DD&MC	05/09/19	P-Sh 90 P- DD&MC 06/09/19 T- MC&PI
A3B5	MC&PI/ DD&MC	06/09/19	P-Sh 90 P- DD&MC 09/09/19 T- MC&PI

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Casnewydd

Appendix 2 - Test Results - Permeability Tests

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT5
Sample Ref.:	B4 L4
Sample Type:	C

Description:
Stiff dark grey gravelly CLAY. Gravel is fine to medium.

SPECIMEN DETAILS

Depth within original sample	10mm
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.33	101.15
Height	*mm*	100.18	100.00
Moisture Content	*%*	23.3	25.1
Bulk Density	*Mg/m³*	2.00	2.03
Dry Density	*Mg/m³*	1.62	1.63

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.76	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	4.2

PERMEABILITY STAGE

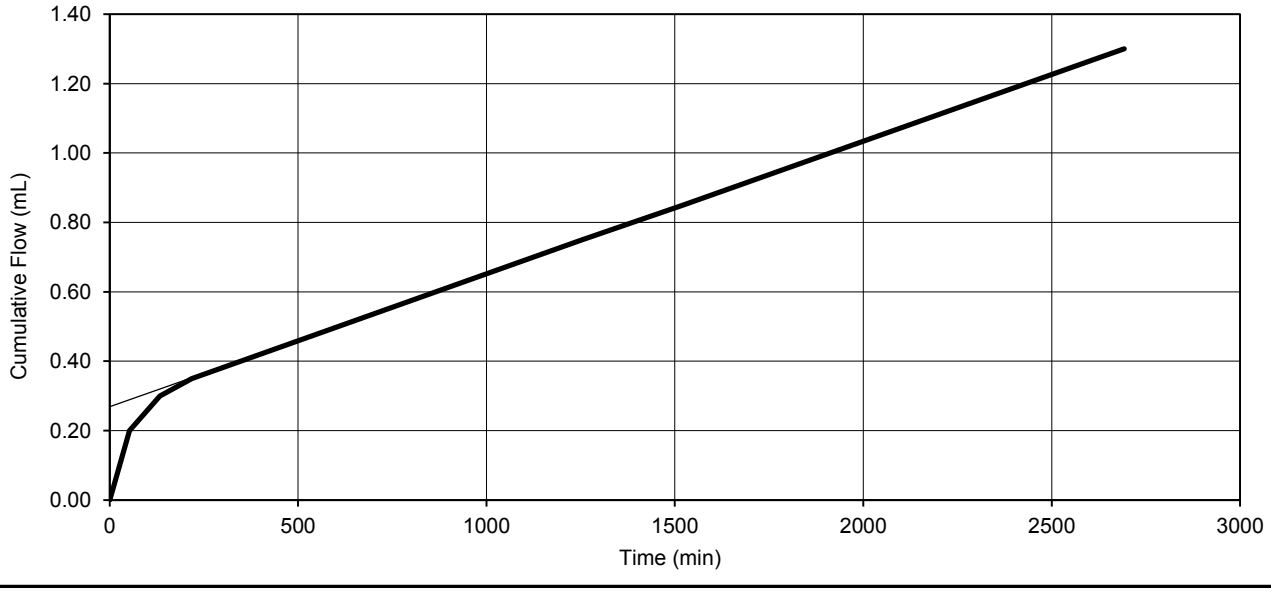
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.8×10^{-11} m/s



Checked and Approved by

P Heritage

P Heritage - Project Co-ordinator
20/08/2019

Project Number:
GEO / 29673

Project Name:
DOCKSWAY CELL 4
AG0390

GEOLABS

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4274**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**03/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-B2-C1	Core 2 A3-B3-C1	Core 3 E3-B8-C1		
Bulk Density	2.02	2.03	2.05		
Moisture Content	24	23	22		
Dry Density	1.63	1.65	1.68		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	0.1	0.8	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 04/09/2019 Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4304**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-B10-C1	Core 2 D5-B4-C1	Core 3 A3-B4-C1	Core 4 E3-B12-C1	
Bulk Density	2.03	2.02	2.05	2.05	
Moisture Content	21	23	22	21	
Dry Density	1.69	1.65	1.68	1.69	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.67Mg/m³	2.1	1.0	0.6	0.5	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 06/09/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4313**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**06/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-B5-C1	Core 2 D5-B5-C1			
Bulk Density	2.05	2.05			
Moisture Content	22	21			
Dry Density	1.69	1.70			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	0.2	1.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 07/09/2019 Fig

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Appendix 4 – Field Logs

Available on request

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Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4275	A3-B2 03.09.19	Layer B2	Grey slightly sandy slightly gravelly CLAY	72	72	68	71	HSV 1
4276	A3-B3 03.09.19	Layer B3	Grey slightly sandy slightly gravelly CLAY	97	74	150	107	HSV 2
4277	E3-B8 03.09.20	Layer B8	Grey slightly sandy slightly gravelly CLAY	125	135	74	111	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	04/09/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4305	E3-B10 05.09.19	Layer B10	Grey slightly sandy slightly gravelly CLAY	108	58	80	82	HSV 1
4306	D5-B4 05.09.19	Layer B4	Grey slightly sandy slightly gravelly CLAY	65	110	120	98	HSV 2
4307	A3-B4 05.09.19	Layer B4	Grey slightly sandy slightly gravelly CLAY	105	90	110	102	HSV 3
4308	E3-B12 05.09.19	Layer B12	Grey slightly sandy slightly gravelly CLAY	105	120	100	108	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	06/09/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4314	A3-B5 06.09.19	Layer B5	Grey slightly sandy slightly gravelly CLAY	130	120	90	113	HSV 1
4315	D5-B5 06.09.19	Layer B5	Grey slightly sandy slightly gravelly CLAY	150	125	120	132	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	07/09/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport
CITY COUNCIL
CYNGOR DINAS
Casnewydd

Appendix 6 – PI, PL, MC, LL Results

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B4 L3	GT3	0.00		B	Dark grey slightly sandy CLAY			26.8	100	51	21	30		
C4 L3	GT1	0.00		B	Dark grey slightly sandy CLAY			22.9	100	50	21	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13885

Number of samples submitted for testing:	9	sample (s)
Natural Moisture Content	6	test(s)
Atterberg Limit	6	test(s)
Particle Density	3	test(s)
Grading	3	test(s)
Date (s) sampled and received at laboratory:	18	Jul-19
Date of receipt of testing instructions	18	Jul-19
Date testing started:	24	Jul-19
Date of issue:	5	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		Mg/m3		%	%	%	%	%	Mg/m3	
D2 L4	GT8	0.00		B	Dark grey slightly sandy CLAY			24.4	100	47	19	28		
D3 L4	GT14	0.00		B	Dark grey slightly sandy CLAY			24.1	100	51	20	31		
D4 L3	GT10	0.00		B	Dark grey slightly sandy CLAY			25.4	100	50	21	29		
D5 L3	GT11	0.00		B	Dark grey slightly sandy CLAY			26.4	100	50	20	30		
E3 L3	GT9	0.00		B	Dark grey slightly sandy CLAY			25.0	100	50	20	30		
E4 L3	GT7	0.00		B	Dark grey slightly sandy CLAY			23.7	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT12		D3 L4	B	Dark grey SILT and CLAY.	2.67	2
GT13		E3 L3	B	Dark grey SILT and CLAY	2.67	2
GT15		D4 L3	B	Dark grey SILT and CLAY	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

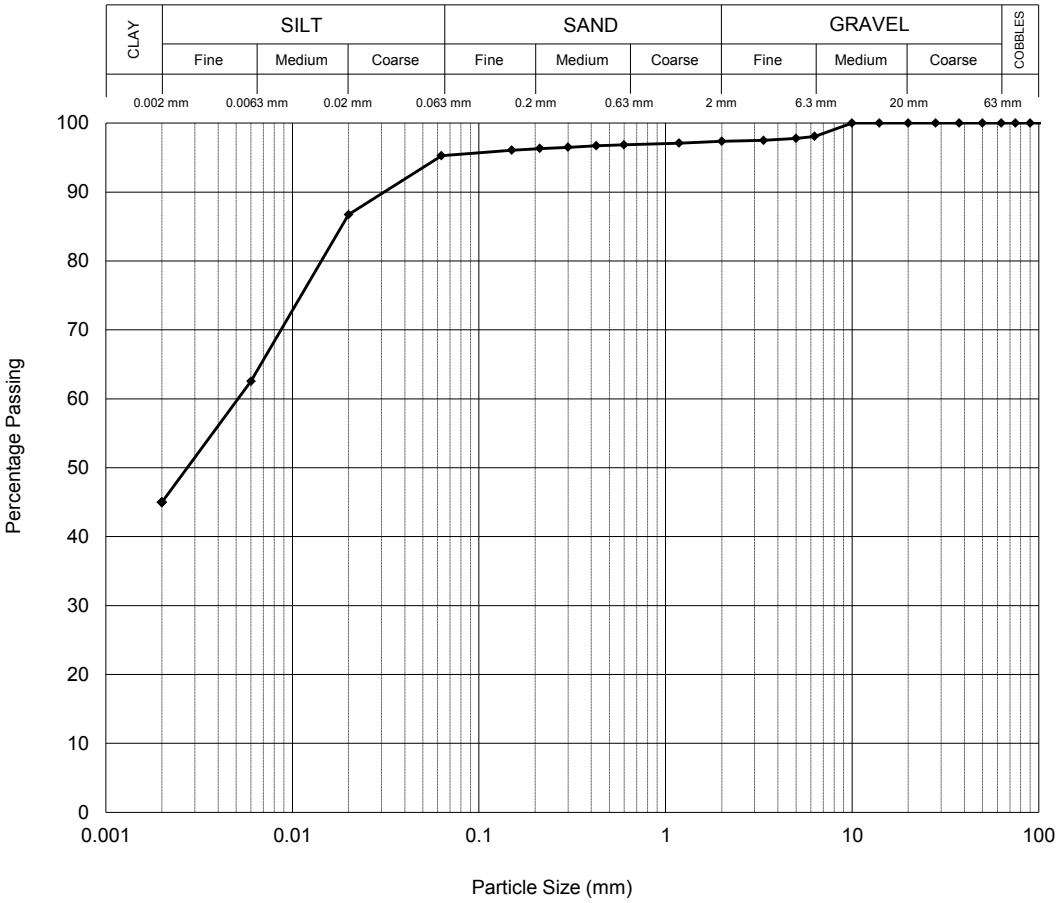
BH / TP No.	GT12
Sample Ref	D3 L4
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	97
1.18 mm	97
600 µm	97
425 µm	97
300 µm	97
212 µm	96
150 µm	96
63 µm	95



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	87
6 µm	63
2 µm	45
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	3
Sand	2
Silt	50
Clay	45

Checked and Approved by

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

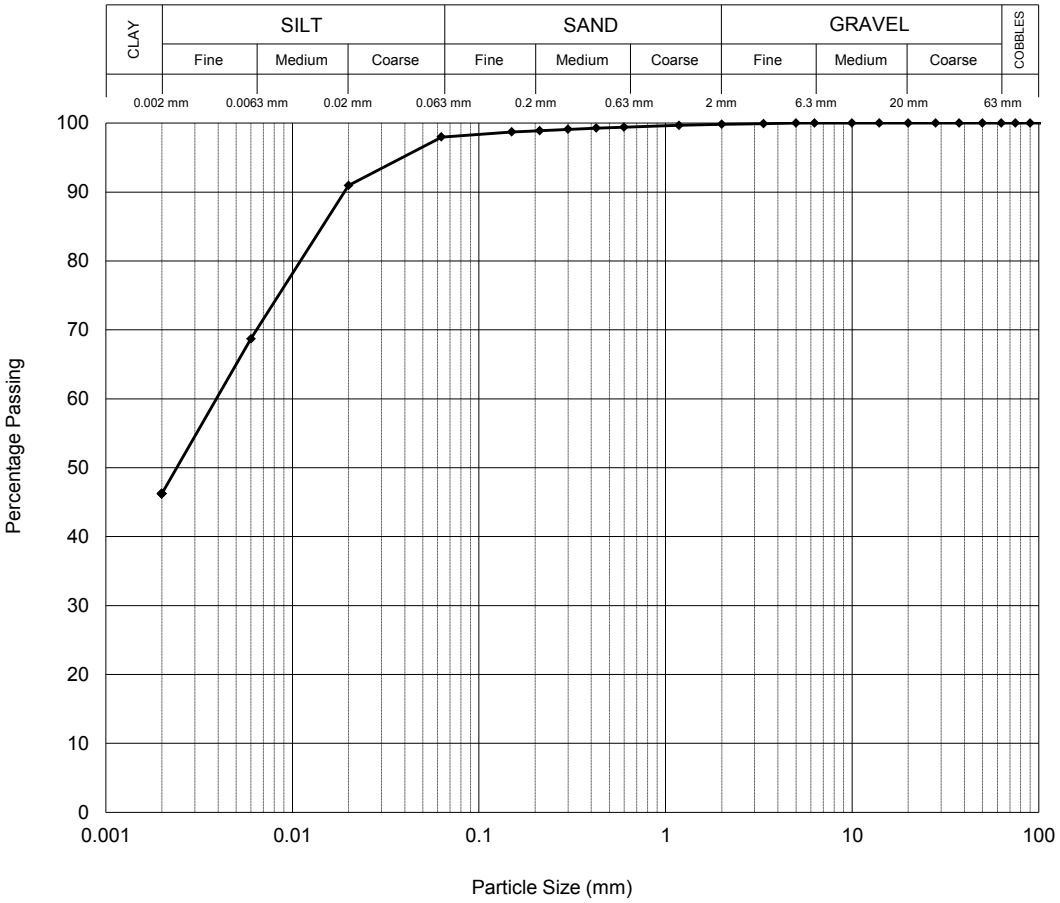
BH / TP No.	GT13
Sample Ref	E3 L3
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	91
6 µm	69
2 µm	46
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

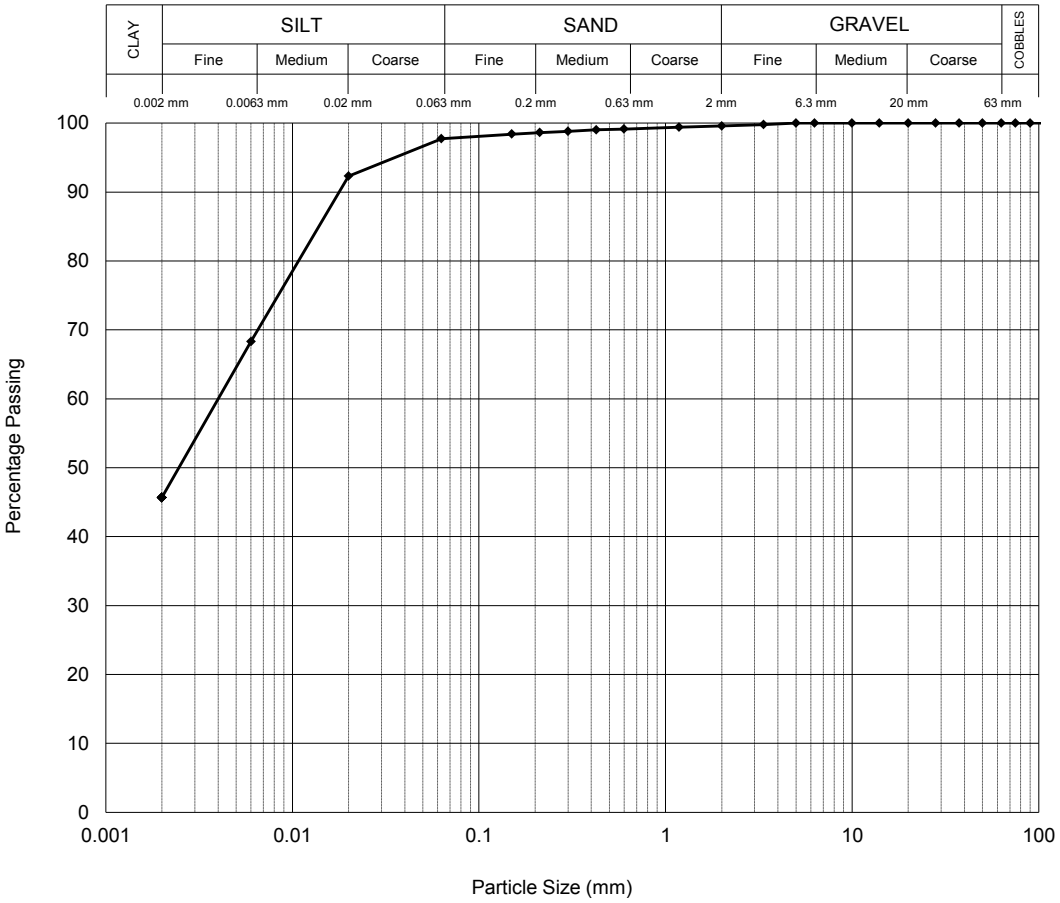
BH / TP No.	GT15
Sample Ref	D4 L3
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	92
6 µm	68
2 µm	46
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13891

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Date (s) sampled and received at laboratory:	23	Jul-19
Date of receipt of testing instructions	23	Jul-19
Date testing started:	24	Jul-19
Date of issue:	5	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L4	GT4	0.00		B	Dark grey slightly sandy CLAY			25.7	100	50	20	30		
A4 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.4	100	50	20	30		
B5 L1	GT2	0.00		B	Dark grey slightly sandy CLAY			26.0	100	51	20	31		
C2 L4	GT1	0.00		B	Dark grey slightly sandy CLAY			25.8	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13895

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	24	Jul-19
Date of receipt of testing instructions	24	Jul-19
Date testing started:	26	Jul-19
Date of issue:	5	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B4 L4	GT2	0.00		B	Dark grey slightly sandy CLAY			18.8	100	50	20	30		
B5 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			25.6	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29673.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT1		B4 L4		Dark grey SILT and CLAY	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29673

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

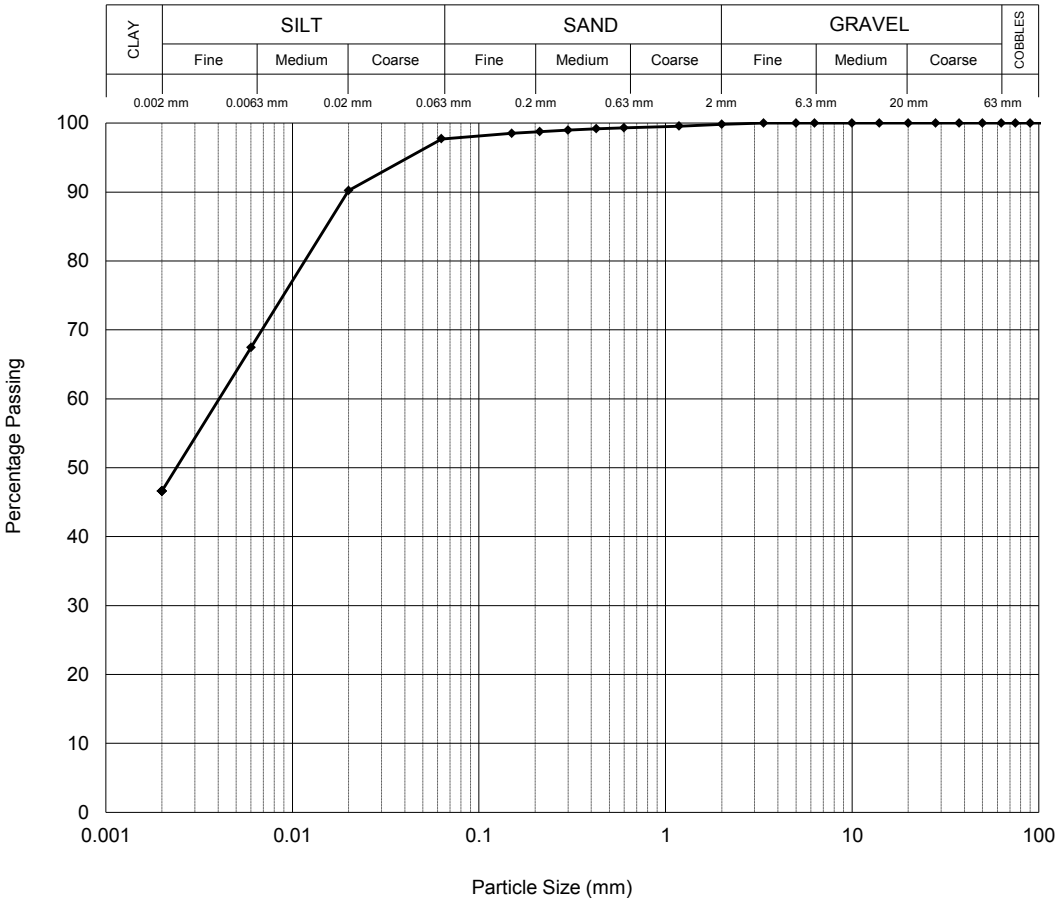
BH / TP No.	GT1
Sample Ref	B4 L4

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	90
6 µm	67
2 µm	47
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29673

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B3 L4	GT2	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		
C3 L4	GT1	0.00		B	Dark grey slightly sandy CLAY			21.8	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.5	100	51	20	31		
E2 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			26.4	100	50	21	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13904

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	26	Jul-19
Date of receipt of testing instructions	26	Jul-19
Date testing started:	3	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.5	100	51	20	31		
E2 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			26.4	100	50	21	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		C2 L4	B	Dark grey CLAY and SILT.	2.70	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29684

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

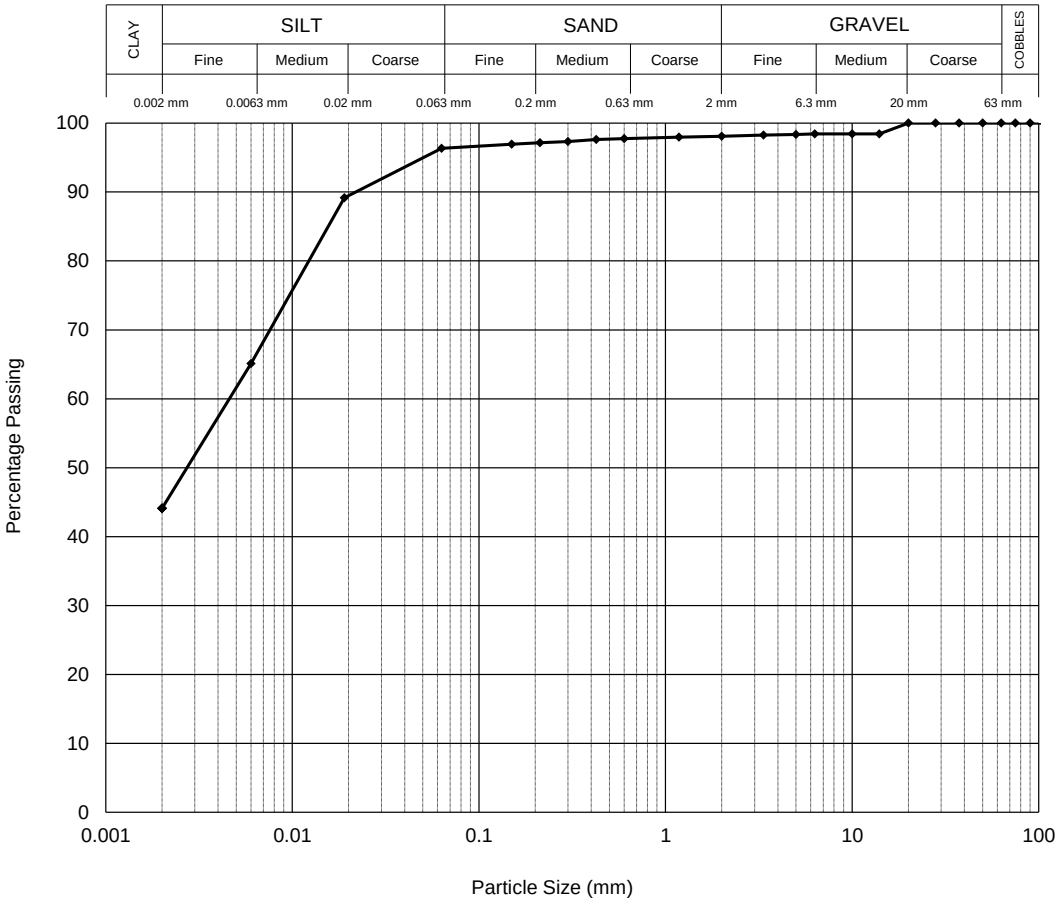
BH / TP No.	GT4
Sample Ref	C2 L4
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	28.6
Size	% Pass
19 µm	89
6 µm	65
2 µm	44

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	52
Clay	44

Checked and Approved by

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29684

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L5	GT4	0.00		B	Dark grey slightly sandy CLAY			23.7	100	51	21	30		
D2 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		
E3 L4	GT7	0.00		B	Dark grey slightly sandy CLAY			26.0	100	51	21	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13906

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	29	Jul-19
Date of receipt of testing instructions	29	Jul-19
Date testing started:	3	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L5	GT4	0.00		B	Dark grey slightly sandy CLAY			23.7	100	51	21	30		
D2 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		
E3 L4	GT7	0.00		B	Dark grey slightly sandy CLAY			26.0	100	51	21	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		C2 L5	B	Dark grey CLAY and SILT.	2.70	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29685

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

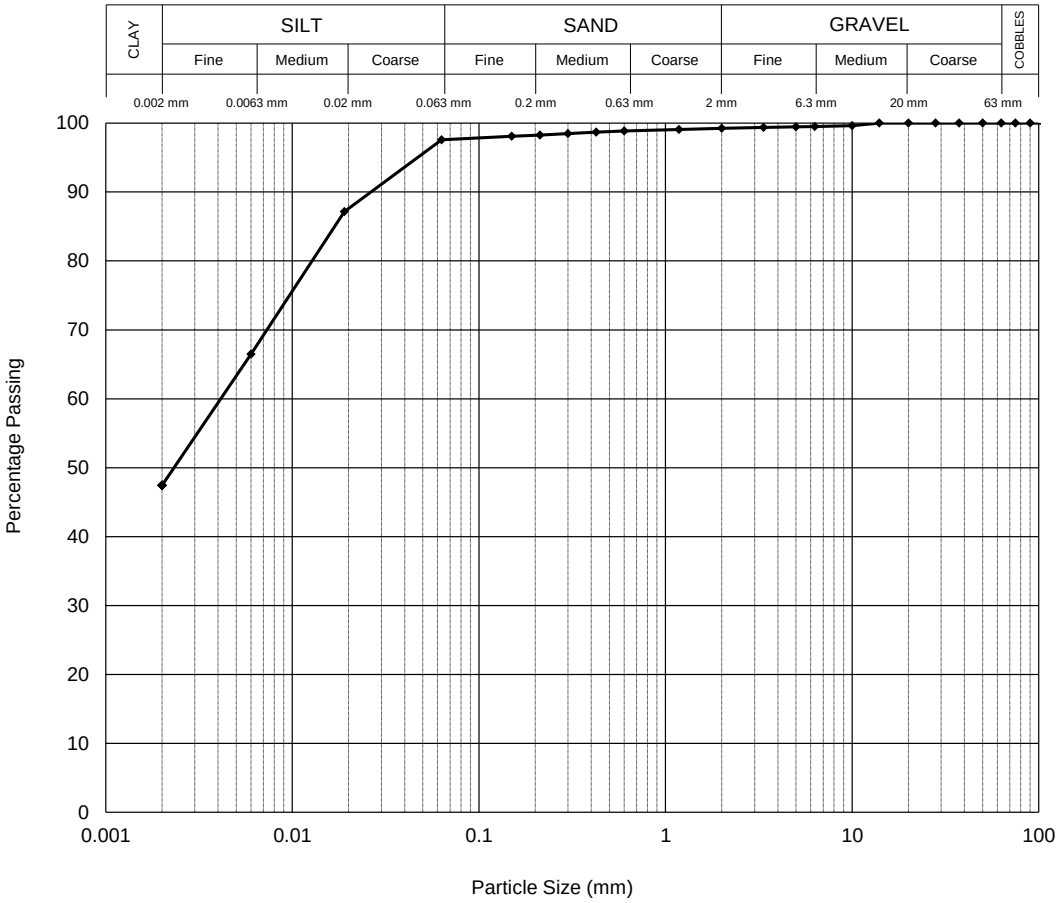
BH / TP No.	GT5
Sample Ref	C2 L5
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	28.6
Size	% Pass
19 µm	87
6 µm	66
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	50
Clay	47

Checked and Approved by

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29685

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B1 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			24.7	100	50	21	29		
B2 L4	GT4	0.00		B	Dark grey slightly sandy CLAY			23.5	100	49	20	29		
B5 L3	GT2	0.00		B	Dark grey slightly sandy CLAY			23.9	100	51	20	31		
C5 L5	GT6	0.00		B	Dark grey slightly sandy CLAY			22.9	100	50	21	29		
D4 L4	GT8	0.00		B	Dark grey slightly sandy CLAY			24.9	100	50	20	30		
E4 L4	GT5	0.00		B	Dark grey slightly sandy CLAY			23.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test — wd - water displacement — wi - immersion in water
Linear measurement unless : — 4pt cone unless : — cas - Casagrande method — 1pt - single point test
Liquid Limit
Particle density — sp - small pyknometer — gj - gas jar

Date Printed	Approved By	Table
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BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT1		B2 L4		Dark grey CLAY and SILT with rare fossil fragments.	2.72	2
GT7		E4 L4		Dark grey CLAY and SILT with rare fossil fragments.	2.70	2
GT9		B5 L3		Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

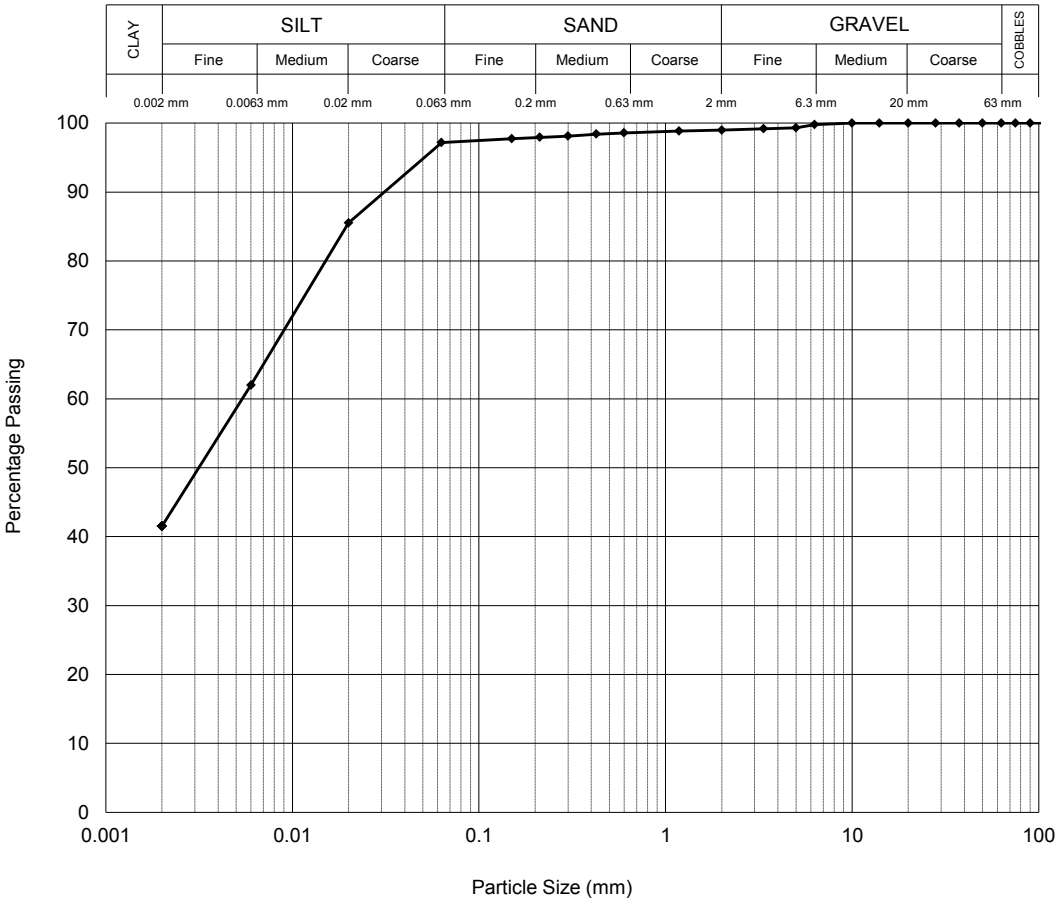
BH / TP No.	GT1
Sample Ref	B2 L4

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	86
6 µm	62
2 µm	42
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	56
Clay	41

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

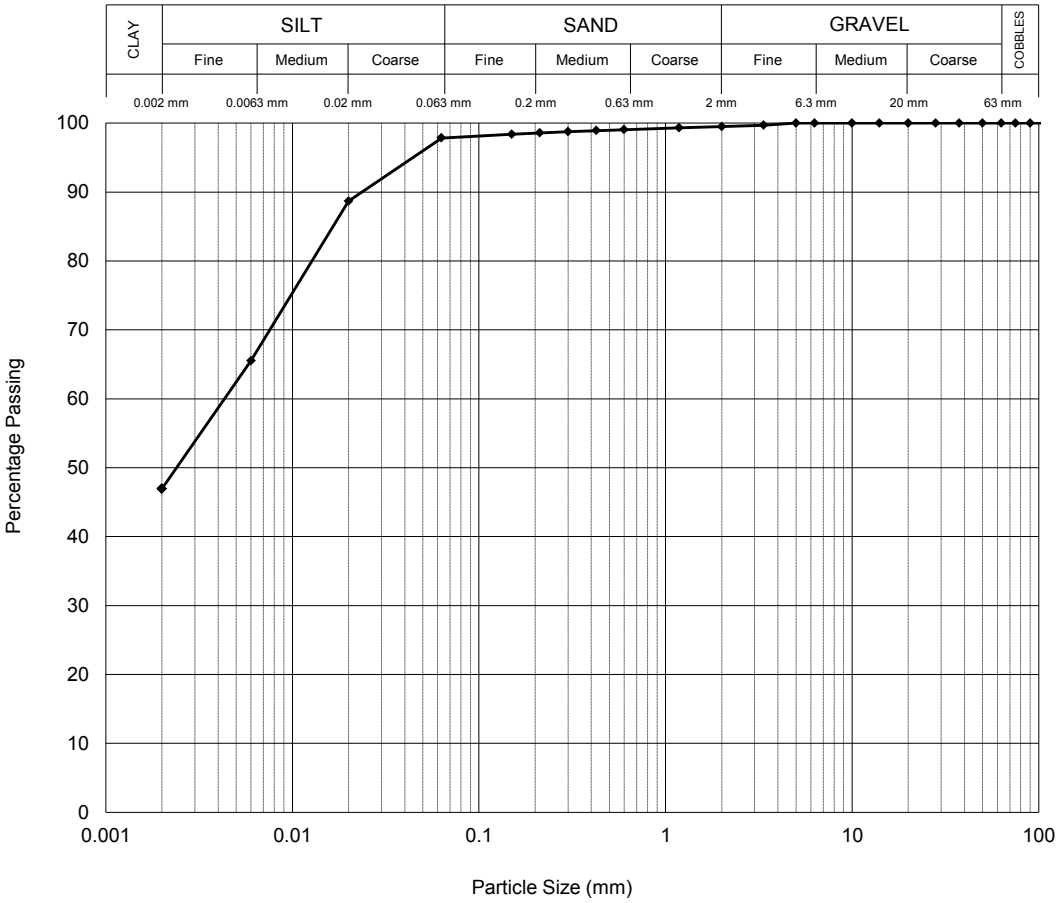
BH / TP No.	GT7
Sample Ref	E4 L4

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	89
6 µm	66
2 µm	47
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

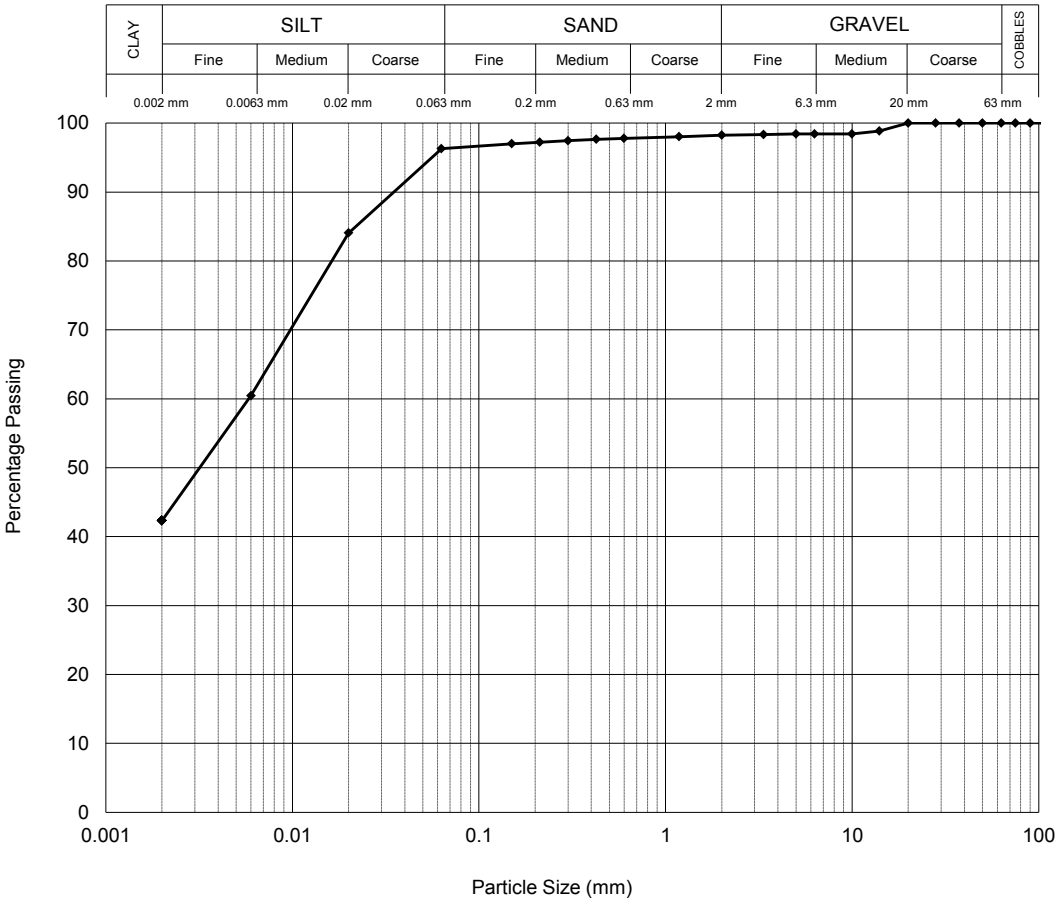
BH / TP No.	GT9
Sample Ref	B5 L3

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	99
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	84
6 µm	60
2 µm	42
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	54
Clay	42

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			26.0	100	49	20	29		
B2 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13918

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	2	Aug-19
Date of receipt of testing instructions	2	Aug-19
Date testing started:	3	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

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Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			26.0	100	49	20	29		
B2 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		A2 L5	B	Dark grey CLAY and SILT with rare fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
04/09/2019

Project Number:

GEO / 29746

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

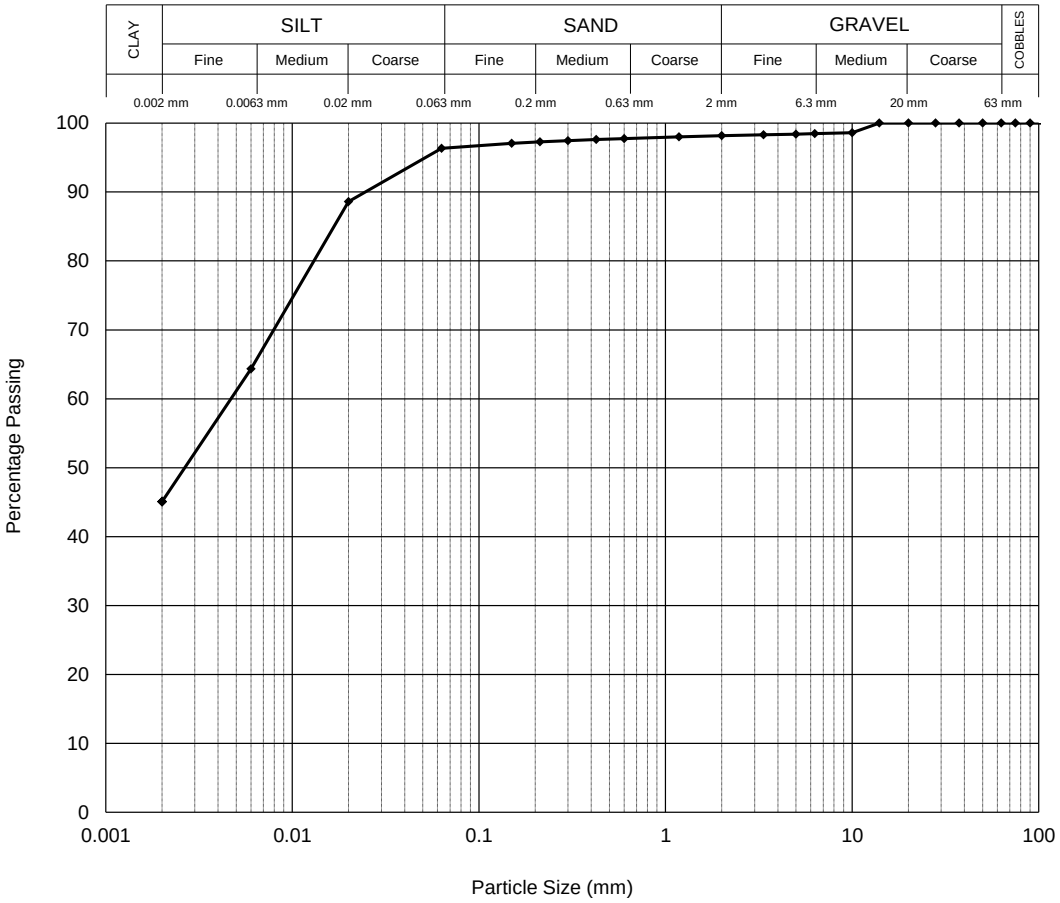
BH / TP No.	GT2
Sample Ref	A2 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	26.2
Size	% Pass
20 µm	89
6 µm	64
2 µm	45

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	51
Clay	45

Checked and Approved by

J Sturges - Operations Manager
04/09/2019

Project Number:

GEO / 29746

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

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Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Sample Top	Sample Base	Sample Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
C3 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			16.5	100	49	20	29		
C4 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.1	100	49	20	29		
E3 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			25.0	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 09/04/2019 00:00

Approved By: Lisa Maiden

Table 1

sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13921

Number of samples submitted for testing:	5	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	2	test(s)
Grading	2	test(s)

Date (s) sampled and received at laboratory:	5 Aug-19
Date of receipt of testing instructions	5 Aug-19
Date testing started:	7 Aug-19
Date of issue:	7 Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Sample Top	Sample Base	Sample Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
C3 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			16.5	100	49	20	29		
C4 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.1	100	49	20	29		
E3 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			25.0	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 09/04/2019 00:00

Approved By: Lisa Maiden

Table 1

sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C3 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2
GT4		C4 L4	B	Dark grey CLAY and SILT.	2.69	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
06/09/2019

Project Number:

GEO / 29747

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

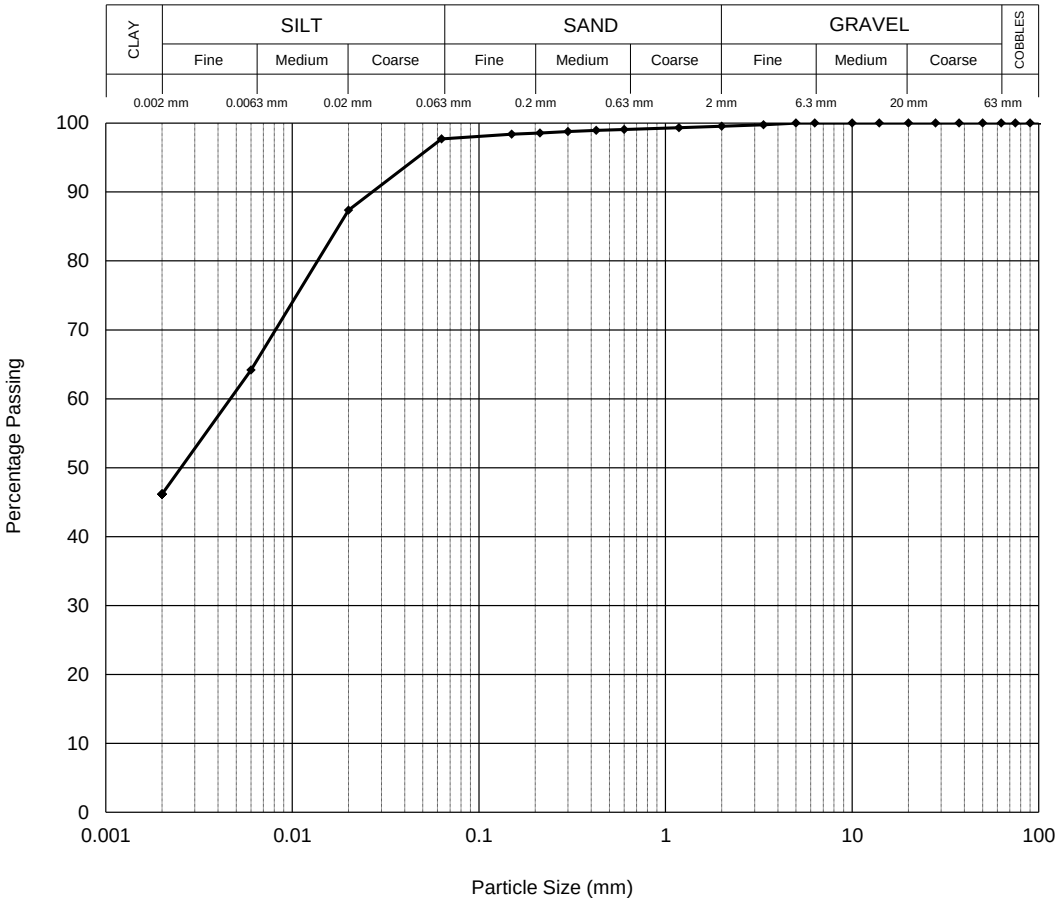
BH / TP No.	GT2
Sample Ref	C3 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	87
6 µm	64
2 µm	46
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

J Sturges - Operations Manager
06/09/2019

Project Number:

GEO / 29747

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

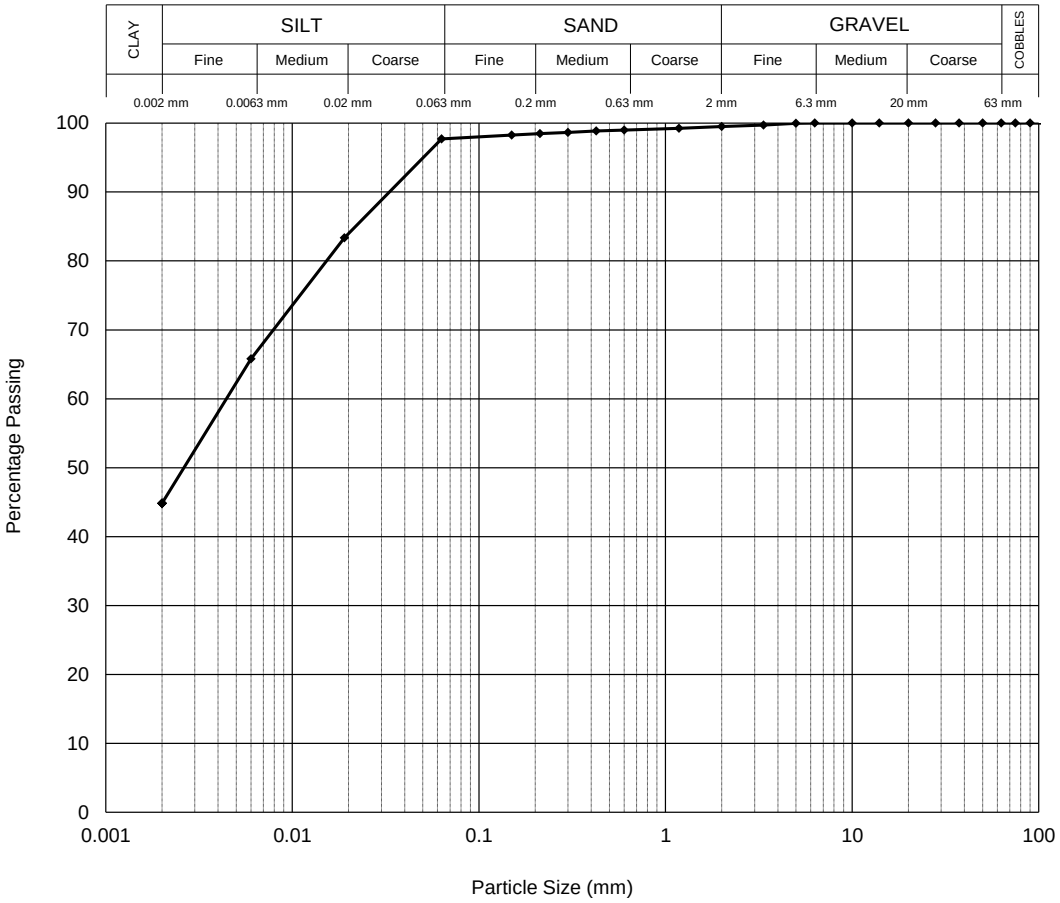
BH / TP No.	GT4
Sample Ref	C4 L4
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	27.6
Size	% Pass
19 µm	83
6 µm	66
2 µm	45

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	53
Clay	44

Checked and Approved by

J Sturges - Operations Manager
06/09/2019

Project Number:

GEO / 29747

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			19.4	100	48	20	28		
D3 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			22.8	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13923

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	6	Aug-19
Date of receipt of testing instructions	6	Aug-19
Date testing started:	7	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			19.4	100	48	20	28		
D3 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			22.8	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29748.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		D3 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.73	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
04/09/2019

Project Number:

GEO / 29748

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

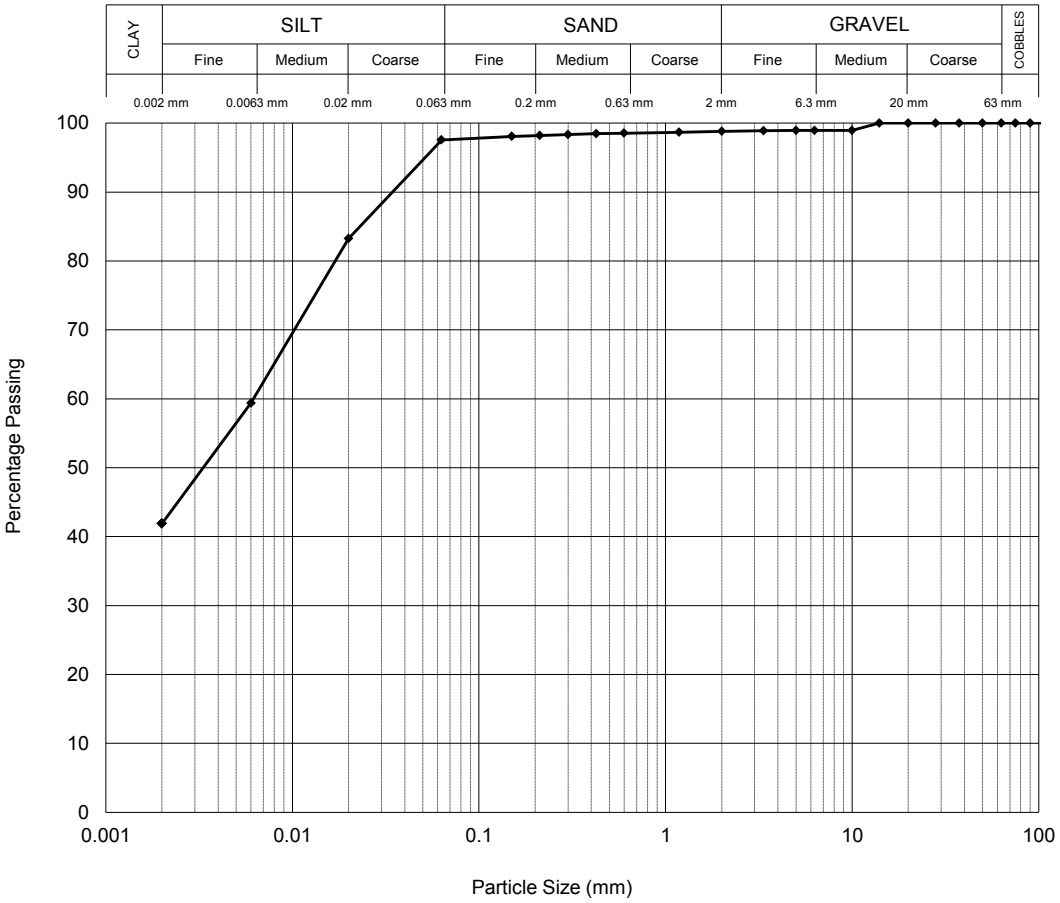
BH / TP No.	GT2
Sample Ref	D3 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26.2
Size	% Pass
20 µm	83
6 µm	59
2 µm	42

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	1
Silt	56
Clay	42

Checked and Approved by

S Burke

S Burke - Senior Technician
04/09/2019

Project Number:

GEO / 29748

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C4 L5	GT4	0.00		B	Dark grey slightly sandy CLAY			23.7	100	47	20	27		
D4 L5	GT2	0.00		B	Dark grey slightly sandy CLAY			20.7	100	47	19	28		
D5 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			21.4	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A4 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			23.2	100	47	19	28		
B3 L5	GT7	0.00		B	Dark grey slightly sandy CLAY			25.1	100	47	19	28		
B4 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			22.3	100	47	20	27		
B5 L4	GT1	0.00		B	Dark grey slightly sandy CLAY			22.1	100	46	19	27		
B5 L5	GT6	0.00		B	Dark grey slightly sandy CLAY			21.5	100	46	20	26		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test | Liquid Limit | Particle density
Linear measurement unless : | 4pt cone unless : | sp - small pyknometer
wd - water displacement | cas - Casagrande method | gj - gas jar
wi - immersion in water | 1pt - single point test

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 7 – Photographs

Streetscene
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South Wales/De Cymru
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Monday 02 September 2019 from Grid E2 (Bund)	**Tuesday 03 September 2019 from Grid A5**
Wednesday 04 September 2019 from Grid A1	**Thursday 05 September 2019 from Grid E3 (bund complete)**

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
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Thursday 05 September 2019 from Grid E2

Friday 06 September 2019 from Grid A5 (bund D5 to B5)

Friday 06 September 2019 from Grid A5 (Bund A1 to A5)

Streetscene
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Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Environmental Services

Title: Docksway Waste Disposal Site
Phase 2 Cell 4a Containment

Construction Quality Assurance
Report No 15 WE 15/09/19

Streetscene
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Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Project Ref: 2506

Document Control Sheet

Project Name: WDS Cell 4a Containment
Project Ref: 2506
Report Title: Construction Quality Assurance Weekly Report

	Name	Position	Signature	Date
Prepared by:	William Watt	CQA Inspector		15-09-19
Reviewed by:				
Approved by:				
Environmental Services				

Revision	Date	Description	Prepared	Reviewed	Approved

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Contents

1.0 Introduction

2.0 Weather

3.0 Progress For the Week

3.1 Stockpile
3.2 Work – progress

4.0 Testing

4.1 Core Cutter Samples
4.2 Permeability Samples
4.3 MC and PI
4.4 Particle Density and Particle Size Distribution Hand
4.5 Hand Shear Vane

5.0 Summary of results

5.1 Acceptability
5.2 Compliance

6.0 Problems encountered

Appendix

1. Progression Plan
2. Test Results
3. Permeability Tests
4. Moisture content/dry density for Compaction
5. Field Logs
6. Hand Shear Vane Logs
7. Liquid Limits, Moisture Contents, Plastic Limits, Plasticity Index.
8. Photographs
9. Final level survey and soft spot record

Streetscene
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Newport/Casnewydd
South Wales/De Cymru
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CYNGOR DINAS
Casnewydd

1.0 Introduction

This weekly report is a consolidation of the CQA observations for the period of the title. It provides an oversite for the CQA Project Manager of the key observations tests, results and progress as observed by the CQA inspector. Its content is based on that prescribed within the CQA plan.

2.0 Weather

Sunny over the weekend. Over cast and showers Monday, Tuesday and Thursday. Fine and sunny Wednesday and Friday.

3.0 Progress for the week

3.1 Stockpile

The clay material stockpile was removed. There was some delay due to weather this week.
31,653 tonnes of material was delivered to the site up to 09 September 2019
The working hours this week were 730am to 1600pm.

3.2 Work Progress

Grids and Layers Worked on this Week

- **Additional Layers**
  Work completed
- **Levelling the Area**
  Work completed
- **Layer 1 to +6**
  Work completed

Work commenced on bunds on Tuesday 27 August 2019

- **Bund E3-E2**

work complete

- **Bund A5 to E5**
  Level 6
  Level 7 & 8 Work completed Thursday 12 September 2019
- **Bund A1 to A5**
  Level 6
  Level 7 & 8 Work completed Thursday 12 September 2019
- **Bund A1 to E2**
  Work completed

All sampling and testing was carried out in accordance with CQA plan.

The clay material was installed and tested in accordance with the CQA plan as per the progress plan Appendix 1 for grid areas of 125m^2. The material was placed with dumpers and dozer to a thickness of 300mm and then rolled with a minimum of 12 pass of the roller (CAT CS573E with Padfoot attachment). The size of the clods were checked and confirmed below the size requirements of the CQA plan.

Sampling and testing by CJ Associates was undertaken Monday and Thursday.

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Plant on site two 9-ton front loaders, 2 excavators, dozer, roller (CAT CS-573E with padfoot attachment) and bowser.

4.0 Testing

Testing was conducted in accordance with the CQA Plan section 4. The testing locations are conducted at pre-determined and arbitrary locations. The scheme for testing comprises:

- 1 core per 25 metre grid square per layer of clay for dry density/moisture content relationship test and insitu density. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 3 hand shear vane tests per 25 metre grid square per layer of clay,
- 1 bulk sample per 25 metre grid square per layer of clay for moister content and atterberg limit. Nominally every 156m^3 which exceeds the 250m^3 CQA plan requirement.
- 1 bulk sample per two 25 metre grid squares per layer of clay for particle density and size distribution. Nominally every 313m^3 which exceeds the 500m^{3}CQA plan requirement
- 1 core for permeability (plus one spare sample for retesting) every 10, 25 metre grid square per layer of clay. Nominally every 1,560m^3 which exceeds the 2,000m^3 CQA plan requirement

4.1 Core Cutter Samples

5 core cutter samples were taken this week
5 results core tests received as per the Appendix 1 and 2.

4.2 Permeability Samples

1 sample was taken this week.
0 Results were received.

4.3 MC and PI,

Samples were taken in accordance with CQA Plan, results received for MC and PI for the areas are recorded within Appendix 1.

4.4 Particle Density and Particle Size Distribution

Samples were taken in accordance with CQA Plan, results received for PD and PSD for the areas are recorded within Appendix 1.

4.5 Hand Shear Vane

Hand Shear Vane results continued at a rate of 3 per Cell. They remained above >50Kn/m^2, with a minimum reading was 62 KN/ m^2 recorded.

5.0 Results Summary

5.1 Acceptability

No results were received this week. The actions for the previous weeks results not in accordance with the CQA Plan Table 3.1 were instructed by the Project Engineer in email 10 September 2019.
C3L5 MC 16.5% - 13921 Additional permeability test undertaken on this layer.
D4L4 MC 20.7% - 13932, this layer was reworked, we are awaiting repeat acceptability testing

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5.2 Compliance
All the results received this week were in accordance with CQA Plan Table 3.2.

6.0 Problems Encountered
- None

Appendix 1 - Progression Plan

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South Wales/De Cymru
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Compliance and Acceptability Sampling Record

Make-up Layers

Grid Ref	-L1		-L1*		-L2	
	Sampling	Result	Sampling	Result	Sampling	Result
A4	DD&MC	P Sh-150			DD&MC	P Sh-75
Date	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
B3	DD&MC	P Sh-55	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 09/07/19 P-PD&PSD 09/07/19		
Date	T-23/05/19	P-24/05/19	T-04/06/19	P-05/06/19		
B4	DD&MC	*F Sh-38*		P Sh-52	DD&MC	P Sh-60
	T-22/05/19	P-23/05/19			T-23/05/19	P-24/05/19
D2	DD&MC	P Sh-56				
	T-20/06/19	P-21/06/19				
E2	MC&PI DD&MC	P Sh-58 P-PI 02/08/19				
	T-24/06/19	P- 25/06/19				
E3	MC&PI/PD&PSD/ DD&MC	P Sh-75 P-PI 02/08/19 P-PD&PSD 02/08/19				
	T-24/06/19	P- 25/06/19				
E4	MC&PI/ DD&MC	P Sh-75 P-PI 22/07/19				
	T-25/06/19	P- 27/06/19				

* Additional sampling due to partial grid completion

Liner Layer Minimum 1.2m

Grid Ref	L1				L2				L3		L4				L5						L6	
	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Result	Sampling	Rework and Retest	Sampling	Result	Sampling	Rework and Retest	Sampling	Rework and Retest		
A1	As B2L1	As B2L1			As B1L2	As B1L2			As A2L3	As A2L3	As B1L4	As B1L4			As A2L5	As A2L5						
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
A2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI/ DD&MC	P Sh-62 P-PI-MC28% 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P-PD&PSD 02/08/19	As B1L4	As B1L4			MC&PI/PD&PSD/ DD&MC	P Sh-75 P-PI 05/09/19 P-PD&PSD 09/09/19						
Date	T--05/06/19	P-06/06/19			T-10/06/19	P-11/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
A3	MC&PI/PD&PSD/ DD&MC	P Sh-70 P-PI 12/07/19 P- PD&PSD 12/07/19	DD&MC	P SH-64	MC&PI/PD&PSD/ DD&MC	P Sh-68 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-66 P-PI 30/07/19 P-PD&PSD 22/08/19	MC&PI/ /DD&MC	P Sh-60 P-PI 05/09/19			MC&PI /DD&MC	P Sh-65 P-19.4% -PI 05/09/19						

Streetscene
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Date	T--10/06/19	P-11/06/19	T-27/06/19	P-28/06/19	T--02/07/19	P-03/07/19			T--11/07/19	P-12/07/19 MC19%	T--23/07/19	P-24/07/19			T--06/08/19	P-07/08/19						
A4	MC&PI/PD&PSD/ DD&MC	P Sh-80 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-85 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-66 P-PI 30/07/19	MC&PI/ /DD&MC	P Sh-60 P-PI 05/09/19			MC&PI/ /DD&MC	P Sh-50 P-PI 05/09/19						
Date	T-04/06/19	P-05/06/19			T-01/07/19	P-02/07/19			T--10/07/19	P-11/07/19	T--23/07/19	P-24/07/19			T--20/08/19	P-22/08/19						
A5	As B5	As B5			DD&MC	P Sh-50			As B5L3	As B5L3	As A4L4	As A4L4			As A4L4	As A4L4						
Date	T-22/07/19	P-24/07/19			T-25/07/19	P-26/07/19			T-31/07/19	P-02/08/19	T--23/07/19	P-24/07/19			T--20/08/19	P-22/08/19						
B1	MC&PI/PD&PSD/ DD&MC	P Sh-62 P-PI 02/08/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	P Sh-85 P-PI 02/08/19			MC&PI/ DD&MC	P Sh-64 P-PI 22/07/19	MC&PI/ DD&MC	P Sh-112 P-PI 05/09/19			AsB2L5	AsB2L5						
Date	T-21/06/19	P-24/06/19			T-24/06/19	P- 25/06/19			T-26/06/19	P- 27/06/19	T-31/06/19	P-02/08/19			T-02/08/19	P-05/08/19						
B2	MC&PI/PD&PSD/ DD&MC	P Sh-52 P-PI 09/07/19 P- PD&PSD 09/07/19			MC&PI / DD&MC	P Sh-58 P-PI 12/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-74 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI /PD&PSD/ DD&MC	P Sh-110 P-PI 05/09/19 P- PD&PSD 05/09/19			MC&PI/ DD&MC	P Sh-65 P-PI 05/09/19						
Date	T-06/06/19	P-07/06/19			T-20/06/19	P-21/06/19			T-26/06/19	P-27/06/19	T-31/07/19	P-02/08/19			T-02/08/19	P-05/08/19						
B3	MC&PI /DD&MC	P Sh 84 P-PI MC26.5% 12/07/19			MC&PI /PD&PSD/DD &MC	P Sh 64 P-PI 22/07/19 P-PD&PSD 31/07/19			MC&PI /PD&PSD/ DD&MC	P Sh-55 P-PI 22/08/19 P-PD&PSD 22/08/19	MC&PI / DD&MC	P Sh-58 P-PI 05/09/19			MC&PI /PD&PSD/ DD&MC	P Sh-54 P-PI 05/09/19 T- PD&PSD						
Date	T- 18/06/19	P-19/06/19			T- 18/06/19	P-28/06/19			T-15/07/19	P-16/07/19	T-25/07/19	P-26/07/19			T-21/08/19	P-22/08/19						
B4	MC&PI /DD&MC	P Sh-67 P-PI 12/07/19			MC&PI /DD&MC	P Sh-66 P-PI 22/07/19			MC&PI /DD&MC	P Sh-52 P-PI MC 26.8% 05/09/19	MC&PI/PD&PSD/ /DD&MC	P Sh-50 P-PI 18.4% 05/09/19 P- PD&PSD 05/09/19			MC&PI /PD&PSD/ DD&MC	P Sh-82 P-PI 05/09/19 T- PD&PSD						
Date	T- 18/06/19	P-19/06/19			T- 27/06/19	P-28/06/19			T- 16/07/19	P-17/07/19	T- 24/07/19	P-25/07/19			T-21/08/19	P-22/08/19						
B5	MC&PI /DD&MC	P Sh-52 P-PI 05/09/19			MC&PI /DD&MC	P Sh-61 P-PI 05/09/19			MC&PI /PSD/PD/DD&MC	P Sh-70 P-PI 05/09/19 P-PSD&PD 05/09/19	MC&PI /DD&MC	P Sh-74 P-PI 05/09/19			MC&PI /DD&MC	P Sh-80 P-PI 05/09/19						
Date	T- 22/07/19	P-24/07/19			T- 24/07/19	P-25/07/19			T-31/07/19	P-02/08/19	T-20/08/19	P-22/08/19			T-21/08/19	P-22/08/19						
C1																						
Date																						
C2	MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 12/07/19 P- PD&PSD 12/07/19			MC&PI/PD&PSD/ DD&MC	P Sh-50 P-PI 22/07/19 P- PD&PSD 08/08/19			MC&PI / DD&MC	P Sh-58 P-PI 25/07/19	MC&PI 18/07/19 &26/07/19/PD&PSD/DD&MC	P Sh 54 P-PI 09/08/19 P-PI 05/09/19 P-PD&PSD 09/09/19			MC&PI / PD&PSD/ DD&MC	P Sh-50 P-PI 05/09/19 P-PSD&PD 09/09/19						
Date	T-19/06/19	P-21/06/19			T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19	T- 26/07/19	P-29/07/19			T-29/07/19	P-30/07/19						
C3	MC&PI/PD&PSD/ DD&MC	P Sh-82 P-PI 22/07/19 P- PD&PSD 02/08/19	MC&PI/PD&PSD/ DD&MC	P Sh-55 *P-PI 22/07/19* P- PD&PSD 02/08/19	MC&PI / DD&MC	P Sh-57 P-PI 22/07/19			MC&PI/ DD&MC	Sh-65 P-PI 22/08/19	MC&PI /PD&PSD/DD &MC	P Sh 54 P-PI 05/09/19 T-PD&PSD			MC&PI /PD&PSD/DD& MC/DD&MC	P Sh 66 P-PI MC16.5% 05/09/19 P-PD&PSD 09/09/19			MC&PI/ PDS&PD/ /DD&MC	P Sh-80 T-PI T-PSD&PD	
Date	T-19/06/19	P-21/06/19	T-28/06/19	P-01/07/19	T-03/07/19	P-04/07/19			T-15/07/19	P-16/07/19	T- 25/07/19	P-26/07/19			T- 05/08/19 T-12/09/18	P-06/08/19 P-13/09/19			T-27/08/19	P- 29/08/19		
C4	MC&PI / DD&MC	P Sh-95 P-PI 22/07/19			MC&PI / /PD&PSDDD &MC	P Sh-68 P-PI 22/07/19 P-PD&PSD 02/08/19			MC&PI /PD&PSD/DD &MC	P Sh 50 P-PI 05/09/19 T-PD&PSD	MC&PI /PD&PSD/DD &MC	P Sh 56 P-PI 05/09/19 P-PD&PSD 09/09/19			MC&PI/ PDS&PD/ /DD&MC	P Sh-76 P-PI 05/09/19 T-PSD&PD			As C3L6	As C3L6		
Date	T-28/06/19	P-01/07/19			T-03/07/19	P-04/07/19			T- 16/07/19	P-17/07/19	T- 05/08/19	P-06/08/19			T-08/08/19	P- 09/08/19			T-27/08/19	P- 29/08/19		
C5	MC&PI/PD&PSD/ DD&MC	P Sh-62 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/PD&PSD/ DD&MC	P Sh-78 P-PI 22/07/19 P- PD&PSD 02/08/19			MC&PI/ DD&MC	Sh-60 P-PI 22/08/19	As D5L3	As D5L3			MC&PI /DD&MC	P Sh-89 P-PI 05/09/19						
Date	T-01/07/19	P-02/07/19			T-02/07/19	P-03/07/19			T-12/07/19	P-16/07/19	T- 17/07/19	P-19/07/19			T-31/07/19	P-02/08/19						
D1																						
Date																						
D2	MC&PI / DD&MC	P Sh-50 P-PI MC29.5% 22/07/19			MC&PI / PD&PSD/DD &MC	P Sh-60 P-PI 25/07/19 P-PD&PSD 09/08/19			As D3L3	As D3L3	MC&PI /DD&MC	P Sh-62 P-PI 05/09/19			MC&PI /DD&MC	P Sh-70 P-PI 05/09/19						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			T-29/07/19	P-30/07/19						
D3	MC&PI / DD&MC	P Sh-62 P-PI 22/07/19			MC&PI /DD&MC	P Sh-80 P-PI 25/07/19			MC&PI / PD&PSD/DD &MC	P Sh-55 P-PI 22/08/19	MC&PI PD& PSD/DD&MC	P Sh-62 P-PI 05/09/19			MC&PI /PSD&PD/DD& MC	P Sh-56 P-PI 05/09/19	DD&MC	P-sh-75	MC&PI /DD&MC	P Sh-78 T-PI		

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										P-PD&PSD 22/08/19		P-PSD&PD 05/09/19				P-PD&PSD 09/09/19						
Date	T-05/07/19	P-08/07/19			T-09/07/19	P-11/07/19			T-15/07/19	P-16/07/19	T-18/07/19	P-19/07/19			F-06/08/19	F-07/08/19	F-07/08/19	F-09/08/19	T-22/08/19	P-23/08/19		
D4	MC&PI / DD&MC	P Sh-74 P-PI MC26.9% 30/07/19 P-PD&PSD 08/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-65 P-PI MC26.2%30/07 /19 P-PD&PSD 22/08/19			MC&PI/ PD&PSD/DD &MC	P Sh-52 P-PI 05/09/19 P-PD&PSD 05/09/19	MC&PI/DD& MC	P Sh-80 P-PI 05/09/19			MC&PI / PD&PSD/DD& MC	P Sh-100 F-PI MC 20.7% T-PD&PSD	MC&PI /DD&MC	P Sh-105 T-PI				
Date	T-10/07/19	P-11/07/19			T--12/07/19	F-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			F-07/08/19	F-09/08/19	T-22/08/19	P-23/08/19				
D5	MC&PI / PD&PSD/ DD&MC	P Sh-60 P-PI 30/07/19			MC&PI/DD& MC	P Sh-79 P-PI MC27.5%30/07 /19			MC&PI/DD& MC	P Sh-64 F-PI MC 26.4% 05/09/19	As D4L4	As D4L4			MC&PI /DD&MC	P Sh-83 P-PI 05/09/19						
Date	T-10/07/19	P-11/07/19			T--12/07/19	P-14/07/19			T--17/07/19	P-19/07/19	T--30/07/19	P-02/08/19			T-08/08/19	P- 09/08/19						
E1																						
Date																						
E2	PD&PSD As E3L1	P- PD&PSD 06/08/19 As E3L1			MC&PI/ DD&MC	P Sh-68 P-PI 25/07/19			As E3L3	As E3L3	MC&PI/ DD&MC	P Sh-62 P-PI 25/07/19			As E3L4	As E3L4						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-26/07/19	P- 29/07/19			T-29/07/19	P-30/07/19						
E3	MC&PI/ DD&MC	P Sh-55 P-PI 22/07/19			MC&PI/ DD&MC	P Sh-54 P-PI 25/07/19	DD&MC	P Sh-72	MC&PI/PD&P SD/DD&MC	P Sh-52 P-PI 05/09/19 P- PD&PSD 05/09/19	MC&PI/ DD&MC	P Sh-85 P-PI 05/09/19			MC&PI/ DD&MC	P Sh-67 P-PI 05/09/19						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19	T-09/07/19	P-11/07/19	T-16/07/19	P-19/07/19	T-29/07/19	P-30/07/19			T-05/08/19	P- 06/08/19						
E4	MC&PI/DD& MC	P Sh-52 P-PI 22/07/19			MC&PI/PD& PSD/DD&MC	P Sh-78 F-PI MC-18.8% 25/07/19 P- PD&PSD 09/08/19			MC&PI/ DD&MC	P Sh-58 P-PI 05/09/19	MC&PI/PD&P SD/ DD&MC	P Sh-105 P-PI 05/09/19 P-PSD&PD 05/09/19	DD&MC	P Sh-55	MC&PI/ PSD&PD/ DD&MC	P Sh-74 T-PI T-PSD&PD						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P- 23/08/19						
E5	As E4L1	As E4L1			As E4L1	As E4L1			As E4L3	As E4L3	As E4L4	As E4L4	As E4L4	As E4L4	MC&PI/ DD&MC	P Sh-74 P-PI 05/09/19						
Date	T-04/07/19	P-05/07/19			T-08/07/19	P-09/07/19			T-16/07/19	P-19/07/19	T-30/07/19	F-02/08/19	T-05/08/19	P-06/08/19	T-22/08/19	P-23/08/19						

T- Test P- Pass F- Fail

MC&PI-	Water content & Atterberg 1/250m3	(1 per Cells/layer)
PD&PSD -	Particle Density & Particle Size Distribution 1/500m3	(1 per 2 Cells/layer)
Sh-	Shear vane 3/250m3 – (minimum value presented)	(3 per Cells/layer)
DD&MC -	Dry density & Moisture content 1/250m3	(1 per Cells/layer)
Permeability triaxial cell – 1/2000m3		(1 per 10 Cells/layer)

1/4 bag at deposit
1/2 bag at deposit
Record
Core (1No)
Core (1No)

T-04/07/19 – Tests completed this week
T-PI – Awaiting test results
F- 05/07/19 Non-Compliant
P- 05/07/19 Result determined acceptable by the CQA Engineer
Where the tests were combined over several smaller grids, a note added to table to refer to associated tested grid, e.g. 'as B2L1'. These are within the CQA plan sampling frequency requirements within table 4.1.

Permeability

Grid Ref	***Result – K_y at 20°C***	***Date Sampled***	***Comments***	***Date Sampling complete***
A4L-1	$4.0x10^{-11}$ m/s	22/05/19	Pass	17/06/19
B2L1	$1.0x10^{-10}$ m/s	06/06/19	Pass	09/07/19
D2L-1	$7.5x10^{-11}$ m/s	21/06/19	Pass	02/08/19
B2L3	$6.2x10^{-11}$ m/s	*26/06/19*	*Pass*	02/08/19
A4L2	$1.4x10^{-11}$ m/s	*01/07/19*	*Pass*	02/08/19
E3L1	$7.2x10^{-11}$	*04/07/19*	*Pass*	*06/08/19*

	m/s			
A3L4		*23/07/19*		
B4L4	$7.8x10^{-11}$ m/s	*24/07/19*	*Pass*	*05/09/19*
D4L4		*01/08/19*		
D4L5		*08/09/19*		
A3B1		*29/08/19*		
C3L5		*12/09/19*	*Dug out L6*	

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Bund

Layer	Ref	Date	Pass/Fail
E3B2	MC&PI/ DD&MC	27/08/19	P-Sh 54 P- DD&MC 29/08/19 T- MC&PI
E3B4	DD&MC	29/08/19	P-Sh 60 P- DD&MC 30/08/19
E3B6	MC&PI/PD&PSD/ DD&MC	30/08/19	P-Sh 50 P- DD&MC 02/09/19 T- MC&PI T- PD&PSD
E3B8	MC&PI/ DD&MC	02/09/19	P-Sh 68 P- DD&MC 04/09/19 T- MC&PI
E3B10	MC&PI/ DD&MC	03/09/19	P-Sh TBA P- DD&MC 06/09/19 T- MC&PI
E3B12	MC&PI/ DD&MC	05/09/12	P-Sh 100 P- DD&MC 06/09/19 T- MC&PI
D5B1	MC&PI/PD&PSD/ DD&MC	28/08/19	P-Sh 74 P- DD&MC 28/08/19 T- MC&PI T- PD&PSD
D5B2	MC&PI/PD&PSD/ DD&MC	29/08/19	P-Sh 80 P- DD&MC 30/08/19 T- MC&PI T- PD&PSD
D5B3	MC&PI/ DD&MC	30/08/19	P-Sh 95 P- DD&MC 02/09/19 T- MC&PI
D5B4	MC&PI/ DD&MC	03/09/19	P-Sh 65 P- DD&MC 06/09/19 T- MC&PI
D5B5	MC&PI/ PD&PSD/ DD&MC	06/09/19	P-Sh 120 P- DD&MC 09/09/19 T- MC&PI T- PD&PSD
D5B6	DD&MC	09/09/19	P-Sh 120 P- DD&MC 10/09/19
D5B7&8	MC&PI/ DD&MC	12/09/19	P-Sh 80 P- DD&MC 13/09/19 T- MC&PI
A3B1	MC&PI/ DD&MC	29/08/19	P-Sh 80 P- DD&MC 30/08/19 T- MC&PI
A3B2	MC&PI/ PD&PSD/ DD&MC	02/09/19	P-Sh 68 P- DD&MC 04/09/19 T- MC&PI T- PD&PSD
A3B3	MC&PI/ DD&MC	03/09/19	P-Sh 74 P- DD&MC 04/09/19 T- MC&PI
A3B4	MC&PI/ DD&MC	05/09/19	P-Sh 90 P- DD&MC 06/09/19 T- MC&PI
A3B5	MC&PI/ DD&MC	06/09/19	P-Sh 90 P- DD&MC 09/09/19 T- MC&PI
A3B6	DD&MC	09/09/19	P-Sh 130 P- DD&MC 10/09/19
A3B5	MC&PI/ DD&MC	12/09/19	P-Sh 62 P- DD&MC 13/09/19 T- MC&PI

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Appendix 2 - Test Results - Permeability Tests

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Appendix 3 - Moisture content/dry density for Compaction

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4316**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**09/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-B6-C1	Core 2 A3-B6-C1			
Bulk Density	2.04	2.07			
Moisture Content	21	21			
Dry Density	1.68	1.71			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	1.4	0.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 10/09/2019
			R Anstee, Materials and Field Testing Director	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4377**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**12/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-B8-C1	Core 2 D5-B8-C1	Core 3 C3-L5-C1		
Bulk Density	2.07	2.02	2.06		
Moisture Content	21	24	21		
Dry Density	1.72	1.63	1.70		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	0.1	0.2	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 13/09/2019	Fig

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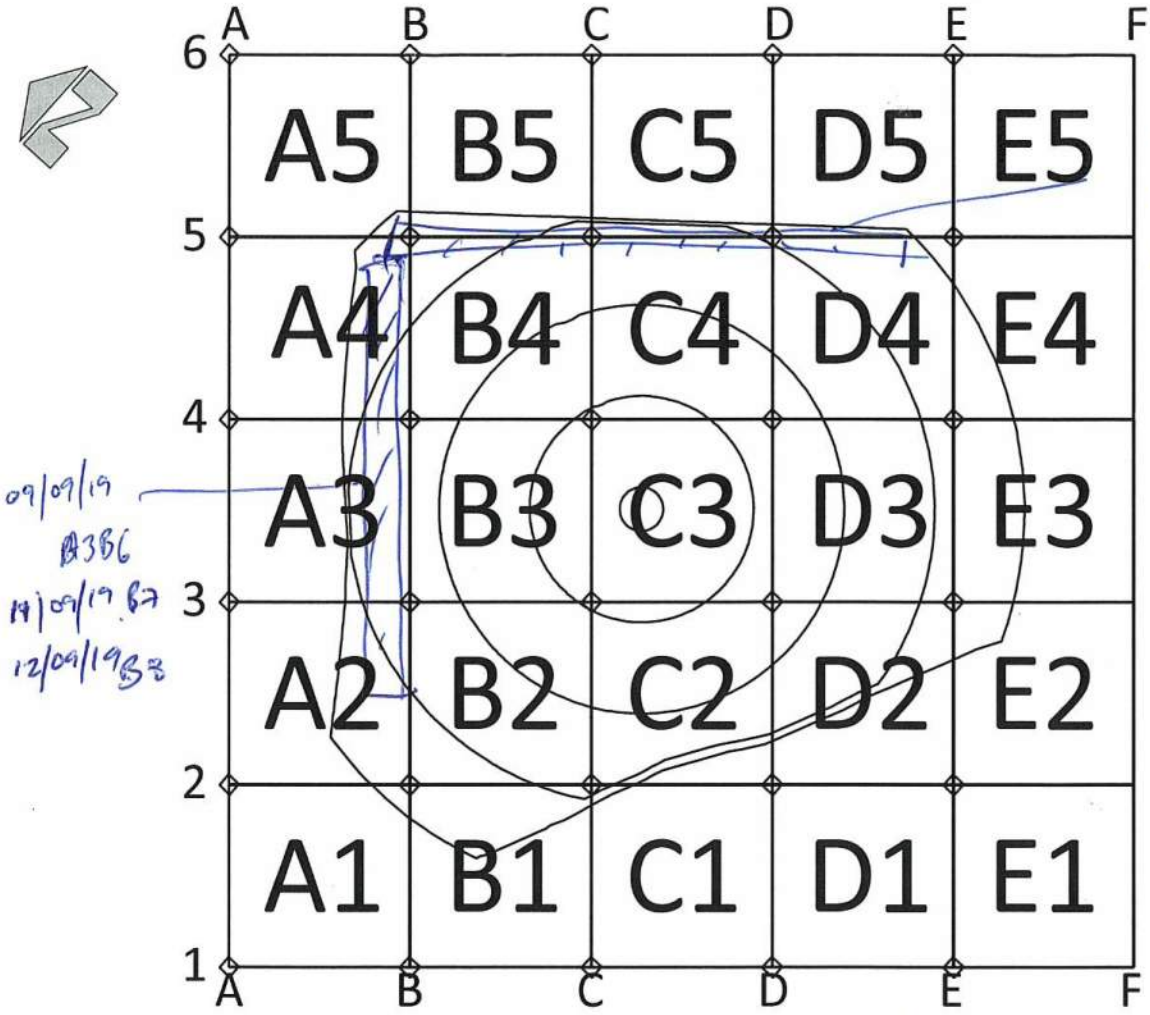
Appendix 4 – Field Logs



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 15/09/19
Plant 2x 5CB 1x Roller 1x Dozer 1x Bowser 2x Dumper	Weather: WEEKEND SUNNY MON - OVERCAST x SHOW TUES - SHOWERS WED - ARM NIGHT RAIN	THUR - RAIN AM to 8am FINE PM. RAIN @ 10:00
Testing MON / THURSAM	Visitors	

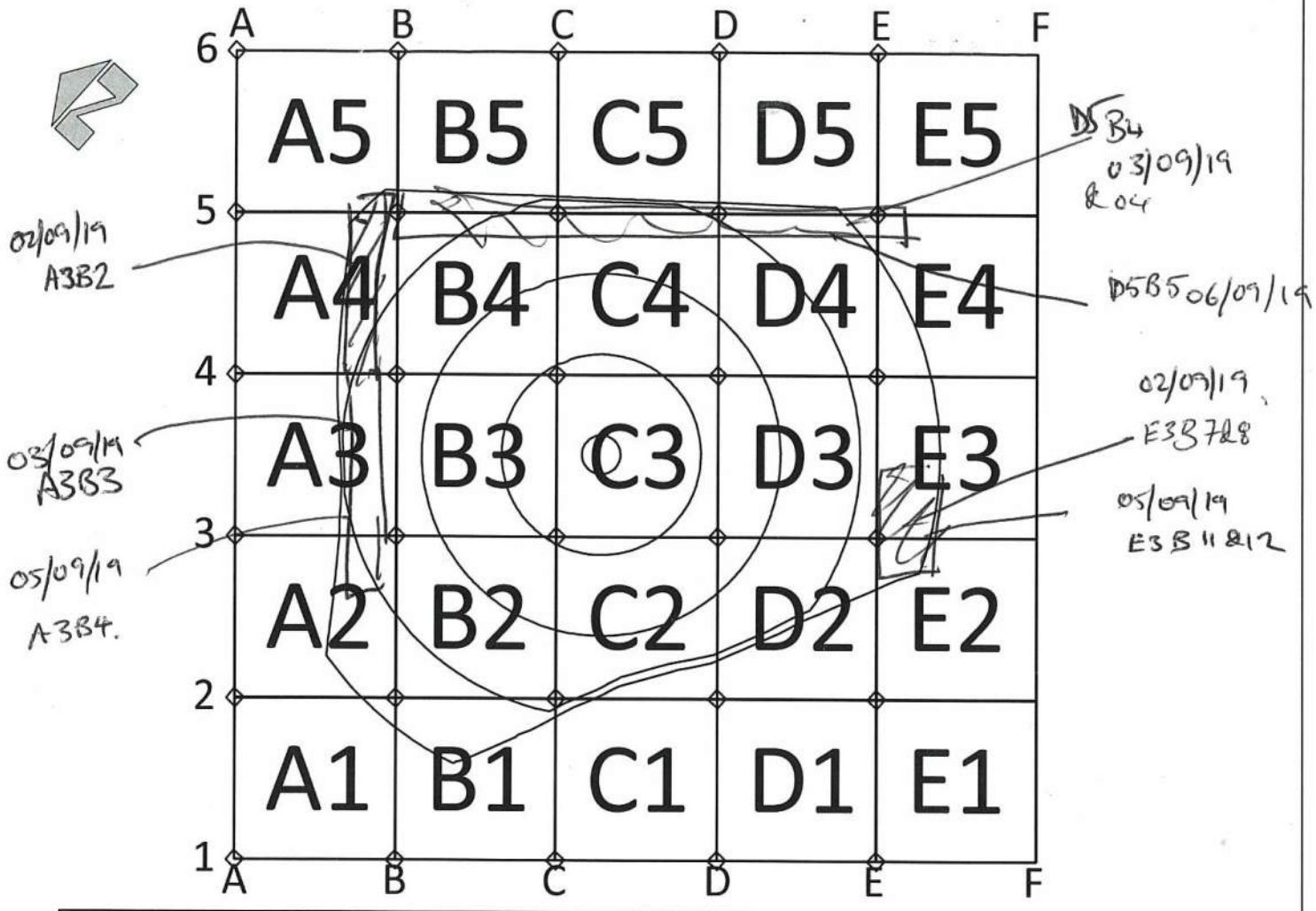
09/09/19 - A3B6 — ✓ No bags using water from batter.
D5B6 — ✓

10-11 - Shaping batters

12/09/19. A3B7 & 8 - (PI+MC) 119/62/81
A5B5
D5B7 & 8 - (PI+MC) 80/100/102
D5B5
CORE + C3L5 + (PERM) -

3

WORKS COMPLETE.



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 08/09/19
Plant: 2x JCB 1x ROLLER 1x DOZER 1x BOBCAT 2x DUMPER	Weather: SUNNY WEEKEND (COOLER) MON - SUNNY 10:45 light showers 11:10am TUES - SUNNY WED - SUNNY. THURS - SUNNY FRI - OVERCAST/clouds & SHOWERS.	
Testing NONE(MON), TUES(TEST) WED(NOTEST) THURS(TEST) FRIDAY(TEST)	Visitors NONE.	

02/09/19 E3B7&8 - (PI+MC) = 125/135/74 ✓

(LACK OF CLAY DELAY) (LIGHT SHOWER @ 10:45 ~~delay~~ 11:10) A3B2 (PI+MC) (PSD+PD) = 72/72/68 ✓

03/09/19 (Lack of Clay (7:30-9am - clay deliveries 9am

A3B3 - (PI+MC) = 97/74/150 ✓

D5B4 - (PI+MC) = 65/110/120 ✓

E3B9&10 - [EXISTING MATERIAL PULLED TO TOP & Rolled] - (PI+MC) = 108/58/80 ✓

04/09/19 - (CONTINUES BUND E5 TO A5.)

05/09/19 - 8x. 9:45am clay delay delivery

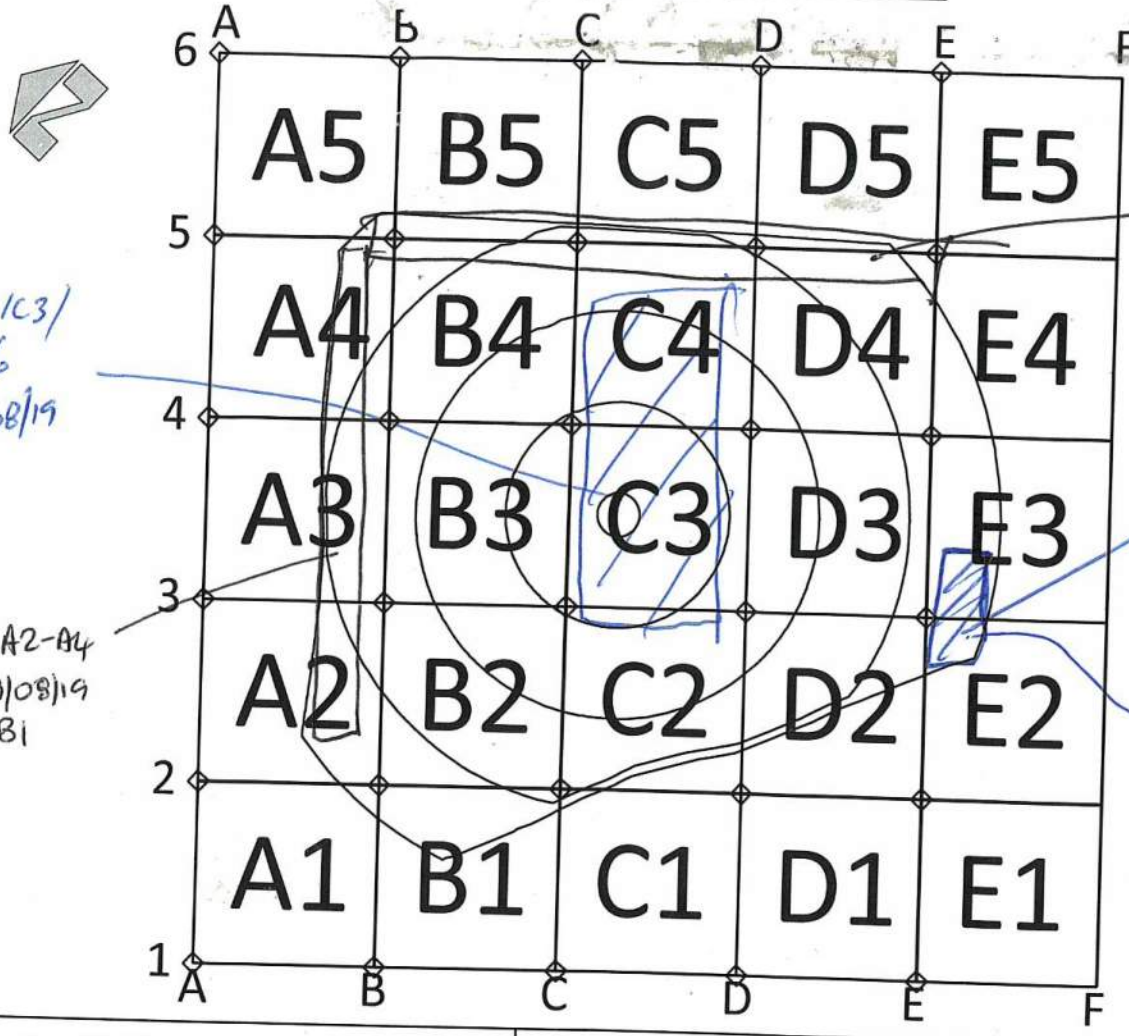
~~A3B4~~ (PI+MC) (PSD+PD) = 105/90/110 ✓

E3B11&12 (PI+MC) = 105/120/100 ✓

06/09/19 - A3 B5 - (PI+MC) = 130/120/90 ✓

D5 B5 - (PI+MC) + (PSD+PD) = 150/125/120 ✓

70/192-28



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 01/09/19
Plant 2×SLB 1×ROLLER 1×DOZER 1×BANGER 2×BUMPER	Weather: WEEKEND (SUNNY & DRY) TUES - AM SUNNY WED - SUNNY AM & RAIN PM.	THURS - SUNNY AM - PM FRI - SUNNY AM
Testing (NONE) TUES, TEST WED, TEST THURS, TEST FRI.	Visitors AIDEN 27/08/19 @ 1500. + 28/09/19 10am - 1300 IAN FASCIATOR 28/08/19 @ 1400 - 1530	[BUNK HOL MONDAY]

27/08/19 - Make up @ B3 & B2 + ~~LEVEL FINAL CHECK~~

MAKE UP C4L6 & C3L6 - (PI + MC)(PSD+PD) 80/90/108
Following NDT removal for wet day & some bund.

E3B2 E3 BUND L2 - (2 layers) (PI+MC.) 98/69/54

28/08/19 - LEVEL SURVEY MAKE UP AREA B4 80mm increase

D5B1 Layer 1 BUND D5 to A5 - (PSD+PD) + (PI+MC) 102/108/74

~~Layer 1 Bund A5 to A1 - (PI+MC).~~

→ Amendment agreed to Bund @ E3 - utilising existing mtrl to form Bund profile i.e. and pushed back to 6m from EXISTING ALIGNMENT with TIE-IN to EXIST 3M HEIGHT. // Bund A1 to A4 re confirmed (work stopped due to rain @ 14:30)

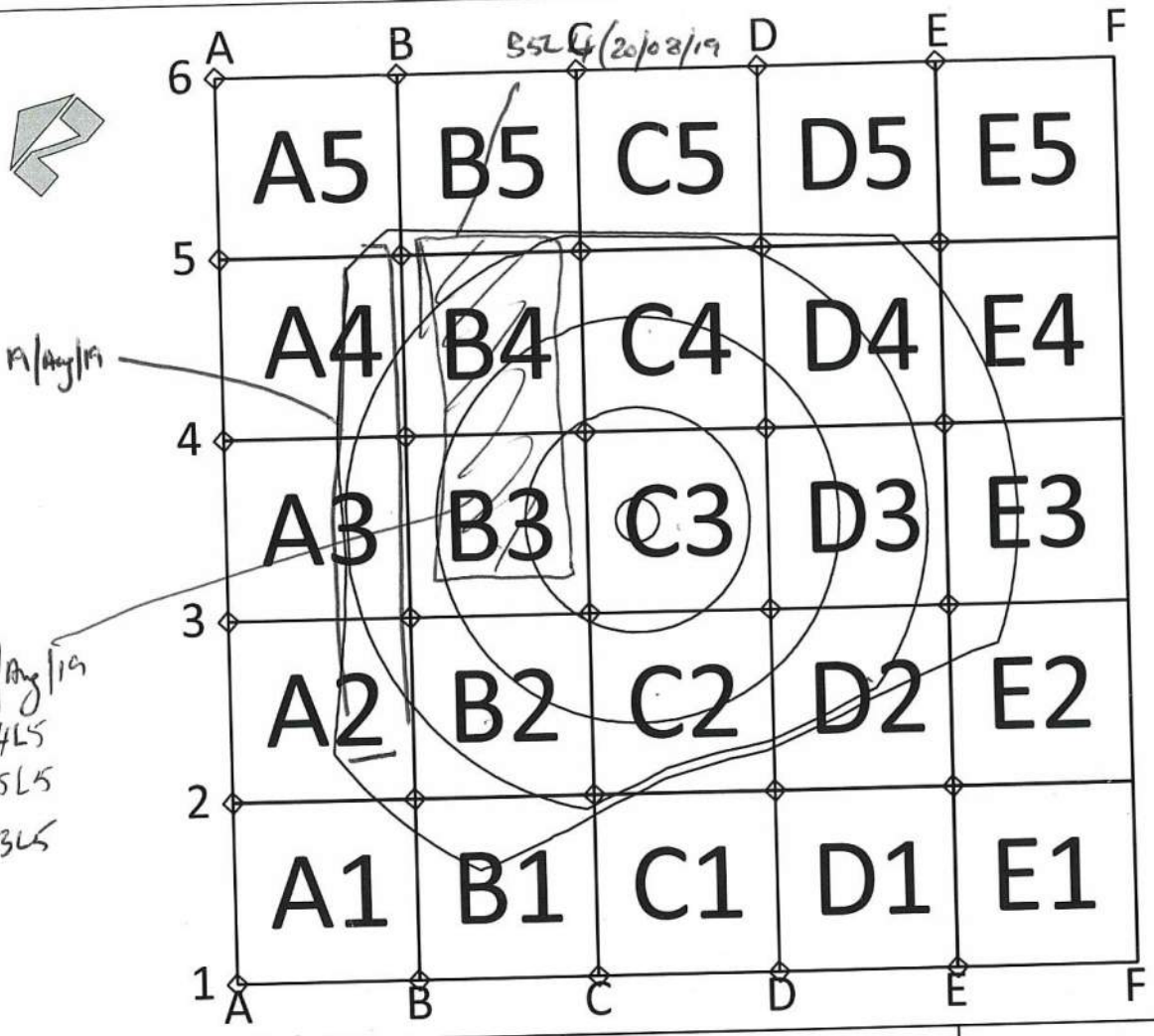
29/08/19 - A5 to E5 (D5B2) - (PI+MC)(PSD+PD) - 80/90/100

E3 to E3B3&4 - ↑ AS (D5B2) - 70/75/60

A2 to A4 A3B1 - (PI+MC) - 150/90/108 [PERM]

30/08/19 - E3B5&6 - (PI+MC) + (PSD+PD) - 120/80/50.

A5 to E5 (D5B3) - (PI+MC) - 105/95/115



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 25/08/19
Plant: 2x JCB 1x Roller 1x Auger 2x 9T Dumper 1x Bowser	Weather: HEAVY RAIN & POOR VISIBILITY MONDAY - Light Showers & SUNNY. TUES - Sunny light showers WED - SUNNY. THUR - SUNNY FRI - SUNNY.	
Testing MON (NONE) TUES (NONE) WED (TEST) THUR (TEST) FRI (NONE)	Visitors : LITTER PICKER - TUESDAY 22/08/19	

→ HEAVY RAIN 12-18 AUG MONDAY
19/Aug/19 - STANDING WATER (TO REMOVE WET AREA TO LAY BUND)
→ REMOVE & RETEST (D3L5 & D4L5.)

(A4 - A1) Bund base Prepare Batter.

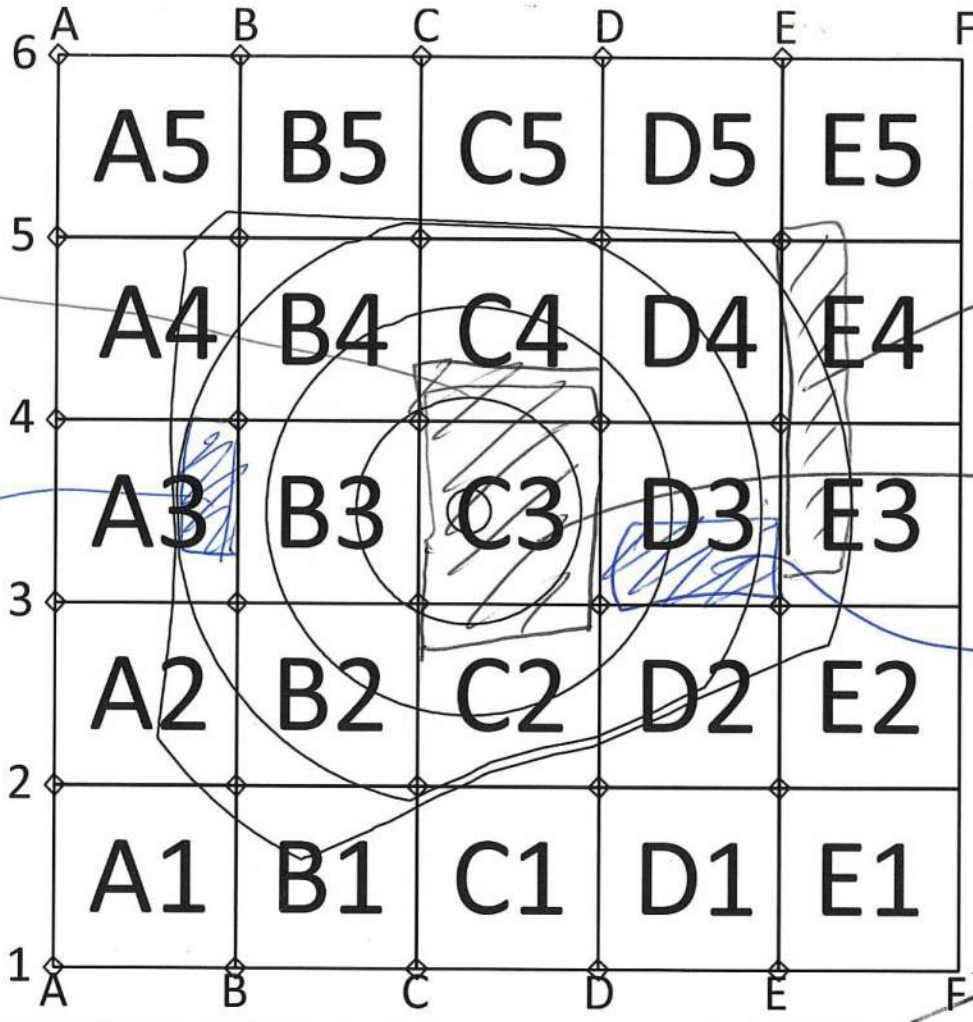
20/08/19 A4L5 20/08/19 (PI + MC) - 64/60/50
B5L4 - 20/08/19 (PI + MC) - 100/88/74

21/08/19 B4L5 - (PI + MC) (DS + D) - 105/82/100
B3L5 - (PI + MC) (DS + D) - 85/60/54
B5L5 - (PI + MC) - 80/85/100
~~C4L6 - (PI + MC)~~

22/08/19 D3L5 - ~~RETEST (PI + MC)~~ (PI + MC) - [Cut in side of Cove from Stone] 78/92/90
D4L5 - - (More Gravel) 105/13/105
E4L5 - (PI + MC) (DS + D) - (74/8?/??)
E5L5 - (PI + MC) - (Larger Rock) (98/74/98)

23/08/19 - Make up in D4 & D3 & C4/C3

ACTUAL 10 PERMS FOR AREA. = 9 GRIDS X 5 = 1 PER 10 = 5 PERMS M



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 11/08/2019
Plant: 2×JCB 1×Roller 1×Dozer 2×9T Dumper 1×Bogie	Weather: MON - FINE HEAVY RAIN WEEKEND (SOME RAIN NONE ON CLAY) TUES - SUNNY (RAIN OVER NIGHT NONE ON PAN) WED - SUNNY THUR - SUNNY FRI RAIN & Heavy rain over night	
Testing: MON TUES (NONE WED), THURS.	Visitors: IAN FISHER - TUES 06/Aug/19	

MON 05/Aug/2019 - E4L4 & E5L4 - Remediation - 55 98 65
C3L5 - (PI + MC) + (PSD+PD) 91 75 66
C4L4 - (PI+MC) + (PSD+PD) 120 56 65
E3L5 ~~E~~ (PI+MC) 89 84 67

TUES 06/Aug/2019. D3L5 (PI+MC) (PSD+PD) - 64 67 56 + ~~PERM~~ x2 TO RIP & REPLACE
A3L5 (PI+MC) - 65 68 70 (8 Mucus)

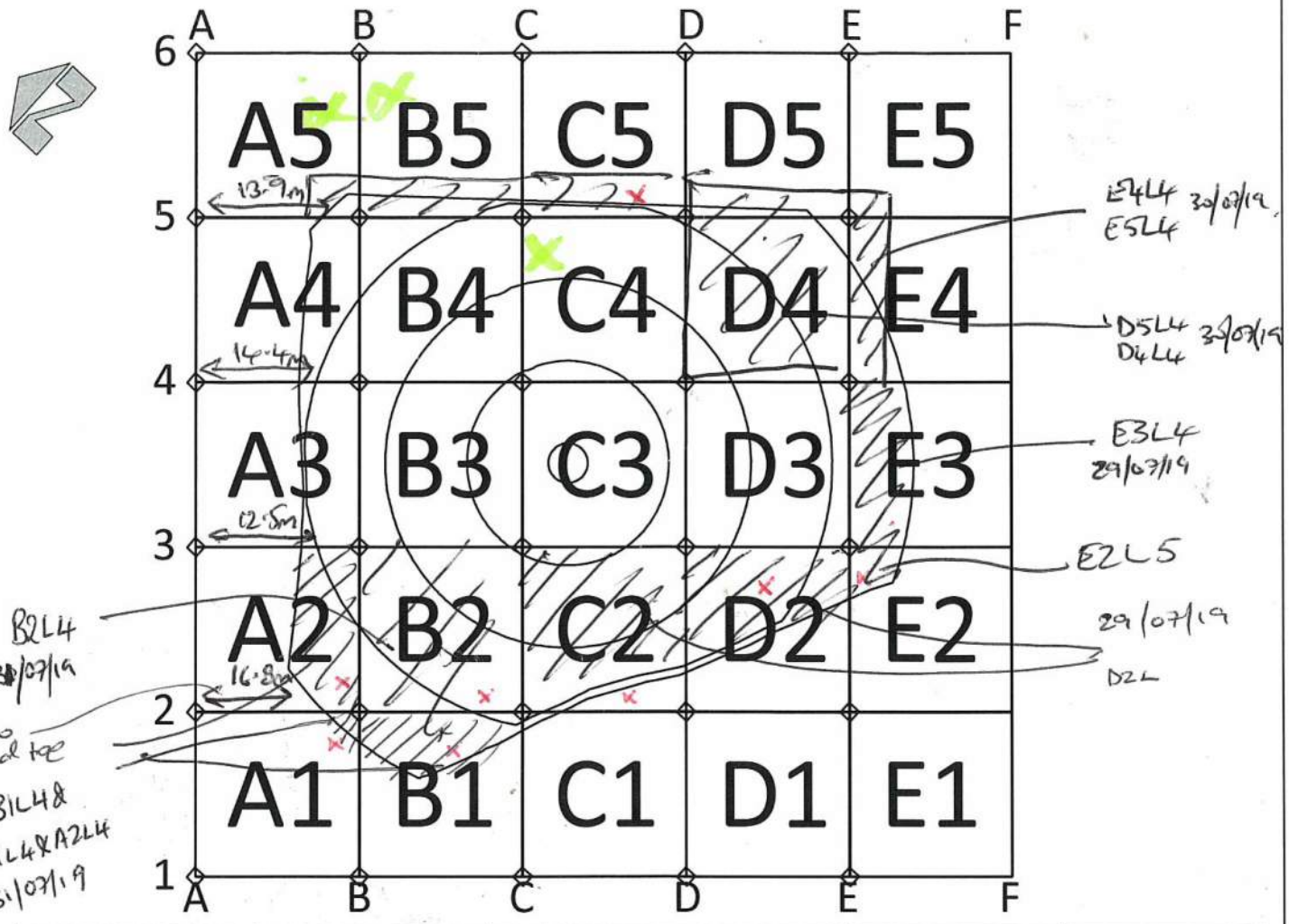
WED 07/08/19 - (*) D4L5 (PI+MC)(PSD+PD) - 100 132 100
(*) D3L5 - RETEST - - 75 81 79

DELETED PERMS

Clay slow for delivery anticipate) the order 7500 TONS required
@ 28 TON PER Truck 270 Trucks = 10 days @ 26 Truck/day ! (only 2 by 10:30am)
- Called Aiden to attend site for levels Monday (NOTE the LEVEL IN E3)

THURS 08/08/19 - C4L5 (PI+MC)(PSD+PD) - 79 85 71
D5L5 (PI+MC) 95 83 87

FRI - Heavy Rain over night NO work on Clay. Delivery continue.
NOTE RECONDITION D4L5 & D3L5



Phase 2 Cell 4C Clay Lining Works 2019		Originator: WW	Date: W/E
Plant	2x JCB 1x Roller 1x 902or 2x 9T Dumpers 1x Bowser	Weather: Sunny over weekend MON: Sunny TUES - Showers AM PM Rain	WED - Fine Sunny THUR - Fine Sunny FRI. - Sunny
Testing	MON / ~~TUES~~ THURS, FRI.	Visitors	Aiden (NCC) - Wednesday 31/07/19 set out grids A, B, C & breakpoint.

MON 29/07/19 - D2L5 - (PI+MC) (110/120/70)

C2L5 - (PI+MC) (PSD+PD) 50/51/118

(E2L5 ~~E2L5~~) & E3L4 - (PI+MC) 85/90/100

TUES 30/07/19 - E4L4 & E5L4 - (PI+MC) (PSD+PD) • 105/120/110 ~~Rejected~~

D5L4 & D4L4 - (PI+MC) ( ) • 85/80/96 Perm x2

WED 31/07/19 - C5L5 - (PI+MC) • 99/140/150

A5L3 B5L3 - (PI+MC) (PSD+PD) • 90/85/70.

A1L4/A2L4/B1L4 - (PI+MC) ~~(PSD+PD)~~ • 150/120/112

B2L4 (PI+MC) (PSD+PD) • 125/127/110

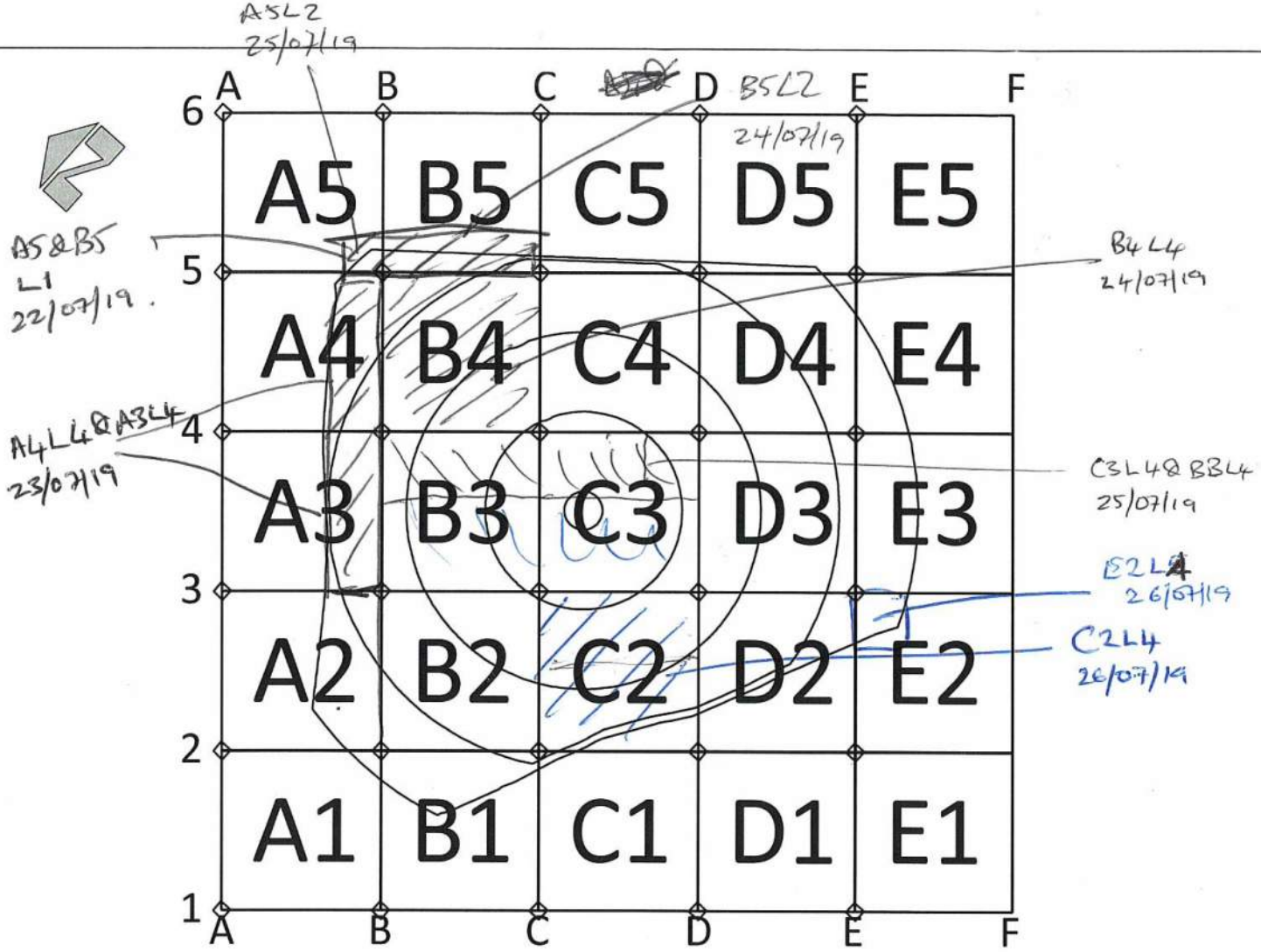
THURS - 01/08/19 ~~B1L5~~ + B2L5 (PI+MC) • 75/90/63 (Clay delivered @ 5.45pm)

A1L5 & A2L5 (PI+MC) (PSD+PD.) • 85/90/75

FRI - 02/08/19.

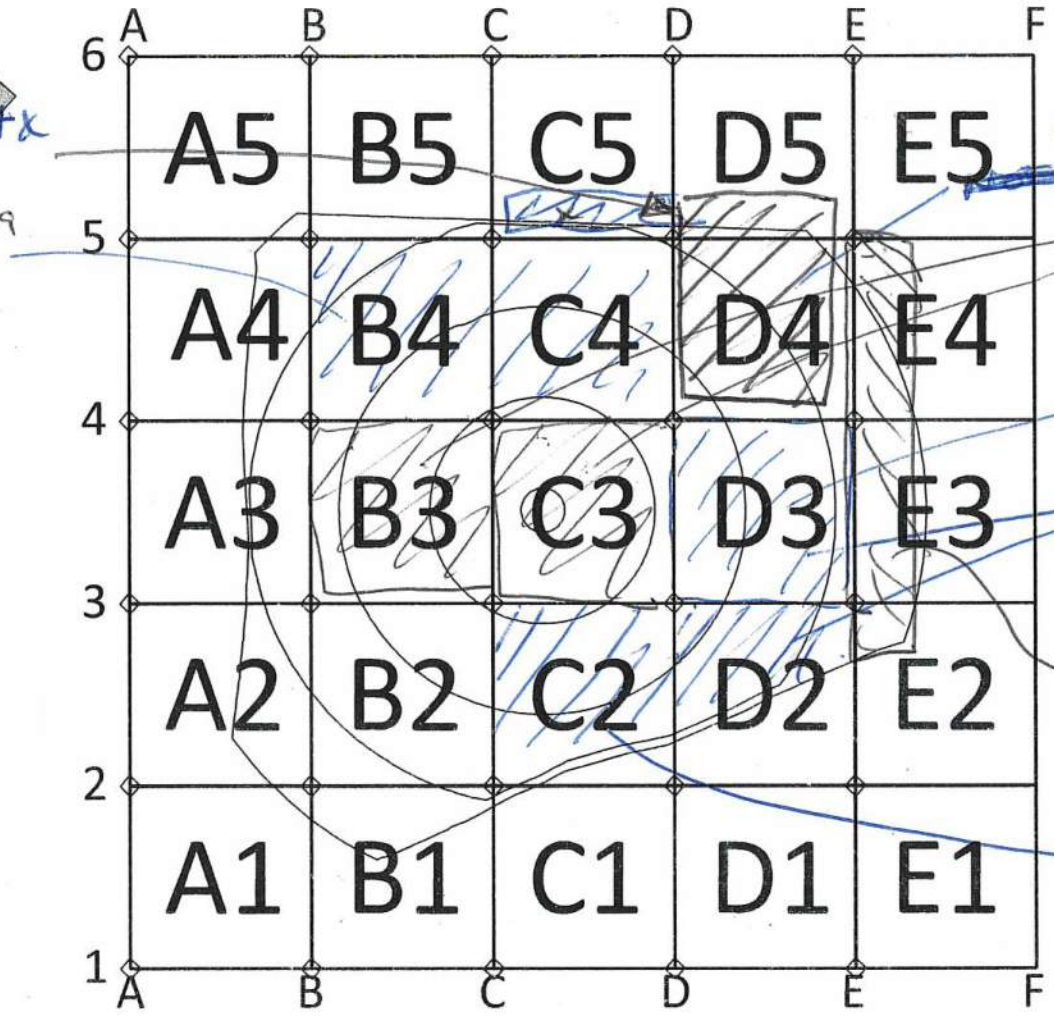
- Core required @ B2 & A2 due to storm & Clay

13x5 = 65/10 = 7 Perms



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 28/07/19
Plant: 2x JCB 1x Roller 1x Dozer 2x 9T Dumpers 1x Bowser	Weather: HEAVY RAIN OVER WEEKEND - NON-FORECAST DRY. TUES - SUNNY AM & PM WED - STORM OVER NIGHT (DRY AM	
Testing - NONE MADE / TUES	Visitors Aidan - 1:30pm 22-07-19 Aidan 10-1500 - 25/07/19 survey levels	

24/July/19 (CORE C2L4) + NEED PERM! [CHECK B2&B1L4??] ~~MEETING + SHOWN WHERE IS JULY 19~~
No Clay too wet to lay AM (Aidan Survey A5&B5
A5&B5 L1 - (PI+MC) - 62/54/60 ✓
23 July 2019 - A4L4 - (PI+MC) - 68/60/102 ✓
A3L4 - (PI+MC) - 60/65/72 ✓ + PERM x2
24 July 2019 - TOO WET TO LAY CLAY + 10am - WORK ON REMOVAL OF SOFT MATL IN C3&C4
B4L4 - (PI+MC) + (PDS+PD) - 50/54/56 + PERM x2
~~B5~~ B5L2 (PI+MC) - 65/70/61
25 July 2019 - ~~A5~~ L2 (-) 58/50/72
C3L4 (PI+MC) + (PDS+PD) 60/55/54
B3L4 (PI+MC) ~~(PDS+PD)~~ 58/62/65
26/July 2019 C2L4 (PI+MC) (PDS+PD) 54/82/72
E2L4 (PI+MC) 68/62/76 ~~E4~~



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 21/07/19
Plant: 2x JCB 1x DUMPER 1x ROLLER 1x BOWSER (1 BROKEN DOWN)	Weather: WEEKEND - SUNNY DRY THURS - OVERCAST DRY. MON - SUNNY FRI - RAIN ALL DAY TUES - SUNNY WED - AM SUNNY & PM	
Testing: MON/TUES/~~NONE~~ WED (CRAIN SICK)/THURS NON & FRI WET	Visitors WATER STM MON. 15/07/19 @ 10AM - 1230pm. • 17.07.19 10AM to 1300 Aden (NCC) attend survey GRID E2/E3 [TRAVEL TO COUNCIL OFFICE 17/07/19 FOR FINAL COVERS]	

15 July 2019 – STORE LOADED OFF PAN FRIDAY & TODAY to avoid traffic conflict

(D2L3) + D3L3 (PI+MC)(PD+PSD) – DD&MC ✓ 55 - 23/25. (27)

→ TEST (C5L3) FROM LAST WEEK. – DD&MC ✓65 2 WORKS ← High moisture (CORE 1)

C3L3 (PI+MC) – DD&MC ✓60

B3L3 (PI+MC)(PD+PSD) – DD&MC ✓65

16 July 2019 – B4L3 – (PI+MC) – 60/72/52 (26/25) PASS

C4L3 – (PI+MC)(PD+PSD) 50/52/52

E5L3 ~~& E4L3~~ – (PI+MC) → 80/109/58

* E3L3 ~~& E2L3~~ – (PI+MC)(DS+D) → 125/52/115

WED 17 ~~JULY~~ 2019 ~~C5L4~~ D5L3 (PI+MC) → 70/78/~~64~~

D4L3 ~~E4L4 D6L3~~ (PI+MC)(DS+D) → 95/88/52

18 JULY 2019 || D3L4 (PI+MC)(DS+D) → 62/80/92

D2L4 (PI+MC) → 69/70/62

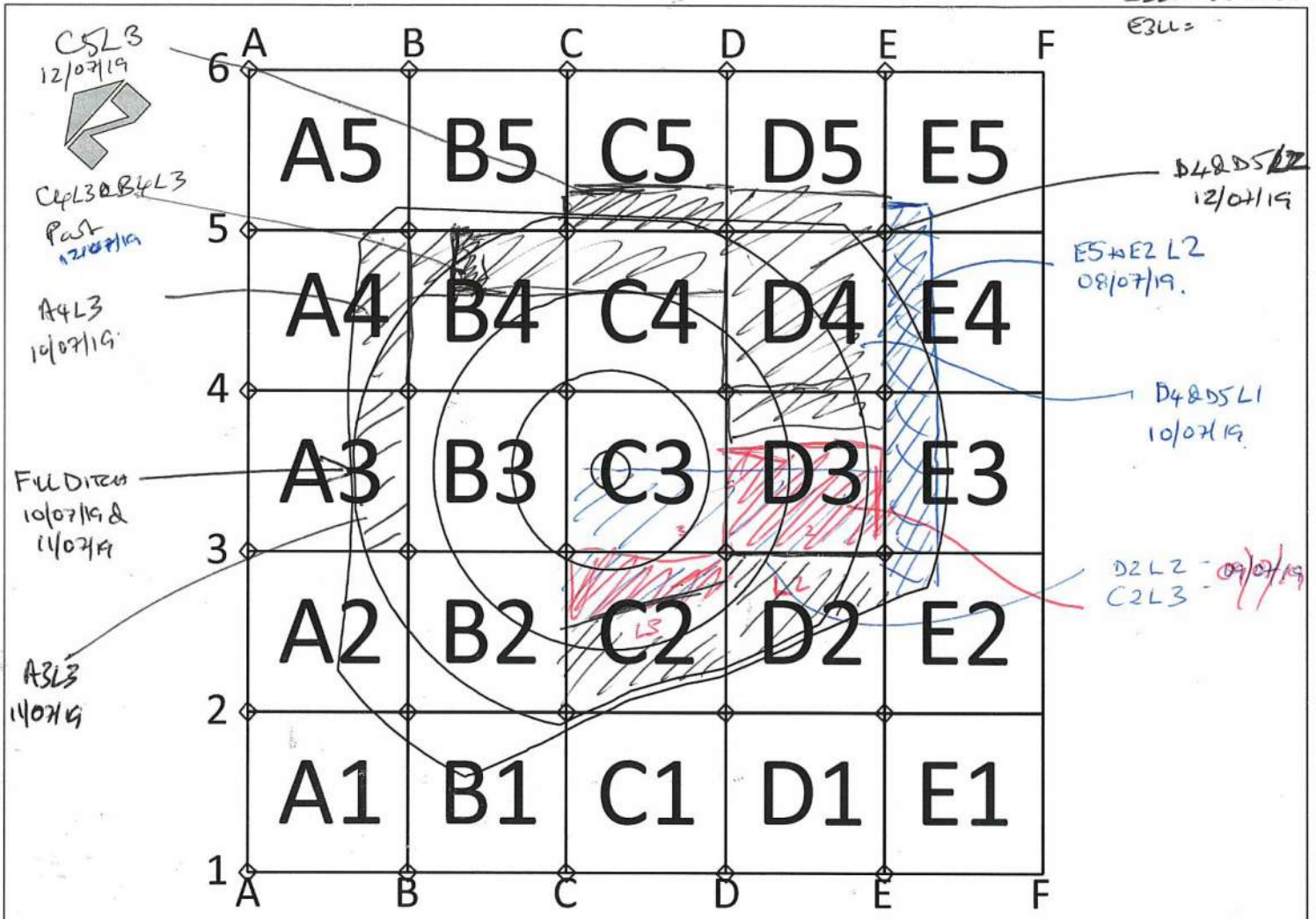
C2L4 – (PI+MC) ✓

19 JULY 2019 – NO ~~JOBS~~ CLAY RAIN. – WORK ON SOFT SPOT A5 & B5

730mm - 1300pm MAT removed excavate area install Rubble ~~450~~ 500mm + geotextile 12x14m

E2L1 = @ E3L1

E3L1 =

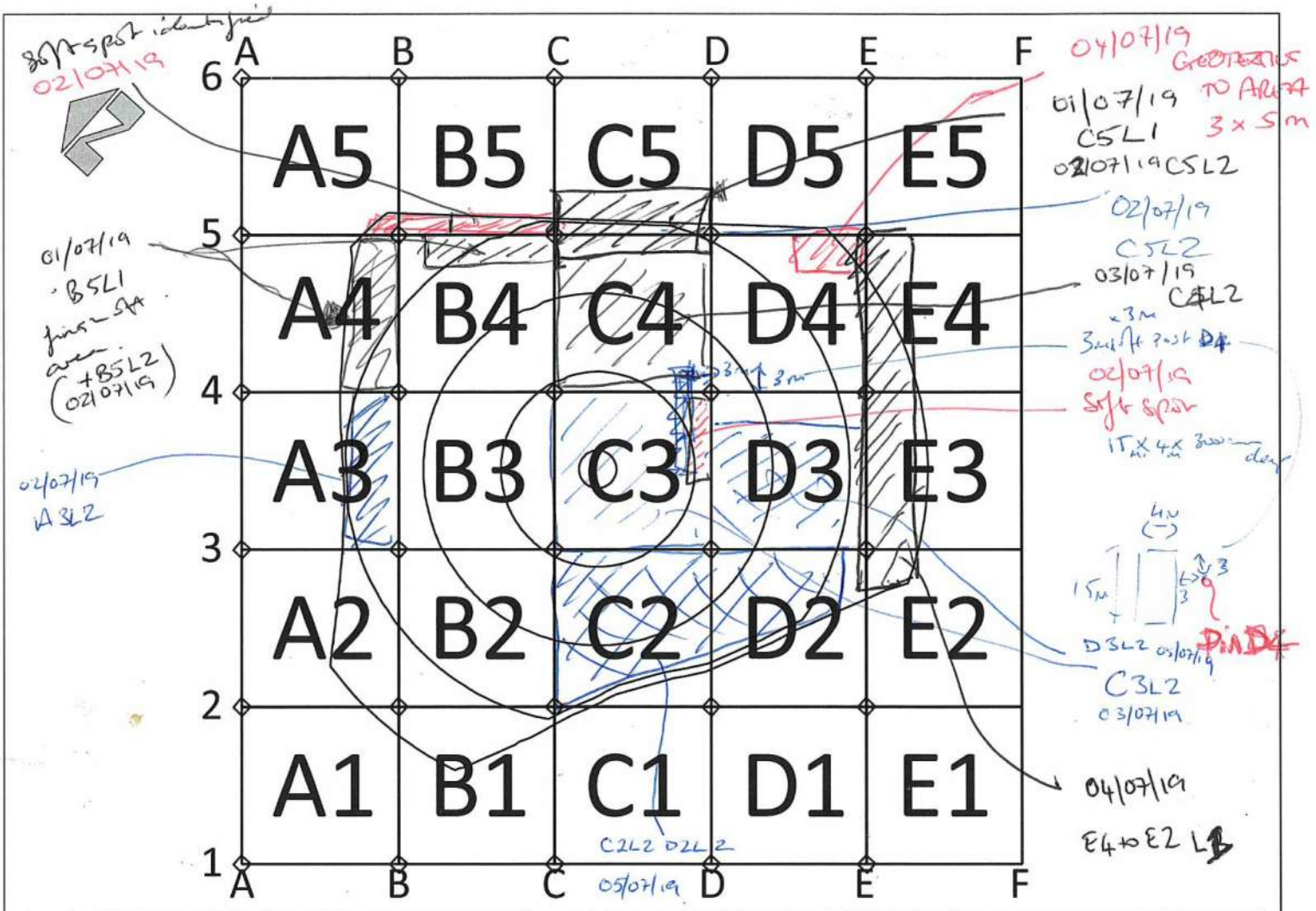


Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 14/07/19
Plant: 1 DOZER - 1 ROLLER - 2 X 3 2 DUMPERS + BANKS MAN FOR TRAFFIC	Weather: DRY OVER WEEKEND MON: - OVERCAST AM - DRY TUES: DRY ALL PM WED: SUNNY AM & PM	THUR: DRY SUNNY, FRI:
Testing TUES - HUNTERY (Richard & Lloyd of CJ&S.) WED THURS / FRI.	Visitors - LEVEL SURVEY ADAM THURSTAN 10/07/19,	

08/07/19 -	E5L2 & E4L2 - (PI+MC) + (DS+D)	100/94/78	23% - Low Comp
	E3L2 - (PI+MC)	74/54/72	∝ 27% - ~~Low Comp~~
	E2L2 - (PI+MC)	126/78/68	∝ 27% - ~~Low Comp~~
	Part ~~D2~~ C2L3		
09/07/19 -	D2L2 - (PI+MC) (DS+D)	72/78/60	-
	C2L3 (PI+MC)	58/64/100	-
	E3L2 - (~~PI+MC~~) Repeat core	150/72/84	-
	D3L2 - (PI+MC)	112/118/90	-
10/07/19 -	D5L1 (PI+MC)	124/60/82	-
	D4L1 (PI+MC) (DS+D)	74/84/76	- DITCH LESS THAN COMPACTION AREA
	A4L3 (PI+MC)	66/74/110	[FILL DITCH IN A3] layer 1
11/07/19	A3L3 (PI+MC) (DS+D) - 2 cores (core 1 top)	100/60/67	[FILL DITCH IN A3] Layer 2
12/07/19	D5L2 (PI+MC) - 2 cores (core 2 top)	65/75/80	
	D4L2 (PI+MC) (DS+D) - " "	90/83/79	
	C5L3 (PI+MC) TO BE CORED NEXT WEEK.		

Part + C4L3 / B4L3

CF3 to NP20/10.5mile



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 07/07/19
Plant: 1 Dozer 1 Roller 2 JCB 2 Dumpers (from Thurs 27.6 [All to mind Banksmen for Traffic])	Weather: Bef over weekend MON SUNNY AM & PM. TUES: SUNNY AM & PM. WED: SUNNY AM & PM. THUR: SUNNY AM & PM. FRI: SUNNY AM & PM.	
Testing • MON. TUES. WED. THU. FRI.	Visitors – Ian 04/07/19	

8/07/19 C5L1 – (PI+MC) + (DS+D) SH (62/82/102) [Banksmen on site from Thursday for Clay delivery]

A4L2 – (PI+MC) SH (110/110/85)

[A4L2 – PERM]

02/07/19 – A3L2 – (PI+MC) + (DS+D) 68/68/75

SOFT Spots @ A5 & B5 identified + Layer 1 soft spot @ C3

– Email sent re ASBESTOS (soft spot Remediation 1.30pm [JCB + 2 x Dumper + Roller + Dozer standby]

• Work on C3L1 • 15 x 4m x 300mm deep. SPOT

C5L2 (78/105/105) (PI+MC) (PERM) 76/86/72 TO 1545 Close play

03/07/19. START WORK FROM NEW STOCKPILE @ A2.

C4L2 (DS+D)(PI+MC) SH 92/78/68

C3L2 (PI+MC) SH 58/57/85

04/07/19. E4L1 – (DS+D)+(PI+MC) – CORE: 52/65/74 (62)

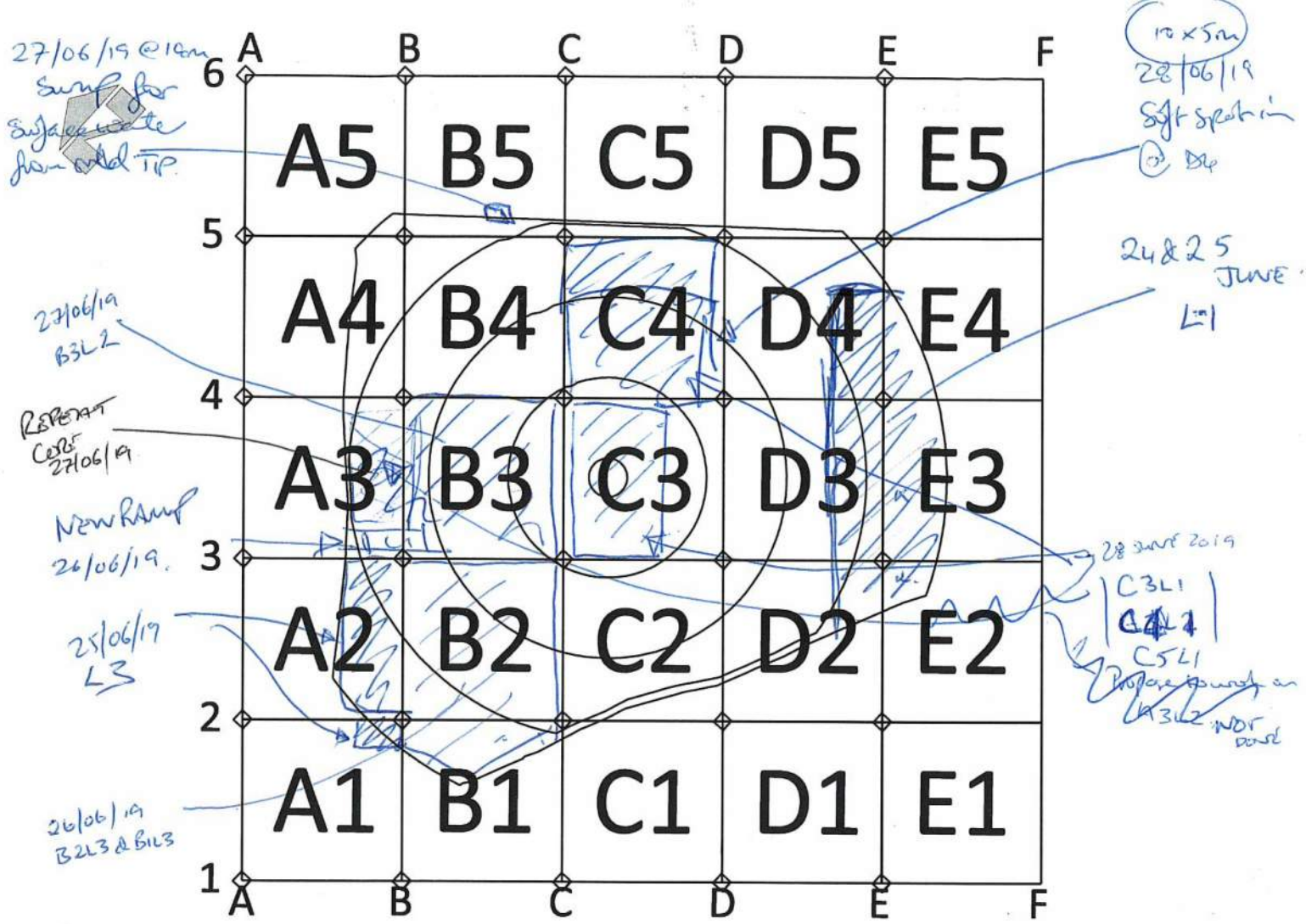
E3L1 – (PI+MC) [PERM E3L1] + SPARE – CORE 55/63/72

05/07/19 E2L1 – (PI+MC) DS+D

– C2L2 (PI+MC) (DS+D) 50 50 114

D2L1 (PI+MC) 50 50 60+ NOTE PART DONE 19 JUNE 2019 COULD BE CONSIDERED (D2L2).

D3L1 (PI+MC) 62 74 100



Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 30/06/19
Plant 1 DOZER 1 ROLLER 2 JCB 2 DUMPERS, Bowser	**Weather:** RAIN OVER WEEKEND / MON - SUNNY AM & PM TUES - RAIN AM (NO CLAY) PM - DRY. WED - DRY AM & PM THURS - DRY AM PM (OVERCAST - WINDY) FRIDAY - DRY AM & PM SHOWERS	
Testing • MONDAY • WEDNES. • THURS. • FRI.	**Visitors** - MARTIN (JIM DAVIES - CONTRACTS FOR CMP)	

24 JUNE 2019 - E2L-1 (PI+MC) - SH 98/81/58
B1L2 (PI+MC) - SH 125/85/100
E3L-1 (PI+MC)+(DS+D) - SH 75/85/100

28 JUNE 2019 FRIDAY
C3L1 (PI+MC)(DS+D) - ~~SH~~ 135/55
C4L1 (PI+MC) - 95/110/110

[NOTE PHOTOS OF FOUNDATION LAYER 300mm/300mm & 220mm

25 JUNE RAIN 730am to 10mm Soft spot @ D4 Add mtrl to Ramp
Completed (E2L-1 & E4L-1) - (PI+MC) 75/85/90 ✓

26 JUNE - A2L3 (PI+MC)+(DS+D) 91/90/78 ✓
B1L3 (PI+MC) 134/89/64 ✓
B2L3 (PI+MC)+(DS+D) 120/74/76 ✓
[B2L3 PERM]
(RAMP const for Clay delivery in PM 1pm-2pm)

27 JUNE - [MTRL DELIVERED TO SITE & STORED IN GRID A2]
B3L2 (PI+MC)(DS+D) 75/88/64
A3L1 - REPEAT CORE FOLLOWING ~~RAIN~~ RAIN EARLY & REWORK 100/100/64
B4L2 (PI+MC) 70/68/66

TESTING

½ bag Sample / Cell 25×25m (MC+PI)

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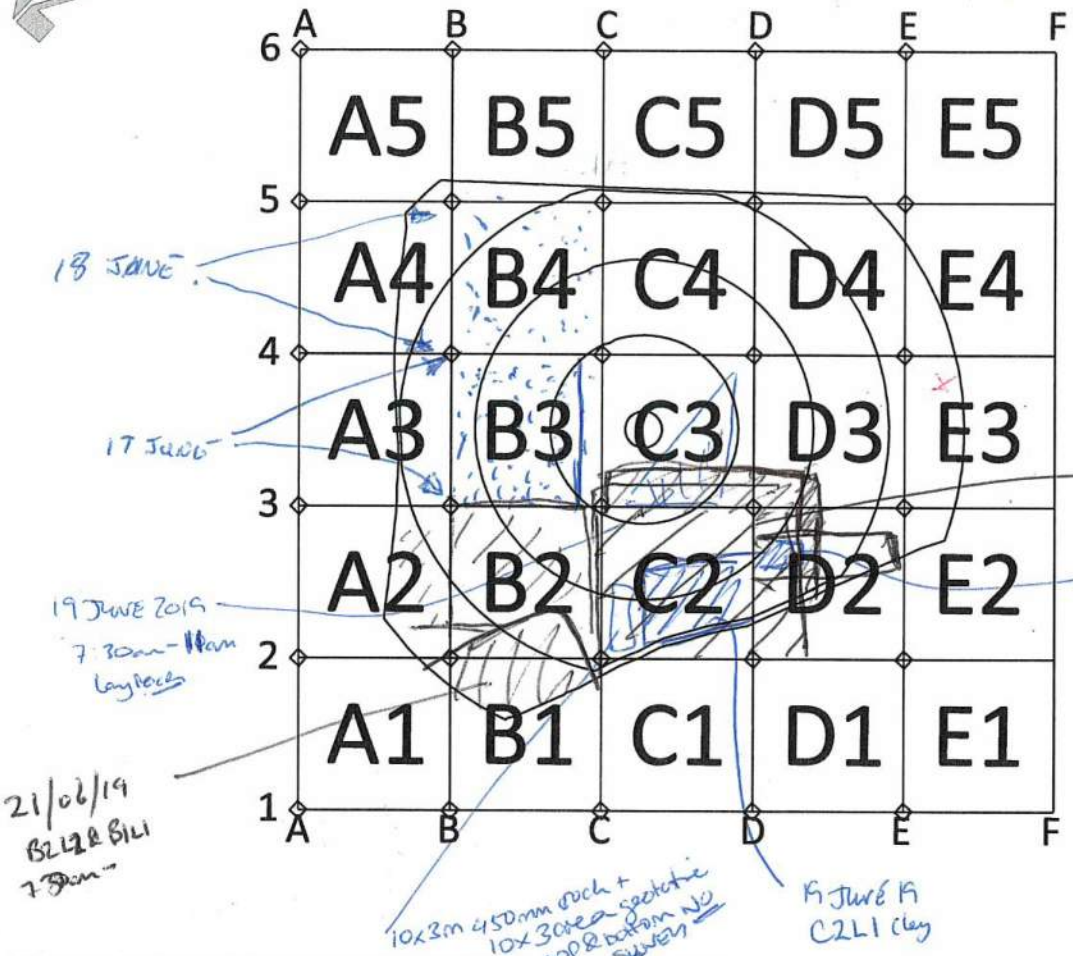

½ bag Sample / Two cores 50×50 (DS+D)

1 core sample / Cell 25×25 (MC & DD)

3 × SHEAR VANE

WEATHER FORECAST @ WED. [DRY THURS & FRI.]

20/06/19 C3L1 + Part D2L1

TRIAL 20/06/19 [730am-10am] 13×8m clay on yesterday

Phase 2 Cell 4C Clay Lining Works 2019		Originator: WW	Date: W/E ~~26/05/19~~ 23/06/19
Plant	1 DOZER 1 ROLLER 2 JCB 2 DUMPER (TON)	WEATHER - MON - DRY. DRIED OUT BY 1050 TUES - MAINLY DRY a.m. SHOWERS P.M. WED - DRY AM - PM (SHORT SHOWER)	THURS - AM DRY SUNNY PM DRY - Occasional showers FRI - AM & PM SUNNY!

Key: Layer 1, Layer 2, Layer 3, Layer 4, Layer 5, Layer 6, Layer 7, Layer 8

17 JUNE 2019
CLAY WET, DRIED OUT ENOUGH TO LAY (B3L1) BY 10.50am. ASKED RICHARD TO ATTEND SITE TOMORROW AT 01.30.

18 JUNE 2019 LAYING CLAY a.m. TO B4 L1. ARRIVED ON SITE AT 01.30 CJA HAD COME EARLY + ALREADY SAMPLED & LEFT SITE. (10.7)
SV B4 B3L1 - (DS+MC) CORE - (PI+MC) + DS 2.03 MC 26/1.64 DD
SV 67 B4L1 - (DS+MC) CORE - (PI+MC) + DS 2.04 MC 24/1.64 DD
N2 SUNNY!

19 JUNE 2019.
Laying ~~FOR~~ GEOGRID to C3 Area & infront of B2/C2 additional Area 10×3×4m2.
C2L1 (DS+D) + (PI+MC) CORE NOTED SH 50/52/112 7:30 - 11:30am

20 JUNE 2019 (B2L2) / Core SH 84/58/78
[two cores test record] (D2L1) / Core SH 58/56/82
~~Copied Core 1..~~
TRIAL EXCAVATE 2 CORES DEPTH @ 340mm CORE 1 and 330mm CORE 2
1500mm between cores NOTED THAT MTRL LAYED @ 300mm for compaction
∴ anticipate layer movement of 30mm. [Litter Picker 8am - 1030am ONLY]
Work on Clay C2L1 + [D2L1 (PART) + C3L1 (PART)] WASH & WATER PBA ON ~~(D2L1)~~? ~~(C3L1)~~!

21 JUNE 2019. - A1L1 × [B1L1] (DS+D) (PI+MC) SH 64/72/74. 10am to 11:38am (D3L1?)
× C3L1 (DS+D) + (PI+MC). 1245 - Asbestos Miter onto site relocated excavator
D2L-1 (PERM) SH 118/92/82

MC + PI = Moisture & Plastic Index - Per layer
DS + D = Dry density & Particle distribution - every 2nd layer

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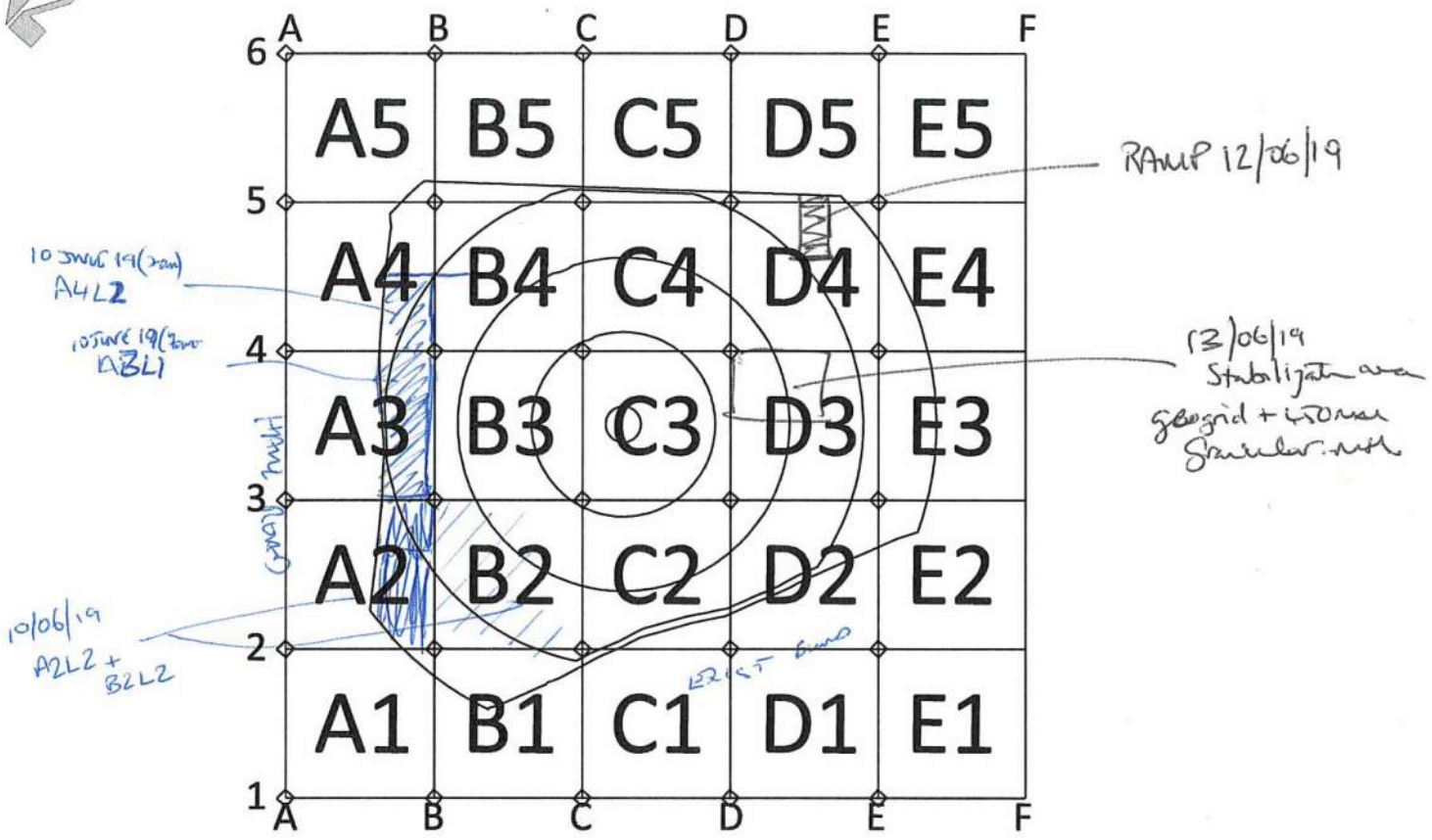

Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 26/05/19 ~~16~~ 06/19
Plant: 1 DOZER 1 ROLLER 2 X JCB 2 DUMPER	WEATHER: MON DRY AM (WATER FROM WEEKEND) RAIN @ 1500 TUES - WET NO RAIN AM - LIGHT SHOWERS. WED - WET - NO GAIN AM - PM THURS AM SHOWERS PM DRY LIGHT SHOWERS	

Key: Layer 1, Layer 2, Layer 3, Layer 4, Layer 5, Layer 6, Layer 7, Layer 8

10 JUNE 2019. A4L2 + A3L1 - (DS+D) + PI + MC) (80/62/62) (PDS GEOTEC EWC Lawrence on site 10am - 12pm)
- A2L2 - (PI + MC) (70/72/72)
B2L2 - (PI + MC) [TO BE DONE]

11 JUNE 2019. WET AM NO WORK. - (Work on Ramp following agreement for subgrade treatment)

12 JUNE 2019. WET - (

13 JUNE 2019 - WET - Work on Stabilization formation (D3) using geogrid to subgrade + 450mm Well graded Stone + some fines. (delay No stone from 1500 to 1600.

14 JUNE 2019.

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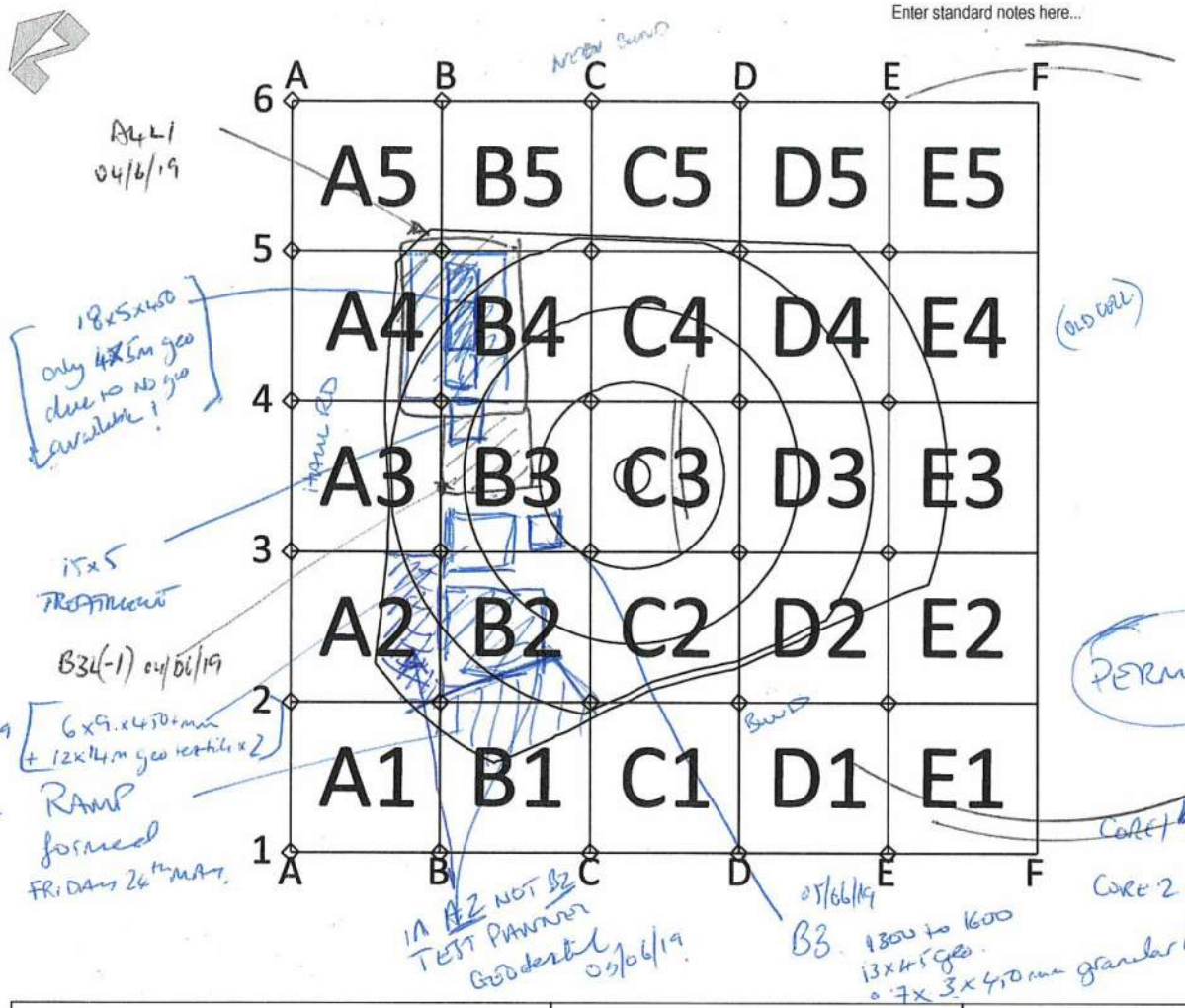

Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 26/05/19 09/06/19
Plant: 1x Dozer 1x ROLLER, 1x JCB 2x DUMPER	MON - DRY NO WATER FOR WEEKENDS. TUES - RAIN (LIGHT) AM - HEAVY RAIN FROM 14:00 WED - DRY AM (HOURS SUNNY AM & PM) FRI - RAIN	

TO DATE 10,500 TON (LIAN).
[EXTRA EXCAVATION 06/06/19]

Key: Layer 1, Layer 2, Layer 3, Layer 4, Layer 5, Layer 6, Layer 7, Layer 8

- 03.06.19 - [WORK ON FRIDAY 24th MAY - RAMP IN Cell B1.]
  Soft spots 18x5M in B4 7:30am - to 10:30 am. - 450mm gravel (5x5m geo@base)
  Clay laying 10:30am into "B4L-3" "A4L-3" - Reach 1 layer below.
- 04.06.19 [Soft spot 15x5m in B3 7:30am - 10:30am 450mm gravel + 2layer geo. very soft area TBA would anticipate additional 450mm gravel to stabalize TBA)

NOTE Layer Pinned to connect @ 150mm thick

* B3 L-2 - (DS+D) + (MC+PI) (98/82/115 SHEAR) CORE.
  A4L1 - [CORE] (DS+D)+(MC+PI) (90/80/100 SHEAR)
  + Bore in layer shown @ final level with granular. Bore in after with Andrew @ 12:30pm Noted @ final level dig to geotextile shows settled 150mm.
  Andrew & Ian Fisher on site agree treatment for second Area B3 to dig out & replace 450mm + 2layer geo agreed trial in Cell B2 soft spot to use geotextile and 300mm clay layer.

TO TEST B4L1 05/06/19 TREATMENT B3/B2 6x9 area excavate 450mm insert stones 450mm (6N) 7:30am - 10am
- A2L1 - (DS+D) (MC+PI) [GEOTEXTILE ONLY] [A2 2.5x12] 95/90/52 + 70/50/108
  [B3/B2 = 7x3m x 450mm 1300 - 1600]
06/06/19 10:30am B3 geotex (8x4.5m) (MINIMUM RETAINED 1.5mm - 930mm)
Am 7:30am levels for survey A2/B2 geotextile (16x8.5m)
Aidan NCL on site @ 930mm WORK IN B2L1 (DS+D)+(MC+PI.)

[WORST CASE FOR COMPACTION INTO UNDERLYING CLAY AREA = 150mm]

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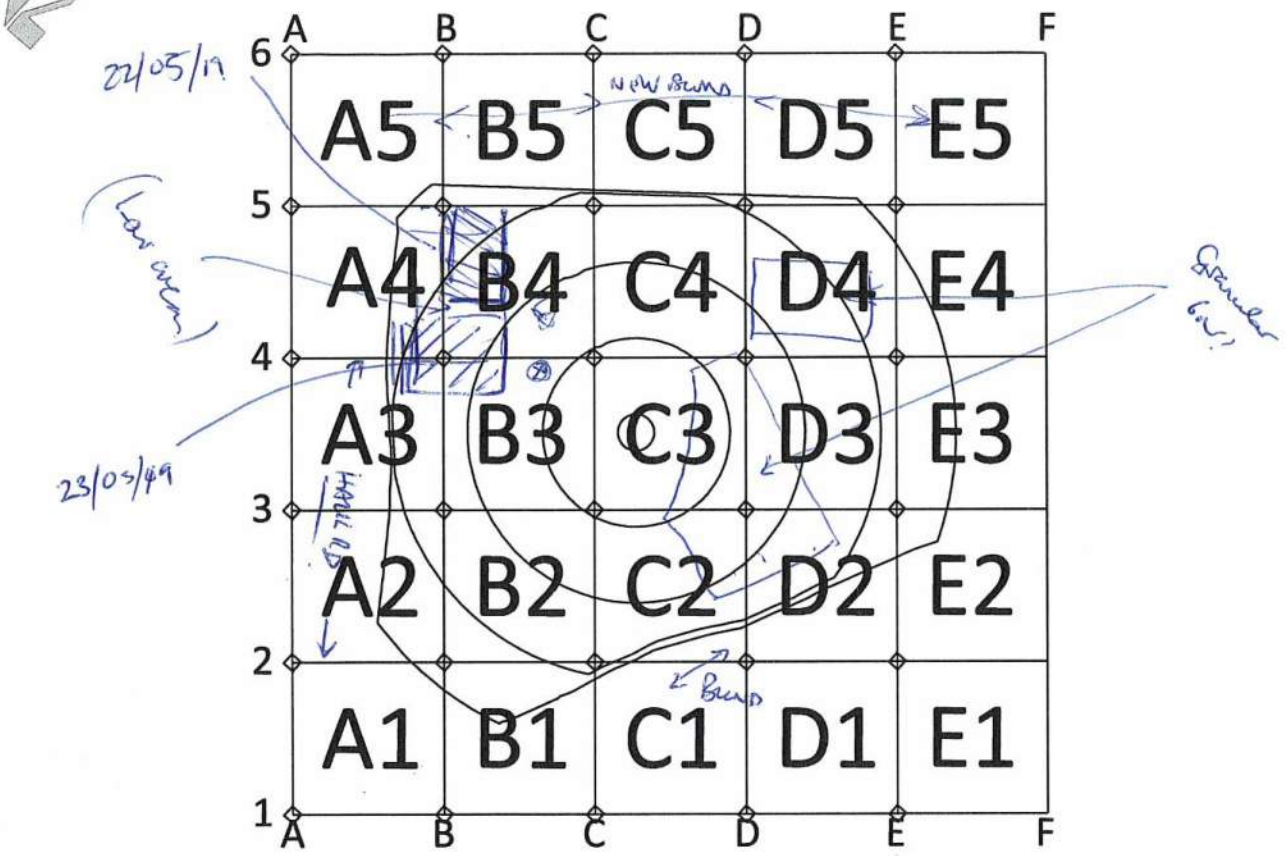

Phase 2 Cell 4C Clay Lining Works 2019	Originator: WW	Date: W/E 26/05/19
Plant: 1 JCB, 1 Dozer, 1 Dumper, 1 Roller	TILES – SLIPPY	

MES 7:30am –

Key: Layer 1, Layer 2, Layer 3, Layer 4, Layer 5, Layer 6, Layer 7, Layer 8

22.05.19

B4L-1 Layer 1 × (23% MC 1.65 on) mtrl – CORE CUTTER – SHEAR VANE 58/54/38 [FAIL < 90kPa]

A4L-1 × mtrl – CORE – SHEAR VANE 150 x 3 MAX.

A4L-1 (PERM.) 4hrs [1 x EXTRA EXCAVATOR + Roller + Dumper x 1 + STONE & 2 x GEOGRID

23.05.19 → (21% MC 1.71 on.) (2 x 4m x 450mm thick) Layer

2 x Dumpers today →

A4L-2 CORE → ON TOP OF STABILIZED AREA. [92/84/75] 1.67 MC 23% MIDDLE AREA (3hrs)

B4L-2 CORE → slightly soft area [78/60/145] → NEWEST (2hrs)

B3L-1 CORE → OLDEST AREA (4hrs) [55/75 95] → 24hrs 64 / 23rd 1.64 (slightly dry)

(WORK IN PM on B4 to proposed level.) ON WOOD

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 5 – Hand Shear Vane

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4317	D3-B6 09.09.19	Layer B6	Grey slightly sandy slightly gravelly CLAY	120	130	150	133	HSV 1
4318	A3-B6 09.09.19	Layer B6	Grey slightly sandy slightly gravelly CLAY	140	150	130	140	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	10/09/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4378	A3-B8 12.09.19	Layer B8	Grey slightly sandy slightly gravelly CLAY	119	62	81	87	HSV 1
4379	D5-B8 12.09.19	Layer B8	Grey slightly sandy slightly gravelly CLAY	80	100	102	94	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee	Date 13/09/2019	Fig. **HV1**
Rev 1.0		R Anstee, Materials and Field Testing Director		

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport
CITY COUNCIL
CYNGOR DINAS
Casnewydd

Appendix 6 – PI, PL, MC, LL Results

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Newport CITY COUNCIL
CYNGOR DINAS Casnewydd

Appendix 7 – Photographs

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Monday 08 September 2019 from Grid A2

Monday 08 September 2019 from Grid A5 (Bund)

Thursday 12 September 2019 from Grid A2 Bund Profile shaped

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Thursday 12 September 2019 from Grid A5 (profiling the edge of the bund)	Thursday 12 September 2019 from Grid C3 (excavation for C3L5 Permeability sample)

Streetscene
Y-Strydynun

Civic Centre/Canolfan Ddinesig
Newport/Casnewydd
South Wales/De Cymru
NP20 4UR

Appendix 8 – Final level survey and soft spot record

NOTES

A3

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Rev	Details	Dr	Ch	Ap	Date

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Newport City Council
Cyngor Dinas Casnewydd

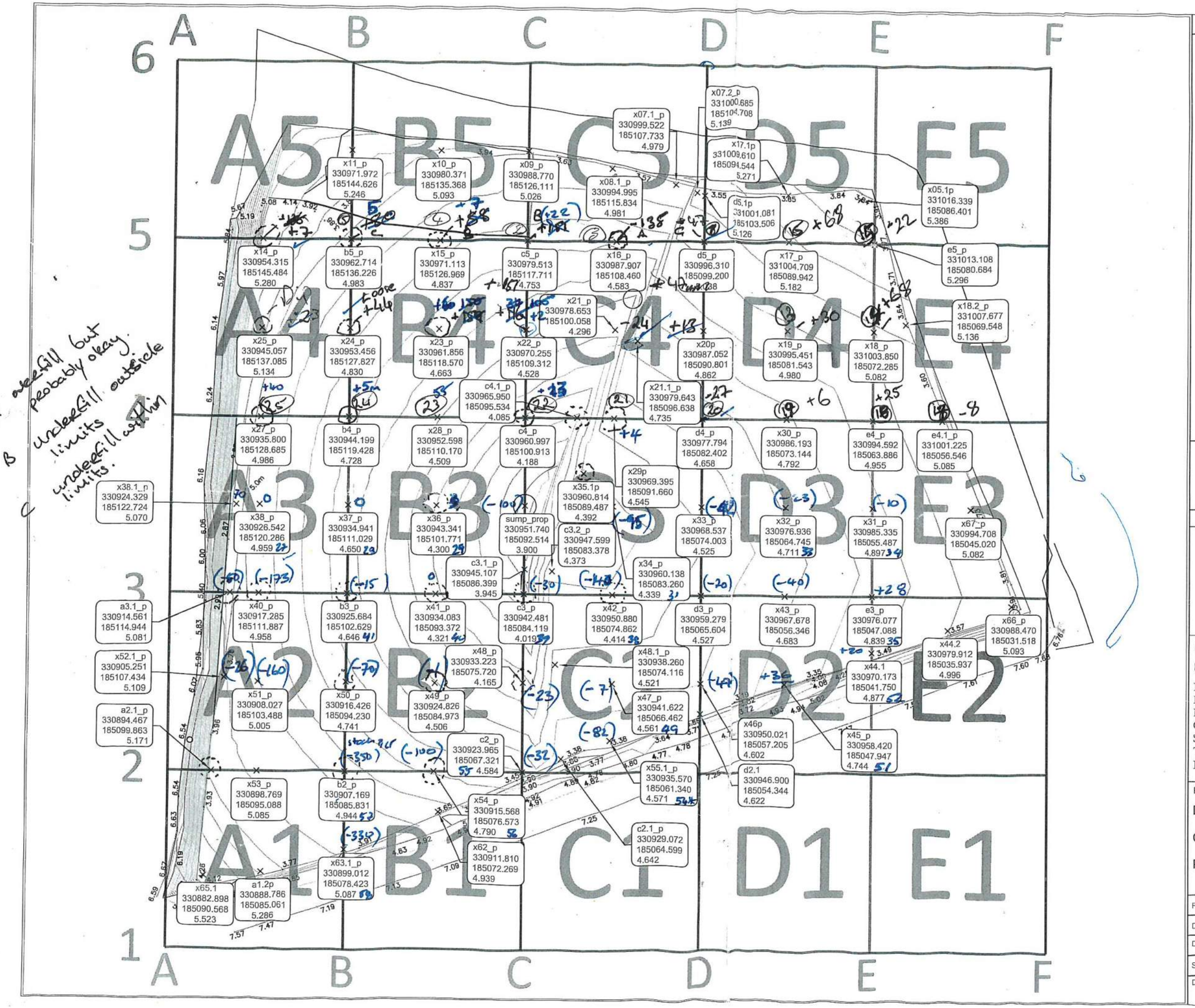
Project

Docksway waste Disposal Site

C4B - Liner Construction

Proposed Level Information

File No. 2514		Status: Setting Out			
Drawn	MDH	Checked		Approved	
Date		Date		Date	
Scales					
Drawing No. 2514 - DD - 601					A



A underfill but probably okay.
B underfill outside limits
underfill within limits.

NOTES

A3

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Newport CITY COUNCIL CYNGOR DINAS Casnewydd

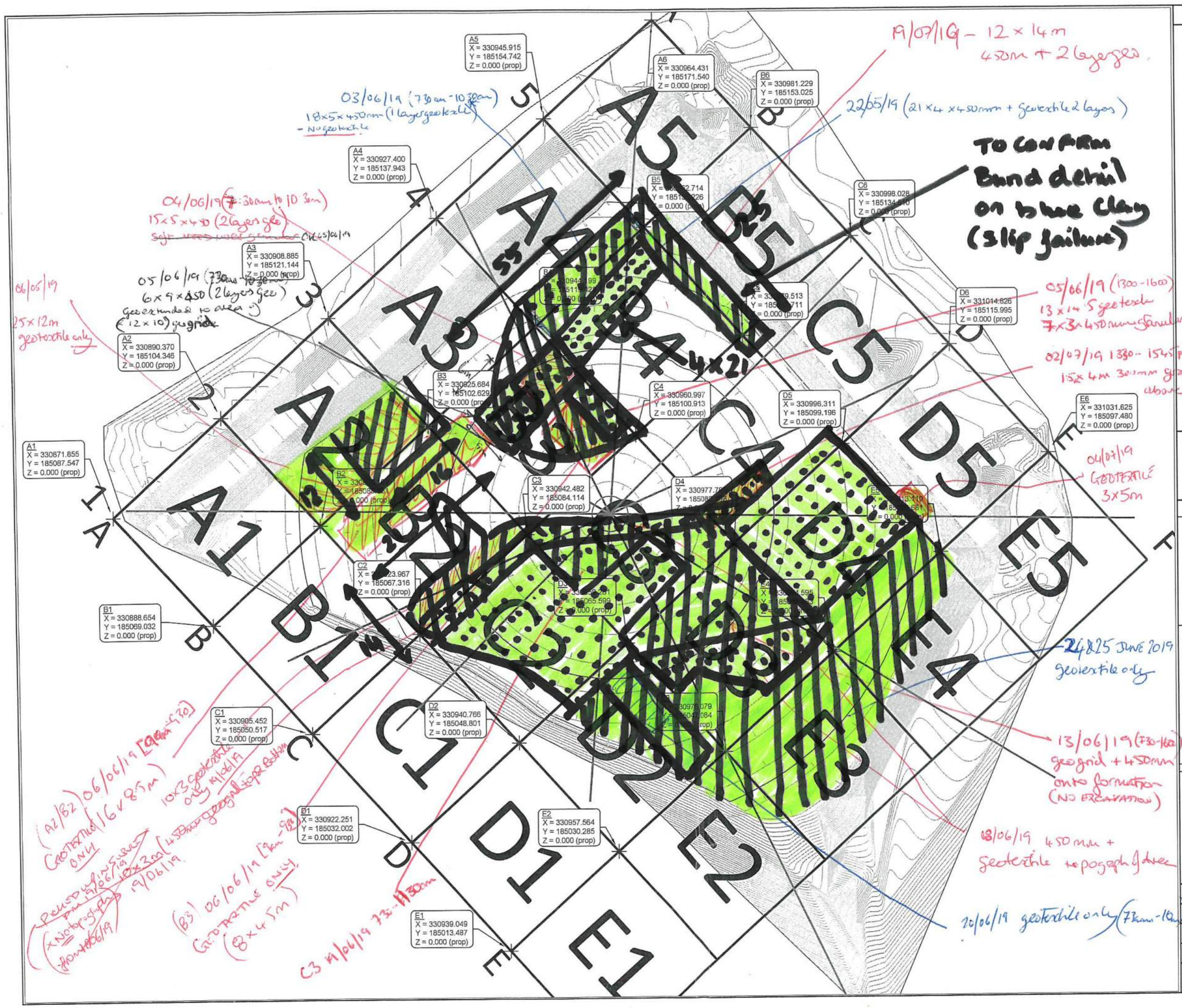
Project

Docksway waste Disposal Site

C4B - Liner Construction

Proposed Level Information

File No. 2514		Status: Setting Out			
Drawn	MDH	Checked		Approved	
Date		Date		Date	
Scales					
Drawing No. 2514 - DD - 601					A



NOTES

A3

450mm (Nominal 75mm STONE) + 2 layers geotextile

PROPOSED AREA [AREA ST DUMPER ROUTING]

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Rev	Details	Dr	Ch	Ap	Date
A	Point levels ammended	AoL			05.05.19

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Project

Docksway WDS

Cell 4B Construction

SKETCH FOUNDATION

File No. 2514		Status: Construction			
Drawn	[redacted]	Checked	[redacted]	Approved	
Date	[redacted]	Date	[redacted]	Date	23.05.19
Scales	NTS				
Drawing No.	[redacted] SK001				A

8 × 0·25 (25 × 25)
= 1,250m³ × 2
= 2500 TONES

BUND - GRID 5
½ (18 + 3) × 2 × 100
= 1400m³

BUND = GRID A
= ½ × 2 × 2 × 100
= 200m³

BUND ASBESTOS
= ½ (15 + 3) × 3 × 25
= 675m³
2,275m³
× 2
5175 TON
+ 2500 TON
* 7,675 TON

A3L1 - 10/06/19 - A3 A3L3 (Finished 10/07/19) = A4 A4L3
A3L2 - 02/07/19
A3L3 - 11/07/19
A3L4 - 23/07/19
A3L5 - 06/08/19

A4L1 - 22/07/19
A4L2 - 24/07/19
A4L3 - 10/07/19
A4L4 - 25/07/19
A4L5 - 07/08/19

B3L1 - 22/06/19
B3L2 - 23/06/19
B3L3 - 04/06/19
B3L4 - 17/06/19
B3L5 - 27/06/19
B4L1 - 22/06/19
B4L2 - 23/06/19
B4L3 - 18/06/19
B4L4 - 27/06/19
B4L5 - 16/07/19
B4L4 - 14/07/19
B4L5 - 21/07/19

B5L1 - 22-07-19
B5L2 - 24-07-19
B5L3 - 31/07/19
B5L4 - 20/08/19
B5L5 - 21/08/19

C3L1 - 20/06/19
C3L1 - 28/06/19 (Corrected)
C3L2 - 03/07/19 + 2.5 (1/04/19) Sump
C3L3 - 15/07/19
C3L4 - 25/07/19
C3L5 - 05/08/19

C4L1 - 28/06/19
C4L2 - 03/07/19
C4L3 - 16/07/19
C4L4 - 07/08/19
C4L5 - 09/08/19

C5L1 - 01/07/19
C5L2 - 02/07/19
C5L3 - 12/07/19
C5L4 - 14/07/19
C5L5 - 31/07/19

C2L1 - 19/06/19
C2L2 - 05/07/19
C2L3 - 09/07/19
C2L4 - 18/07/19
C2L5 - 29/07/19

D2L1 - 21/06/19
D2L1 - 05/07/19
D2L2 - 09/07/19
D2L3 - 15/07/19
D2L4 - 18/07/19
D2L5 - 29/07/19

D3L1 - 24/06/19
D3L1 - 05/07/19
D3L2 - 09/07/19
D3L3 - 15/07/19
D3L4 - 18/07/19
D3L5 - 06/08/19
RETEST - 22/08/19

D4L1 - 10/07/19
D4L2 - 12/07/19
D4L3 - 17/07/19
D4L4 - 30/07/19
D4L5 - 08/08/19

D5L1 - 10/07/19
D5L2 - 12/07/19
D5L3 - 17/07/19
D5L4 - 30/07/19
D5L5 - 08/08/19

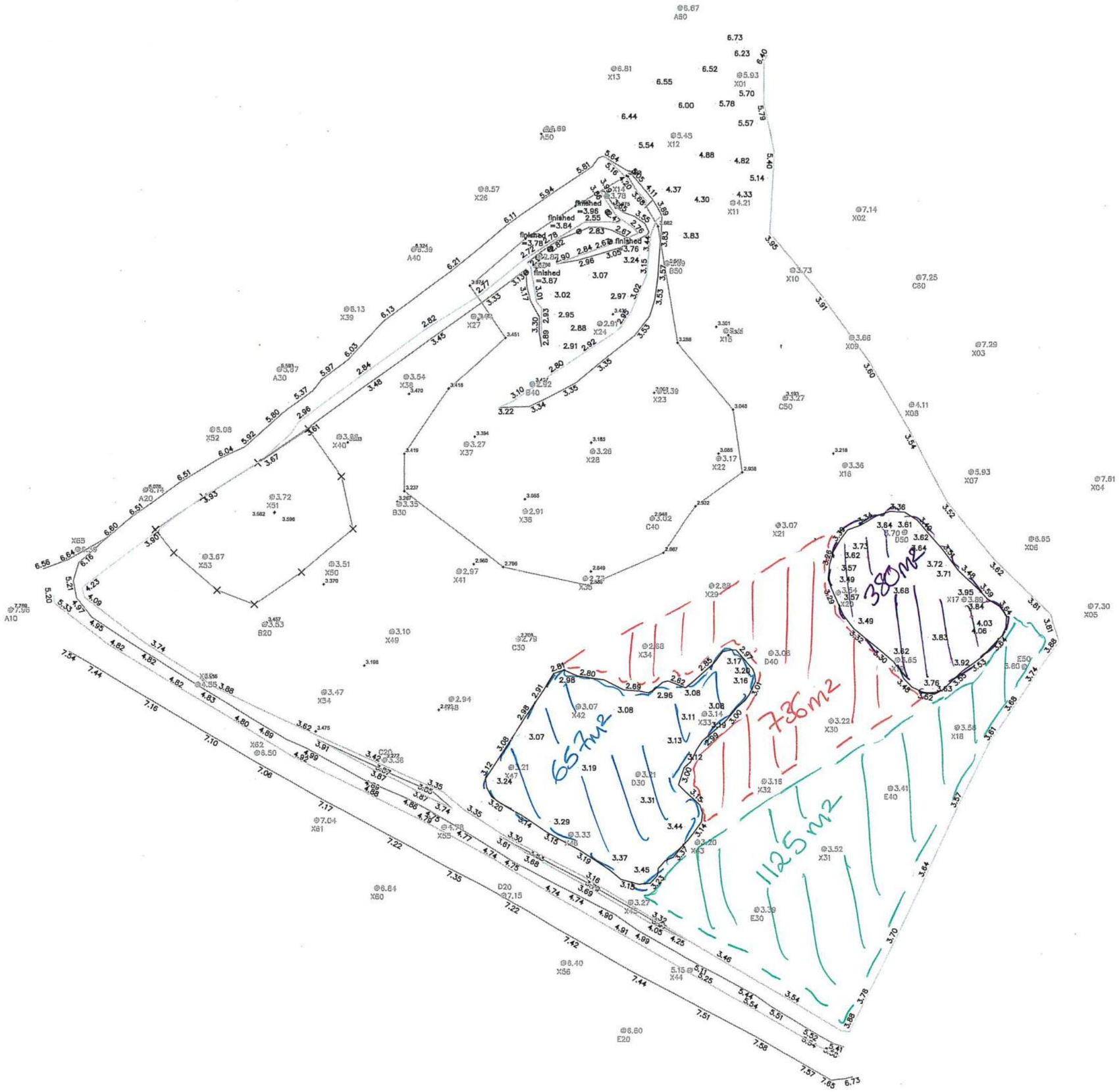
E4L1 - 25/06/19
E4L1 04/07/19
E4L2 08/07/19
E4L3 = 16/07/19
E4L4 = 16/07/19
E4L5 = 30/07/19

E3L1 - 24/06/19
E3L1 04/07/19
E3L2 08/07/19
RETEST
E3L3 - 16/07/19
E3L4 = 16/07/19
E3L5 05/08/19
E4L5 22/08/19

E2L1 - 24/06/19
E2L1 04/07/19
RETEST
E2L2 = 08/07/19
E2L3 = 16/07/19
E2L4 - 30/07/19
E2L5 - 31/07/19

E5L1 04/07/19
E5L2 08/07/19
E5L3 16/07/19
E5L4 30/07/19
E5L5 22/08/19

30 TRUCKS
23 DAY



EXISTING:
1037 m2

ADDITIONAL:
1861 m2

Appendix 2 CQA Plan

now part of

Area 2, Docksway Disposal Site Newport

Construction Quality Assurance Plan & Performance Specification for Cell 4a Basal Clay Lining

On behalf of **Newport City Council**

Project Ref: 14739/3544 | Rev: CQA_4_rev01 | Date: May 2019

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Document Control Sheet

Project Name: **Area 2, Docksway Disposal Site, Newport**
Project Ref: **14739/3544**
Report Title: **CQA Plan for Cell 4a Basal Clay Lining**
Doc Ref: **CQA_4_rev01**
Date: **14th May 2019**

	Name	Position	Signature	Date
Prepared by:	Kate Riley	Associate	KR	14/05/19
Reviewed by:	Kate Riley	Associate	KR	14/05/19
Approved by:	Paul Jeffery	Director	PJ	14/05/19
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
01	05/2019	ISSUE	VKR	VKR	RHT

This report has been prepared by Peter Brett Associates LLP ('PBA') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which PBA was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). PBA accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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1 General

1.1 Introduction

1.1.1 This Construction Quality Assurance (CQA) Plan and Performance Specification has been prepared by Peter Brett Associates LLP (PBA). It applies to the basal clay lining works that are required as part of the construction of the next engineered waste containment cell (Cell 4a) in Area 2 of Docksway Disposal Site, Newport.

1.1.2 Cell 4 has been split into two halves, with the basal clay lining works for the first half (4b) having previously been completed during summer 2018. This document refers to the proposed basal clay lining works for Cell 4a but includes review of and reference to clay source testing carried out in both 2018 and 2018 on material from the same source (see Section 2.2)

1.1.3 The general principles of the basal clay lining works have previously been provided as part of the revision to the Environmental Permit (EPR/DP3733BK) for the site in 2015. This describes that the Engineered Barrier System (EBS) incorporates a minimum 1.2m thick engineered clay liner constructed over the natural geological barrier that exists at the site. This CQA plan describes the processes, methods, tests and controls that will be applied to the importation and construction of the engineered clay liner. The general principles of the basal clay lining works have previously been applied to Cells 1, 2, 3 and 4b at the site.

1.1.4 The objectives of this CQA Plan are to define the roles and responsibilities of the various parties involved in the contract for the basal clay lining works. It also sets out the quality procedures to be adopted during the construction works in order to promote effective management of the contract and provide verification that the construction works have been undertaken to meet the requirements of the design.

1.1.5 The objectives of the Performance Specification are to define the compliance criteria that are required to be achieved by the completed liner, and the acceptability limits and testing frequency required during the construction of the liner to meet the requirements of the guidance provided in Environment Agency (EA) document LFE 4 – Earthworks in landfill engineering.

1.2 Definitions and Duties

Definitions

1.2.1 In the context of this document, the following definitions shall apply:

1.2.2 **Construction Quality Assurance (CQA)**: A systematic, planned and recorded series of actions designed to provide confidence that items, services or activities meet contractual or regulatory design and specification requirements and will perform satisfactorily in service. The CQA for the basal clay lining works will be recorded by an independent CQA Inspector and certified by a CQA Engineer based on test and results provided by the Contractor and records and reports provided by the CQA Inspector.

Parties (Definitions)

1.2.3 The following parties shall be defined as follows, with associated duties:

1.2.4 **Employer** means the person or persons, firm, company, or other body who own and have responsibility for the facility. The Employer has entered in to a contract with the Contractor for the execution of the Works specified in the Contract Documents provided by the Employer.

1.2.5 **Contractor** means the person or persons, firm, company or other body to whom the Contract has been awarded by the Employer, and includes the Contractor's personal representatives or other parties, for example, Sub-Contractors. The Contractor is the party responsible for the preparation and construction of the works as described within the Contract documents, and for ensuring that the clay liner meets the minimum requirements of the Performance Specification.

1.2.6 **CQA Engineer** means the person appointed by the Employer to act as independent CQA Engineer for the purposes of the Contract to provide independent oversight, technical direction and verification that the works, as recorded by the CQA Inspector, are constructed and recorded in accordance with the CQA Plan and Performance Specification. The CQA Engineer shall be responsible for the preparation of the CQA Validation Report.

1.2.7 **CQA Inspector** shall be responsible for the day to day technical direction, oversight and recording of all of the works undertaken as part of the basal clay lining works contract.

Parties (Roles)

1.2.8 The **Employer** is Newport City Council, who shall:

- prepare the contract documents and drawings and appoint the Contractor, CQA Engineer and CQA Inspector;
- review other site-specific documentation including proposed layouts and Contractor's qualifications;
- review all changes to the design, drawings, and specifications;
- oversee budgetary and contractual matters;
- provide day to day management of the works and direction to the Contractor;
- provide surveying services;
- provide setting out in accordance with contract documents;
- provide technical support where required;
- attend pre-construction, progress, site and CQA-related meetings;
- liaise with all parties.

1.2.9 The **Contractor** is Jim Davis Civil Engineering Ltd, and they are responsible for undertaking the whole of the works in accordance with the Contract, and for providing a level of site attendance as defined in the Contract. The Contractor is responsible for control of the works, and for ensuring the suitability and acceptability of the source clay, and for ensuring sampling, testing and compliance of the clay liner are in accordance with the CQA Plan and Performance Specification. The Contractor will also ensure that all daily records and testing reports/results are made available to the Employer's CQA Engineer and the CQA Inspector.

1.2.10 The **CQA Engineer** is Peter Brett Associates LLP (PBA). The CQA Engineer:

- reviews the source material, specifies and attends the compaction trial.
- reviews the compaction trial results and prepares the CQA Plan and Performance Specification in general accordance with LFE-4;

- reviews information and reports provided by the CQA Inspector, attends site to monitor progress in accordance with the scope agreed with the Employer, attends progress meetings, and liaises with the CQA Inspector. Provides confirmation that the CQA Inspectors records indicate that the construction and performance of the clay liner is compliant with the CQA Plan and Performance Specification.

- prepares the final CQA Validation Report.

1.2.11 The **CQA Inspector** is Mr William Watt, and is located at the site for the duration of the CQA works and is directed and monitored by the Employer and CQA Engineer. The CQA Inspector:

- acts as the on-site representative of the Employer providing independent 3rd party monitoring of the works under the technical direction of the CQA Engineer;

- familiarises the Contractor with the CQA and Performance requirements for the project;

- manages the daily activities of the Contractor;

- attends all CQA-related meetings (for example, Pre-construction and Progress meetings);

- prepares the ongoing preparation of the Record Drawings;

- monitors and records on-site acceptability and compliance testing;

- assigns and records locations for testing and sampling;

- prepares daily reports and logs and a weekly written report for the CQA Engineer;

- reports to the CQA Engineer, and logs in their daily report any relevant observations;

- oversees the collection and shipping of all samples for laboratory testing;

- reviews results of laboratory testing and makes appropriate recommendations following discussion with the CQA Engineer;

- reports any unresolved deviations from this CQA Plan to the Employer and CQA Engineer;

- provides all logs and relevant data to the CQA Engineer for the preparation of the final report;

- reviews all Certifications and Documentation from the Contractor and makes appropriate recommendations.

1.2.12 The above list of the CQA Inspector's duties is not exhaustive and may include additional roles as required.

1.3 Relationship with Other Documents

1.3.1 In the event of ambiguity or conflict between this CQA Plan and Performance Specification and other Contract Documents, then in general the CQA Plan and Performance Specification shall take precedence, where the matter relates to acceptability and compliance of the clay liner. Should resolution on this basis not be possible, then the Employer, in consultation with the CQA Engineer, shall decide on which interpretation is applicable.

1.4 Key Personnel

1.4.1 The **Client** / **Employer** is: Newport City Council, Civic Centre, Newport, Monmouthshire, South Wales, NP20 4UR.

1.4.2 The **CQA Engineer** is: Peter Brett Associates LLP, Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN.

1.4.3 The **CQA Inspector** is: Mr William Watt. CV presented in Appendix 1.

1.4.4 The **Contractor** is: Jim Davis Civil Engineering Ltd, Ty-Gwyn, Banalog Terrace, Hollybush, Blackwood, South Wales, NP12 0SG.

2 Design Philosophy

2.1 Area 2 General Design

2.1.1 Area 2 is designed on a full containment principle and includes a basal liner as part of an engineered barrier system designed to minimise risks to groundwater from potential leachate leakage. The design is in accordance with the 'Area 2 Engineering Design Philosophy' (PBA, 2004) and the 'Conceptual Model and Hydrogeological Risk Assessment for Area 2' (PBA, 2005).

2.1.2 The presence of a low permeability engineered clay barrier and the underlying natural geological barrier (the natural alluvial clays underlying the site) will act to minimise the leakage and transport of contaminants from the site.

2.1.3 The engineered barrier system (EBS) will comprise 1.2m of imported clay, which will be engineered to have a maximum permeability of 1 x 10^{-9} m/s. The underlying in-situ alluvial clays typically have a permeability of lower than 1 x 10^{-9} m/s.

2.2 Clay Liner Design – Clay Source Evaluation

2.2.1 The clay to be used for the basal lining works will be from the Lower Lias Clay Formation, imported from Wingmoor Farm located at Bishops Cleeve in Gloucestershire. This is the same source material that has been used previously for the basal clay lining in Cells 2, 3, and 4b, and its suitability has therefore previously been fully demonstrated and accepted by Natural Resources Wales (NRW).

2.2.2 Notwithstanding the previous suitability testing for Cells 2 and 3, additional material suitability testing has been undertaken on seventeen samples of the source clay for use in Cell 4 (twelve in 2018 for Cell 4b and five in 2019 for Cell 4a). The source testing identified that the average Optimum Moisture Content (OMC) of the source material was 20% with an average maximum dry density (MDD) of 1.65Mg/$m^{3.}$ The moisture content of the 'as received' material was in the range between 15% and 25%. The average plastic limit was 24% and the liquid limit of each of the samples was <90% in accordance with LFE 4.

2.2.3 The classification and compaction testing results from the source clay samples were used to specify the criteria for remoulded permeability testing carried out in a triaxial cell and the results of these tests indicated a maximum permeability in the samples tested of 6.3 x 10^{-10} m/s. The samples for the laboratory permeability testing were recompacted at values that covered a range of positions both inside and outside of the acceptance envelope, including up to 10% air voids. The results therefore indicate not only that the source clay is capable of achieving the permeability requirements of the engineered clay liner, but that this can be achieved for material with up to 10% air voids.

2.2.4 The source testing results were used to define the ranges of acceptable limits for the specification of the imported clay, to be used initially in the clay compaction trial (undertaken in 2018), and then, subject to the results of the clay compaction trial, in the main basal clay lining works. Therefore, the acceptability limits for the imported clay for Cell 4a have been set as follows;

- Moisture content range: 21% to 26%. Based on the maximum mc for the material to achieve a minimum undrained shear strength (for trafficability) of 50kPa. The minimum is based on the mean plastic limit minus 3%.
- Plasticity Index: between 10% and 65% in accordance with LFE 4.
- Liquid Limit: ≤90% in accordance with LFE 4.

- Percentage fines <0.063mm: ≥20% but with a minimum clay content of 8% in accordance with LFE 4.

2.2.5 The compliance requirements for the constructed clay liner are provided in both LFE4 and set out in the Environmental Permit for the site. Therefore, the compliance limits for the clay liner are as follows;

- In situ density tests must demonstrate that material selection and compaction achieve an air voids content of not more than 5% with a dry density of 1.56 Mg/m^3 or above (95% of average Maximum Dry Density).

- Permeability: ≤1 x 10^{-9} m/sec.

2.3 Methodology and Plant

2.3.1 The moisture content range of the 'as received' material from the source has been identified during the source evaluation as sometimes being outside of the acceptable moisture content range due to it being too dry. This has similarly been the case during previous cell development. Therefore, the proposed methodology includes for 'conditioning' the material both prior to it leaving the source site and on the receiving site through the addition of water and mixing prior to laying the material within the cell. This process also helps to break down any clods of the material present. Once the material is conditioned, it will be transported to the working area and laid in layers of specified thickness (determined following a previous field trial, see Appendix 1 and Section 2.4 below). Samples of the material will then be taken for acceptability testing and then the layer will be compacted using a CAT CS-573D vibrating roller with padfoot shell kit attached (vibratory tamping roller). Each layer will be subject to a minimum number of passes of the roller (12 passes on a 300mm layer) determined following a previous field trial, (see Appendix 1 and Section 2.4 below), and then samples of the compacted material will be obtained using the core cutter method for laboratory permeability and in-situ density testing. The samples will be transported to a UKAS accredited laboratory appointed for the laboratory compliance testing.

2.4 Field Compaction Trial

2.4.1 A field compaction trial was undertaken at the site on the 15th May 2018 and this is described in Appendix 2. The laboratory results and destructive testing of the trial pad indicate that both methods of compaction could achieve the minimum compliance requirements for the clay liner.

3 Performance Specification

3.1.1 Based on the guidance provided in LFE4, the results of the clay source assessment and the field compaction trial, the following tables contain the specification for material acceptability and compliance for Cell 4a. An acceptance envelope is provided as Figure 1.

Table 3.1 – Specification - Acceptability

Property	Value	Test Method
Water Content	21% - 26%	In accordance with BS EN ISO 17892-1: 2014. Bulk sample
Atterberg Limits	PL ≤90% PI 10-65%	In accordance with BS1377-2: 1990. Bulk sample
Particle Size Distribution	Percentage fines <0.063mm: ≥20% but with a minimum clay content of 8%	In accordance with BS EN ISO 17892-4: 2016. Bulk sample
Determination of undrained shear strength using Hand shear vane	>50 kPa	In accordance with BS1377-9: 1990.
Maximum clod size	No greater than 2/3rd compacted layer thickness	Visual observation and direct measurement.

Table 3.2 – Specification - Compliance

Property	Value	Test Method
Dry density/moisture content relationship (in situ density)	≤ 5% air voids ≥ 95% MDD (1.56 Mg/m^3)	In accordance with BS 1377-9: 1990. Sampled by core cutter method. Results to be within acceptance envelope shown in Figure 1.
Determination of permeability in a triaxial cell	Maximum 1 x 10^{-9} m/s	In accordance with BS 1377-6: 1990. Sampled by core cutter method
Clay Liner Thickness	Minimum 1.2m	Topographic Survey

4 Quality Procedures and Testing Requirements

4.1 Setting Out / Survey

4.1.1 The Employer shall provide the Contractor with a topographical survey of the site and shall agree with the Contractor the precise extents of the basal clay lining. The basal clay lining shall key in to the existing clay lining beneath the adjacent Cell 4b. The Contractor shall apply a grid to the survey drawing, indicating the maximum extent of the proposed areas for clay lining. The grid shall comprise 25m by 25m cells and each grid cell shall be assigned a unique ID and shall have a unique set of co-ordinates to allow identification for sampling purposes. The Contractor shall undertake pre commencement and post completion topographical surveys to demonstrate the minimum 1.2m liner thickness has been achieved. The Contractor shall provide to the CQA Engineer the as built drawings and cross sections to demonstrate this.

4.2 Sampling and Testing Requirements

4.2.1 Sampling and testing of imported materials both pre- and post-compaction shall be undertaken in accordance with the Specification, reproduced in Tables 4.1 and 4.2 below. The testing laboratory must be UKAS accredited for the tests being undertaken.

4.2.2 The CQA Inspector will determine the locations for the proposed sampling, based on the frequency of testing specified and their site observations, and shall inform the Contractor accordingly. The Contractor shall arrange for these samples to be undertaken in the presence of the CQA Inspector or a representative from the CQA Engineer. Copies of all test data shall be provided by the Contractor to the CQA Engineer and the CQA Inspector. The CQA Inspector will keep a daily record of all the work carried out, samples taken and results received, and shall provide weekly summary reports of the work, detailing progress, problems, testing and the proposed work programme. These summaries will be included in the CQA Validation Report.

Table 4.1 Testing Schedule - Acceptability

Test/Requirement	Frequency	Comments
Lift Thickness	per cell/layer (uncompacted thickness)	Direct observation/measurement
Topographic survey	Prior to commencement (commencing surface) and on completion of the basal clay lining	-
Water Content	Minimum 1 per 250m^3	-
Atterberg Limits	Minimum 1 per 250m^3	-

Test/Requirement	Frequency	Comments
Particle Density	1 per 500m^3	-
Particle size distribution	1 per 500m^3	-
Hand shear vane	3 per layer per 25m by 25m cell	To be included in CQA Engineers reports
Maximum clod size	Noted for each layer per 25m by 25m cell	To be included in CQA Engineers reports
Photographs	Daily	Must be labelled and referenced

Table 4.2 Testing Schedule - Compliance

Test	Frequency	Comments
Dry density/moisture content relationship (in situ density)	1 per layer, per 25m x 25m cell	Unique ID and labelling
Determination of permeability in a triaxial cell	1 per 2000m^3	Unique ID and labelling

4.3 Reinstatement of Sample Locations

4.3.1 Sample locations will be reinstated by replacement with conditioned material and hand tamped into place.

4.4 Clay Liner Acceptance

4.4.1 The clay liner shall be considered acceptable in respect of the Landfill Directive and Environmental Permit when:

- it has been verified that the Contractor's setting out, construction thickness and slope gradients conform with the Contract drawings and documents;
- placement has been undertaken correctly to achieve < 5% air voids;
- all permeability tests record a coefficient of permeability (k) of not greater than 1 x 10^{-9} m/s;
- all acceptability and compliance tests show conformance to the Performance Specification.

4.4.2 In addition, in order to form a suitable working platform for landfill construction, the clay liner shall have an undrained shear strength of not less than 50 kPa.

4.5 Contractor's Records

4.5.1 The Contractor shall record the following information and provide the information to the CQA Engineer and CQA Inspector in weekly progress reports:

- Number of layers/grid squares completed (that week and cumulative);
- Site photographs;
- Total volume of material placed that week;
- Acceptability and compliance test results for that week, including laboratory certificates;
- Description of any failures of acceptability or compliance tests and proposed remedial actions; and
- Minutes of site/progress meetings.

5 Documentation

5.1 Document Collation

5.1.1 The CQA Inspector will document that the Specification has been satisfied during construction. The CQA Inspector will maintain a site file of plans and specifications, checklists, test results, daily records, record drawings, photographs, and other pertinent documents. The Contractor shall provide the following documents to the CQA Engineer and CQA Inspector

- Laboratory details and accreditation certificates
- Test results
- Weekly reports
- Construction drawings

5.1.2 The CQA Inspector shall promptly acknowledge receipt, review documentation, and either acknowledge that the information is satisfactory, or reject and provide reasons for doing so.

5.1.3 Should the CQA Inspector not receive this information, or if the information is unsatisfactory or not in compliance with the Specification, then the CQA Inspector shall reject the works related to the unsatisfactory/missing information, and the works shall not be allowed to proceed.

5.2 Daily Reports

5.2.1 The Contractor shall provide the CQA Inspector with daily reports which detail the following:

- the volume of material and number of layers placed, and their location with reference to the grid cell layout drawing;
- the location and unique identification number (ID) of any samples obtained;
- the results of any laboratory or in-situ testing, cross-referenced to the sample IDs;
- location and volume of any materials removed as a result of failed testing.

5.2.2 In addition, the CQA Inspector shall maintain a Daily Diary, which will contain the following:

- Prevailing weather conditions
- Contractor's plant and personnel
- Work undertaken (cross-referenced to the grid layout plan) and results received and reviewed.
- Construction problems and solutions
- Record of site visitors
- Photographs of work progress

5.2.3 Upon completion of the works, the CQA Inspector will prepare an 'as-built' layout plan of the works that will be referenced to the site records, together with results of all testing carried out.

5.2.4 The CQA Inspector will prepare and forward a weekly report to the CQA Engineer.

5.2.5 All of the above will be forwarded as one complete package by the CQA Inspector to the CQA Engineer on completion of the works, to be utilised for, and included within, the CQA Validation Report that will be prepared by the CQA Engineer.

5.3 CQA Validation Report

5.3.1 At the completion of the project, and once the CQA Engineer has received all the necessary and required data from the CQA Inspector, the CQA Engineer will provide to the Employer and to Natural Resources Wales (NRW), a signed Construction Quality Assurance Validation Report, which will outline the works undertaken and indicate whether compliance with the Specification and CQA Plan has been achieved. At a minimum, it will include:

- Project description.
- Contractor's submissions.
- Daily/weekly logs/records as received from the CQA Inspector.
- As-constructed drawings received from the CQA Inspector/Employer.
- Testing (laboratory) certificates.

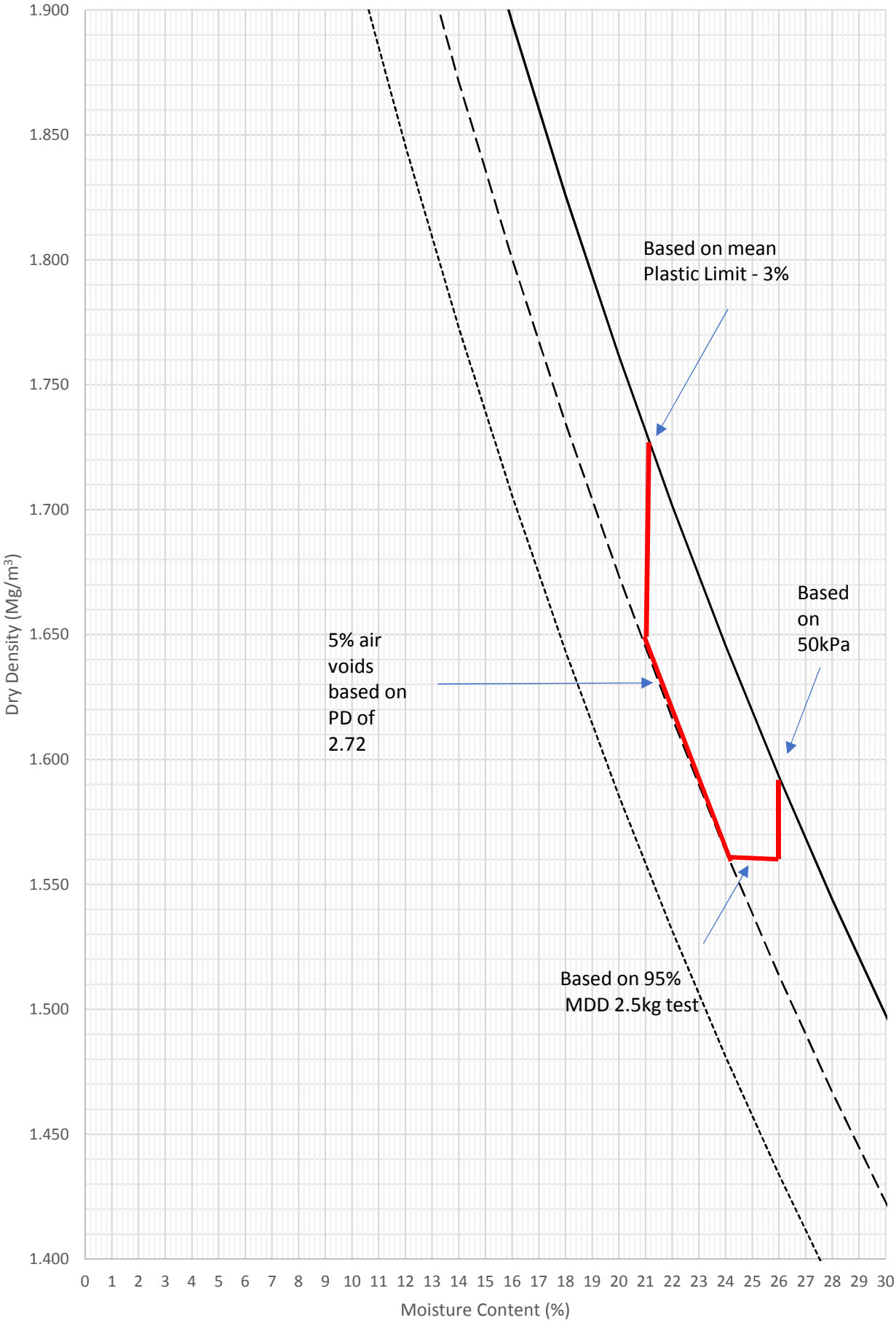
References

EA, 2014 Earthworks in landfill engineering: Design, construction and quality assurance of earthworks in landfill engineering. EA document reference LFE4, dated June 2014. Environment Agency.

MCHW, 2016 Manual of Contract Documents for Highway Works. Volume 1, Specification for Highway Works. Series 600 – Earthworks. Department for Transport, 2016 amendment. Accessed via www.standardsforhighways.co.uk.

Figures

Figure 1 - Acceptance Envelope



Appendices

CAPITA

William Watt- Project Manager & construction Supervision

Chartered Professional Engineer 50554557
MB(App.Fin) Master of Business (Applied Finance), Queensland University of Technology, AUS 2008
B.Eng Civil (Hons) Bristol University UK 1996,

Profile

William has developed his engineering experience since 1996. He has managed and delivered infrastructure planning, design, supervision and verification projects.

William has experience in project management and supervision of civil design, analysing construction and delivering design policy, procedure and programs. He has undertaken due diligence, value engineering and variation assessments under various contract forms.

Key Experience

- contract administration and procurement for Infrastructure, property, highway and civil work, systems and procedures development including quality assurance, health and safety and Environment;
- Design and supervision of infrastructure: highways, drainage, hard standings, pavement, cycleway, traffic analysis implementation, signs and lines, public utilities plant, minor structures and civil works for ITS, lighting, mechanical and electrical

Project Experience

2016 Capita Infrastructure and Property Consulting Engineers

William is a Project Manager for the design and delivery of infrastructure projects.

2016-2018 Wales: Brynglas Tunnel Refurbishment, Newport

Civil Design Lead Client: Costain Group Plc

William was the civil design lead for the M4 Brynglas tunnels referbishment. The tunnels were originally built in 1967 and are twin bore 360m long. My tasks included the development of the reference design and he managed the engineering discipline leads in hydraulics, geotechnics, environment, highways, pavement, structures and tunnel civil works.

Supervision, monitoring and design instructions for the onsite geotechnical testing for the pavement and geotechnical works

2011 Australia: Woogaroo Creek sewer TBM Shaft, Goodna,

Site supervision and design variations
Client: WDS Construction

Construction certification for onsite testing and design variations for the sewerage thrust bore tunnel access shafts and temporary road diversion. The work comply with all safety requirements of the Principal Contract Theiss.

2008 Australia: Hale St Link (Go Between Bridge) Alliance, Brisbane

QA Manager identifying appropriate testing and QA

Client: Hale Street Alliance- Seymour Whyte, Macmahon, Bouygues Travaux Publics in an alliance, Hyder Consulting and Brisbane City Council

William was part of the team that produced the target cost estimate design for a AUD $320 million Brisbane City Council Design & Build Alliance project. William worked with the construction team to develop the testing requirements for the design and construction. The design was for; a bridge across the Brisbane River, online

junction improvement and connecting infrastructure.

2007 Australia: Grant and Station Road Junction Improvements, QLD

Design Manager Client: Moreton Bay regional Council

A AUD 60,000 project for Caboolture Shire Council to design the upgraded and signalised two existing junctions. Supervising the onsite pavement foundation testing to confirm the

2003 - 2006DynCorp International, Sultanate of Oman

William was head hunted to plan and deliver engineering services for the US Air Force War Reserve Material facilities repair and renewals program. With the Chief Engineer, William reported to DynCorp's Management team and US Air Force. William developed approved project scopes, a work program, external consultants' designs, contractors' award, site supervision and answered technical queries.

2000 - 2003WS Atkins, UK and Sultanate of Oman

During his time at WS Atkins William developed from a highways design engineering role to design management and project management roles for the Highways Agency Area 2 program. William joined WS Atkins International team and was seconded to the Oman office to provide engineering design support for Civil Infrastructure projects.

2002 Sultanate of Oman: Khasab Port Expansion—Khasab

Resident Engineer Client: Ministry of Transport and Fisheries

An OMR 17 million project for the Ministry of Transportation Construction—supervised the construction of a 180 m quay wall, dredging, land reclamation, construction of breakwaters and monitoring of quarrying operations.

2002-2000 UK: M4 Motorway Junction 14 to 15 Earthworks stabilisation

Project Manager Client: Highways Agency

A GBP 2 million framework contract for Highways Agency—managed the design and construction of 1 km of earthworks stabilisation; and responsible for the geotechnical design, drainage and specification.

1997 - 2000Parsons & Brinckerhoff, UK

William developed his skills under supervision as a graduate highways engineer providing design and resident engineering services for the local and state networks within the southwest Wales region.

1997-2000 UK: A40 Carmarthen Eastern Bypass, Wales

Graduate Engineer & Supervision Client: National Assembly for Wales

A GBP 27 million construction project for National Assembly for Wales constructed in an environmentally sensitive area in West Wales, William supervised the construction of structures, earthworks and highways.

1997-2000 UK: A485 On-Line Road Improvement, Wales

Graduate Engineer Client: Carmarthen County Council

A GBP 7 million construction project for Carmarthen County Council, as part of a design team, William produced road alignment, pavement, drainage and structure designs for a project in the heart of rural Wales. William assisted within the public enquiry process developing documentation.

1996 - 1997 UK: Powys Engineering Consultancy, Wales

Having graduated from Bristol University William undertook freelance work as a minor works engineer for

Appendix 2: Field Trial Description

A field compaction trial was carried out on site on 15th May 2018, using stockpiles of imported clay from the source at Wingmoor Farm quarry, Bishops Cleeve. The material was conditioned on site. The conditioning was observed by the Contractor, the Employer and the CQA Inspector, and was controlled on site by the Contractor using MCV testing.

Following conditioning, an initial sacrificial basal layer was placed within the footprint of the proposed Cell 4, as marked out by the Contractor. The sacrificial base layer was not subject to any testing, in accordance with LFE4, but was compacted in two halves, in accordance with the proposed methodologies. The area marked out for the trial measured 14m wide, by 20m in length and additionally included ramps for acceleration and deceleration. The materials were brought from the stockpile to the trial area by a dumper and spread using a tracked dozer.

The trial pad was split into two halves with one half comprising un-compacted layers 300mm thick and subject to 12 passes of the roller, and the other half comprising un-compacted layers 250mm thick and subject to 6 passes of the roller. Each half of the trial pad received a total of 4 layers including the sacrificial base/first layer and therefore testing was undertaken on layers 2 through to 4 only.

Once the sacrificial base layer was completed, the second layer was placed with material from the conditioned stockpile. Disturbed sample for MCV testing and representative bulk samples were obtained from the placed material prior to spreading to the required thickness. A field MCV test was then carried out on the sample prior to the layer being compacted. The bulk samples were scheduled for moisture content, Atterberg limits, particle size distribution, particle density and compaction testing.

Following compaction of the second layer, four core samples were obtained by CJ Associates Site Testing Services from the completed layer. Laboratory permeability and density testing were scheduled on two of the cores, whilst the other two were taken as ‘reserve’ cores in case re-testing was required. Three hand shear vane (HSV) tests were carried out on the completed layer.

A further two layers were completed as described above until three layers had been placed, compacted, and sampled, in accordance with LFE 4, all on top of the sacrificial base layer

Once all four layers were completed, a trench was cut through both trial pad halves to allow visual observation of the effectiveness of the different compaction methods. The trench was inspected by the Employer, the Contractor, and the CQA Inspector to identify the presence of any oversize materials, clods, the achieved thickness and the nature of the inter-layer bonding. The conclusions are described in Section 2.4 of the main text of the CQA Plan and Performance Specification.

The results of the field and laboratory testing are summarised in Table A1 below.

Table A1 Summary of Compaction Trial Testing Results

	Trial Pad 1: 250mm – 6 passes			Trial Pad 2: 300mm – 12 passes		
	Layer 2	Layer 3	Layer 4	Layer 2	Layer 3	Layer 4
MC (%)	17-20	23-25	19-23	21-23	19-20	20-21
LL (%)	47-48	48	48	48-50	48	47-49
PI (%)	21-22	23-24	22	23-25	22	21-23
Percentage Fines <0.063mm	93-97	97	98	97-98	96-98	97-98
HSV (kPa)	120*	81*	100*	104*	79*	130*
% air voids	<5	<5	<5	<5	<5	<5
Permeability (m/s)	7.9×10^{-11}	4.3×10^{-11}	7.8×10^{-11}	4.4×10^{-11}	3.0×10^{-11}	1.2×10^{-10}

* denotes average value based on 3 readings

Appendix 3 Drawing Number 14791/155/001

CELL 4A

CELL 4B

CELL 3A

CELL 3B

Northern Bund

Western Cell Division Bund

Cell Division Bund

Spine Drain

Feeder Drain

Temporary Rodding Eye

Temporary Rodding Eyes

Sump

MW

A

B

C

D

E

0 10 20
metres

Key

- Spine Drain
- Feeder Drain
- Sump
- MW Monitoring Well
- Side Slope Sump
- Rodding Eye

Mark	Revision	Date	Drawn	Chkd	Appd

SCALING NOTE: Do not scale this drawing - any errors or omissions shall be reported to Stantec without delay.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

Drawing Issue Status

DRAFT

DOCKSWAY DISPOSAL SITE AREA 2, CELLS 3 AND 4 GENERAL ARRANGEMENT AND LEACHATE EXTRACTION DETAIL

Client

NEWPORT CITY COUNCIL

Stantec

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READING
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Date of 1st Issue	Designed	Drawn
20.01.2020	PJ	davco
A1 Scale	Checked	Approved
1:500	VKR/PJ	-

Drawing Number	Revision
14739/155/001	0

User name: vokon_david

File Location: j:\14739\155 - permit revision 2015\03_ figures & drawings\cad\dwgs\14739_155_001.dwg

Appendix 4 Laboratory Test Results

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3464**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**21/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B1-L1-C1	Core 2 C3-L1-C1			
Bulk Density	1.99	1.98			
Moisture Content	26	24			
Dry Density	1.59	1.59			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.5	3.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 22/06/2019	Fig

SAMPLE COLLECTION FORM

Client:	Jim Davies Civil Engineering Limited
Project:	Docksway Cell 4

Description of Batch: ☐ Disturbed ☑ Undisturbed

Type of Sample: ☑ Insitu ☐ Bulk ☐ Spot ☐ Riffled

Method of Sampling: ☐ BS EN 932 ☐ BS 1377

No. of Increments:

Location of Sampling	Please see Location Reference
Material Description:	Grey slightly sandy slightly gravelly CLAY
Material Supplier:	Unknown
Material Source:	Unknown

Date Sampled:	24/06/2019	Time Sampled:		Site Ref.:	Core 1 - Core 3
Weather:	Overcast				
Sampled By:	G Tucker	Samplers Signature:			

Tests Required

Aggregates	Soils	Insitu
☐ Moisture Content	☐ Moisture Content	☐ Sand Replacement Density
☐ PSD Washed	☐ PSD Washed	☑ Core Cutter Density
☐ PSD Dry	☐ PSD Dry	☐ Nuclear Density
☐ LA Coeficient	☐ Plastic Limit	☐ CBR (Insitu)
☐ Flakiness Index	☐ Liquid Limit	☐ Plate Bearing Test
☐ Particle Density	☐ Atterberg Limits	☐ TRL Probe
	☐ CBR (Laboratory)	
	☐ 2.5kg Rammer Compaction	
	☐ 4.5kg Rammer Compaction	
	☐ Vibrating Hammer Compaction	
	☐ Particle Density	

Other Tests: *please specify*

Specification	BS1377: Part 9	Material Class:	

Further Instructions:

Client Signature:		Print Name:	

For Laboratory Use Only

Delivered to the Laboratory: ☐

Collected from Site: ☐

Sampled By the Laboratory: ☑

Sampling Certificate Received ☑ Yes ☐ No

Date Received:	24/06/2019
Project Number:	AG0390
Sample Number	3521

Mass of Bulk Sample Received:	

QA Ref.	CJ Associates King Road Avenue, Avonmouth, Bristol, BS11 9HF	Received By		Checked	
TBA		Date		Date	

In-Situ Density Test (Core Cutter Method)

BS1377: PART 9: 1990

Project No.:	AG0390
Project Name:	Docksway Cell 4
Client:	Jim Davies Civil Engineering Limited

Sample No.:	3521

Location Ref. (chainage etc)		Core 1 B1-L2-C1	Core 2 E2-L-1-C1	Core 3 E3-L-1-C1	Core 4 C5-B2-C1	Core 5 B3-L3-C1
Core Test No.		1	2	3	4	5
Length of Core Cutter	mm	130.36	130.24	130.16		
Diameter of Core Cutter	mm	100.21	100.56	100.37		
Volume of Core Cutter	m^3	1.028	1.034	1.030		
Mass of Core Cutter	g	0.0	0.0	0.0	0.0	0.0
Mass of Core Cutter and Wet Soil	g	2143.0	2094.0	2106.0	0.0	0.0
Mass of Wet Soil	g	2143.0	2094.0	2106.0		
Bulk Density Pb	Mg/m^3	2.08	2.02	2.04		

Moisture Content

Container Reference		A21	AA41	A18		
Mass of container (p1)	g	1333	1363	1335		
Mass of container & wet soil (p2)	g	3476	3457	3441		
Mass of container and dry soil (p3)	g	3106	3062	3047		
Moisture Content w	$\frac{p2-p3}{p3-p1}x100$ %	20.9	23.2	23.0		
Dry Density Pd	$\frac{100xPb}{100+w}x100$ Mg / m^3	1.72	1.64	1.66		
Air Voids %		1.08	1.87	1.07	#VALUE!	#VALUE!

Additional Information

Maximum Dry Density of Material	Optimum Moisture Content
N/A	N/A
Particle density	2.74

Relative Compaction				
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

QA Ref. BS 1377 Part 9 CC Rev. 1.0		Operator		Checked	
		Date	24/08/2018	Date	

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3521**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**24/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B1-L2-C1	Core 2 E2-L-1-C1	Core 3 E3-L-1-C1		
Bulk Density	2.08	2.02	2.04		
Moisture Content	21	23	23		
Dry Density	1.72	1.64	1.66		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	1.1	1.9	1.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 25/06/2019
			R Anstee, Materials and Field Testing Director	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3553**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**26/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A2-L3-C1	Core 2 E4-L-1-C1	Core 3 B1-L3-C1	Core 4 B2-L3-C1	
Bulk Density	2.04	2.05	2.01	2.04	
Moisture Content	24	23	24	24	
Dry Density	1.64	1.67	1.62	1.64	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	0.7	1.2	1.7	0.4	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 27/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3560**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**27/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B4-L2-C1	Core 2 B3-L2-C1	Core 3 A3-L1-C1 Retest		
Bulk Density	2.01	1.99	2.06		
Moisture Content	26	23	23		
Dry Density	1.60	1.62	1.67		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	0.6	3.4	0.3		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 28/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3571**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**28/06/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C3-L1-C1	Core 2 C4-L1-C1			
Bulk Density	2.02	2.02			
Moisture Content	24	25			
Dry Density	1.63	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.5	0.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 30/06/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3583**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**01/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C5-L1-C1	Core 2 A4-L2-C1			
Bulk Density	2.04	2.01			
Moisture Content	23	25			
Dry Density	1.66	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.0	1.6			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 02/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3589**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**02/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C5-L2-C1	Core 2 A3-L2-C1			
Bulk Density	2.04	2.02			
Moisture Content	23	26			
Dry Density	1.66	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.4	0.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 03/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3594**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**03/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C4-L2-C1	Core 2 C3-L2-C1			
Bulk Density	2.03	2.00			
Moisture Content	23	26			
Dry Density	1.65	1.59			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.7	0.6			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 04/07/2019 Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3601**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**04/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-L1-C1	Core 2 E4-L1-C1			
Bulk Density	2.00	2.02			
Moisture Content	24	25			
Dry Density	1.61	1.61			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.9	0.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 05/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3612**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L1-C1	Core 2 C2-L2-C1	Core 3 D2-L1-C1		
Bulk Density	2.02	2.00	2.00		
Moisture Content	24	25	25		
Dry Density	1.62	1.60	1.60		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	1.1	2.0	1.5		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 06/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3619**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**08/07/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E4-L2-C1	Core 2 E3-L2-C1	Core 3 E2-L2-C1		
Bulk Density	1.99	1.98	1.99		
Moisture Content	23	27	27		
Dry Density	1.61	1.57	1.56		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.6	1.1	0.4		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee, Materials and Field Testing Director	Date 09/07/2019 Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3639**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**09/07/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-L2-C1	Core 2 D2-L2-C1	Core 3 C2-L3-C1	Core 4 D3-L2-C1	
Bulk Density	2.03	2.03	1.99	2.01	
Moisture Content	24	22	26	24	
Dry Density	1.64	1.66	1.57	1.63	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	1.3	2.6	0.8	2.2	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 11/07/2019	Fig
			R Anstee, Materials and Field Testing Director		

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3644**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**10/07/2019**	Material Source:	**Unknown**
Tested By:	**R Colamazza**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D4-L1-C1	Core 2 D5-L1-C1	Core 3 A4-L3-C1		
Bulk Density	2.00	2.00	2.02		
Moisture Content	23	25	22		
Dry Density	1.62	1.60	1.65		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.1	2.1	2.9		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

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TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3665**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**11/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-L3-Core1	Core 2 A3-L3-Core2			
Bulk Density	1.99	2.06			
Moisture Content	24	22			
Dry Density	1.61	1.68			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	3.1	1.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 12/07/2019	Fig
			R Anstee, Materials and Field Testing Director		

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3665**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**11/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-L3-Core1	Core 2 A3-L3-Core2			
Bulk Density	1.99	2.06			
Moisture Content	24	22			
Dry Density	1.61	1.68			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	3.1	1.1			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 12/07/2019	Fig
			R Anstee, Materials and Field Testing Director		

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3679**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**12/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D4-L2-Core1	Core 2 D4-L2-Core2	Core 3 D5-L2-Core1	Core 4 D5-L2-Core2	
Bulk Density	1.98	1.98	2.01	2.00	
Moisture Content	24	27	24	25	
Dry Density	1.59	1.57	1.62	1.59	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	3.2	1.0	1.4	1.7	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee, Materials and Field Testing Director	Date 14/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3693**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**15/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L3-Core1	Core 2 D3-L3-Core2	Core 3 C3-L3-Core1	Core 4 C3-L3-Core2	
Bulk Density	1.96	2.01	2.01	2.01	
Moisture Content	25	25	25	25	
Dry Density	1.57	1.60	1.61	1.62	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	3.6	1.0	0.9	1.1	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee, Materials and Field Testing Director	Date 16/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3694**		

Site Reference:	**Core 5 - Core 8**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**15/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 5 C5-L3-Core1	Core 6 C5-L3-Core2	Core 7 B3-L3-Core1	Core 8 B3-L3-Core2	
Bulk Density	1.98	1.99	1.98	2.00	
Moisture Content	27	23	24	25	
Dry Density	1.56	1.62	1.59	1.60	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	1.2	3.7	3.1	1.5	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3705**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**16/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B4-L3-Core1	Core 2 C4-L3-Core1			
Bulk Density	2.02	1.97			
Moisture Content	24	26			
Dry Density	1.63	1.56			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.0	2.0			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 17/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3764**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**23/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B5-L1-C1	Core 2 A4-L4-C1	Core 3 A3-L4-C1		
Bulk Density	2.01	1.97	2.04		
Moisture Content	23	25	23		
Dry Density	1.64	1.58	1.65		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.3	2.9	0.9		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 24/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3768**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**24/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B4-L4-C1	Core 2 B5-L2-C1			
Bulk Density	2.02	2.02			
Moisture Content	24	24			
Dry Density	1.63	1.64			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.5	1.7			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 25/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3781**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**25/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A5-L2-C1	Core 2 B3-L4-C1	Core 3 C3-L4-C1		
Bulk Density	1.99	1.98	2.01		
Moisture Content	24	25	25		
Dry Density	1.60	1.59	1.61		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	3.2	2.3	0.7		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 26/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3804**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**26/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C2-L4-C1	Core 2 E2-L4-C1			
Bulk Density	2.02	2.02			
Moisture Content	24	24			
Dry Density	1.63	1.63			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	1.1	1.7			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 27/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3807**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**29/07/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C2-L5-C1	Core 2 D2-L5-C1	Core 3 E4-L4-C1		
Bulk Density	2.02	2.01	1.98		
Moisture Content	23	26	26		
Dry Density	1.64	1.60	1.57		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.74Mg/m³	1.9	0.4	1.7		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 30/07/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3829**		

Site Reference:	**Core 1 - Core 5**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**01/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B1-L4-C1	Core 2 B2-L4-C1	Core 3 E4-L4-C1	Core 4 D4-L4-C1	Core 5 C5-L5-C1
Bulk Density	2.04	2.02	2.03	2.02	2.07
Moisture Content	22	23	20	24	22
Dry Density	1.67	1.65	1.68	1.63	1.70

Relative Compaction	N/A	N/A	N/A	N/A	N/A
Air Voids % Using PD 2.74Mg/m³	1.8	2.7	4.1	2.0	0.7

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 02/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3830**		

Site Reference:	**Core 6**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**01/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 6 B5-L3-C1				
Bulk Density	2.02				
Moisture Content	24				
Dry Density	1.63				

Relative Compaction	N/A				
Air Voids % Using PD 2.74Mg/m³	1.6				

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 02/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3857**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**02/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A2-L5-C1	Core 2 B2-L5-C1			
Bulk Density	2.06	2.03			
Moisture Content	22	23			
Dry Density	1.68	1.65			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.74Mg/m³	0.9	1.9			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 03/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3863**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E4-L4-C1 Retest	Core 2 C3-L5-C1	Core 3 C4-L4-C1	Core 4 E3-L5-C1	
Bulk Density	2.02	2.01	2.00	2.00	
Moisture Content	22	23	23	23	
Dry Density	1.66	1.64	1.63	1.63	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.74Mg/m³	3.4	2.5	3.7	3.1	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 06/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3869**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**06/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L5-C1	Core 2 A3-L5-C1			
Bulk Density	2.06	2.05			
Moisture Content	20	21			
Dry Density	1.71	1.70			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	1.6	0.9			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 07/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**3880**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**08/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Sunny**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L5-C1 Retest	Core 2 D4-L5-C1	Core 3 D5-L5-C1	Core 4 C4-L5-C1	
Bulk Density	2.08	2.06	2.02	2.00	
Moisture Content	20	20	23	25	
Dry Density	1.74	1.71	1.64	1.61	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.67Mg/m³	0.8	1.3	0.5	0.2	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee — R Anstee, Materials and Field Testing Director	Date 09/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4007**		

Site Reference:	**Core 1 - Core 5**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**21/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 B5-L4-C1	Core 2 A4-L5-C1	Core 3 B3-L5-C1	Core 4 B4-L5-C1	Core 5 B5-L5-C1
Bulk Density	2.02	2.00	2.06	2.02	2.00
Moisture Content	23	24	21	21	24
Dry Density	1.65	1.62	1.70	1.67	1.61

Relative Compaction	N/A	N/A	N/A	N/A	N/A
Air Voids % Using PD 2.67Mg/m³	1.2	1.4	0.0	1.9	1.1

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4016**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**22/08/2019**	Material Source:	**Unknown**
Tested By:	**L Llewellyn**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-L5-C1 Retest	Core 2 E5-L5-C1	Core 3 D4-L5-C1 Retest	Core 4 E4-L5-C1	
Bulk Density	2.01	2.01	2.04	2.02	
Moisture Content	23	23	21	21	
Dry Density	1.64	1.64	1.69	1.67	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.67Mg/m³	1.7	1.3	1.7	2.2	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 23/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4149**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**28/08/2019**	Material Source:	**Unknown**
Tested By:	**R Anstee**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast with showers**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 C3-L6-C1	Core 2 D5-B1-C1	Core 3 E3-B2-C1		
Bulk Density	2.02	2.03	2.03		
Moisture Content	22	21	23		
Dry Density	1.65	1.67	1.65		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	1.4	1.4	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 29/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4153**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**29/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-B4-C1	Core 2 A3-B1-C1	Core 3 D5-B2-C1		
Bulk Density	2.00	2.04	1.99		
Moisture Content	23	22	25		
Dry Density	1.62	1.67	1.59		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	1.3	0.4	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 30/08/2019
			R Anstee, Materials and Field Testing Director	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4163**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**30/08/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-B6-C1	Core 2 D5-B3-C1			
Bulk Density	2.02	2.01			
Moisture Content	23	23			
Dry Density	1.64	1.63			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	0.8	1.0			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 31/08/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4274**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**03/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-B2-C1	Core 2 A3-B3-C1	Core 3 E3-B8-C1		
Bulk Density	2.02	2.03	2.05		
Moisture Content	24	23	22		
Dry Density	1.63	1.65	1.68		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	0.1	0.8	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 04/09/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4304**		

Site Reference:	**Core 1 - Core 4**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**05/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 E3-B10-C1	Core 2 D5-B4-C1	Core 3 A3-B4-C1	Core 4 E3-B12-C1	
Bulk Density	2.03	2.02	2.05	2.05	
Moisture Content	21	23	22	21	
Dry Density	1.69	1.65	1.68	1.69	

Relative Compaction	N/A	N/A	N/A	N/A	
Air Voids % Using PD 2.67Mg/m³	2.1	1.0	0.6	0.5	

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 06/09/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4313**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**06/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-B5-C1	Core 2 D5-B5-C1			
Bulk Density	2.05	2.05			
Moisture Content	22	21			
Dry Density	1.69	1.70			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	0.2	1.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 07/09/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4316**		

Site Reference:	**Core 1 - Core 2**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**09/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 D3-B6-C1	Core 2 A3-B6-C1			
Bulk Density	2.04	2.07			
Moisture Content	21	21			
Dry Density	1.68	1.71			

Relative Compaction	N/A	N/A			
Air Voids % Using PD 2.67Mg/m³	1.4	0.2			

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R Anstee, Materials and Field Testing Director	Date 10/09/2019	Fig

TEST REPORT

Insitu Density Test (Core Cutter)

BS 1377 Part 9

Project No.:	**AG0390**	Client:	**Jim Davies Civil Engineering Limited**
Project Name:	**Docksway Cell 4**	Address:	**Ty Gwyn Banalog Terrace Hollybush Blackwood NP12 0SG**
Sample No.:	**4377**		

Site Reference:	**Core 1 - Core 3**	Sample Type:	**Insitu**
Location in works:	**Please see Location Reference**	Material Description:	**Grey slightly sandy slightly gravelly CLAY**
Date Tested:	**12/09/2019**	Material Source:	**Unknown**
Tested By:	**G Tucker**	Material Supplier:	**Unknown**
Environmental Conditions:	**Overcast**	Specification:	**BS1377: Part 9**

Test Results

Location Reference	Core 1 A3-B8-C1	Core 2 D5-B8-C1	Core 3 C3-L5-C1		
Bulk Density	2.07	2.02	2.06		
Moisture Content	21	24	21		
Dry Density	1.72	1.63	1.70		

Relative Compaction	N/A	N/A	N/A		
Air Voids % Using PD 2.67Mg/m³	0.1	0.2	0.1		

Relative compaction based on:-	Maximum Dry Density	N/A	Mg/m^3
	Optimum Moisture Content	N/A	%
OMC/MDD relates to sample:-			

QA Ref. BS 1377 Part 9 CC Rev. 1.0	cjassociates King Road Avenue, Avonmouth, Bristol, BS11 9HF Tel: 0117 9821473	UKAS TESTING 1429	Approver R. Anstee	Date 13/09/2019	Fig
			R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3465	B1-L1 21.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	62	72	74	69	HSV 1
3466	C3-L1 21.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	118	92	82	97	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	22/06/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3522	B1-L2 24.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	125	>150	78	>118	HSV 1
3523	E2-L-1 24.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	96	81	58	78	HSV 2
3524	E3-L-1 24.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	75	85	100	87	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R Anstee, Materials and Field Testing Director	25/06/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3554	A2-L3 26.06.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	91	90	78	86	HSV 1
3555	E4-L-1 26.06.19	Layer -1	Grey slightly sandy slightly gravelly CLAY	75	85	90	83	HSV 2
3556	B1-L3 26.06.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	134	89	64	96	HSV 3
3557	B2-L3 26.06.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	120	74	76	90	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	27/06/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3561	B4-L2 27.06.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	70	68	66	68	HSV 1
3562	B3-L2 27.06.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	75	88	64	76	HSV 2
3563	A3-L1 Retest 27.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	100	100	68	89	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R Anstee, Materials and Field Testing Director	28/06/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3572	C3-L1 28.06.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	97	135	55	96	HSV 1
3573	C4-L1 28.06.20	Layer 1	Grey slightly sandy slightly gravelly CLAY	95	110	110	105	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee	Date 30/06/2019	Fig. **HV1**
Rev 1.0		R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3584	C5-L1 01.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	62	82	102	82	HSV 1
3585	A4-L2 01.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	110	110	85	102	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	02/07/2019	HV1

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HAND SHEAR VANE

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Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3590	C5-L2 02.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	78	105	105	96	HSV 1
3591	A3-L2 02.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	68	68	79	72	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	03/07/2019	HV1

TEST REPORT
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Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
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NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3595	C4-L2 03.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	92	78	68	79	HSV 1
3596	C3-L2 03.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	58	57	85	67	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R Anstee, Materials and Field Testing Director	04/07/2019	HV1

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Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3602	E3-L1 04.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	55	65	72	64	HSV 1
3603	E4-L1 04.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	52	62	74	63	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	05/07/2019	HV1

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Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3613	D3-L1 05.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	74	62	100	79	HSV 1
3614	C2-L2 05.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	114	50	50	71	HSV 2
3615	D2-L1 05.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	60	50	50	53	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R Anstee, Materials and Field Testing Director	06/07/2019	HV1

TEST REPORT
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Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3620	E4-L2 08.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	100	90	78	89	HSV 1
3621	E3-L2 08.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	74	54	72	67	HSV 2
3622	E2-L2 08.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	126	78	68	91	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	09/07/2019	HV1

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Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3640	E3-L2 09.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	>150	72	84	>102	HSV 1
3641	D2-L2 09.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	72	78	60	70	HSV 2
3642	C2-L3 09.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	58	64	100	74	HSV 3
3643	D3-L2 09.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	112	118	80	103	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	11/07/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

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Project Name: Docksway Cell 4

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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3645	D4-L1 10.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	74	84	76	78	HSV 1
3646	D5-L1 10.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	124	60	82	89	HSV 2
3647	A4-L3 10.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	66	74	110	83	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	11/07/2019	**HV1**

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Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3666	A3-L3 11.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	100	60	67	76	HSV 1

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	12/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3666	A3-L3 11.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	100	60	67	76	HSV 1

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	12/07/2019	HV1

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Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3680	D4-L2 12.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	65	75	80	73	HSV 1
3681	D5-L2 12.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	90	83	79	84	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	14/07/2019	HV1

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Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3695	D3-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	65	65	55	62	HSV 1
3696	C3-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	75	65	70	70	HSV 2
3697	C5-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	75	60	80	72	HSV 3
3698	B3-L3 15.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	60	60	55	58	HSV 4

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 16/07/2019
Rev 1.0			Fig. **HV1**

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Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3706	B4-L3 16.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	60	72	52	61	HSV 1
3707	C4-L3 16.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	50	52	52	51	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	17/07/2019	HV1

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Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3719	E4-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	80	108	58	82	HSV 1
3720	E3-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	125	52	115	97	HSV 2
3721	D4-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	95	78	52	75	HSV 3
3722	D3-L4 18.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	62	98	92	84	HSV 4
3723	D5-L3 18.07.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	70	78	64	71	HSV 5
3724	D2-L4 18.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	69	70	62	67	HSV 6

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	19/07/2019	HV1

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Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
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NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3765	B5-L1 23.07.19	Layer 1	Grey slightly sandy slightly gravelly CLAY	62	52	60	58	HSV 1
3766	A4-L4 23.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	68	60	102	77	HSV 2
3767	A3-L4 23.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	60	65	72	66	HSV 3

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	24/07/2019	HV1

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Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3769	B4-L4 24.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	50	54	56	53	HSV 1
3770	B5-L2 24.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	65	70	61	65	HSV 2

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	25/07/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3782	A5-L2 25.07.19	Layer 2	Grey slightly sandy slightly gravelly CLAY	58	50	72	60	HSV 1
3783	B3-L4 25.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	58	62	65	62	HSV 2
3784	C3-L4 25.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	60	55	54	56	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	26/07/2019	HV1

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Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3805	C2-L4 26.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	54	82	72	69	HSV 1
3806	E2-L4 26.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	68	62	76	69	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	27/07/2019	HV1

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Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3808	C2-L5 29.07.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	50	118	51	73	HSV 1
3809	D2-L5 29.07.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	70	110	120	100	HSV 2
3810	E3-L4 29.07.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	85	90	100	92	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3831	B1-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	150	120	112	127	HSV 1
3832	B2-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	125	127	110	121	HSV 2
3833	E4-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	105	120	110	112	HSV 3
3834	D4-L4 01.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	85	80	96	87	HSV 4
3835	C5-L5 01.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	89	114	150	118	HSV 5
3836	B5-L3 01.08.19	Layer 3	Grey slightly sandy slightly gravelly CLAY	90	85	70	82	HSV 6

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	02/08/2019	**HV1**

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Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3858	A2-L5 02.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	85	90	75	83	HSV 1
3859	B2-L5 02.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	85	90	65	80	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	03/08/2019	HV1

TEST REPORT
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Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3864	E4-L4 Retest 05.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	55	98	65	73	HSV 1
3865	C3-L5 05.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	91	75	66	77	HSV 2
3866	C4-L4 05.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	120	56	65	80	HSV 3
3867	E3-L5 05.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	89	84	67	80	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	06/08/2019	**HV1**

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Project Name: Docksway Cell 4

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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3870	D3-L5 06.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	64	67	56	62	HSV 1
3871	A3-L5 06.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	65	68	70	68	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	07/08/2019	HV1

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Client: Jim Davies Civil Engineering Limited

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Address: Ty Gwyn Banalog Terrace
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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
3881	D3-L5 Retest 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	75	81	79	78	HSV 1
3882	D4-L5 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	100	132	100	111	HSV 2
3883	D5-L5 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	79	85	76	80	HSV 3
3884	C4-L5 08.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	95	83	87	88	HSV 4

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 09/08/2019
Rev 1.0			Fig. **HV1**

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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4008	B5-L4 21.08.19	Layer 4	Grey slightly sandy slightly gravelly CLAY	100	88	74	87	HSV 1
4009	A4-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	64	60	50	58	HSV 2
4010	B3-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	85	60	54	66	HSV 3
4011	B4-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	105	82	100	96	HSV 4
4012	B5-L5 21.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	80	85	100	88	HSV 5

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver R. Anstee R Anstee, Materials and Field Testing Director	Date 22/08/2019
Rev 1.0			Fig. **HV1**

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Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4017	D3-L5 Retest 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	78	92	90	87	HSV 1
4018	E5-L5 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	98	74	98	90	HSV 2
4019	D4-L5 Retest 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	105	130	105	113	HSV 3
4020	E4-L5 22.08.19	Layer 5	Grey slightly sandy slightly gravelly CLAY	74	80	79	78	HSV 4

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	23/08/2019	**HV1**

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Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4150	C3-L6 28.08.19	Layer 6	Grey slightly sandy slightly gravelly CLAY	80	90	108	93	HSV 1
4151	D5-B1 28.08.19	Layer B1	Grey slightly sandy slightly gravelly CLAY	102	108	74	95	HSV 2
4152	E3-B2 28.08.19	Layer B2	Grey slightly sandy slightly gravelly CLAY	98	69	54	74	HSV 3

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	29/08/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4154	E3-B4 29.08.19	Layer B4	Grey slightly sandy slightly gravelly CLAY	70	75	60	68	HSV 1
4155	A3-B1 29.08.19	Layer B1	Grey slightly sandy slightly gravelly CLAY	150	80	108	113	HSV 2
4156	D5-B2 29.08.19	Layer B2	Grey slightly sandy slightly gravelly CLAY	80	90	100	90	HSV 3

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	30/08/2019	**HV1**

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4164	E3-B6 30.08.19	Layer B6	Grey slightly sandy slightly gravelly CLAY	80	120	50	83	HSV 1
4165	D5-B3 30.08.19	Layer B3	Grey slightly sandy slightly gravelly CLAY	105	95	115	105	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	31/08/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4275	A3-B2 03.09.19	Layer B2	Grey slightly sandy slightly gravelly CLAY	72	72	68	71	HSV 1
4276	A3-B3 03.09.19	Layer B3	Grey slightly sandy slightly gravelly CLAY	97	74	150	107	HSV 2
4277	E3-B8 03.09.20	Layer B8	Grey slightly sandy slightly gravelly CLAY	125	135	74	111	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
	King Road Avenue, Bristol, BS11 9HF	R. Anstee	04/09/2019	HV1
Rev 1.0	Tel 0117 9821473	R Anstee, Materials and Field Testing Director		

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4305	E3-B10 05.09.19	Layer B10	Grey slightly sandy slightly gravelly CLAY	108	58	80	82	HSV 1
4306	D5-B4 05.09.19	Layer B4	Grey slightly sandy slightly gravelly CLAY	65	110	120	98	HSV 2
4307	A3-B4 05.09.19	Layer B4	Grey slightly sandy slightly gravelly CLAY	105	90	110	102	HSV 3
4308	E3-B12 05.09.19	Layer B12	Grey slightly sandy slightly gravelly CLAY	105	120	100	108	HSV 3

QA Ref.	cjassociates	Approver	Date	Fig.
Rev 1.0	King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	R. Anstee R Anstee, Materials and Field Testing Director	06/09/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4314	A3-B5 06.09.19	Layer B5	Grey slightly sandy slightly gravelly CLAY	130	120	90	113	HSV 1
4315	D5-B5 06.09.19	Layer B5	Grey slightly sandy slightly gravelly CLAY	150	125	120	132	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	07/09/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4317	D3-B6 09.09.19	Layer B6	Grey slightly sandy slightly gravelly CLAY	120	130	150	133	HSV 1
4318	A3-B6 09.09.19	Layer B6	Grey slightly sandy slightly gravelly CLAY	140	150	130	140	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	10/09/2019	HV1

TEST REPORT
HAND SHEAR VANE

Project No.: AG0390

Client: Jim Davies Civil Engineering Limited

Project Name: Docksway Cell 4

Address: Ty Gwyn Banalog Terrace
Hollybush
Blackwood
NP12 0SG

Sample No	Sample ID	Depth (m)	Description	KPA Reading			Average	Remarks
4378	A3-B8 12.09.19	Layer B8	Grey slightly sandy slightly gravelly CLAY	119	62	81	87	HSV 1
4379	D5-B8 12.09.19	Layer B8	Grey slightly sandy slightly gravelly CLAY	80	100	102	94	HSV 2

QA Ref.	cjassociates King Road Avenue, Bristol, BS11 9HF Tel 0117 9821473	Approver	Date	Fig.
Rev 1.0		R Anstee, Materials and Field Testing Director	13/09/2019	HV1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13752

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	2	test(s)
Grading	2	test(s)

Date (s) sampled and received at laboratory:	4	Jun-19
Date of receipt of testing instructions	4	Jun-19
Date testing started:	7	Jun-19
Date of issue:	9	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A4 L1		0.00		B	Dark grey slightly sandy CLAY			25.3	100	47	20	27		
B3 L1		0.00		B	Dark grey slightly sandy CLAY			24.9	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
A4L1			B	Dark grey CLAY and SILT with rare fine to medium pyritic fossil fragments.	2.71	2
B3L1			B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29403

Project Name:

DOCKSWAY CELL 4
L13752

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

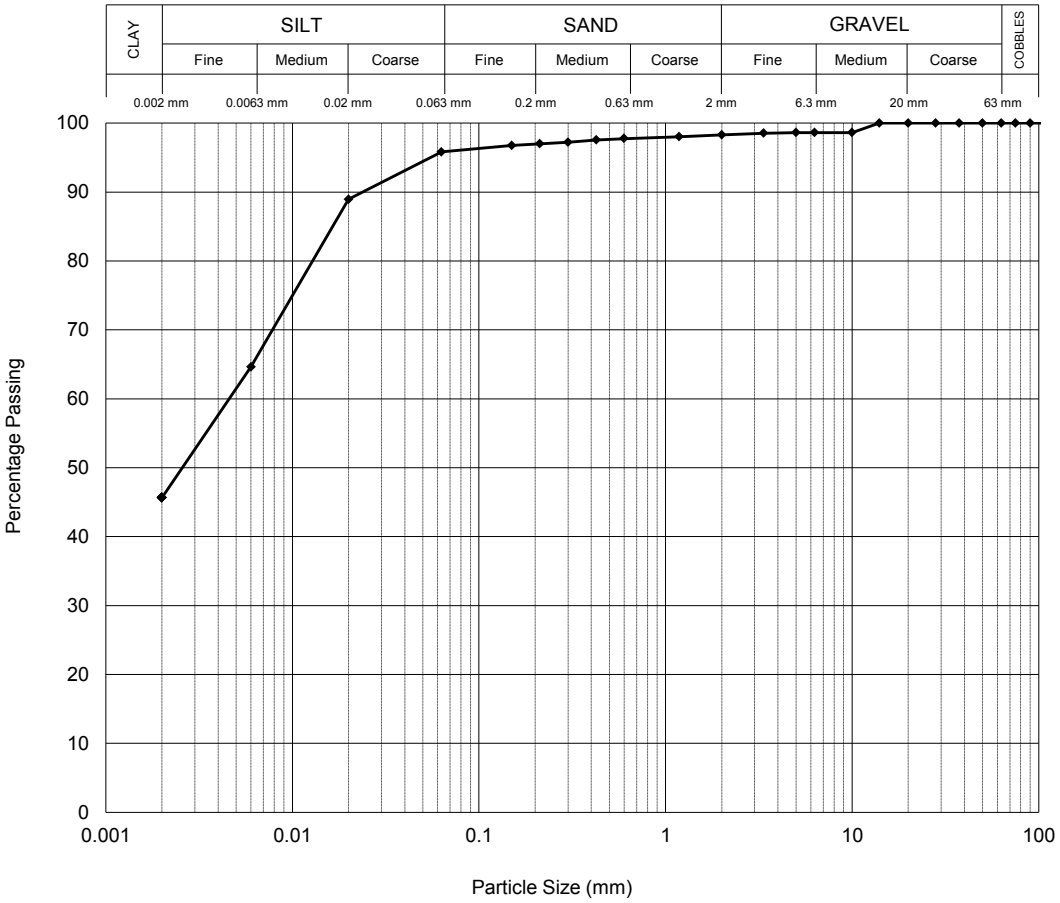
BH / TP No.	A4L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare fine to medium pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	24.9
Size	% Pass
20 µm	89
6 µm	65
2 µm	46

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	50
Clay	46

Checked and Approved by

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29403

Project Name:

DOCKSWAY CELL 4
L13752

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

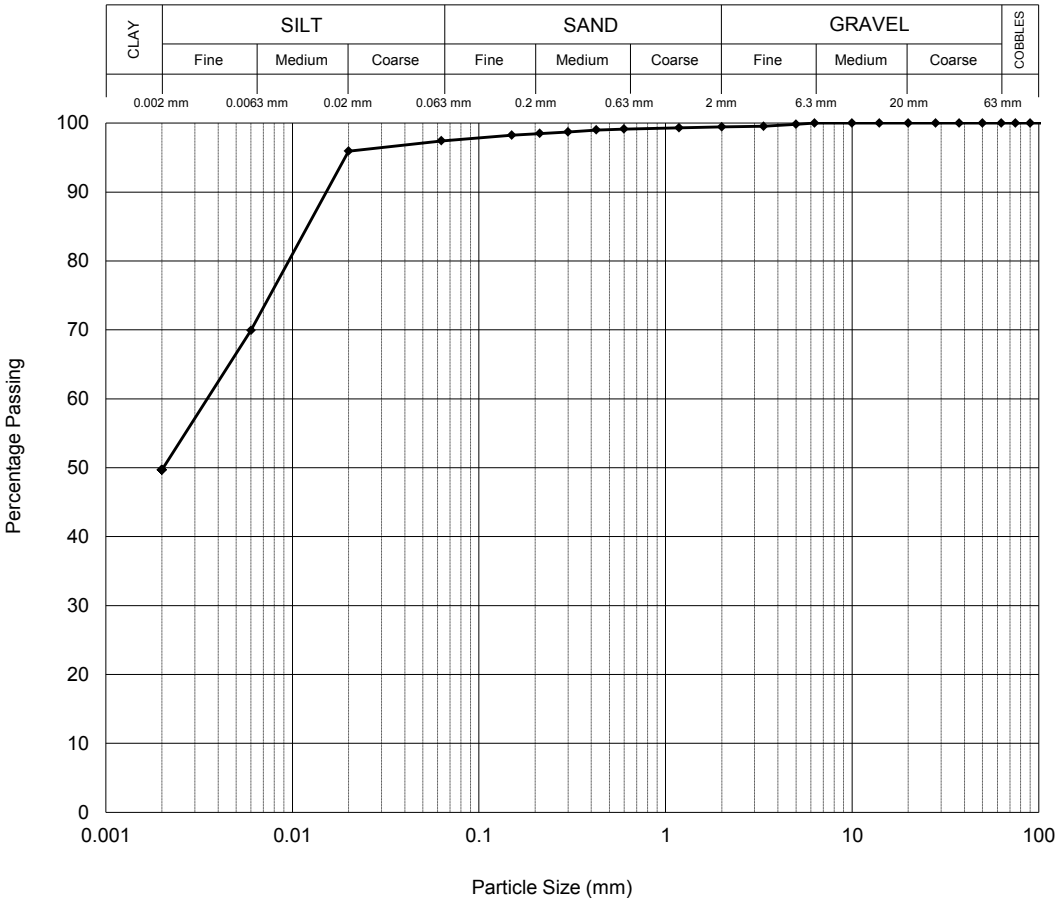
BH / TP No.	B3L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	24.9
Size	% Pass
20 µm	96
6 µm	70
2 µm	50

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	48
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29403

Project Name:

DOCKSWAY CELL 4
L13752

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13754

Number of samples submitted for testing:	2	sample (s)
Natural Moisture Content	1	test(s)
Atterberg Limit	1	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	5	Jun-19
Date of receipt of testing instructions	5	Jun-19
Date testing started:	7	Jun-19
Date of issue:	9	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

1429

Approved by :

Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A2 L1	RA2	0.00		B	Dark grey slightly gravelly slightly sandy CLAY			24.6	99	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test | Liquid Limit | Particle density
Linear measurement unless : | 4pt cone unless : | sp - small pyknometer
wd - water displacement | cas - Casagrande method | gj - gas jar
wi - immersion in water | 1pt - single point test

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
A2L1			B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29404

Project Name:

DOCKSWAY CELL 4
L13754

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

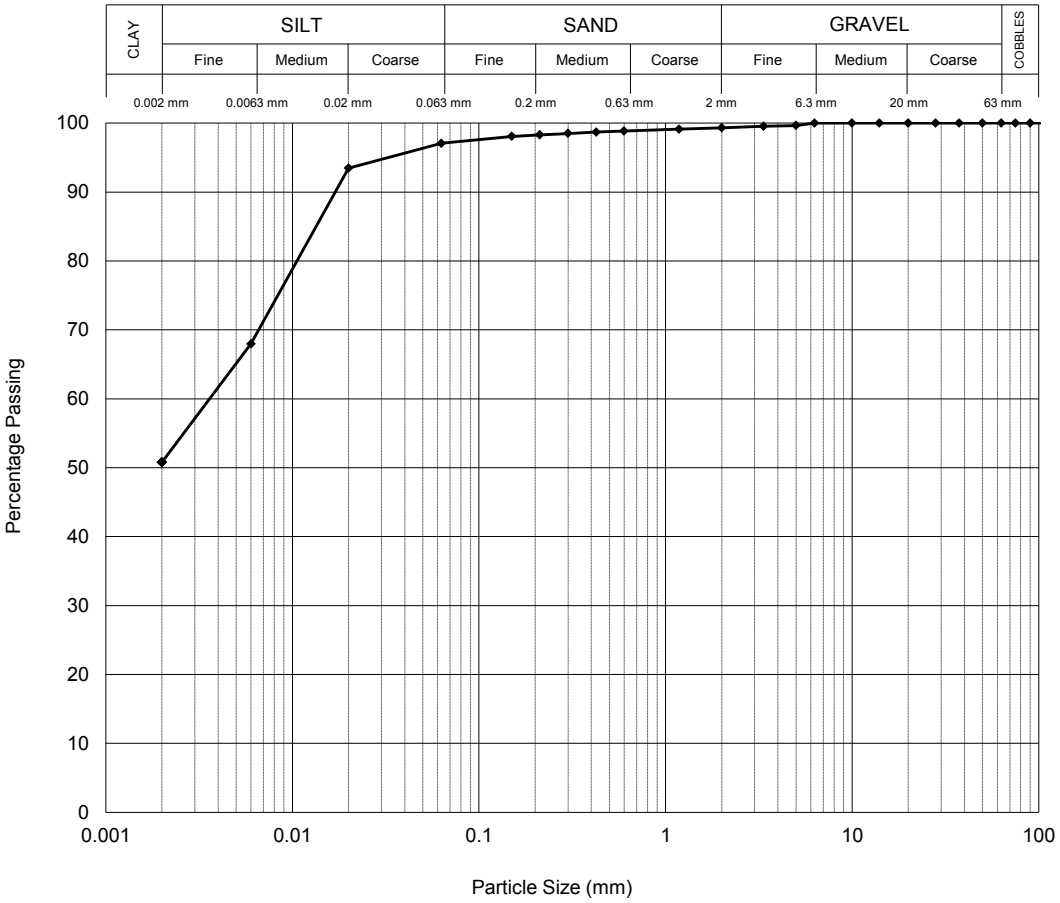
BH / TP No.	A2L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	24.9
Size	% Pass
20 µm	93
6 µm	68
2 µm	51

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	46
Clay	51

Checked and Approved by

S Burke

S Burke - Senior Technician
02/07/2019

Project Number:

GEO / 29404

Project Name:

DOCKSWAY CELL 4
L13754

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13756

Number of samples submitted for testing:	3	sample (s)

Natural Moisture Content	1	test(s)
Atterberg Limit	1	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	6	Jun-19
Date of receipt of testing instructions	6	Jun-19
Date testing started:	7	Jun-19
Date of issue:	9	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B2 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			24.5	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29410.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		B2L1		Dark grey silty CLAY with rare pyrite.	2.61	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
28/06/2019

Project Number:

GEO / 29410

Project Name:

DOCKSWAY CELL 4
L13756

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

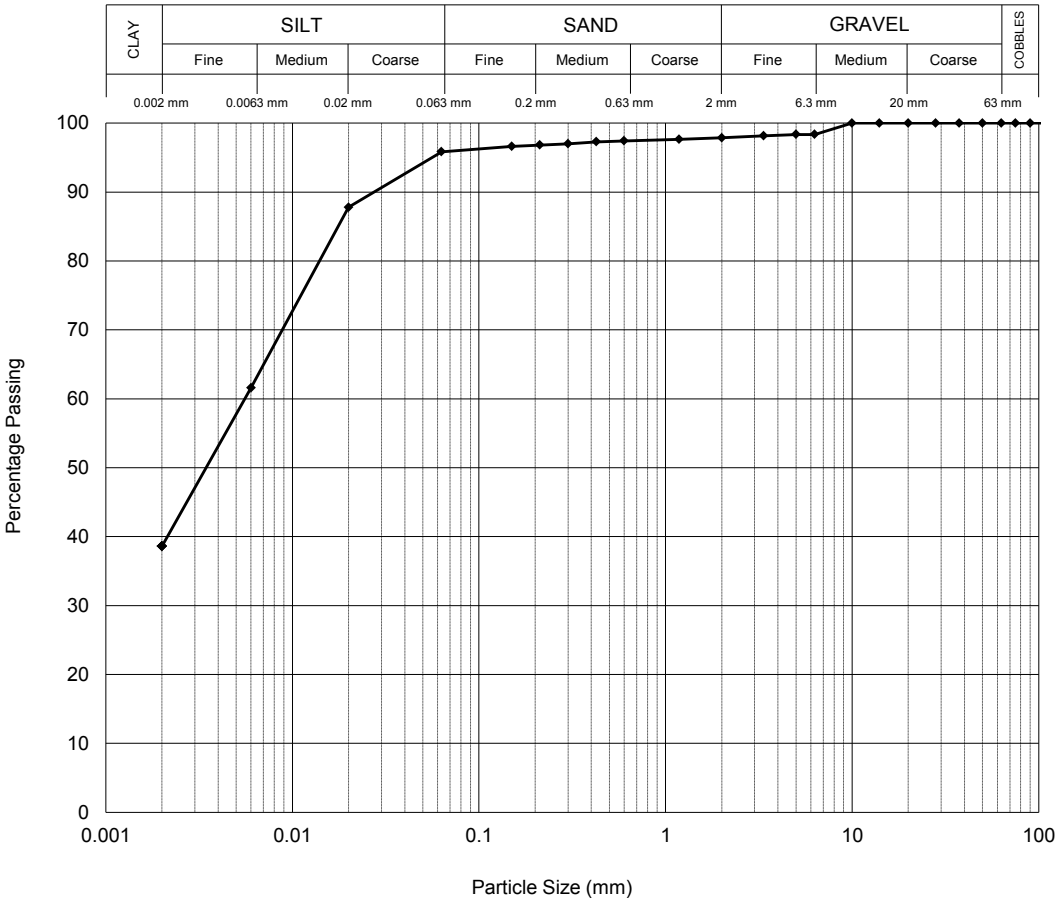
BH / TP No.	GT5
Sample Ref	B2L1

Description

Dark grey silty CLAY with rare pyrite.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	97
425 µm	97
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	88
6 µm	62
2 µm	39
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	57
Clay	39

Checked and Approved by

S Burke

S Burke - Senior Technician
28/06/2019

Project Number:

GEO / 29410

Project Name:

DOCKSWAY CELL 4
L13756

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT3
Sample Ref.:	B2L1 - Core

Description:
Firm dark grey slighty gravelly CLAY. Gravel is fine.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.12	100.99
Height	*mm*	100.13	100.01
Moisture Content	*%*	24.3	25.8
Bulk Density	*Mg/m³*	2.00	2.04
Dry Density	*Mg/m³*	1.61	1.62

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.78	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	3.0

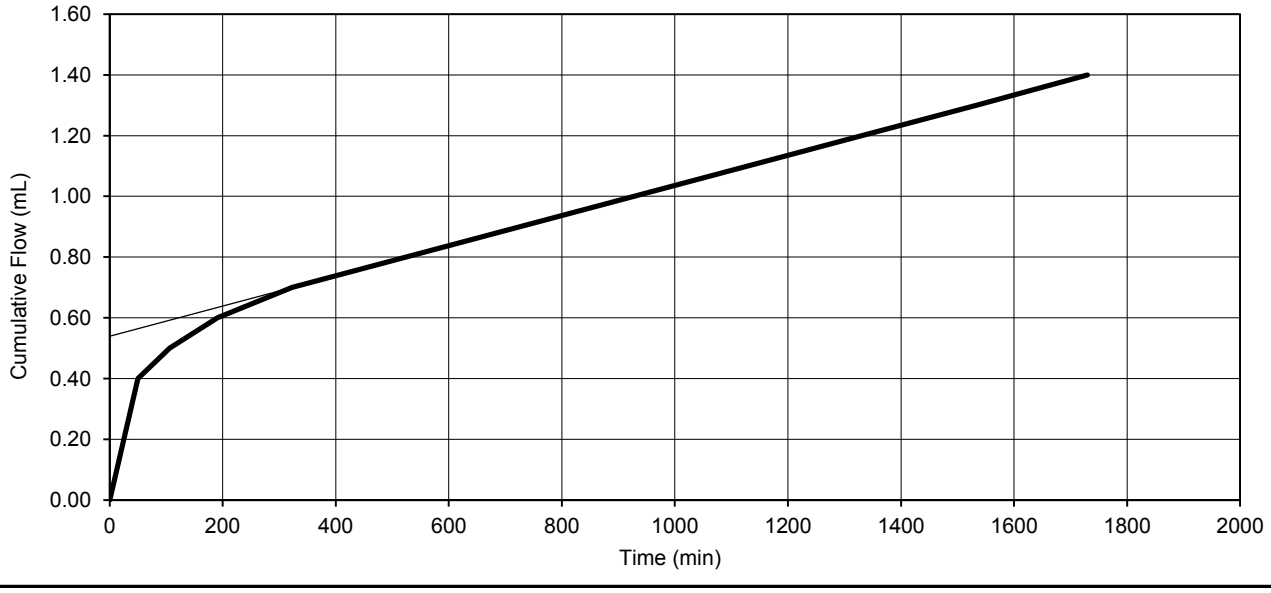
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	2
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 1.0×10^{-10} m/s



Checked and Approved by

P Heritage

P Heritage - Project Co-ordinator
25/06/2019

Project Number:

GEO / 29410

Project Name:

DOCKSWAY CELL 4
L13756

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UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13763

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	10	Jun-19
Date of receipt of testing instructions	10	Jun-19
Date testing started:	13	Jun-19
Date of issue:	12	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A2 L2		0.00		B	Dark grey slightly sandy CLAY			27.9	100	49	20	29		
A3 L1		0.00		B	Dark grey slightly sandy CLAY			22.3	100	47	19	28		
B2 L2		0.00		B	Dark grey slightly sandy CLAY			22.4	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
A3-L1			B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
05/07/2019

Project Number:

GEO / 29436

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

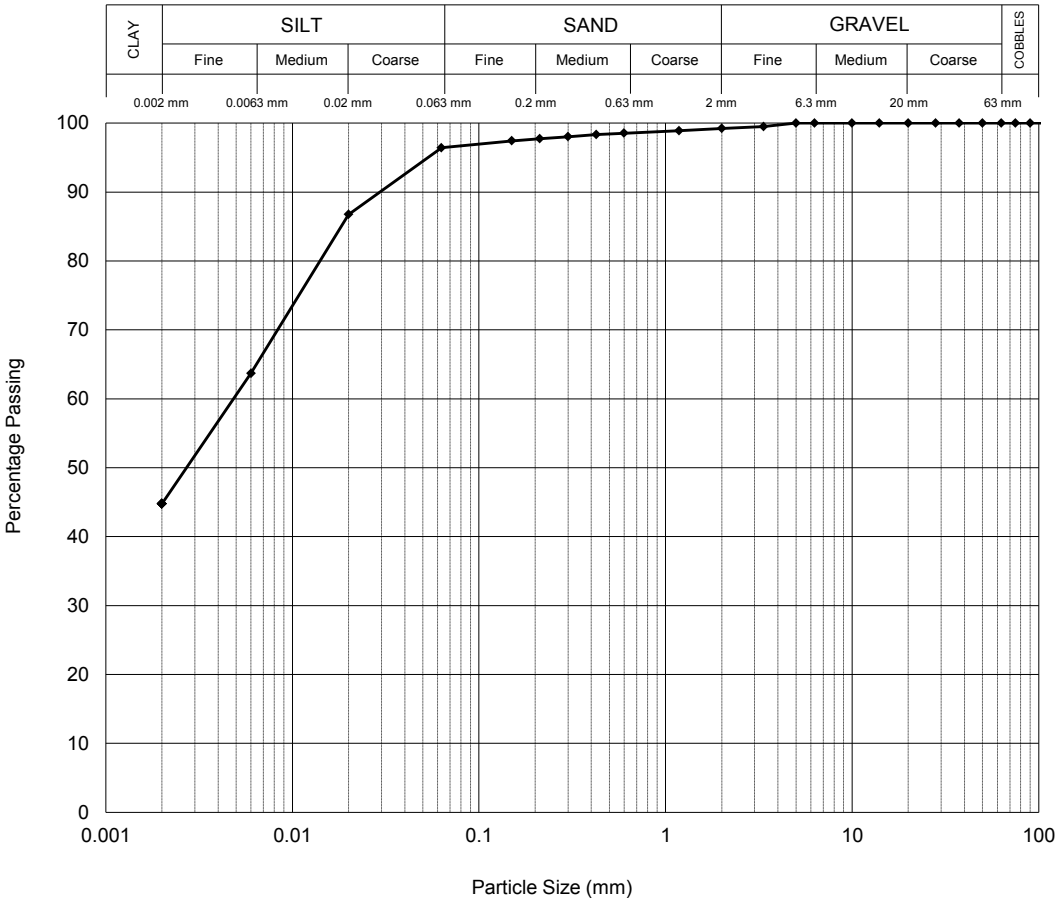
BH / TP No.	A3-L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25.3
Size	% Pass
20 µm	87
6 µm	64
2 µm	45
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	3
Silt	52
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
05/07/2019

Project Number:

GEO / 29436

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13786

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	20	Jun-19
Date of receipt of testing instructions	20	Jun-19
Date testing started:	25	Jun-19
Date of issue:	12	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		w	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B3 L1	GT7	0.00		B	Dark grey slightly sandy CLAY			26.5	100	48	20	28		
B4 L1	GT5	0.00		B	Dark grey slightly sandy CLAY			24.8	100	48	20	28		
C2 L1	GT8	0.00		B	Dark grey slightly sandy CLAY			25.0	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT6		C2-L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
05/07/2019

Project Number:

GEO / 29474

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

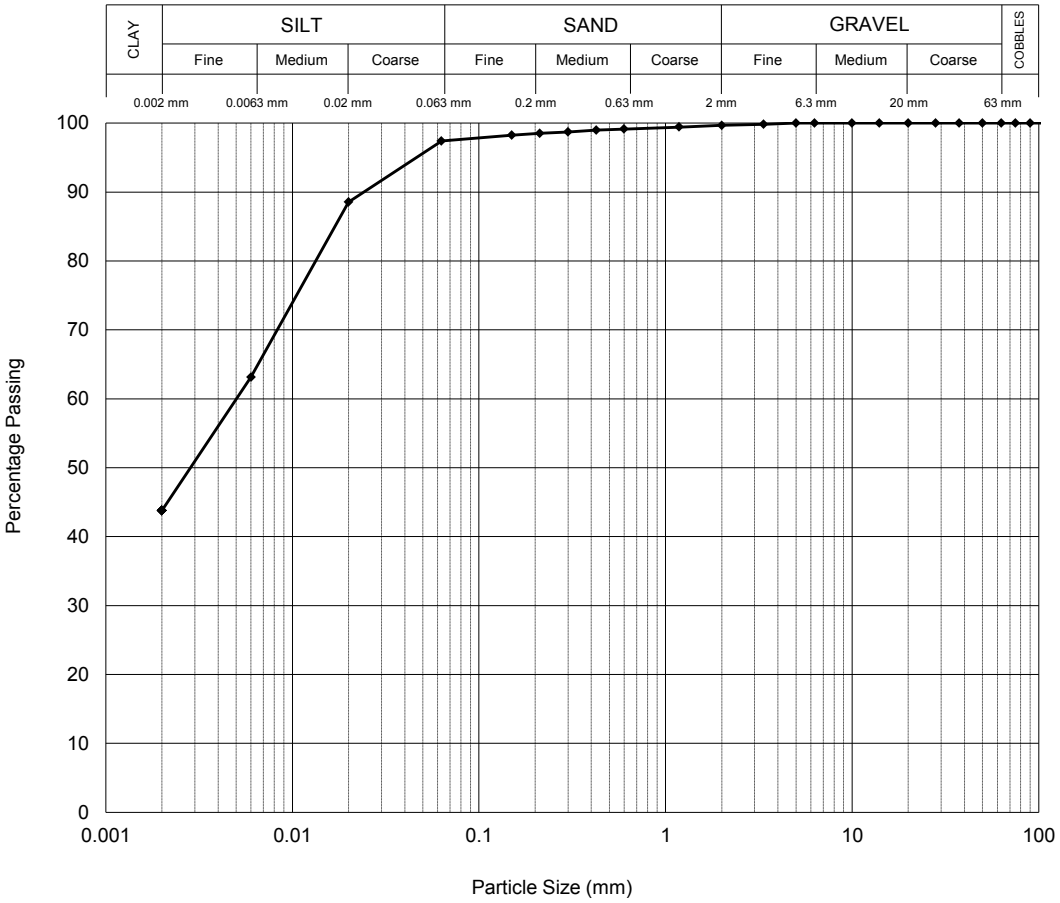
BH / TP No.	GT6
Sample Ref	C2-L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	63
2 µm	44

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	54
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
05/07/2019

Project Number:

GEO / 29474

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13797

Number of samples submitted for testing:	5	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	21	Jun-19
Date of receipt of testing instructions	21	Jun-19
Date testing started:	25	Jun-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B1 L1	GT2	0.00		B	Dark grey slightly sandy CLAY			25.5	100	45	20	25		
C3 L1	GT1	0.00		B	Dark grey slightly sandy CLAY			24.1	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
07/08/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29473.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		B1 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.71	2
GT4		C3 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.73	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

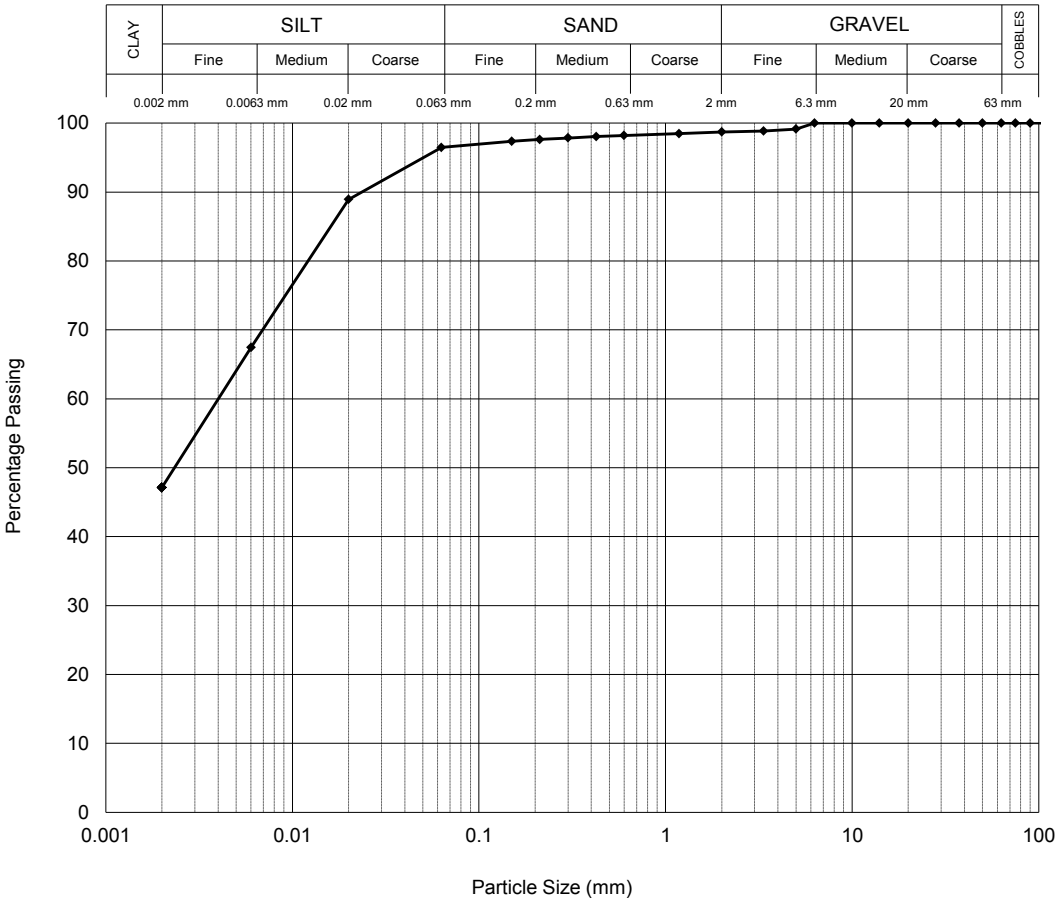
BH / TP No.	GT3
Sample Ref	B1 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	98
600 µm	98
425 µm	98
300 µm	98
212 µm	98
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	67
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

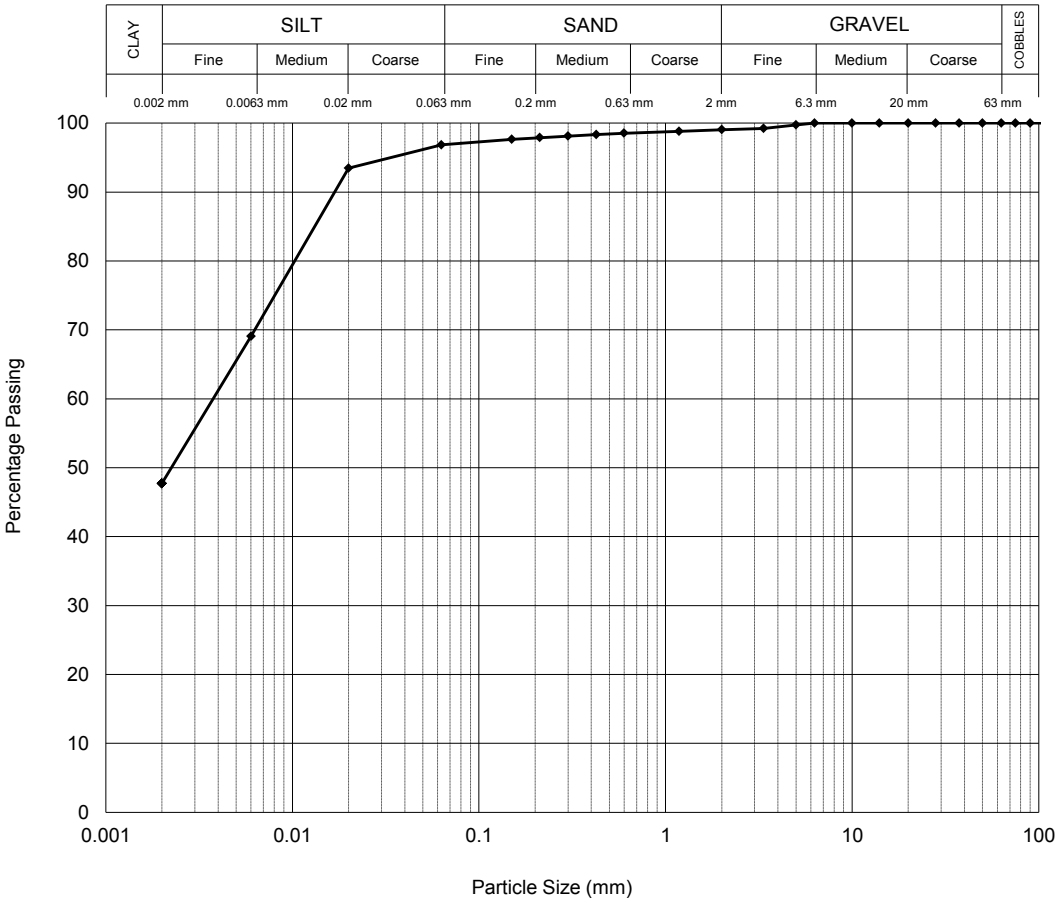
BH / TP No.	GT4
Sample Ref	C3 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	93
6 µm	69
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT7
Sample Ref.:	D2-L1
Sample Type:	C

Description:
Firm dark grey gravelly CLAY. Gravel is fine to medium weakly cemented mudstone.

SPECIMEN DETAILS

Depth within original sample	10 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.03	100.86
Height	*mm*	100.59	100.42
Moisture Content	*%*	24.2	25.4
Bulk Density	*Mg/m³*	2.02	2.05
Dry Density	*Mg/m³*	1.63	1.64

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.82	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	4.1

PERMEABILITY STAGE

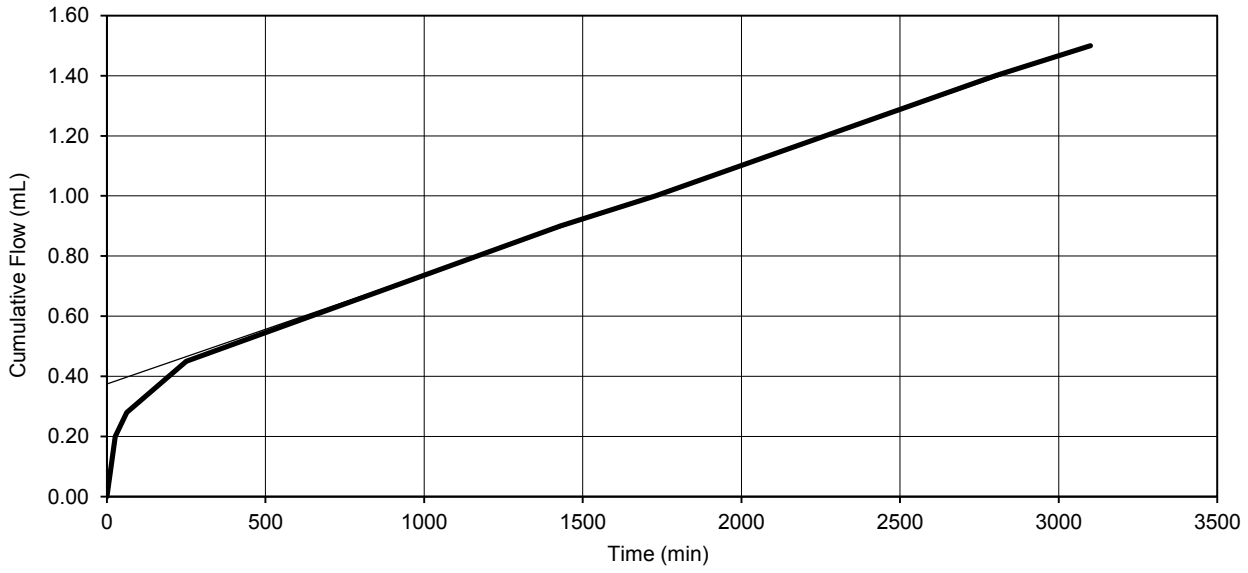
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.5×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
19/07/2019

Project Number:

GEO / 29473

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13801

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	24	Jun-19
Date of receipt of testing instructions	24	Jun-19
Date testing started:	27	Jun-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.: AG0390

Project Name: Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
B1 L2	GT4	0.00		B	Dark grey slightly sandy CLAY			24.9	100	48	20	28		
E2 L-1	GT5	0.00		B	Dark grey slightly sandy CLAY			24.9	100	48	20	28		
E3 L-1	GT6	0.00		B	Dark grey slightly sandy CLAY			25.4	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed: 07/08/2019 00:00

Approved By: Lisa Maiden

Table 1

sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
E3 L-1		GT7	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.71	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
30/07/2019

Project Number:

GEO / 29489

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

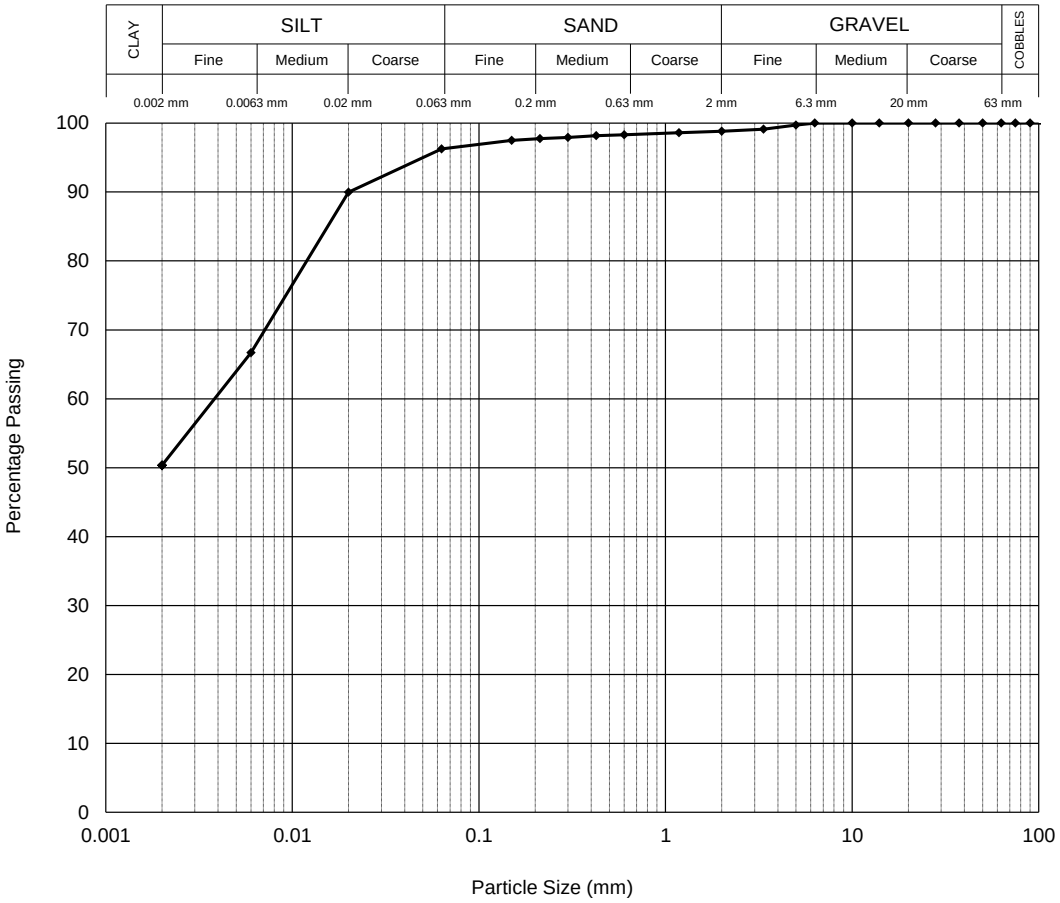
BH / TP No.	E3 L-1
Sample Ref	GT7
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	98
425 µm	98
300 µm	98
212 µm	98
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25.4
Size	% Pass
20 µm	90
6 µm	67
2 µm	50

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	3
Silt	46
Clay	50

Checked and Approved by

J Sturges - Operations Manager
30/07/2019

Project Number:

GEO / 29489

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13812

Number of samples submitted for testing:	7	sample (s)

Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	26	Jun-19
Date of receipt of testing instructions	26	Jun-19
Date testing started:	3	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L3	GT8	0.00		B	Dark grey slightly sandy CLAY			25.9	100	48	19	29		
B1 L3	GT11	0.00		B	Dark grey slightly sandy CLAY			25.8	100	49	20	29		
B2 L3	GT9	0.00		B	Dark grey slightly sandy CLAY			24.6	100	49	19	30		
E4 L-1	GT7	0.00		B	Dark grey slightly sandy CLAY			26.5	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT10		B2 L3	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.73	2
GT6		A2 L3	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.75	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

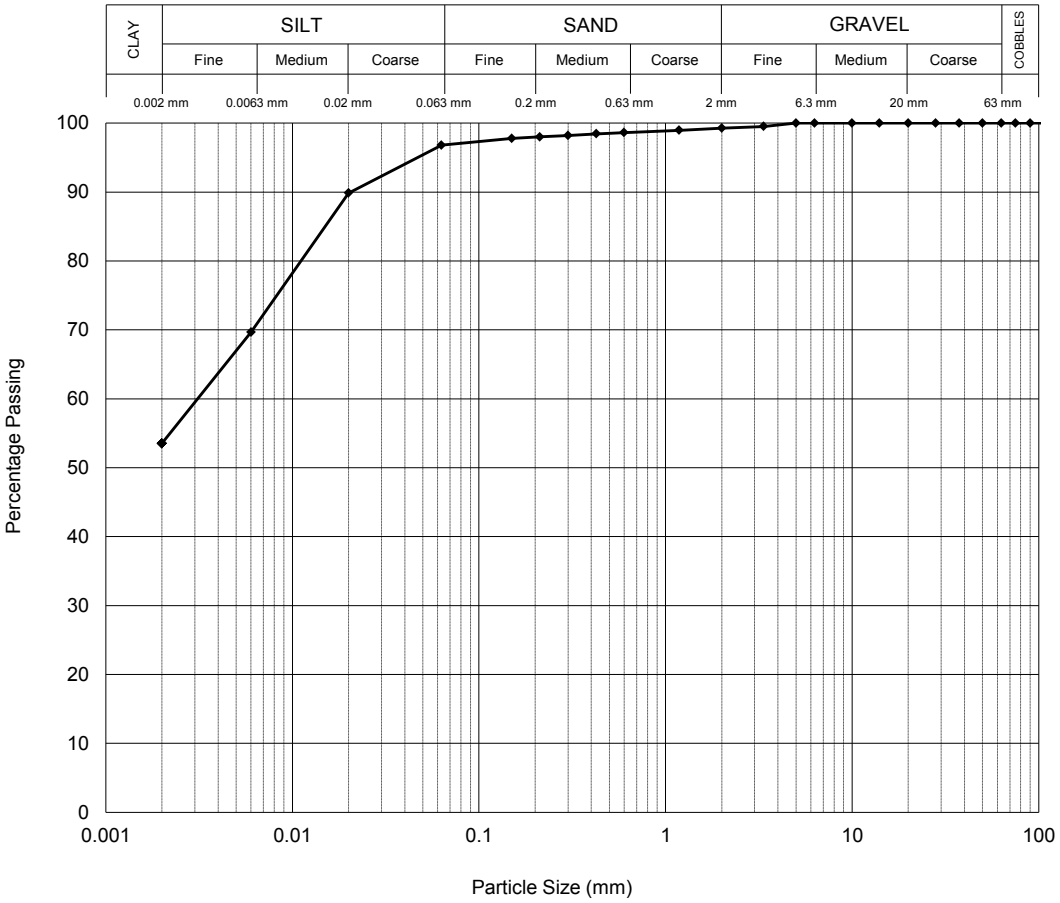
BH / TP No.	GT6
Sample Ref	A2 L3
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	90
6 µm	70
2 µm	54

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	43
Clay	54

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

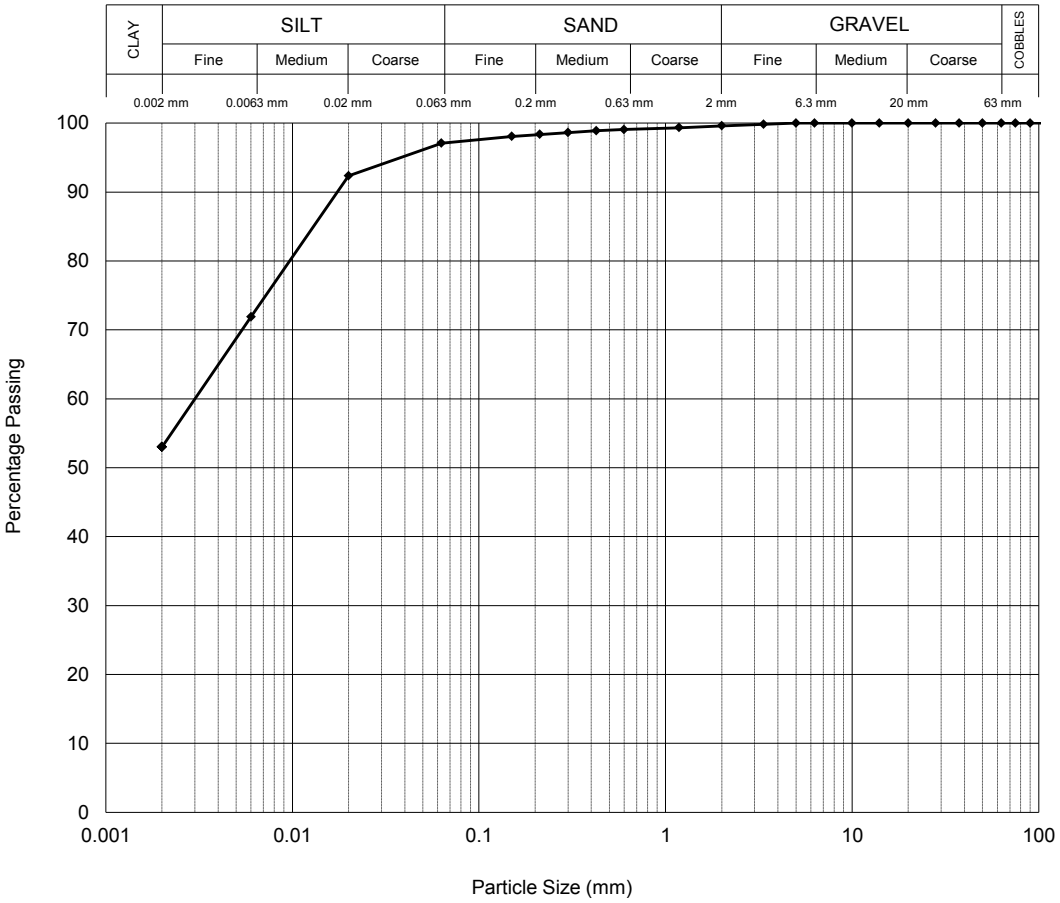
BH / TP No.	GT10
Sample Ref	B2 L3
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	92
6 µm	72
2 µm	53

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	3
Silt	44
Clay	53

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29510

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT5
Sample Ref.:	B2 L3
Sample Type:	C

Description:
Firm dark grey slightly gravelly CLAY.

SPECIMEN DETAILS

Depth within original sample	10mm
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.37	101.17
Height	*mm*	100.29	100.09
Moisture Content	*%*	24.4	26.1
Bulk Density	*Mg/m³*	1.96	1.99
Dry Density	*Mg/m³*	1.57	1.58

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.69	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	4.8

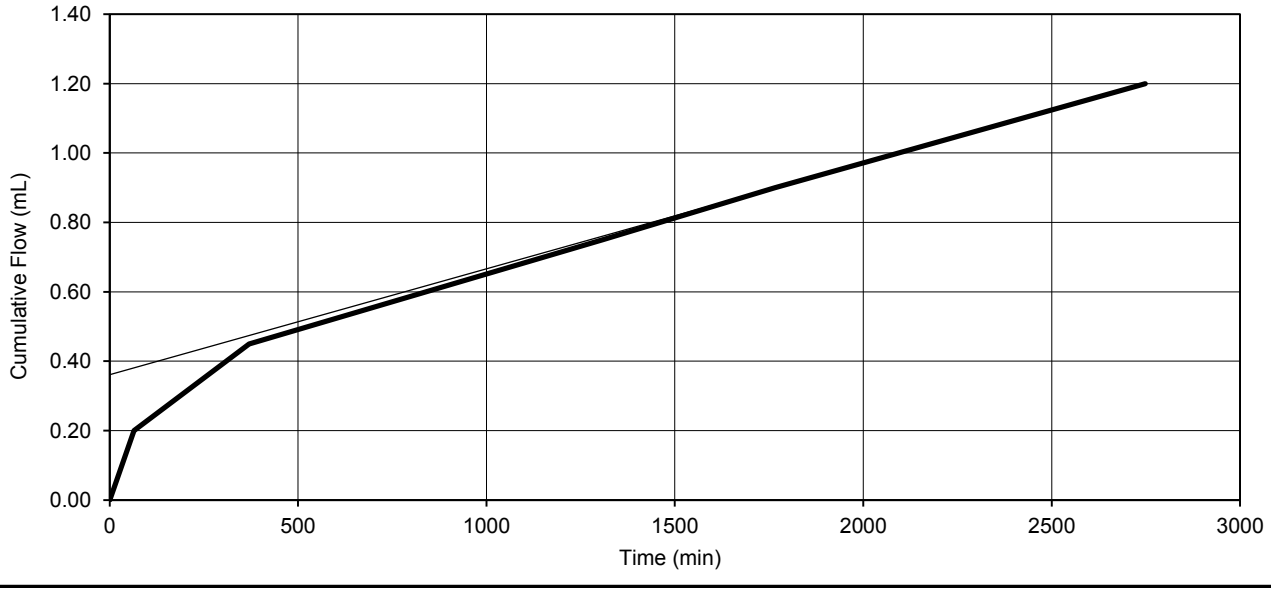
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	2
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 6.2×10^{-11} m/s



Checked and Approved by

P Heritage

P Heritage - Project Co-ordinator
22/07/2019

Project Number:
GEO / 29510

Project Name:
DOCKSWAY CELL 4
AG0390

GEOLABS®
UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13814

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	27	Jun-19
Date of receipt of testing instructions	27	Jun-19
Date testing started:	3	Jul-19
Date of issue:	30	Jul-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B3 L2	GT2	0.00		B	Dark grey slightly sandy CLAY			23.1	100	49	20	29		
B4 L2	GT1	0.00		B	Dark grey slightly sandy CLAY			22.3	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
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BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		B3 L2	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29511

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

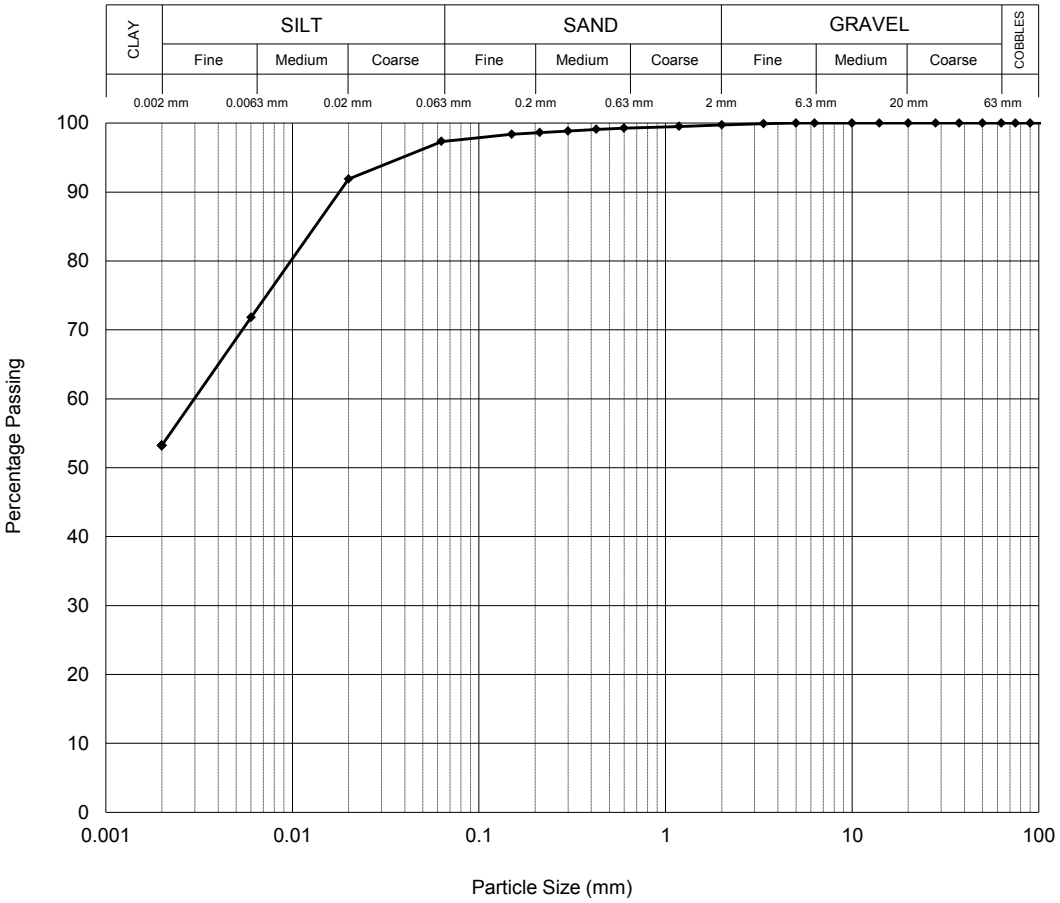
BH / TP No.	GT3
Sample Ref	B3 L2
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	92
6 µm	72
2 µm	53

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	44
Clay	54

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29511

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13816

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	28	Jun-19
Date of receipt of testing instructions	28	Jun-19
Date testing started:	3	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L1	GT3	0.00		B	Dark grey slightly sandy CLAY			25.7	100	48	19	29		
C4 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			26.7	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		C3 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29512

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

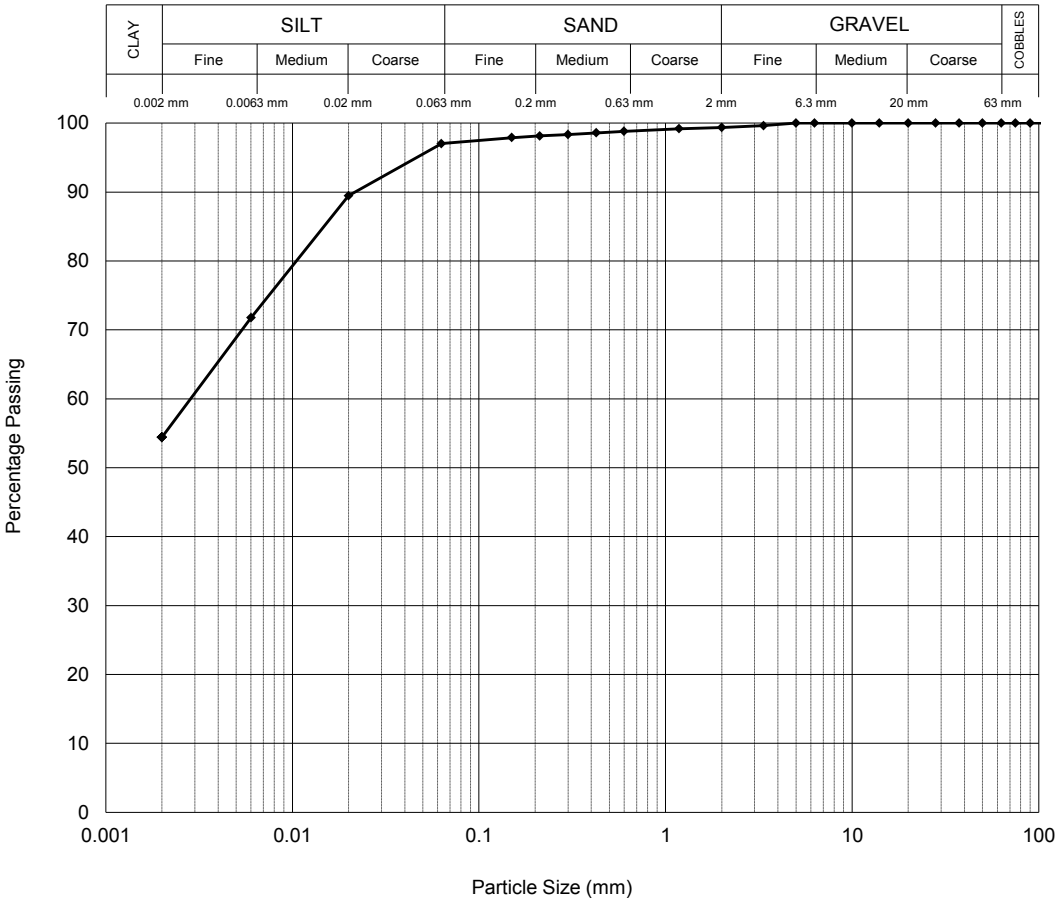
BH / TP No.	GT5
Sample Ref	C3 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	72
2 µm	54

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	43
Clay	54

Checked and Approved by

S Burke

S Burke - Senior Technician
16/07/2019

Project Number:

GEO / 29512

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13826

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	1	Jul-19
Date of receipt of testing instructions	1	Jul-19
Date testing started:	6	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A4 L2	GT6	0.00		B	Dark grey slightly sandy CLAY			25.3	100	48	20	28		
C5 L1	GT1	0.00		B	Dark grey slightly sandy CLAY			25.6	100	47	19	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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		sheet 1

1128 - Particle Density Summary - 29532.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C5 L1	B	Dark grey CLAY / SILT.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29532

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

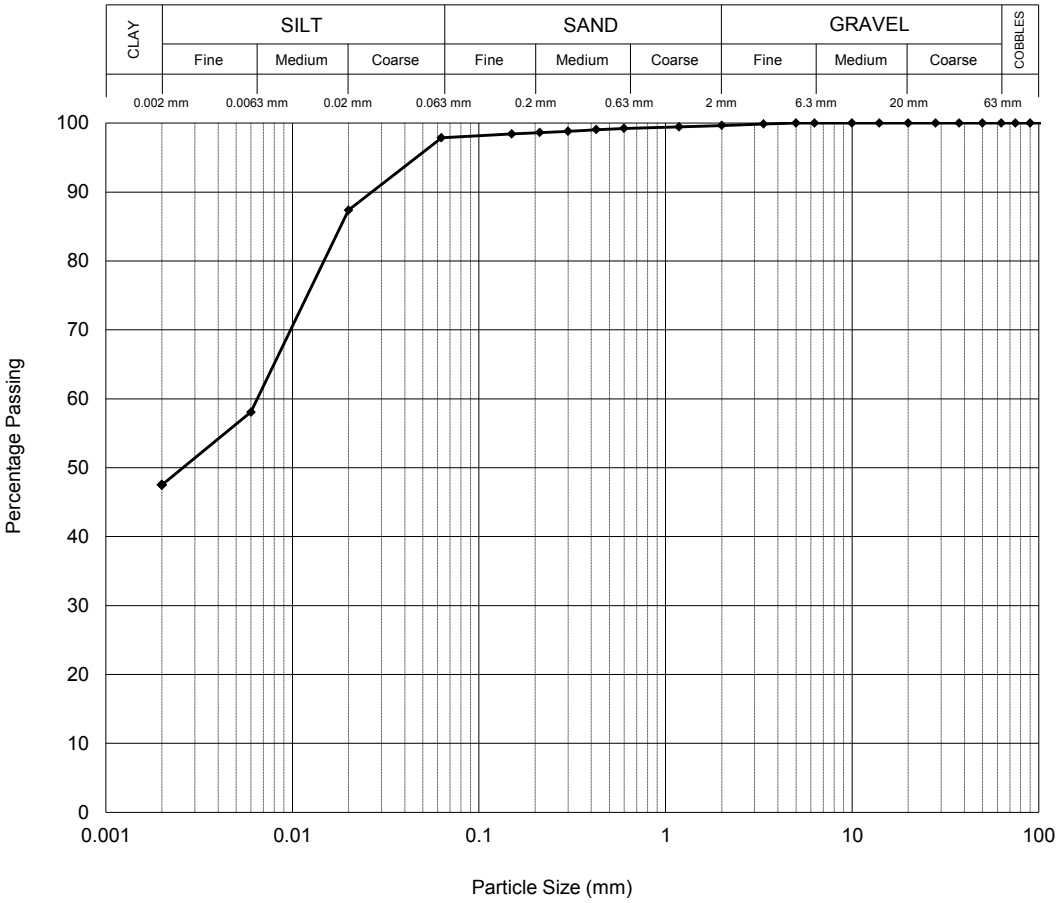
BH / TP No.	GT2
Sample Ref	C5 L1
Sample Type	B

Description

Dark grey CLAY / SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	87
6 µm	58
2 µm	48
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	50
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29532

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT5
Sample Ref.:	A4 L2
Sample Type:	C

Description:
Firm dark grey slighty gravelly CLAY. Gravel is fine.

SPECIMEN DETAILS

Depth within original sample	15 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.11	100.84
Height	*mm*	100.30	100.03
Moisture Content	*%*	25.6	27.4
Bulk Density	*Mg/m³*	1.95	2.00
Dry Density	*Mg/m³*	1.56	1.57

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.77	0.98

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	6.6

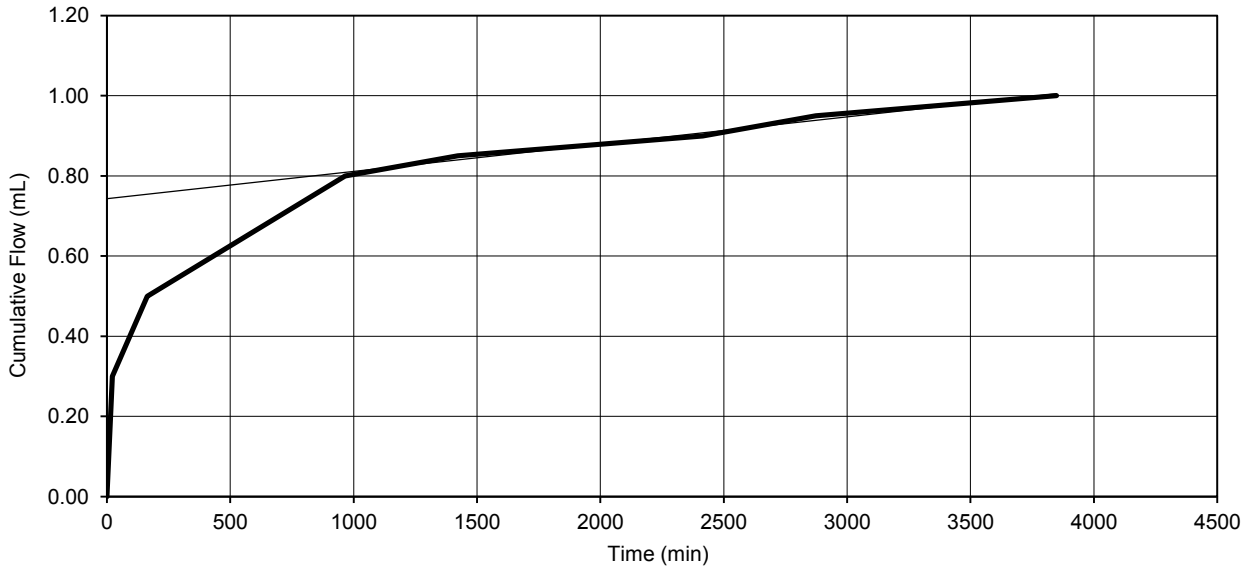
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 1.4×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
26/07/2019

Project Number:

GEO / 29532

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13829

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	2	test(s)
Grading	2	test(s)

Date (s) sampled and received at laboratory:	2	Jul-19
Date of receipt of testing instructions	2	Jul-19
Date testing started:	9	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A3 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			25.7	100	47	20	27		
C5 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			21.8	100	46	20	26		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		C5 L2	B	Dark grey SILT and CLAY	2.68	2
GT6		A3 L2	B	Dark grey SILT and CLAY	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29533

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

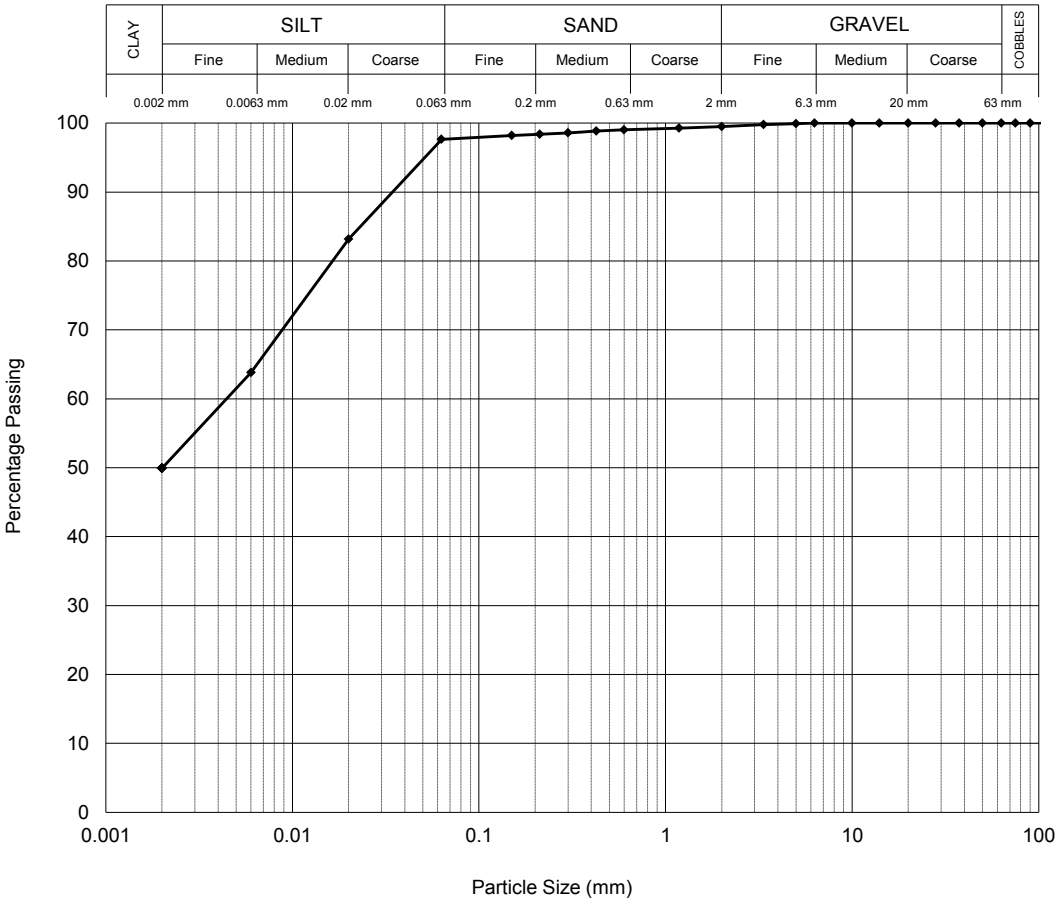
BH / TP No.	GT4
Sample Ref	C5 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	83
6 µm	64
2 µm	50
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	48
Clay	50

Checked and Approved by

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29533

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

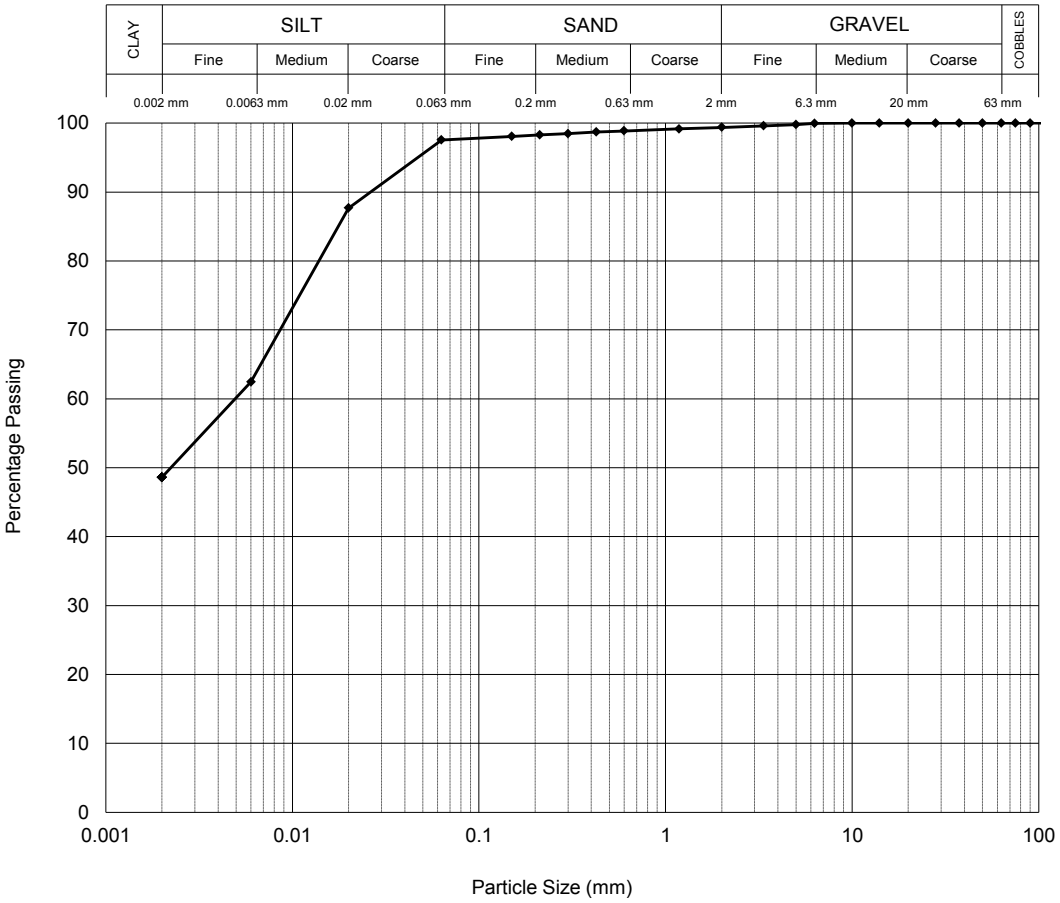
BH / TP No.	GT6
Sample Ref	A3 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	88
6 µm	62
2 µm	49
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
29/07/2019

Project Number:

GEO / 29533

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13835

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	3	Jul-19
Date of receipt of testing instructions	3	Jul-19
Date testing started:	9	Jul-19
Date of issue:	2	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
C3 L2	GT1	0.00		B	Dark grey slightly sandy CLAY			25.8	100	48	21	27		
C4 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			24.6	96	48	21	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C4 L2		Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29559

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

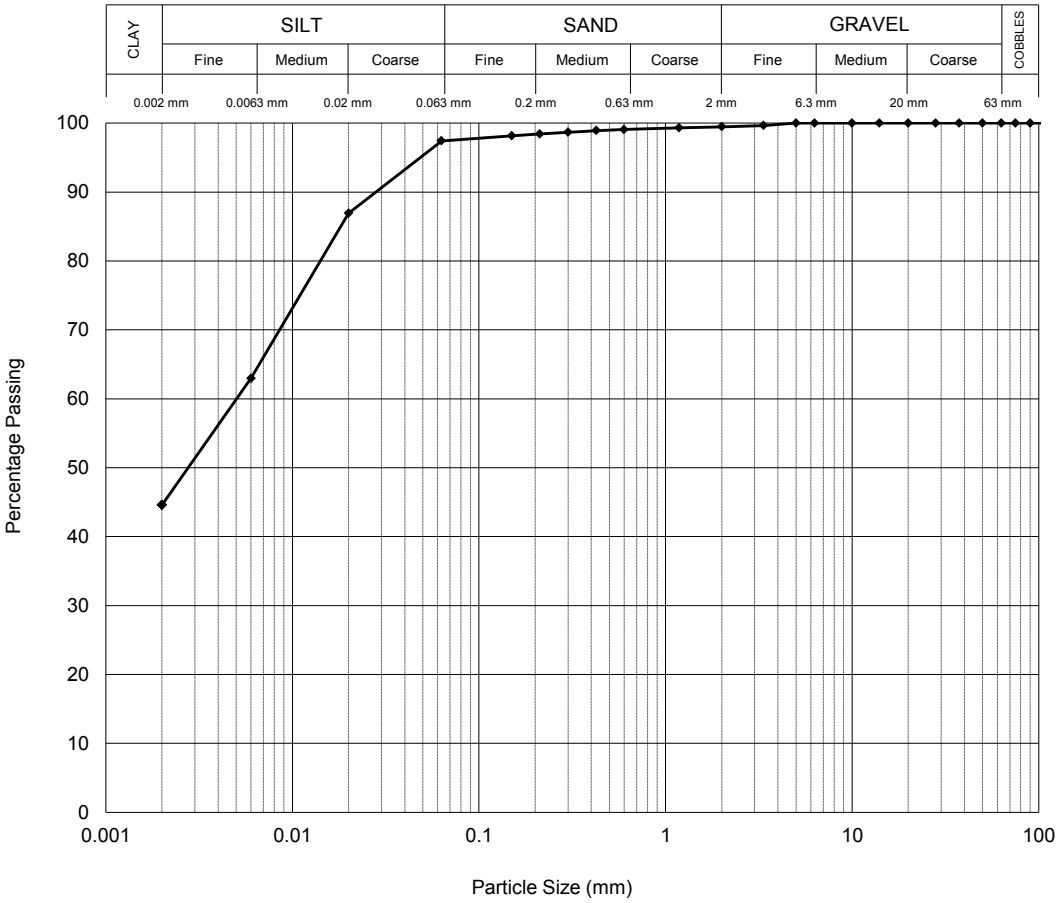
BH / TP No.	GT2
Sample Ref	C4 L2

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.1
Size	% Pass
20 µm	87
6 µm	63
2 µm	45

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	53
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
01/08/2019

Project Number:

GEO / 29559

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13838

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	4	Jul-19
Date of receipt of testing instructions	4	Jul-19
Date testing started:	9	Jul-19
Date of issue:	5	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
E3 L1	GT5	0.00		B	Dark grey slightly sandy CLAY			25.1	100	48	20	28		
E4 L1	GT4	0.00		B	Dark grey slightly sandy CLAY			24.3	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT6		E2 L1	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.67	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
01/08/2019

Project Number:

GEO / 29560

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

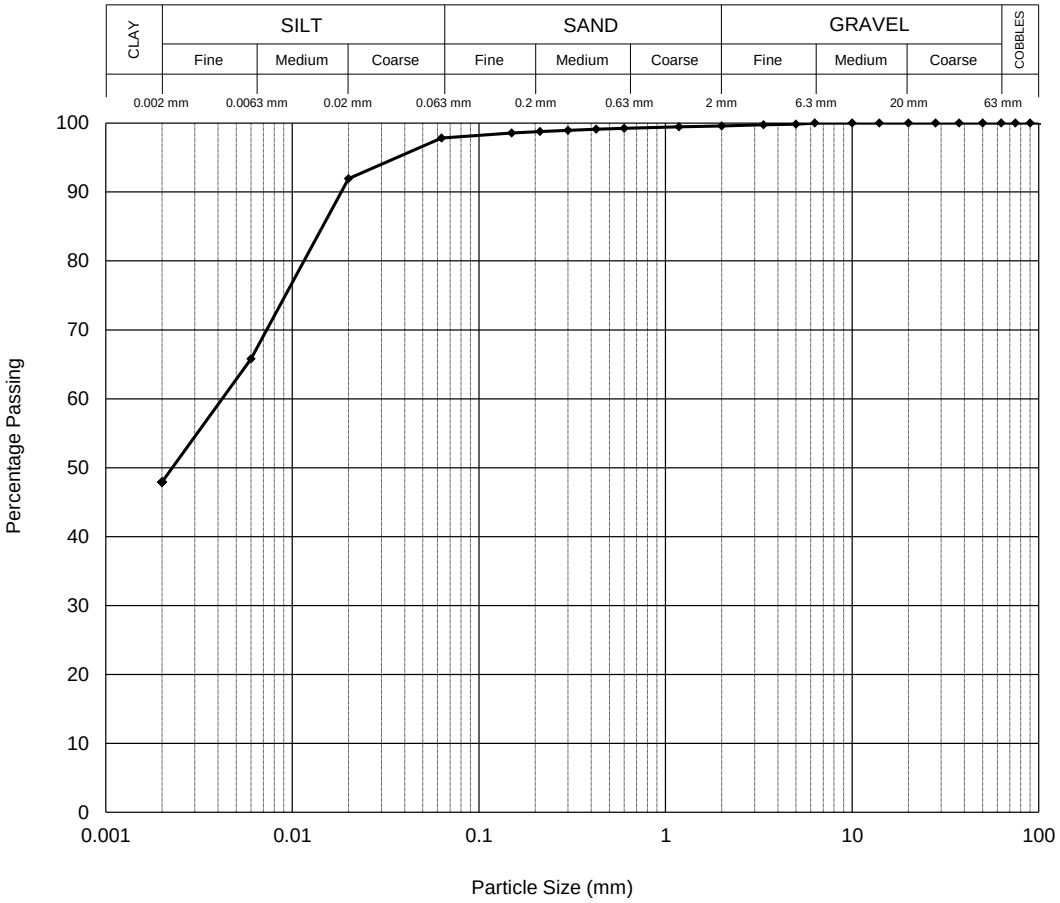
BH / TP No.	GT6
Sample Ref	E2 L1
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.4
Size	% Pass
20 µm	92
6 µm	66
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	50
Clay	48

Checked and Approved by

J Sturges - Operations Manager
01/08/2019

Project Number:

GEO / 29560

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT3
Sample Ref.:	E3 L1
Sample Type:	C

Description:
Firm dark grey gravelly CLAY. Gravel is fine weakly cemented mudstone.

SPECIMEN DETAILS

Depth within original sample	15 mm from top
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	100.73	100.67
Height	*mm*	100.30	100.24
Moisture Content	*%*	25.7	26.4
Bulk Density	*Mg/m³*	1.96	1.98
Dry Density	*Mg/m³*	1.56	1.56

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.72	0.97

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	1.5

PERMEABILITY STAGE

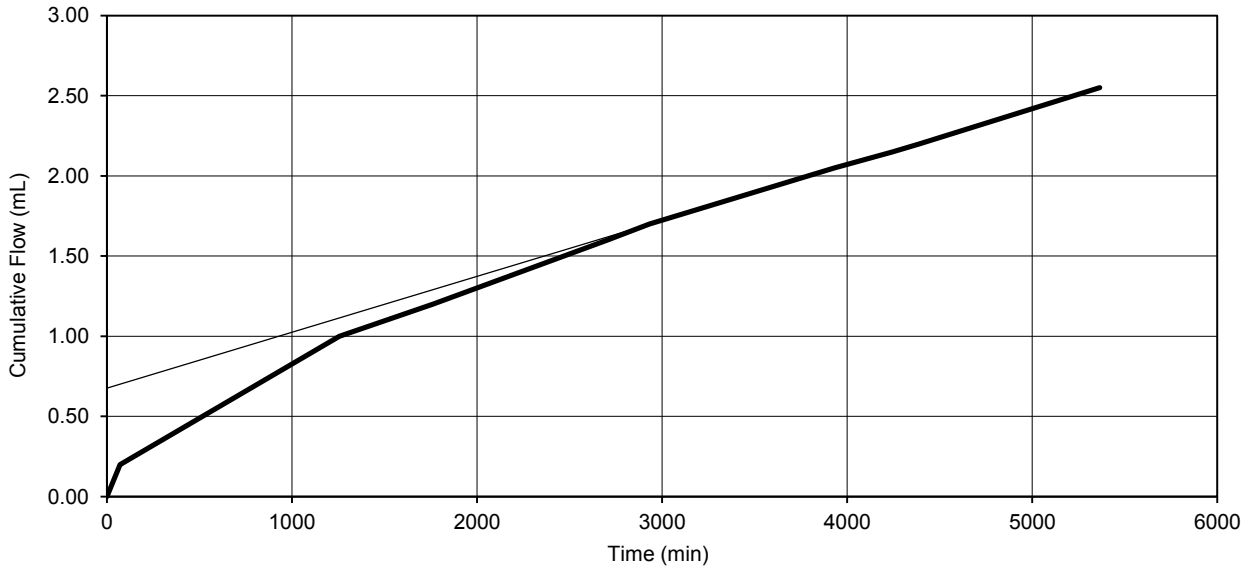
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.2×10^{-11} m/s



Checked and Approved by

C F Wallace - Technical Manager
26/07/2019

Project Number:

GEO / 29560

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13840

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	5	Jul-19
Date of receipt of testing instructions	5	Jul-19
Date testing started:	9	Jul-19
Date of issue:	8	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
C2 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			24.0	100	49	21	28		
D2 L1	GT6	0.00		B	Dark grey slightly sandy CLAY			29.5	100	49	20	29		
D3 L1	GT7	0.00		B	Dark grey slightly sandy CLAY			25.8	100	49	21	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
22/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		C2 L2	B	Dark grey SILT and CLAY.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29610

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

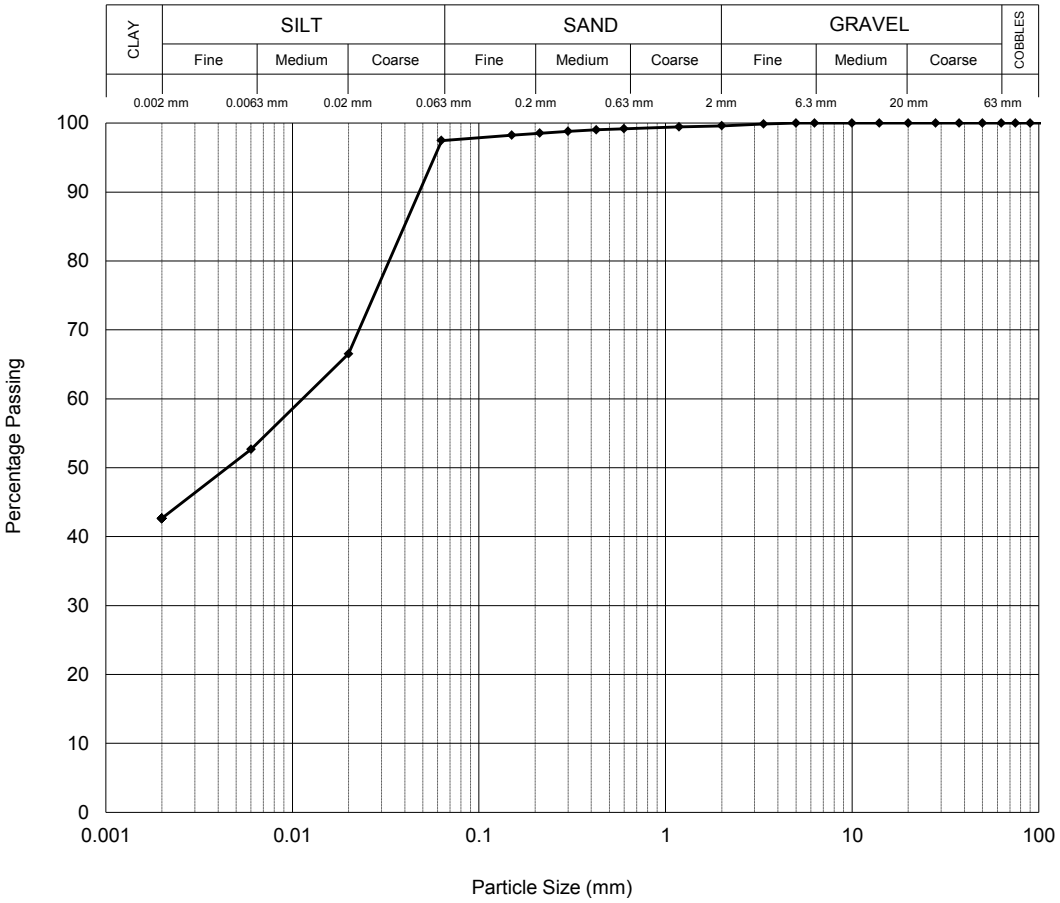
BH / TP No.	GT4
Sample Ref	C2 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	67
6 µm	53
2 µm	43

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	55
Clay	43

Checked and Approved by

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29610

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13845

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	8	Jul-19
Date of receipt of testing instructions	8	Jul-19
Date testing started:	15	Jul-19
Date of issue:	9	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
E2 L2	GT4	0.00		B	Dark grey slightly sandy CLAY			23.0	96	49	21	28		
E3 L2	GT7	0.00		B	Dark grey slightly sandy CLAY			23.4	100	49	20	29		
E4 L2	GT5	0.00		B	Dark grey slightly sandy CLAY			18.8	100	49	21	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
24/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT6		E4 L2	B	Dark grey SILT and CLAY	2.67	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29611

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

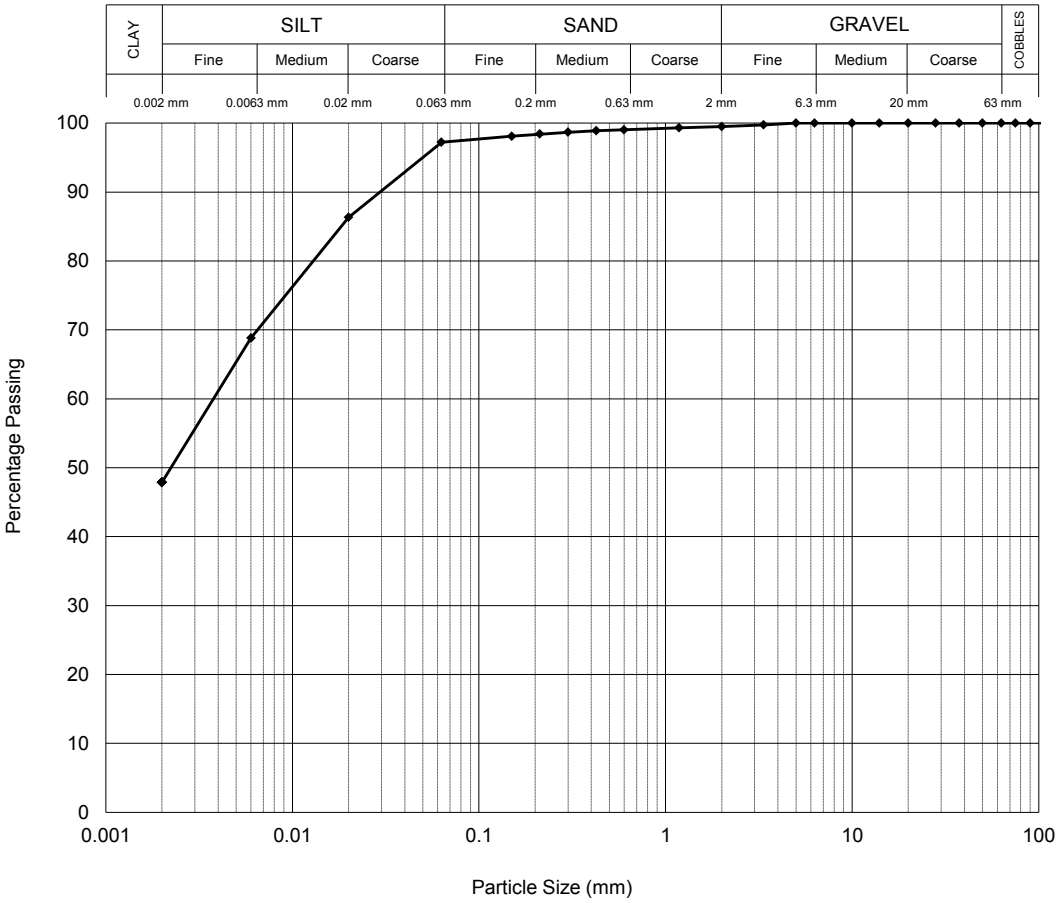
BH / TP No.	GT6
Sample Ref	E4 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	86
6 µm	69
2 µm	48
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	49
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29611

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13854

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	9	Jul-19
Date of receipt of testing instructions	9	Jul-19
Date testing started:	15	Jul-19
Date of issue:	9	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
C2 L3		0.00		B	Dark grey slightly sandy CLAY			23.8	100	48	20	28		
D2 L2		0.00		B	Dark grey slightly sandy CLAY			23.6	100	48	21	27		
D3 L2		0.00		B	Dark grey slightly sandy CLAY			26.0	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
24/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
		D2 L2	B	Dark grey SILT and CLAY	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29612

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

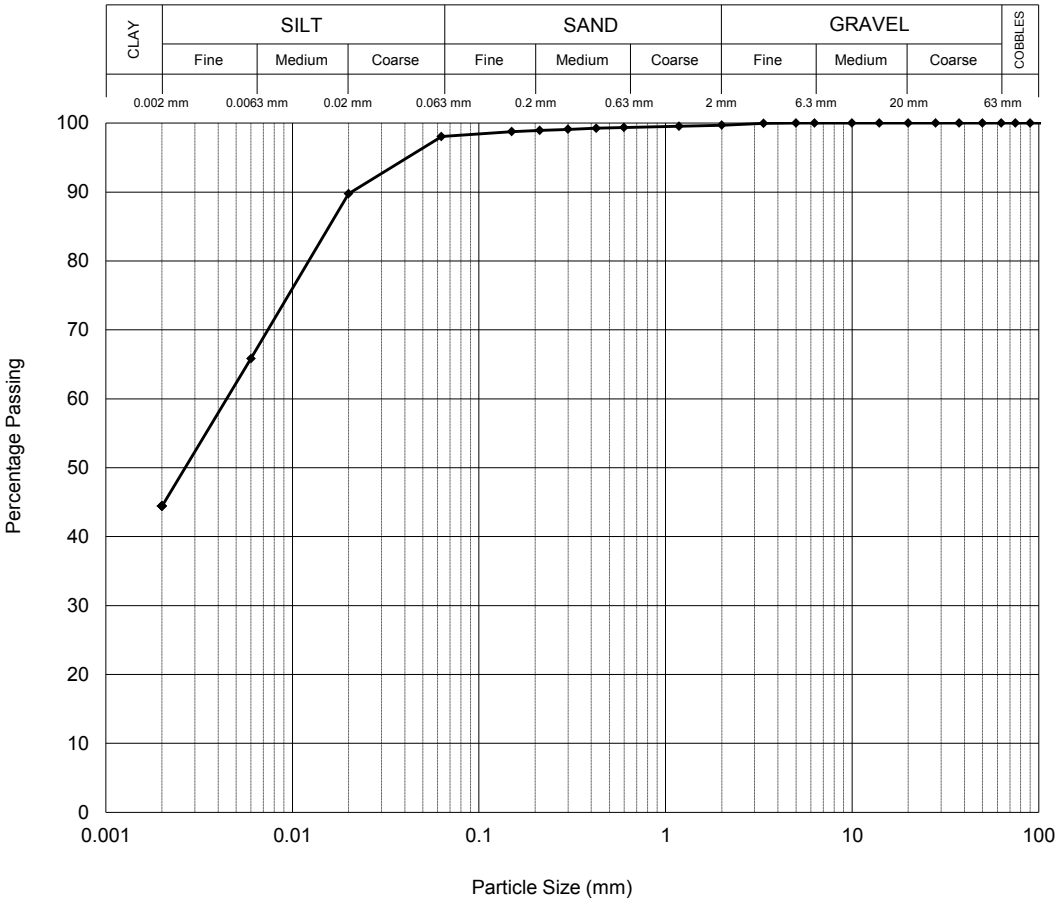
Sample Ref	D2 L2
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	90
6 µm	66
2 µm	44
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	54
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
09/08/2019

Project Number:

GEO / 29612

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13855

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	10	Jul-19
Date of receipt of testing instructions	10	Jul-19
Date testing started:	16	Jul-19
Date of issue:	8	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
D4 L1		0.00		B	Dark grey slightly sandy CLAY			26.9	100	48	19	29		
D5 L1		0.00		B	Dark grey slightly sandy CLAY			22.2	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
29/07/2019	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29613.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
		D4 L1	B	Dark grey SILT and CLAY with rare fine gravel	2.64	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29613

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

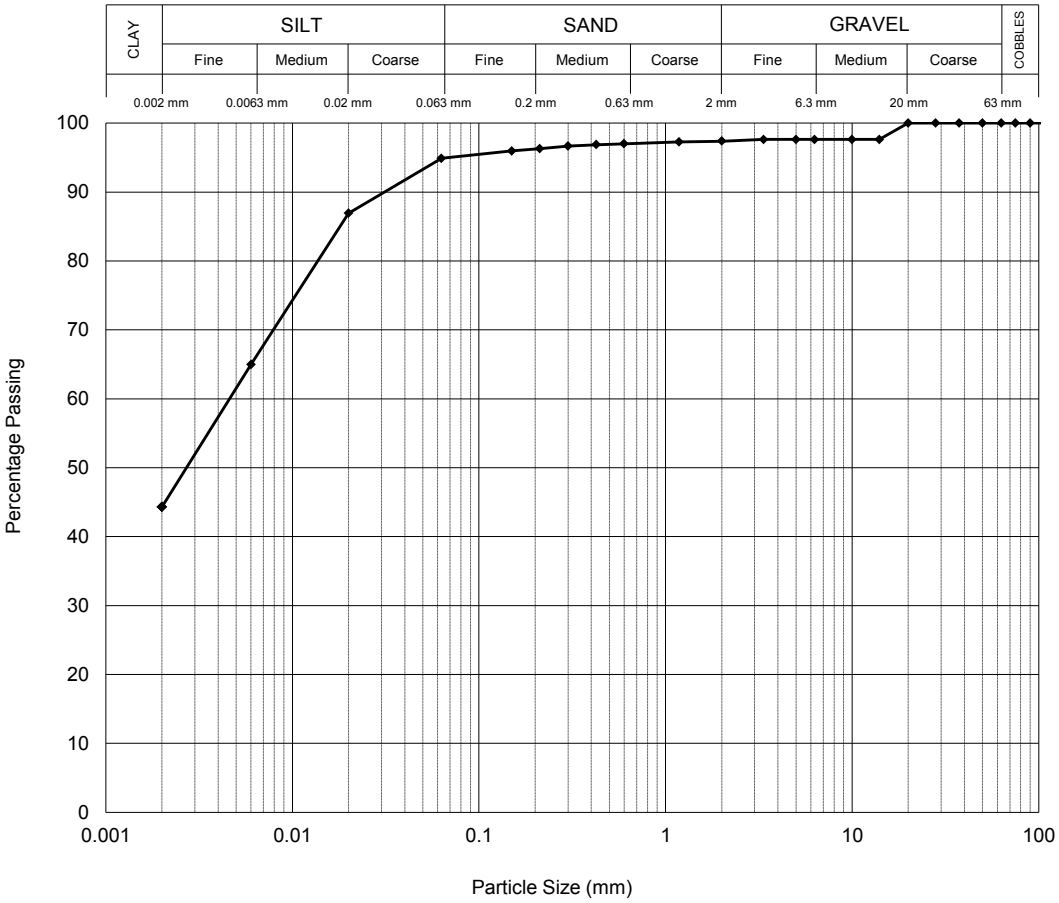
Sample Ref	D4 L1
Sample Type	B

Description

Dark grey SILT and CLAY with rare fine gravel

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	97
1.18 mm	97
600 µm	97
425 µm	97
300 µm	97
212 µm	96
150 µm	96
63 µm	95



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	87
6 µm	65
2 µm	44
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	3
Sand	2
Silt	51
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
07/08/2019

Project Number:

GEO / 29613

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13859

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	11	Jul-19
Date of receipt of testing instructions	11	Jul-19
Date testing started:	17	Jul-19
Date of issue:	21	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A3 L3	GT4	0.00		B	Dark grey slightly sandy CLAY			24.8	100	48	20	28		
A4 L3	GT6	0.00		B	Dark grey slightly sandy CLAY			24.1	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
29/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		A3 L3	B	Dark grey clayey SILT with rare pyritic fossil fragments.	2.65	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29614

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

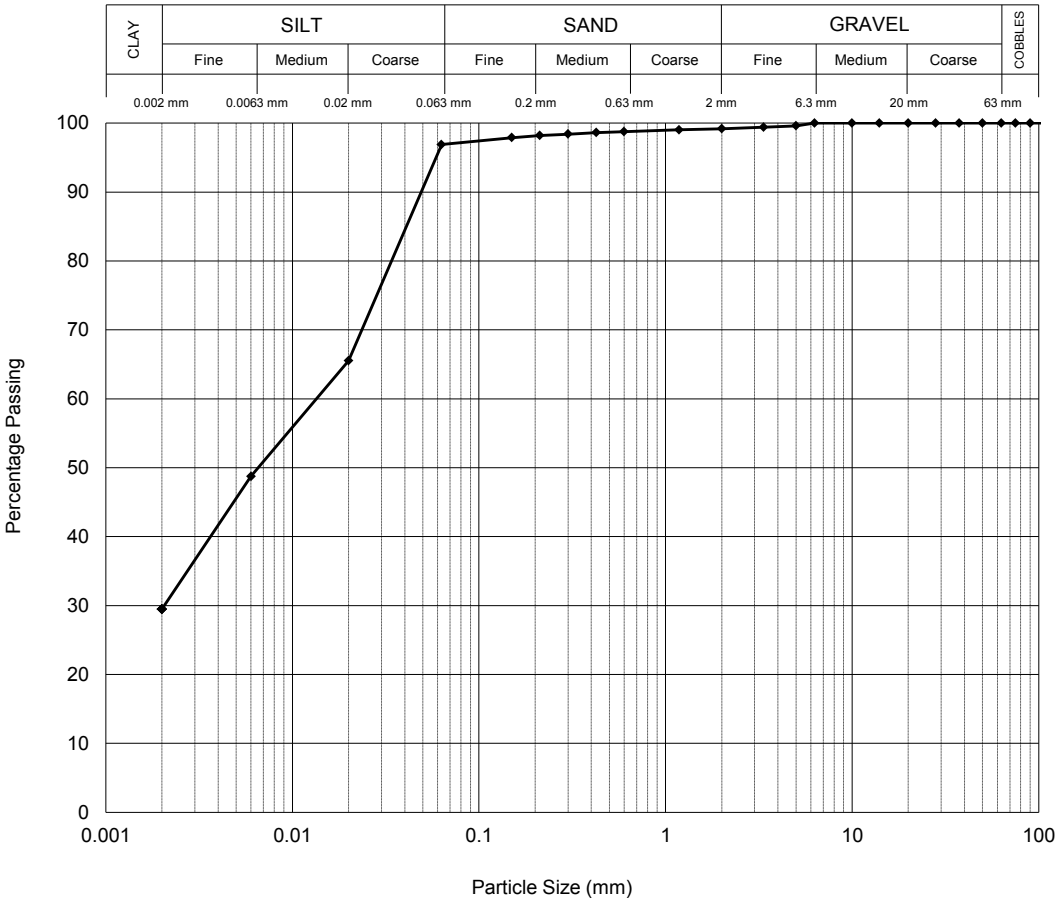
BH / TP No.	GT5
Sample Ref	A3 L3
Sample Type	B

Description

Dark grey clayey SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	66
6 µm	49
2 µm	29

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	67
Clay	30

Checked and Approved by

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29614

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13863

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	12	Jul-19
Date of receipt of testing instructions	12	Jul-19
Date testing started:	19	Jul-19
Date of issue:	21	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
D4 L2	GT6	0.00		B	Dark grey slightly sandy CLAY			26.2	100	48	19	29		
D5 L2	GT7	0.00		B	Dark grey slightly sandy CLAY			27.5	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
29/07/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		D4 L2	B	Dark grey CLAY and SILT with rare fossil fragments.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29615

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

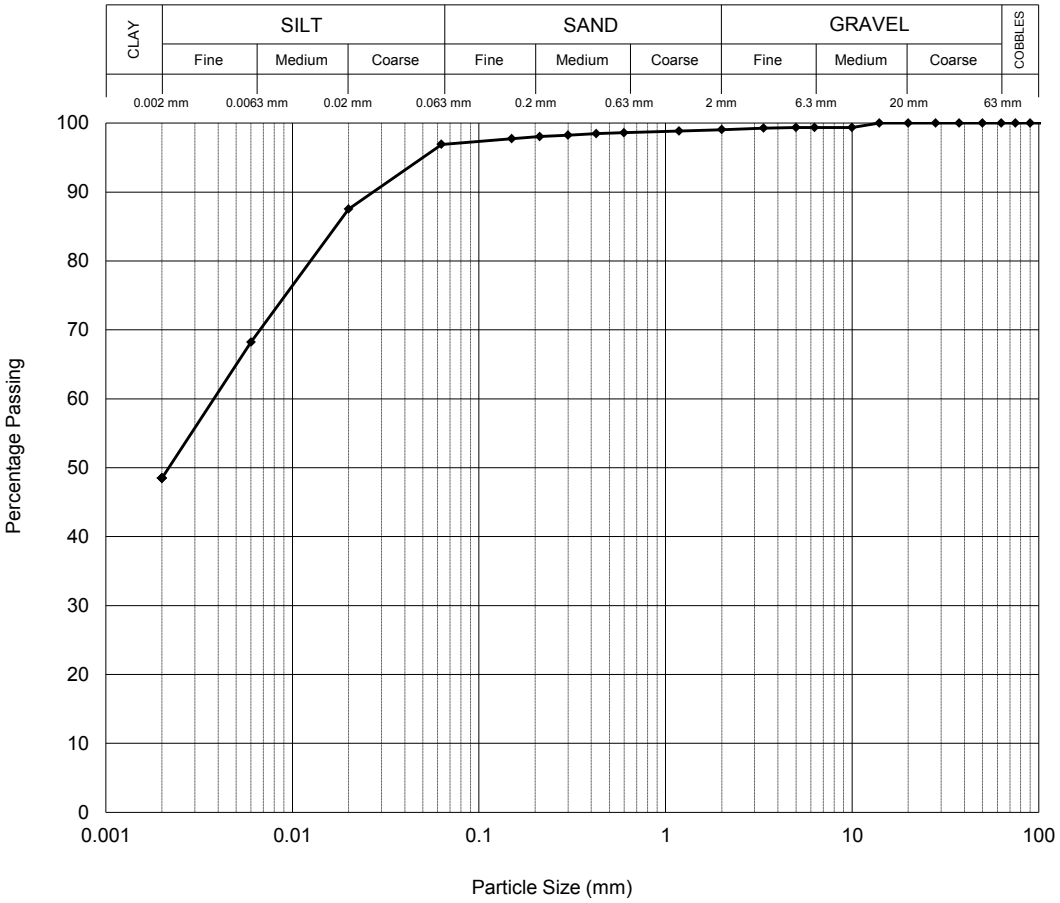
BH / TP No.	GT5
Sample Ref	D4 L2
Sample Type	B

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	88
6 µm	68
2 µm	48
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	48
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
15/08/2019

Project Number:

GEO / 29615

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13865

Number of samples submitted for testing:	6	sample (s)
Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Date (s) sampled and received at laboratory:	15	Jul-19
Date of receipt of testing instructions	15	Jul-19
Date testing started:	20	Jul-19
Date of issue:	21	Aug-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
B3 L3	GT5	0.00		B	Dark grey slightly sandy CLAY			23.5	100	48	20	28		
C3 L3	GT4	0.00		B	Dark grey slightly sandy CLAY			25.1	100	49	20	29		
C5 L3	GT1	0.00		B	Dark grey slightly sandy CLAY			24.7	100	49	19	30		
D3 L3	GT2	0.00		B	Dark grey slightly sandy CLAY			25.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
08/01/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		D3 L3	B	Dark grey CLAY and SILT with rare shell fragments.	2.67	2
GT6		B3 L3	B	Dark grey CLAY and SILT.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/08/2019

Project Number:

GEO / 29650

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

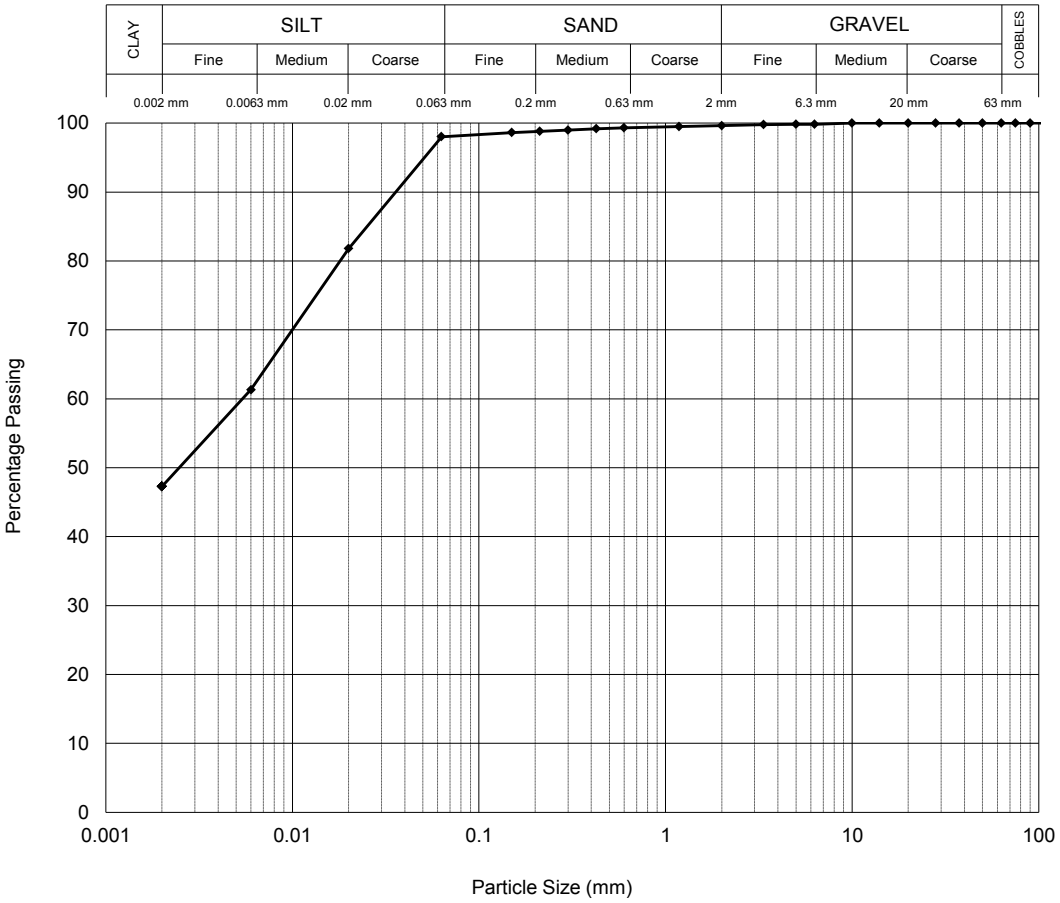
BH / TP No.	GT3
Sample Ref	D3 L3
Sample Type	B

Description

Dark grey CLAY and SILT with rare shell fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.4
Size	% Pass
20 µm	82
6 µm	61
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
16/08/2019

Project Number:

GEO / 29650

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

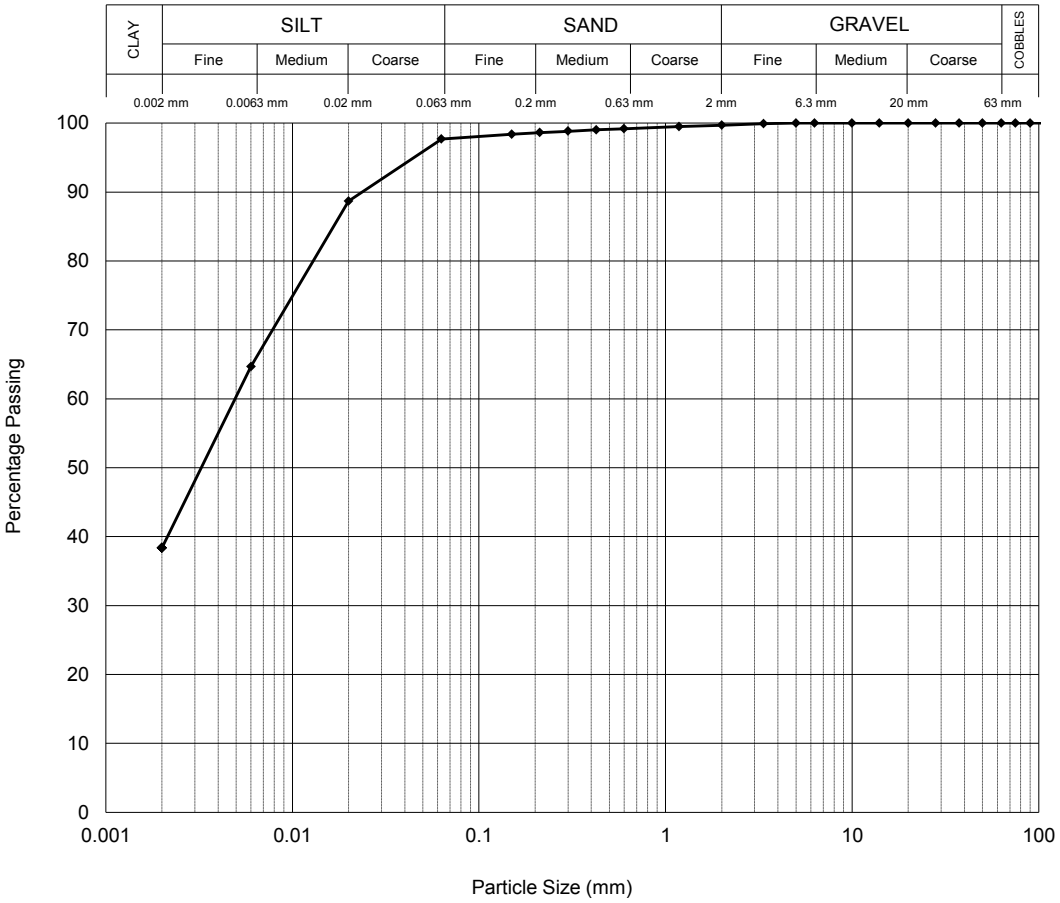
BH / TP No.	GT6
Sample Ref	B3 L3
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	89
6 µm	65
2 µm	38

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	59
Clay	39

Checked and Approved by

S Burke

S Burke - Senior Technician
16/08/2019

Project Number:

GEO / 29650

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13875

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	16	Jul-19
Date of receipt of testing instructions	16	Jul-19
Date testing started:	24	Jul-19
Date of issue:	2	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B4 L3	GT3	0.00		B	Dark grey slightly sandy CLAY			26.8	100	51	21	30		
C4 L3	GT1	0.00		B	Dark grey slightly sandy CLAY			22.9	100	50	21	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C4 L3	B	Dark brown CLAY and SILT with rare pyrite.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
02/10/2019

Project Number:

GEO / 29651

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

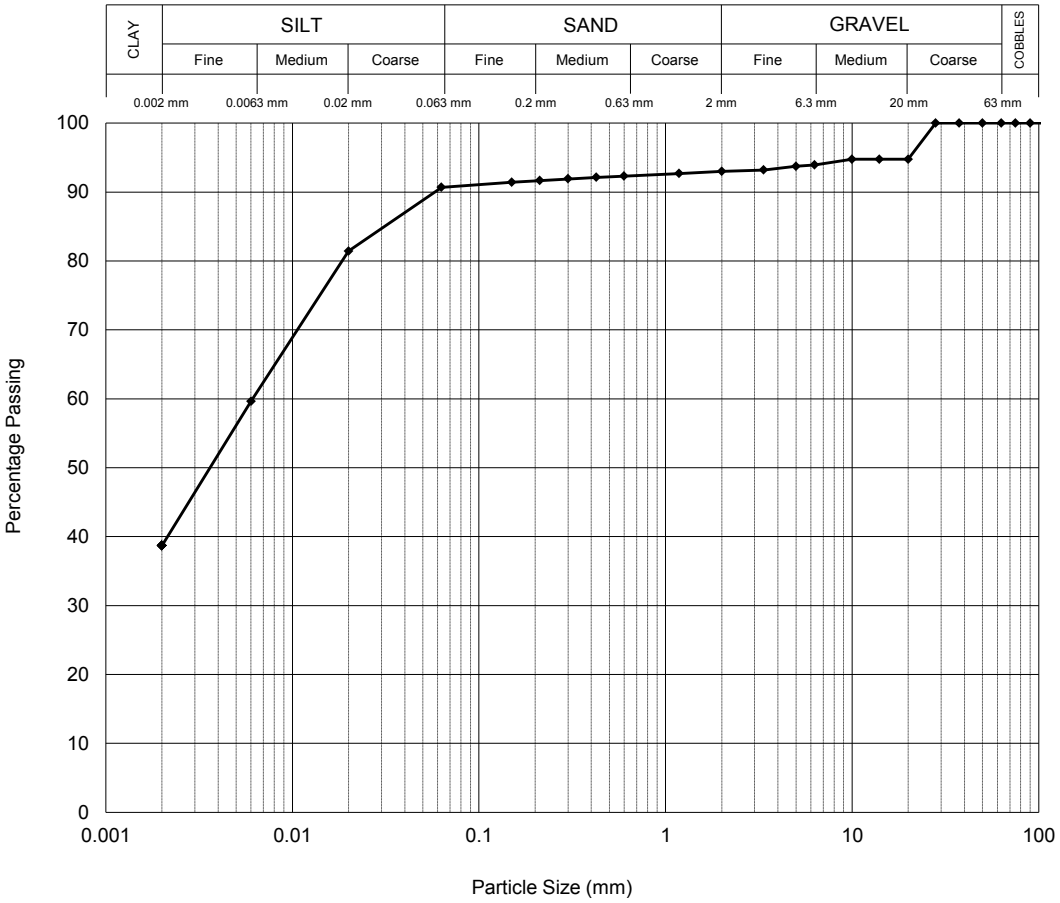
BH / TP No.	GT2
Sample Ref	C4 L3
Sample Type	B

Description

Dark brown CLAY and SILT with rare pyrite.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	95
14.0 mm	95
10.0 mm	95
6.30 mm	94
5.00 mm	94
3.35 mm	93
2.00 mm	93
1.18 mm	93
600 µm	92
425 µm	92
300 µm	92
212 µm	92
150 µm	91
63 µm	91



Sedimentation	
Pre-treatment used	
Temp (°C)	25.2
Size	% Pass
20 µm	81
6 µm	60
2 µm	39

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	7
Sand	2
Silt	52
Clay	39

Checked and Approved by

S Burke

S Burke - Senior Technician
02/10/2019

Project Number:

GEO / 29651

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13885

Number of samples submitted for testing:	9	sample (s)
Natural Moisture Content	6	test(s)
Atterberg Limit	6	test(s)
Particle Density	3	test(s)
Grading	3	test(s)
Date (s) sampled and received at laboratory:	18	Jul-19
Date of receipt of testing instructions	18	Jul-19
Date testing started:	24	Jul-19
Date of issue:	5	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
D2 L4	GT8	0.00		B	Dark grey slightly sandy CLAY			24.4	100	47	19	28		
D3 L4	GT14	0.00		B	Dark grey slightly sandy CLAY			24.1	100	51	20	31		
D4 L3	GT10	0.00		B	Dark grey slightly sandy CLAY			25.4	100	50	21	29		
D5 L3	GT11	0.00		B	Dark grey slightly sandy CLAY			26.4	100	50	20	30		
E3 L3	GT9	0.00		B	Dark grey slightly sandy CLAY			25.0	100	50	20	30		
E4 L3	GT7	0.00		B	Dark grey slightly sandy CLAY			23.7	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT12		D3 L4	B	Dark grey SILT and CLAY.	2.67	2
GT13		E3 L3	B	Dark grey SILT and CLAY	2.67	2
GT15		D4 L3	B	Dark grey SILT and CLAY	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

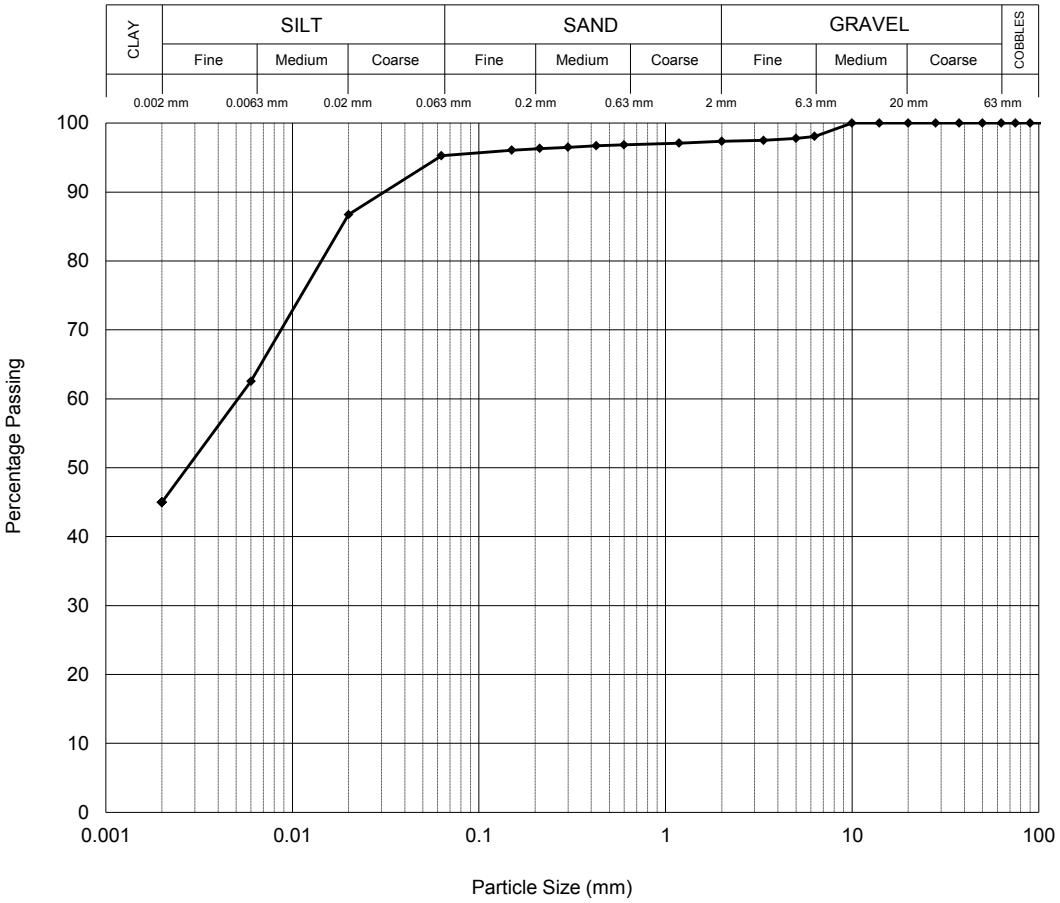
BH / TP No.	GT12
Sample Ref	D3 L4
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	97
1.18 mm	97
600 µm	97
425 µm	97
300 µm	97
212 µm	96
150 µm	96
63 µm	95



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	87
6 µm	63
2 µm	45
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	3
Sand	2
Silt	50
Clay	45

Checked and Approved by

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

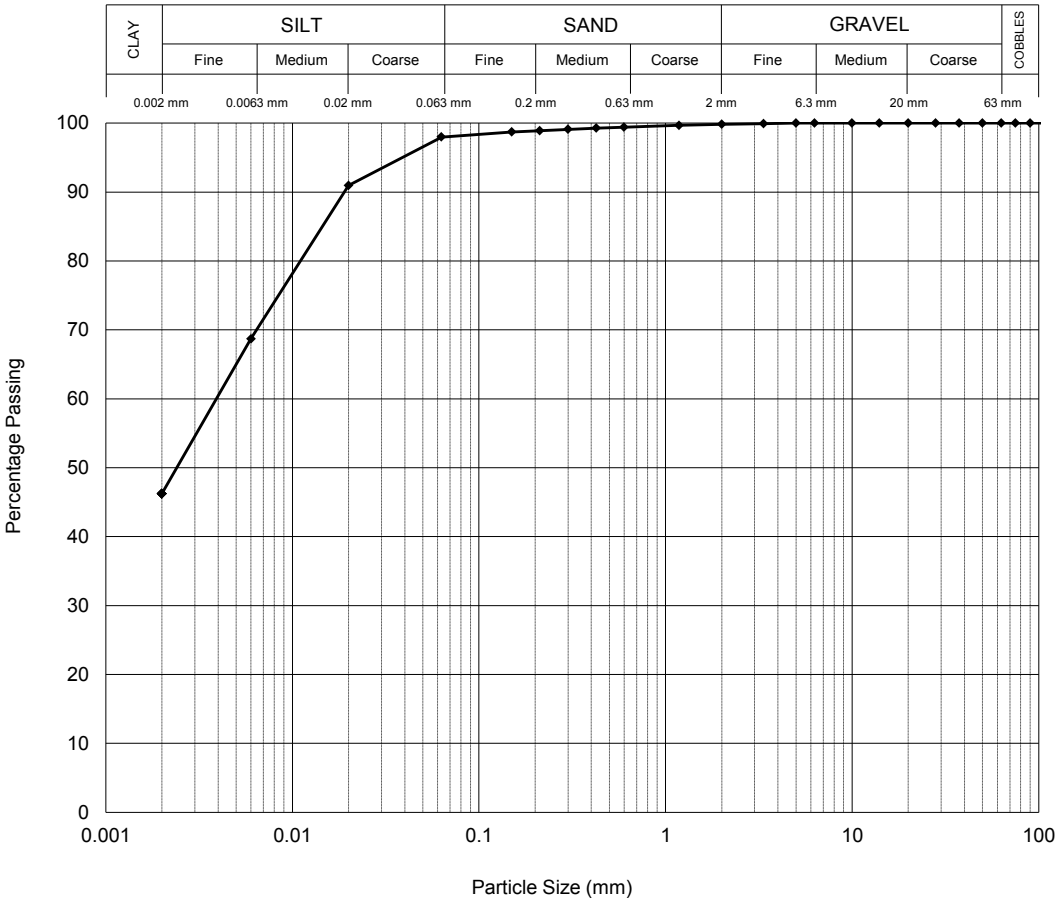
BH / TP No.	GT13
Sample Ref	E3 L3
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	91
6 µm	69
2 µm	46
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

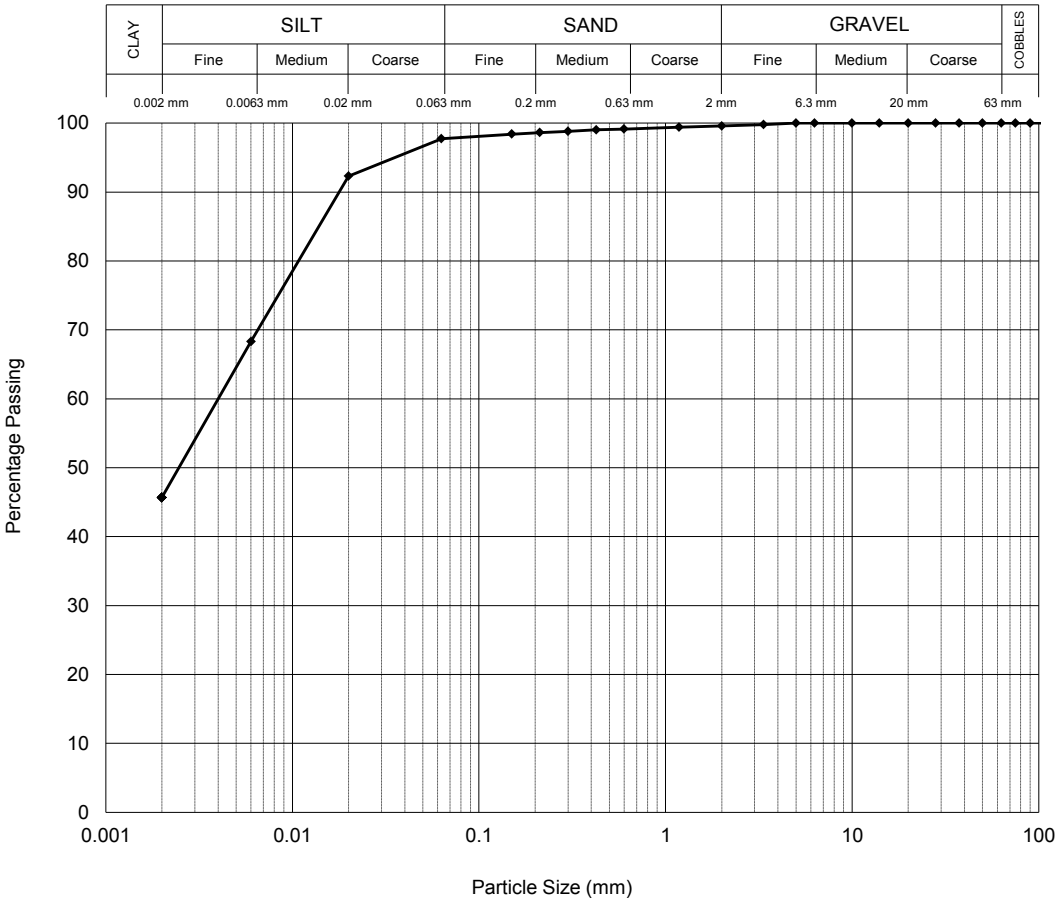
BH / TP No.	GT15
Sample Ref	D4 L3
Sample Type	B

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	92
6 µm	68
2 µm	46
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

S Burke

S Burke - Senior Technician
21/08/2019

Project Number:

GEO / 29652

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13891

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Date (s) sampled and received at laboratory:	23	Jul-19
Date of receipt of testing instructions	23	Jul-19
Date testing started:	24	Jul-19
Date of issue:	5	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L4	GT4	0.00		B	Dark grey slightly sandy CLAY			25.7	100	50	20	30		
A4 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.4	100	50	20	30		
B5 L1	GT2	0.00		B	Dark grey slightly sandy CLAY			26.0	100	51	20	31		
C2 L4	GT1	0.00		B	Dark grey slightly sandy CLAY			25.8	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13895

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	TBC	test(s)

Date (s) sampled and received at laboratory:	24	Jul-19
Date of receipt of testing instructions	24	Jul-19
Date testing started:	26	Jul-19
Date of issue:	5	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B4 L4	GT2	0.00		B	Dark grey slightly sandy CLAY			18.8	100	50	20	30		
B5 L2	GT3	0.00		B	Dark grey slightly sandy CLAY			25.6	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT1		B4 L4		Dark grey SILT and CLAY	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29673

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

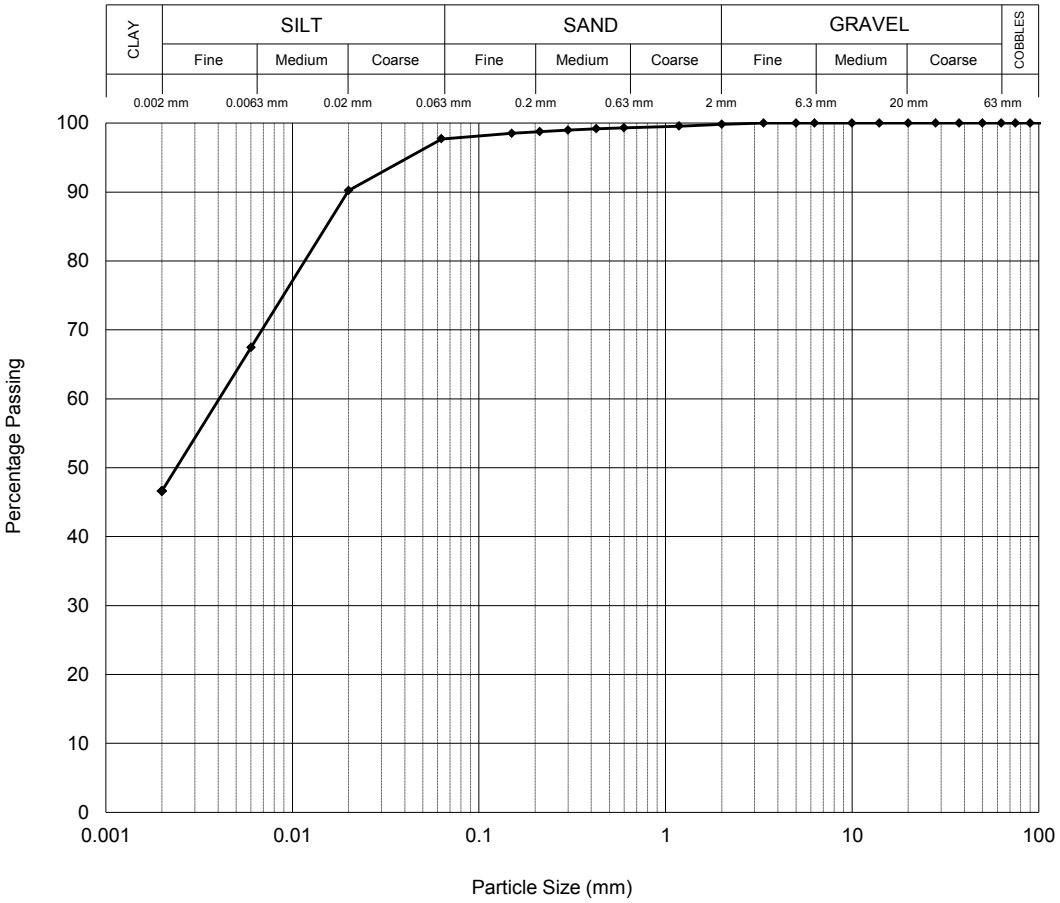
BH / TP No.	GT1
Sample Ref	B4 L4

Description

Dark grey SILT and CLAY

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	90
6 µm	67
2 µm	47
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29673

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT5
Sample Ref.:	B4 L4
Sample Type:	C

Description:
Stiff dark grey gravelly CLAY. Gravel is fine to medium.

SPECIMEN DETAILS

Depth within original sample	10mm
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.33	101.15
Height	*mm*	100.18	100.00
Moisture Content	*%*	23.3	25.1
Bulk Density	*Mg/m³*	2.00	2.03
Dry Density	*Mg/m³*	1.62	1.63

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.76	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	4.2

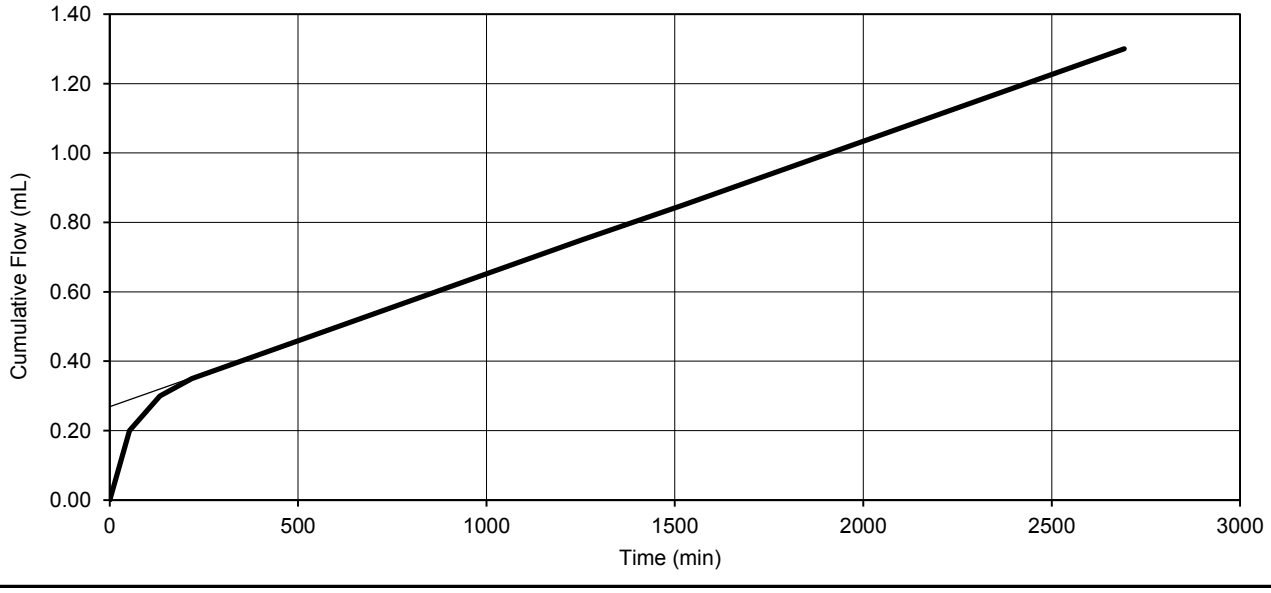
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.8×10^{-11} m/s



Checked and Approved by

P Heritage

P Heritage - Project Co-ordinator
20/08/2019

Project Number:

GEO / 29673

Project Name:

DOCKSWAY CELL 4
AG0390

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UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13897

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	25	Jul-19
Date of receipt of testing instructions	25	Jul-19
Date testing started:	26	Jul-19
Date of issue:	2	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
B3 L4	GT2	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		
C3 L4	GT1	0.00		B	Dark grey slightly sandy CLAY			21.8	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
21/08/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		C3 L4	B	Dark grey CLAY and SILT.	2.65	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/10/2019

Project Number:

GEO / 29683

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

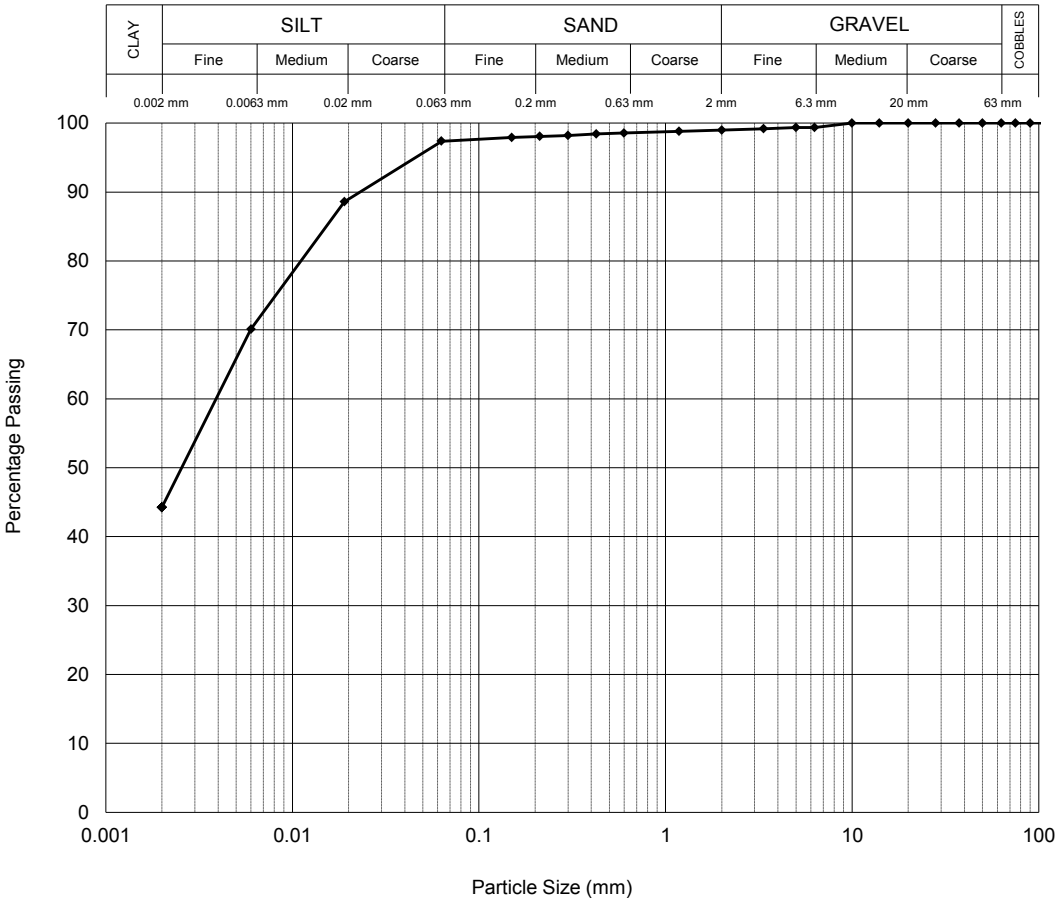
BH / TP No.	GT3
Sample Ref	C3 L4
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	28.6
Size	% Pass
19 µm	89
6 µm	70
2 µm	44

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	53
Clay	44

Checked and Approved by

S Burke

S Burke - Senior Technician
01/10/2019

Project Number:

GEO / 29683

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13904

cjassociates

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	26	Jul-19
Date of receipt of testing instructions	26	Jul-19
Date testing started:	3	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C2 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.5	100	51	20	31		
E2 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			26.4	100	50	21	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		C2 L4	B	Dark grey CLAY and SILT.	2.70	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29684

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

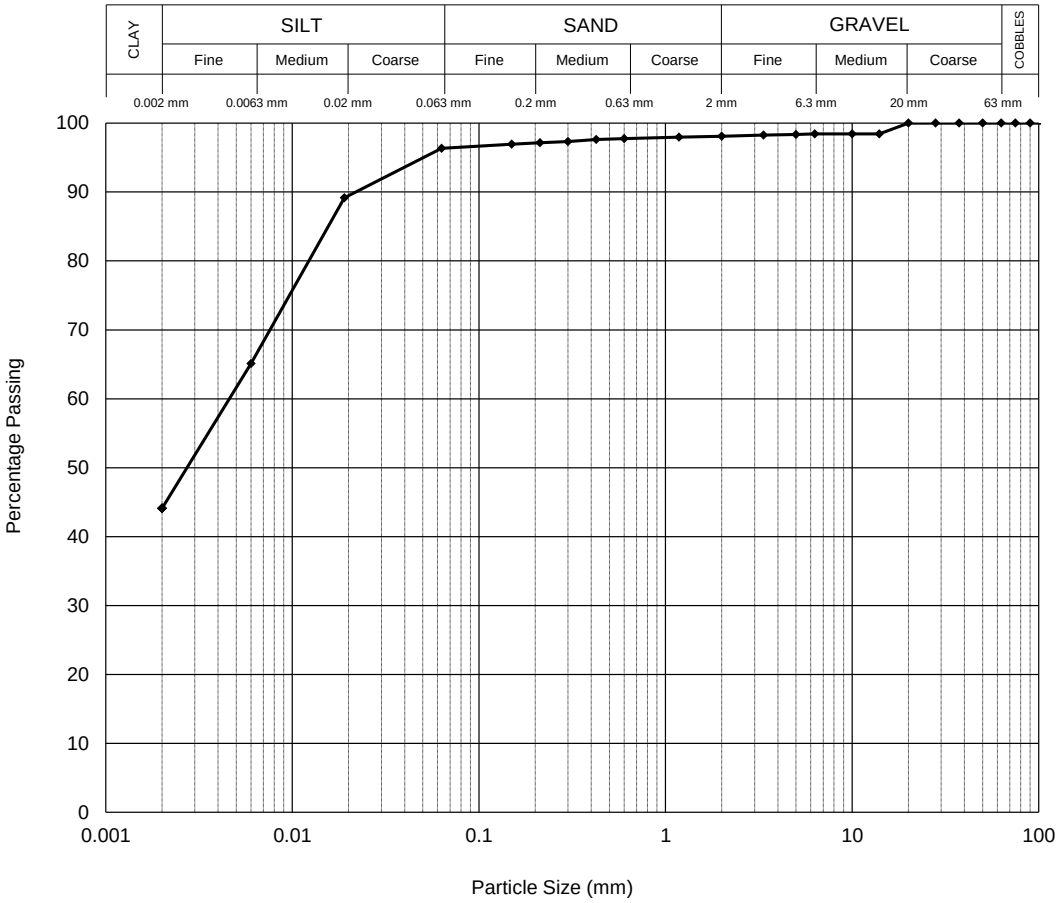
BH / TP No.	GT4
Sample Ref	C2 L4
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	28.6
Size	% Pass
19 µm	89
6 µm	65
2 µm	44

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	52
Clay	44

Checked and Approved by

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29684

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13906

Number of samples submitted for testing:	4	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	29	Jul-19
Date of receipt of testing instructions	29	Jul-19
Date testing started:	3	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
C2 L5	GT4	0.00		B	Dark grey slightly sandy CLAY			23.7	100	51	21	30		
D2 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		
E3 L4	GT7	0.00		B	Dark grey slightly sandy CLAY			26.0	100	51	21	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT5		C2 L5	B	Dark grey CLAY and SILT.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29685

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

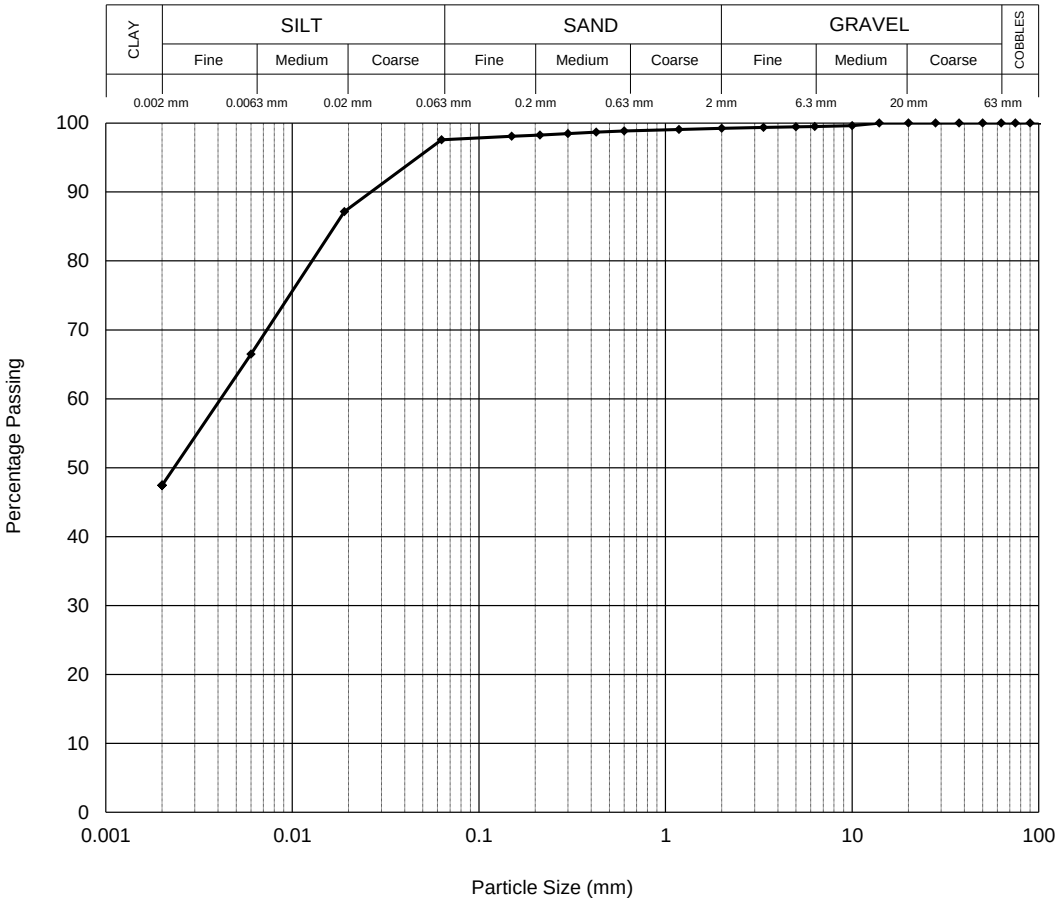
BH / TP No.	GT5
Sample Ref	C2 L5
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	28.6
Size	% Pass
19 µm	87
6 µm	66
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	50
Clay	47

Checked and Approved by

J Sturges - Operations Manager
05/09/2019

Project Number:

GEO / 29685

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13914

Number of samples submitted for testing:	10	sample (s)

Natural Moisture Content	6	test(s)
Atterberg Limit	6	test(s)
Particle Density	3	test(s)
Grading	3	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	7	test(s)

Date (s) sampled and received at laboratory:	1	Aug-19
Date of receipt of testing instructions	1	Aug-19
Date testing started:	3	Aug-19
Date of issue:	14	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
B1 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			24.7	100	50	21	29		
B2 L4	GT4	0.00		B	Dark grey slightly sandy CLAY			23.5	100	49	20	29		
B5 L3	GT2	0.00		B	Dark grey slightly sandy CLAY			23.9	100	51	20	31		
C5 L5	GT6	0.00		B	Dark grey slightly sandy CLAY			22.9	100	50	21	29		
D4 L4	GT8	0.00		B	Dark grey slightly sandy CLAY			24.9	100	50	20	30		
E4 L4	GT5	0.00		B	Dark grey slightly sandy CLAY			23.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test — wd - water displacement — wi - immersion in water
Linear measurement unless : — 4pt cone unless : — cas - Casagrande method — 1pt - single point test
Liquid Limit
Particle density — sp - small pyknometer — gj - gas jar

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT1		B2 L4		Dark grey CLAY and SILT with rare fossil fragments.	2.72	2
GT7		E4 L4		Dark grey CLAY and SILT with rare fossil fragments.	2.70	2
GT9		B5 L3		Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

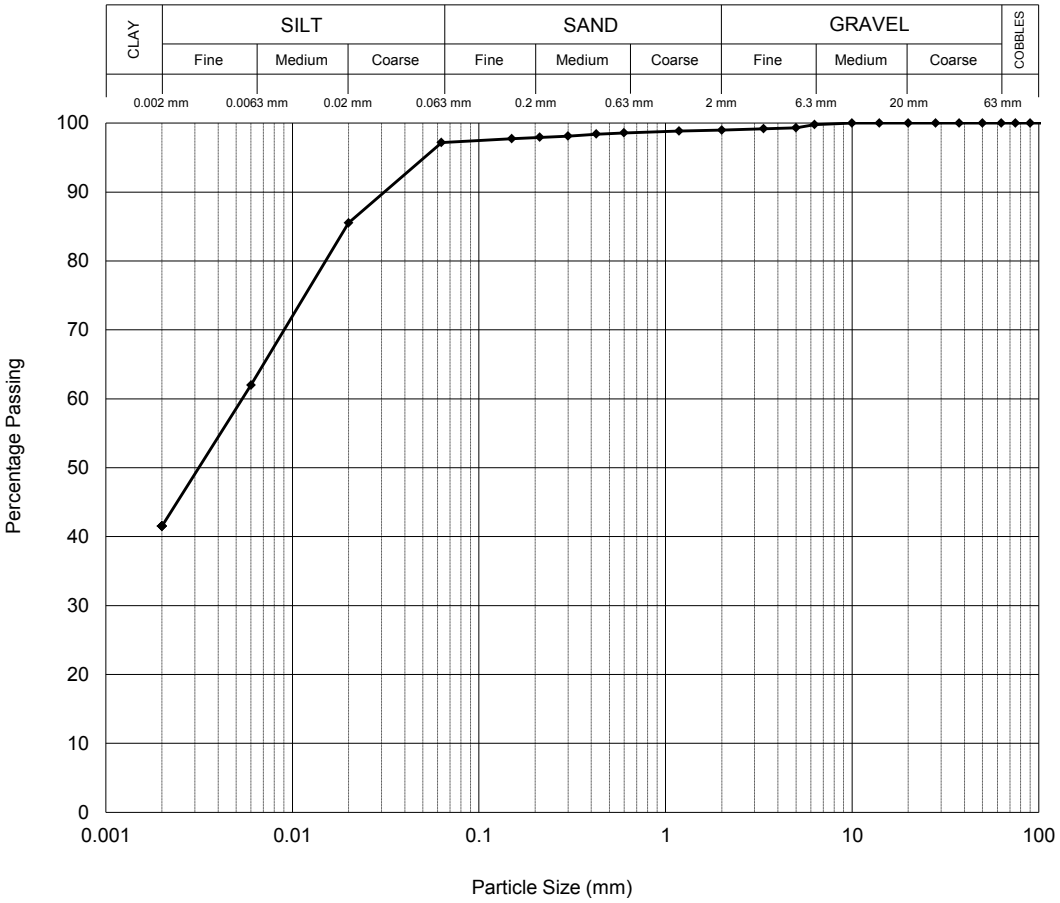
BH / TP No.	GT1
Sample Ref	B2 L4

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	86
6 µm	62
2 µm	42
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	56
Clay	41

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

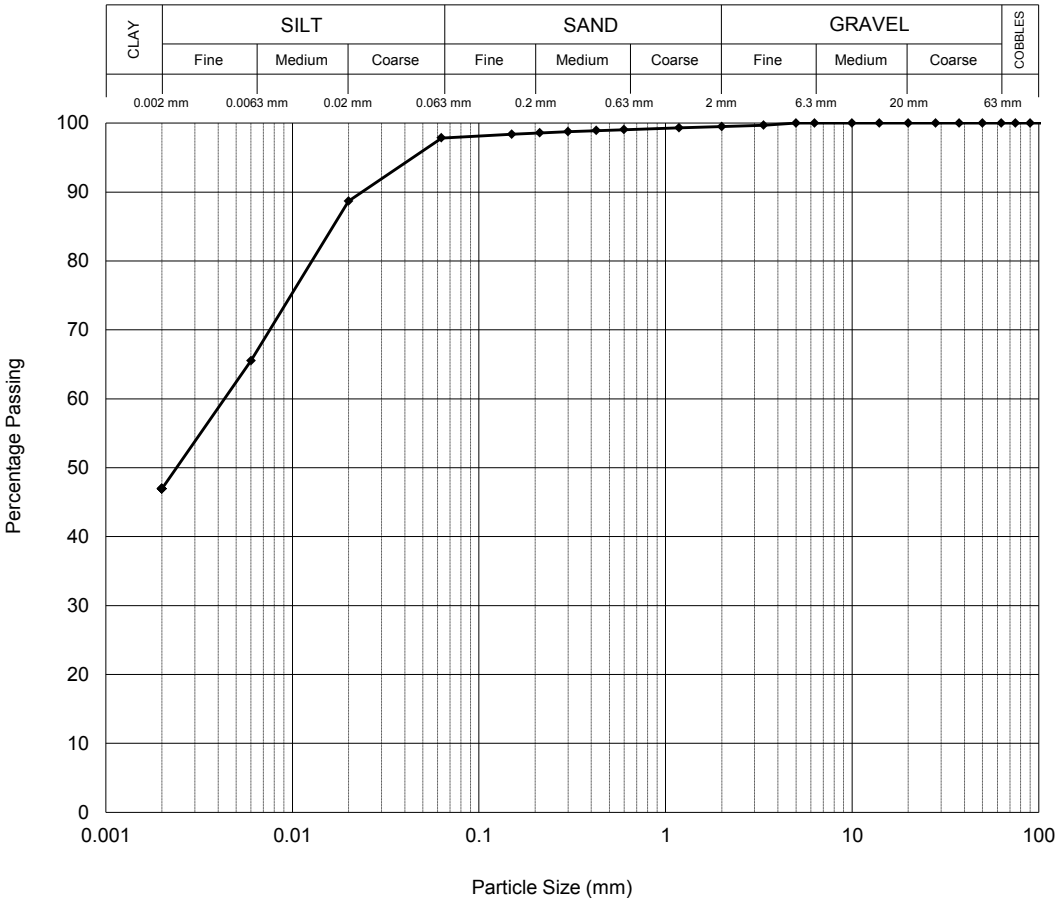
BH / TP No.	GT7
Sample Ref	E4 L4

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	89
6 µm	66
2 µm	47
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

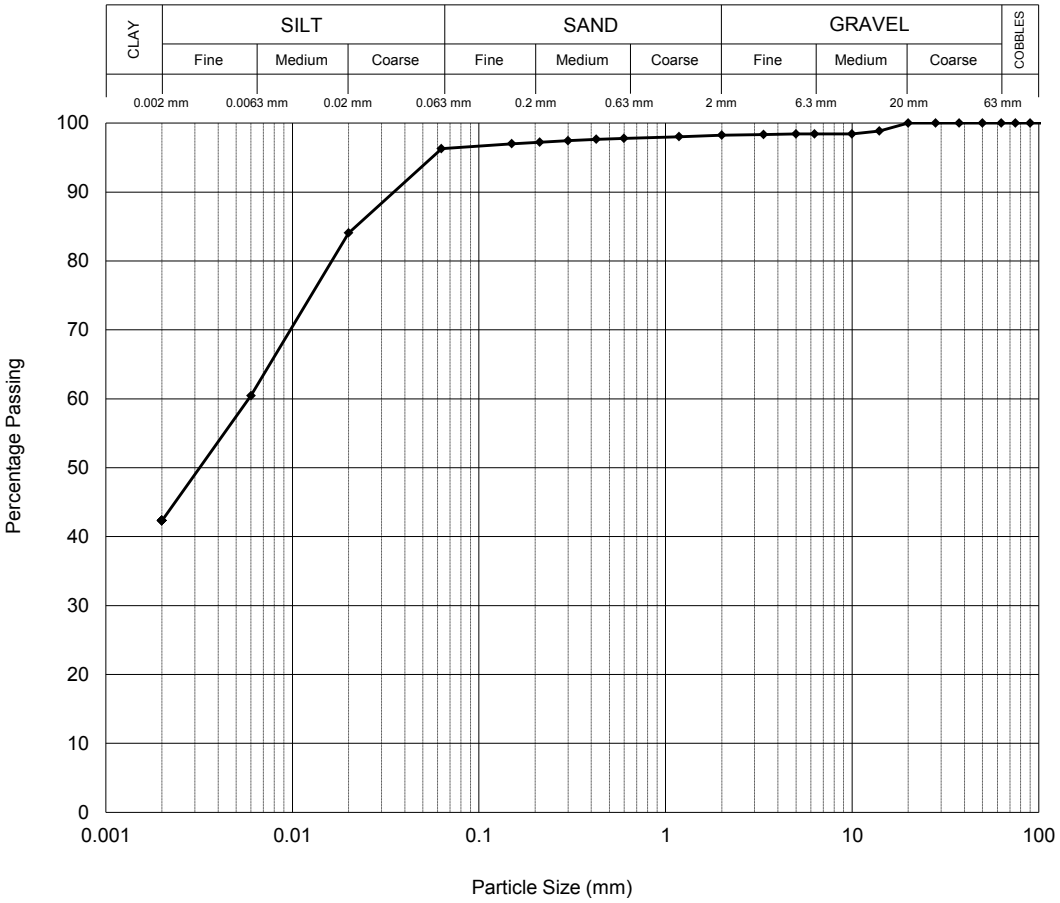
BH / TP No.	GT9
Sample Ref	B5 L3

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	99
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	84
6 µm	60
2 µm	42
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	54
Clay	42

Checked and Approved by

S Burke

S Burke - Senior Technician
22/08/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

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BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT16
Sample Ref.:	D4 L4

Description:
Stiff grey CLAY

SPECIMEN DETAILS

Depth within original sample	20mm
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	96.54	96.41
Height	*mm*	100.43	100.29
Moisture Content	*%*	21.0	24.6
Bulk Density	*Mg/m³*	2.18	2.25
Dry Density	*Mg/m³*	1.80	1.81

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.34	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	3.1

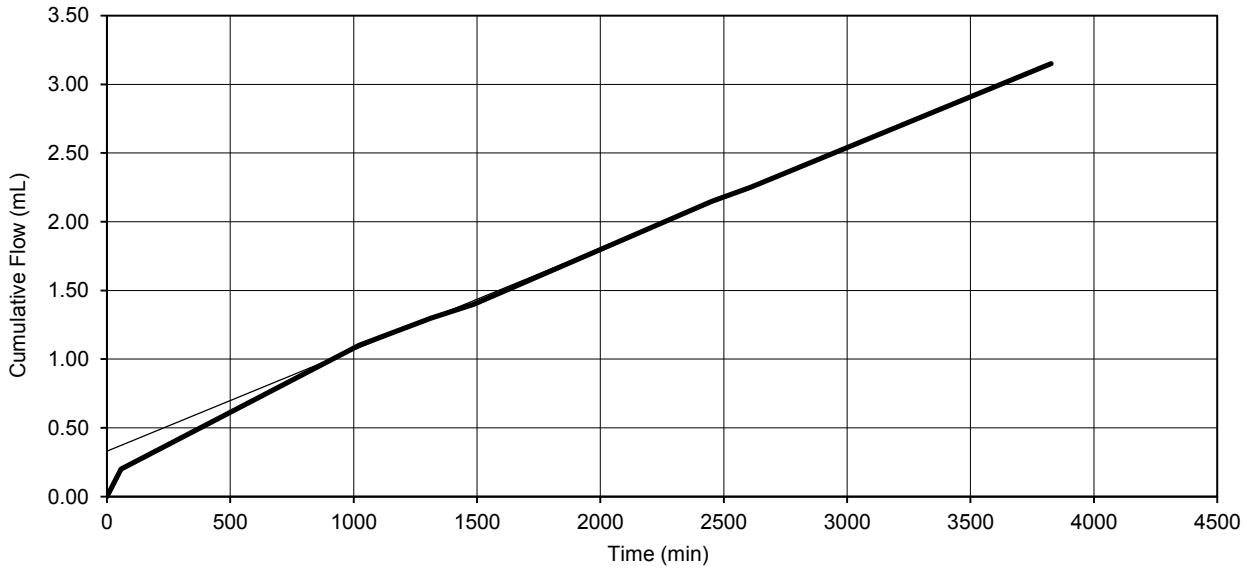
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	7
Consolidation	*days*	1
Flow	*days*	3

Coefficient of Permeability
k_v at 20 °C = 1.7×10^{-10} m/s



Checked and Approved by

P Heritage

P Heritage - Project Manager
09/09/2019

Project Number:

GEO / 29718

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13918

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	2	Aug-19
Date of receipt of testing instructions	2	Aug-19
Date testing started:	3	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A2 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			26.0	100	49	20	29		
B2 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	50	20	30		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test — Linear measurement unless : wd - water displacement; wi - immersion in water

Liquid Limit — 4pt cone unless : cas - Casagrande method; 1pt - single point test

Particle density — sp - small pyknometer; gj - gas jar

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		A2 L5	B	Dark grey CLAY and SILT with rare fossil fragments.	2.72	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
04/09/2019

Project Number:

GEO / 29746

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

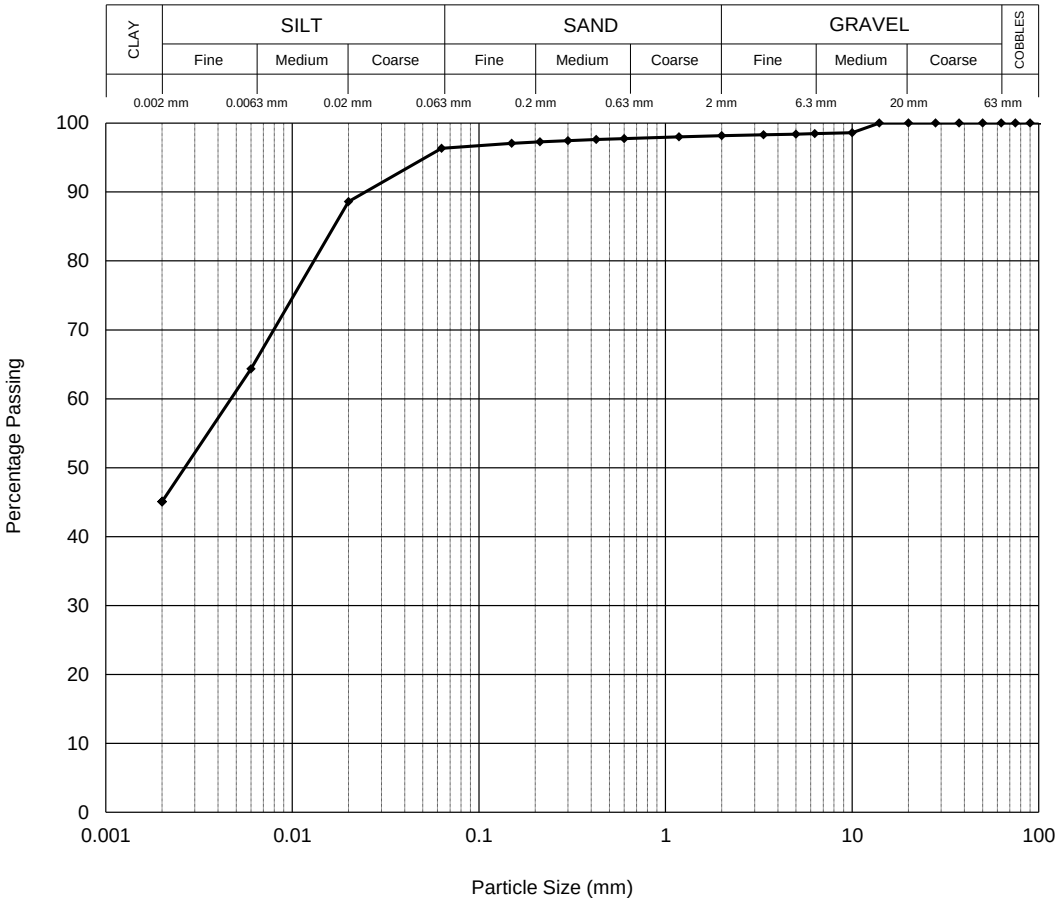
BH / TP No.	GT2
Sample Ref	A2 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	98
600 µm	98
425 µm	98
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	26.2
Size	% Pass
20 µm	89
6 µm	64
2 µm	45

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	51
Clay	45

Checked and Approved by

J Sturges - Operations Manager
04/09/2019

Project Number:

GEO / 29746

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13921

Number of samples submitted for testing:	5	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	2	test(s)
Grading	2	test(s)

Date (s) sampled and received at laboratory:	5	Aug-19
Date of receipt of testing instructions	5	Aug-19
Date testing started:	7	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			16.5	100	49	20	29		
C4 L4	GT3	0.00		B	Dark grey slightly sandy CLAY			25.1	100	49	20	29		
E3 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			25.0	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		C3 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2
GT4		C4 L4	B	Dark grey CLAY and SILT.	2.69	2

Notes

Test Method

1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
06/09/2019

Project Number:

GEO / 29747

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

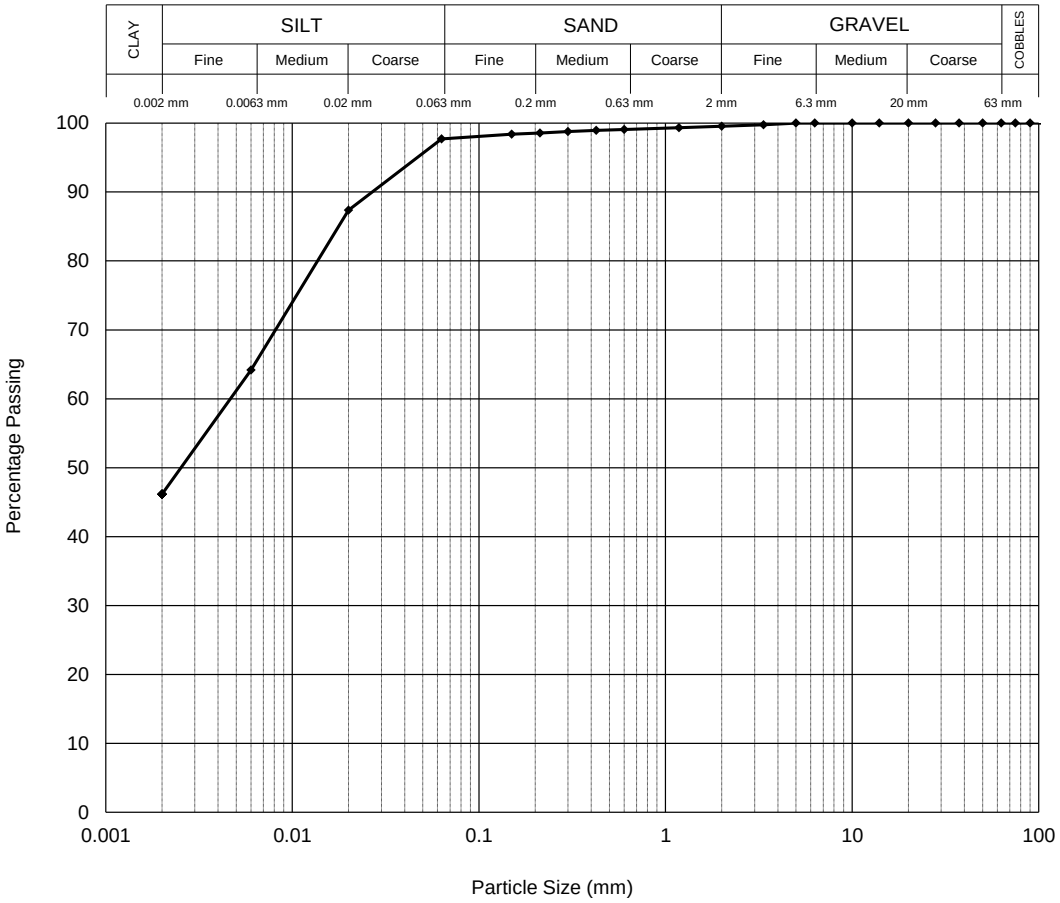
BH / TP No.	GT2
Sample Ref	C3 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	87
6 µm	64
2 µm	46

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

J Sturges - Operations Manager
06/09/2019

Project Number:

GEO / 29747

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

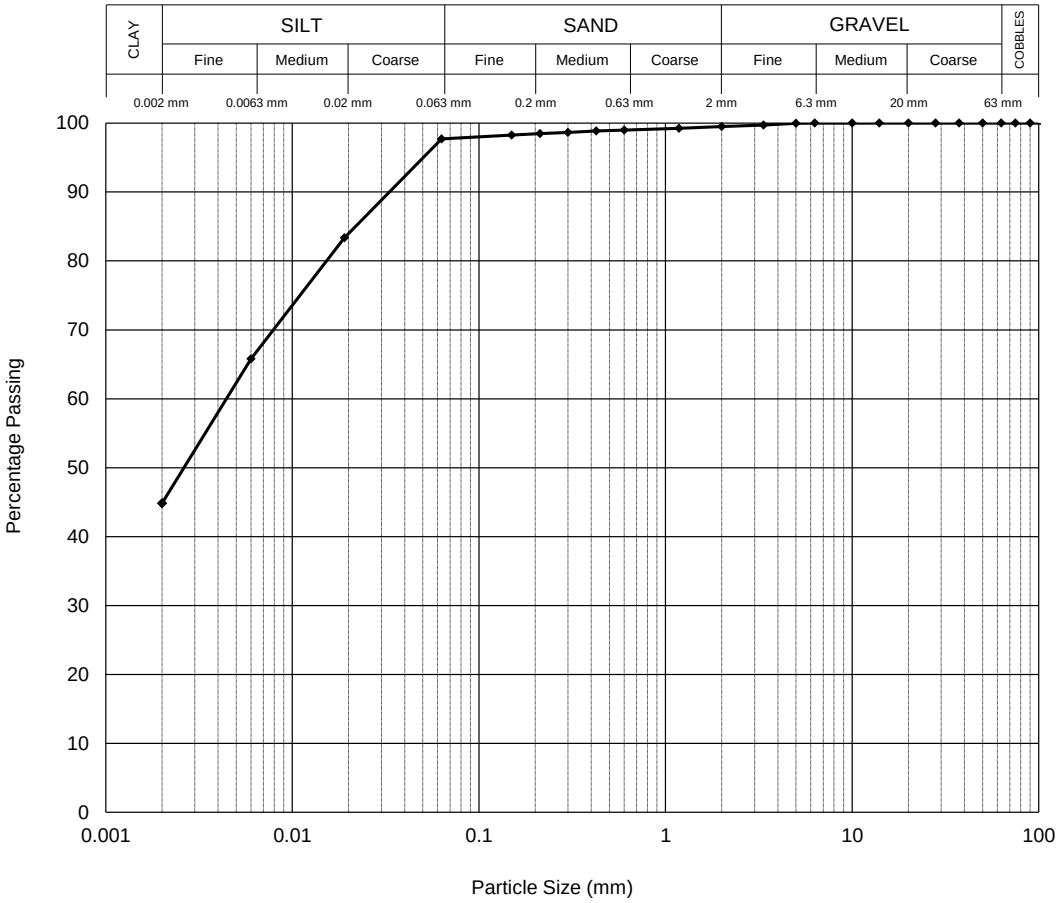
BH / TP No.	GT4
Sample Ref	C4 L4
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	27.6
Size	% Pass
19 µm	83
6 µm	66
2 µm	45

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	53
Clay	44

Checked and Approved by

J Sturges - Operations Manager
06/09/2019

Project Number:

GEO / 29747

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13923

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	6	Aug-19
Date of receipt of testing instructions	6	Aug-19
Date testing started:	7	Aug-19
Date of issue:	7	Sep-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			19.4	100	48	20	28		
D3 L5	GT1	0.00		B	Dark grey slightly sandy CLAY			22.8	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29748.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		D3 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.73	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
04/09/2019

Project Number:

GEO / 29748

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

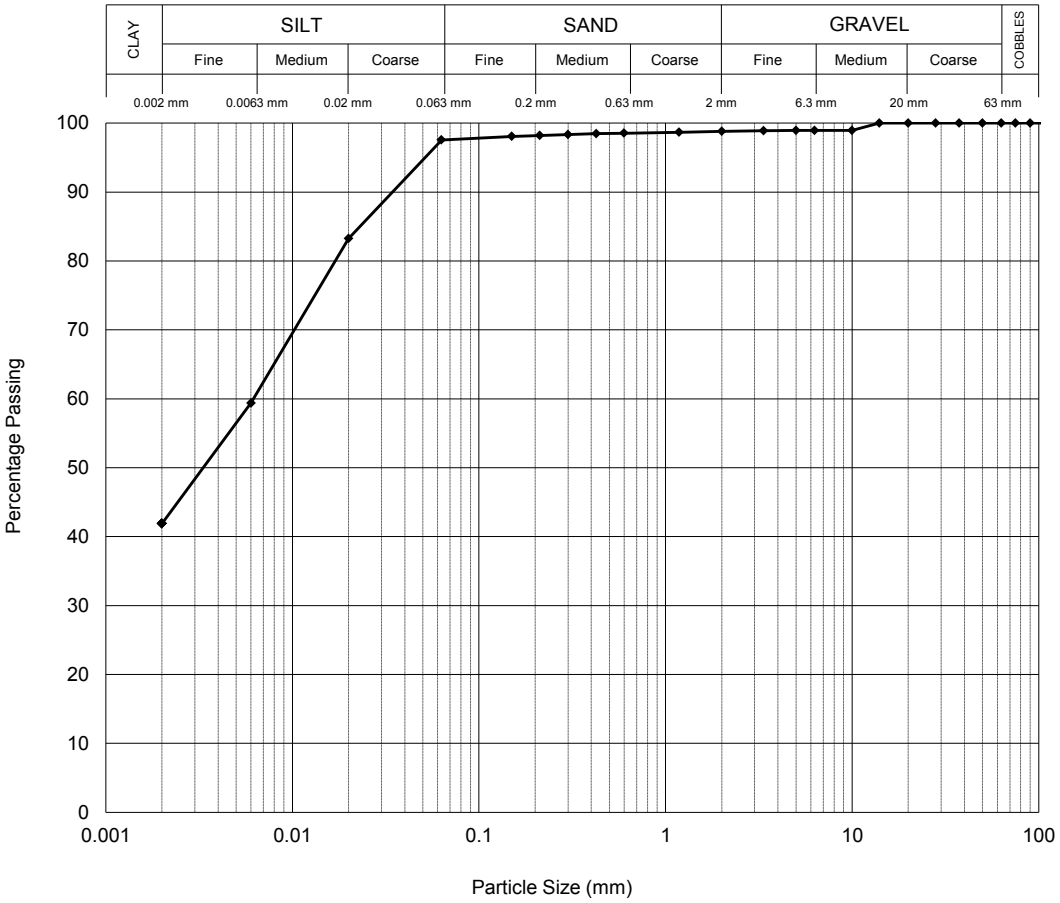
BH / TP No.	GT2
Sample Ref	D3 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26.2
Size	% Pass
20 µm	83
6 µm	59
2 µm	42

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	1
Silt	56
Clay	42

Checked and Approved by

S Burke

S Burke - Senior Technician
04/09/2019

Project Number:

GEO / 29748

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13932

Number of samples submitted for testing:	6	sample (s)

Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	3	test(s)

Date (s) sampled and received at laboratory:	8	Aug-19
Date of receipt of testing instructions	8	Aug-19
Date testing started:	13	Aug-19
Date of issue:	14	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C4 L5	GT4	0.00		B	Dark grey slightly sandy CLAY			23.7	100	47	20	27		
D4 L5	GT2	0.00		B	Dark grey slightly sandy CLAY			20.7	100	47	19	28		
D5 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			21.4	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Borehole / Trial Pit	Depth (m)	Sample Ref	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
GT1		D4 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.															Particle Density = 2.72 Mg/m³ Particle Size Distribution
GT3		C4 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.															Particle Density = 2.70 Mg/m³ Particle Size Distribution
GT6		D4 L5	C	Stiff grey CLAY															Triaxial Permeability

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
14/10/2019

Project Number:

GEO / 29758

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS®

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT1		D4 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.72	2
GT3		C4 L5	B	Dark grey CLAY and SILT with rare pyritic fossil fragments.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
14/10/2019

Project Number:

GEO / 29758

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

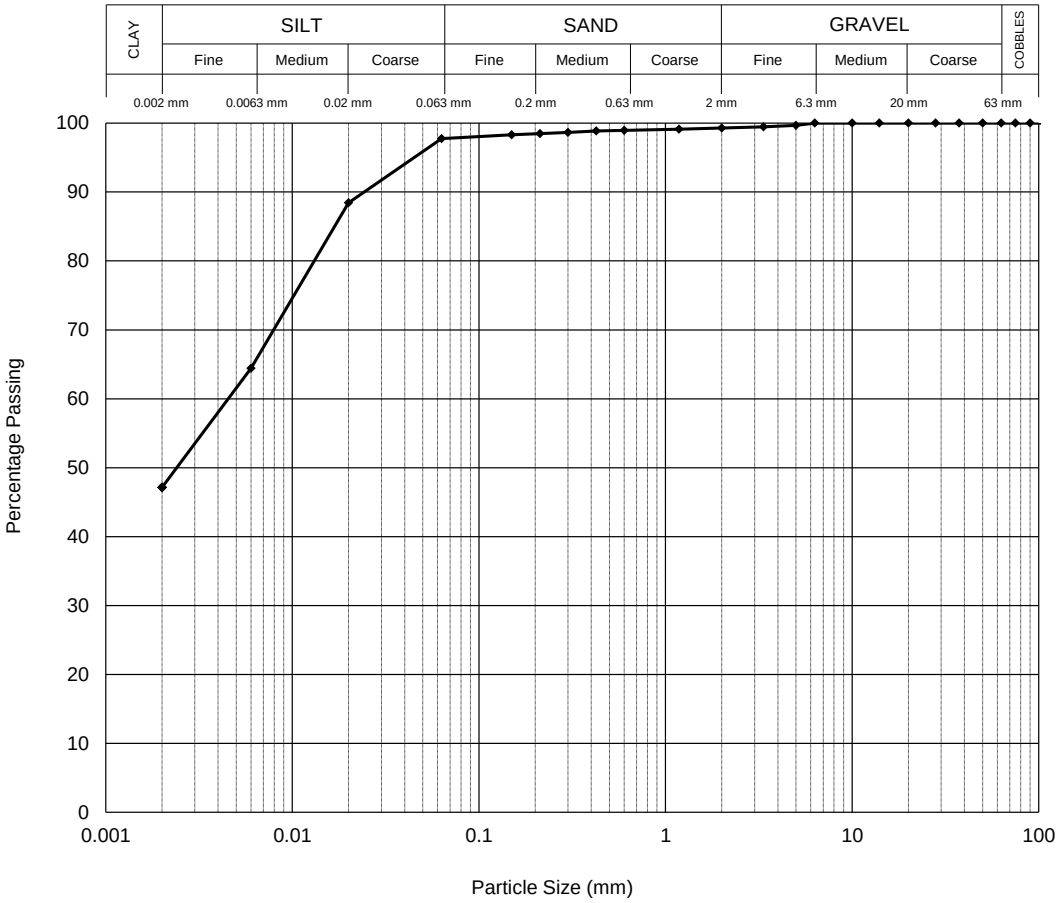
BH / TP No.	GT1
Sample Ref	D4 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	98
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	88
6 µm	64
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	51
Clay	46

Checked and Approved by

J Sturges - Operations Manager
27/09/2019

Project Number:

GEO / 29758

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

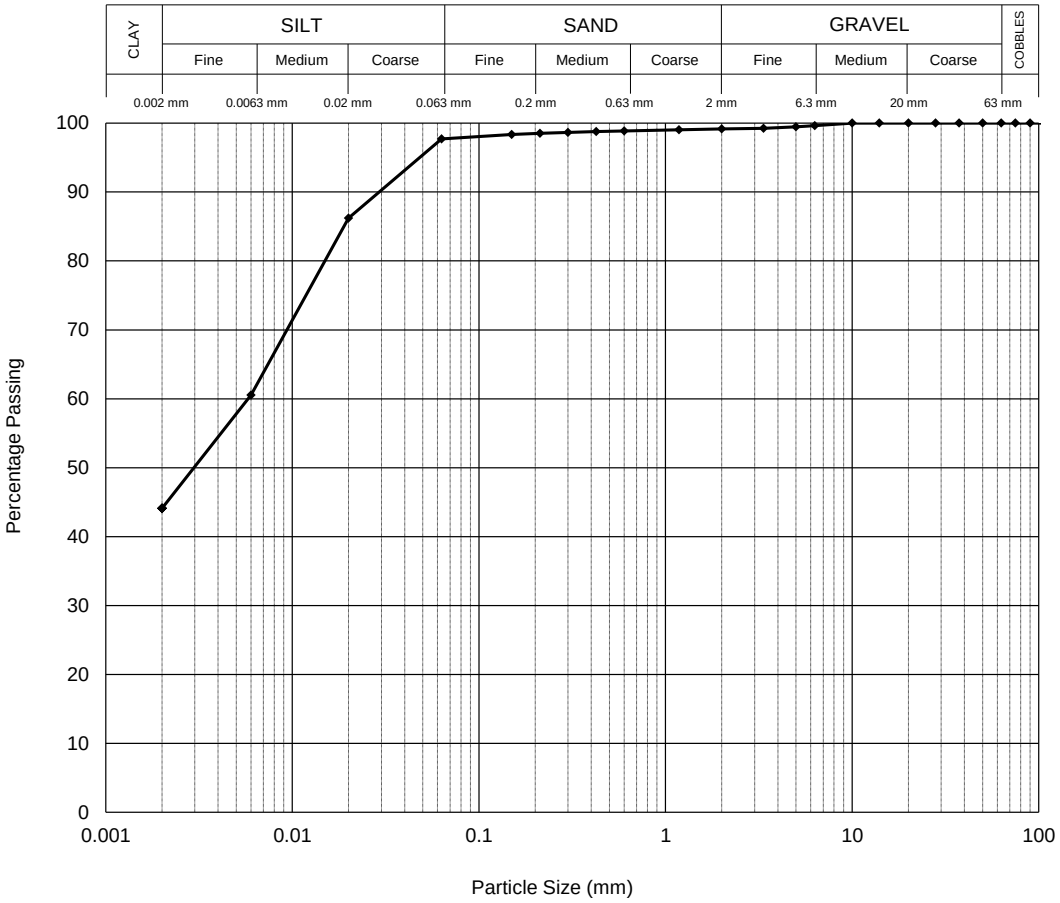
BH / TP No.	GT3
Sample Ref	C4 L5
Sample Type	B

Description

Dark grey CLAY and SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	86
6 µm	61
2 µm	44

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	1
Silt	54
Clay	44

Checked and Approved by

J Sturges - Operations Manager
27/09/2019

Project Number:

GEO / 29758

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT6	Description:	Stiff grey CLAY
Sample Ref.:	D4 L5		
Sample Type:	C	Remarks:	ASU

SPECIMEN DETAILS

Depth within original sample	20mm
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	99.53	99.25
Height	*mm*	100.05	99.77
Moisture Content	*%*	23.8	25.0
Bulk Density	*Mg/m³*	2.04	2.07
Dry Density	*Mg/m³*	1.65	1.66

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		1.00	0.98

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	6.5

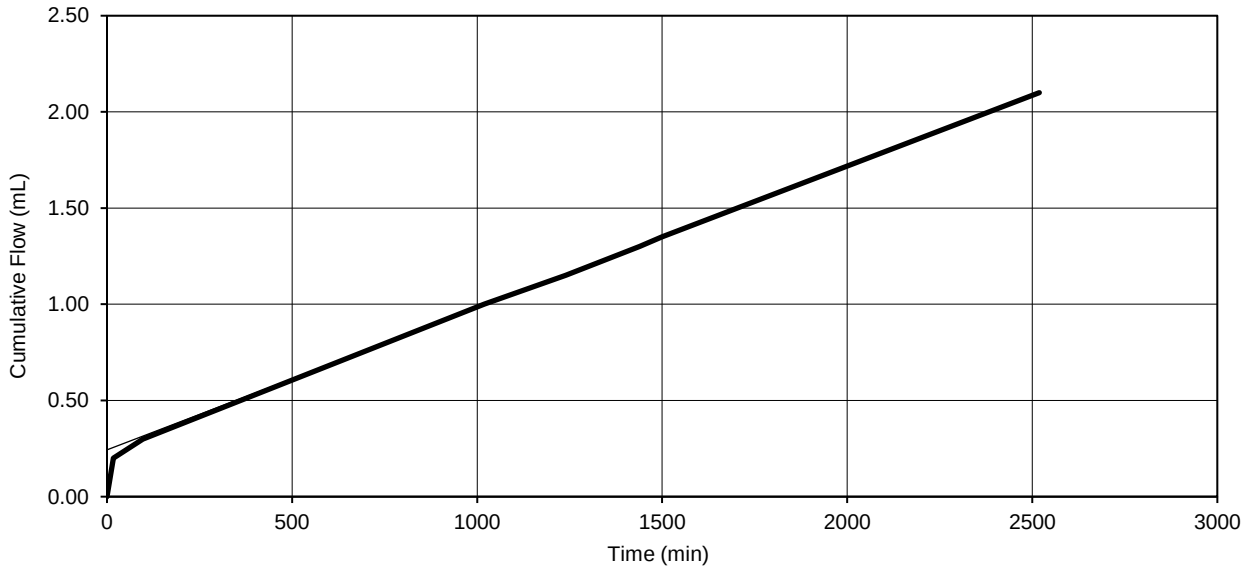
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	2
Consolidation	*days*	3
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 1.6×10^{-10} m/s



Checked and Approved by

J Sturges - Operations Manager
27/09/2019

Project Number:

GEO / 29758

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13951

Number of samples submitted for testing:	7	sample (s)
Natural Moisture Content	5	test(s)
Atterberg Limit	5	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Date (s) sampled and received at laboratory:	21	Aug-19
Date of receipt of testing instructions	21	Aug-19
Date testing started:	27	Aug-19
Date of issue:	14	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A4 L5	GT3	0.00		B	Dark grey slightly sandy CLAY			23.2	100	47	19	28		
B3 L5	GT7	0.00		B	Dark grey slightly sandy CLAY			25.1	100	47	19	28		
B4 L5	GT5	0.00		B	Dark grey slightly sandy CLAY			22.3	100	47	20	27		
B5 L4	GT1	0.00		B	Dark grey slightly sandy CLAY			22.1	100	46	19	27		
B5 L5	GT6	0.00		B	Dark grey slightly sandy CLAY			21.5	100	46	20	26		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test | Liquid Limit | Particle density
Linear measurement unless : | 4pt cone unless : | sp - small pyknometer
wd - water displacement | cas - Casagrande method | gj - gas jar
wi - immersion in water | 1pt - single point test

Date Printed	Approved By	Table
09/04/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		B4 L5	B	Dark grey clayey SILT with rare pyritic fossil fragments.	2.68	2
GT4		B3 L5	B	Dark grey clayey SILT with rare pyritic fossil fragments.	2.69	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J Sturges - Operations Manager
10/10/2019

Project Number:

GEO / 29825

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

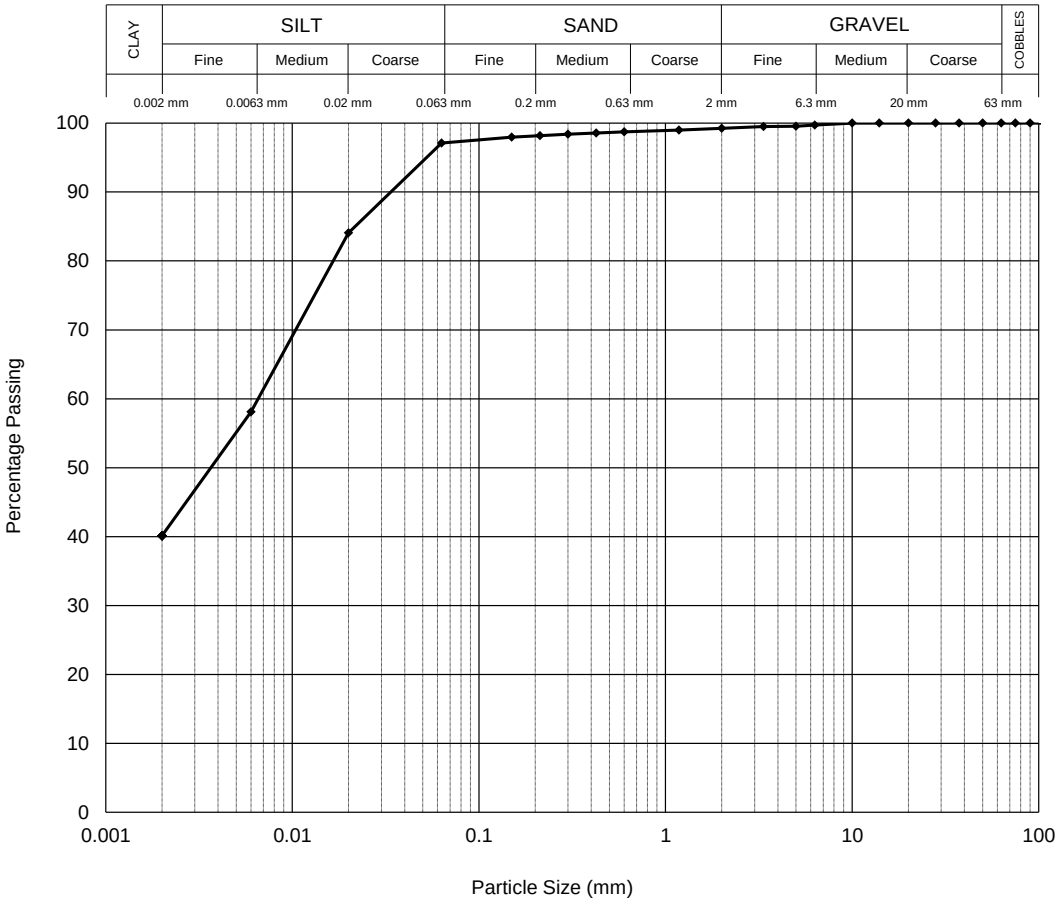
BH / TP No.	GT2
Sample Ref	B4 L5
Sample Type	B

Description

Dark grey clayey SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	26.4
Size	% Pass
20 µm	84
6 µm	58
2 µm	40

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	57
Clay	40

Checked and Approved by

J Sturges - Operations Manager
10/10/2019

Project Number:

GEO / 29825

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

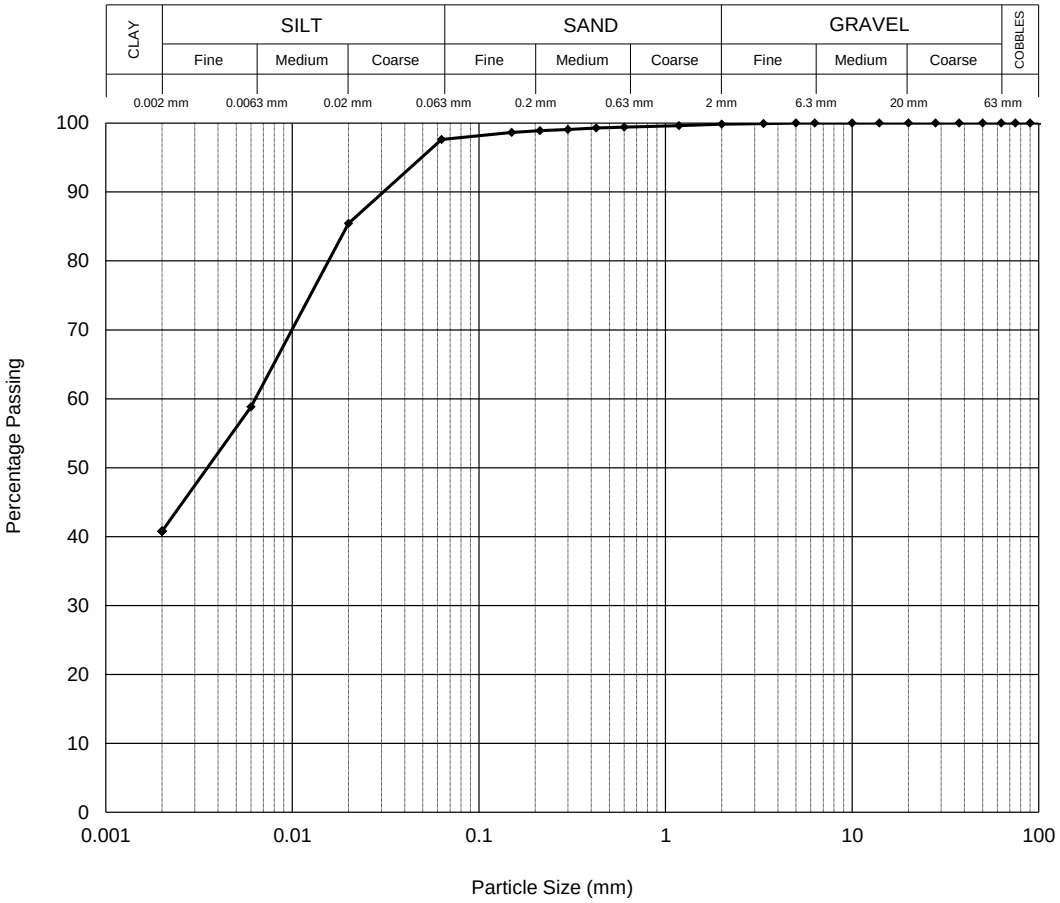
BH / TP No.	GT4
Sample Ref	B3 L5
Sample Type	B

Description

Dark grey clayey SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26.4
Size	% Pass
20 µm	85
6 µm	59
2 µm	41

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	57
Clay	41

Checked and Approved by

J Sturges - Operations Manager
10/10/2019

Project Number:

GEO / 29825

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13959

Number of samples submitted for testing:	5	sample (s)
Natural Moisture Content	4	test(s)
Atterberg Limit	4	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	22	Aug-19
Date of receipt of testing instructions	22	Aug-19
Date testing started:	22	Aug-19
Date of issue:	2	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
D3 L5	LL4	0.00		B	Dark grey slightly sandy CLAY			22.4	100	48	19	29		
D4 L5	LL3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	48	19	29		
E4 L5	LL5	0.00		B	Dark grey slightly sandy CLAY			23.2	100	47	20	27		
E5 L5	LL1	0.00		B	Dark grey slightly sandy CLAY			25.4	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test — Linear measurement unless : wd - water displacement; wi - immersion in water

Liquid Limit — 4pt cone unless : cas - Casagrande method; 1pt - single point test

Particle density — sp - small pyknometer; gj - gas jar

Date Printed	Approved By	Table
09/11/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
LL2		E4 L5	B	Dark grey very clayey SILT with rare pyritic fossil fragments.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
27/09/2019

Project Number:

GEO / 29826

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

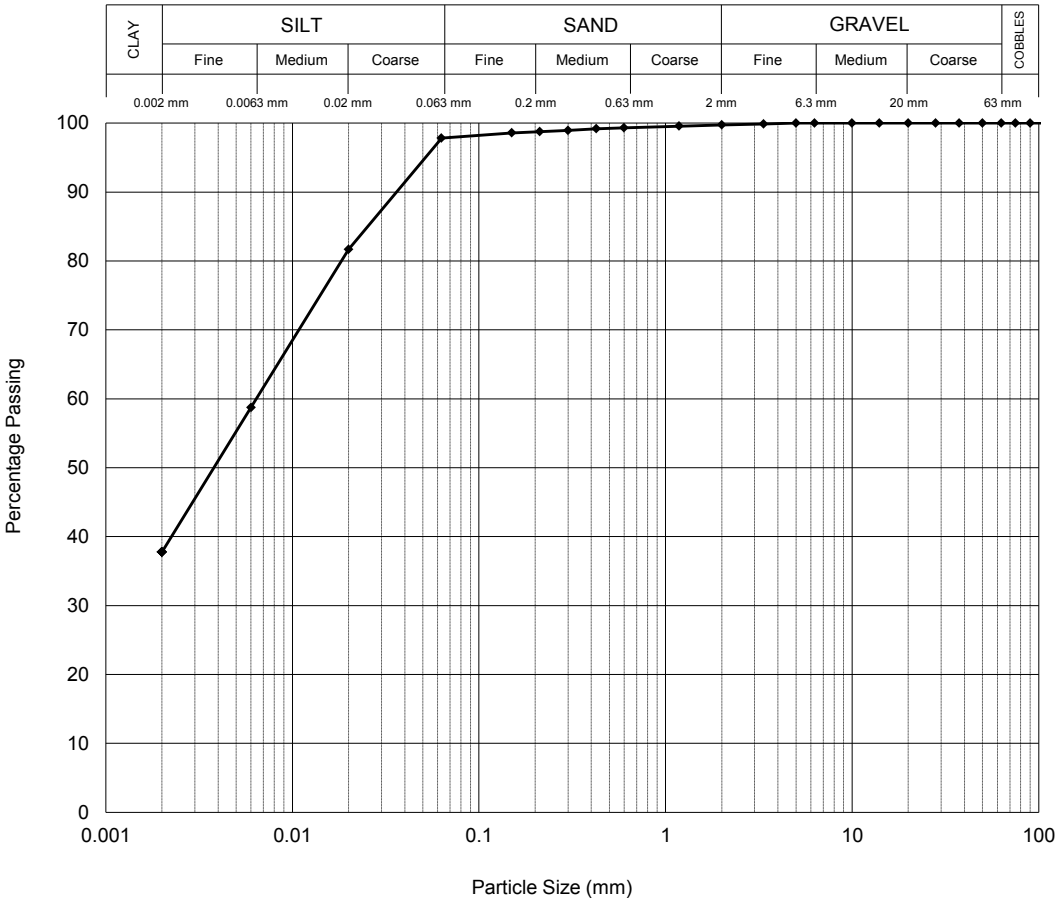
BH / TP No.	LL2
Sample Ref	E4 L5
Sample Type	B

Description

Dark grey very clayey SILT with rare pyritic fossil fragments.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	26.5
Size	% Pass
20 µm	82
6 µm	59
2 µm	38

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	60
Clay	38

Checked and Approved by

S Burke

S Burke - Senior Technician
27/09/2019

Project Number:

GEO / 29826

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13976

Number of samples submitted for testing:	5	sample (s)
Natural Moisture Content	3	test(s)
Atterberg Limit	3	test(s)
Particle Density	2	test(s)
Grading	2	test(s)
Date (s) sampled and received at laboratory:	28	Aug-19
Date of receipt of testing instructions	28	Aug-19
Date testing started:	3	Sep-19
Date of issue:	2	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
C3 L6	GT1	0.00		B	Dark grey slightly sandy CLAY			24.5	99	47	19	28		
D5 B1	GT5	0.00		B	Dark grey slightly sandy CLAY			25.1	100	46	19	27		
E3 B2	GT2	0.00		B	Dark grey slightly sandy CLAY			20.3	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
09/11/2019 00:00	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT3		D5 B1	B	Dark grey CLAY and SILT.	2.69	2
GT4		C3 L6	B	Dark grey CLAY and SILT.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/10/2019

Project Number:

GEO / 29874

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

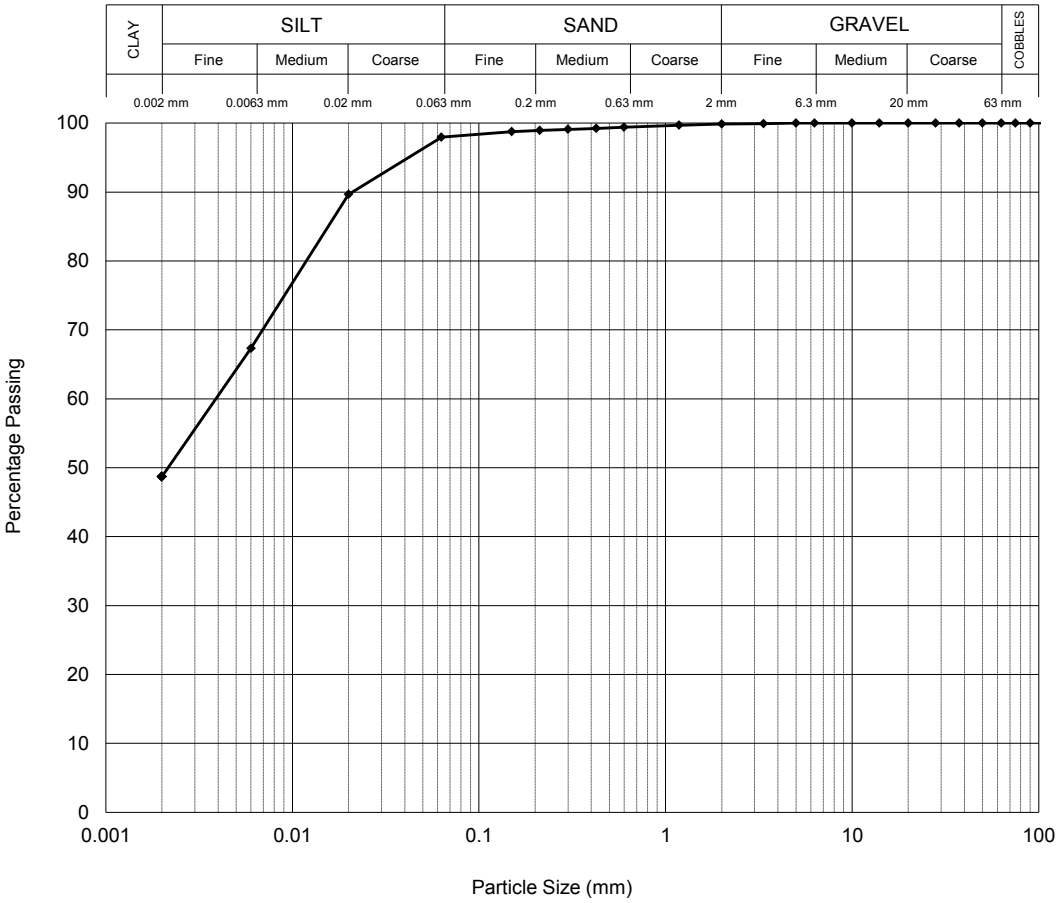
BH / TP No.	GT3
Sample Ref	D5 B1
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
No Pre-treatment used	
Temp (°C)	26
Size	% Pass
20 µm	90
6 µm	67
2 µm	49
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	49
Clay	49

Checked and Approved by

S Burke

S Burke - Senior Technician
01/10/2019

Project Number:

GEO / 29874

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

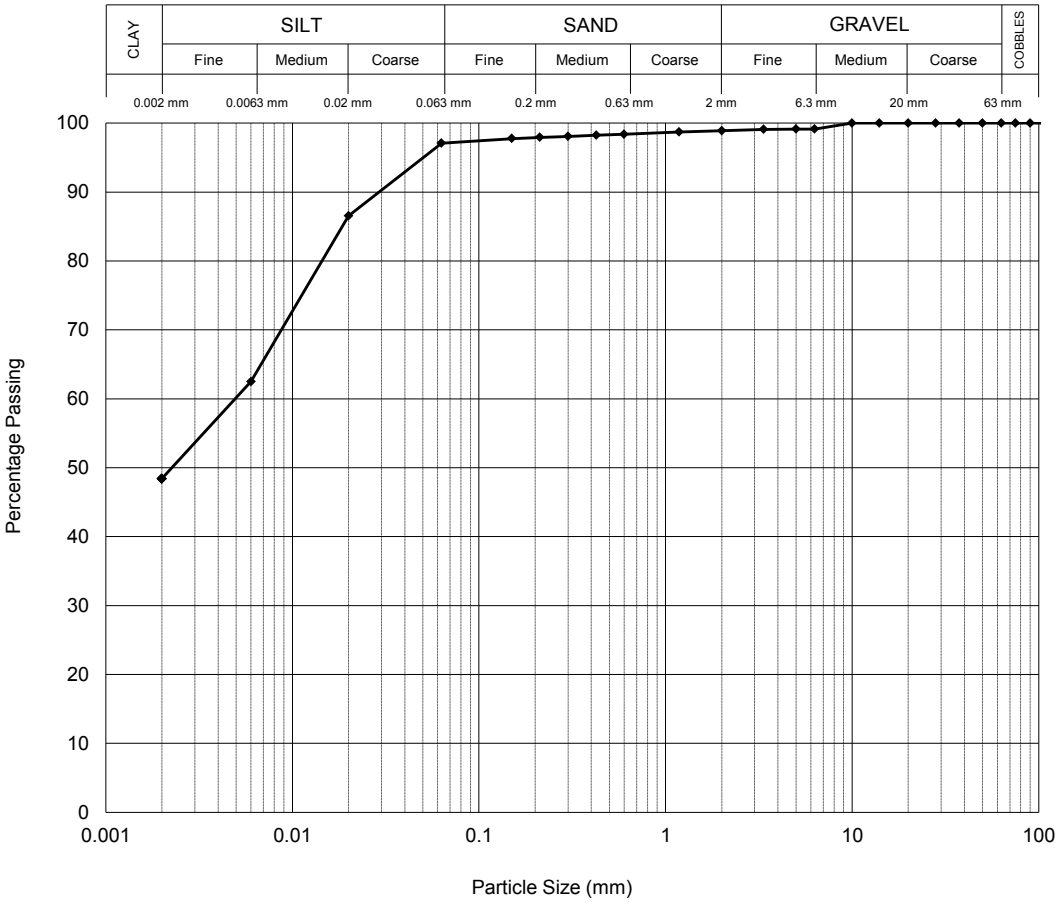
BH / TP No.	GT4
Sample Ref	C3 L6
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	99
5.00 mm	99
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	98
425 µm	98
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.1
Size	% Pass
20 µm	87
6 µm	63
2 µm	48

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	49
Clay	48

Checked and Approved by

S Burke

S Burke - Senior Technician
01/10/2019

Project Number:

GEO / 29874

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13978

Number of samples submitted for testing:	4	sample (s)

Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	4	test(s)

Date (s) sampled and received at laboratory:	29	Aug-19
Date of receipt of testing instructions	29	Aug-19
Date testing started:	4	Sep-19
Date of issue:	14	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 B1	GT3	0.00		B	Dark grey slightly sandy CLAY			20.8	100	48	19	29		
D5 B2	GT1	0.00		B	Dark grey slightly sandy CLAY			20.2	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		D5 B2	B	Dark grey CLAY and SILT.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

J A Reynolds - Laboratory Manager
09/10/2019

Project Number:

GEO / 29875

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

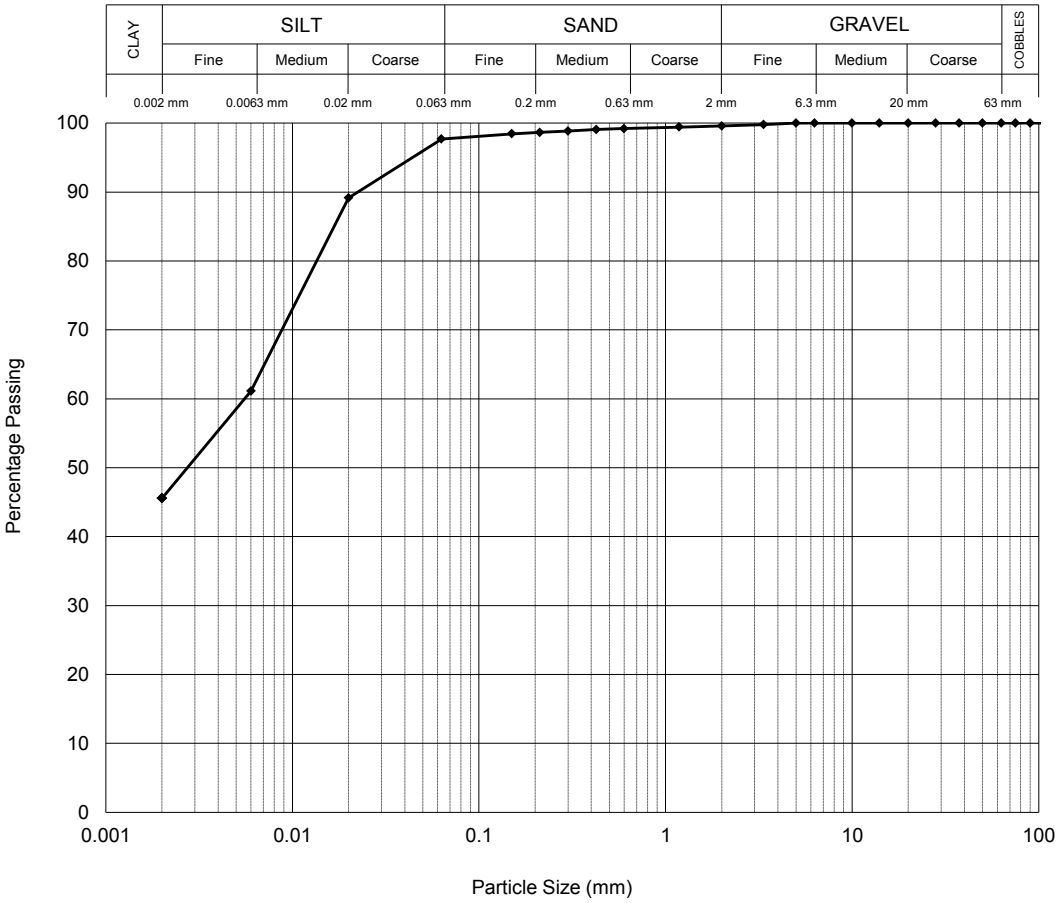
BH / TP No.	GT2
Sample Ref	D5 B2
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.1
Size	% Pass
20 µm	89
6 µm	61
2 µm	46
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	52
Clay	46

Checked and Approved by

J A Reynolds - Laboratory Manager
09/10/2019

Project Number:

GEO / 29875

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT7
Sample Ref.:	A3 B1
Sample Type:	C

Description:
Stiff dark grey CLAY.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.11	101.07
Height	*mm*	100.23	100.19
Water Content	*%*	20.3	21.9
Bulk Density	*Mg/m³*	2.08	2.11
Dry Density	*Mg/m³*	1.73	1.73

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.30	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	1.0

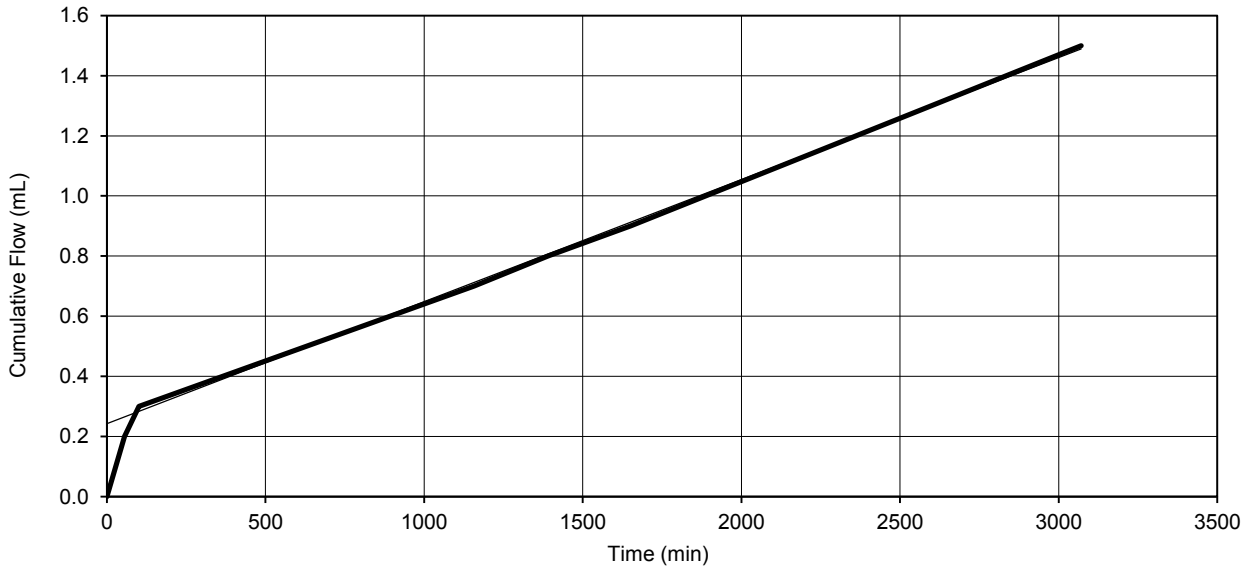
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.2
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	2
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 8.3×10^{-11} m/s



Checked and Approved by

J A Reynolds - Laboratory Manager
09/10/2019

Project Number:
GEO / 29875

Project Name:
DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13980

cjassociates

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	30	Aug-19
Date of receipt of testing instructions	30	Aug-19
Date testing started:	4	Sep-19
Date of issue:	8	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
D5 B3	GT3	0.00		B	Dark grey slightly sandy CLAY			20.9	100	48	20	28		
E3 B6	GT1	0.00		B	Dark grey slightly sandy CLAY			22.9	100	48	19	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
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1128 - Particle Density Summary - 29876.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		E3 B6	B	Dark grey CLAY and SILT.	2.68	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29876

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

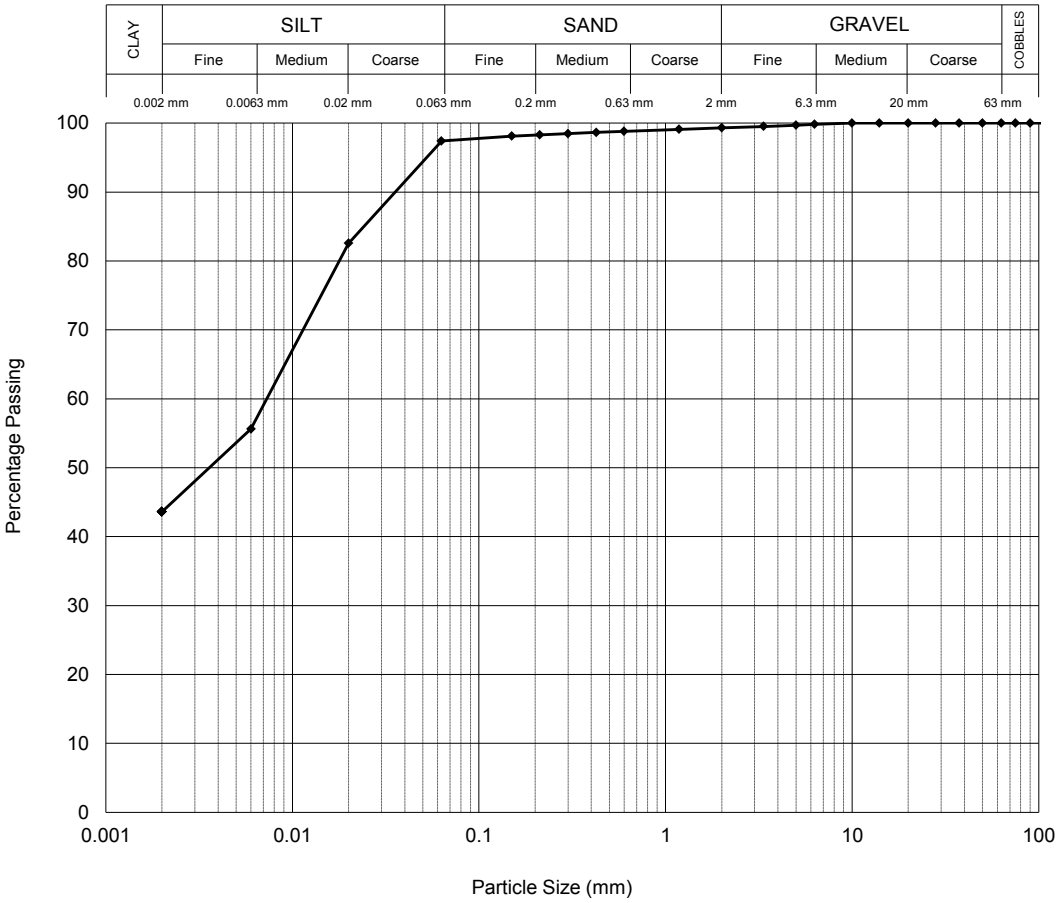
BH / TP No.	GT2
Sample Ref	E3 B6
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25.1
Size	% Pass
20 µm	83
6 µm	56
2 µm	44
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	54
Clay	43

Checked and Approved by

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29876

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13991

Number of samples submitted for testing:	6	sample (s)

Natural Moisture Content	5	test(s)
Atterberg Limit	5	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	3	Sep-19
Date of receipt of testing instructions	3	Sep-19
Date testing started:	4	Sep-19
Date of issue:	8	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 B2	GT5	0.00		B	Dark grey slightly sandy CLAY			19.7	100	49	20	29		
A3 B3	GT2	0.00		B	Dark grey slightly sandy CLAY			19.0	100	48	19	29		
D5 B4	GT1	0.00		B	Dark grey slightly sandy CLAY			19.6	100	48	19	29		
E3 B10	GT3	0.00		B	Dark grey slightly sandy CLAY			18.7	100	47	19	28		
E3 B8	GT6	0.00		B	Dark grey slightly sandy CLAY			20.7	100	49	20	29		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test — Linear measurement unless : wd - water displacement; wi - immersion in water

Liquid Limit — 4pt cone unless : cas - Casagrande method; 1pt - single point test

Particle density — sp - small pyknometer; gj - gas jar

Date Printed	Approved By	Table
09/11/2019 00:00	Lisa Maiden	1
		sheet 1

1128 - Particle Density Summary - 29877.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT4		A3 B2	B	Dark grey CLAY and SILT.	2.67	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29877

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

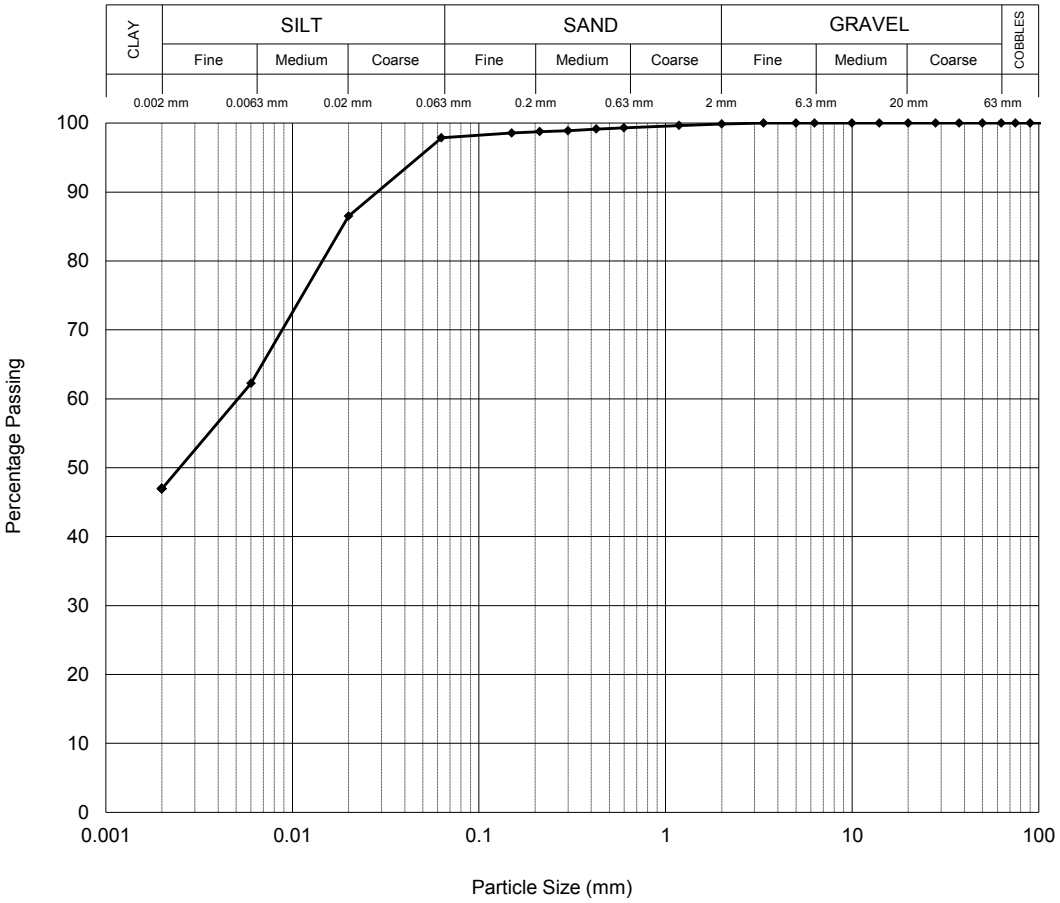
BH / TP No.	GT4
Sample Ref	A3 B2
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	99
63 µm	98



Sedimentation	
Pre-treatment used	
Temp (°C)	25.1
Size	% Pass
20 µm	86
6 µm	62
2 µm	47

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	0
Sand	2
Silt	51
Clay	47

Checked and Approved by

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29877

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L13998

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)
Date (s) sampled and received at laboratory:	5	Sep-19
Date of receipt of testing instructions	5	Sep-19
Date testing started:	8	Sep-19
Date of issue:	8	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A3 B4	GT1	0.00		B	Dark grey slightly sandy CLAY			22.3	100	47	20	27		
E3 B12	GT3	0.00		B	Dark grey slightly sandy CLAY			22.5	100	46	20	26		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
16/09/2019	Lisa Maiden	1
		sheet 1

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT2		A3 B4	B	Dark grey clayey SILT.	2.74	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29930

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

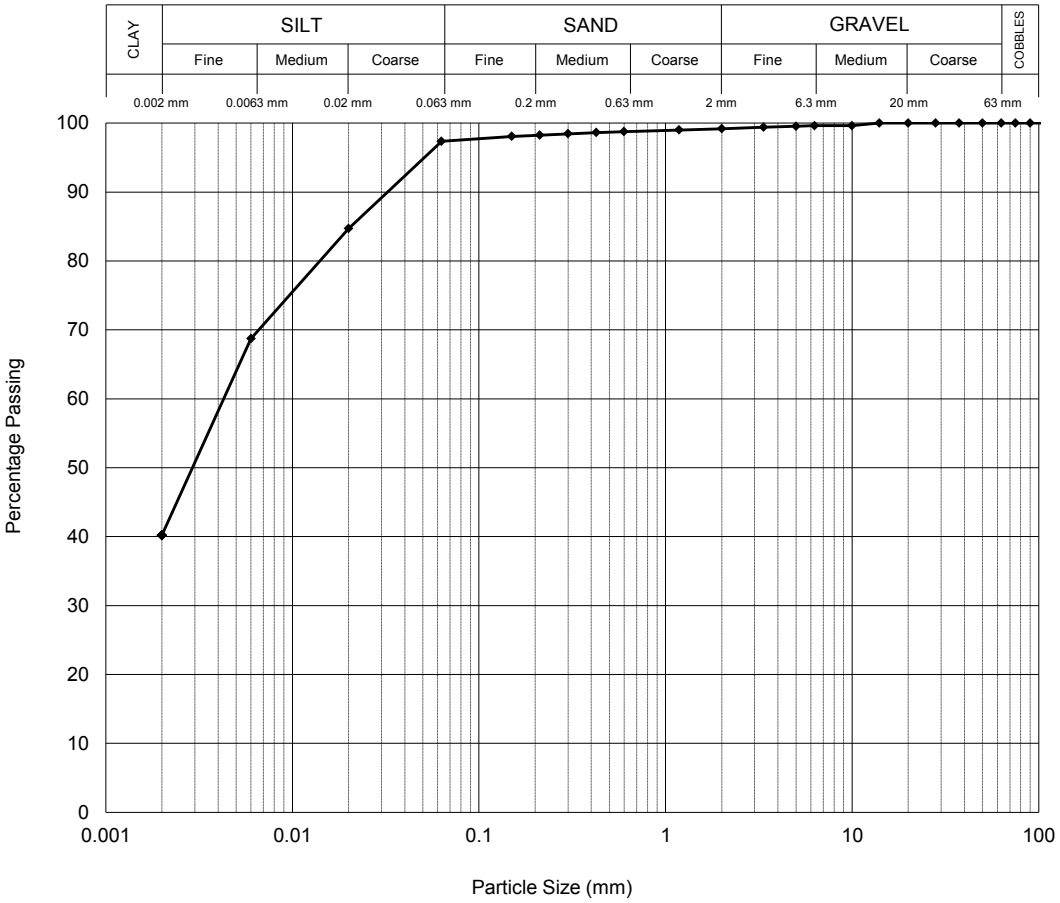
BH / TP No.	GT2
Sample Ref	A3 B4
Sample Type	B

Description

Dark grey clayey SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	98
63 µm	97



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	85
6 µm	69
2 µm	40
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	1
Sand	2
Silt	57
Clay	40

Checked and Approved by

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29930

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L14004

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Particle Density	1	test(s)
Grading	1	test(s)

Date (s) sampled and received at laboratory:	6	Sep-19
Date of receipt of testing instructions	6	Sep-19
Date testing started:	8	Sep-19
Date of issue:	8	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density bulk / dry Mg/m3		*w* %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
	Ref	Top	Base	Type										
A3 B5	GT2	0.00		B	Dark grey slightly sandy CLAY			22.1	100	48	20	28		
D5 B5	GT3	0.00		B	Dark grey slightly sandy CLAY			22.0	100	47	20	27		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key			Date Printed	Approved By	Table
Density test	Liquid Limit	Particle density			1
Linear measurement unless :	4pt cone unless :	sp - small pyknometer	16/09/2019		
wd - water displacement	cas - Casagrande method	gj - gas jar			sheet
wi - immersion in water	1pt - single point test			Lisa Maiden	1

1128 - Particle Density Summary - 29931.XLSM

BS1377: Part 2:1990 / BS EN ISO 17892-3 : 2015

PARTICLE DENSITY

Borehole / Trial Pit	Depth (m)	Sample Ref	Sample Type	Description	Particle Density Mg/m³	Test Method
GT1		D5 B5	B	Dark grey CLAY and SILT.	2.70	2

Notes

Test Method
1. Gas jar : BS1377 : Part 2 : 1990 Clause 8.2
2. Pycnometer : BS EN ISO 17892-3:2015 (UKAS Accredited)

Version 1.00 - 30/12/1899

Checked and Approved by:

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29931

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

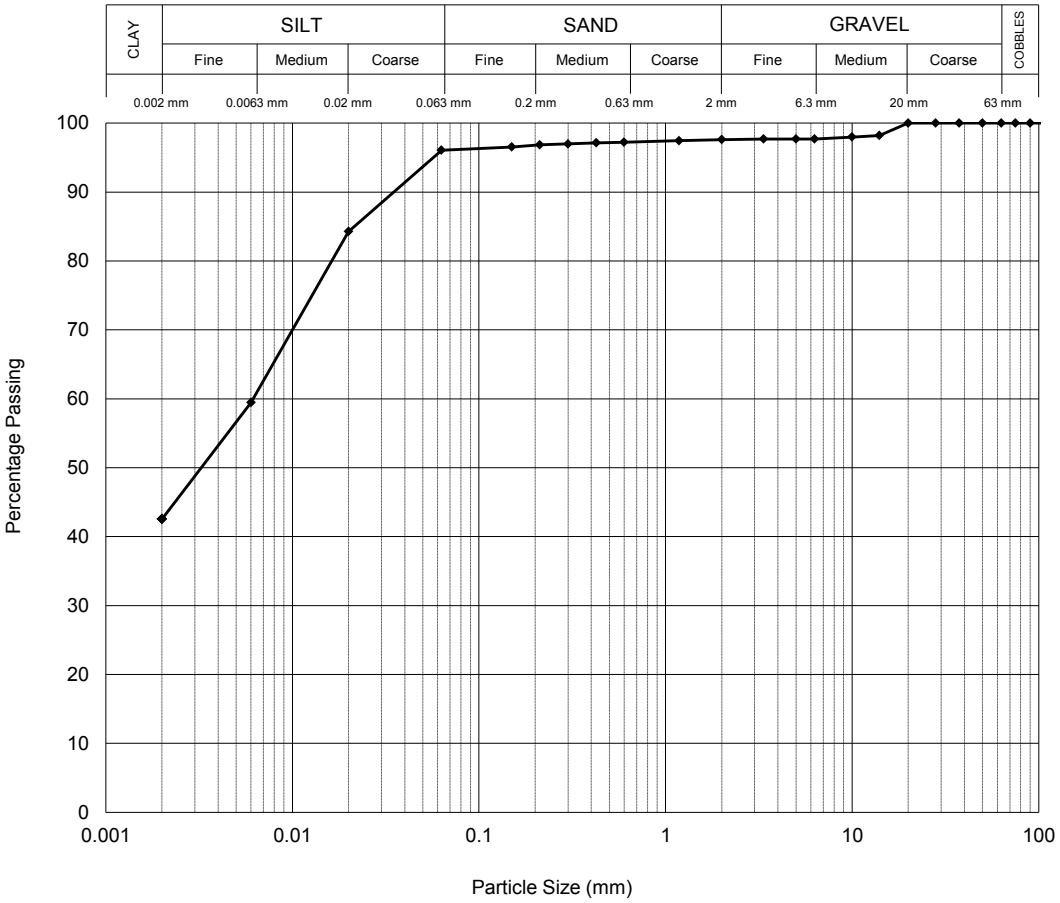
BH / TP No.	GT1
Sample Ref	D5 B5
Sample Type	B

Description

Dark grey CLAY and SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	98
6.30 mm	98
5.00 mm	98
3.35 mm	98
2.00 mm	98
1.18 mm	97
600 µm	97
425 µm	97
300 µm	97
212 µm	97
150 µm	97
63 µm	96



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	84
6 µm	59
2 µm	43
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0
Gravel	2
Sand	2
Silt	54
Clay	42

Checked and Approved by

S Burke

S Burke - Senior Technician
07/10/2019

Project Number:

GEO / 29931

Project Name:

DOCKSWAY CELL 4
AG0390

GEOLABS

UKAS TESTING 1982

Laboratory Test Certificate

Site	Docks Way Cell 4
Client	Jim Davies Civil Engineering Ltd
F.A.O.	Andrew Miles
Address	Tygwyn Banalog Terrace Hollybush Blackwood NP12 0SG
Order Number	Email Andrew Miles
Job Number	AG0390
Lab Number	L14018

Number of samples submitted for testing:	3	sample (s)
Natural Moisture Content	2	test(s)
Atterberg Limit	2	test(s)
Permeability in Triaxial Cell (upto 4 days)	1	test(s)
Permeability additional days	5	test(s)
Date (s) sampled and received at laboratory:	12	Sep-19
Date of receipt of testing instructions	12	Sep-19
Date testing started:	13	Sep-19
Date of issue:	14	Oct-19

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.

UKAS TESTING
1429

Approved by :
Lisa Maiden

C.J. Associates Geotechnical Ltd
King Road Avenue
Avonmouth - Bristol BS11 9HF
Tel: 0117 982 1473 Fax: 0117 982 8200

cjassociates

Summary of Classification Test Results

Project No.	Project Name
AG0390	Docksway Cell 4

Hole No.	Sample				Soil Description	Density		*w*	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		bulk	dry							
						Mg/m3		%	%	%	%	%	Mg/m3	
A3 B8	GT6	0.00		B	Dark grey slightly sandy CLAY			24.7	100	47	20	27		
D5 B8	GT7	0.00		B	Dark grey slightly sandy CLAY			21.9	100	48	20	28		

All tests performed in accordance with BS1377:1990 unless specified otherwise
Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key

Density test	Liquid Limit	Particle density
Linear measurement unless :	4pt cone unless :	sp - small pyknometer
wd - water displacement	cas - Casagrande method	gj - gas jar
wi - immersion in water	1pt - single point test	

Date Printed	Approved By	Table
19/09/2019	Lisa Maiden	1
		sheet 1

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	GT3
Sample Ref.:	C3L5
Sample Type:	C

Description:
Stiff dark grey CLAY.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	100.82	98.22
Height	*mm*	100.12	97.54
Water Content	*%*	22.1	25.5
Bulk Density	*Mg/m³*	2.01	2.24
Dry Density	*Mg/m³*	1.65	1.79

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.67	1.00

CONSOLIDATION STAGE

Effective pressure	*kPa*	50
Volume change	*mL*	61.8

PERMEABILITY STAGE

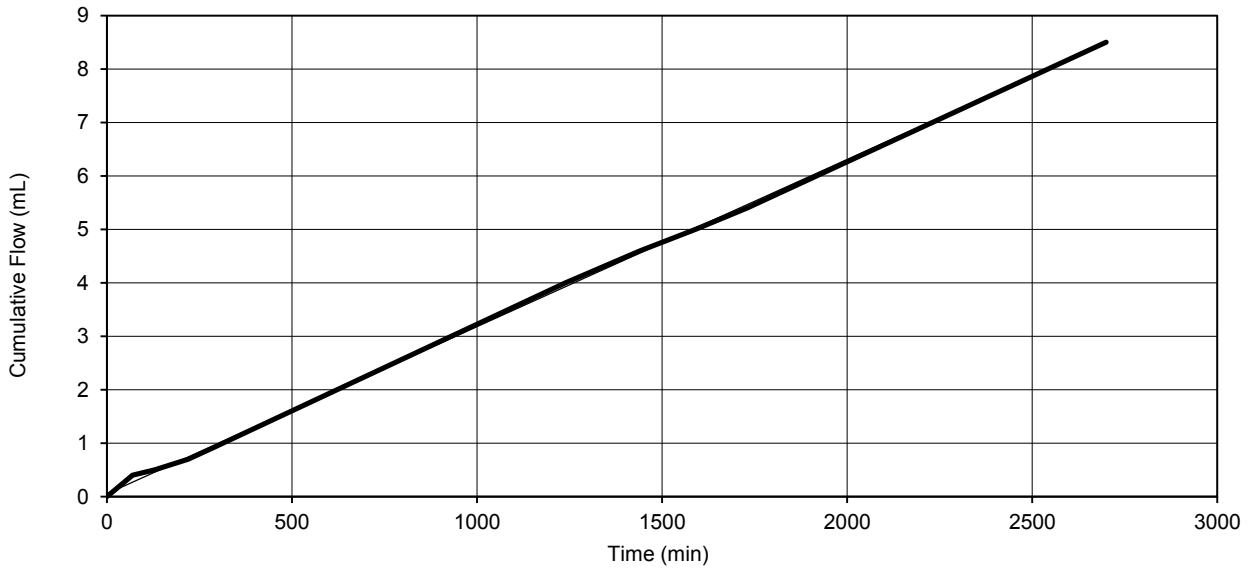
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	10
Hydraulic gradient		10.5
Mean effective stress	*kPa*	45

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	3
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 6.6×10^{-10} m/s



Checked and Approved by

J A Reynolds - Laboratory Manager
09/10/2019

Project Number:

GEO / 29932

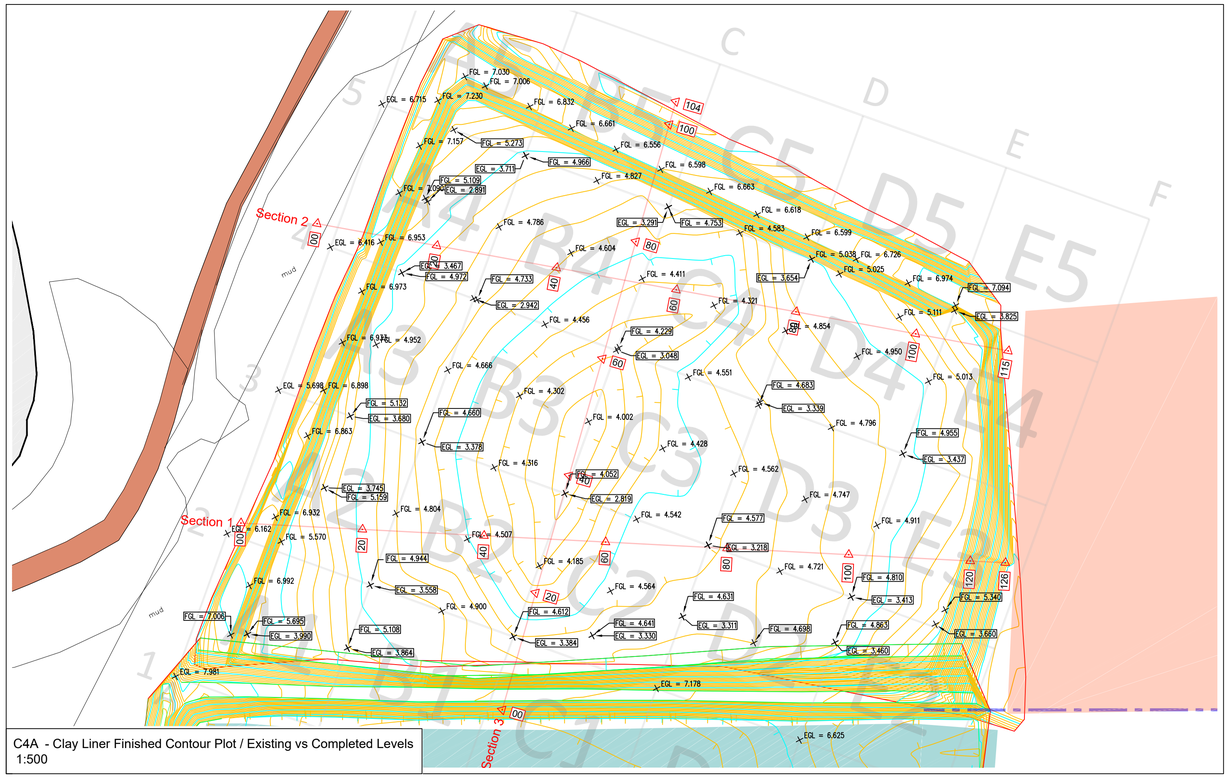
Project Name:

DOCKSWAY CELL 4
AG0390

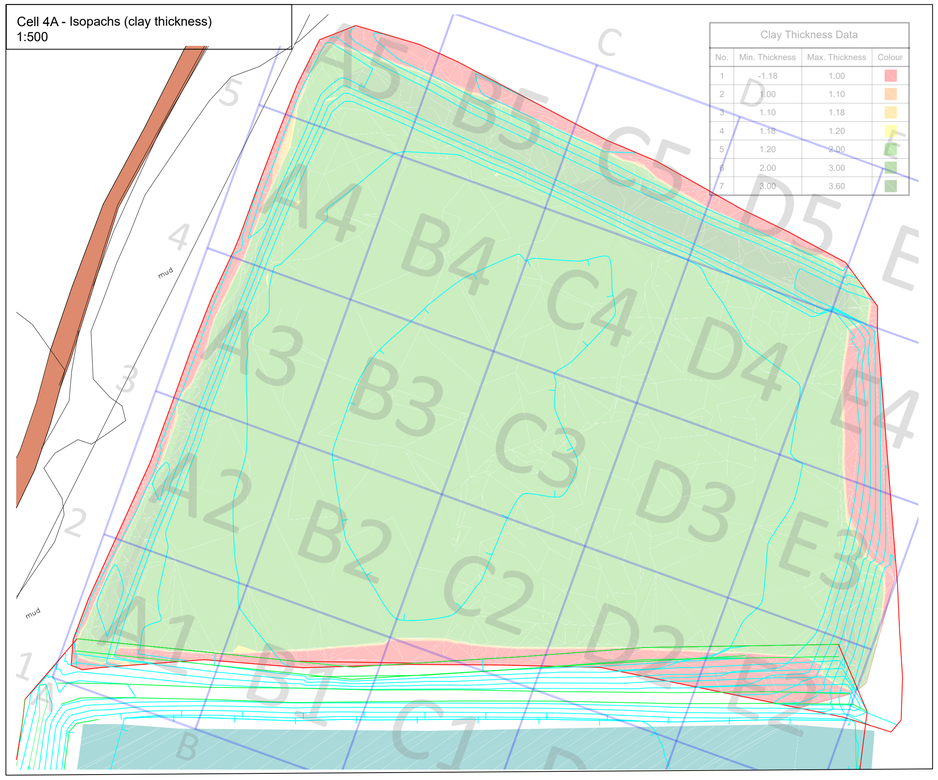
GEOLABS

UKAS TESTING 1982

Appendix 5 As Built Drawing



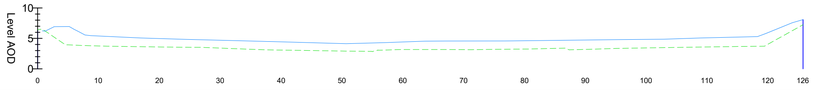
C4A - Clay Liner Finished Contour Plot / Existing vs Completed Levels
1:500



Cell 4A - Isopachs (clay thickness)
1:500

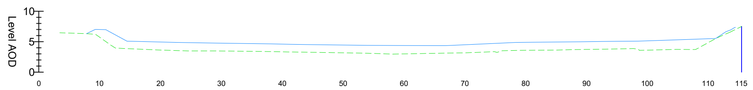
Clay Thickness Data			
No.	Min. Thickness	Max. Thickness	Colour
1	-1.18	1.00	
2	1.00	1.10	
3	1.10	1.18	
4	1.18	1.20	
5	1.20	2.00	
6	2.00	3.00	
7	3.00	3.60	

SECTION 1
Scale: H 1:500,V 1:500. Datum: 0.000



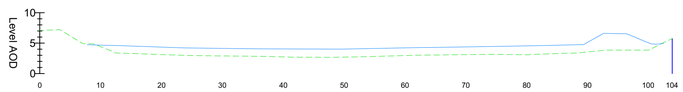
Existing Levels	6.484	3.758	3.592	3.408	3.082	2.921	3.170	3.150	3.247	3.189	3.437	3.593	4.040	7.247
Finished Levels		5.391	4.975	4.695	4.431	4.154	4.413	4.569	4.614	4.730	4.842	5.098	5.948	6.684
Level Difference		1.633	1.384	1.287	1.349	1.233	1.242	1.419	1.367	1.541	1.405	1.506	1.908	0.637

SECTION 2
Scale: H 1:500,V 1:500. Datum: 0.000



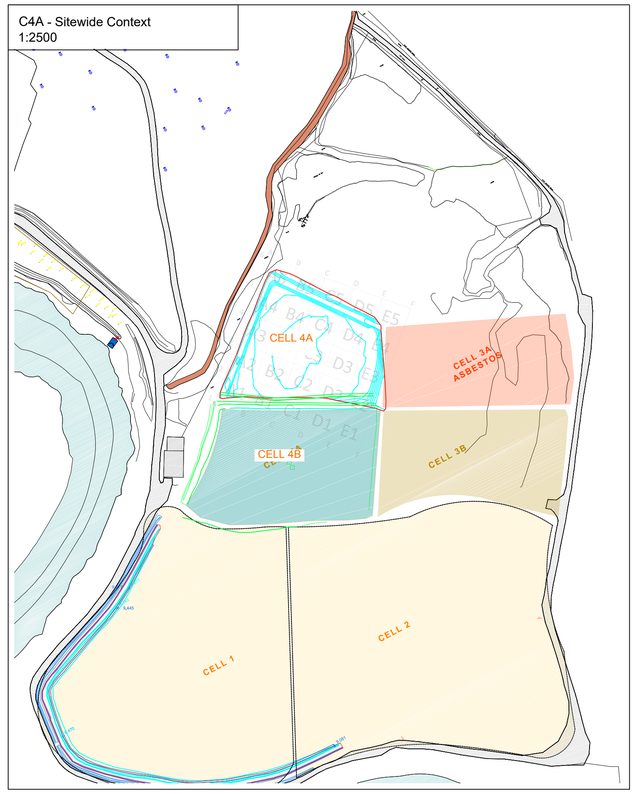
Existing Levels	5.720	3.626	3.470	3.335	3.170	2.994	3.166	3.582	3.729	3.607	4.854	7.501
Finished Levels	6.996	4.945	4.751	4.600	4.451	4.375	4.497	4.895	4.995	5.137	5.479	
Level Difference	1.265	1.319	1.282	1.265	1.282	1.381	1.330	1.313	1.267	1.530	0.625	

SECTION 3
Scale: H 1:500,V 1:500. Datum: 0.000



Existing Levels	7.001	4.410	3.125	2.868	2.738	2.703	2.954	3.109	3.083	3.549	3.856	5.744
Finished Levels	4.667	4.349	4.134	4.046	4.026	4.218	4.380	4.550	5.133	5.049		
Level Difference	0.256	1.225	1.239	1.308	1.322	1.264	1.271	1.467	1.584	1.193		

C4A - Sitewide Context
1:2500



NOTES A1

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Rev	Details	Dr	Ch	Ap	Date

Streetscene
Paul Symonds
Head of Streetscene
Newport City Council
Civic Centre, Newport
South Wales, NP20 4UR.
Telephone: 01633 656656
Email:streetscene@newport.gov.uk

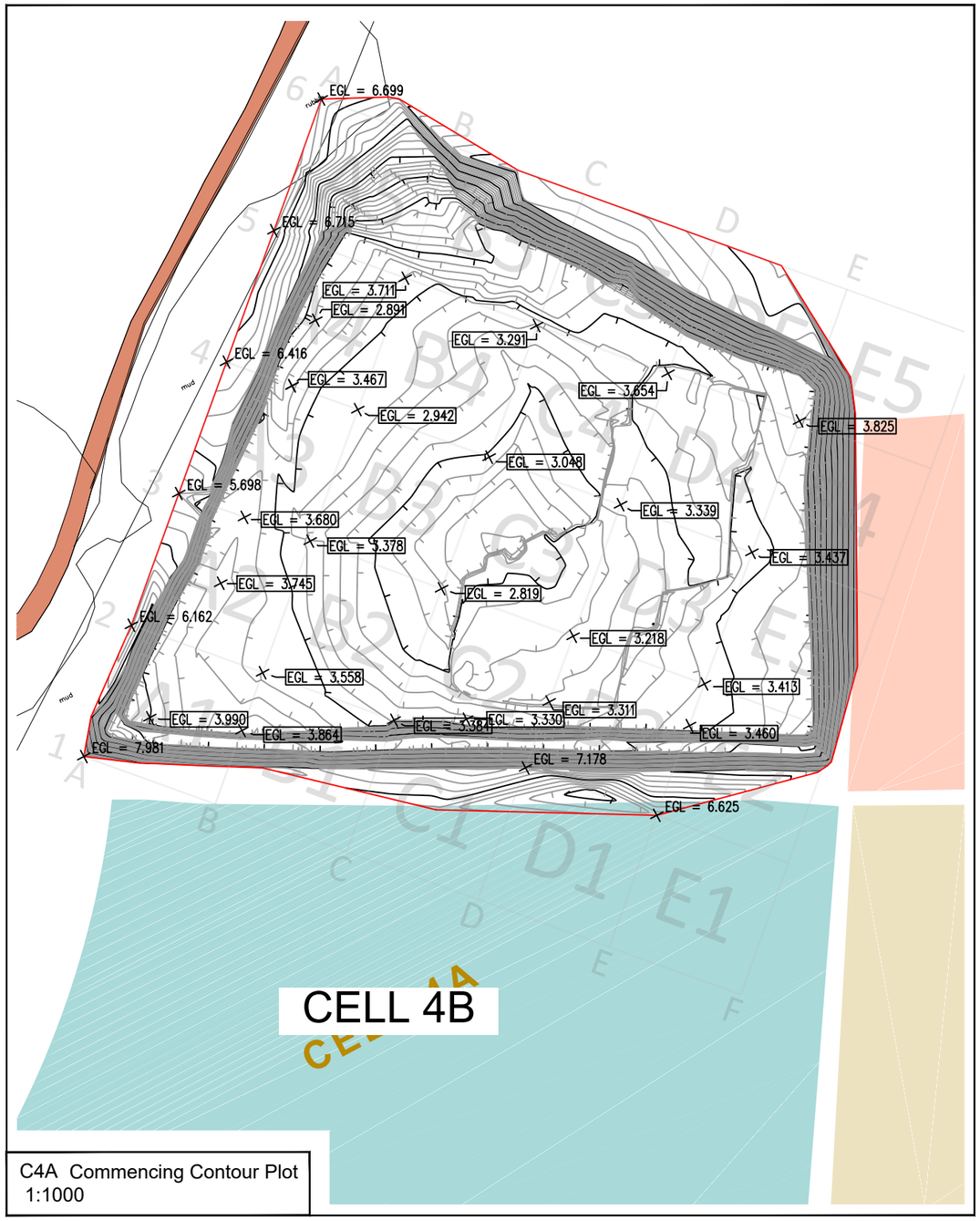
Newport City Council / Cyngor Dinas Casnewydd

Project

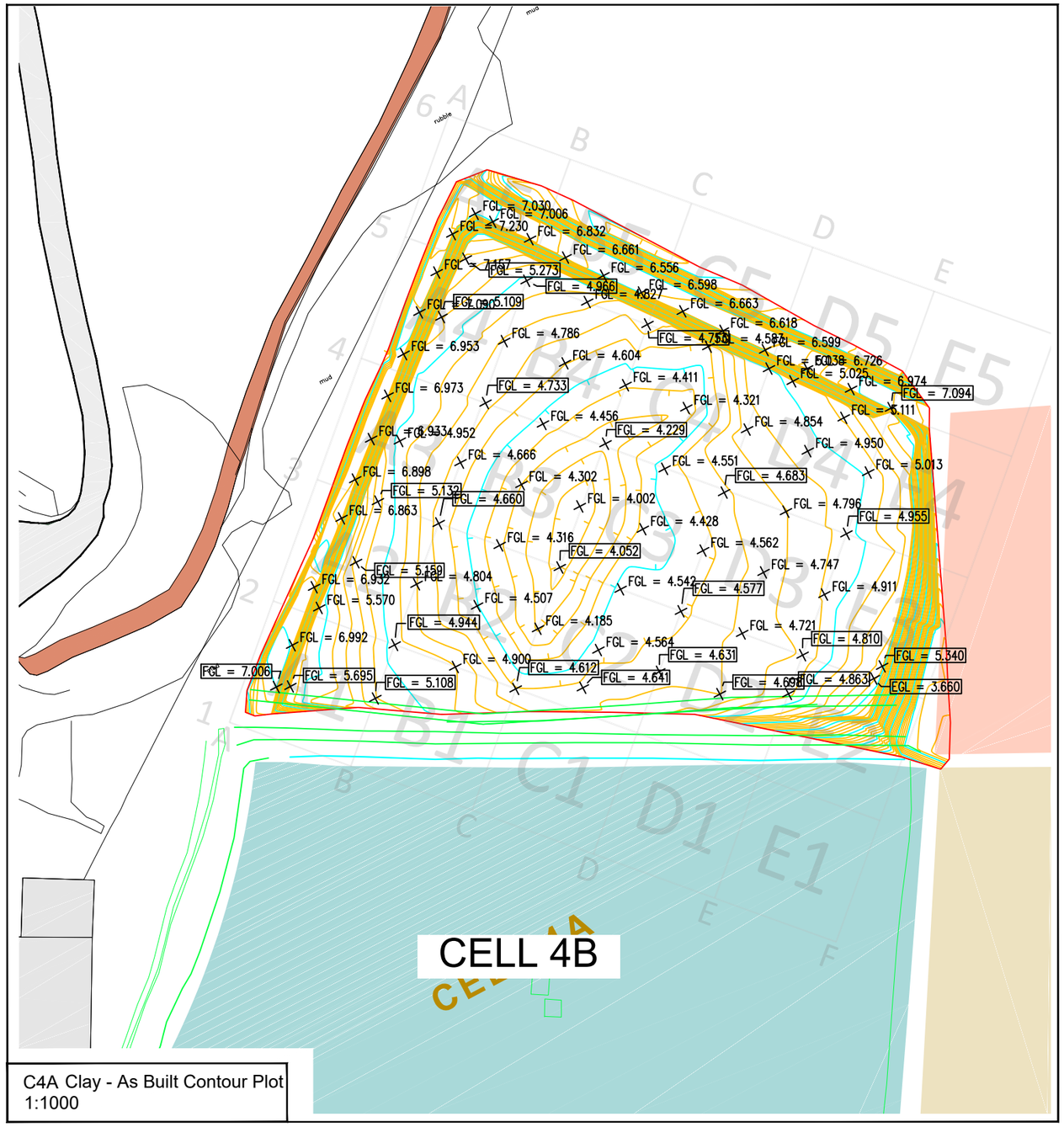
Docksway Waste Disposal Site

Cell 4A Clay Lining Works 2019

File No. 2514		Status: As Built			
Drawn By	MDH	Checked By		Approved By	
Date	Feb 2020	Date		Date	
Scales	Various				
Drawing No.	2514B_AB_01				



C4A Commencing Contour Plot
1:1000



C4A Clay - As Built Contour Plot
1:1000

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A3 NOTES	Rev	Details	Dr	Ch	Ap	Date

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Civic Centre, Newport
South Wales, NP20 4UR.
Telephone: 01633 656656
Email: streetscene@newport.gov.uk

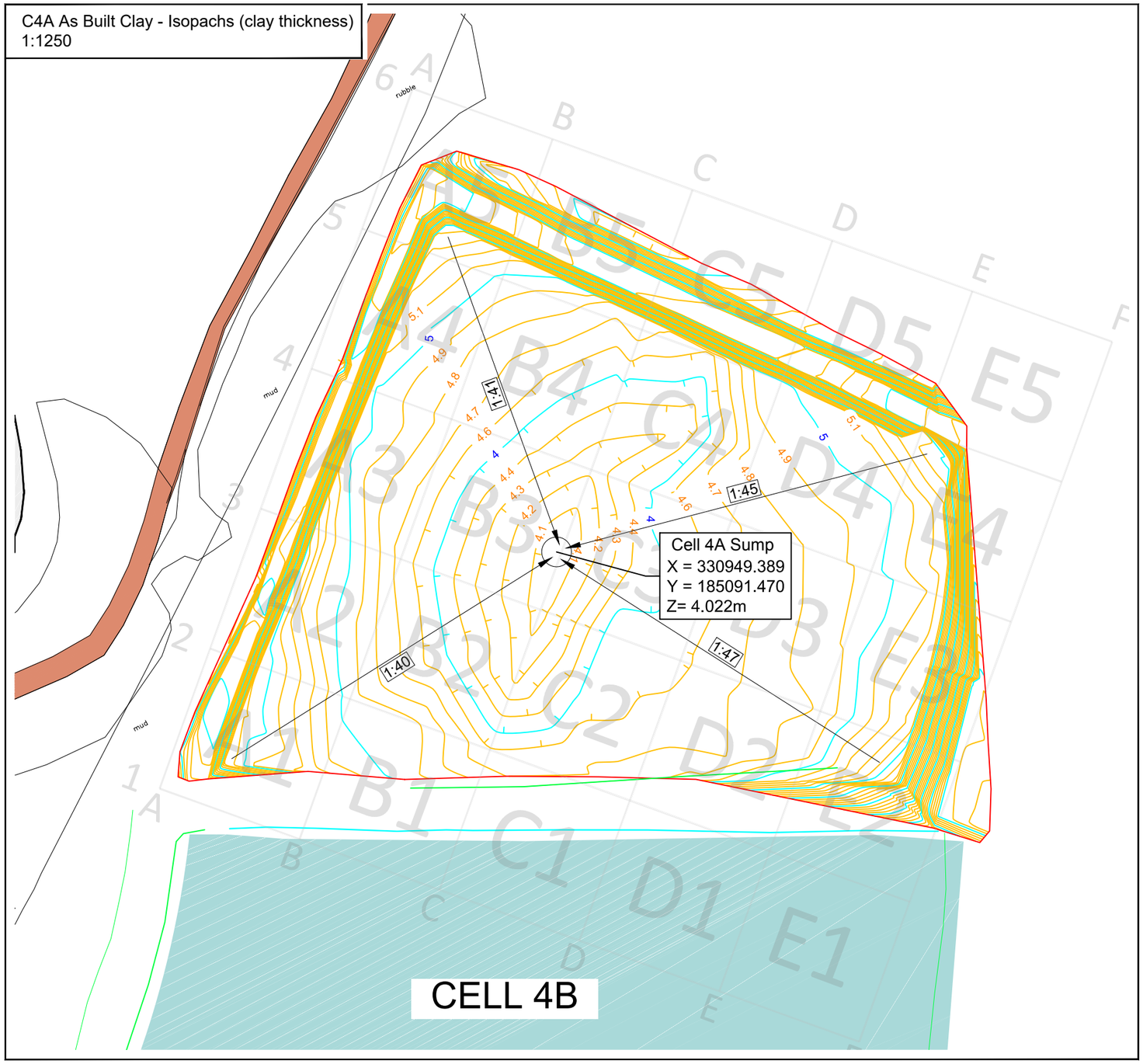
Newport City Council / Cyngor Dinas Casnewydd

Project
Docksway Waste Disposal Site

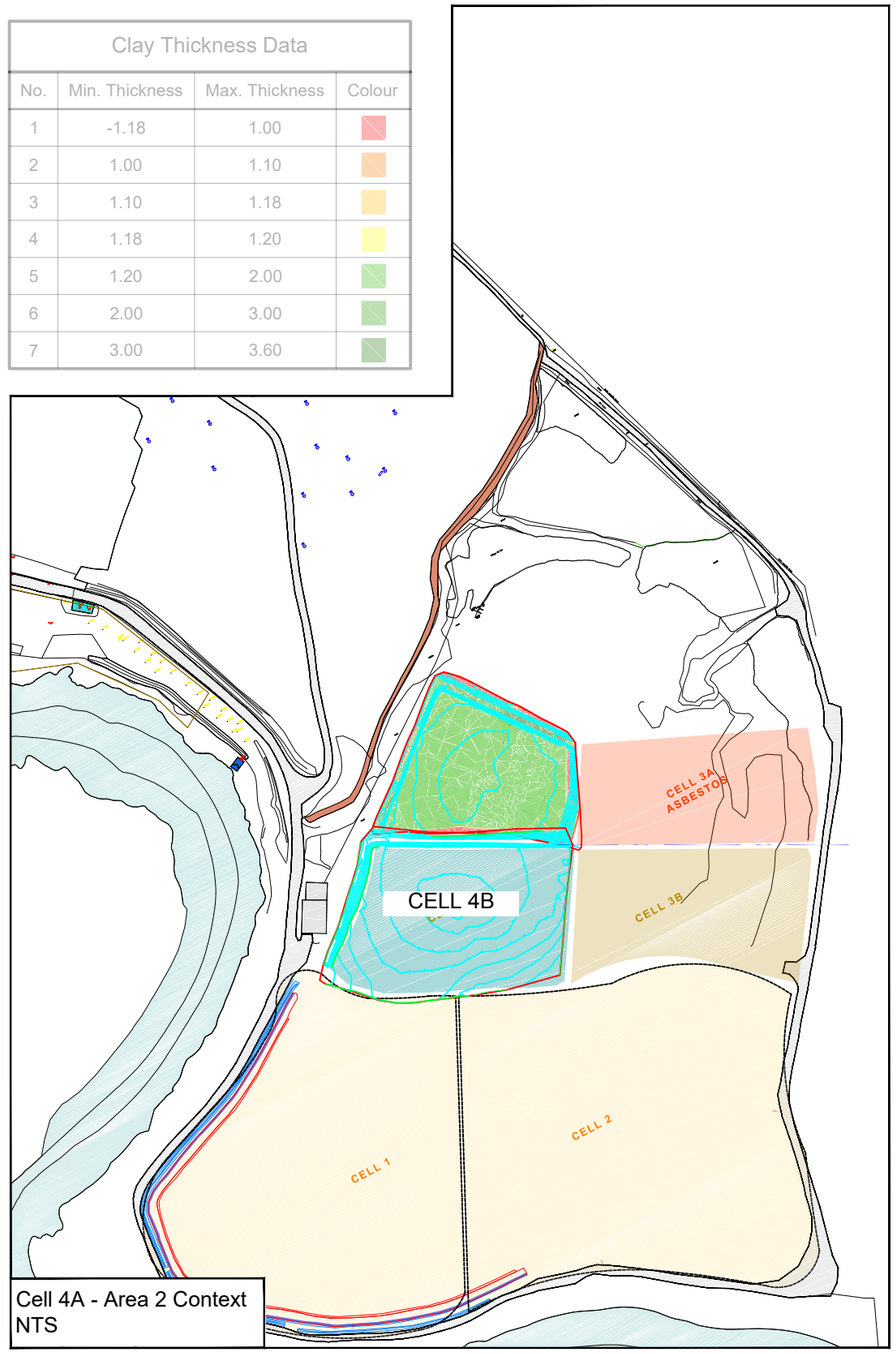
Cell 4A Clay As Built Details

File No. 2514		Status: As Built				
Drawn	MDH	Checked		Approved		
Date	Dec 2018	Date		Date		
Scales	see drawing panes					
Drawing No. 2514_AB_02						

C4A As Built Clay - Isopachs (clay thickness)
1:1250



Clay Thickness Data			
No.	Min. Thickness	Max. Thickness	Colour
1	-1.18	1.00	
2	1.00	1.10	
3	1.10	1.18	
4	1.18	1.20	
5	1.20	2.00	
6	2.00	3.00	
7	3.00	3.60	



Cell 4A - Area 2 Context
NTS

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A3 NOTES	Rev	Details	Dr	Ch	Ap	Date

Streetscene
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Civic Centre, Newport
South Wales, NP20 4UR.
Telephone: 01633 656656
Email: streetscene@newport.gov.uk

Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project
Docksway Waste Disposal Site
Cell 4A Clay Liner
As Built Details

File No. 2514		Status: As Built				
Drawn	MDH	Checked		Approved		
Date	Feb 2020	Date		Date		
Scales	see drawing panes					
Drawing No.	2514B_AB_03					

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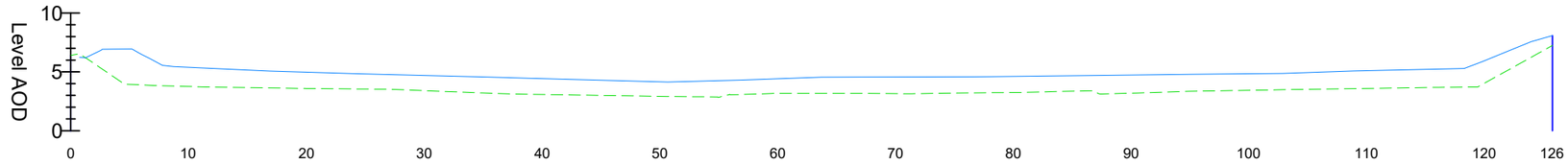
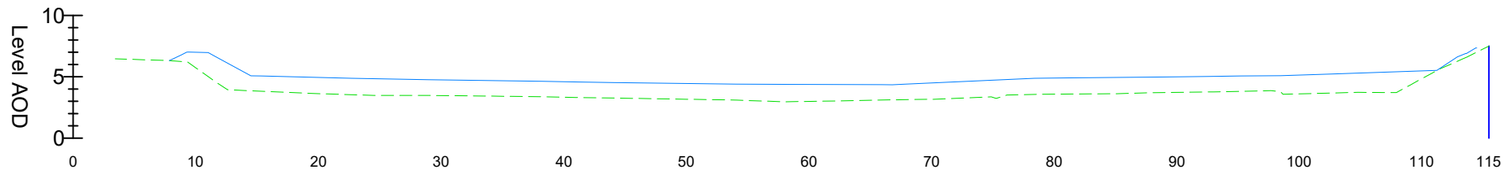


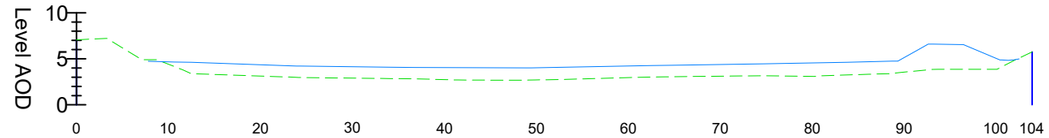
Existing Levels	6.404	3.758	3.592	3.408	3.082	2.921	3.170	3.150	3.247	3.189	3.437	3.593	4.040	7.247
Finished Levels		5.391	4.975	4.695	4.431	4.154	4.413	4.569	4.614	4.730	4.842	5.098	5.948	8.094
Level Difference		1.633	1.384	1.287	1.349	1.233	1.242	1.419	1.367	1.541	1.405	1.506	1.908	0.837

SECTION 2
Scale: H 1:500,V 1:500. Datum: 0.000



Existing Levels	5.730	3.626	3.470	3.335	3.170	2.994	3.166	3.582	3.729	3.607	4.854	7.581
Finished Levels	6.996	4.945	4.751	4.600	4.451	4.375	4.497	4.895	4.995	5.137	5.479	
Level Difference	1.265	1.319	1.282	1.265	1.282	1.381	1.330	1.313	1.267	1.530	0.625	

SECTION 3
Scale: H 1:500,V 1:500. Datum: 0.000



Existing Levels	7.961	4.410	3.125	2.898	2.738	2.703	2.954	3.109	3.083	3.549	3.856	5.744
Finished Levels		4.667	4.349	4.134	4.046	4.026	4.218	4.380	4.550	5.133	5.049	
Level Difference		0.256	1.225	1.236	1.308	1.322	1.264	1.271	1.467	1.584	1.193	

NOTES A3

1. Not to be scaled
2. Refer to drawing number 2514B_AB_01 for section key plan

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Rev	Details	Dr	Ch	Ap	Date

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Telephone: 01633 656656
Email: streetscene@newport.gov.uk

Newport CITY COUNCIL CYNGOR DINAS Casnewydd

Project

Docksway Waste Disposal Site

Cell 4A Clay Liner

As Built Details (Clay Liner Sections)

File No. 2514		Status: As Built / CQA			
Drawn	MDH	Checked		Approved	
Date	Feb 2020	Date		Date	
Scales	see drawing panes				
Drawing No.	2514B_AB_04				

Appendix 6 CQA Inspector Technical Note

Docksway Waste Disposal Site Phase 2 Cell 4a Containment

CQA Inspector Note on Bund Acceptability Test Results 20 September 2019

Location	Acceptability test	Compliance Testing
E3B2	F- MC&PI 20.3%MC 19/09/19	The core test 29/08/19 same area 23%.
E3B8	F- MC&PI MC20.7% 19/09/19	The core test 04/09/19 same area 22%.
E3B10	F- MC&PI MC18.7% 19/09/19	The core test 06/09/19 same area 21%.

The bund located adjacent to the asbestos cell where the moisture content of the non-compliant acceptability testing varies between 18.7% to 20.7% and the associated compliance testing 21% to 23%.

Location	Acceptability test	Compliance Testing
D5B2	F- MC&P I 20.2%MC 19/09/19	The core test 29/08/19 same area 25%.
D5B3	F- MC&PI 20.9% MC 19/09/19	The core test 30/08/19 same area 23%.
D5B4	P- MC&PI MC19.6% 19/09/19	The core test 05/09/19 same area 23%.

The bund location to the north of the cell where the moisture content of the non-compliant acceptability testing varies between 19.6% to 20.9% and the associated compliance testing 23% to 25%.

Location	Acceptability test	Compliance Testing
A3B1	F- MC&PI MC 20.8% 19/09/19	The core test 30/08/19same area 22%
A3B2	F- MC&PI MC19.7% 19/09/19	The core test 04/09/19same area 24%
A3B3	F- MC&PI MC19.0% 19/09/19	The core test 04/09/19 same area 23%

The bund location to the east of the cell where the moisture content of the non-compliant acceptability testing varies between 19.7% to 20.8% and the associated compliance testing 22% to 24%.

Comments

Of the 20 acceptability moisture content samples of the bunds, 9 tests are outside the moisture requirements. However, all 20 Compatibility tests are within tolerance.

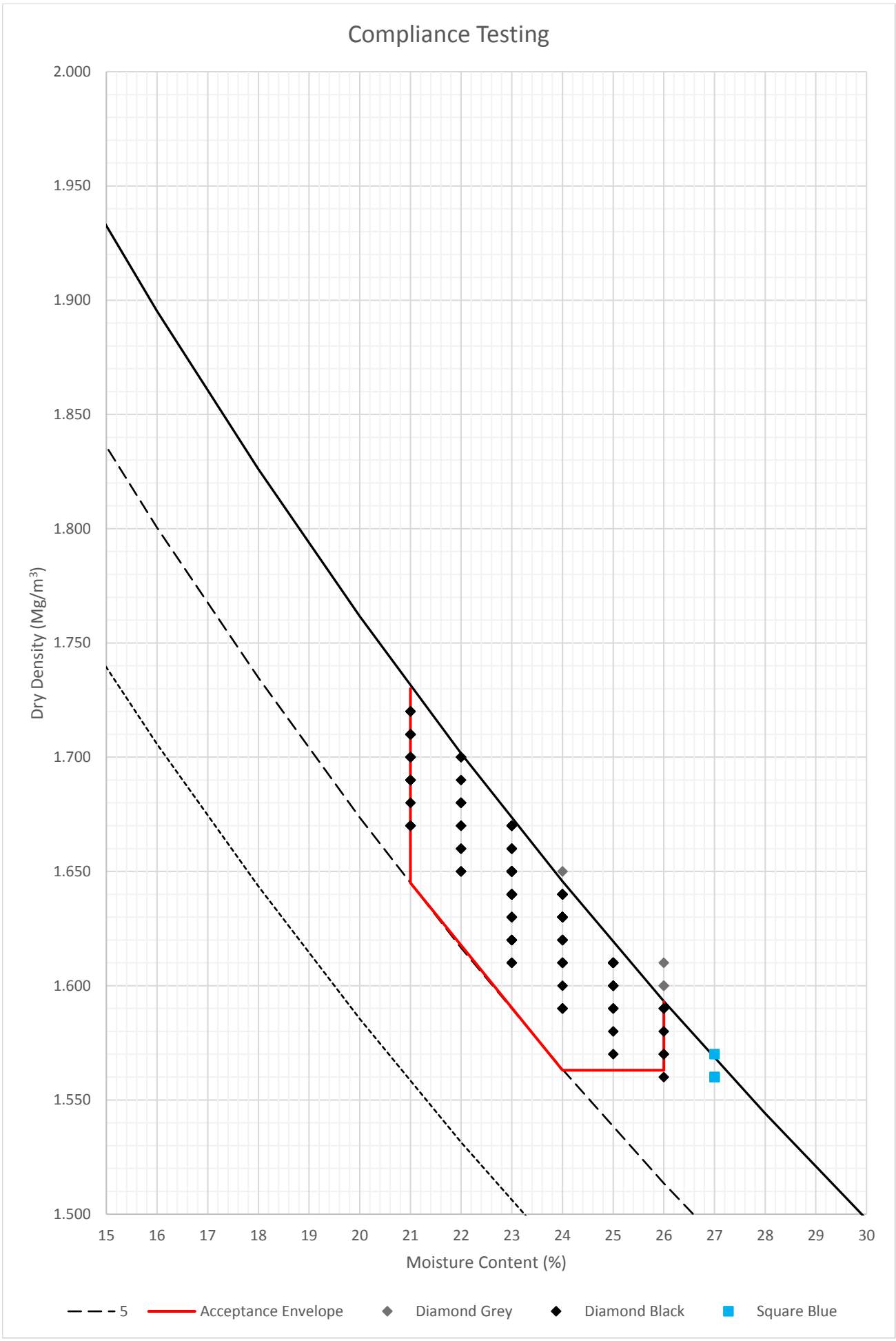
It was noted that there were dryer pockets within the material delivered to the grids from the dumpers at the point the samples were taken. The material was then further mixed through the operation of the dozer and compacter to provide a more homogeneous product which is shown by the compliant compliance testing.

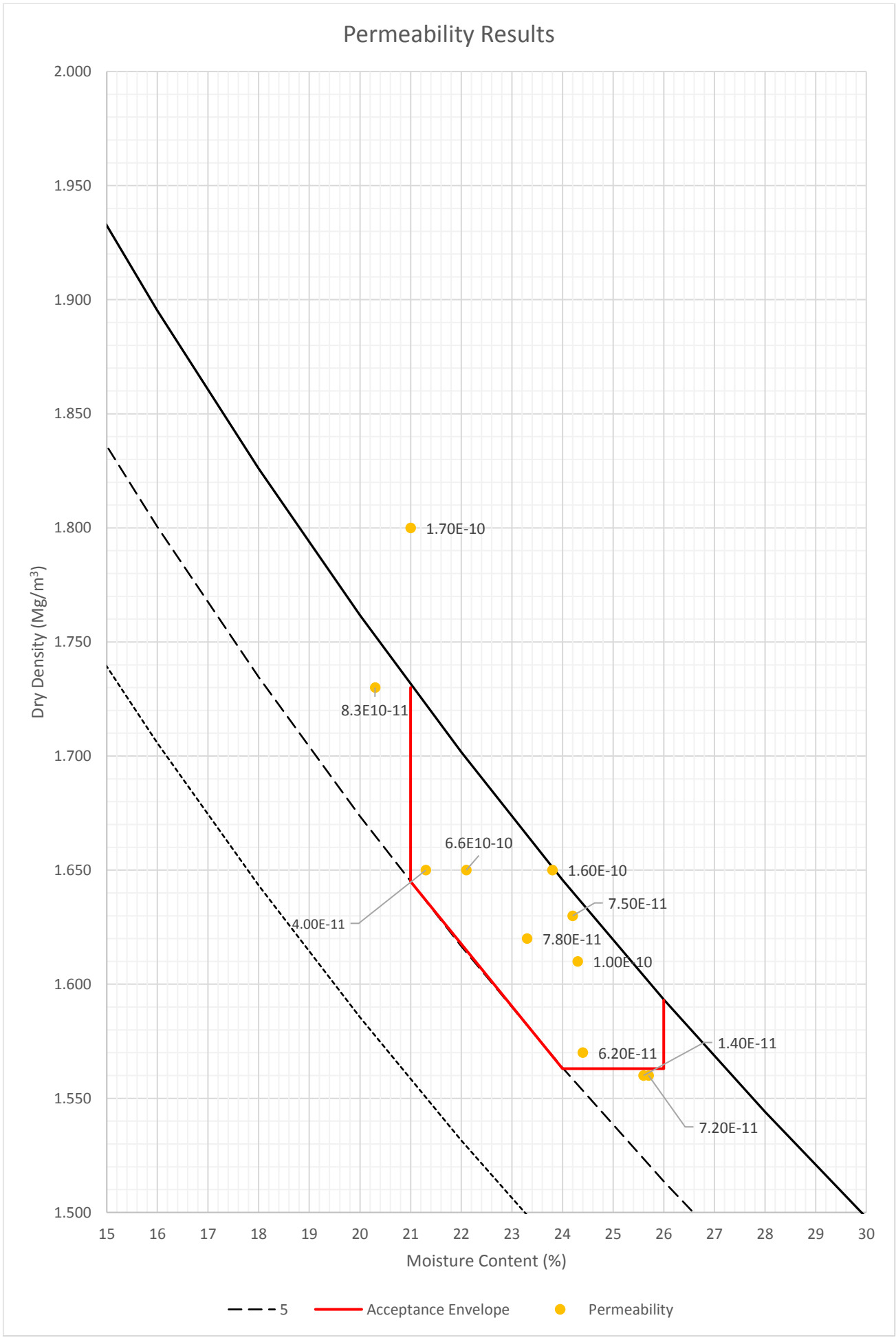
The moisture contents of the acceptability samples above may not be indicative of the final product where:

- additional mixing is performed by the dozer and compactor
- compliance testing is in tolerance
- the associated sampling and testing tolerances for the acceptability testing
- potential drying of the acceptability samples taken at the dates above and the tests reported on the 11 September 2019

I note that any intrusive testing which could create flow paths should be witnessed by the CQA team.

Appendix 7 Compaction Graphs


Compliance Testing
2.000
1.950
1.900
1.850
1.800
1.750
1.700
1.650
1.600
1.550
1.500
Dry Density (Mg/m³)
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
Moisture Content (%)
5
Acceptance Envelope
Diamond Grey
Diamond Black
Square Blue


Permeability Results
2.000
1.950
1.900
1.850
1.800
1.750
1.700
1.650
1.600
1.550
1.500
Dry Density (Mg/m³)
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
Moisture Content (%)
1.70E-10
8.3E10-11
6.6E10-10
1.60E-10
7.50E-11
4.00E-11
7.80E-11
1.00E-10
6.20E-11
1.40E-11
7.20E-11
5
Acceptance Envelope
Permeability