PHASE II GEO-ENVIRONMENTAL ASSESSMENT REPORT

Argoed High School

November 2020

hsp consulting

CIVIL | STRUCTURAL | GEOTECHNICAL & ENVIRONMENTAL | TRAFFIC AND TRANSPORT

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Argoed High School,
Bryn Road,
Mold,

Phase II Geo-Environmental Assessment Report

This report was produced by HSP Consulting Engineers Ltd for Gleeds Management Services Limited on behalf of the Department for Education (DfE) as the Phase II Geo-environmental Assessment Report for the Argoed High School to identify possible areas of contamination and provide an assessment of potential ground related development constraints to inform feasibility.

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Executive Summary

HSP Consulting has been commissioned by Gleeds Management Services Limited to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to the development, preliminary parameters for design and recommendations for any mitigation measures should they be required to inform a feasibility study.

The site supports Argoed High School which is located off Bryn Road, Mold. The approximate National Grid Reference for the centre of the site is (NGR) 326380 364562.

The ground investigation comprised 12No window sample boreholes to a maximum depth of 5.00m and 4No. trial pits to a maximum depth of 2.20m begl. Made Ground was encountered across the site to a maximum depth of 5.00m begl. Superficial Till deposits were encountered underlying the Made Ground across the site and comprised firm to very stiff sandy slightly gravelly CLAY. Bedrock of the Pennine Lower Coal Measures Formation was encountered underlying the Made Ground and Till deposits. The deposits generally comprised firm to very stiff very sandy slightly gravelly CLAY underlain by extremely weak MUDSTONE. In addition, black friable dull saturated COAL was encountered between 1.70 – 1.90m begl within one exploratory hole location.

Assuming no significant level changes, the natural deposits are considered to be a suitable formation layer where they are encountered in a firm condition. Foundations within fine soils should be a minimum of 0.90m in depth, traditional strip or pad footings are considered appropriate and an allowable bearing pressure of 120kN/m^2 should be readily achievable. Should significant cut and fill be required and therefore significant changes in level across proposed building footprints, then an alternative foundation solution may be necessary.

It is considered that the natural fine soils at shallow depth may be suitable for use as engineered fill without modification. However, it should be noted that some moisture contents derived from the geotechnical testing are outside the range of OMCs and therefore modification of some material may be required. Further materials testing and an earthworks appraisal is recommended for design.

The concentrations of potential contaminants recorded at the site are below the relevant GACs and mitigation measures will not be required.

Ground gas concentrations have been monitored on six occasions in order to obtain an indication of the ground gas regime at the site. Comparison of the steady state gas screening value with Table 2 of BS8485:2015 + A1:2019 indicates the site falls in a Characteristic Situation 1 and therefore no ground gas protection measures are required, subject to Environmental Health Officer approval.

The executive summary contains an overview of key findings and conclusions. However, no reliance should be placed on the executive summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the executive summary.

1. Introduction

1.1 Background

Detailed designs have not been provided for the site; however a preferred feasibility option has been provided indicating a new school building upon the playing fields immediately to the east of the existing school.

1.2 Client Brief & Scope

HSP Consulting has been commissioned by Gleeds Management Services Limited on behalf of the DfE to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to the development, preliminary parameters for design and recommendations for any mitigation measures should they be required.

The report presents the following information:

- details of the ground investigation undertaken and the ground conditions encountered,
- details and results of the geotechnical testing and contamination analysis,
- recommendations for mitigating constraints to the proposed development where appropriate and providing parameters for foundation design.

Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites.

1.3 Report Objectives

The objectives of this report are to:

- establish the geological and hydrogeological conditions using existing available/published information;
- summarise available information and identify site specific geotechnical and environmental hazards which may place a constraint upon the proposed site use;
- produce an updated Conceptual Site Model identifying potential pollution linkages between sources of contamination, pathways and receptors.

1.4 Limitations

The recommendations made in this report are based on the findings of the intrusive ground investigation undertaken by HSP Consulting Ltd between the 25th June and 3rd August 2020.

1.5 Previous Reports

HSP Consulting have completed a Phase I Geo-environmental Desk Study Report for the site, details of which can be found below:

- HSP Consulting Engineers Limited, Phase 1 Geo-environmental Assessment, ‘Argoed High School’. June 2020, Ref: C3250/PI.

2. Review of Existing Information & Geoenvironmental Setting

2.1 The Site

2.1.1 Location

The Argoed High School site is located off Bryn Road, Mold, CH7 6RY. The approximate National Grid Reference for the centre of the site is (NGR) 326380 364562. A Site Location Plan is included in Appendix I.

2.1.2 Description

The site comprises the existing Argoed High School. Bryn Road, immediately north of the site slopes downhill from west to east with the main drop off / parking area to the east of the school entrance. A large landscaping bund is evident immediately behind the drop off area and to the east of the gates.

The existing school is on two levels with the west of the school at a higher level and the east lower. The existing two storey school appears to be late 70's early 1980's construction, concrete and blockwork with much of the school having flat roofing.

Moving around the east of the site towards the proposed development site for the new school (existing playing fields) there are some large boundary trees not evident on the outline proposed plans. The access moves around the east of the buildings to a tarmac playground bordered by a small landscape bund with two portakabins.

The playing fields slope towards the eastern boundary where a stream runs down the southern boundary to the east and then northerly at the periphery. Boundary trees are mainly deciduous and predominantly found around the bottom eastern half of the field.

2.1.3 Surrounding Land Use

The main features of interest identified are:

North:	Residential area and highways (Bryn Road).
East:	Agricultural Fields (grass).
South:	Residential area and sports fields.
West:	Residential area and highways (Snowdon Avenue).

2.1.4 Site Access

The site is accessed through the existing school gates off Bryn Road.

2.1.5 Proposed End Use

The proposed end use will be a new build High School on the existing campus playing fields immediately to the east of the existing school buildings. The preferred option indicates a new build school with associated hard and soft landscaping, and additional multi use all weather play areas. Some areas of the existing site are due to remain such as the southern MUGA. The layout changes include demolition of the existing school, extensive hard and soft

landscaping as well as new vehicle drop off and parking provision. The preferred option layout is presented in Appendix II.

2.2 Geology

2.2.1 Made Ground

The BGS mapping does not indicate any Made Ground on the site, however, limited localised made ground should be anticipated associated with development of terraces for the existing school buildings and level play areas, observed during the desk study walkoever.

2.2.2 Superficial Deposits

Superficial Till deposits of Devensian age are recorded across the site.

2.2.3 Bedrock Geology

Bedrock Geology of the Pennine Lower Coal Measures Formation of the Carboniferous Period is recorded across the site and described by the BGS as '*Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part.*'

2.3 Pertinent Site Sensitivity Information

Based on the information collated for the desk study, the geo-environmental setting of the site is summarised as follows:

- The site is shown as an open field from the earliest mapping, with no significant changes until the 1980s when Argoed High School is recorded on site. No significant changes are recorded on subsequent mapping. The surrounding land within 250m is predominantly recorded as open fields with residential housing expansion to the west of the site from the 1970's. No significant changes are recorded on subsequent mapping.
- Superficial Till deposits are recorded across the site on relevant BGS mapping, underlain by bedrock geology of the Pennine Lower Coal Measures Formation.
- Made Ground is not indicated within the site boundary on the published geological mapping, however, limited localised made ground should be anticipated associated with development of the school.
- The superficial Till deposits are classified as a Secondary Undifferentiated Aquifer and the Pennine Lower Coal Measures Formation bedrock deposits are classified as a Secondary A Aquifer.
- The radon probability changes across the site, Basic radon protection measures are required in the north west corner of the site (intermediate probability radon area where 5% - 10% of properties are above the action level). Radon protective measures are not required elsewhere on site at present.
- The site does lie within a Coal Authority standing advice or reporting area. There are three mine shafts within the site boundary. The site in general is not within a High Risk Development Area. However, a Coal Mining Risk Assessment (CMRA) may be

required to support a planning application if there is interaction between the proposed layout and the known shafts.

Based on the above, the environmental sensitivity of the site can be considered to be Low at this stage.

3. Fieldwork & Factual Information

Site work was carried out on the 25th June and 3rd August 2020. Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations (Ref. 5) and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites (Ref. 7).

Given the geology underlying the site and potential for encountering coal seams, in particular within the east of the site, a permit was obtained by the Coal Authority prior to undertaking the exploratory holes where coal may have been encountered.

The exploratory holes were positioned by HSP Consulting Engineers Limited to provide general coverage of the site and provide information for foundation design and obtain representative soil samples for geotechnical and geo-environmental analysis.

3.1 Exploratory Methods

The exploratory methods are detailed in the table below.

Type	Quantity	Maximum Depth (m)	Details
Windowless Sampling Borehole	12	5.00	WS01 to WS12
Mechanically Excavated Trial Pits	4	2.20	TP101 - 104

The exploratory holes were logged and sampled by an Engineer from HSP Consulting Ltd and the logs are presented in Appendix III. The exploratory hole locations are shown on the Ground Investigation Layout Plan presented in Appendix IV.

Fragmentary bulk, disturbed and undisturbed samples were recovered from materials revealed within all the exploratory holes. Geo-environmental samples, placed in plastic tubs and glass jars supplied by the laboratory, were also obtained specifically for chemical analysis. The samples were taken to UKAS accredited laboratories for further examination and testing.

3.2 In-situ Testing

3.2.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were carried out at 1.00m intervals in the boreholes to 5.00m depth. The SPTs were undertaken in accordance with BS 1377:1990 and the results are included on the appended borehole logs (Appendix II).

3.2.2 Mexecone Probe Tests

Mexecone Probe Tests were positioned across the areas of the proposed MUGA Pitches to obtain an indication of the likely California Bearing Ratio within these areas. The results are included within Appendix VIII.

3.3 Laboratory Testing

The laboratory testing schedules were prepared by HSP Consulting Ltd.

3.3.1 Geotechnical Testing

Geotechnical testing has been scheduled to be undertaken by a UKAS accredited laboratory as part of the works at the site:

- Particle Size Distributions
- Optimum Moisture Contents
- Natural Moisture Contents
- Atterburg Limits
- Recompacted California Bearing Ratios
- One Dimensional Consolidations
- Moisture Condition Values

The laboratory testing has been carried out by Professional Soil Laboratory (PSL) (UKAS accredited, laboratory No.4043), in accordance with BS1377:1990 using calibrated equipment specifically for the British Standard.

3.3.2 Chemical Analysis

The geo-environmental samples retained specifically for chemical analysis were stored in cooled containers until delivery to the laboratory by courier.

Chemical analysis was scheduled on fourteen soil samples for the presence of a selected suite of potential contaminants as outlined in the tables below:

Table 1 – Chemical samples and testing suites

Exploratory Hole Location & Depth	Sample Description
WS01 0.20m	Made Ground [1,3]
WS02 1.00m	Made Ground [1,2]
WS02 2.30m	Made Ground [3]
WS02 4.60m	Made Ground [1,3,4]
WS04 1.00m	CLAY [2]
WS05 0.60m	Made Ground [2]
WS06 0.30m	Made Ground [1,3,4]
WS06 1.70m	CLAY [1,2]
WS07 0.10m	Made Ground [1,4]
WS08 0.35m	Made Ground [1,3,4]
WS09 1.50m	CLAY [2]
WS10 0.10m	Made Ground [1,3,4,5]
WS11 2.50m	CLAY [2]
WS12 1.00m	CLAY [2]

[1] HSP Standard Suite, [2] BRE Short Suite, [3] Asbestos Screen, [4] Organic Matter, [5] BS3882 Topsoil.

Metals	Cadmium	Chromium (III & VI)	Copper
	Lead	Mercury	Nickel
	Zinc		
Semi Metals and Non-metals	Arsenic	Boron	Selenium
Others	pH	Asbestos	
Inorganic Chemicals	Cyanide	Sulphate	Sulphide
Organic Chemicals	PAH (US EPA 16)	TPH (CWG)	Phenol

The contamination analysis was carried out by Chemtest Environmental Ltd (UKAS accredited, laboratory No. 2183) during the period 1st July – 12th August 2020. The results are presented in Appendix V.

3.4 Ground Conditions

3.4.1 Published Geology

The published geology indicates the site is underlain by superficial Till deposits and bedrock deposits of the Pennine Lower Coal Measures Formation as described in section 2.2.2 and 2.2.3 above.

3.4.2 Ground Conditions on site or General Geology & Revealed Strata

The exploratory hole data confirms the published information. The strata generally comprises:

Table 2 – Encountered Ground Conditions

	Strata	Depth (mbegl)	Thickness (m)	Description
Anthropogenic	MADE GROUND	G.L. – 0.10	0.10m	MADE GROUND comprising grass overlying sandy clayey topsoil.
	MADE GROUND	G.L. – 0.30	0.30m	MADE GROUND comprising sandy slightly gravelly clayey topsoil.
	MADE GROUND	G.L.– 1.10	1.00m	MADE GROUND comprising sandy slightly gravelly clay.
	MADE GROUND	0.10 – 5.00	1.85m	MADE GROUND comprising very sandy slightly gravelly clay.
	MADE GROUND	1.90 – 2.10	0.20m	MADE GROUND comprising very sandy clay with organic odour.
	MADE GROUND	0.70 – 0.80	0.10m	MADE GROUND comprising sand.
Superficial	TILL	0.45 – 3.00	2.10m	Firm to very stiff sandy slightly gravelly CLAY.
Bedrock	PENNINE LOWER COAL MEASURES FORMATION	2.10 – 3.00	0.90m	Firm to very stiff very sandy slightly gravelly CLAY.
	PENNINE LOWER COAL MEASURES FORMATION	1.80 – 4.00	1.00m	Extremely weak MUDSTONE
	PENNINE LOWER COAL MEASURES FORMATION	1.70 – 1.90	0.20m	Black friable dull saturated COAL.

3.5 Groundwater Levels

Groundwater was encountered between 1.00 – 2.70m during the advancement of the window sample boreholes.

Groundwater was monitored on four occasions in conjunction with the ground gas monitoring. Groundwater was recorded between 0.00 – 2.34m begl during the monitoring visits.

The high groundwater levels may in part be due to ingress of meteoric water into the monitoring well rather than a true groundwater level. However, significant groundwater strikes were encountered on site, in particular where coal was intersected, where groundwater rose significantly, during the 20 minute observation period.

3.6 Ground Gas Monitoring

Sources of potential ground gas were identified within the Desk Study, prior to the ground investigation and therefore ground gas monitoring has been undertaken.

Gas monitoring installations were constructed within three of the window sample boreholes at the site. Each well has been constructed using 50mm diameter HDPE pipe with the top half a metre being plain and the remainder slotted. All of the borehole installations have a 6mm pea gravel surround to the slotted pipe with a bentonite seal above and a gas tap. The covers are cemented flush with ground level and are either a round or square lockable stopcock cover.

The results of the ground gas monitoring are discussed in Section 5.5 below.

3.7 Visual and Olfactory Evidence of Contamination

No visual and olfactory evidence of contamination was noted in the exploratory holes during the ground investigation.

4. Geotechnical Assessment

4.1 Detailed Ground Model

For the purpose of this foundation assessment the information gained from the window sample boreholes and trial pits has been included. The borehole logs are presented in Appendix II.

4.1.1 Made Ground

Made Ground comprising sandy clayey topsoil or sandy slightly gravelly clayey topsoil was encountered across the site from ground level to a maximum depth of 0.30m begl.

Underlying the topsoil is Made Ground comprising sandy slightly gravelly clay and very sandy slightly gravelly clay with subordinate sand and very sandy clay deposits.

The depth of Made Ground varies across the site to a maximum depth of 2.10m begl with the exception of WS02 which was undertaken on a raised landform in the north of the site and encountered 5.00m of Made Ground the base of which was not penetrated in this exploratory location.

4.1.2 Superficial Till Deposits

Superficial Till deposits were encountered underlying the Made Ground across the site. The deposits comprised firm to very stiff sandy slightly gravelly CLAY. The base of the superficial deposits was not penetrated within all exploratory holes.

4.1.3 Pennine Lower Coal Measures Formation

Bedrock deposits of the Pennine Lower Coal Measures Formation were encountered underlying the Made Ground and Superficial Till deposits. The deposits generally comprised firm to very stiff very sandy slightly gravelly CLAY underlain by extremely weak MUDSTONE. In addition, black friable dull saturated COAL was encountered between 1.70 – 1.90 within one exploratory hole location. The base of the formation was not encountered in any of the exploratory holes.

4.1.4 In-situ & Laboratory Testing

A series of Standard Penetration Tests (SPT's) undertaken within all boreholes have returned SPT 'N' values of 4 - 25 at 1.00m depth. The following table summarises the N values at depth across the site.

Table 3 – SPT N Values

Depth (m)	Range of 'N' Values	Mean 'N' Value	Description
1.00	4 - 25	15	Made Ground
	11 - 24	17	CLAY
2.00	4	4	Made Ground
	13 – 50	33	CLAY/MUDSTONE
3.00	11	11	Made Ground
	22 – 50	41	MUDSTONE/CLAY

Seven particle size distribution (P.S.D.) tests have been undertaken to confirm the visual description and engineering behaviour of the superficial and bedrock deposits.

Seven plasticity index and moisture content determinations have been undertaken in the laboratory on disturbed samples of the fine deposits to confirm the visual description and engineering behaviour of the soils.

Table 4 – Determination of Plasticity Index and Natural Moisture Content

Sample Ref:	Laboratory Material Descriptions	LL (%)	PL (%)	PI (%)	% passing 425µm	Mod PI (%)*	Soil Class	MC (%)	PL -4%
WS1 @ 1.50m	*Brown mottled grey gravelly sandy CLAY.*	40	20	20	80	16.0	CI	13	16
WS2 @ 3.00m	*Brown mottled grey gravelly sandy CLAY.*	36	18	18	85	15.3	CI	16	16
WS3 @ 2.90m	*Grey sandy CLAY*	43	20	23	100	23.0	CI	13	16
WS5 @ 1.00m	*Brown slightly gravelly sandy CLAY*	47	23	24	92	22.1	CI	19	19
WS09 @ 0.90m	*Brown mottled grey slightly gravelly very sandy CLAY*	31	16	15	93	22.1	CL	15	12
WS10 @ 0.60m	*Brown slightly gravelly very sandy CLAY*	35	18	17	97	16.5	CI	15	18
WS12 @ 1.50m	*Brown slightly gravelly very sandy CLAY*	33	17	16	95	15.2	CL	14	17

4.1.5 Assessment

Classification testing indicates the majority of the soils at the site broadly conform to a 2C Stony Cohesive Material classification in accordance with Series 600 of the 'Specification for Highways Works' with the remaining two of the seven particle size distribution tests aligning with a 2A/2B classification. The right-hand columns of Table 4 above show the Plastic Limit -4% and the natural moisture content. Plastic Limit -4% is the 'Acceptable Upper Limit' for 2B Dry Cohesive Material. All results are either the same or below this value and therefore material which aligns with the 2A/2B particle size envelope is likely to conform to a 2B Dry Cohesive Material classification in accordance with Series 600 of the 'Specification for Highways Works'. The Plasticity Index results indicate compliance with the definition of soils of low to intermediate plasticity (CL - CI) after the classification system of BS5930: 2015. These soils are generally considered to be of low to medium Volume Change Potential in accordance with the National House Building Council (NHBC) Standards, Chapter 4.2: 2007.

Compaction tests to obtain maximum dry density and optimum moisture content relationships were undertaken on six representative samples using a 2.5kg and 4.5kg rammer. Optimum moisture contents of between 13 – 14% and maximum dry densities between 1.87mg/m^3 and 1.91mg/m^3 were recorded for tests using the 2.5kg rammer and Optimum moisture contents of between 8.6% and 11% and maximum dry densities between 1.97mg/m^3 and 2.09mg/m^3 were recorded for tests using the 4.5kg rammer. Of the 6No samples tested, three have optimum moisture content which are the same as the initial moisture contents. The remaining three have an initial moisture content 3% lower than the optimum moisture content (OMC). Although the above shows conformity between initial and optimum moisture contents, it should be noted that some moisture contents derived for other tests are outside the range of OMCs and therefore modification of some material may be required.

6No. recompacted CBRs using a 2.5kg hammer were undertaken on bulk samples from the mechanically excavated trial pits. The samples were tested at 'as received' moisture and the results range between 11.0% and 34.0%.

One dimensional consolidation tests were undertaken on six samples of clay resulting in m_v values between 0.101m^2/MN and 0.266m^2/MN which represent clays of medium compressibility. In addition, four moisture condition value tests have been undertaken, two were completed at "as received" moisture and two were completed at a range of moisture contents.

Finally, given the geology underlying the site and chemical results obtained as part of this investigation. Should modification be required, selection of appropriate binders needs to be considered given the possible risk of heave associated with sulphate bearing soils. It may be prudent to undertake addition chemical tests to determine the most appropriate binder once the earthworks strategy, including proposed cut and fill, has been determined.

The results of the geotechnical testing undertaken are presented in Appendix V.

4.2 Earthworks

The proposals show that a significant cut and fill operation will be required to form a development platform prior to construction of the proposed school buildings.

A detailed cut and fill strategy has not yet been undertaken for the site. However, given the current site topography, it is likely that some building footprints will likely be within areas of both cut and fill.

Based on the limited testing undertaken as part of this ground investigation for feasibility, it is considered that the natural fine soils at shallow depth may be suitable for use as engineered fill without modification. However, it should be noted that some moisture contents derived from the geotechnical testing are outside the range of OMCs and therefore modification of some material may be required. Further materials testing and an earthworks appraisal is recommended for design.

Should materials prove to be suitable, placement and compaction would need to be strictly controlled and supervised. Project programming should consider the 'earthworks window' (prevailing dry & warm climatic conditions) as the soil materials will be susceptible to softening during periods of wet weather and will be easily damaged by site traffic and deterioration at times of heavy rainfall.

Care should be taken to ensure that fill materials are consistent in any earthworks and there is apparent variability within the natural materials. Where obvious inconsistencies are apparent within excavated soil sources for engineered fill they should be deposited in such a way that all parts of the site receive roughly equal amounts of a given material, in roughly the same sequence, thus ensuring a uniform distribution of fill types over the whole fill thickness. The difficulties of managing this would be compounded if modification is not implemented with potential double handling and stockpiling of materials for drying, mixing, and placement. These activities could all also impact significantly upon any proposed construction programme.

The argillaceous rock and coal seams encountered from 1.70m begl are unlikely to suitable for use as engineered fill. In addition, significant groundwater strikes which subsequently rose were recorded when coal was encountered within the exploratory holes suggesting groundwater within the coal seams on site may be under artesian pressure. Given the above, the rock head profile and seam depths should be used as a constraint within any volumetric (cut & fill) modelling.

4.3 Excavations

Excavations to proposed formation levels for new foundations and infrastructure should be feasible using standard excavation plant and equipment. Random and potentially severe falls should be anticipated from the faces of near vertically sided unsupported excavations carried out at the site. Where personnel are required to enter near vertically sided excavations, it is considered that full support should be provided to the full depth of all excavations.

It is recommended that all support systems are continually assessed by fully trained or experienced personnel.

In addition, significant groundwater strikes which subsequently rose were encountered when COAL was identified within the exploratory holes suggesting groundwater within the coal seams on site may be under artesian pressure. It should be noted that groundwater levels may vary due to seasonal variations or other effects. Should shallow groundwater entries be encountered at the site within the superficial deposits during groundwork operations, traditional sump and pump dewatering should be sufficient if required. However, if groundwater strikes associated with the coal seams are encountered within excavations, then tradition sump and dump dewatering may not be sufficient.

4.4 Foundations

For the purpose of this foundation assessment the information gained from window sample boreholes WS6 – WS12, which are located within proximity to the proposed buildings, have

been utilised. The foundation assessment assumes no changes in level at the site and should be reviewed when development plans and levels are more certain. Any proposed cut and fill will likely determine the foundation solution and it may be prudent to allow for piling and a suspended ground floor slab within any cost appraisal for feasibility depending on the depth of cut and fill underlying proposed building footprints..

The natural fine deposits encountered are considered to be a suitable formation layer where they are encountered in a firm condition. Foundations within fine soils should be a minimum of 0.90m begl in depth. The table below shows the indicative allowable bearing pressure (ABP) that could be achieved using strip or pad foundations across the building footprint.

Table 6 – Allowable Bearing Capacity

Depth (m)	SPT $(N_1)_{60}$ Value	Eurocode 7 Soil Strength Description	Consistency (BS5930) Description	Approximate ABP (k/Nm^2) – 0.60m wide strip footing	Approximate ABP (kN/m^2) – 2x2m pad footing
1.00	14.8	Medium Strength	Firm	120	125
2.00	14.8	Medium Strength	Firm	135	140
3.00	26.4	High Strength	Stiff	235	250

From the above table, it would be recommended that an ABP of 120kN/m^2 could be utilised for design across the site. Given the relatively shallow depth of the underlying argillaceous bedrock across the site, where possible all foundations should bear onto one soil type, to reduce the risk of hard spots and differential settlement. In this case the most appropriate founding strata is likely the shallow superficial Till deposits.

Mature and semi mature trees were identified within close proximity of the proposed school. The soils on site are of medium to high volume change potential. Foundations should be deepened and designed in accordance with NHBC Chapter 4.2 Building near trees (Ref. 10).

4.5 Ground Floor Slab

A ground bearing floor slab is considered appropriate for the proposed school building providing a sub-floor void is not require for heave protection or as a result of regarding the site levels. Reference should be made to NHBC Standards Chapter 4.2 for confirmation.

The ground gas regime for the site is Characteristic Situation 1 and therefore no ground gas protection measures including sub-floor void are required. However, this assessment is subject to approval by the Local Authority Environmental Health Officer and therefore floor slab design should be considered in conjunction with the environmental assessment below.

4.6 Concrete Classification

The results of sulphate and pH testing carried out on selected soil samples taken during this investigation have been compared with the recommendations outlined in BRE Special Digest 1, Part 1: 2005.

The guidelines given in BRE Special Digest 1 are based upon a site classification relating to its previous usage. It is considered appropriate to define this site as a 'brownfield site' location for the purposes of concrete classification.

On the basis of the above, it is considered appropriate to adopt a basic Design Sulphate Class of DS-3 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-3. However, this classification is based on a limited number of results with the majority of results exhibiting a lower Design Sulphate Class. It may therefore be prudent to undertake further testing once the layout is more certain due to the potential for disturbance of pyritic ground during enabling works.

4.7 Pavement Design

7No. insitu MEXE probe tests were conducted across the site. From this an indicative California Bearing Ratio (CBR) can be provided. The results can be found in Appendix IX.

Following guidance provided within 'Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 2' the CBR value chosen for design should be the minimum measured value, not the average. Therefore, for the proposed development, a CBR value of 3% at 300mm begl, 4% at 450mm and 7% at 600mm begl should be assumed for design purposes. The CBR tests at 150mm begl were all within the topsoil and therefore have not been included within the test results.

It is recommended that further confirmatory California Bearing Ratio tests are undertaken at formation as required during the course of the development.

4.8 Coal Mining Constraints

The site does lie within a Coal Authority standing advice or reporting area. A Coal Authority Consultants Report for the site is presented within the HSP Phase I Report (Ref 1)

The report provides details of three mine shafts within the site boundary. None of the three records provide any treatment details.

The location of the shafts as well as any relevant potential zone of influence will need to be accurately overlaid onto the proposed development plans to determine if further assessment is required or precautions need to be considered during detailed design. The shaft coordinates are provided in the existing HSP Phase I report (Ref 1) and until further information is available the zone of influence around each shaft should be assumed to be the Coal Authority default of 20m.

The site in general is not within a High Risk Development Area. However a Coal Mining Risk Assessment (CMRA) may be required to support a planning application if there is interaction between the proposed layout, the known shafts/zone of influence and shallow coal recorded on the available BGS borehole logs.

In addition to the shafts located within the red line boundary. Multiple coal seams have been identified on historical logs as well as the exploratory holes completed as part of this investigation. These coal seams are encountered at shallow depth as well as potentially outcropping within the site boundary. Our general guidance note addressing some of the risks including combustion, sulphates and hard-spots plus guidance on mitigation is provided in Appendix IX.

5. Environmental Assessment

5.1 Introduction

The approach to the human health risk assessment reported here follows the principals given in CLR 11, i.e. application of the following assessment hierarchy:

- Tier 1 risk screening by establishment of potential pollutant linkages, i.e. the preliminary conceptual site model (PCSM), or
- Tier 2 generic quantitative assessment using generic assessment criteria (GACs) that represent 'acceptably low' risk, or
- Tier 3 quantitative risk assessment using site specific assessment criteria (SSACs) that represent 'unacceptable risk', or where generic assessment criteria are not available, or they are not applicable to the CSM.

The results of laboratory analysis have been screened against GACs including the Defra Category 4 Screening Levels (C4SL) and LQM and CIEH S4ULs for Human Health Risk Assessment (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3180. All rights reserved). (Refs 9 and 10 respectively).

In the absence of a standard scenario for a school environment the standard exposure scenario of residential without home grown produce has been used to identify potential exposure pathways for human health receptors. Controlled water, flora and fauna and property receptors have also been included within the CSM. Our Tier 2 HHRAs for school sites are screened against the GACs representative of minimal risk for residential without home grown produce end use, we believe this to be appropriate based on the precautionary principle the CLR guidance advocates.

It should be noted that organic contamination (PAH, TPH and BTEX) have been screened against the GAC for 1% Soil Organic Matter (SOM).

The assessment of PAHs is undertaken using the surrogate marker approach; recommended by Health Protection Agency (2010) guidance, providing the PAH profile is sufficiently similar to the coal tars tested by Culp et al (1998). Where PAH profile is not sufficiently coal tar like the TEF method is adopted using the LQM and CIEH S4ULs. Prior to assessment a PAH profile is generated for all samples analysed for PAH using the LQM PAH Profiling Tool v1.3, the graphical output is presented in Appendix IV.

5.2 Assessment of Soil Analysis Results

Fourteen samples, as detailed in section 3.3.2, were scheduled for analysis from the development area. These provide a basis for characterising the soils to outline the potential impacts on human health and any environmental receptors from any contamination found.

The screening process for on-site human health receptors show that the GACs, representative of minimal risk for a residential without home grown produce setting were not exceeded.

In addition, five samples were screened for asbestos with no asbestos identified within any of the samples.

5.3 Assessment of Topsoil Analysis Results

One sample was scheduled for a full BS3882 Topsoil analysis suite. The results identified a non-compliance with the multi-purpose range for all samples, detailed in the table below.

Parameter	Multipurpose Range	Result
Mass Loss on Ignition	5 - 20mg/l	3.5
Extractable Phosphorus	16 - 140mg/l	2.1
Extractable Magnesium	51 - 600mg/l	1100

There are also non-compliances with two of the three (acidic and calcareous) specific purpose ranges. These parameters which are not compliant with the three ranges are detailed below. The results are compliant with the requirement of the Low Fertility ranges.

Specific Purpose Range	Non-compliant Parameters
Acidic	Mass Loss on Ignition, Soil pH value, extractable phosphorus, extractable magnesium.
Calcareous	Mass Loss on Ignition, Soil pH value, extractable phosphorus, extractable magnesium.

5.4 Human Health Mitigation

The concentrations of potential contaminants recorded at the site indicates an acceptably low risk and therefore mitigation measures are not required as part of the proposed development.

Should any obvious evidence of unexpected contamination be encountered during the redevelopment works it should be reported to HSP so that an inspection can be made and appropriate sampling and assessment work be carried out.

Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to potentially contaminated soils and dust. Consideration should be given to the HSE document HSG 66 ‘Protection of workers and the General Public during Redevelopment of Contaminated Land’.

The approval of the local Environmental Health Officer should be sought with respect to the soil contamination assessment and mitigation proposals.

5.5 Water Supply

The environmental testing for the site has been compared to the following document in order to assess the most appropriate pipe material that should be used upon the site for mains water supply:

> 'Guidance for the selection of water supply pipes to be used in Brownfield sites – UK Water Industry Research – Ref: 10/WM/03/21.'

The chemical results show no exceedances of PE and PVC pipe threshold values and therefore, it is considered that specialist materials are unlikely to be required for water supply pipes at the site. However, confirmation of supply pipes should be sought from utility providers.

5.6 Ground Gas Risk Assessment

At the time of writing no detailed layout plans have been provided. For the purpose of this assessment, the school is classified as Building Type B as outlined in Table 3 of BS8485:2015+ A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings (Ref 15). This is a conservative assessment, subject to change once the building occupancy and maintenance controls are better defined.

Ground gas concentrations were initially monitored on four occasions in order to obtain an indication of the ground gas regime at the site. However, due to grounds maintenance, WS08 could not be located during two monitoring visits and therefore two additional visits were completed to reduce uncertainty and provide a robust dataset for assessment.

The results indicate that methane has not been recorded above the monitor's limit of detection (<0.1%vol). Carbon dioxide has been recorded at a maximum concentration of 3.4% vol in air in WS06.

One positive gas flow of 3.7l/hr was recorded within WS06 during one monitoring event. No other positive flow readings have been recorded during the monitoring visits including visits during period of lower atmospheric pressure. It is considered that this positive flow is the result of groundwater close to the top of the response zone causing a piston effect within the installation and not a true reading of gas flow.

The results have been assessed in line with the guidance provided in BS8485:2015 + A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings (Ref 15) and CIRIA Document C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings' (Ref 16).

Comparison of the worst case steady state gas screening value with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 2. However, based on the data set as a whole and groundwater levels, it would be inappropriate to base the assessment on the worst case flow readings.

Comparison of derived ground gas screening values excluding the erroneous flow result with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 1 (CS1) and therefore no ground gas protection measures are required, subject to Environmental Health Officer approval.

5.7 Waste Classification

The results of the chemical testing have been assessed using web-based software for classifying hazardous waste, using HazWasteOnline™. The materials tested are likely to be classified as non-hazardous. The results are included in Appendix IV.

Please note the above classification provides an indication of how the material should be classified for removal off site; however this should be used at your approved waste handler's discretion and further testing may be required prior to any offsite disposal.

5.8 Conceptual Site Model

Based on the findings of this site investigation and Phase I Report, a conceptual site model has been produced and is presented in the table below.

Table 4 - Updated Conceptual Site Model.

Source	Pathway	Receptor	Consequence	Probability	Risk	Comments
On site **S1:** Historical and Contemporary land use: Agricultural Land, Education Facility.	**P1:** Human uptake pathways	**R1:** End Users **R2:** Construction and maintenance workers	Mild	Unlikely	Very Low	Concentrations of contaminants of concern are below the relevant GACs within the near surface deposits sampled across the site and therefore the risk is considered to be VERY LOW. Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to potentially contaminated soils and dust.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff.	**R3:** Controlled Water: Groundwater & Surface Water	Mild	Unlikely	Very Low	Superficial and Bedrock geology is classified as Secondary (Undifferentiated) and Secondary A Aquifers respectively. No significant contamination was identified during the ground investigation across the site, therefore the risk to controlled water is considered to be VERY LOW.
Off Site (within 250m) **S2**: Historical and Contemporary land use: Agricultural land, residential dwellings, allotments. **S3**: Historical Ponds – Ground Gas Source	**P2:** Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff. **P5:** Vertical and lateral migration of ground gases and/or vapour.	**R1:** End Users **R2:** Construction and maintenance workers	Minor	Unlikely	Very Low	Ground gas concentrations have been monitored on six occasions, in order to obtain an indication of the ground gas regime at the site. The results indicate the site is characterised as CS1 and therefore no ground gas protection measures are required, subject to EHO approval. Given the above the residual risk is considered to be VERY LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man- made). **P4:** Surface runoff.	**R4:** Property, services and substructures **R5:** Adjacent Residential Properties	Mild	Low	Low	The natural soils may contain sulphates that present a risk to buried concrete. Testing indicates the soils are unlikely to be aggressive to concrete and it is considered appropriate to adopt a basic Design Sulphate Class of DS-3 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-3. However, it may therefore be prudent to undertake further testing once the layout is more certain. The chemical results show no exceedances of PE and PVC pipe threshold values and therefore, it is considered of specialist materials are unlikely to be required for water supply pipes at the site. However, confirmation of supply pipes should be sought from utility providers.
	P6: Root uptake.	**R6:** Proposed Flora and fauna	Mild	Unlikely	Very Low	Extensive planting is unlikely therefore the risk of uptake to proposed flora and fauna is VERY LOW.

6. References

1. HSP Consulting Engineers Limited, Phase 1 Geo-environmental Assessment, 'Proposed Argoed High School'. June 2020, Ref: C3250/PI
2. BRITISH GEOLOGICAL SURVEY. 1999. Flint. England and Wales Sheet 108. Bedrock and Superficial Deposits. 1:50 000 (Keyworth, Nottingham: British geological Survey).
3. British Geological Survey Lexicon Search - http://www.bgs.ac.uk/lexicon/
4. Department of the Environment Industry Profiles.
5. Site Investigation in Construction, Volume 3, Specification for Ground Investigation 2nd Edition.
6. BS 5930:2015 Code of Practice for Site Investigations.
7. BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)
8. BS10175:2011 +A1:2013 Investigation of Potentially Contaminated Sites - Code of Practice.
9. NHBC Standards, Chapter 4.2, Building near trees.
10. Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.
11. Department for Environment, Food and Rural Affairs and Contaminated Land: Applications in Real Environments (CL:AIRE) (December 2013). SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination.
12. BRE Special Digest 1:Concrete in Aggressive Ground, 2005, Building Research Establishment.
13. CL:AIRE The definition of Waste: Development Industry Code of Practice, 2008.
14. NHBC & RSK Group Plc, March 2007. Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. Ed 4.
15. BS8485:2015 + A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings
16. CIRIA C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'
17. Department for Environment, Food and Rural Affairs and Contaminated Land: Applications in Real Environments (CL:AIRE) (December 2013). SP1010: Appendix E Provisional C4SLs for Benzo(a)pyrene as a surrogate marker for PAHs.
18. www.environment-agency.gov.uk
19. Environment Agency, Freshwater Environmental Quality Standards (EQS) contained in the Hydrogeological Risk Assessment for Landfills and the Derivation of Groundwater Control and Trigger Levels, 2015.
20. HMSO, Water Supply (Water Quality) Regulations, 2002

Appendix I

NOTES: DO NOT SCALE

N

- Approximate Red Line Boundary

hsp consulting
Lawrence House, Meadowbank Way,
Eastwood, Nottingham, NG16 3SB
Tel: 01773 535 555 Fax: 0870 600 6091
www.hspconsulting.com

CLIENT:
Gleeds Management Services

PROJECT:
Argoed High School

TITLE:
Site Location Plan

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN: MPK	DATE: April 2020
PROJECT No: C3250	DRAWING No: 50

Appendix II

Red line boundary

Pedestrian Access

Vehicular Access

Current Access Points

Main Vehicular Route

Drainage Ditches

Existing Trees

Existing Hedgerow

Noise

Overhead Cables

Foot Bridge

Existing Right of Way

Building for Demolition

Photo View

Gradient / Embankment

+39.0m

Level

N

Completed Scheme.

Argoed Primary School			
School Specifics:			
No. of pupils	600		
FTE staff	55		
Total Building Area / m2			
Generated from BB99	3,040	Test Scheme	Difference
Childcare	0	0	0
Basic Teaching	1450	1450	0
Hall	351	351	0
Learning resources	125	125	0
Staff & Admin	182	182	0
Storage	237	237	0
Float	155	155	0
Total	**2,500**	**2,500**	0
BB99 External Spaces / m2			
Pitches	12,000	4000	-8,000
Soft play	2,300	1865	-435
Games courts	1,800	1800	0
Hard play	1,300	1309	9
Habitat	800	900	100
Float	3,000	3000	0
Total Net	**21,200**	12,874	-8,326
Parking			
No. of Spaces	55	55	0
Min Other	2120		
Max Other	4340		
Childcare			
Min Total Gross	**23,800**		
Max Total Gross	**26,500**		

Argoed Secondary School			
School Specifics:			
No. of pupils	700		
FTE staff	65		
Total Building Area / m2			
Generated from BB98	3,040	Test Scheme	Difference
Childcare	0	0	0
Basic Teaching	2,150	2,150	-
Hall	810	810	-
Learning resources	250	250	-
Staff & Admin	335	335	-
Storage	420	420	-
Float	460	460	-
Dining & Social	165	165	-
Total	**4,590**	**4,590**	-
BB98 External Spaces / m2			
Pitches	34,500	25000	-9,500
Soft play	2,550	2300	-250
Games courts	2,000	6700	4,700
Hard play	1,450	1300	-150
Habitat	900	2689	1,789
Float	4,500	4500	0
Total Net	**45,900**	42489	-3,411
Parking			
No. of Spaces	65	65	0
Min Other	1,000		
Max Other	11,400		
Childcare			
Min Total Gross	**46,900**		
Max Total Gross	**57,300**		

Points of Note.

- School areas shown are based on BB98 & BB99 Gross Floor areas.
- Adjacencies have yet to be resolved.
- Building components aligned north - south where possible, with teaching spaces on the east and west elevations.
- Building located away from Bryn Road - noise and pollution.
- Existing woodland retained and identified as Habitat Space.
- Existing games court retained. To be considered whether this sits outside of the MIM contract.
- External amenities - games courts - located towards the front of the site to facilitate access for community use and site management.

Site Access.

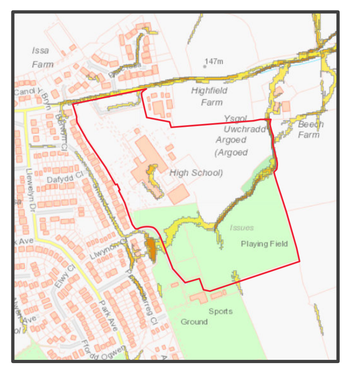
- Access off proposed new road. Position of turn-off TBC.

Phasing and Delivery.

- No existing buildings on the site.
- Development wholly dependent on the delivery of the new road.

Utilities:

- Not currently known.



0 5m 10m 20m 50m

Appendix III

Borehole Log

Borehole No. **WS01**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 25/06/2020 -	Logged By HD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	TJ		0.10			MADE GROUND - Grass overlying brown sandy clayey topsoil. Sand is fine to coarse.
		0.50	D		0.50			MADE GROUND - Brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is mixed lithologies and coal.
		1.00		N=18 (4,4/4,4,5,5)				Firm to stiff brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies and coal.
		1.50	D					
		2.00		50 (10,12/50 for 155mm)	1.90 2.00			Extremely weak light grey MUDSTONE . End of borehole at 2.00 m

Remarks

AGS

Borehole Log

hsp consulting			Borehole No. **WS02** Sheet 1 of 1
Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 25/05/2020 -	Logged By HD

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
		1.00	TJ					MADE GROUND - Brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
		1.00		N=4 (1,0/1,0,1,2)	1.10			
		1.50	B					MADE GROUND - Brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
		1.95	J		1.90			
		2.00		N=4 (1,1/1,1,1,1)	2.10			MADE GROUND - Dark blackish brown very sandy clay. Sand is fine to coarse with organic odour.
		2.30	TJ					MADE GROUND - Blackish brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of mixed lithologies, brick and coal.
		3.00	B					
		3.00		N=11 (0,1/2,3,3,3)				
					3.50			MADE GROUND - Brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies, brick and concrete.
		4.00		N=14 (3,3/3,3,4,4)				
		4.60	TJ					
		5.00		N=29 (3,4/4,5,8,12)	5.00			End of borehole at 5.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS03**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 25/05/2020 -	Logged By HD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
		0.50	TJ					MADE GROUND - Blackish brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of mixed lithologies, brick and coal.
		1.00		N=15 (3,3/4,3,4,4)				
					1.85			Firm to stiff brown very sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies and coal.
		2.00		N=13 (3,3/3,4,3,3)	2.10			Firm to stiff light grey very sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded of mudstone.
		2.90	B					
		3.00		N=22 (6,5/5,4,6,7)	3.00			Extremely weak light grey MUDSTONE
		4.00		50 (25 for 95mm/50 for 135mm)	4.00			End of borehole at 4.00 m

Remarks

Borehole Log

Borehole No. **WS04**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 25/05/2020 -	Logged By HD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	TJ		0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse.
		1.00 1.00	TJ	N=14 (2,2/3,3,4,4)	0.90			MADE GROUND - Blackish brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of mixed lithologies, brick and coal.
		2.00 2.00	B	N=20 (4,3/4,5,6,5)				Firm to very stiff brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded of mixed lithologies and coal.
		3.00 3.00	B	N=40 (10,8/7,13,8,12)	3.00			End of borehole at 3.00 m

Remarks

Borehole Log

Borehole No. **WS05**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 25/05/2020 -	Logged By HD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse.
		0.60	TJ		0.70			MADE GROUND - Blackish brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of mixed lithologies, brick and coal.
		1.00	B		0.80			MADE GROUND - Red sand. Sand is fine to coarse.
		1.00		N=11 (2,2/2,2,3,4)				Firm brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded of mixed lithologies and coal.
		2.00		N=15 (5,3/3,4,4,4)				
					2.50			Extremely weak light grey MUDSTONE.
		3.00	B		3.00			End of borehole at 3.00 m
		3.00		50 (25 for 85mm/50 for 5mm)				

Remarks

AGS

Borehole Log

Borehole No. **WS06**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	TJ		0.20			MADE GROUND - Grass overlying dark brown sandy slightly gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies and brick.
					0.45			MADE GROUND - Orangish brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies and coal.
		1.00		N=24 (4,4/4,6,7,7)				
		1.70	B					Firm to stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to angular of mixed lithologies and coal.
					1.80			Extremely weak yellowish brown MUDSTONE.
		2.00		50 (25 for 135mm/50 for 125mm)	2.00			End of borehole at 2.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS07**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	TJ		0.30			MADE GROUND - Grass overlying dark brown sandy slightly gravelly clayey topsoil. Gravel is sub-rounded to angular of mixed lithologies.
					0.60			MADE GROUND - Orangish brown sandy gravelly clay. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies and coal.
		1.00		N=20 (3,4/4,4,6,6)				Firm to stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to angular of mixed lithologies and coal.
	▼				1.70			Black friable dull saturated COAL.
		1.90	T		1.90			Very stiff light grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone.
		2.00		50 (25 for 145mm/50 for 190mm)	2.00			End of borehole at 2.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS08**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.35	TJ		0.40			MADE GROUND - Grass overlying brown mottled grey sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to sub-rounded of mixed lithologies and concrete.
		1.00		N=15 (3,3/3,4,4,4)				Firm to very stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to angular of mixed lithologies and coal.
		2.00		N=40 (6,6/8,10,12,10)				
		2.80		N=50 (13,10/50 for 295mm)	2.80			End of borehole at 2.80 m

Remarks

Borehole Log

Borehole No. **WS09**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			MADE GROUND - Grass overlying dark brown sandy slightly gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies and brick.
		0.90	D					Firm to stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to angular of mixed lithologies and coal.
		1.00		N=14 (2,2/3,3,4,4)				
	▼	1.50	T					
		2.00		N=15 (13,10/4,3,4,4)				
					2.70			Extremely weak light grey MUDSTONE.
		3.00		N=28 (9,7/7,7,7,7)				
		3.50		50 (25 for 5mm/50 for 5mm)	3.50			End of borehole at 3.50 m

Remarks

AGS

Borehole Log

Borehole No. **WS10**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.20			MADE GROUND - Grass overlying dark brown sandy slightly gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies and brick.
		0.60	T					MADE GROUND - Brown mottled grey sandy gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies and coal.
		1.00		N=25 (3,2/7,8,7,3)	1.40			Firm to stiff brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies,
	▼	2.00		N=40 (6,7/10,10,10,10)	2.50			Firm to stiff light grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone.
		3.00		50 (25 for 65mm/50 for 20mm)	2.70 3.00			Extremely weak light grey MUDSTONE. End of borehole at 3.00 m

Remarks

Borehole Log

Borehole No. **WS11**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	TJ		0.30			MADE GROUND - Grass overlying dark brown sandy slightly gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies and brick.
		1.00		N=18 (4,3/4,4,4,6)				Firm to very stiff brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
		2.00		N=18 (3,3/3,4,6,5)				
		2.50	T					
		3.00		N=50 (8,12/50 for 295mm)	3.00			End of borehole at 3.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS12**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: -	Hole Type WS
Location: Argoed High School		Level:	Scale 1:50
Client: Gleeds Management Services Limited		Dates: 03/08/2020 -	Logged By HEB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			MADE GROUND - Grass overlying dark brown sandy slightly gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to rounded of mixed lithologies and brick.
	▼	1.00 1.00	T	N=20 (3,3/5,5,5,5)				Firm to very stiff slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
		1.50 1.50	D	50 (25 for 40mm/50 for 20mm)	1.50			End of borehole at 1.50 m

Remarks

AGS

Trial Pit Log

Trialpit No **TP101** Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: - Level:	Date 03/08/2020
Location: Argoed High School		Dimensions (m): Depth 2.00	Scale 1:25
Client: Gleeds Management Services Limited			Logged HD

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
	0.60	B					MADE GROUND - Brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
	1.00	B					
	1.40	B					
	2.00	B		2.00			End of pit at 2.00 m

1
2
3
4
5

Remarks:

Stability:

Trial Pit Log

Trialpit No **TP102** Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: - Level:	Date 03/08/2020
Location: Argoed High School		Dimensions (m): Depth 2.20	Scale 1:25
Client: Gleeds Management Services Limited			Logged HD

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
	0.40	B					MADE GROUND - Brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
	1.00	B					
	1.20	B					
	1.50	B					
				2.20			End of pit at 2.20 m

Remarks:

Stability:

Trial Pit Log

Trialpit No **TP103** Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: - Level:	Date 03/08/2020
Location: Argoed High School		Dimensions (m): Depth 1.00	Scale 1:25
Client: Gleeds Management Services Limited			Logged HD

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50	B		0.10			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
							MADE GROUND - Brown sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to rounded of mixed lithologies.
				1.00			End of pit at 1.00 m

1 2 3 4 5

Remarks:

Stability:

Trial Pit Log

hsp consulting

Trialpit No **TP104**

Sheet 1 of 1

Project Name: Argoed High School	Project No. C3250	Co-ords: - Level:	Date 03/08/2020
Location: Argoed High School		Dimensions (m): Depth 1.20	Scale 1:25
Client: Gleeds Management Services Limited			Logged HD

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	B		0.20			MADE GROUND - Grass overlying sandy clayey topsoil. Sand is fine to coarse.
				1.20			MADE GROUND - Blackish brown very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of mixed lithologies, brick and coal.
							End of pit at 1.20 m

1 2 3 4 5

Remarks:

Stability:

AGS

Appendix IV

DO NOT SCALE

NOTES:

N

- Approximate Red Line Boundary

- Window sample borehole

-Trial Pit

- Approximate MEXE Probe Location

hsp consulting
Lawrence House, Meadowbank Way,
Eastwood, Nottingham, NG16 3SB
Tel: 01773 535 555 Fax: 0870 600 6091
www.hspconsulting.com

CLIENT:
Gleeds Management Services

PROJECT:
Argoed High School

TITLE:
Ground Investigation Layout Plan

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN:	DATE:
HJD	August 2020
PROJECT No:	DRAWING No:
C3250	502

Appendix V

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	20-16651-2		
Initial Date of Issue:	07-Jul-2020	**Date of Re-Issue:**	08-Sep-2020
Client	HSP Consulting Engineers Limited		
Client Address:	Lawrence House Meadowbank Way Eastwood Nottinghamshire NG16 3SB		
Contact(s):	Howard Daley		
Project	C3250 Argoed High School		
Quotation No.:		**Date Received:**	01-Jul-2020
Order No.:	SC13380	**Date Instructed:**	01-Jul-2020
No. of Samples:	10		
Turnaround (Wkdays):	5	**Results Due:**	07-Jul-2020
Date Approved:	07-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: C3250 Argoed High School

Client: HSP Consulting Engineers Limited		**Chemtest Job No.:**			20-16651	20-16651	20-16651	20-16651	20-16651	20-16651	20-16651
Quotation No.:		**Chemtest Sample ID.:**			1024785	1024786	1024787	1024789	1024792	1024793	1024794
		Sample Location:			WS01	WS02	WS02	WS03	WS04	WS04	WS05
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.20	1.00	2.30	0.50	0.05	1.00	0.60
		Date Sampled:			25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020
		Asbestos Lab:			COVENTRY		COVENTRY				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
ACM Type	U	2192		N/A	-		-				
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected				
ACM Detection Stage	U	2192		N/A	-		-				
Moisture	N	2030	%	0.020	13	11				16	7.6
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	None	Stones	None	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Sand	Clay	Clay	Sand	Clay	Sand
pH	M	2010		4.0	8.1	8.4				8.2	8.5
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.48	< 0.40					
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.015	< 0.010				< 0.010	< 0.010
Total Sulphur	M	2175	%	0.010		< 0.010				< 0.010	< 0.010
Sulphur (Elemental)	M	2180	mg/kg	1.0	1.3	< 1.0					
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50					
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50					
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	4.0	1.7					
Sulphate (Acid Soluble)	M	2430	%	0.010		< 0.010				< 0.010	0.030
Arsenic	M	2450	mg/kg	1.0	5.9	8.7					
Cadmium	M	2450	mg/kg	0.10	< 0.10	< 0.10					
Chromium	M	2450	mg/kg	1.0	19	26					
Copper	M	2450	mg/kg	0.50	6.8	24					
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10					
Nickel	M	2450	mg/kg	0.50	11	38					
Lead	M	2450	mg/kg	0.50	23	14					
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20					
Zinc	M	2450	mg/kg	0.50	32	51					
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50					
Organic Matter	M	2625	%	0.40		0.59					
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0					
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0					
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0					

Results - Soil

Project: C3250 Argoed High School

Client: HSP Consulting Engineers Limited		**Chemtest Job No.:**			20-16651	20-16651	20-16651	20-16651	20-16651	20-16651	20-16651
Quotation No.:		**Chemtest Sample ID.:**			1024785	1024786	1024787	1024789	1024792	1024793	1024794
		Sample Location:			WS01	WS02	WS02	WS03	WS04	WS04	WS05
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.20	1.00	2.30	0.50	0.05	1.00	0.60
		Date Sampled:			25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020	25-Jun-2020
		Asbestos Lab:			COVENTRY		COVENTRY				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0					
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0					
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0					
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0					
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0					
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10					
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10					
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0					
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0					
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0					
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0					
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0					
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0					
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0					
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30					

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-20468-1
Initial Date of Issue:	17-Aug-2020
Client	HSP Consulting Engineers Limited
Client Address:	Lawrence House Meadowbank Way Eastwood Nottinghamshire NG16 3SB
Contact(s):	Howard Daley
Project	C3250 Argoed High School

Quotation No.:		**Date Received:**	06-Aug-2020
Order No.:		**Date Instructed:**	06-Aug-2020
No. of Samples:	8		
Turnaround (Wkdays):	5	**Results Due:**	12-Aug-2020
Date Approved:	17-Aug-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: C3250 Argoed High School

Client: HSP Consulting Engineers Limited		**Chemtest Job No.:**			20-20468	20-20468	20-20468	20-20468	20-20468	20-20468	20-20468	20-20468
Quotation No.:		**Chemtest Sample ID.:**			1043561	1043562	1043563	1043565	1043566	1043567	1043569	1043570
		Sample Location:			WS06	WS06	WS07	WS08	WS09	WS10	WS11	WS12
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.30	1.70	0.10	0.35	1.50	0.10	2.50	1.00
		Date Sampled:			03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020
		Asbestos Lab:			COVENTRY			COVENTRY				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-			-				
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected			No Asbestos Detected				
ACM Detection Stage	U	2192		N/A	-			-				
Moisture	N	2030	%	0.020	13	11	30	11	15	24	10	10
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones and Roots	Stones and Roots	Stones	Roots and Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Clay	Sand	Sand	Sand	Sand	Sand	Sand
pH	M	2010		4.0	8.0	8.3	6.7	8.2	8.4	6.5	8.4	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	2.7	< 0.40	0.40	< 0.40		< 0.40		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	1.7	0.012	0.054	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Sulphur	M	2175	%	0.010		< 0.010			0.013		0.020	0.020
Sulphur (Elemental)	M	2180	mg/kg	1.0	< 1.0	1.5	5.3	4.4		< 1.0		
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50		
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	3.0	1.8	0.87	1.9		0.69		
Sulphate (Acid Soluble)	M	2430	%	0.010		< 0.010			< 0.010		< 0.010	< 0.010
Arsenic	M	2450	mg/kg	1.0	7.3	5.3	7.9	6.7		5.0		
Cadmium	M	2450	mg/kg	0.10	< 0.10	0.15	0.28	0.21		0.19		
Chromium	M	2450	mg/kg	1.0	22	17	19	18		14		
Copper	M	2450	mg/kg	0.50	36	20	14	12		12		
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Nickel	M	2450	mg/kg	0.50	17	28	14	17		13		
Lead	M	2450	mg/kg	0.50	18	15	60	61		49		
Selenium	M	2450	mg/kg	0.20	0.28	0.32	0.28	0.24		0.28		
Zinc	M	2450	mg/kg	0.50	80	56	59	60		61		
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50		
Organic Matter	M	2625	%	0.40	0.76		8.1	3.1		6.6		
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	[C] < 5.0	< 5.0	< 5.0		< 5.0		

Results - Soil

Project: C3250 Argoed High School

Client: HSP Consulting Engineers Limited		**Chemtest Job No.:**			20-20468	20-20468	20-20468	20-20468	20-20468	20-20468	20-20468	20-20468
Quotation No.:		**Chemtest Sample ID.:**			1043561	1043562	1043563	1043565	1043566	1043567	1043569	1043570
		Sample Location:			WS06	WS06	WS07	WS08	WS09	WS10	WS11	WS12
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.30	1.70	0.10	0.35	1.50	0.10	2.50	1.00
		Date Sampled:			03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020	03-Aug-2020
		Asbestos Lab:			COVENTRY			COVENTRY				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	[C] < 5.0	< 5.0	< 5.0		< 5.0		
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	[C] < 10	< 10	< 10		< 10		
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		0.54		
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		0.46		
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10		< 0.10		
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0		< 2.0		
Benzene	M	2760	µg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Toluene	M	2760	µg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
o-Xylene	M	2760	µg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	[C] < 1.0	< 1.0	< 1.0		< 1.0		
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30		< 0.30		

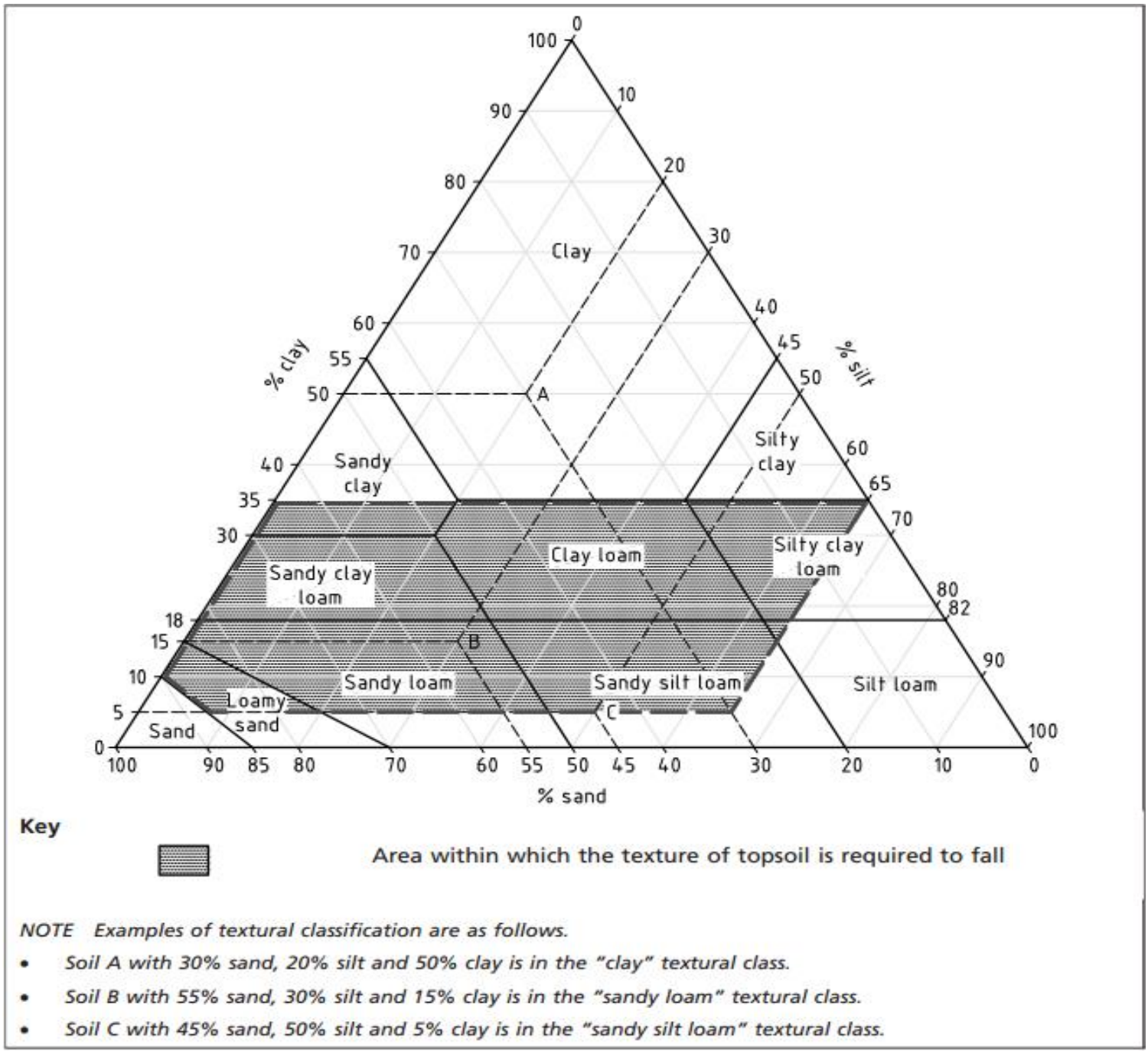
Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 20-20468
Chemtest Sample ID.: 1043567
Client Sample Ref.:
Sample Location: WS10
Client Sample ID.:
Top Depth (m): 0.10
Bottom Depth (m):
Date Sampled: 03-Aug-2020
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture							**Acid**	**Low F**	**Calc.**
Clay content	%				23				
Silt content	%				23				
Sand content	%				55				
Soil texture class		See Attached Chart			Sandy Clay Loam	YES			
Mass Loss on Ignition									
Clay 5-20%		3.0-20			3.5	NO	NO	YES	NO
Clay 20-35%		5.0-20							
Stone Content	**% m/m**								
>2mm		0-30			23	YES			
>20mm		0-10			< 0.020	YES			
>50mm		0			< 0.020	YES			
Soil pH value		5.5-8.5			6.5	YES	NO	YES	NO
Carbonate (Calcareous only)	%				2.3				YES
Electrical Conductivity	µS/cm	If >3300 do ESP			2200	YES			
Available Nutrient Content									
Nitrogen %		>0.15			0.40	YES	YES		YES
Extractable phosphorus	mg/l	16-140			2.1	NO	NO	YES	NO
Extractable potassium	mg/l	121-1500			1000	YES	YES		YES
Extractable magnesium	mg/l	51-600			1100	NO	NO		NO
Carbon : Nitrogen Ratio		<20:1			5.2/1	YES	YES	YES	YES
Exchangeable sodium	**%**	<15			0.76				
Available Calcium	mg/l				23000				
Available Sodium	mg/l				220				
Phytotoxic Contaminants (by soil pH)		**< 6.0**	**6.0-7.0**	**> 7.0**					
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	69	YES			
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	15	YES			
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	17	YES			
Visible Contaminants	**% mm**								
>2mm		<0.5			0.000	YES			
….. of which plastics		<0.25			0.000	YES			
….. man-made sharps		zero in 1kg			0.000	YES			

Topsoil: BS3882:2015
Texture Classification Chart



Key

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

- *Soil A with 30% sand, 20% silt and 50% clay is in the "clay" textural class.*
- *Soil B with 55% sand, 30% silt and 15% clay is in the "sandy loam" textural class.*
- *Soil C with 45% sand, 50% silt and 5% clay is in the "sandy silt loam" textural class.*

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1043562			WS06	03-Aug-2020	C	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix VI

LABORATORY REPORT

4043

Contract Number: PSL20/3317

Report Date: 07 September 2020

Client's Reference: C3250

Client Name: HSP Consulting
Lawrence House
4 Meadowbank Way
Eastwood
Nottingham
NG16 3SB

For the attention of: Howard Daley

Contract Title: Argoed High School

Date Received: 3/7/2020
Date Commenced: 3/7/2020
Date Completed: 4/8/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

S Royle (Laboratory Manager)
S Eyre (Senior Technician)
L Knight (Senior Technician)

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e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS01		B	0.50		Brown mottled grey gravelly sandy CLAY.
WS01		B	1.50		Brown mottled grey gravelly sandy CLAY.
WS02		B	1.50		Brown mottled grey gravelly sandy CLAY.
WS02		B	3.00		Brown mottled grey gravelly sandy CLAY.
WS03		B	2.90		Grey sandy CLAY.
WS04		B	2.00		Brown mottled grey gravelly sandy CLAY.
WS04		B	3.00		Brown mottled grey gravelly sandy CLAY.
WS05		B	1.00		Brown slightly gravelly sandy CLAY.
WS05		B	3.00		Brown mottled grey sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS01		B	0.50		15							
WS01		B	1.50		13			40	20	20	80	Intermediate plasticity CI.
WS02		B	1.50		14							
WS02		B	3.00		16			36	18	18	85	Intermediate plasticity CI.
WS03		B	2.90		13			43	20	23	100	Intermediate plasticity CI.
WS04		B	2.00		13							
WS04		B	3.00		10							
WS05		B	1.00		19			47	23	24	92	Intermediate plasticity CI.
WS05		B	3.00		11							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

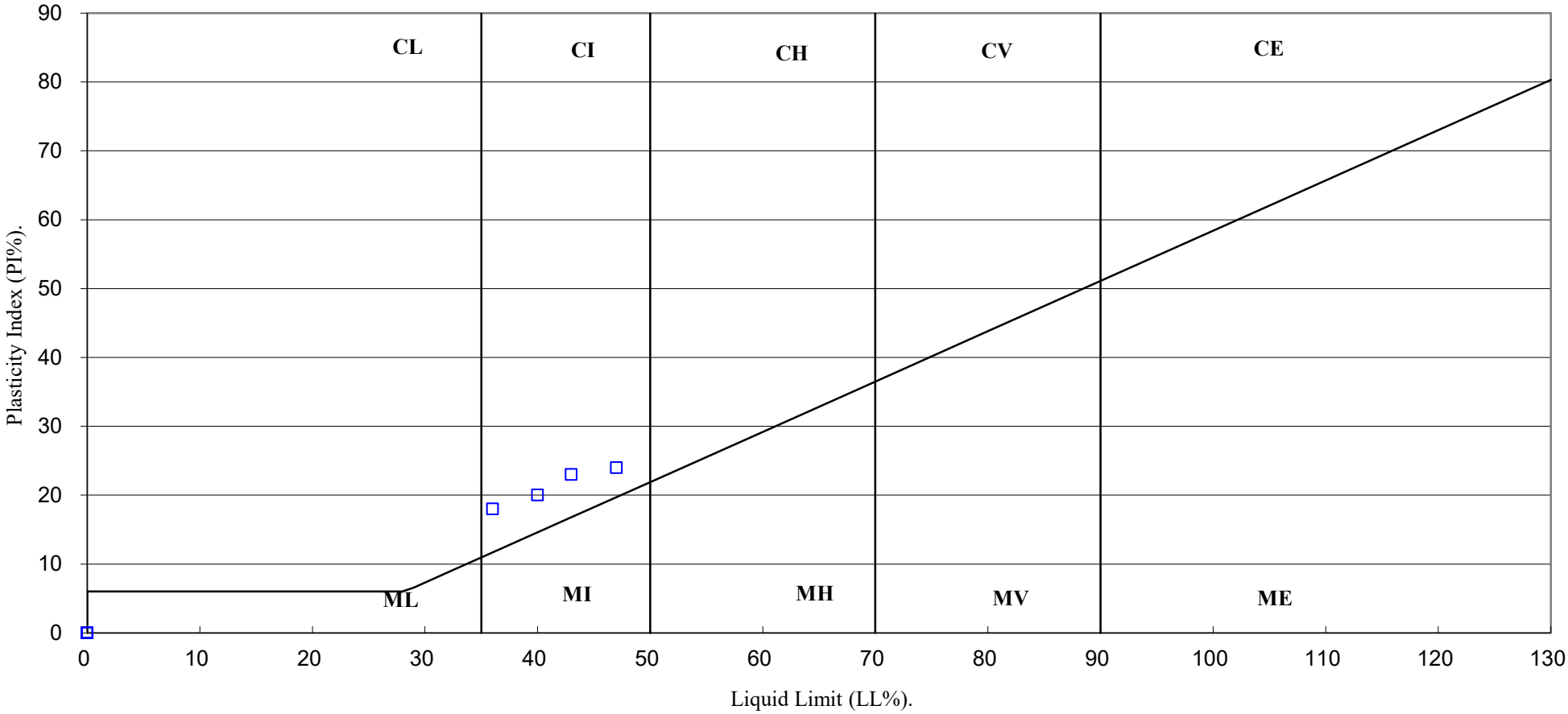
Contract No:

PSL20/3317

Client Ref:

C3250

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Argoed High School	Contract No: PSL20/3317 Client Ref: C3250

PARTICLE SIZE DISTRIBUTION TEST

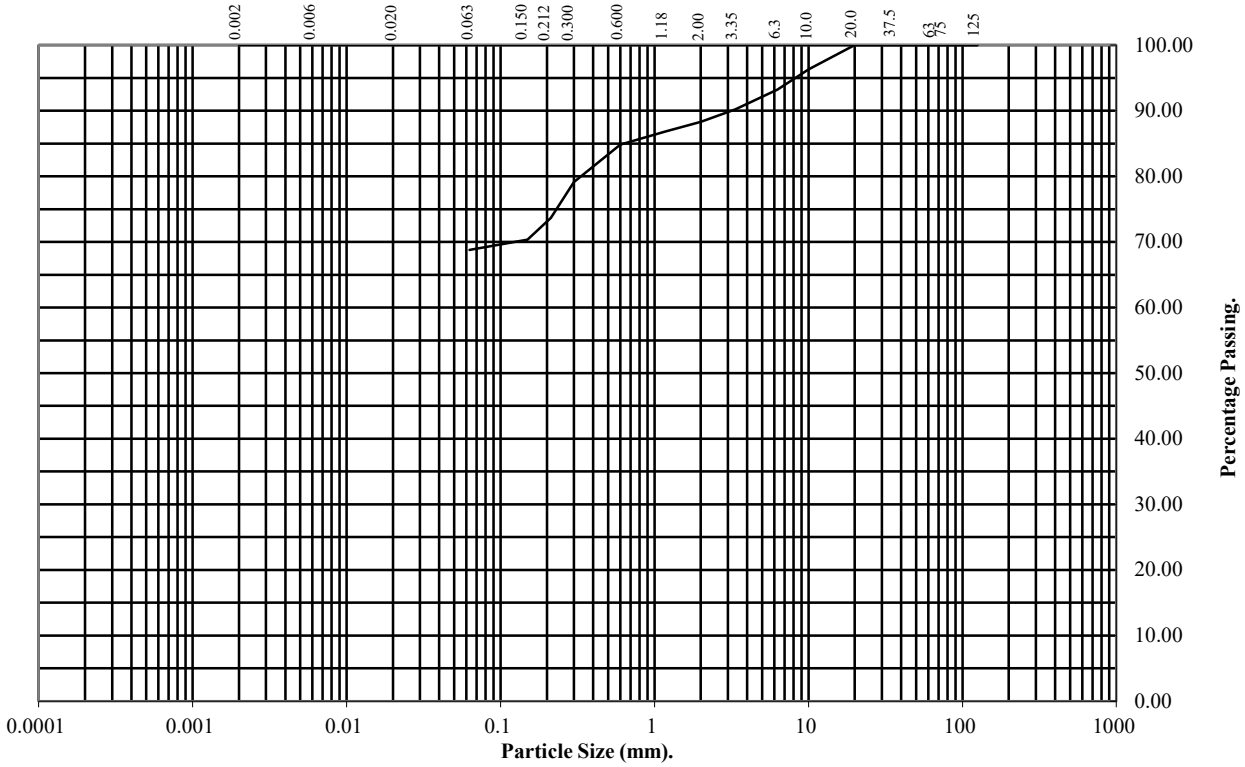
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **WS02** **Top Depth (m):** **1.50**

Sample Number: **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	96
6.3	93
3.35	90
2	88
1.18	87
0.6	85
0.3	79
0.212	74
0.15	70
0.063	69

Soil Fraction	Total Percentage
Cobbles	0
Gravel	12
Sand	19
Silt/Clay	69

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

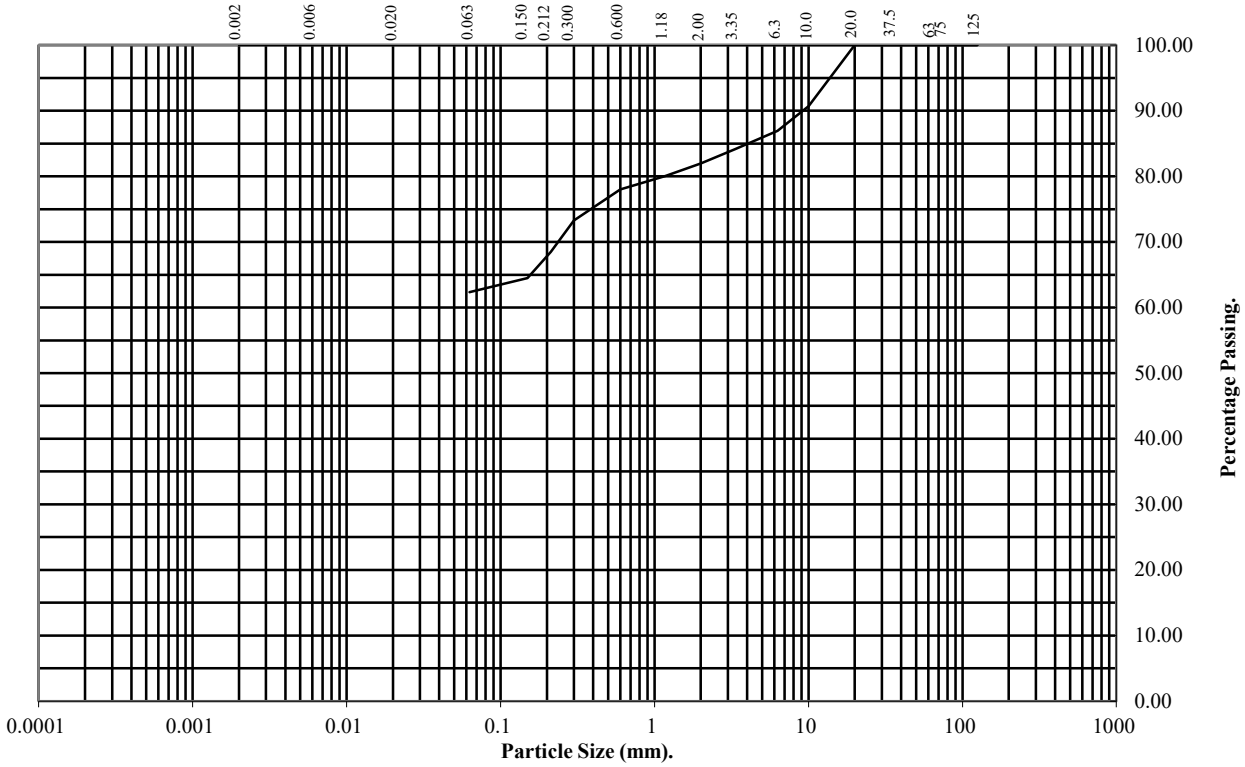
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **WS04** **Top Depth (m):** **3.00**

Sample Number: **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	91
6.3	87
3.35	84
2	82
1.18	80
0.6	78
0.3	73
0.212	68
0.15	64
0.063	62

Soil Fraction	Total Percentage
Cobbles	0
Gravel	18
Sand	20
Silt/Clay	62

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

Contract No: PSL20/3317

Client Ref: C3250

LABORATORY REPORT

4043

Contract Number: PSL20/4002

Report Date: 28 August 2020

Client's Reference: C3250

Client Name: HSP Consulting
Lawrence House
4 Meadowbank Way
Eastwood
Nottingham
NG16 3SB

For the attention of: Howard Daley

Contract Title: Argoed High School

Date Received: 5/8/2020
Date Commenced: 5/8/2020
Date Completed: 28/8/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

L Knight (Senior Technician)
S Eyre (Senior Technician)
S Royle (Laboratory Manager)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP101		B	0.60		Brown very gravelly very sandy CLAY.
TP101		B	1.00		Brown very gravelly very sandy CLAY.
TP101		B	1.40		Brown very gravelly very sandy CLAY.
TP101		B	2.00		Brown gravelly very sandy CLAY.
TP102		B	0.40		Brown very gravelly very sandy CLAY.
TP102		B	1.00		Brown very gravelly very sandy CLAY.
TP102		B	1.20		Brown very gravelly very sandy CLAY.
TP102		B	1.50		Brown very gravelly very sandy CLAY.
TP103		B	0.50		Brown very gravelly very sandy CLAY.
TP104		B	0.50		Brown very gravelly sandy CLAY.
WS06		B	0.50	1.50	Brown slightly gravelly very sandy CLAY.
WS09		D	0.90		Brown mottled grey slightly gravelly very sandy CLAY.
WS10		D	0.60		Brown slightly gravelly very sandy CLAY.
WS10		B	0.30	1.20	Brown slightly gravelly very sandy CLAY.
WS12		D	1.50		Brown slightly gravelly very sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS09		D	0.90		15			31	16	15	93	Low plasticity CL.
WS10		D	0.60		15			35	18	17	97	Intermediate plasticity CI.
WS12		D	1.50		14			33	17	16	95	Low plasticity CL.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

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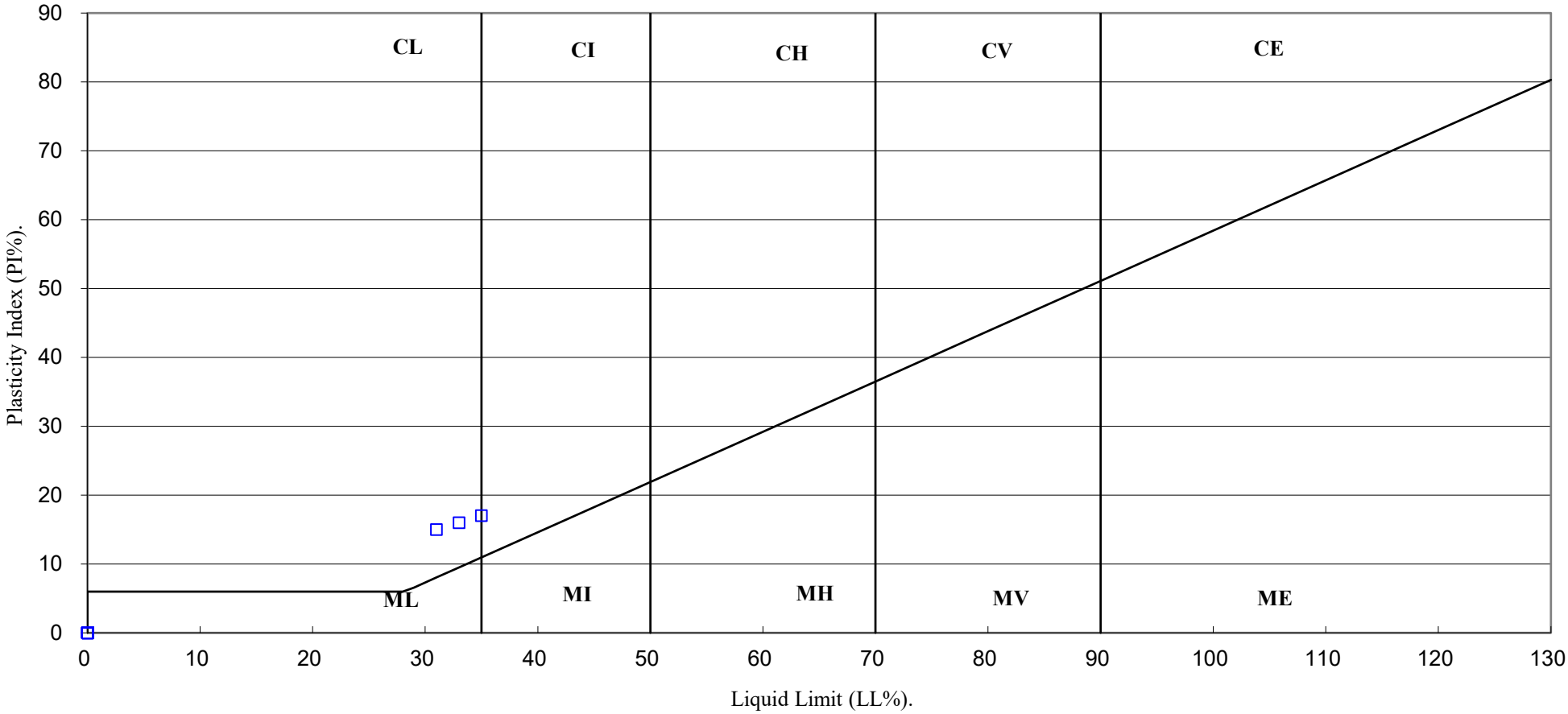
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Argoed High School	Contract No: PSL20/4002 Client Ref: C3250

PARTICLE SIZE DISTRIBUTION TEST

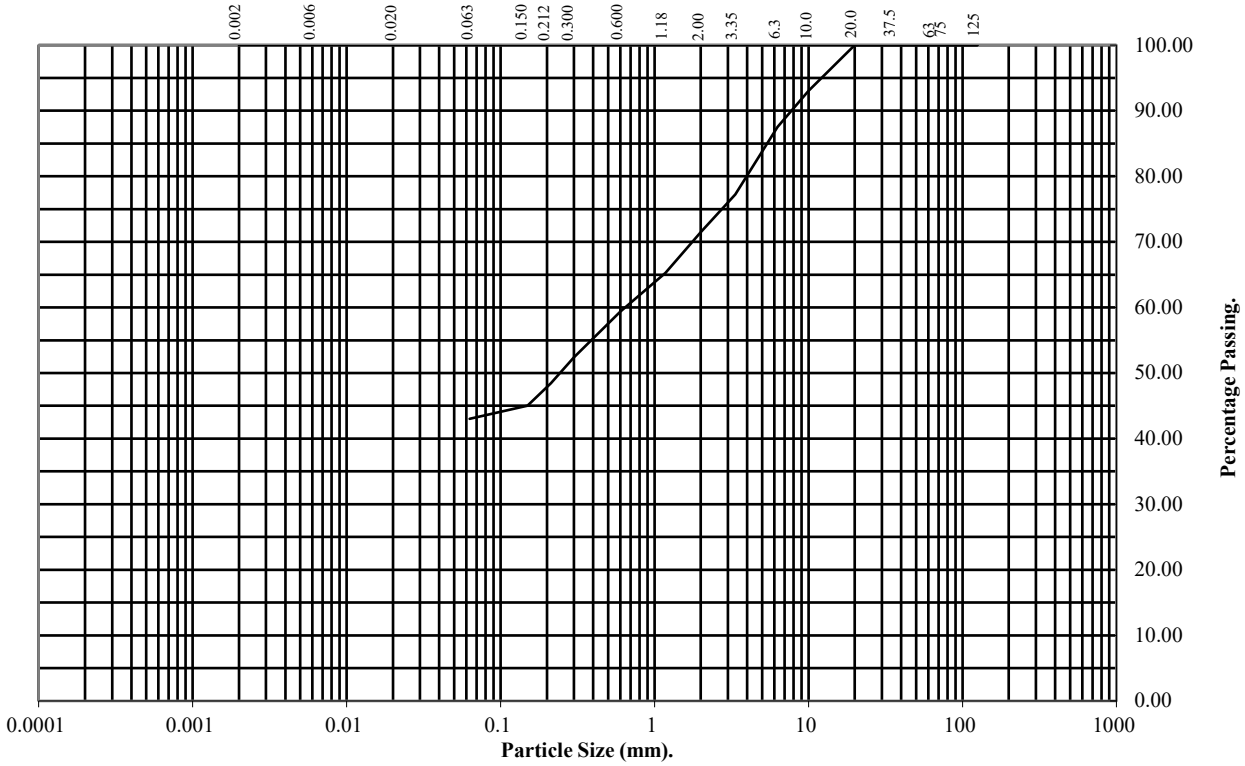
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP101 **Top Depth (m):** 0.60

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	93
6.3	88
3.35	77
2	71
1.18	65
0.6	59
0.3	52
0.212	48
0.15	45
0.063	43

Soil Fraction	Total Percentage
Cobbles	0
Gravel	29
Sand	28
Silt/Clay	43

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

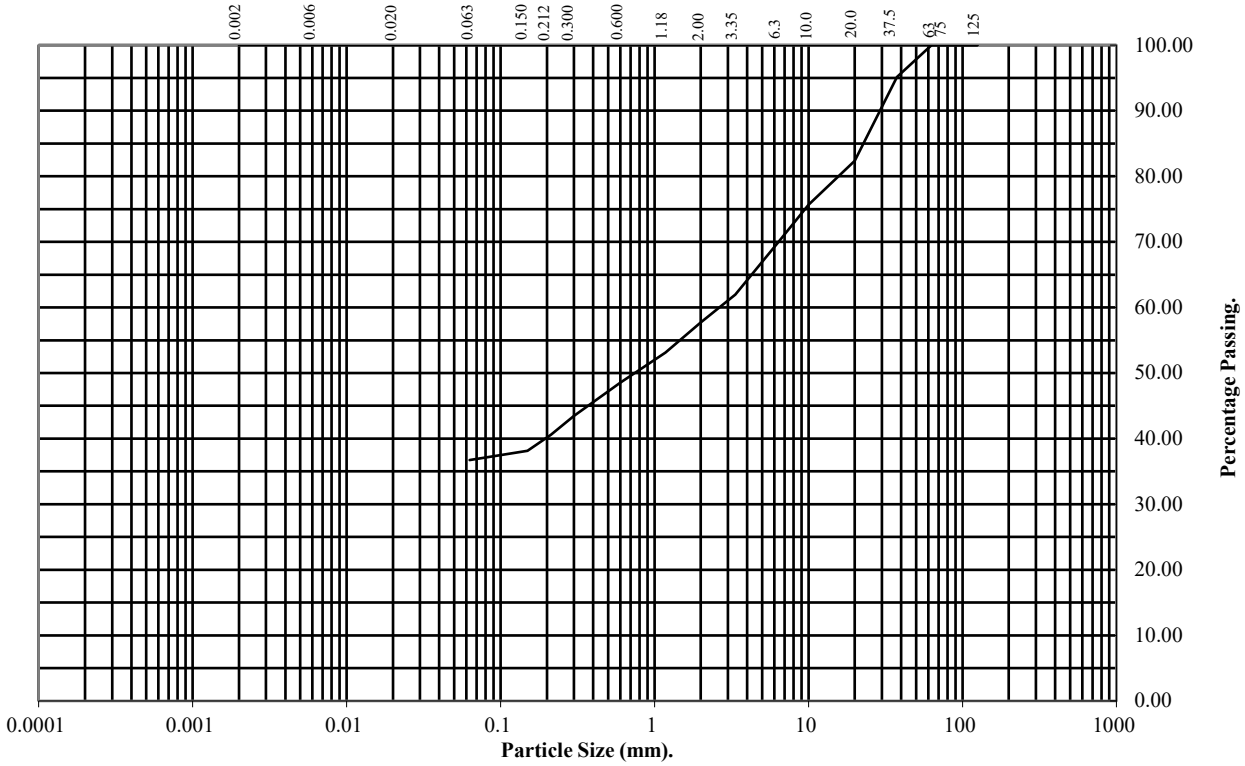
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP101 **Top Depth (m):** 1.40

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	95
20	82
10	76
6.3	70
3.35	62
2	58
1.18	53
0.6	49
0.3	43
0.212	41
0.15	38
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	42
Sand	21
Silt/Clay	37

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

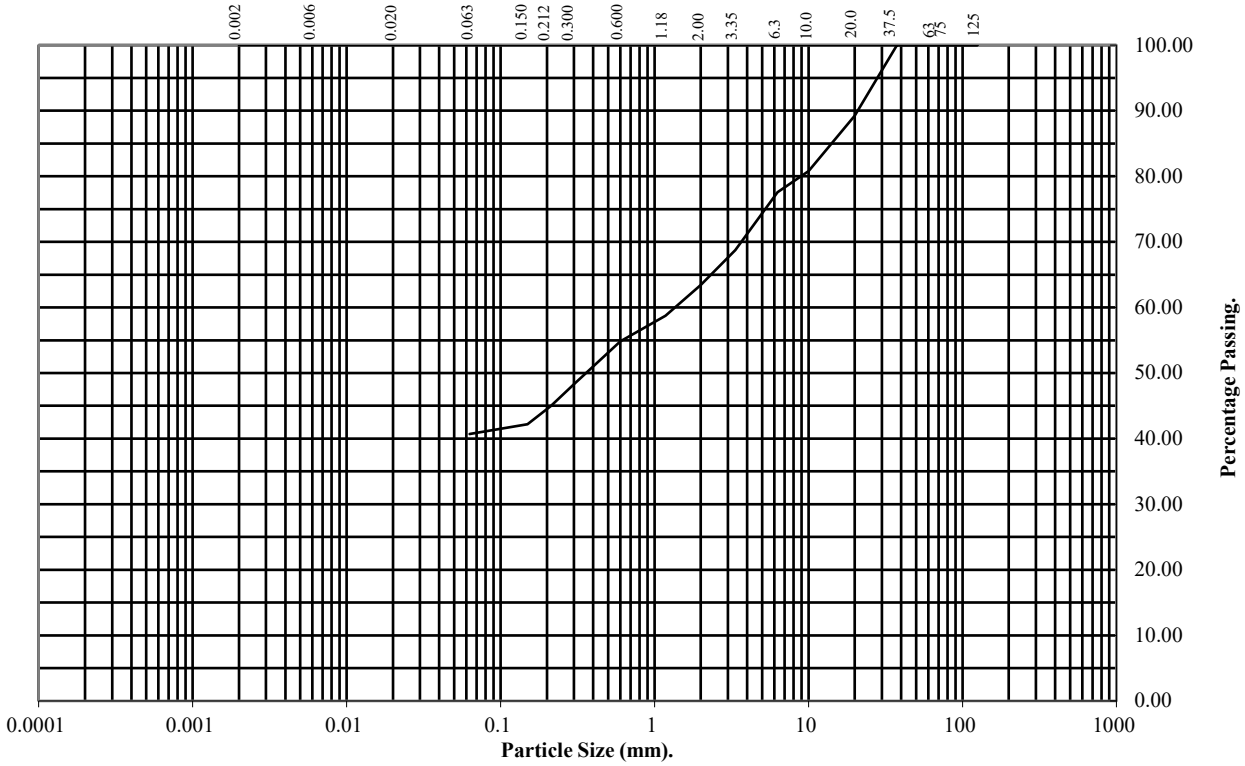
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP102 **Top Depth (m):** 1.20

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	89
10	81
6.3	78
3.35	69
2	63
1.18	59
0.6	55
0.3	48
0.212	45
0.15	42
0.063	41

Soil Fraction	Total Percentage
Cobbles	0
Gravel	37
Sand	22
Silt/Clay	41

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

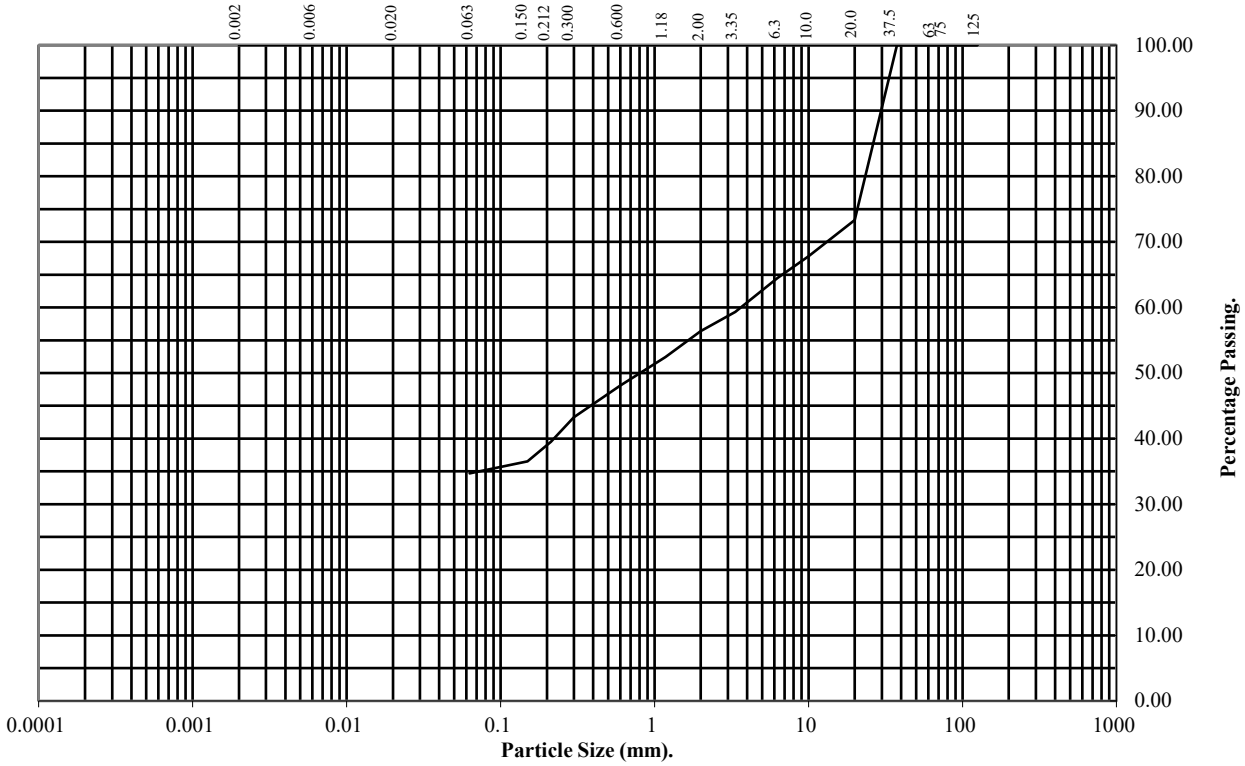
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP103 **Top Depth (m):** 0.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	73
10	68
6.3	64
3.35	59
2	56
1.18	52
0.6	48
0.3	43
0.212	39
0.15	37
0.063	35

Soil Fraction	Total Percentage
Cobbles	0
Gravel	44
Sand	21
Silt/Clay	35

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

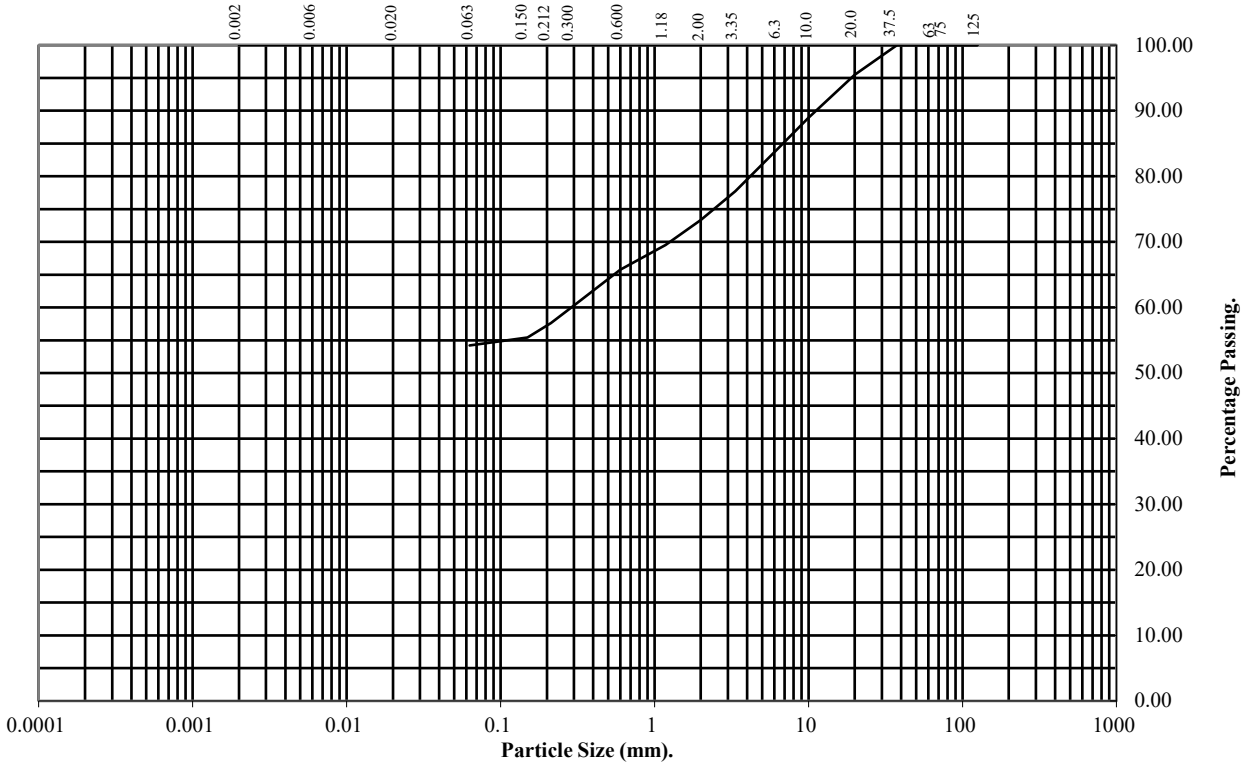
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP104 **Top Depth (m):** 0.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	89
6.3	84
3.35	78
2	73
1.18	70
0.6	66
0.3	60
0.212	58
0.15	55
0.063	54

Soil Fraction	Total Percentage
Cobbles	0
Gravel	27
Sand	19
Silt/Clay	54

Remarks:

See Summary of Soil Descriptions

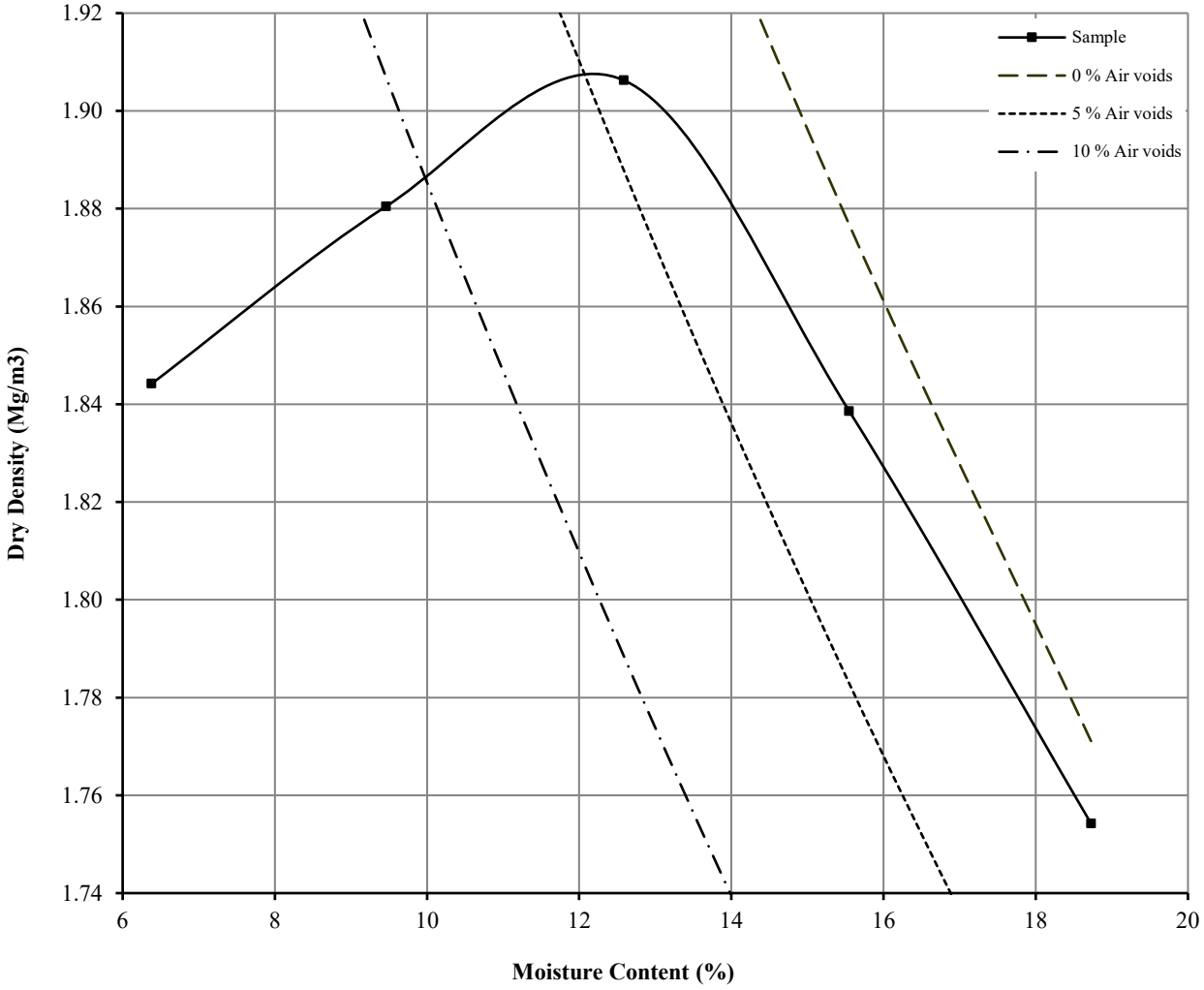
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number: TP101 **Top Depth (m) :** 0.60

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		13	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.91	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions.					

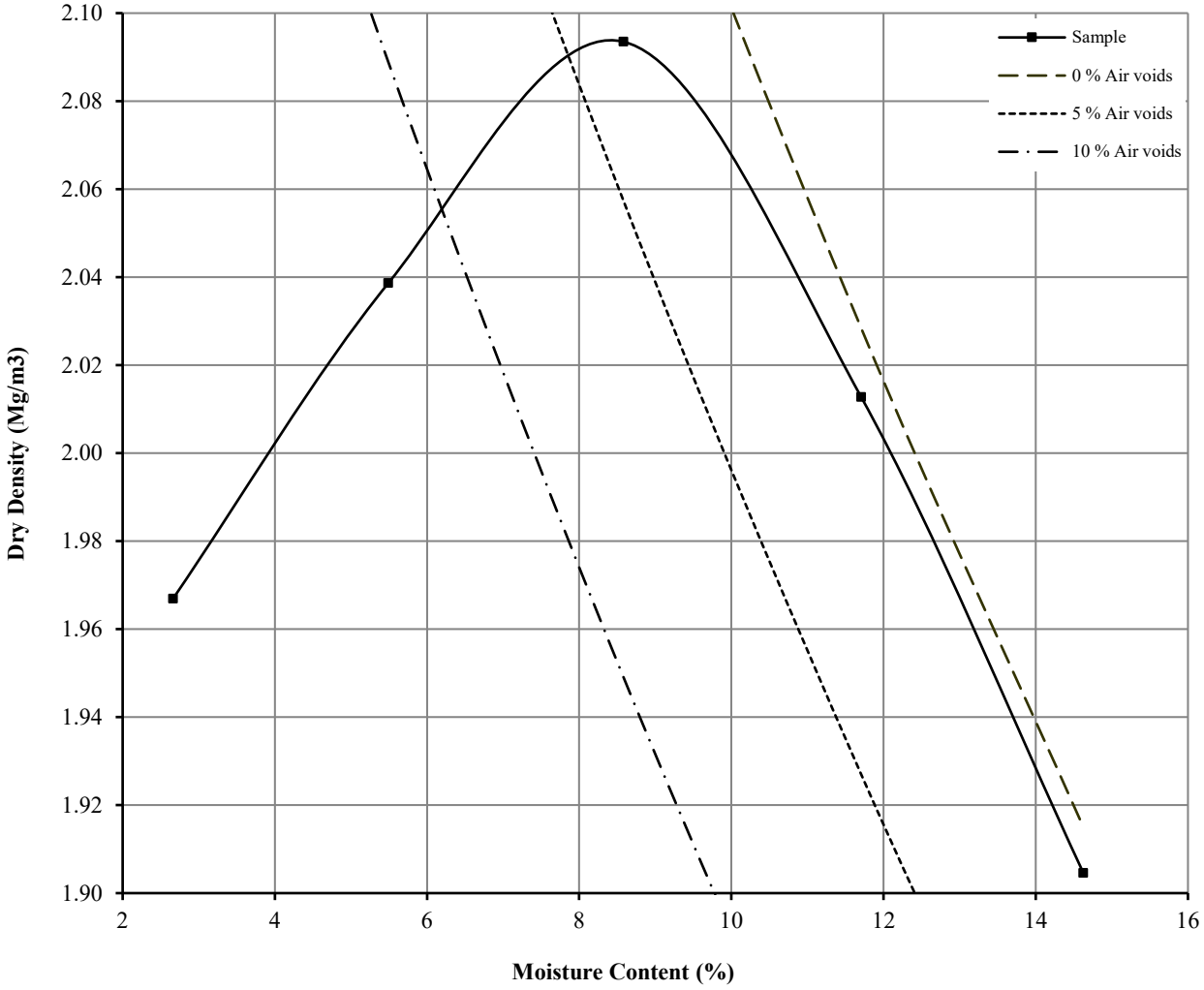
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: TP101 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		8.6	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.66	Assumed	Material Retained on 37.5 mm Test Sieve (%):		16
Maximum Dry Density (Mg/m3):		2.09	Material Retained on 20.0 mm Test Sieve (%):		5
Optimum Moisture Content (%):		9			
Remarks See summary of soil descriptions.					

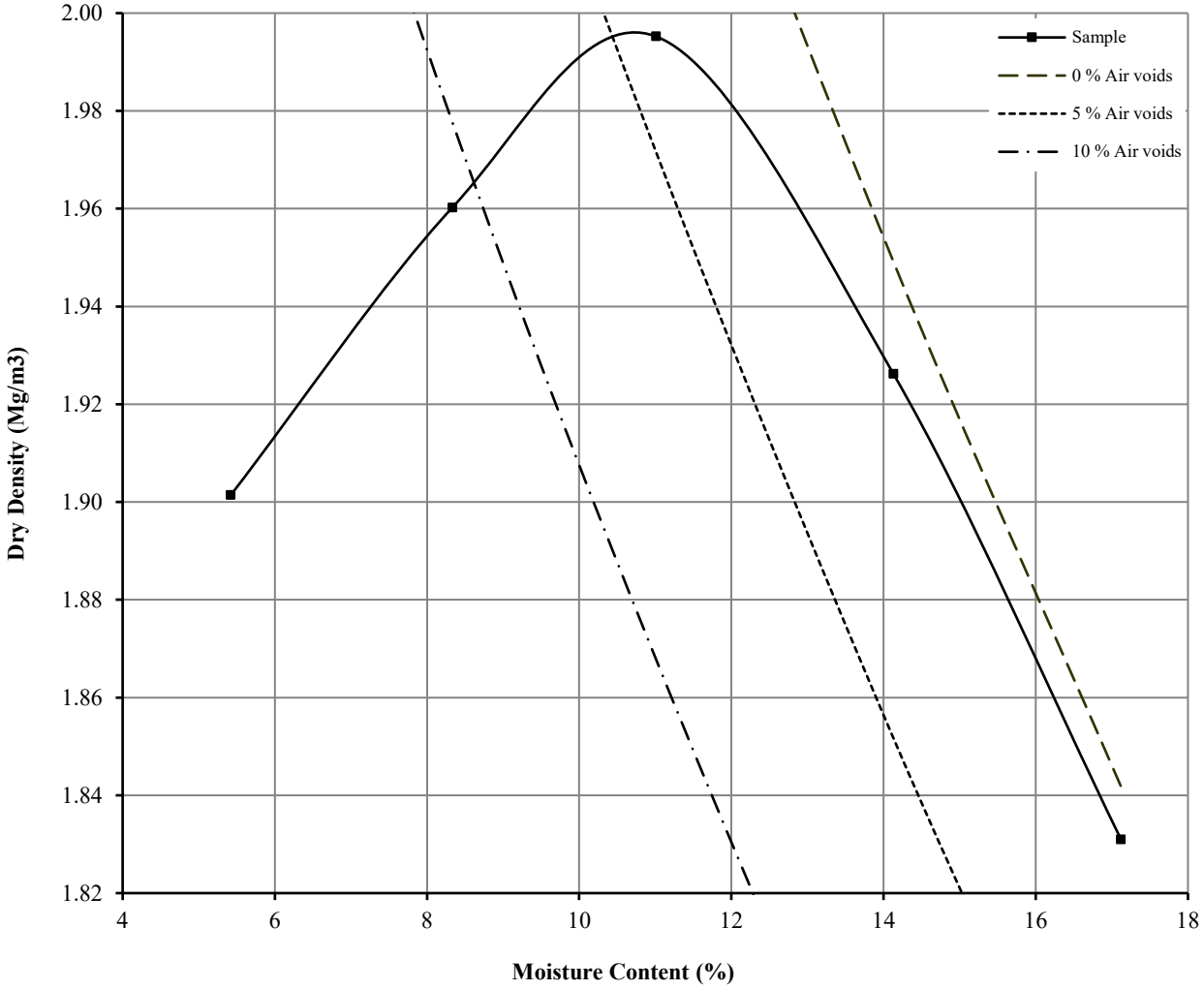
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: TP101 **Top Depth (m) :** 1.40

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		11	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Assumed	Material Retained on 37.5 mm Test Sieve (%):		5
Maximum Dry Density (Mg/m3):		2.00	Material Retained on 20.0 mm Test Sieve (%):		13
Optimum Moisture Content (%):		11			
Remarks See summary of soil descriptions.					

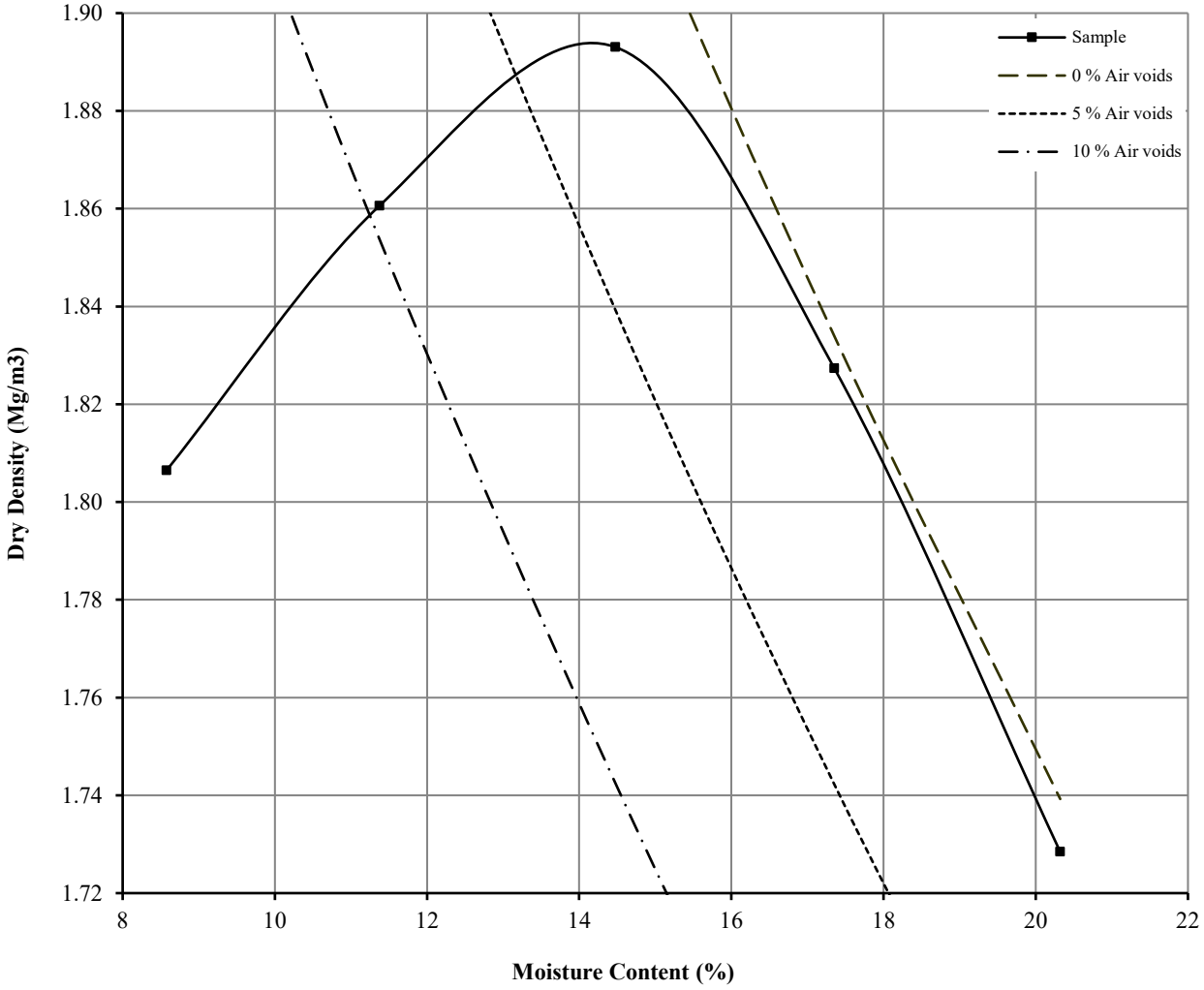
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: TP102 **Top Depth (m) :** 0.40

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		11	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.89	Material Retained on 20.0 mm Test Sieve (%):		14
Optimum Moisture Content (%):		14			
Remarks See summary of soil descriptions.					

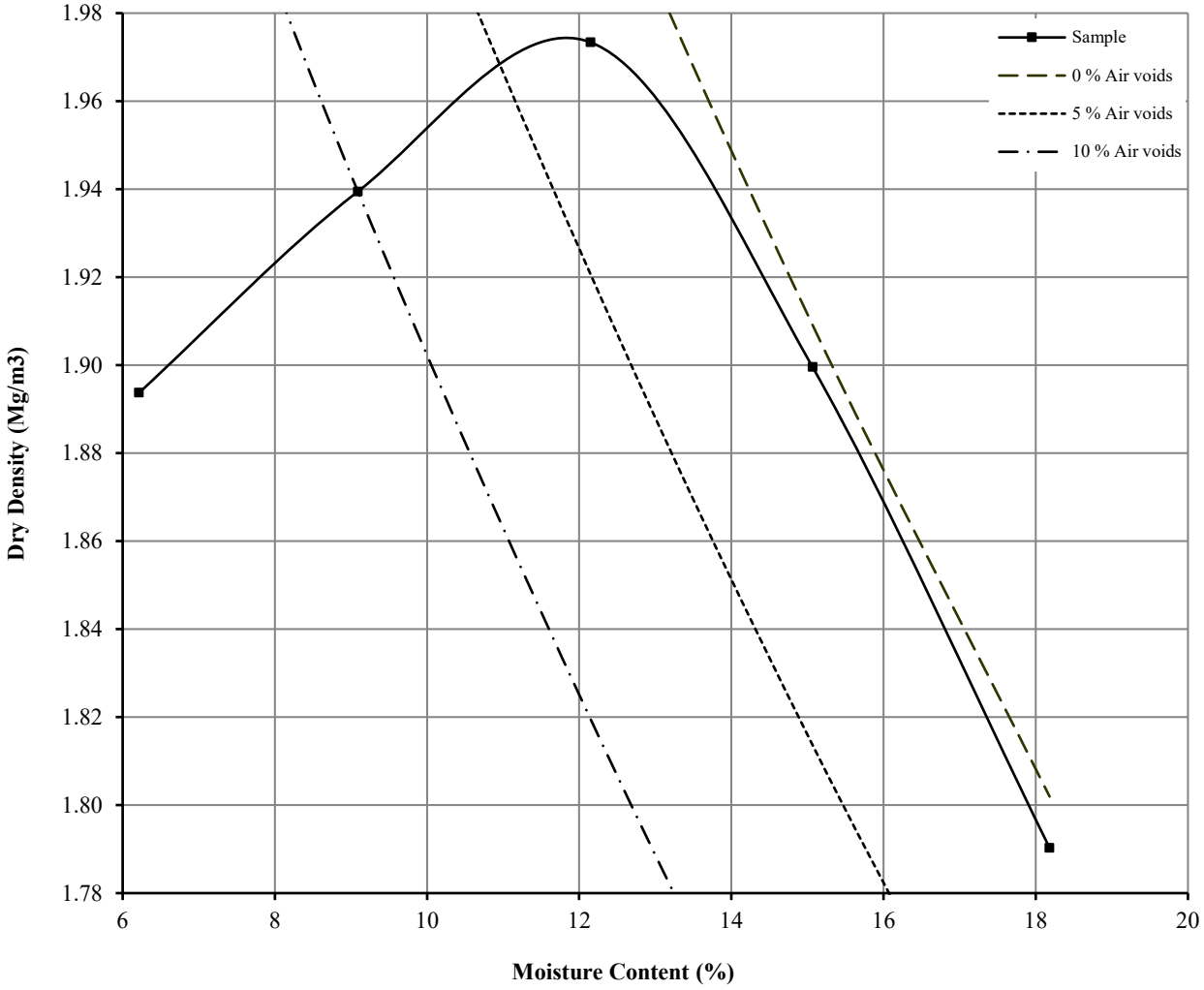
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: TP102 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B

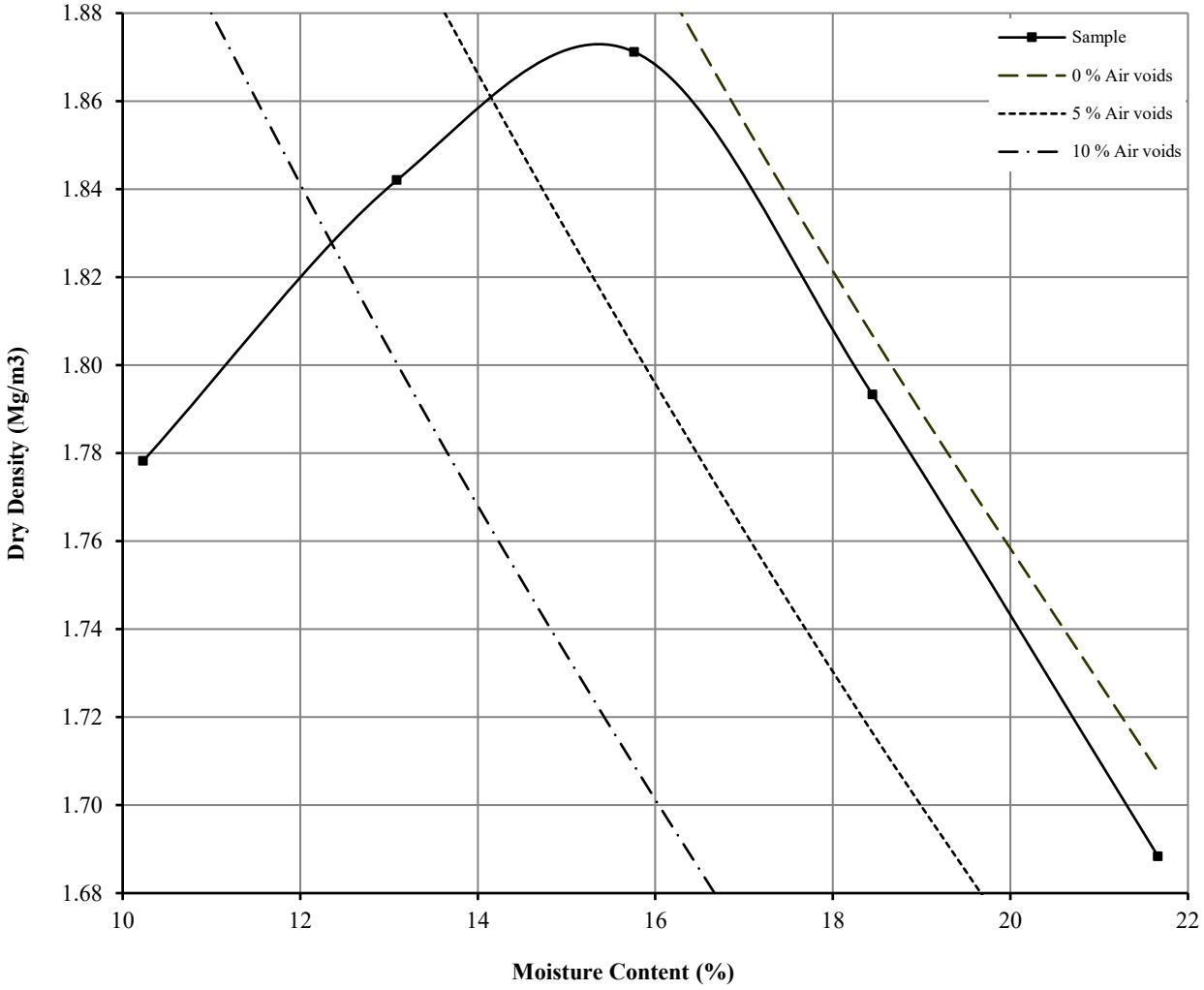


Initial Moisture Content:		9.1	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.68	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.97	Material Retained on 20.0 mm Test Sieve (%):		10
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions.					

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number:	**WS06**	**Top Depth (m) :**	**0.50**
Sample Number:		**Base Depth (m) :**	**1.50**
Sample Type:	**B**		



Initial Moisture Content:		13	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.71	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.87	Material Retained on 20.0 mm Test Sieve (%):		2
Optimum Moisture Content (%):		16			
Remarks See summary of soil descriptions.					

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Argoed High School**	**Contract** **PSL20/4002** **Client Ref** **C3250**

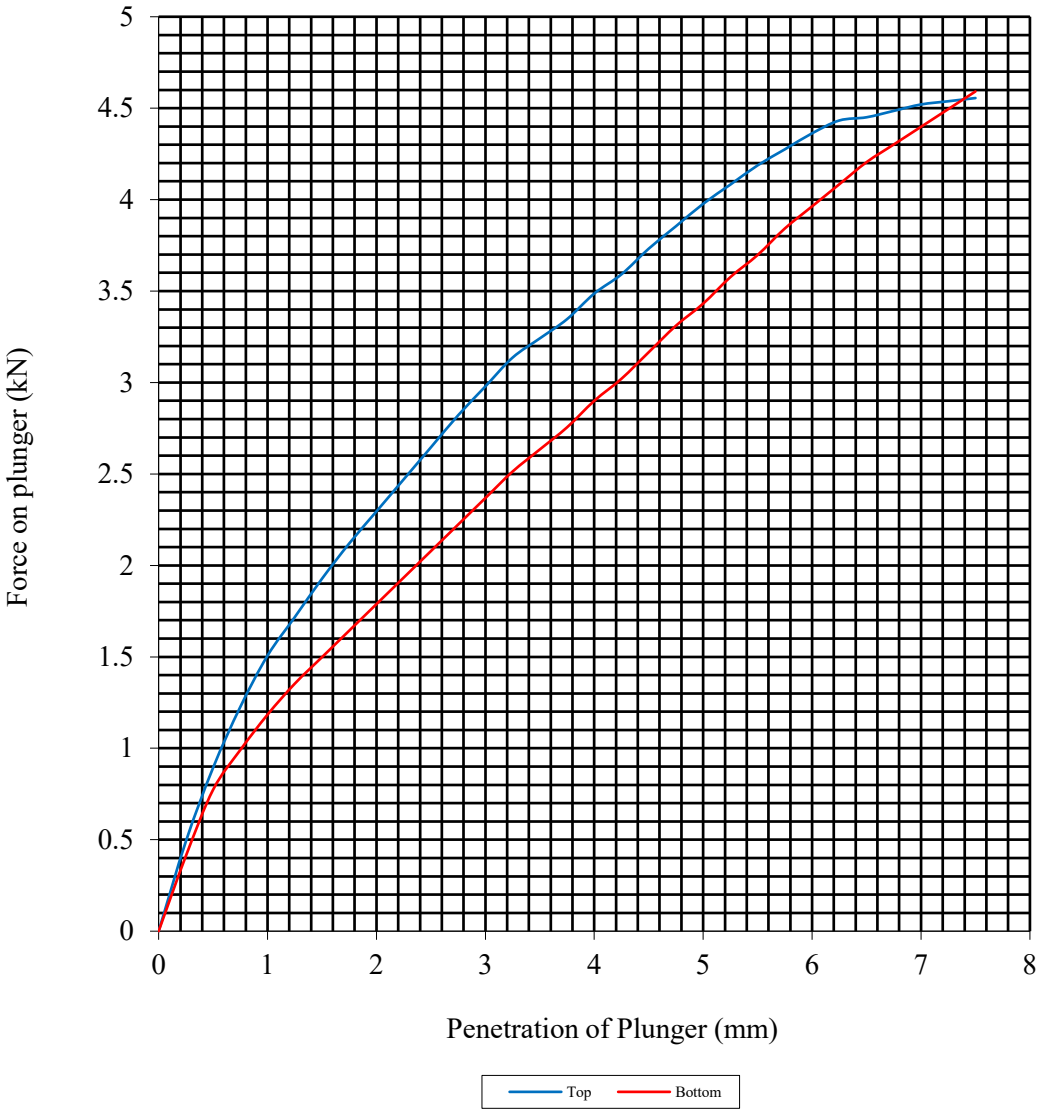
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP101 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	12	Surcharge Kg:	4.20	Sample Top	12	Sample Top	20.0
Bulk Density Mg/m3:	2.07	Soaking Time hrs	0	Sample Bottom	12	Sample Bottom	17.2
Dry Density Mg/m3:	1.84	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			7				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

Contract No: PSL20/4002

Client Ref: C3250

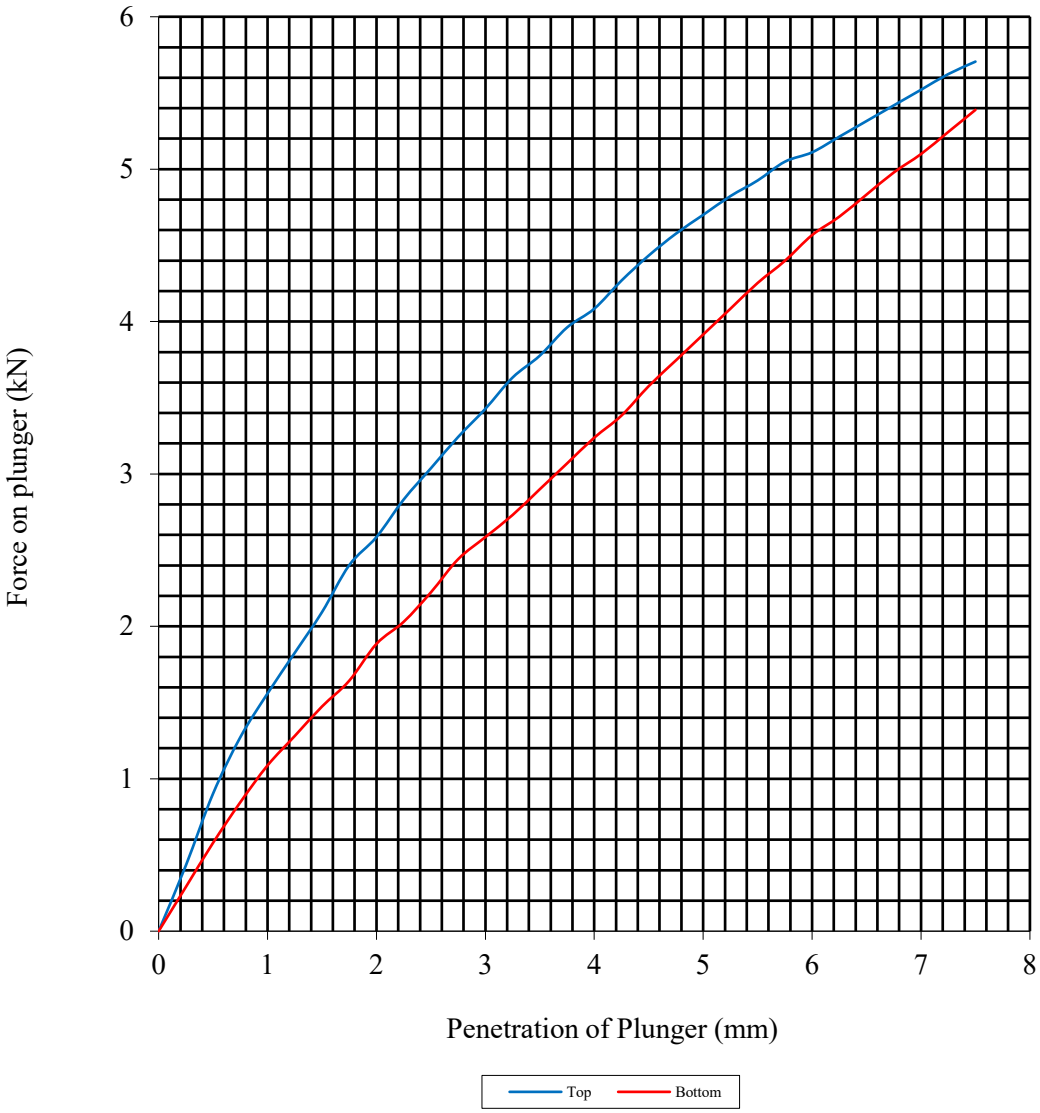
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP102 **Top Depth (m):** 0.40

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	11	Surcharge Kg:	4.20	Sample Top	11	Sample Top	23.5
Bulk Density Mg/m3:	2.07	Soaking Time hrs	0	Sample Bottom	11	Sample Bottom	19.6
Dry Density Mg/m3:	1.86	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			14				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

Contract No: PSL20/4002

Client Ref: C3250

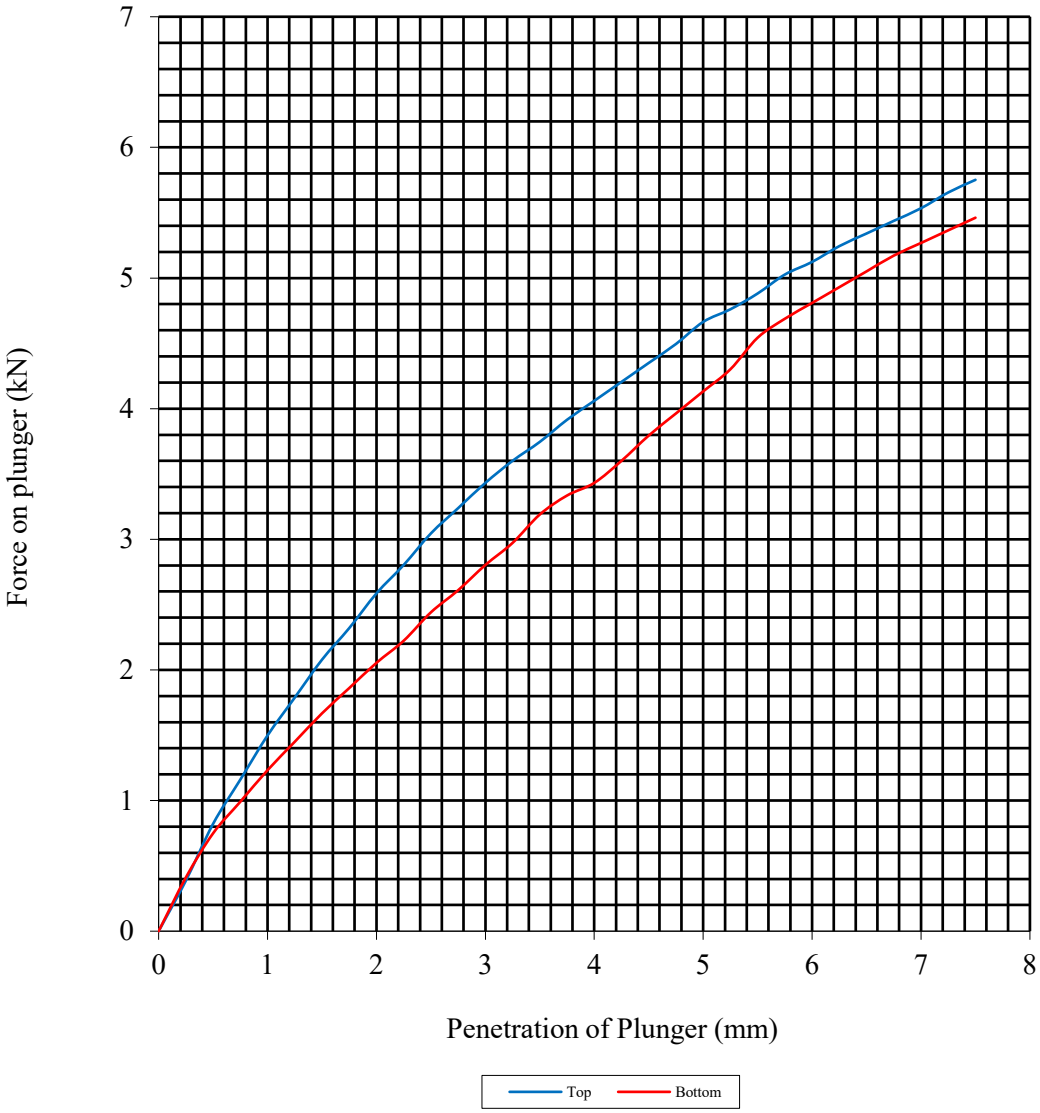
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP102 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	12	Surcharge Kg:	4.20	Sample Top	12	Sample Top	23.3
Bulk Density Mg/m3:	2.12	Soaking Time hrs	0	Sample Bottom	12	Sample Bottom	20.7
Dry Density Mg/m3:	1.89	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			13				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

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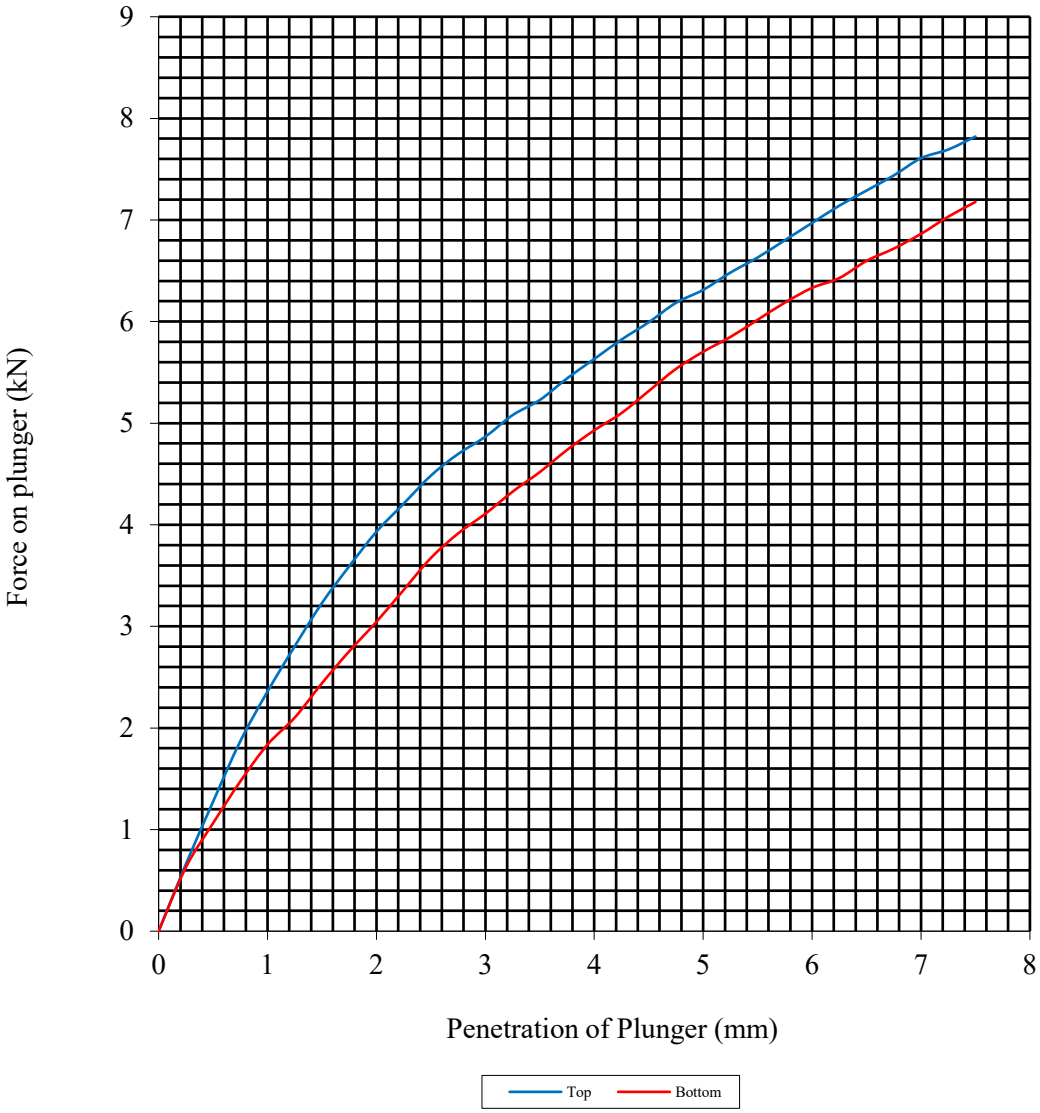
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: TP103 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	8.3	Surcharge Kg:	4.20	Sample Top	8.4	Sample Top	34.0
Bulk Density Mg/m3:	1.97	Soaking Time hrs	0	Sample Bottom	8.1	Sample Bottom	28.5
Dry Density Mg/m3:	1.82	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			27				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

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Client Ref: C3250

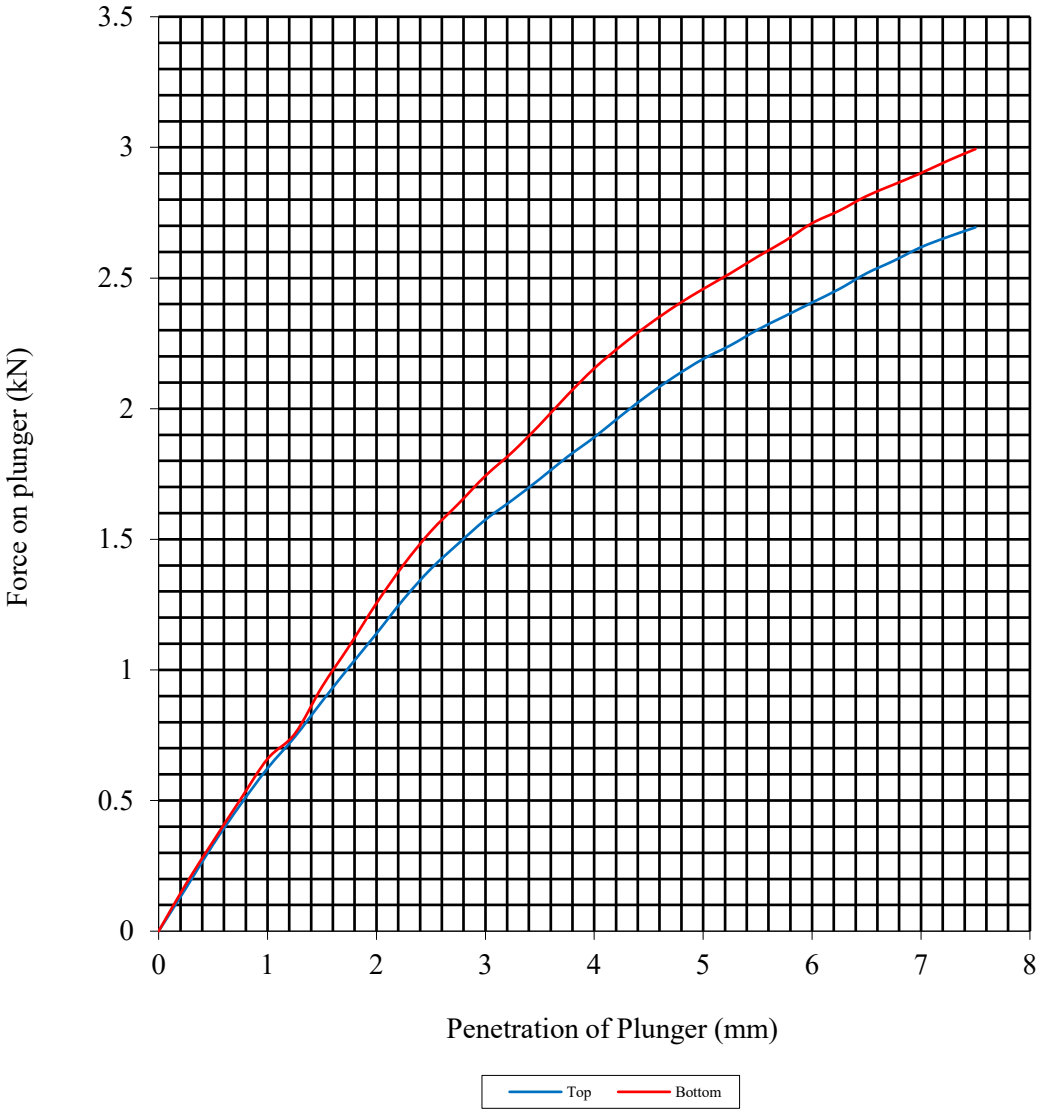
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP104 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	20	Surcharge Kg:	4.20	Sample Top	20	Sample Top	11.0
Bulk Density Mg/m3:	1.92	Soaking Time hrs	0	Sample Bottom	20	Sample Bottom	12.3
Dry Density Mg/m3:	1.60	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			5				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

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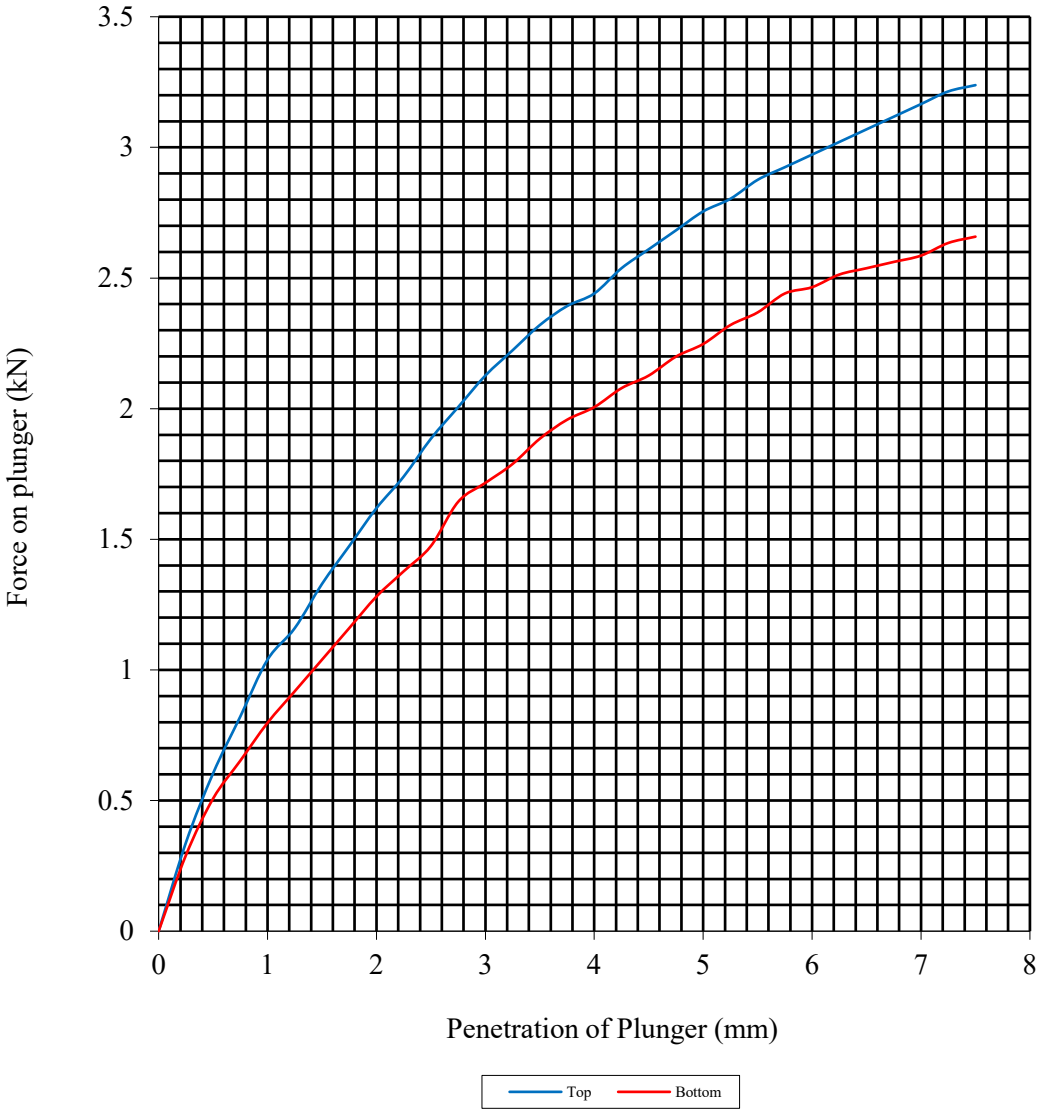
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: WS10 **Top Depth (m):** 0.30

Sample Number: **Base Depth (m):** 1.20

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	16	Surcharge Kg:	4.20	Sample Top	16	Sample Top	14.3
Bulk Density Mg/m3:	2.15	Soaking Time hrs	0	Sample Bottom	16	Sample Bottom	11.2
Dry Density Mg/m3:	1.86	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			2				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Argoed High School

Contract No: PSL20/4002

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ONE DIMENSIONAL CONSOLIDATION TEST

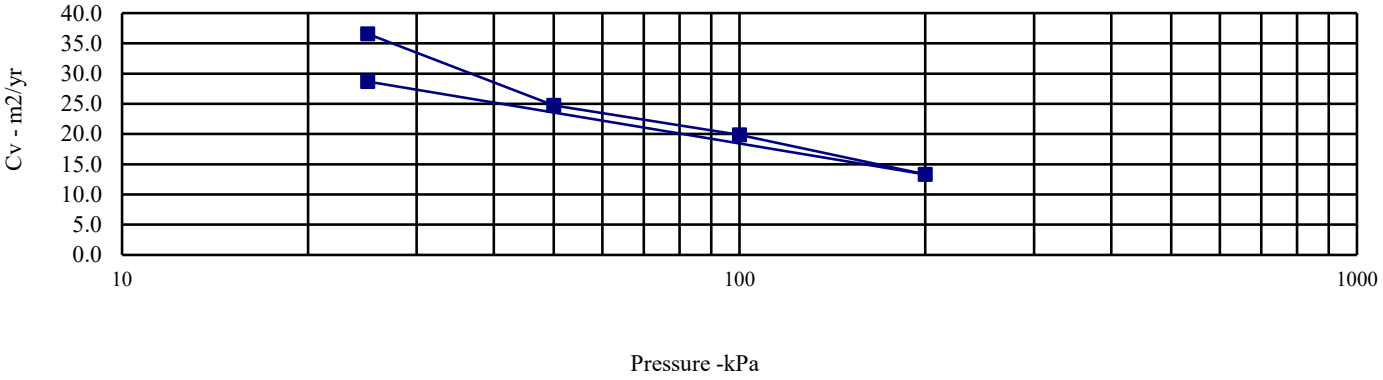
BS 1377: Part 5: 1990: Clause 3

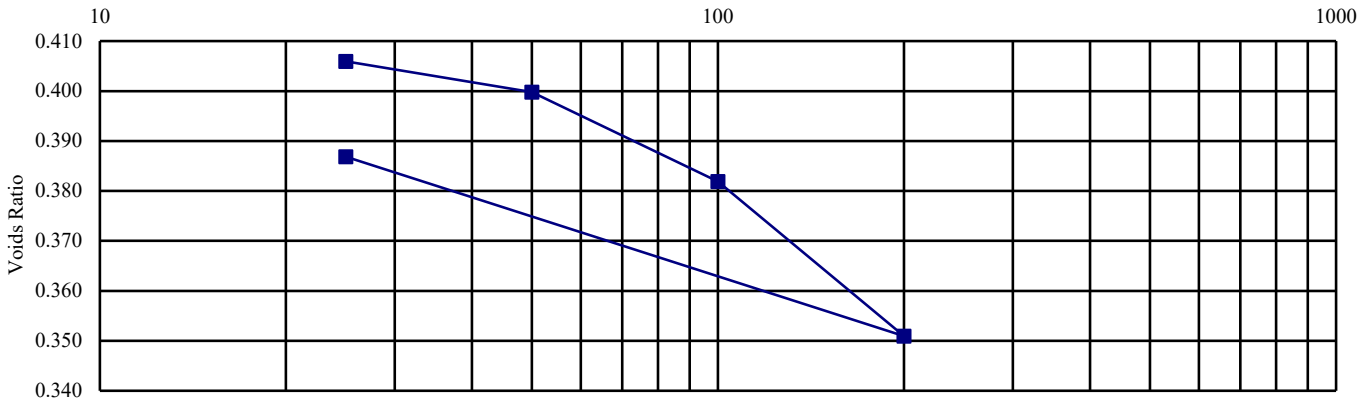
Hole Number: TP102 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m) :**

Sample Type: B

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	14						
Bulk Density (Mg/m3):	2.14	0	25	0.148	36.561	Method used to	
Dry Density (Mg/m3):	1.88	25	50	0.176	24.733	determine CV:	T90
Voids Ratio:	0.411	50	100	0.255	19.837	Nominal temperature	
Degree of saturation:	88.3	100	200	0.224	13.318	during test ' C:	20
Height (mm):	20.296	200	25	0.152	28.665	Remarks:	
Diameter (mm)	75.038					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Argoed High School**	**Contract No:** PSL20/4002 **Client Ref:** C3250

ONE DIMENSIONAL CONSOLIDATION TEST

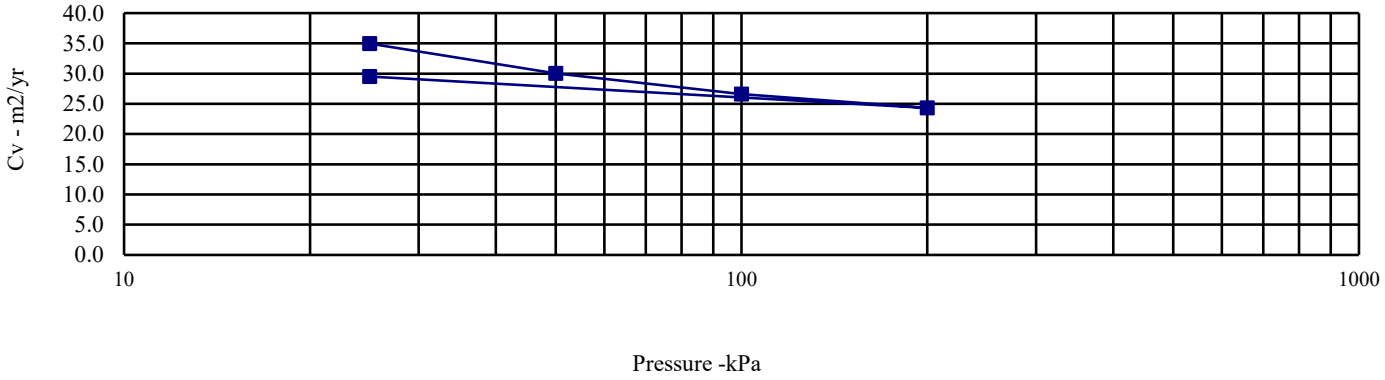
BS 1377: Part 5: 1990: Clause 3

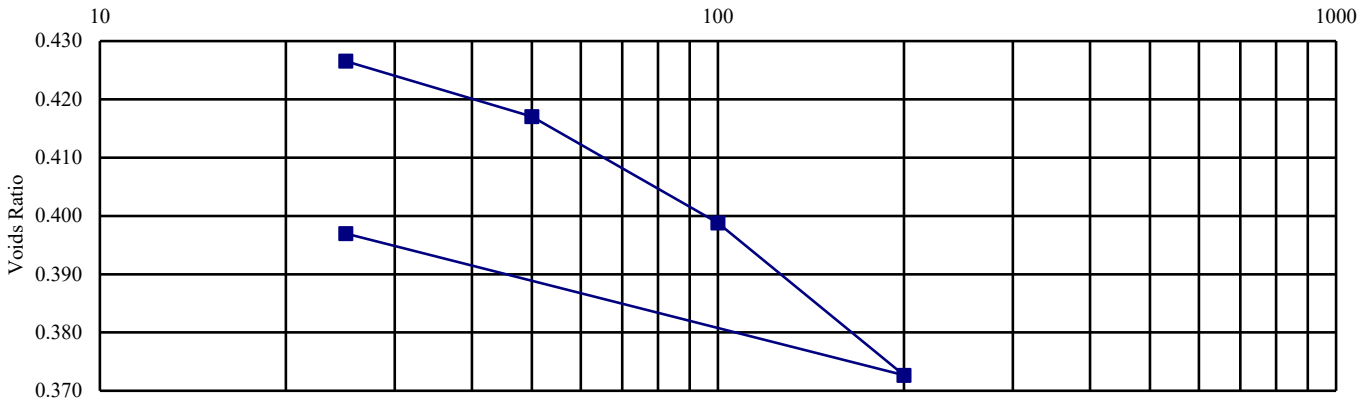
Hole Number: TP102 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m) :**

Sample Type: B

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	16						
Bulk Density (Mg/m3):	2.15	0	25	0.139	34.953	Method used to	
Dry Density (Mg/m3):	1.85	25	50	0.266	30.037	determine CV:	T90
Voids Ratio:	0.432	50	100	0.257	26.597	Nominal temperature	
Degree of saturation:	98.5	100	200	0.187	24.317	during test ' C:	20
Height (mm):	20.088	200	25	0.101	29.518	Remarks:	
Diameter (mm)	75.048					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	Argoed High School	Contract No: PSL20/4002 Client Ref: C3250

MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

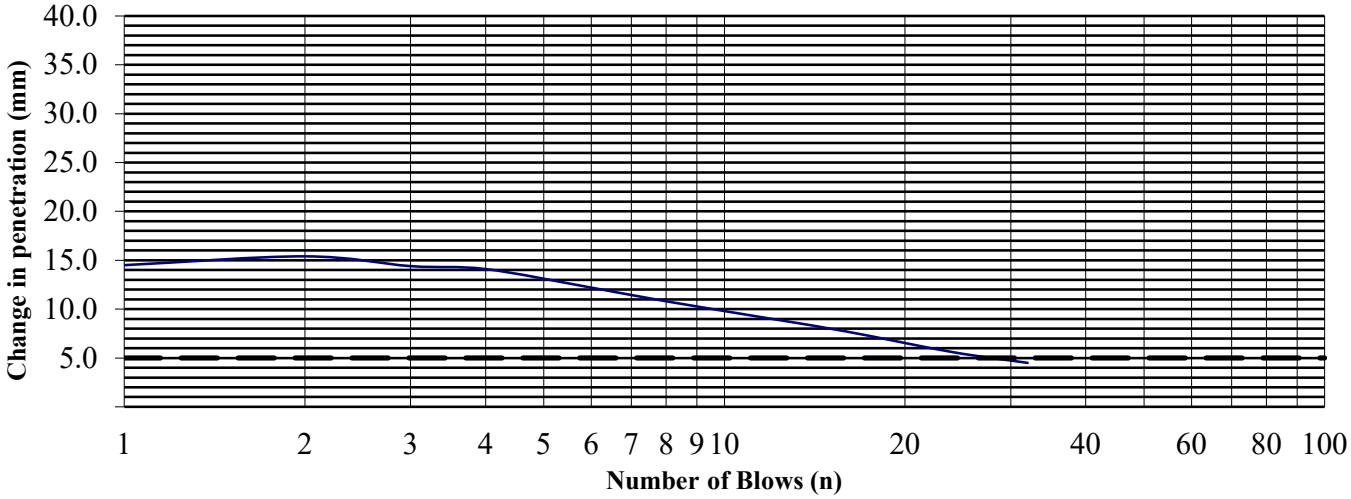
Hole Number: TP101 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B

Material Retained on the 20mm BS Test Sieve (%):	21
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	93.5	14.5
2	86.6	15.4
3	82.0	14.4
4	79.0	14.1
6	74.2	12.2
8	71.2	10.8
12	67.6	9.0
16	64.9	7.7
24	62.0	5.6
32	60.4	4.5
48	58.6	
64	57.2	
96	56.4	
128	55.9	
192		
256		

Test Results.

Moisture Content (%)	9.0
MCV	14.4

MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

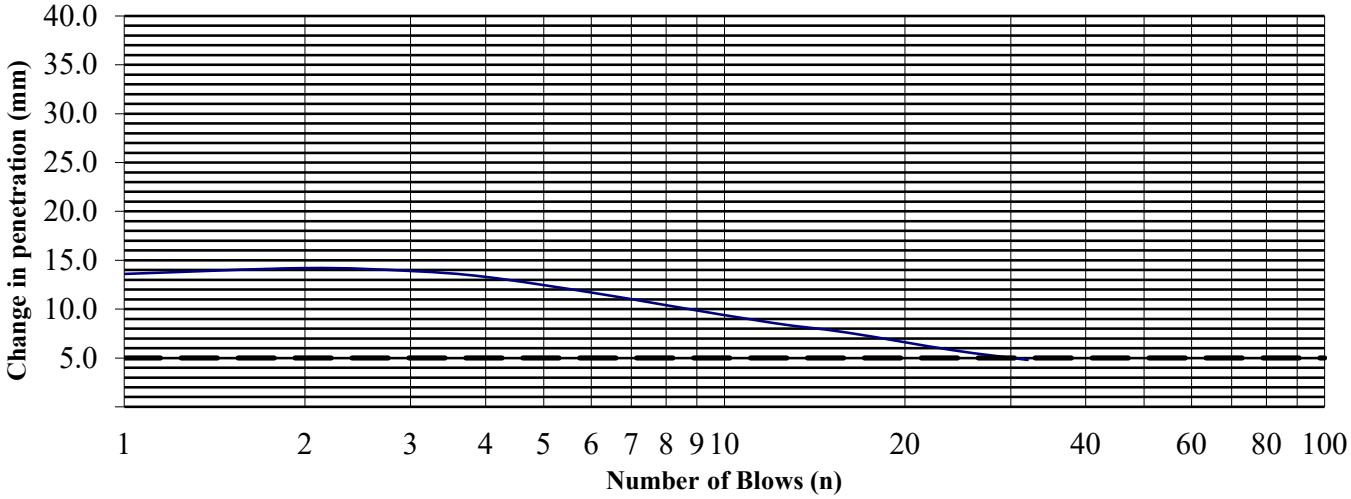
Hole Number: TP102 **Top Depth (m):** 1.20

Sample Number: **Base Depth (m):**

Sample Type: B

Material Retained on the 20mm BS Test Sieve (%):	11
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	89.9	13.6
2	83.2	14.2
3	79.1	13.9
4	76.3	13.3
6	71.9	11.7
8	69.0	10.4
12	65.2	8.6
16	63.0	7.6
24	60.2	5.8
32	58.6	4.8
48	56.6	
64	55.4	
96	54.4	
128	53.8	
192		
256		

Test Results.

Moisture Content (%)	11
MCV	14.7

MOISTURE CONDITION VALUE CALIBRATION

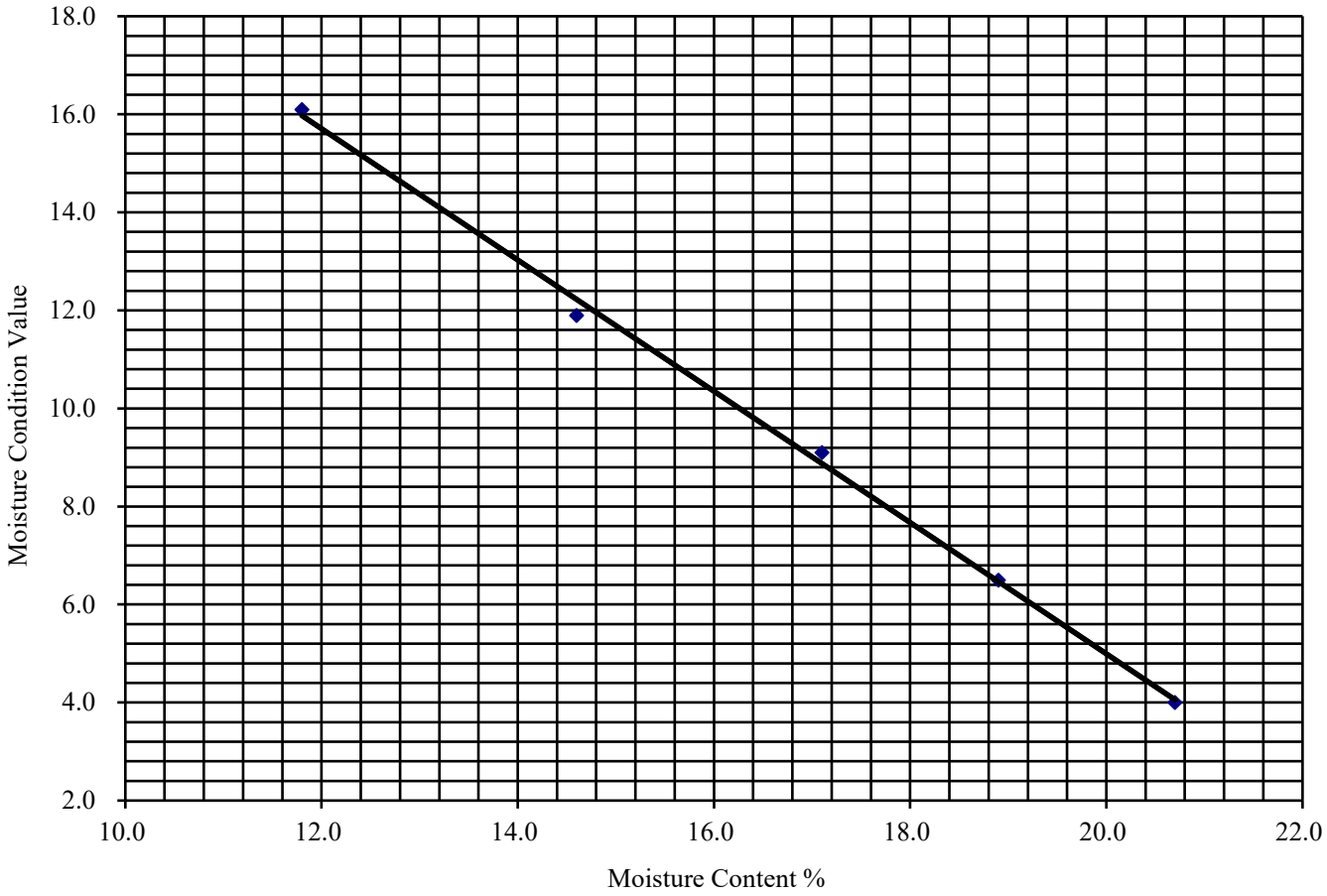
BS1377 : Part 4 : 1990 Clause 5.5

Hole Number: TP102 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B

Initial Moisture Content (%):	9.3
Single/Separate Samples Tested	Separate
Material Retained on the 20mm BS Test Sieve (%):	comp



Test Results.

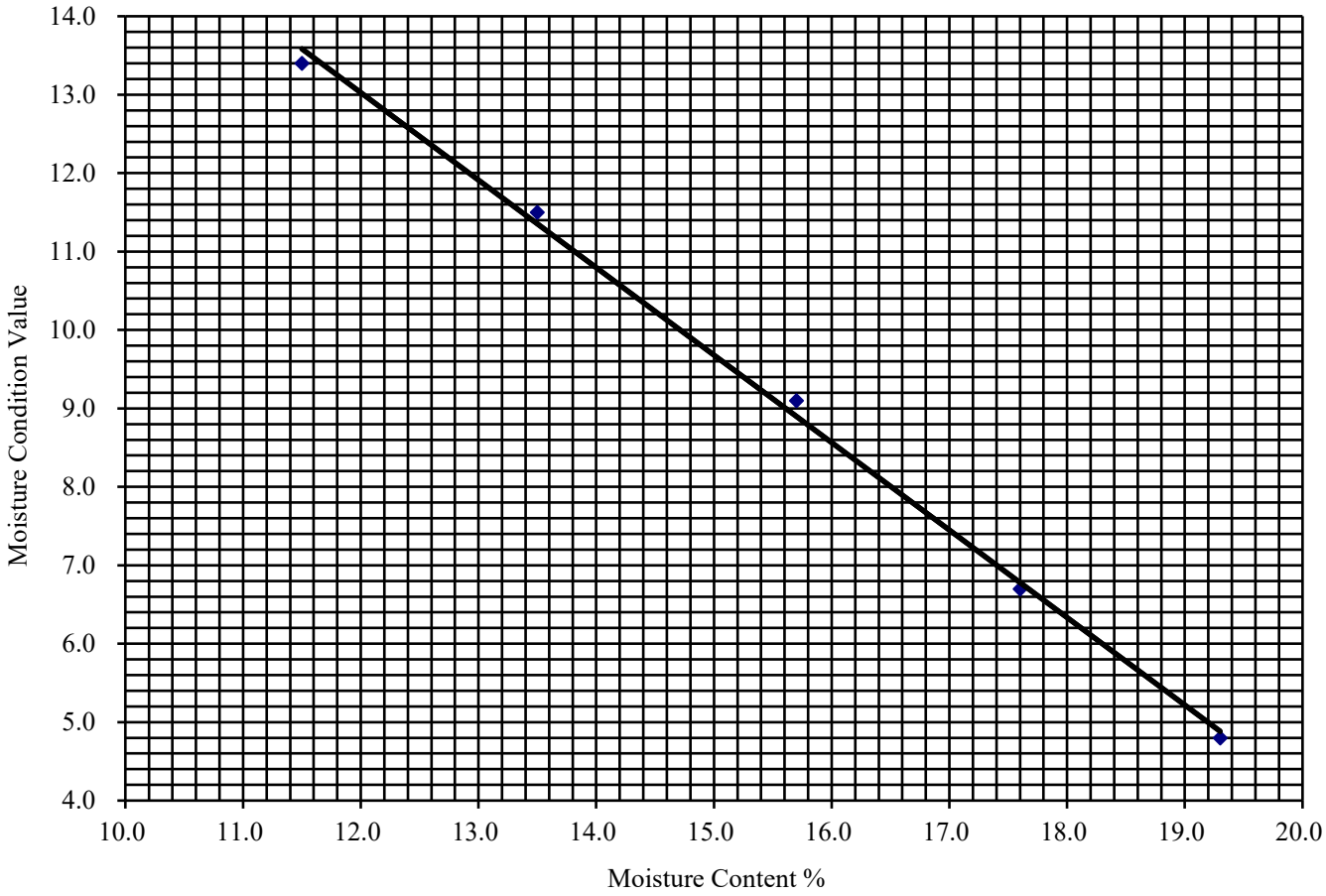
Test Number	1	2	3	4	5
Moisture Content (%)	11.8	14.6	17.1	18.9	20.7
MCV	16.1	11.9	9.1	6.5	4.0

MOISTURE CONDITION VALUE CALIBRATION

BS1377 : Part 4 : 1990 Clause 5.5

Hole Number:	**WS06**	**Top Depth (m):**	**0.50**
Sample Number:		**Base Depth (m):**	**1.50**
Sample Type:	**B**		

Initial Moisture Content (%):	13
Single/Separate Samples Tested	Separate
Material Retained on the 20mm BS Test Sieve (%):	2



Test Results.

Test Number	1	2	3	4	5
Moisture Content (%)	11.5	13.5	15.7	17.6	19.3
MCV	13.4	11.5	9.1	6.7	4.8

CBR Test Results (MEXE Probe)

Job No.	C3250
Job Name	Argoed High School
Date	August 2020

MP1				
Position	Depth (mm)			
	150	300	450	600
P1	Topsoil	14		
P2		8	14	
P3		3	4	8
P4		3	4	7
P5		14		
Minimum CBR Value		3.0	4.0	7.0

MP2				
Position	Depth (mm)			
	150	300	450	600
P1	Topsoil	14		
P2		14		
P3		3	5	7
P4		3	8	14
P5		3	14	
Minimum CBR Value		3.0	5.0	7.0

MP3				
Position	Depth (mm)			
	150	300	450	600
P1	Topsoil	3	4	7
P2		14		
P3		14		
P4		8	14	
P5		3	8	14
Minimum CBR Value		3.0	4.0	7.0

MP4				
Position	Depth (mm)			
	150	300	450	600
P1	Topsoil	3	4	14
P2		3	4	8
P3		3	4	7
P4		14		
P5		14		
Minimum CBR Value		3.0	4.0	7.0

If Empty - Means unable to penetrate further due to strata strength

CBR Test Results (Mexecone)

Job No.	C3250
Job Name	Argoed High School
Date	August 2020

MP5

Position	Depth (mm)			
	150	300	450	600
P1	T	14		
P2	o	14		
P3	p	3	14	
P4	s	3	6	9
P5	o	3	6	9
Minimum CBR Value	i l	3.0	6.0	9.0

MP6

Position	Depth (mm)			
	150	300	450	600
P1	T	6	6	8
P2	o	5	8	9
P3	p	6	8	14
P4	s	14	8	14
P5	o	6	14	
Minimum CBR Value	i l	5.0	6.0	8.0

MP7

Position	Depth (mm)			
	150	300	450	600
P1	T	3	4	7
P2	o	14		
P3	p	14		
P4	s	8	14	
P5	o	3	4	8
Minimum CBR Value	i l	3.0	4.0	7.0

If Empty - Means unable to penetrate further due to strata strength

Appendix VII

Waste Classification Report

Z7XXC-BN3M8-EU63Q

Job name

C3250 Argoed High School

Description/Comments

Project

C3250 Argoed High School

Site

C3250 Argoed High School

Related Documents

#	Name	Description
1	HWOL_20-20468-20200817 170014.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Howard Daley
Date:
08 Sep 2020 13:25 GMT
Telephone:
01773 535555

Company:
HSP Consulting Engineers Limited
Lawrence House 4 Meadowbank Way
Eastwood
4 Meadowbank Way, Eastwood
Nottingham
NG16 3SB

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	11 Feb 2020
Advanced Hazardous Waste Classification	12 Feb 2020

Report

Created by: Howard Daley
Created date: 08 Sep 2020 13:25 GMT

Job summary

Classification of sample: WS06 0.30m

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

Sample details

Sample Name:
WS06 0.30m
Sample Depth:
0.30 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		7.3 mg/kg	1.32	8.385 mg/kg	0.000839 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		2.7 mg/kg	3.22	7.563 mg/kg	0.000756 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	27.974 mg/kg	0.0028 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		36 mg/kg	1.126	35.263 mg/kg	0.00353 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	18 mg/kg	1.56	24.427 mg/kg	0.00157 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17 mg/kg	2.976	44.019 mg/kg	0.0044 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.28 mg/kg	2.554	0.622 mg/kg	0.0000622 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		80 mg/kg	2.774	193.081 mg/kg	0.0193 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8	pH		8	pH	8pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0347 %		

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

Classification of sample: WS06 1.70m

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

Sample details

Sample Name:
WS06 1.70m
Sample Depth:
1.70 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5.3 mg/kg	1.32	6.228 mg/kg	0.000623 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.15 mg/kg	1.142	0.153 mg/kg	0.0000153 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	22.113 mg/kg	0.00221 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		20 mg/kg	1.126	20.041 mg/kg	0.002 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	15 mg/kg	1.56	20.824 mg/kg	0.00134 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		28 mg/kg	2.976	74.169 mg/kg	0.00742 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.32 mg/kg	2.554	0.727 mg/kg	0.0000727 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		56 mg/kg	2.774	138.263 mg/kg	0.0138 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.3	pH		8.3	pH	8.3 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				1.5	mg/kg		1.335	mg/kg	0.000133 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0291 %		

Key

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

Classification of sample: WS07 0.10m

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

Sample details

Sample Name:
WS07 0.10m
Sample Depth:
0.10 m
Moisture content:
30%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 30% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		7.9 mg/kg	1.32	7.301 mg/kg	0.00073 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.4 mg/kg	3.22	0.902 mg/kg	0.0000902 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.28 mg/kg	1.142	0.224 mg/kg	0.0000224 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	19.439 mg/kg	0.00194 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		14 mg/kg	1.126	11.034 mg/kg	0.0011 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	60 mg/kg	1.56	65.512 mg/kg	0.0042 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14 mg/kg	2.976	29.167 mg/kg	0.00292 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.28 mg/kg	2.554	0.501 mg/kg	0.0000501 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		59 mg/kg	2.774	114.572 mg/kg	0.0115 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
14		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
16		ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
17		xylene 601-022-00-9 / 202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4] / 95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5		<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<**LOD**
19		pH PH		6.7 pH		6.7 pH	6.7 pH		
20		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
21		acenaphthylene 205-917-1 / 208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
22		acenaphthene 201-469-6 / 83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
23		fluorene 201-695-5 / 86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
24		phenanthrene 201-581-5 / 85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
25		anthracene 204-371-1 / 120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
26		fluoranthene 205-912-4 / 206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
27		pyrene 204-927-3 / 129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
28		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
29		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
30		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
31		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
33		indeno[123-cd]pyrene 205-893-2 / 193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
34		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
35		benzo[ghi]perylene 205-883-8 / 191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
36		sulfur { sulfur } 016-094-00-1 / 231-722-6 / 7704-34-9		5.3 mg/kg		3.71 mg/kg	0.000371 %	✓	
						Total:	0.0242 %		

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

Classification of sample: WS08 0.35m

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

Sample details

Sample Name:
WS08 0.35m
Sample Depth:
0.35 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		6.7 mg/kg	1.32	7.873 mg/kg	0.000787 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	boron { diboron trioxide; boric oxide }		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
	005-008-00-8 / 215-125-8 / 1303-86-2							
3	cadmium { cadmium oxide }		0.21 mg/kg	1.142	0.214 mg/kg	0.0000214 %	✓	
	048-002-00-0 / 215-146-2 / 1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		18 mg/kg	1.462	23.414 mg/kg	0.00234 %	✓	
	/ 215-160-9 / 1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0 / 215-607-8 / 1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }		12 mg/kg	1.126	12.024 mg/kg	0.0012 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
7	lead { lead chromate }	1	61 mg/kg	1.56	84.682 mg/kg	0.00543 %	✓	
	082-004-00-2 / 231-846-0 / 7758-97-6							
8	mercury { mercury dichloride }		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X / 231-299-8 / 7487-94-7							
9	nickel { nickel chromate }		17 mg/kg	2.976	45.031 mg/kg	0.0045 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		0.24 mg/kg	2.554	0.545 mg/kg	0.0000545 %	✓	
	034-002-00-8 / /							
11	zinc { zinc chromate }		60 mg/kg	2.774	148.139 mg/kg	0.0148 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
12	TPH (C6 to C40) petroleum group		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
	/ / TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X / 216-653-1 / 1634-04-4							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				4.4	mg/kg		3.916	mg/kg	0.000392 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.031 %		

Key

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

Classification of sample: WS09 1.50m

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

Sample details

Sample Name:
WS09 1.50m
Sample Depth:
1.50 m
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.4 pH		8.4 pH	8.4 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS10 0.10m

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

Sample details

Sample Name:
WS10 0.10m
Sample Depth:
0.10 m
Moisture content:
24%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 24% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		5 mg/kg	1.32	5.017 mg/kg	0.000502 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	boron { diboron trioxide; boric oxide }		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
	005-008-00-8 / 215-125-8 / 1303-86-2							
3	cadmium { cadmium oxide }		0.19 mg/kg	1.142	0.165 mg/kg	0.0000165 %	✓	
	048-002-00-0 / 215-146-2 / 1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		14 mg/kg	1.462	15.551 mg/kg	0.00156 %	✓	
	/ 215-160-9 / 1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0 / 215-607-8 / 1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }		12 mg/kg	1.126	10.268 mg/kg	0.00103 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
7	lead { lead chromate }	1	49 mg/kg	1.56	58.088 mg/kg	0.00372 %	✓	
	082-004-00-2 / 231-846-0 / 7758-97-6							
8	mercury { mercury dichloride }		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X / 231-299-8 / 7487-94-7							
9	nickel { nickel chromate }		13 mg/kg	2.976	29.405 mg/kg	0.00294 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		0.28 mg/kg	2.554	0.543 mg/kg	0.0000543 %	✓	
	034-002-00-8 / /							
11	zinc { zinc chromate }		61 mg/kg	2.774	128.609 mg/kg	0.0129 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
12	TPH (C6 to C40) petroleum group		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
	/ / TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X / 216-653-1 / 1634-04-4							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				6.5	pH		6.5	pH	6.5 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.54	mg/kg		0.41	mg/kg	0.000041 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.46	mg/kg		0.35	mg/kg	0.000035 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0243 %		

Key

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

Classification of sample: WS11 2.50m

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

Sample details

Sample Name:
WS11 2.50m
Sample Depth:
2.50 m
Moisture content:
10%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.4 pH		8.4 pH	8.4 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS12 1.00m

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

Sample details

Sample Name:
WS12 1.00m
Sample Depth:
1.00 m
Moisture content:
10%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.3 pH		8.3 pH	8.3 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Appendix A: Classifier defined and non CLP determinands

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

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

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

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

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

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

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

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

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

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

zinc {zinc chromate}

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

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

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

sulfur {sulfur}

Elemental sulfur most likely to be worst case scenario hazardous

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2020.241.4455.8692 (28 Aug 2020)
HazWasteOnline Database: 2020.241.4455.8692 (28 Aug 2020)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Waste Classification Report

SMM2G-JRH8C-ABLX5

Job name

Argoed High School

Description/Comments

Project

C3250 Argoed High School

Site

C3250 Argoed High School

Related Documents

#	Name	Description
1	HWOL_20-16651-20200908 091840.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Howard Daley
Date:
08 Sep 2020 13:20 GMT
Telephone:
01773 535555

Company:
HSP Consulting Engineers Limited
Lawrence House 4 Meadowbank Way
Eastwood
4 Meadowbank Way, Eastwood
Nottingham
NG16 3SB

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	11 Feb 2020
Advanced Hazardous Waste Classification	12 Feb 2020

Report

Created by: Howard Daley
Created date: 08 Sep 2020 13:20 GMT

Job summary

Classification of sample: WS01 0.20m

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

Sample details

Sample Name:
WS01 0.20m
Sample Depth:
0.20 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		5.9 mg/kg	1.32	6.777 mg/kg	0.000678 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	boron { diboron trioxide; boric oxide }		0.48 mg/kg	3.22	1.345 mg/kg	0.000134 %	✓	
	005-008-00-8 / 215-125-8 / 1303-86-2							
3	cadmium { cadmium oxide }		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0 / 215-146-2 / 1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		19 mg/kg	1.462	24.16 mg/kg	0.00242 %	✓	
	215-160-9 / 1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0 / 215-607-8 / 1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }		6.8 mg/kg	1.126	6.661 mg/kg	0.000666 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
7	lead { lead chromate }	1	23 mg/kg	1.56	31.212 mg/kg	0.002 %	✓	
	082-004-00-2 / 231-846-0 / 7758-97-6							
8	mercury { mercury dichloride }		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X / 231-299-8 / 7487-94-7							
9	nickel { nickel chromate }		11 mg/kg	2.976	28.483 mg/kg	0.00285 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
	034-002-00-8							
11	zinc { zinc chromate }		32 mg/kg	2.774	77.232 mg/kg	0.00772 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
12	TPH (C6 to C40) petroleum group		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
	TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X / 216-653-1 / 1634-04-4							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				1.3	mg/kg		1.131	mg/kg	0.000113 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.018 %		

Key

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

Classification of sample: WS02 1.00m

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

Sample details

Sample Name:
WS02 1.00m
Sample Depth:
1.00 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.7 mg/kg	1.32	10.223 mg/kg	0.00102 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26 mg/kg	1.462	33.82 mg/kg	0.00338 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24 mg/kg	1.126	24.049 mg/kg	0.0024 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	14 mg/kg	1.56	19.435 mg/kg	0.00125 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		38 mg/kg	2.976	100.657 mg/kg	0.0101 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		51 mg/kg	2.774	125.919 mg/kg	0.0126 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.4	pH		8.4	pH	8.4 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0324 %		

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

Classification of sample: WS04 1.00m

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

Sample details

Sample Name:
WS04 1.00m
Sample Depth:
1.00 m
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.2 pH		8.2 pH	8.2 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS05 0.60m

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

Sample details

Sample Name:
WS05 0.60m
Sample Depth:
0.60 m
Moisture content:
7.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.6% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.5 pH		8.5 pH	8.5 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Appendix A: Classifier defined and non CLP determinands

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

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

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

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

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

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

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

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

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

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

zinc {zinc chromate}

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

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

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

sulfur {sulfur}

Elemental sulfur most likely to be worst case scenario hazardous

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2020.241.4455.8692 (28 Aug 2020)
HazWasteOnline Database: 2020.241.4455.8692 (28 Aug 2020)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Appendix VIII

Gas Monitoring Certificate

Project Number C3250
Project Name Argoed High School, North Wales
Client Gleeds Management Services Ltd

WS06

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.7	<0.1	<1	<1		2.07	1.80
00:15	<0.1	<0.1	<0.1	13.2	2.4	1	<1			
00:30	<0.1	<0.1	<0.1	14.1	1.7	<1	<1			
00:45	<0.1	<0.1	<0.1	15.9	1.2	1	1			
01:00	<0.1	<0.1	<0.1	16.7	1.1	<1	1			
01:15	<0.1	<0.1	<0.1	15.0	1.7	<1	1			
01:30	<0.1	<0.1	<0.1	16.7	1.7	<1	<1			
01:45	<0.1	<0.1	<0.1	16.9	1.7	<1	<1			
02:00	<0.1	<0.1	<0.1	15.7	1.6	<1	<1			
02:15	<0.1	<0.1	<0.1	16.7	1.4	1	<1			
02:30	<0.1	<0.1	<0.1	17.2	1.0	1	1			
02:45	<0.1	<0.1	<0.1	17.7	0.9	<1	<1			
03:00	<0.1	<0.1	<0.1	18.2	0.8	<1	<1			
03:15	<0.1	<0.1	<0.1	18.8	0.7	<1	<1			
03:30	<0.1	<0.1	<0.1	19.0	0.7	<1	<1			
03:45	<0.1	<0.1	<0.1	19.1	0.6	<1	<1			
04:00	<0.1	<0.1	<0.1	19.2	0.6	<1	<1			
04:15	<0.1	<0.1	<0.1	19.3	0.5	<1	<1			
04:30	<0.1	<0.1	<0.1	19.4	0.5	<1	<1			
04:45	<0.1	<0.1	<0.1	19.4	0.5	<1	<1			
05:00	<0.1	<0.1	<0.1	19.4	0.5	<1	<1			
Steady	**<0.1**	**<0.1**	**<0.1**	**19.4**	**0.5**	**<1**	**<1**	**#####**	**2.07**	**1.80**
Peak	**0.0**	**0.0**	**0.0**	**20.7**	**2.4**	**1.0**	**1.0**	**0.0**	**2.07**	**1.80**

Date	Notes:			
23/09/2020	Engineer	DRS	Barometric Pressure, mbar	980
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS08

	Detection Limit								
	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.7	<0.1	<1	<1		2.81	1.13
00:15	<0.1	<0.1	<0.1	20.8	0.2	<1	<1			
00:30	<0.1	<0.1	<0.1	20.7	0.2	<1	<1			
00:45	<0.1	<0.1	<0.1	20.7	0.2	<1	<1			
01:00	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
01:15	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
01:30	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
01:45	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
02:00	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
02:15	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
02:30	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
02:45	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
03:00	<0.1	<0.1	<0.1	20.8	0.1	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**<0.1**	**<0.1**	**20.8**	**0.1**	**<1**	**<1**	**#####**	**2.81**	**1.13**
Peak	**0.0**	**0.0**	**0.0**	**20.8**	**0.2**	**0.0**	**0.0**	**0.0**	**2.81**	**1.13**

Date	Notes:			
23/09/2020	Engineer	DRS	Barometric Pressure, mbar	980
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

Gas Monitoring Certificate

Project Number C3250
Project Name Argoed High School, North Wales
Client Gleeds Management Services Ltd

WS09

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	-47.2	<0.1	<0.1	20.6	0.3	<1	<1		3.40	0.20
00:15	-2.8	<0.1	<0.1	18.9	1.3	<1	<1			
00:30	-2.7	<0.1	<0.1	17.7	1.8	<1	<1			
00:45	-1.9	<0.1	<0.1	17.0	2.1	<1	<1			
01:00	<0.1	<0.1	<0.1	16.7	2.2	<1	<1			
01:15	<0.1	<0.1	<0.1	16.5	2.2	<1	<1			
01:30	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
01:45	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
02:00	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
02:15	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
02:30	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
02:45	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
03:00	<0.1	<0.1	<0.1	16.3	2.2	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**<0.1**	**<0.1**	**16.3**	**2.2**	**<1**	**<1**	**#####**	**3.40**	**0.20**
Peak	**-1.9**	**0.0**	**0.0**	**20.6**	**2.2**	**0.0**	**0.0**	**0.0**	**3.40**	**0.20**

Date	Notes:			
23/09/2020	Engineer	DRS	Barometric Pressure, mbar	980
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	14

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS06

Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
Detection Limit		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
00:00	-7.2	<0.1	<0.1	10.5	0.2	<1	<1		2.10	0.40
00:15	-24.2	<0.1	<0.1	8.6	3.0	<1	1			
00:30	-30.7	<0.1	<0.1	7.7	3.1	2	3			
00:45	-37.8	<0.1	<0.1	7.6	3.1	3	1			
01:00	-40.8	<0.1	<0.1	7.6	3.1	2	1			
01:15	-44.6	<0.1	<0.1	7.5	3.1	2	1			
01:30	-42.7	<0.1	<0.1	7.4	3.1	2	1			
01:45	-48.1	<0.1	<0.1	7.4	3.1	<1	1			
02:00	-48.1	Gas kit started to struggle								
02:15	-48.1									
02:30	-48.1									
02:45	-48.1									
03:00	-48.1									
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**-48.1**	**tarted t**	**<0.1**	**7.4**	**3.1**	**<1**	**1.0**	**#####**	**2.10**	**0.40**
Peak	**-7.2**	**0.0**	**0.0**	**10.5**	**3.1**	**3.0**	**3.0**	**0.0**	**2.10**	**0.40**

Date	Notes:			
07.10.2020	Engineer	DRS	Barometric Pressure, mbar	992
			Pressure Trend	Riisng
	Equipment	GFM430	Air Temp (˚C)	13

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS08

	Detection Limit								
	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	0.0	<0.1	<0.1	20.6	<0.1	<1	<1		2.85	0.22
00:15	0.0	<0.1	<0.1	20.7	1.2	<1	<1			
00:30	0.0	<0.1	<0.1	19.8	0.9	2	<1			
00:45	0.0	<0.1	<0.1	20.2	0.6	1	<1			
01:00	0.0	<0.1	<0.1	20.4	0.5	2	<1			
01:15	0.0	<0.1	<0.1	20.6	0.3	1	<1			
01:30	0.0	<0.1	<0.1	20.7	0.2	2	<1			
01:45	0.0	<0.1	<0.1	20.8	0.1	2	<1			
02:00	0.0	<0.1	<0.1	20.8	0.1	1	<1			
02:15	0.0	<0.1	<0.1	20.8	<0.1	2	<1			
02:30	0.0	<0.1	<0.1	20.8	<0.1	1	<1			
02:45	0.0	<0.1	<0.1	20.8	<0.1	1	<1			
03:00	0.0	<0.1	<0.1	20.8	<0.1	1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**0.0**	**<0.1**	**<0.1**	**20.8**	**<0.1**	**1.0**	**<1**	**#####**	**2.85**	**0.22**
Peak	**0.0**	**0.0**	**0.0**	**20.8**	**1.2**	**2.0**	**0.0**	**0.0**	**2.85**	**0.22**

Date	Notes:			
07.10.2020	Engineer	DRS	Barometric Pressure, mbar	992
			Pressure Trend	Riisng
	Equipment	GFM430	Air Temp (˚C)	13

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS09

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00		BH flooded unable to monitor							3.46	0.00
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**######**	**d unable**	**#####**	**#####**	**#####**	**#####**	**#####**	**#####**	**3.46**	**0.00**
Peak	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.46**	**0.00**

Date	Notes:		Barometric Pressure, mbar	992
07.10.2020	Engineer	DRS	Pressure Trend	Riisng
	Equipment	GFM430	Air Temp (˚C)	13

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS06

	Detection Limit								
	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.9	<0.1	<1	<1		2.11	1.68
00:15	<0.1	<0.1	<0.1	13.5	2.1	<1	<1			
00:30	<0.1	<0.1	<0.1	13.3	2.1	<1	<1			
00:45	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
01:00	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
01:15	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
01:30	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
01:45	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
02:00	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
02:15	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
02:30	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
02:45	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
03:00	<0.1	<0.1	<0.1	13.2	2.1	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**<0.1**	**<0.1**	**13.2**	**2.1**	**<1**	**<1**	**#####**	**2.11**	**1.68**
Peak	**0.0**	**0.0**	**0.0**	**20.9**	**2.1**	**0.0**	**0.0**	**0.0**	**2.11**	**1.68**

Date	Notes:			
19/08/2020	Engineer	HJD	Barometric Pressure, mbar	1002
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	16

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS08

	Detection Limit								
	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	21.0	<0.1	<1	<1		2.74	2.34
00:15	<0.1	<0.1	<0.1	19.9	0.9	<1	<1			
00:30	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
00:45	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
01:00	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
01:15	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
01:30	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
01:45	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
02:00	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
02:15	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
02:30	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
02:45	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
03:00	<0.1	<0.1	<0.1	19.7	1.0	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**<0.1**	**<0.1**	**19.7**	**1.0**	**<1**	**<1**	**#####**	**2.74**	**2.34**
Peak	**0.0**	**0.0**	**0.0**	**21.0**	**1.0**	**0.0**	**0.0**	**0.0**	**2.74**	**2.34**

Date	Notes:			
19/08/2020	Engineer	HJD	Barometric Pressure, mbar	1002
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	16

Gas Monitoring Certificate

Project Number C3250
Project Name Argoed High School, North Wales
Client Gleeds Management Services Ltd

WS09

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	<0.1	<0.1	<0.1	21.0	<0.1	<1	<1		3.36	0.49
00:15	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
00:30	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
00:45	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
01:00	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
01:15	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
01:30	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
01:45	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
02:00	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
02:15	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
02:30	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
02:45	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
03:00	<0.1	<0.1	<0.1	20.8	0.8	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**<0.1**	**<0.1**	**20.8**	**0.8**	**<1**	**<1**	**#####**	**3.36**	**0.49**
Peak	**0.0**	**0.0**	**0.0**	**21.0**	**0.8**	**0.0**	**0.0**	**0.0**	**3.36**	**0.49**

Date	Notes:			
19/08/2020	Engineer	HJD	Barometric Pressure, mbar	1002
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	16

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS06

	Detection Limit								
	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.2	0.1	<1	<1		2.10	1.39
00:15	<0.1	<0.1	<0.1	12.7	3.3	<1	<1			
00:30	<0.1	<0.1	<0.1	11.7	3.4	<1	1			
00:45	<0.1	<0.1	<0.1	11.5	3.4	1	<1			
01:00	<0.1	<0.1	<0.1	11.5	3.4	<1	<1			
01:15	<0.1	<0.1	<0.1	11.5	3.4	<1	<1			
01:30	<0.1	<0.1	<0.1	11.4	3.4	<1	<1			
01:45	<0.1	<0.1	<0.1	11.4	3.4	<1	<1			
02:00	<0.1	<0.1	<0.1	11.4	3.4	<1	<1			
02:15	<0.1	<0.1	<0.1	11.4	3.4	<1	<1			
02:30	<0.1	<0.1	<0.1	11.4	3.4	<1	1			
02:45	<0.1	<0.1	<0.1	11.4	3.4	<1	<1			
03:00	<0.1	<0.1	<0.1	11.3	3.4	<1	<1			
03:15	<0.1	<0.1	<0.1	11.3	3.4	<1	<1			
03:30	<0.1	<0.1	<0.1	11.3	3.4	<1	<1			
03:45	<0.1	<0.1	<0.1	11.3	3.4	<1	<1			
04:00	<0.1	<0.1	<0.1	11.3	3.4	<1	<1			
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**<0.1**	**<0.1**	**11.3**	**3.4**	**<1**	**<1**	**#####**	**2.10**	**1.39**
Peak	**0.0**	**0.0**	**0.0**	**20.2**	**3.4**	**1.0**	**1.0**	**0.0**	**2.10**	**1.39**

Date	Notes:			
25.08.2020	Engineer	DRS	Barometric Pressure, mbar	967
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	11

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS08

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00		Unable to locate Borehole								
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	#####	**o locate**	#####	#####	#####	#####	#####	#####	#####	######
Peak	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.00**	**0.00**

Date	Notes:			
25.08.2020	Engineer	DRS	Barometric Pressure, mbar	967
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	11

Gas Monitoring Certificate

Project Number C3250
Project Name Argoed High School, North Wales
Client Gleeds Management Services Ltd

WS09

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00	<0.1	<0.1	<0.1	20.3	0.1	<1	<1		3.50	0.22
00:15	<0.1	<0.1	<0.1	19.6	1.0	<1	<1			
00:30	<0.1	<0.1	<0.1	19.4	1.1	<1	<1			
00:45	<0.1	<0.1	<0.1	19.2	1.2	<1	<1			
01:00	<0.1	<0.1	<0.1	19.1	1.2	<1	<1			
01:15	<0.1	<0.1	<0.1	19.1	1.2	<1	<1			
01:30	<0.1	<0.1	<0.1	18.8	1.3	<1	<1			
01:45	<0.1	<0.1	<0.1	18.8	1.3	<1	<1			
02:00	<0.1	<0.1	<0.1	18.4	1.3	<1	<1			
02:15	<0.1	<0.1	<0.1	18.4	1.4	<1	<1			
02:30	<0.1	<0.1	<0.1	18.3	1.4	<1	<1			
02:45		Stopped monitoring due to the gas kit started to struggle								
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	**<0.1**	**e to the g**	**<0.1**	**18.3**	**1.4**	**<1**	**<1**	**#####**	**3.50**	**0.22**
Peak	**0.0**	**0.0**	**0.0**	**20.3**	**1.4**	**0.0**	**0.0**	**0.0**	**3.50**	**0.22**

Date	Notes:			
25.08.2020	Engineer	DRS	Barometric Pressure, mbar	967
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	11

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS06

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.5	0.1	<1	<1		2.06	1.42
00:15	<0.1	<0.1	<0.1	14.0	2.2	<1	1			
00:30	<0.1	<0.1	<0.1	12.0	2.3	<1	1			
00:45	<0.1	<0.1	<0.1	13.9	1.6	<1	1			
01:00	<0.1	<0.1	<0.1	14.9	1.5	<1	<1			
01:15	<0.1	<0.1	<0.1	15.5	1.3	<1	<1			
01:30	<0.1	<0.1	<0.1	16.1	1.1	<1	1			
01:45	<0.1	<0.1	<0.1	17.1	0.9	<1	<1			
02:00	<0.1	<0.1	<0.1	17.7	0.8	<1	1			
02:15	<0.1	<0.1	<0.1	18.1	0.7	<1	1			
02:30	<0.1	<0.1	<0.1	18.4	0.6	<1	3			
02:45	<0.1	<0.1	<0.1	18.8	0.6	<1	1			
03:00	<0.1	<0.1	<0.1	19.2	0.5	<1	<1			
03:15	<0.1	<0.1	<0.1	19.2	0.5	<1	1			
03:30	<0.1	<0.1	<0.1	19.3	0.5	1	<1			
03:45	<0.1	<0.1	<0.1	19.4	0.5	<1	<1			
04:00	<0.1	<0.1	<0.1	19.4	0.5	<1	1			
04:15	<0.1	<0.1	<0.1	19.6	0.4	<1	<1			
04:30	<0.1	<0.1	<0.1	19.6	0.4	<1	<1			
04:45	<0.1	<0.1	<0.1	19.6	0.4	<1	<1			
05:00	<0.1	<0.1	<0.1	19.6	0.4	<1	<1			
Steady	**<0.1**	**<0.1**	**<0.1**	**19.6**	**0.4**	**<1**	**<1**	**#####**	**2.06**	**1.42**
Peak	**0.0**	**0.0**	**0.0**	**20.5**	**2.3**	**1.0**	**3.0**	**0.0**	**2.06**	**1.42**

Date	Notes:			
02.09.2020	Engineer	DRS	Barometric Pressure, mbar	994
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	16

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS08

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00		Unable to locate BH								
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	#####	**le to loc**	#####	#####	#####	#####	#####	#####	#####	######
Peak	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.00**	**0.00**

Date	Notes:			
02.09.2020	Engineer	DRS	Barometric Pressure, mbar	994
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	16

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS09

		Detection Limit	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00		BH flooded							3.50	0.05
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	#####	**BH flood**	#####	#####	#####	#####	#####	#####	**3.50**	**0.05**
Peak	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.50**	**0.05**

Date	Notes:			
02.09.2020	Engineer	DRS	Barometric Pressure, mbar	994
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (˚C)	16

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS06

		Detection Limit								
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.0	0.7	<1	<1		2.03	1.47
00:15	0.1	<0.1	<0.1	18.6	0.8	<1	<1			
00:30	0.1	<0.1	<0.1	18.1	0.7	<1	<1			
00:45	0.2	<0.1	<0.1	17.6	0.7	<1	<1			
01:00	0.2	<0.1	<0.1	17.6	0.7	<1	<1			
01:15	0.3	<0.1	<0.1	17.6	0.7	<1	<1			
01:30	0.4	<0.1	<0.1	17.9	0.7	<1	<1			
01:45	0.5	<0.1	<0.1	17.9	0.7	<1	<1			
02:00	0.6	<0.1	<0.1	17.9	0.7	<1	<1			
02:15	0.7	<0.1	<0.1	17.9	0.7	<1	<1			
02:30	0.8	<0.1	<0.1	17.9	0.7	<1	<1			
02:45	0.9	<0.1	<0.1	17.9	0.7	<1	<1			
03:00	0.9	<0.1	<0.1	17.9	0.7	<1	<1			
03:15	0.9	<0.1	<0.1	17.9	0.7	<1	<1			
03:30	2.8	<0.1	<0.1	17.9	0.7	<1	<1			
03:45	3.7	<0.1	<0.1	17.9	0.7	<1	<1			
04:00	3.7	<0.1	<0.1	17.9	0.7	<1	<1			
04:15	3.7	<0.1	<0.1	17.9	0.7	<1	<1			
04:30	3.7	<0.1	<0.1	17.9	0.7	<1	<1			
04:45	3.7	<0.1	<0.1	17.9	0.7	<1	<1			
05:00	3.7	<0.1	<0.1	17.9	0.7	<1	<1			
Steady	**3.7**	**<0.1**	**<0.1**	**17.9**	**0.7**	**<1**	**<1**	#####	**2.03**	**1.47**
Peak	**3.7**	**0.0**	**0.0**	**20.0**	**0.8**	**0.0**	**0.0**	**0.0**	**2.03**	**1.47**

Date	Notes:			
08/09/2020	Engineer	HEB	Barometric Pressure, mbar	1003
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	18

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS08

	Detection Limit								
	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
00:00	<0.1	<0.1	<0.1	20.7	<0.1	<1	<1		2.83	0.86
00:15	<0.1	<0.1	<0.1	20.7	0.3	<1	<1			
00:30	<0.1	<0.1	<0.1	20.6	0.2	<1	<1			
00:45	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
01:00	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
01:15	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
01:30	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
01:45	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
02:00	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
02:15	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
02:30	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
02:45	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
03:00	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
03:15	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
03:30	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
03:45	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
04:00	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
04:15	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
04:30	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
04:45	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
05:00	<0.1	<0.1	<0.1	20.6	0.1	<1	<1			
Steady	**<0.1**	**<0.1**	**<0.1**	**20.6**	**0.1**	**<1**	**<1**	**#####**	**2.83**	**0.86**
Peak	**0.0**	**0.0**	**0.0**	**20.7**	**0.3**	**0.0**	**0.0**	**0.0**	**2.83**	**0.86**

Date	Notes:			
08/09/2020	Engineer	HEB	Barometric Pressure, mbar	1003
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	18

Gas Monitoring Certificate

Project Number	C3250
Project Name	Argoed High School, North Wales
Client	Gleeds Management Services Ltd

WS09

		Detection Limit	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
Time	Gas Flow Rate. (l/hr)	Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm	Depth of Installation. (mbgl)	Depth of Groundwater (mbgl
00:00		Flooded								
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	#####	**Flooded**	#####	#####	#####	#####	#####	#####	#####	######
Peak	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.00**	**0.00**

Date	Notes:			
08/09/2020	Engineer	HEB	Barometric Pressure, mbar	1003
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (˚C)	18

Appendix IX

COAL SEAM OUTCROP PRECAUTIONS – GUIDANCE NOTE 1

There are four potential problems at a coal seam outcrop:

- Shallow opencast workings (day-eyes)
- Combustion (spontaneous or otherwise)
- Sulphates
- 'Hard spot' (differential settlement)

This guidance note addresses the risk of combustion, sulphates and hard-spots.

In general the risk of igniting an unworked seam encountered at outcrop or at shallow depth in footings or drainage excavations is low. The risk is increased where aeration occurs (especially where the seam has been worked).

Dependent upon the calorific value of the seam, where it is less than 450mm thick, the coal is unlikely to be able to sustain prolonged combustion and generate sufficient heat to cause a problem.

Where it is thicker than 450mm the following general guidance applies:-

Where coal is exposed in footing excavations (over 450mm thick) it should be sealed from the air using compacted clay (or concrete used in footing).

Where coal is exposed in services trenches (over 450mm thick), the trench should be back filled above the pipe bedding surrounding the pipe or service with reasonably compacted clayey soil or sub-base. Sealing around manhole chambers should be carried out (as above) where the seam is over 900mm thick.

(*care required in carrying out compaction – no plant used where cover to pipe is less than 450mm).

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Where seam is exposed across plot

Table 1

Seam thickness (mm)	Cover/seal thickness outside house footprint (incombustible material)	Cover/seal thickness beneath house (mm) (only applies where there is oversite beneath timber floor or where there is a beam and block floor)	Notes/comments
450-900	500mm for 5m	None	(unless open fire is to be used – 300mm)
900-2000	750mm for 7.5m	300	(if open fire to be used – remove coal for radius of 2m beneath centre of grate)
1000-3000	1000mm for 10m	500	(if open fire to be used – remove coal for radius of 3m beneath centre of grate)
>3000			Removal of coal

Notes for Table 1

1.If there is a layer of natural strata above the seam the thickness of the seal may be reduced accordingly.

Sulphates

Unless testing shows otherwise, sulphate precautions should be taken where foundations are in contact with a coal seam. Minimum class 2 conditions to BRE Digest 363 should be taken.

Geotechnical considerations where coal encountered in footings

Coal usually has a bearing capacity greater than that of natural clay soils surrounding it. The coal is very unlikely to cause a hard-spot problem any more onerous than a sandstone. Where sharp boundaries are encountered in footings between coal and clay, additional thickening and strengthening of the strip footing may be necessary.