

51A The Drive, Ickenham, Uxbridge, UB10 8AG

GROUND INVESTIGATION



Eye Construction Limited

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P21-178gi

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For and on behalf of Paddock Geo Engineering Limited			

1.0 INTRODUCTION

Paddock Geo Engineering Limited (PGE) were instructed by Eye Construction Limited; the Client, to undertake a Ground Investigation and geotechnical appraisal in relation to the construction of a new residential property, following the demolition of the existing building, at 51A The Drive, Ickenham, Uxbridge, UB10 8AG.

1.1 Terms of Reference

- BS 5930:2015 Site Investigation Code of Practice
- BS EN 1997-2, Eurocode 7. Geotechnical design. Ground investigation and Testing
- BS EN ISO 22475 Series (1-3), Geotechnical investigation and testing. Sampling methods and groundwater measurements.
- NHBC Standards Chapter 4.2 2006, Building Near Trees
- TRL Laboratory Report 1132:1984 – The Structure of Bituminous Road, Appendix C Table C1
- BS 5930:1999+A2:2010 Site Investigation Code of Practice
- BS EN 1997-2, Eurocode 7. Geotechnical design. Ground investigation and testing
- BS EN ISO 22475 Series (1-3), Geotechnical investigation and testing. Sampling methods and groundwater measurements.
- NHBC Standards Chapter 4.2 2006, Building Near Trees
- BRE412 1996 Desiccation in Clay Soils
- BRE240 1993 Low Rise Buildings on Shrinkable Clay Soils: Part 1
- BRE241 1990 Low Rise Buildings on Shrinkable Clay Soils: Part 2

1.2 Objective

The objective of the Ground Investigation for the site comprised the following elements:

- An Intrusive Investigation
- A Geotechnical Appraisal for foundation options appraisal
- Soil infiltration data
- Soil waste classification

The scope of work was discussed and agreed with the Client prior to commencement. The investigation was carried out in order to provide data on the sub-soil characteristics of the site, the groundwater regime and also to recover samples for geotechnical laboratory testing and chemical analysis. This data was employed to derive a ground model for the site, foundation options appraisal, infiltration data and soil waste classification for the proposed development.

2.0 THE SITE

2.1 Site Description

The subject site is located in predominately residential area on the western outskirts of the village of Ickenham in Greater London. The site is roughly rectangular in shape and oriented roughly in an east-northeast to west-southwest direction. The site comprises a two-storey residential building and standalone single-storey garage close to the centre, a textured concrete driveway in the east and a largely soft-landscaped garden in the west. The residential building is generally surrounded by paving slabs to the west, north and south, forming walkways and a patio fronting the garden. A structure, of timber construction, is present in the north-west corner of the site and houses a small swimming pool. The swimming pool itself appears to be constructed above-ground, formed by concrete walls and timber surrounds. The swimming pool and associated structure did not appear to be in use at the time of investigation and some vegetation was observed within the building. The swimming pool structure is fronted by a small courtyard to the south, surfaced with paving slabs, and this area is recessed by c.3.0m from the adjoining garden formed by a retaining wall and accessed by a set of steps. The majority of the garden comprises grassed lawn, although several mature and semi-mature are present and the far west of the site is partially overgrown.

The eastern and central portions of the site are generally flat but the garden in the west slopes moderately downwards generally towards the west. The boundaries of the eastern and central portions of the site are generally formed by brick walls, with occasional hedgerow. The boundaries of the western portion of the site are formed by a combination of hedgerows and timber fencing. Residential houses and associated gardens surround the site to the north, east and south and the access road The Drive runs adjacent to the eastern site boundary. A wooded area is located adjacent to the west of the site.

A Site Plan is presented in Appendix A.

2.2 Proposed Development

We understand that the proposed development involves the demolition of the existing residential building and garage followed by the construction of a new residential building. Although no detailed development plans have been provided at the time of writing this report, it is understood that the new development will be positioned in roughly the same footprint of the existing building, albeit with a slight extension. It is currently unknown whether the swimming pool building in the west of the site will be demolished.

2.3 Tree Locations

No arboricultural reports or plans have been provided for the site at the time of writing this report to determine the species and height of trees in the vicinity of the site. Based upon site observations and with reference to the supplied topographical survey plan, several trees are located in close vicinity to the proposed development area, on and off-site, including Beech, Ash, Oak and Holly trees.

3.0 INTRUSIVE INVESTIGATION FIELDWORKS

An intrusive investigation was designed to establish the ground conditions beneath the site in relation to the development of a Ground Model for the proposed development. The works were also employed to gather geotechnical data to derive a foundation options appraisal, infiltration data, and carry out a soil waste classification assessment for off-site disposal of groundworks arisings.

The main fieldworks were carried out on 9th June 2021 and comprised the forming of 3 no. percussion liner sampler boreholes and 1no. trial pits using a tracked excavator to assess the ground conditions, recover samples for subsequent laboratory testing and allow infiltration testing to the BRE365 methodology.

The percussion liner sampler boreholes were formed to a targeted depth of between 5.00m and 6.00m below ground level (bgl). The trial pit was formed to a targeted depth of 1.00m below ground level (bgl) to facilitate infiltration testing.

The boreholes and trial pits were positioned in open accessible areas and to clear buried services following a Cable Avoidance Tool (CAT) survey and consultation of buried services plans where available. Access to the rear of the current dwelling was not possible with the excavator employed so trial pitting was limited to open areas at the front of the site. The exploratory positions were generally constrained by suitable open areas of the site and buried services across the site area.

Soil strength testing was undertaken in the field employing Standard Penetration Testing (SPT) carried out at 1.0m centres within the Window Sample boreholes and hand vane shear strength testing in fine grained soils from intact borehole liner arising.

The boreholes and trial pits were backfilled with arisings once logged and tested.

A series of photographs taken during the fieldworks are presented in Appendix B.

The depth of the boreholes and trial pits, sample details, strata descriptions and comments on the groundwater conditions are detailed on the Logs which are presented in Appendix B along with an Exploratory Point Location Plan. The details and rationale of the exploratory point placement is summarised below. It should be noted, the positioning of the exploratory holes were limited by access at the time of the investigation; as such no exploratory holes were possible in close vicinity to the east and north of the existing residential property.

Exploratory Location Details and Rationale

Exploratory Location (Depth)	Location Details
SA1 (1.00m)	To carry out infiltration testing in the east of the site in limited open space.
WS1 (5.00m)	Confirm ground conditions to the west of the existing residential property and undertake a falling head permeability test.
WS2 (6.00m)	Confirm ground conditions to the south of the existing residential property.

Exploratory Location (Depth)	Location Details
WS3 (6.00m)	Confirm ground conditions in the east of the site.

3.1 Encountered Strata

The exploratory point arisings were logged by a Geotechnical Engineer generally in accordance with BS5930:2015.

The geology beneath the proposed development areas generally indicated a consistent profile, comprising a thin veneer of Made Ground over cohesive units of the London Clay Formation.

A log of the exploratory holes and Exploratory Point Location Plan showing the positions investigated are presented in Appendix B.

MADE GROUND

Made Ground was encountered in all exploratory hole to depths of between 0.30m and 0.40m bgl. In WS1 and WS2 the Made Ground comprised either reworked Topsoil (WS1) or paving slabs over concrete (WS2) surfacing, over a brown sandy gravelly (brick and flint) CLAY to depths of 0.40m bgl. In SA1 and WS3, the Made Ground comprised grey brown gravelly sand to depths of 0.30m bgl. Gravel comprised metal, flint, brick, sandstone and glass.

LONDON CLAY FORMATION

London Clay Formation deposits were encountered within all exploratory holes directly underlying the Made Ground. These deposits predominantly comprised stiff, locally firm and very stiff, orange brown and grey slightly sandy silty CLAY with rare rounded concretions.

The London Clay Formation was encountered to the base of all of the exploratory holes at depths of between 1.00m and 6.00m bgl depth.

ROOTS

Roots and rootlets were identified at shallow depth to c. 0.30m bgl in all locations except WS2.

3.2 Groundwater Conditions

Groundwater was not encountered within any of the exploratory points to the maximum depth penetrated of 6.00m bgl.

3.3 Sampling Strategy

Disturbed samples of the strata encountered were recovered at regular intervals within all the exploratory points to the full depth of the investigation for geotechnical laboratory testing. These were used to gather soil data to allow classification of the soils encountered in relation to the derivation of foundation design criteria.

4.0 FOUNDATION DESIGN CRITERIA

4.1 Geotechnical Laboratory Testing

Representative samples were sent to an external laboratory following visual assessment and logging of the borehole and trial pit arisings. The testing programme was designed to classify the properties of the encountered soils and to determine the chemistry of the soil in relation to the design of buried concrete.

4.1.1 Atterberg Limits

The results of 6no. Atterberg Limit determinations carried out on samples of fine-grained London Clay Formation soils encountered are presented in Appendix C.

The soils tested have been assessed for their volume change potential (VCP) in accordance with NHBC Standards Chapter 4.2 and are detailed in the table below.

Atterberg Limit Testing

Exploratory Point	Depth (m)	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Passing 0.425mm	Casegrande Classification	NHBC Modified Plasticity Index	NHBC Volume Change Potential
WS1	1.8	27	74	21	53	100	CV	53	High
WS2	1.0	16	81	26	55	100	CV	55	High
WS2	4.0	18	62	21	41	100	CH	41	High
WS3	1.0	19	69	20	49	100	CH	49	High
WS3	3.8	22	64	21	43	100	CH	43	High
WS3	5.8	22	65	23	42	100	CH	42	High

The samples of fine-grained soils tested have Modified Plasticity Indices of between 41% and 55% and therefore can be classified as High Volume Change Potential employing the NHBC classification scheme.

4.1.2 Natural Moisture Content

A test was performed to determine the natural moisture content (NMC) of the fine-grained soil samples from those samples subjected to Atterberg Limit testing. Full profiles of the NMC versus depth for the boreholes were not completed.

One of the most commonly used criteria to indicate the onset of significant desiccation is the Driscoll Criteria, this is when soil water content falls below the values equivalent to $0.40 \times$ the Liquid Limit and Plastic Limit + 2% of that soil.

This criterion is only intended to be a crude estimate of the onset of significant desiccation in clays, and therefore suffers from several problems which mainly relate to the particular method adopted and limits of accuracy used to determine the Atterberg Limits by the laboratory as well as the fact that changes in soil moisture content caused by desiccation may in fact be quite small.

Furthermore, it does not take into account the general decrease in soil moisture contents with depth that is encountered with most over-consolidated clays, such as the Glacial Clays. However, it can be assumed that generally speaking soil moistures lower than the Driscoll Criteria are indicative of the onset of significant desiccation and should be used only as a rough guide as it is deemed unwise to use an assessment of desiccation solely on this criterion, particularly if desiccation is slight. The 'rule' should be applied with caution and should always be supported by other evidence.

The results of the Natural Moisture Content (NMC) were compared to the Driscoll Criteria for each sample subjected to Atterberg Limit testing as a screening exercise and allow an assessment of the potential of desiccation of the near surface soils on the site.

The Driscoll Criteria employed were based on the Atterberg Limit parameters for each sample assessed.

The result of the initial assessment indicated that the soils from WS1 and WS3 indicated potential desiccated. The profile for WS1 located to the rear (west) of the proposed dwelling indicated potential desiccation below c. 2.80m bgl and the profile for WS3 to the front (east) of the proposed dwelling indicated potential desiccation from the near surface to the full depth.

These results are presented in the Laboratory Test Result Summaries in Appendix C.

4.1.3 Particle Size Distribution

Particle Size Distribution (PSD) testing was not carried out as no suitable soils were identified during the site works.

4.1.4 pH and SO_x

The level of pH, sulphate and other determinands within the BRE SD1 Suite have been determined for selected samples from above and at the proposed likely foundation invert level, to assess the appropriate Design Sulphate Class for buried concrete in accordance with BRE Special Digest 1 Table 2. The results of the analysis are presented in Appendix D along with the chemical laboratory results.

The table below summarises the reported pH values, Total Sulphate and 2:1 Water Soluble Sulphate concentrations.

Design Sulphate Class for Site

Trial pits	Depth	pH	Water Soluble Sulphate (2:1 Water Extract) (mg/l)	Total Sulphate (%)	Appropriate Design Sulphate Class
WS1	0.80	7.2	110	0.034	DS-1
WS1	2.00	8.4	120	0.049	DS-1
WS2	1.50	8.4	140	0.040	DS-1
WS3	0.80	8.0	770	0.180	DS-2

The above assessment assumes that all of the Total Sulphate (%) is in a suitable form that following ground disturbance could oxidise.

The Design Sulphate Class for the site is DS-1 and DS-2 with a worst case Aggressive Chemical Environment for Concrete (ACEC) site classification of AC-1s.

No groundwater was encountered to the full depth (6.00m) of the investigation during the fieldworks.

4.2 In-Situ Testing

Standard Penetration Testing (SPT) was carried out at 1.0m centres within the Window Sample boreholes. A Hand Vane was also employed on fine grained soils within the intact arisings to assess the shear strength of the fine-grained soils encountered. The SPT and Hand Shear vane values are presented with the Exploratory Point Logs in Appendix B.

The fine-grained London Clay Formation soils were typically of medium to high strengths at depths of below 1.00m depth with hand shear vane readings of between 49kPa and 135kPa. The SPT testing results with the London Clay Formation deposits ranged between 8 and 31, indicating corresponding soil strength of between 36kPa and 140kPa employing the correction by Stroud and Butler, 1975 for soils with a PI>40%.

5.0 ENGINEERING EVALUATION

5.1 Introduction

We understand that the proposed development involves the demolition of the existing residential building and garage followed by the construction of a new residential building. Although no detailed development plans have been provided at the time of writing this report, it is understood that the new development will be positioned in roughly the same footprint of the existing building, albeit with a slight extension. It is currently unknown whether the swimming pool building in the west of the site will be demolished.

5.2 Foundation Design Considerations

The geology beneath the proposed development areas generally indicated a consistent profile, comprising a thin veneer of Made Ground over cohesive units of the London Clay Formation.

Made Ground was encountered in all exploratory hole to depths of between 0.30m and 0.40m bgl. In WS1 and WS2 the Made Ground comprised either reworked Topsoil (WS1) or paving slabs over concrete (WS2) surfacing, over a brown sandy gravelly (brick and flint) CLAY to depths of 0.40m bgl. In SA1 and WS3, the Made Ground comprised grey brown gravelly sand to depths of 0.30m bgl. Gravel comprised metal, flint, brick, sandstone and glass.

London Clay Formation deposits were encountered within all exploratory holes directly underlying the Made Ground. These deposits predominantly comprised stiff, locally firm and very stiff, orange brown and grey slightly sandy silty CLAY with rare rounded concretions and coal fragments.

The London Clay Formation was encountered to the base of all of the exploratory holes at depths of between 1.00m and the base of the deepest boreholes of 6.00m bgl.

The fine-grained London Clay Formation soils were typically of medium to high strengths at depths of below 1.00m depth.

No groundwater strikes were recorded within any of the exploratory holes to the maximum depth of at 6.00m bgl during the fieldworks.

The London Clay Formation fine-grained soils has been assessed as **High VCP**.

5.3 New Structure Foundation Design Criteria

5.3.1 Building Near Trees Assessment

The London Clay Formation soils are classified as High VCP for design. On this basis consideration should be given to deepening foundation to account for the effects of tree and other major vegetation predominantly along the site boundaries, and / or new planting proposed within the development scheme.

No arboricultural reports or plans have been provided for the site at the time of writing this report to determine the species and height of trees in the vicinity of the site. Based upon site observations and with reference to the supplied topographical survey plan, several trees are located in close vicinity to the proposed development area, on- and off-site, including three beech trees, ash, oak and holly trees.

As an initial assessment of the potential minimum foundation depths required for the London Clay Formation soil with respect to the trees located in close vicinity to the proposed development area a minimum foundation depth assessment has been carried out employing the NHBC Section 4.2 methodology to give an indication if conventional strip foundations are likely to be suitable for the proposed development in these areas of the site.

A detailed assessment should be carried out using the data within this report once a final development plan has been produced by the scheme foundation design Engineer. This will allow a detailed reassessment of the required minimum foundation depths for the development.

The table below summarises the initial assessment of the closest and highest water demand tree species present which are considered likely to influence foundations of the proposed new structures.

It details the worst-case minimum foundation depths required by NHBC Guidance in relation to the proposed development and employing a High VCP for the fine-grained London Clay Formation soils.

Minimum Foundation Depth Assessment

Suspected Tree Species (Location)	Water Demand	Approximate Distance from the closest Dwelling structure (D) (m)	Mature Height * (mature height) (H) (m)	D/H	Zone of influence	Recommended depth of foundations- High VCP Soils (m below base of tree)
<i>Beech (offsite to the northeast)</i>	Moderate	4	20	0.20	$0.75 * 20 = 15\text{m}$	2.00m
<i>Beech (offsite to the northeast)</i>	Moderate	10	20	0.50	$0.75 * 20 = 15\text{m}$	1.45m
<i>Ash (onsite in the northeast)</i>	Moderate	12	23	0.52	$0.75 * 23 = 17.25\text{m}$	1.45m
<i>Holly (onsite in the northeast)</i>	Low	10	12	0.83	$0.50 * 12 = 6.0\text{m}$	Outside zone of influence.
<i>Oak (onsite in the northeast)</i>	High	15	24	0.63	$1.25 * 24 = 30\text{m}$	2.20m
<i>Beech (onsite in the northwest)</i>	Moderate	15	20	0.75	$0.75 * 20 = 15\text{m}$	1.00m

Based on the worst-case assessment above, this indicates a minimum foundation depth for some of the new build structures of greater than 2.20m below the base of the impacting trees based on existing trees currently located in close vicinity to the proposed development area.

A detailed reassessment of the required minimum foundation depths should be carried out once a final detailed development layout has been decided and a proposed planting and final assessment of the tree species and those to be retained has been produced.

Where foundations are greater than 1.5m depth or within the zone of influence of a tree, heave protection should be employed such as 'clay board'. However, it is likely to be difficult to place heave protection within the sides of relatively deep open excavations and inspection may require locally deeper excavations, prior to pouring of any concrete.

Where foundations lay outside the zone of influence of any trees the minimum foundation depth of 1.50m bgl are recommended to be considerate of restrictive new planting given the High VCP soils identified.

5.3.2 Excavations

Excavations should be readily achieved within the near surface soils using conventional plant.

The soils encountered within the borehole and trial pits are considered likely to remain stable in the short term up to depths of at least 2.00m.

No groundwater strikes were recorded within any of the trial pits to the maximum depth of drilling at 6.00m bgl during the fieldworks.

At no time should any excavations be entered by personnel without correct shoring and only after an assessment of whether the task can be completed without entry to the excavation has been completed.

5.4 Foundation Options Discussion

Conventional foundations, such as spread and isolated pads, placed into Made Ground, variable soils and potentially desiccated soils are generally subjected to increased risk of settlement, especially differential settlement. Therefore, it is not recommended that foundations be placed into the shallow Made Ground or potentially desiccated soils encountered on site.

Potentially desiccated soils were encountered to the front of the proposed dwelling in WS3 from the near surface, however, the borehole WS3 location was adjacent to a hedgerow and some 5m distal from the front of the proposed dwelling, which may reduce the identified potential desiccation. Further to this the desiccation profile from WS1 recovered from the rear of the proposed dwelling was not adjacent to any significant trees or bushes and as such could be classed as a control. This profile indicated potential desiccation from below 2.80m depth, suggesting a natural decrease in moisture content with depth below this depth. If this were the case then conventional foundations may be suitable for the development with depths based on an updated detailed building near trees assessment when the nature of existing trees has been confirmed and proposed planting is finalised.

For conventional foundation outside the influence of any trees and bearing onto the High VCP London Clay Formation soils a minimum foundation depth of 1.50m bgl should be employed to be protective of restrictive new planting.

For foundations inside the influence of trees, a minimum foundation depth of c 2.20m bgl will be required, with depths to be finalised from an updated detailed building near trees assessment. Excavation of trench fill foundations may be feasible at the site beyond 2.5m given the relative stability of the London Clay Formation soils and lack of an identified shallow groundwater table. Deeper trench fill foundations may therefore be considered as a suitable founding option for the site if considered an economical option. However, if foundations in excess of 2.5m depth are proposed, they should be designed by a Structural Engineer in accordance with the requirements of the NHBC Standards (Chapter 4.2.8). Furthermore, when trench fill foundations are considered, the design should take into account soil desiccation risk from additional detailed testing along the walls of the proposed development if within the influencing distance of trees.

Given the proposed foundations depths and additional desiccation profile testing required for a conventional strip foundation solution, a potentially economic alternative would be deeper foundation taken into the underlying London Clay Formation, such as a piled solution.

The above foundation options and design approaches are subject to detailed Structural Engineer design and regulator agreement.

5.5 Bearing Capacity

Should a conventional spread foundation option be considered, either at a minimum depth of 1.5m (outside the influence of trees) or at a minimum depth of 1.50m, an allowable bearing capacity would be of the order of **120kPa**.

These estimates further include a factor of safety of 3 against general shear failure and should keep settlements within tolerable limits.

Any excavations for the footings should be inspected by a suitably qualified person to assess the variability of the soils and groundwater conditions. If, following inspection, the soil conditions differ from those identified within this geotechnical appraisal the recommendations may require reassessment. Any roots, organic matter, and in particular any 'soft/loose' or otherwise unsuitable material encountered at the founding depth should be removed prior to pouring of any concrete.

5.6 Piled Foundations

Should assessed minimum foundation depths be too deep for conventional foundations or the bearing capacities derived above not be sufficient for the proposed development then consideration of alternative foundation solutions such as piles may provide the required improvement in bearing capacities.

Piled foundations are likely to provide a satisfactory foundation option for the proposed development with piles extending into the London Clay Formation at greater depth than investigated during this ground investigation.

A cable percussion borehole with attendant sampling, testing and supplementary ground investigation report will be required to provide a further range of geotechnical parameters and to assist structural engineer and piling contractor with the piled foundation design. The advice of a specialist piling contractor should be sought who can provide an assessment of the suitability of their piles.

5.7 Ground Floor Slabs

In accordance with the NHBC standards, as clay soils of high volume change potential are present at the site, it is recommended that suspended floor slabs with a void be adopted.

5.8 Sub-Surface Concrete

The Design Sulphate Class was generally variable across the site and with depth with a worst case Design Sulphate Class of **DS-2**.

A worst case Aggressive Chemical Environment for Concrete (ACEC) site classification is general **AC-1s** classification.

No groundwater was encountered within the borehole or trial pits to a maximum depth of 5.00m during the fieldworks.

5.9 Surface Water Soakaways and Soil Permeability

Infiltration testing was carried out on the site within Trial Pits SA1 employing the BRE365 methodology only as this was the only areas accessible at the time of the siteworks. Infiltration potential to the rear of the proposed dwelling was assessed through Falling Head testing to BS5930 within WS1. Only one cycle of testing was carried out within the trial pit and borehole due to poor infiltration. The infiltration factor calculation sheets are presented in Appendix D and the testing summarised below.

Infiltration Testing Results

Trial Pit	Test Number	Depth of Test (m begl)	Infiltration Factors (ms^{-1})
SA1	1	0.52m – 1.00m	No infiltration
	2	N/A	-
	3		-
WS1	1	0.00m – 5.00m	No infiltration

Given the infiltration rates recorded, it is considered that conventional soakaways are not suitable on the site within the London Clay Formation.

5.10 Access Roadways and Parking Areas

In situ CBR determinations was not carried out on the site at the proposed development level. Employing the TRL Laboratory Report 1132 – The Structure of Bituminous Road, Appendix C Table C1 allows an estimate of CBR value based on soil equilibrium suction index. Based upon the laboratory testing on the London Clay Formation soils at formation level a worst case CBR value of 1.5-3.5% can be employed dependent upon the groundwater table and the prevailing condition at the time of placement.

Therefore, given the above results a conservative design CBR value of **2.0%** is considered appropriate for the site at formation level.

This value should be confirmed and can likely be increased with in-situ CBR determination when the site has been reduced to the development level to expose the formation soils.

6.0 SOIL WASTE ASSESSMENT

6.1 Classification Testing and Assessment

The HazWaste online classification system was employed to assess the waste classification employing the total determinand concentrations on a composite sample obtained from Made Ground and natural soils from across the site, in relation to groundworks arising disposal. This indicated the soils tested to have a Non-Hazardous classification with EWC code **17 05 04**.

Waste Acceptance Criteria (WAC) testing was also carried out to determine if the soils tested could be disposed of into an inert facility on composite samples of the near surface and deeper natural soils. This indicates that the samples of soils had leachable determinand levels generally below the related guidance levels for disposal into an inert facility.

The results of the soil waste classification testing are presented in Appendix C.

On the above basis, it is considered that the near surface natural soils tested would classify as non-hazardous waste and may be suitable for disposal into an inert facility.

All waste classification should be confirmed with the waste receiving facility prior to disposal. The waste receiving facility, especially if not an inert landfill, may also require the total soil priority contaminant concentrations which are also presented in Appendix C.

7.0 CERTIFICATION

This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.

The conclusions and recommendations given in this report are based on our understanding of the future plans for the site and based on a scope of works agreed by the Client and afforded by the agreed budget. No responsibility is accepted for conditions not encountered, which are between exploratory points or outside of the agreed scope of work.

If the future plans for the site are changed, such as the site is developed for a more or less sensitive use, then a different interpretation might be appropriate.

The report has been prepared generally following the guidelines and principles established in the British Standards, BS5930:1999+A2:2010, BS 10175:2011, entitled 'Investigation of Potentially Contaminated Sites – Code of Practice' and the DEFRA/EA Contaminated Land Reports CLR7 and CLR8.

It necessarily relies on the co-operation of other organisations and the free availability of information and total access. No responsibility can, therefore, be accepted for conditions arising from information that was not available to the investigating team as a result of information being withheld or access being denied.

This report may suggest an opinion on a suspected configuration of strata or conditions between exploratory points and below the maximum depth of investigation. However, this is for guidance only and no liability can be accepted for its accuracy. Comments on the groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. It should be noted, however, that groundwater levels might vary due to seasonal or other effects.

It should be noted that this report is based solely on the samples collected in the exploratory hole locations investigated. During the works and following general site clearance, should the sub-soil conditions in other areas of the site appear to be inconsistent with those found in the areas sampled then this geotechnical appraisal and site contamination assessment may need to be reviewed.

This report is prepared and written in the context of the proposals stated in the introduction to this report and it should not be used in a differing context. Furthermore, new information, improved practices and changes in legislation may require an alteration to the report in whole or in part after its submission. Therefore, with any changes in circumstances, or after one year from the date of the report, the report should be referred back to Paddock Geo Engineering Limited for re-assessment (and, if necessary, for an estimate for the cost of such).

The copyright of this report and any associated plans and documents prepared by Paddock Geo Engineering Limited is owned by them and should not be reproduced, published or adapted, in whole or part, without their written consent.

REFERENCES

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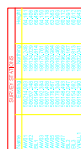
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APPENDIX A – MAPS AND PLANS

Site Location Plan



Accession	Site description	Species	Sexes & Ages	Seasons & Months	Locality
10000	10000	10000	10000	10000	10000
10001	10001	10001	10001	10001	10001
10002	10002	10002	10002	10002	10002
10003	10003	10003	10003	10003	10003
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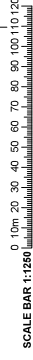
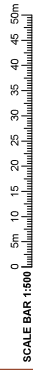
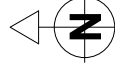
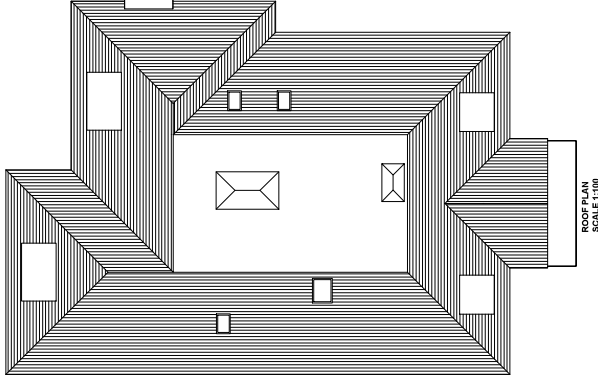
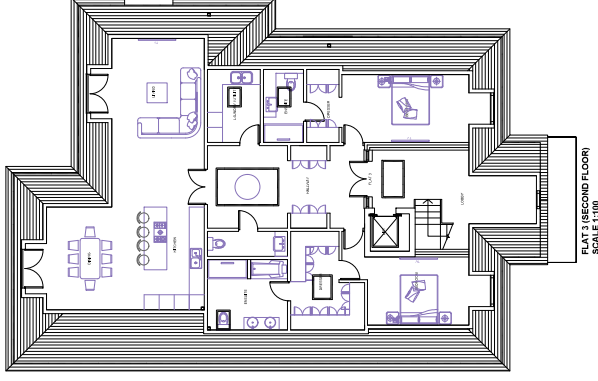
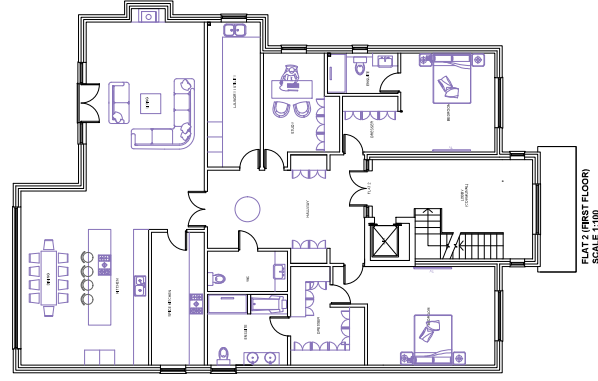
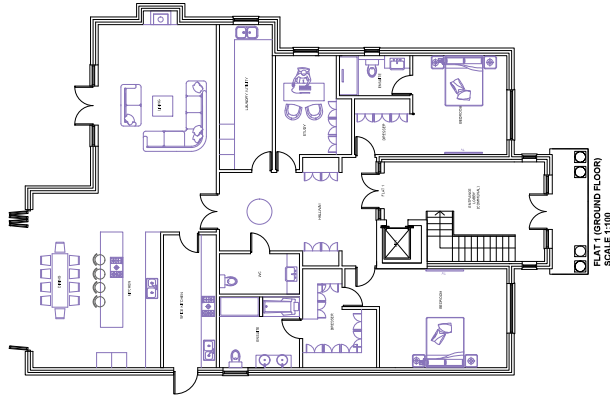


Revision	Rev Drawn	Rev App'd	Date	Revision Description
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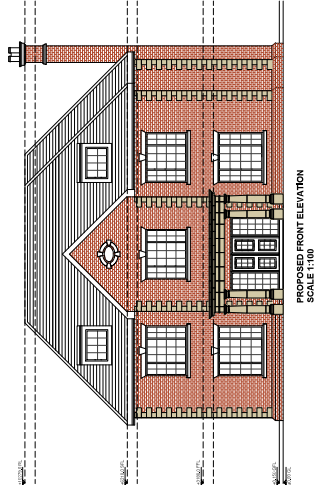
SYNTEGRA
CONSULTING

Syntegra House, 63 Milford Road, Reading, RG1 8LG
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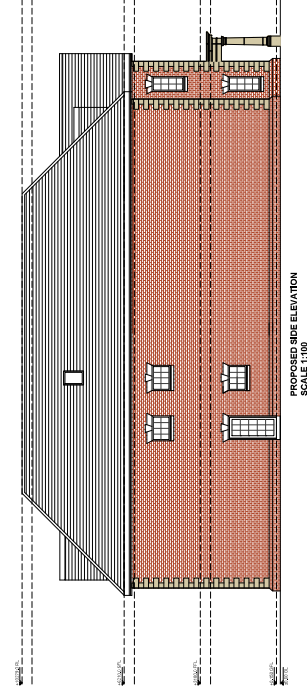
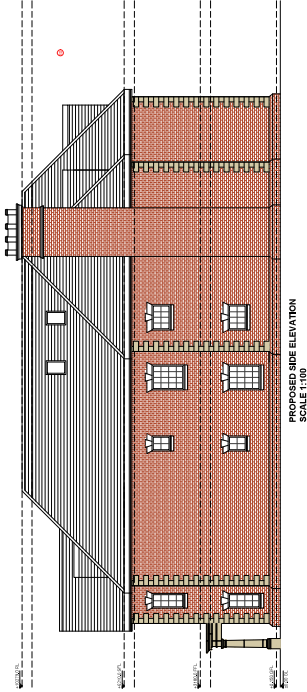
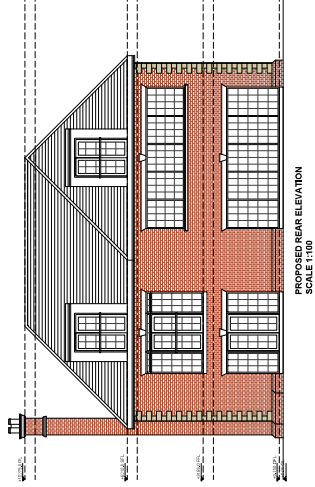
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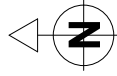


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LANDMARK GROUP

THE RELAYS
50 GERRARD STREET, 50 GERRARD STREET, 50 GERRARD STREET
BIRMINGHAM, B1 1AA
TEL: 0121 666 121 500
EMAIL: INFO@LANDMARK-GROUP.CO.UK



RIBA 
Chartered Practice

CLIENT / JOB ADDRESS: 518 THE DRIVE LYXBRIDGE UB10 9AG	DRAWING TITLE / DESCRIPTION PROPOSED FRONT ELEVATION
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SUBMISSION / REF PLANNING APPLICATION	REVISION / DESCRIPTION	DRAWN BY DATE
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ALL MEASUREMENTS TO BE CHECKED ON SITE AND NOT SCALED FROM THE DRAWING. ANY DISCREPANCIES TO BE
THE LANDMARK GROUP'S RESPONSIBILITY. THE DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES
TO ALL WORK TO THE SATISFACTION OF LOCAL AUTHORITY INSPECTOR. NO DEVIATION FROM THESE DRAWING WHAT
SO EVER UNLESS AGREED IN WRITING WITH LANDMARK GROUP.
THAMES WATER (OR OTHER LOCAL WATER PROVIDER) BUILD OVER AGREEMENTS MAY BE REQUIRED. THIS IS SUBJECT
TO A DRAINAGE INSPECTION AND MAY REQUIRE AN ADDITIONAL FEE, WHICH WILL BE PAYABLE TO THE WATER
PROVIDER AND LANDMARK GROUP.
ALL GUTTERS, FOUNDATIONS AND DOWNPIPES TO REMAIN WITHIN THE BOUNDARY LINES OF THE SUBJECT PROPERTY
ALL PLANS ARE SUBJECT TO FULL PLANS APPROVAL BY BUILDING CONTROL, NOT BUILDING NOTICE.
DRAFT DRAWINGS
**NOTE: DRAWINGS AND CALCULATIONS TO BE APPROVED BY LOCAL AUTHORITY OR APPROVED BUILDING CONTROL
INSPECTOR BEFORE WORK COMMENCES.**

BELOW GROUND DRAINAGE	
1	CONNECTIONS TO PUBLIC SEWERS REQUIRE THE AGREEMENT OF THE LOCAL AUTHORITY. THE DRAINAGE IS TO BE CONSIDERED TO THE OWNERS OF THE SEWER. THIS SHOULD BE DEFINED AS PART OF THE DRAINAGE AGREEMENT. THE DRAINAGE IS TO BE CONSIDERED TO BE DISCHARGED INTO A PUBLIC SEWER. THE LOCAL AUTHORITY MUST BE NOTIFIED OF THE PROPOSAL.
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WITH SEPARATE SYSTEMS FOR FILL WATER AND SURFACE WATER	6
WITH SEPARATE SYSTEMS WHERE FILL WATER IS CONNECTED TO THE MAIN SEWER, WHILE SURFACE WATER DISPOSAL IS BY SOME OTHER MEANS, OR BY OTHER SUITABLE MEANS, OR AS A COMBINED SYSTEM	6
WHERE THE SEWERAGE UNDERTAKER PERMITS SURFACE WATER DRAINS TO BE CONNECTED TO THE MAIN SEWER, PROVIDED THAT WHERE THE FLOWAGE UNDERMAY EXCEEDS SURFACE WATER DRAINS TO BE CONNECTED TO A FILL WATER SYSTEM.	6
AN INTERCEPTOR SHOULD BE INSTALLED ON THE SURFACE WATER SIDE OF THE FILL SEWER JUNCTION, OR TRAPPED GULLIES SHOULD BE USED.	6
WHERE THE SURFACE WATER IS NOT CONNECTED TO SURFACE WATER DRAINS, THERE SHOULD BE A 1:1 TRAP ON THE GROUNDING WATER SIDE.	6

[illegible]

LANDMARK
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SUNSHINE
GERBARDY CROSS
HUCKINGHAM BRIDGE, S.9.9 Q&E

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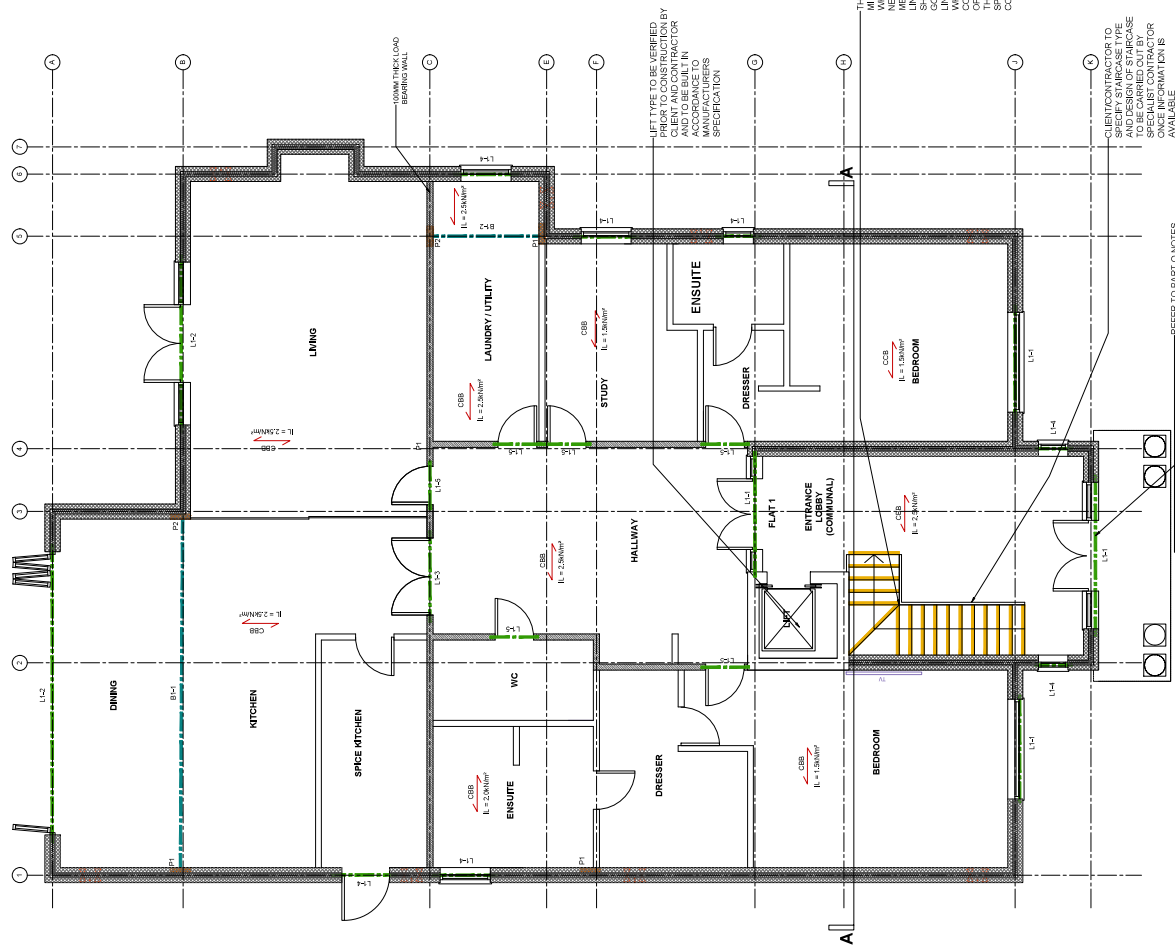
BEAM AND BLOCK	
1	BEAM & BLOCK FLOOR TO DISMAY BE ORDERED BY CONTRACTOR. ALL DETAILS INDICATE BEAM & BLOCK SUPPLIER TO PROVIDE DRAWINGS AND SPECIFICATIONS TO BE ORDERED BY CONTRACTOR. TO BE ORDERED BY CONTRACTOR.
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MASONRY	
1	SUPPLEMENTARY PAPER (SEE BLOCKWORK TO BE 22 MM PER METRE).
2	EXPANSION JOINTS TO BE ORDERED BY CONTRACTOR. TO BE ORDERED BY CONTRACTOR.
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INTERNAL TIMBER STUD WALL PANELS	
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FLAT 1 (GROUND FLOOR) SHOWING FIRST FLOOR STRUCTURE

SCALE BAR 1:100 0 1m 2 3 4 5 6 7 8 9 10m



LANDMARK GROUP
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OF EXCELLENCE
CONSTRUCTION
RECKONING PARTNERS, SLP
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CLIENT / JOB ADDRESS SIA THE DRIVE UXBRIDGE MIDLESEX PROJECT DESCRIPTION	SUBMISSION / REF BUILDING REGS AND STRUCTURAL DRAWING TITLE (GROUND FLOOR PLAN)	DATE: 05.11.2020 DRAWN BY: DV CHECK: MS/KG

1. STRUCTURAL AND BUILDING DRAWINGS TO BE READ IN CONJUNCTION WITH ALL RELATED DRAWINGS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE CLIENT BEFORE PROCEEDING WITH THE WORKS.
3. DIMENSIONS INDICATE STRUCTURAL ELEMENTS ONLY.
4. ALL EXISTING UTILITIES AND DIMENSIONS INDICATED ON THE DRAWINGS ARE FOR BALANCE ONLY AND ARE TO BE CHECKED ON SITE BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF WORKS.
6. ALL WORKMANSHIP AND MATERIALS ARE TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING CODES OF PRACTICE AND GOOD BUILDING PRACTICE.
7. ALL DIMENSIONS ARE TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING CODES OF PRACTICE AND GOOD BUILDING PRACTICE.
8. SOME AREAS OF THE DRAWING HAVE BEEN ASSIGNED TO BE ORDERED ONCE BY MAIN CONTRACTOR AND ANY DISCREPANCIES REPORTED TO THE CLIENT.
9. IT IS THE RESPONSIBILITY OF THE CLIENT TO ENSURE THAT THOSE UNDERTAKING THE WORKS ARE COMPETENT AND EXPERIENCED IN THE TYPE OF WORK TO BE UNDERTAKEN.
10. ALL WORKS TO BE ORDERED BY THE CLIENT.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF WORKS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF WORKS.
13. ALL DIMENSIONS ARE TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING CODES OF PRACTICE AND GOOD BUILDING PRACTICE.
14. DIMENSIONS AND CALCULATIONS TO BE APPROVED BY LOCAL AUTHORITY OR APPROVED BUILDING CONTROL INSPECTOR BEFORE WORK COMMENCES.

REV.	DESCRIPTION	DRAWN BY	CHECKED BY	DATE
P2	BUILDING CONTROL CHANGE	DV	KG	10.06.21

LEGEND	
	STEELWORK
	BLOCKWORK
	MASONRY
	TIMBER
	LINTEL

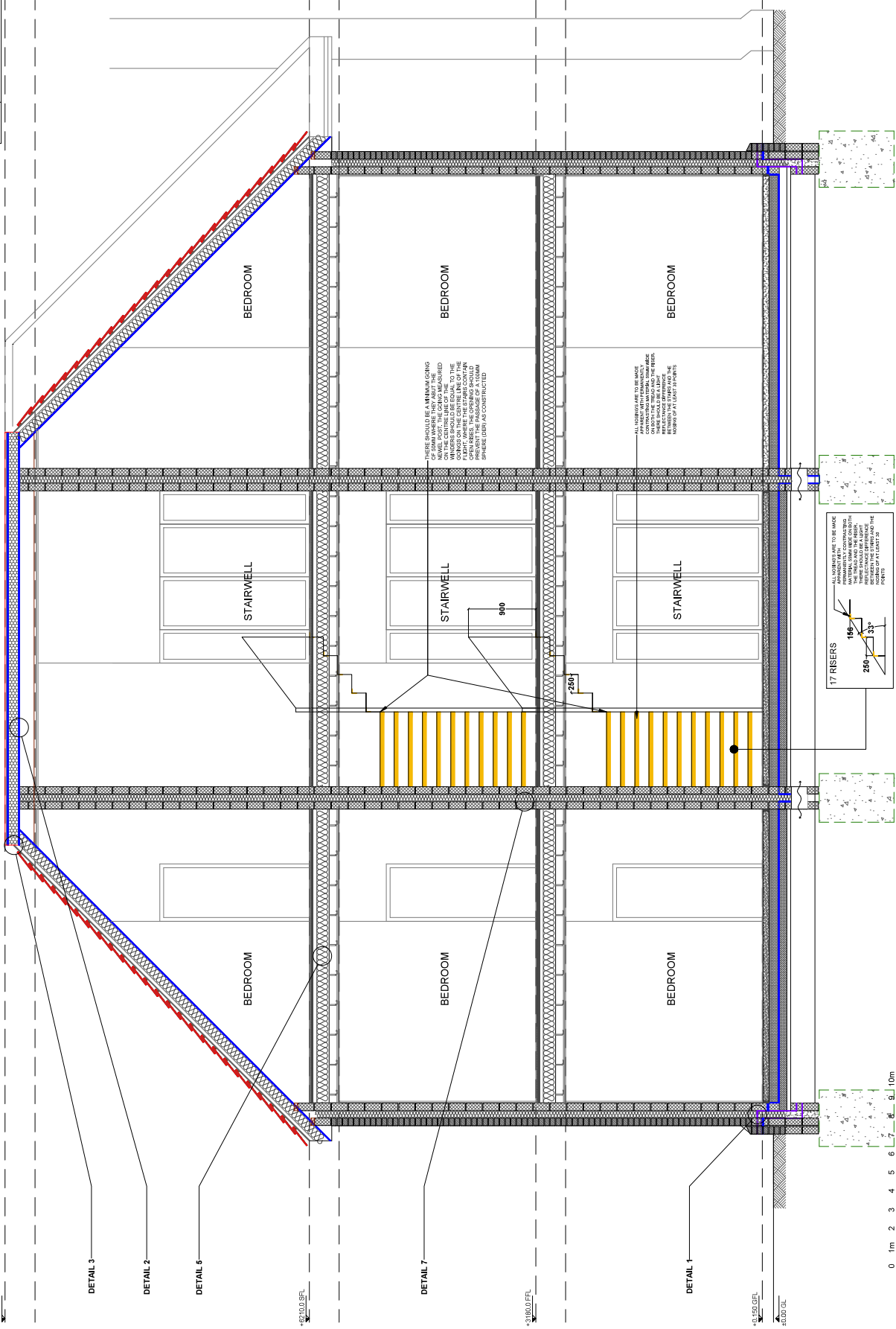
STEEL BEAMS, PADSTONE SCHEDULE AND CONNECTION LOAD	
REF	STEEL MEMBER SIZE P1 (LxWxTH) (mm) P2 (LxWxTH) (mm)
B-1	UC254x254x127 S275 400x100x100 C24 400x100x100 C24
B-2	UC254x254x127 S275 400x100x100 C24 400x100x100 C24

TIMBER SCHEDULE	
REF	TIMBER MEMBER SIZE
F-1	24x24x2400 C24
F-2	20x20x2400 C24
F-3	17x17x2400 C24

LINTEL SCHEDULE	
REF	LINTEL TYPE
L-1	REINFORCED CONCRETE
L-2	UC 200x200x60 S275
L-3	UC 200x200x60 S275
L-4	UC 200x200x60 S275
L-5	UC 200x200x60 S275

APPROVED BY
BUILDING CONTROL

REV.	DESCRIPTION	DRAWN BY	CHECKED BY	DATE
P1	PRELIMINARY	DV	KG	23.11.20



APPROVED BY
BUILDING CONTROL

LANDMARK GROUP
THE PILLARS
BUCKINGHAMSHIRE, SL9 9QE
GERALD ADAMS
TEL: 0189532 560
EMAIL: NEW LANDMARK GROUP/UK

CLIENT / JOB ADDRESS
SIA THE DRIVE
ICKENHAM
UK BRIDGE

PROJECT DESCRIPTION
UNIT 503

RIBA #
Chartered Practice

SUBMISSION / REF
BUILDING REGS AND STRUCTURAL
DRAWING TITLE
SECOND FLOOR PLAN

DATE: 09.11.2020 **SCALE:** 1:50 @ A1
DRAWN BY: DV **CHECK:** MS/KG
DRAWING No: 200

1. STRUCTURAL AND BUILDING DRAWINGS TO BE READ IN CONJUNCTION WITH ALL RELATED DRAWINGS.

2. ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE CLIENT BEFORE PROCEEDING WITH THE WORKS.

3. DIMENSIONS SHOWN ON THESE DRAWINGS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

4. ALL EXISTING DETAILS AND DIMENSIONS INDICATED ON THE DRAWINGS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

5. THE DRAWINGS ARE TO BE USED FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

6. ALL WORKMANSHIP AND MATERIALS ARE TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING CODES OF PRACTICE AND GOOD BUILDING PRACTICE.

7. ALL DIMENSIONS ARE TO BE MADE TO THE CENTRE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.

8. SOME AREAS OF THE DRAWINGS HAVE BEEN ASSIGNED TO OTHER CONTRACTORS AND ANY DISCREPANCIES REPORTED TO THE CLIENT.

9. IT IS THE RESPONSIBILITY OF THE CLIENT TO ENSURE THAT THOSE UNDERTAKING THE WORKS ARE COMPETENT AND EXPERIENCED IN THE TYPE OF WORK TO BE UNDERTAKEN.

10. ALL WORKS SHOWN ON THESE DRAWINGS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

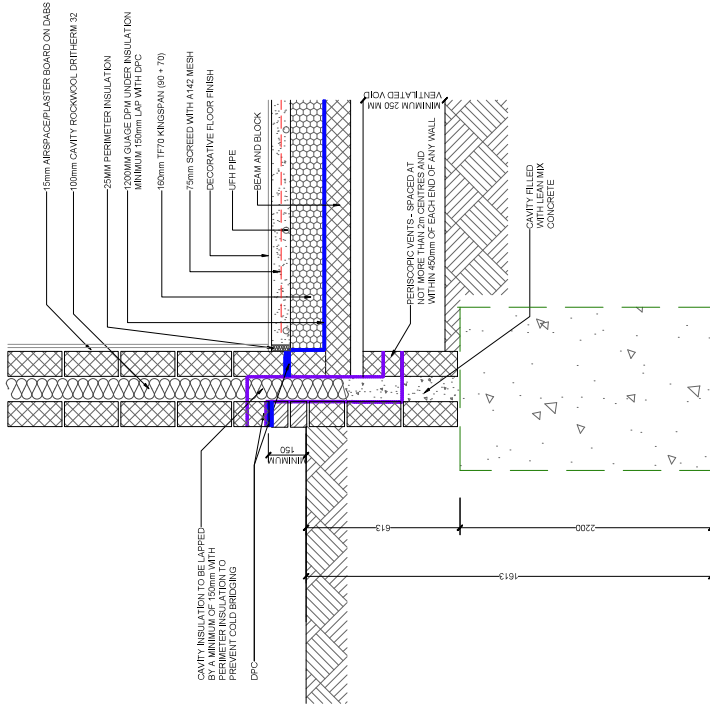
11. DIMENSIONS SHOWN ON THESE DRAWINGS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

12. DIMENSIONS SHOWN ON THESE DRAWINGS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

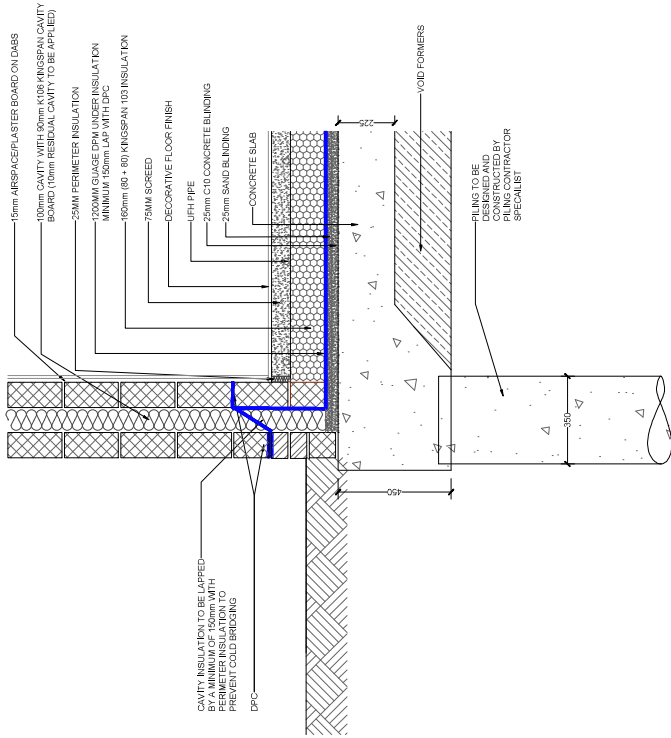
13. ALL DIMENSIONS ARE TO BE MADE TO THE CENTRE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.

14. DIMENSIONS AND CALCULATIONS TO BE APPROVED BY LOCAL AUTHORITY OR APPROVED BUILDING CONTROL INSPECTOR BEFORE WORK COMMENCES.

REV.	DESCRIPTION	CHECKED BY	DATE
P1	PRELIMINARY	DV	KG
			23.11.20



DETAIL 1 - FOUNDATION AND GROUND FLOOR DETAIL (OPTION 1)
SCALE 1:10



DETAIL 1 - INDICATIVE PILING AND GROUND FLOOR DETAIL (OPTION 2)
SCALE 1:10

SCALE BAR 1:100 0 1m 2 3 4 5 6 7 8 9 10m



LANDMARK GROUP
THE PILLARS
OF EXCELLENCE
BRICKENHAM STREET, SUTTON
TEL: 0189532 560
EMAIL: INFO@LANDMARK-GROUP.CO.UK

CLIENT / JOB ADDRESS SIA THE DRIVE UXENHAM LEICESTERSHIRE	COB RPI with LABC REGISTERED
PROJECT DESCRIPTION UNIT 303	RIBA # Chartered Practice

SUBMISSION / REF BUILDING REGS AND STRUCTURAL	DATE: 09.11.2020
DRAWING TITLE DETAILS 1 OF 3	SCALE: 1:10 @ A1
DRAWN BY: DV	CHECK: MS/KG
DRAWING No: 201	

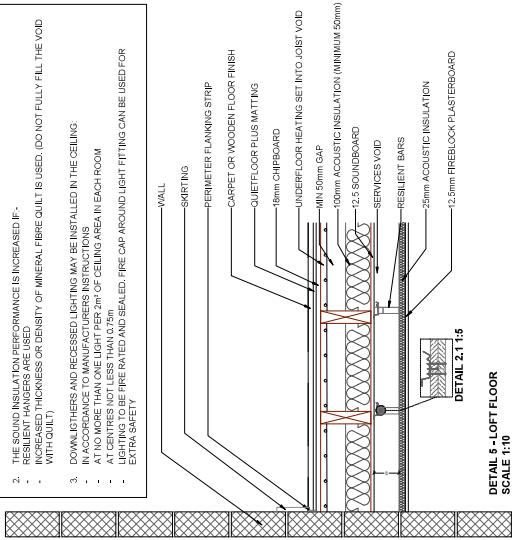
APPROVED BY
BUILDING CONTROL

- STRUCTURAL AND BUILDING DRAWINGS TO BE READ IN CONJUNCTION WITH ALL RELATED DRAWINGS.
- ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE CLIENT BEFORE PROCEEDING WITH THE WORKS.
- ENGINEERS DRAWINGS INDICATE STRUCTURAL ELEMENTS ONLY.
- ALL EXISTING DETAILS AND DIMENSIONS INDICATED ON THE DRAWINGS ARE FOR BALANCE ONLY AND ARE TO BE CHECKED ON SITE BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF ALL WORKS.
- ALL SERVICES ARE TO BE LOCATED AND PROTECTED AS NECESSARY BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE WORKS.
- ALL WORKMANSHIP AND MATERIALS ARE TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING CODES OF PRACTICE AND GOOD BUILDING PRACTICE.
- SOME AREAS OF THE DRAWINGS HAVE BEEN ASSIGNED ALL ARE TO BE CHECKED ON SITE BY THE CONTRACTOR AND ANY DISCREPANCIES REPORTED SO THAT IT IS THE RESPONSIBILITY OF THE CLIENT TO ENSURE THAT THOSE UNDERSTANDING THE WORKS ARE COMPREHENSIVE AND EXPRESSED IN THE TYPE OF WORK TO BE UNDERTAKEN.
- ALL WORKS SHOWN ON THESE DRAWINGS ARE TO BE UNDERTAKEN BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF ALL WORKS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF ALL WORKS.
- ALL UTILITY, EXISTING SERVICES AND DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ALL WORKS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITY PRIOR TO COMMENCEMENT OF ALL WORKS.

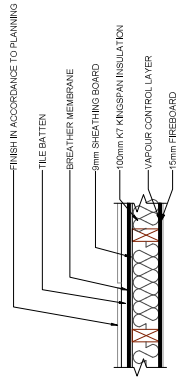
REV.	DESCRIPTION	DRAWN BY	CHECKED BY	DATE
P1	PRELIMINARY	DV	KG	23.11.20

NOTE

1. ALL CEILING TREATMENTS TO BE INSTALLED IN ACCORDANCE TO MANUFACTURERS INSTRUCTIONS. ALL JOINTS MUST BE SEALED WITH TAPE OR CAULKED WITH SEALANT
2. THE SOUND INSULATION PERFORMANCE IS INCREASED IF:-
 - RESILIENT HANGERS ARE USED
 - 100mm KINGS PAN INSULATION IS USED
 - MINIMUM DENSITY OF MINERAL FIBRE QUILT IS USED. (DO NOT FULLY FILL THE VOID WITH QUILT)
3. DOWNLIGHTS AND RECESSED LIGHTING MAY BE INSTALLED IN THE CEILING.
 - IN ACCORDANCE TO MANUFACTURERS INSTRUCTIONS
 - AT NO MORE THAN ONE LIGHT PER 2m² OF CEILING AREA IN EACH ROOM
 - AT CENTRES NOT LESS THAN 675mm
 - DOWNLIGHTS MUST BE FIRE RATED AND SEALED. FIRE CAP AROUND LIGHT FITTING CAN BE USED FOR EXTRA SAFETY

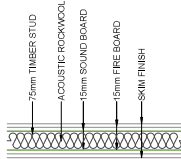


DETAIL 2.1.1.5
SCALE 1:10

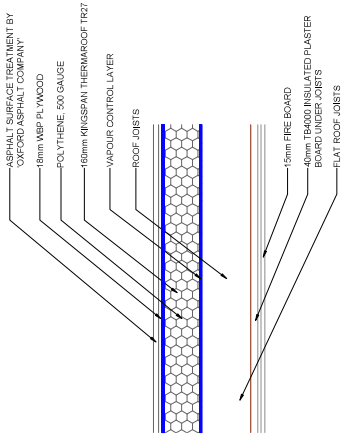


DETAIL 4 - DORMER CHEEK DETAIL
SCALE 1:10

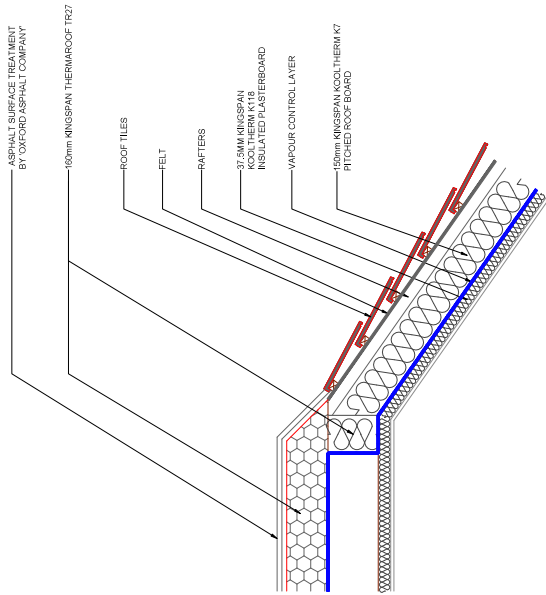
INTERVAL WALLS BETWEEN BEDROOMS AND OTHER ROOMS INCLUDING WC SHOULD ACHIEVE A RATING, TYPICALLY STUD WALL WITH TIMBER STUDS OF 180mm MINIMUM DENSITY OF 100kg/m³ MINIMUM 25MM THICK WITH A LAYER OF MINERAL WOOL MINIMUM 25MM THICK WITH A MINIMUM DENSITY OF 100kg/m³ PLACED IN BETWEEN THE STUDS. THE MINIMUM DENSITY OF 100kg/m³ AND MINIMUM DENSITY PER UNIT AREA OF 10kg/m².



DETAIL 6 - PARTITION
SCALE 1:10

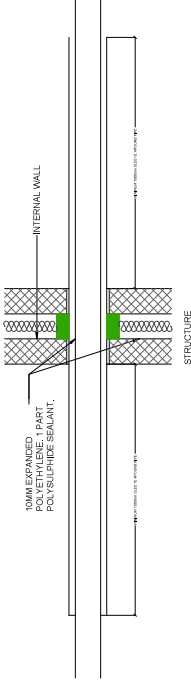


DETAIL 2 - WARM DECK ROOF (INCLUDING DORMERS)
SCALE 1:10



DETAIL 3 - WARM DECK ROOF AND PITCHED ROOF JUNCTION
SCALE 1:10

NOTE: OPENING INTO STRUCTURE AS SMALL AS POSSIBLE AND PROVIDE FIRE STOPPING BETWEEN PIPE AND STRUCTURE



DETAIL 7 - PENETRATING PIPES THROUGH STRUCTURE (APARTMENTS)
SCALE 1:10

SCALE BAR 1:100 0 1m 2 3 4 5 6 7 8 9 10m



LANDMARK GROUP

THE PILLARS
OF EXCELLENCE
GERMANY'S
BRICKENHANSER, S. 1902
TEL: 0049 531 560
EMAIL: INFO@LANDMARK-GRUPPE.CO.UK

CLIENT / JOB ADDRESS
SIA THE DRIVE
ICKENHAM
UKENHIDE

PROJECT DESCRIPTION
UNIT 303

RIBA #
Chartered Practice

SUBMISSION / REF
BUILDING REGS AND STRUCTURAL
DRAWING TITLE
DETAILS 2 OF 3

DATE: 09.11.2020
DRAWN BY: DV
CHECK: MS/KG

SCALE: 1:10 @ A1
CHECK: MS/KG

DRAWING No: 202

APPROVED BY
BUILDING CONTROL

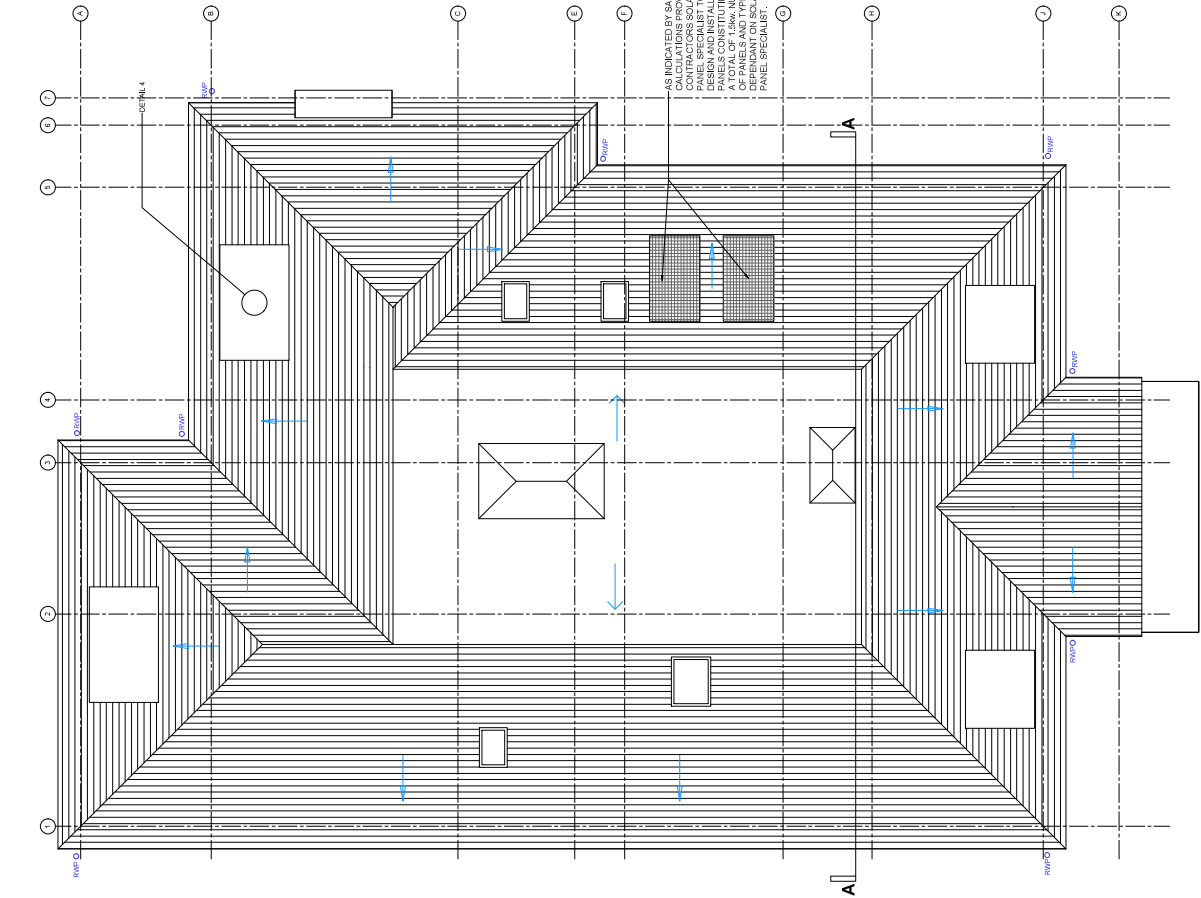
1. STRUCTURAL AND BUILDING DRAWINGS TO BE READ IN CONJUNCTION WITH ALL RELATED DRAWINGS.
2. ALL DRAWINGS TO BE CHECKED ON SITE AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE QUINCY BEFORE PROCEEDING WITH THE WORKS.
3. BUILDING DRAWINGS INDICATE STRUCTURAL ELEMENTS ONLY.
4. ALL EXISTING DETAILS AND DIMENSIONS INDICATED ON THE DRAWINGS ARE FOR BALANCE ONLY AND ARE TO BE CHECKED ON SITE BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND PERMITS FOR ALL WORKS TO BE CARRIED OUT.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND PERMITS FOR ALL WORKS TO BE CARRIED OUT.
7. ALL WORKMANSHIP AND MATERIALS ARE TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BUILDING CODES OF PRACTICE AND GOOD BUILDING PRACTICE.
8. SOME AREAS OF EXISTING WORK HAVE BEEN ASSIGNED ALL ARE TO BE CHECKED ON SITE BY THE CONTRACTOR AND ANY DISCREPANCIES REPORTED SO THAT IT IS THE RESPONSIBILITY OF THE CLIENT TO ENSURE THAT THOSE UNDERTAKING THE WORKS ARE COMPETENT AND EXPERIENCED IN THE TYPE OF WORK TO BE UNDERTAKEN.
9. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATIONS.
10. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATIONS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND PERMITS FOR ALL WORKS TO BE CARRIED OUT.
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13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND PERMITS FOR ALL WORKS TO BE CARRIED OUT.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND PERMITS FOR ALL WORKS TO BE CARRIED OUT.

REV.	DESCRIPTION	DRAWN BY	CHECKED BY	DATE
P1	PRELIMINARY	DV	KG	23.11.20

SCALE BAR 1:100

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
TRANSITION / REF		BUILDING REGULATIONS		KANSAS STATE		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY		KANSAS CITY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

**APPROVED BY
BUILDING CONTROL**

[illegible]

REV.	DESCRIPTION	DRAWN BY	CHECKED BY	DATE
P1	PRELIMINARY	DV	KG	23.11.20

RAINWATER DRAINAGE LEGEND	
	DENOTES RAINWATER PIPE
	DENOTES PLANT ROOF RAINWATER FALL DIRECTION (RANGE 1:40 - 1:50)
	DENOTES PITCHED ROOF RAINWATER FALL DIRECTION (45°)

ROOF PLAN

[illegible]

APPENDIX B – SITE DETAILS

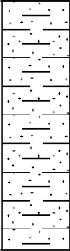
Exploratory-Hole Location Plan

Trial Pit and Borehole Logs

Site Photographs



**Not to scale.
All positions are approximate.
Based on plan provided
by the client.**

					Site 51A The Drive, Ickenham, Uxbridge, UB10 8AG		Trial Pit Number SA1		
Machine : 3 ton Machine excavator Method : Trial Pit		Dimensions 1.10m x 0.30m		Ground Level (mOD)		Client Eye Construction Limited		Job Number P21-178	
		Location		Dates 09/06/2021		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
					(0.30)	Grey brown gravelly SAND with frequent roots and rootlets upto 10mm diameter. Gravel of metal, flint, brick, sandstone and glass. (MADE GROUND)			
					0.30	Stiff grey mottled orange brown sandy CLAY with rare rounded concretions and coal. (LONDON CLAY FORMATION) ...metal post noted in corner of trial pit			
					(0.70)				
					1.00	Complete at 1.00m			
					Remarks Infiltration testing undertaken. No groundwater encountered. Trial pit sides remained stable upon completion.				
					Scale (approx) 1:20		Logged By SF		Figure No. P21-178.SA1

PADDOCK GEO ENGINEERING					Site 51A The Drive, Ickenham, Uxbridge, UB10 8AG		Number WS1		
Machine : Dando Terrier Rig Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Eye Construction Limited		Job Number P21-178	
		Location		Dates 09/06/2021		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30	C				(0.20) 0.20 (0.20) 0.40	Grass onto grey gravelly sandy CLAY with frequent rootlets. (MADE GROUND) Brown sandy gravelly CLAY. Gravel of brick and flint. (MADE GROUND) Stiff orange brown mottled grey silty CLAY. (LONDON CLAY FORMATION)			
0.80	C								
1.00-1.45 1.00	SPT(C) N=8 D		1,2/1,2,2,3						
1.60	SV 67kPa								
1.80	D								
2.00-2.45 2.00	SPT(C) N=16 D		2,2/3,3,4,6						
2.60	SV 72kPa								
2.80	D				(4.60)				
3.00-3.45 3.00	SPT(C) N=19 D		3,3/4,4,5,6						
3.60	SV 84kPa								
3.80	D								
4.00-4.45 4.00	SPT(C) N=27 D		4,5/5,5,8,9						
4.60	SV 111kPa								
4.80	D								
5.00-5.45 5.00	SPT(C) N=31 D		5,6/6,8,8,9		5.00	Complete at 5.00m			
Remarks Boreholes remained stable upon completion. No groundwater encountered.								Scale (approx) 1:40	Logged By SF
								Figure No. P21-178.WS1	

PADDOCK GEO ENGINEERING					Site 51A The Drive, Ickenham, Uxbridge, UB10 8AG		Number WS2		
Machine : Dando Terrier Rig Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Eye Construction Limited		Job Number P21-178	
		Location		Dates 09/06/2021		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	C				0.04 (0.12) (0.24) 0.40	Paving slabs. (MADE GROUND) Grey CONCRETE. (MADE GROUND) Brown sandy gravelly CLAY. Gravel of flint and brick. (MADE GROUND)			
0.80	C		1,1/1,2,2,3		(0.90)	Firm grey silty CLAY. (LONDON CLAY FORMATION)			
1.00-1.45 1.00	SPT(C) N=8 D				1.30	Stiff to very stiff orange brown mottled grey slightly sandy silty CLAY with rare fine concretions. (LONDON CLAY FORMATION)			
1.50	C								
1.80	D								
2.00-2.45 2.00	SPT(C) N=16 D		2,2/3,4,4,5						
2.60	SV 75kPa								
2.80	D								
3.00-3.45 3.00	SPT(C) N=19 D		3,4/4,4,5,6						
3.60	SV 117kPa				(4.70)				
3.80	D								
4.00-4.45 4.00	SPT(C) N=25 D		4,5/5,6,7,7						
4.60	SV 83kPa								
4.80	D								
5.00-5.45 5.00	SPT(C) N=30 D		4,5/6,6,7,11						
5.60	SV 101kPa								
5.80	D								
6.00-6.45 6.00	SPT(C) N=29 D		4,5/6,7,8,8		6.00	Complete at 6.00m			
Remarks No groundwater encountered. Boreholes remained stable upon completion.							Scale (approx) 1:40	Logged By SF	Figure No. P21-178.WS2

PADDOCK GEO ENGINEERING					Site 51A The Drive, Ickenham, Uxbridge, UB10 8AG		Number WS3		
Machine : Dando Terrier Rig Method : Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client Eye Construction Limited		Job Number P21-178	
		Location		Dates 09/06/2021		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	C				(0.30) 0.30	Grey brown gravelly SAND with frequent roots and rootlets upto 10mm diameter. Gravel of metal, flint, brick, sandstone and glass. (MADE GROUND)			
0.80 0.80 1.00-1.45 1.00	C D SPT(C) N=12 D		1,2/2,3,3,4		(0.70) 1.00	Stiff grey mottled orange brown sandy CLAY with rare rounded concretions (LONDON CLAY FORMATION)			
2.00 2.00-2.45 2.00	SV 49kPa SPT(C) N=17 D		2,3/3,4,5,5			Stiff orange brown mottled grey silty CLAY. (LONDON CLAY FORMATION)			
2.80 2.80	SV 104kPa D								
3.00-3.45 3.00	SPT(C) N=18 D		3,3/3,4,5,6						
3.80 3.80	SV 106kPa D				(5.00)				
4.00-4.45 4.00	SPT(C) N=21 D		3,4/4,5,5,7						
4.80 4.80	SV 135kPa D								
5.00-5.45 5.00	SPT(C) N=31 D		4,5/6,7,8,10						
5.80	D								
6.00-6.45 6.00	SPT(C) N=31 D		4,5/6,8,8,9		6.00	Complete at 6.00m			
Remarks Poor recovery between 3.00m and 4.00m depth. No groundwater encountered. Boreholes remained stable upon completion.							Scale (approx) 1:40	Logged By SF	
							Figure No. P21-178.WS3		



Front of the site and entrance looking west



Rear of the site looking east

PADDOCK
GEO ENGINEERING

Client: Eye Construction Limited
Project No: P21-178
Project Title: 51A The Drive, Ickenham,
Uxbridge, UB10 8AG

Date Taken: July 2021



Pool area



Pool building internals



SA1



SA1 Arisings



WS1



WS2



Ws3

APPENDIX C – GEOTECHNICAL DATA

Geotechnical Laboratory Testing Results

Driscoll Criteria Plots

Infiltration Testing Data



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Report on the Determination of the Moisture Content of Soil to BS 1377 Part 2: Clause 3.2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Newton Longville, MK
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-1
Date of Report: 06-Jul-21
Date of Test: 01-Jul-21

Test Details

Date Sample Received: 14-Jun-21

Sample Location: WS1 1.0m WS1 1.80m WS1 2.80m WS1 3.0m WS1 3.80m WS1 4.00m WS1 4.80m WS1 5.00m

Test Results

Laboratory Sample No.:	L4012	L4013	L4014	L4015	L4016	L4017	L4018	L4019
------------------------	-------	-------	-------	-------	-------	-------	-------	-------

Client Identification:

Type of Sample:	B	B	B	B	B	B	B	B
-----------------	---	---	---	---	---	---	---	---

Soil Description:

Moisture Content(%)	28	27	25	18	25	19	27	21
---------------------	----	----	----	----	----	----	----	----

Name: Andrew Titcomb

Position: Director

For and on behalf of Eurotest Ltd



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Report on the Determination of the Moisture Content of Soil to BS 1377 Part 2: Clause 3.2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Newton Longville, MK
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-3
Date of Report: 20-Jul-21
Date of Test: 01-Jul-21

Test Details

Sample Location: WS2 1.00m WS2 4.00m WS3 1.00m WS3 0.80m WS3 1.80m WS3 2.00m
Date Sample Received: 14-Jun-21

Test Results

Laboratory Sample No.: L4020 L4021 L4023 L4022 L4024 L4025

Client Identification:

Type of Sample: B B B B B B

Soil Description:

Moisture Content(%): 16 18 19 25 25 16

Name: Andrew Titcomb
Position: Director
For and on behalf of Eurotest Ltd



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Report on the Determination of the Moisture Content of Soil to BS 1377 Part 2: Clause 3.2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Newton Longville, MK
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-2
Date of Report: 06-Jul-21
Date of Test: 01-Jul-21

Test Details

Date Sample Received: 14-Jun-21

Sample Location: WS3 3.80m WS3 4.00m WS3 4.80m WS3 5.00m WS3 5.80m WS3 6.00m WS3 2.80m WS3 3.00m

Test Results

Laboratory Sample No.:	L4028	L4029	L4030	L4031	L4032	L4033	L4026	L4027
------------------------	-------	-------	-------	-------	-------	-------	-------	-------

Client Identification:

Type of Sample:	B	B	B	B	B	B	B	B
-----------------	---	---	---	---	---	---	---	---

Soil Description:

Moisture Content(%)	22	22	23	21	22	19	22	15
---------------------	----	----	----	----	----	----	----	----

Name: Andrew Titcomb

Position: Director

For and on behalf of Eurotest Ltd



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Report on the Determination of the Plastic Limit and Plasticity Index of Soil to BS 1377 Part 2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Milton Keynes
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-L4013
Date of Report: 06-Jul-21
Date of Test: 03-Jul-21

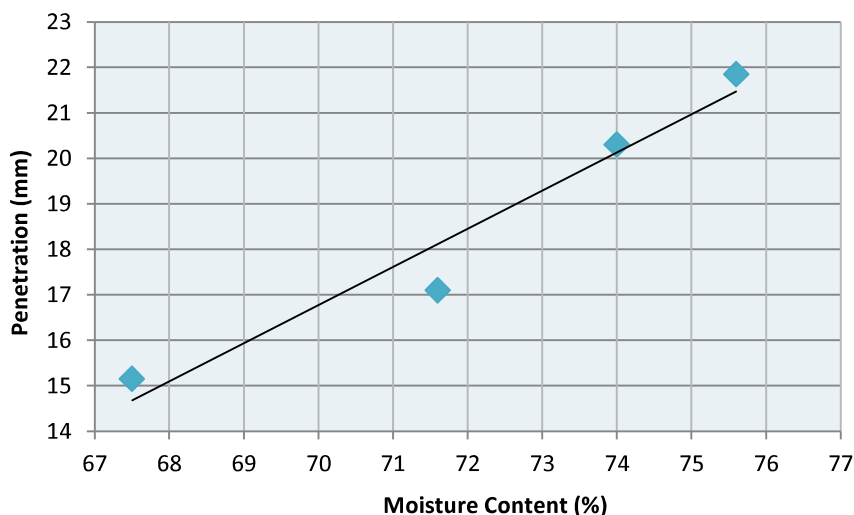
Test Details

Sample Location: WS1 1.80m
Client Identification: Class 2
Type of Sample: Bulk
Soil Description: Brownish CLAY

Laboratory Sample No.: L4013
Date Sample Received: 14/06/2021
% Retained on 425 μ m sieve: 0

Test Results

Liquid Limit (%): 74
Plastic Limit (%): 21
Plasticity Index (%): 53



Sample preparation: BS 1377 Part 2 Clause 4.2.3 : 1990 - Specimen from natural soil

Liquid limit: BS 1377 Part 2 Clause 4.3 : 1990 - Determination of liquid limit - Cone penetrometer method

Plastic limit: BS 1377 Part 2 Clause 5.3 : 1990 - Determination of plastic limit

Plasticity index: BS 1377 Part 2 Clause 5.4 : 1990 - Derivation of plasticity index

Test variations: None

Name: Andrew Titcomb
For and on behalf of Eurotest Ltd



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Report on the Determination of the Plastic Limit and Plasticity Index of Soil to BS 1377 Part 2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Milton Keynes
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-L4020
Date of Report: 06-Jul-21
Date of Test: 03-Jul-21

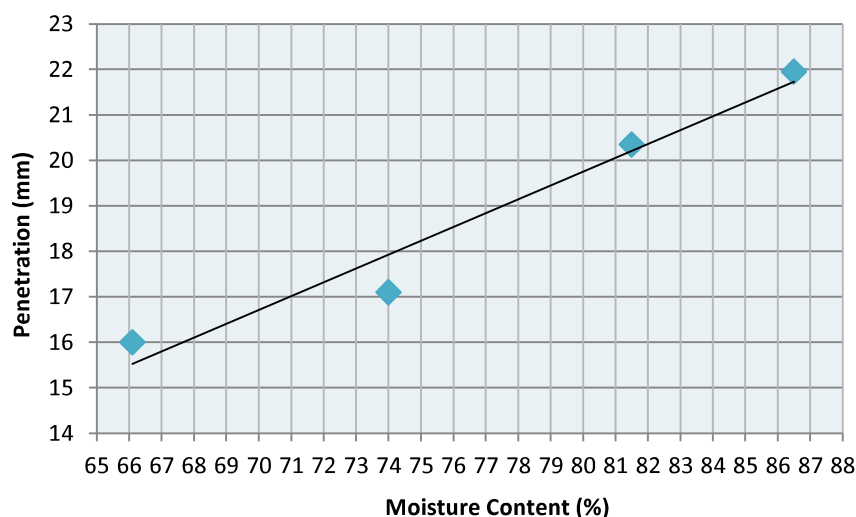
Test Details

Sample Location: WS2 1.00m
Client Identification: Class 2
Type of Sample: Bulk
Soil Description: Brownish CLAY

Laboratory Sample No.: L4020
Date Sample Received: 14/06/2021
% Retained on 425 μ m sieve: 0

Test Results

Liquid Limit (%): 81
Plastic Limit (%): 26
Plasticity Index (%): 55



Sample preparation: BS 1377 Part 2 Clause 4.2.3 : 1990 - Specimen from natural soil

Liquid limit: BS 1377 Part 2 Clause 4.3 : 1990 - Determination of liquid limit - Cone penetrometer method

Plastic limit: BS 1377 Part 2 Clause 5.3 : 1990 - Determination of plastic limit

Plasticity index: BS 1377 Part 2 Clause 5.4 : 1990 - Derivation of plasticity index

Test variations: None

Name: Andrew Titcomb
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Report on the Determination of the Plastic Limit and Plasticity Index of Soil to BS 1377 Part 2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Milton Keynes
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-L4021
Date of Report: 06-Jul-21
Date of Test: 03-Jul-21

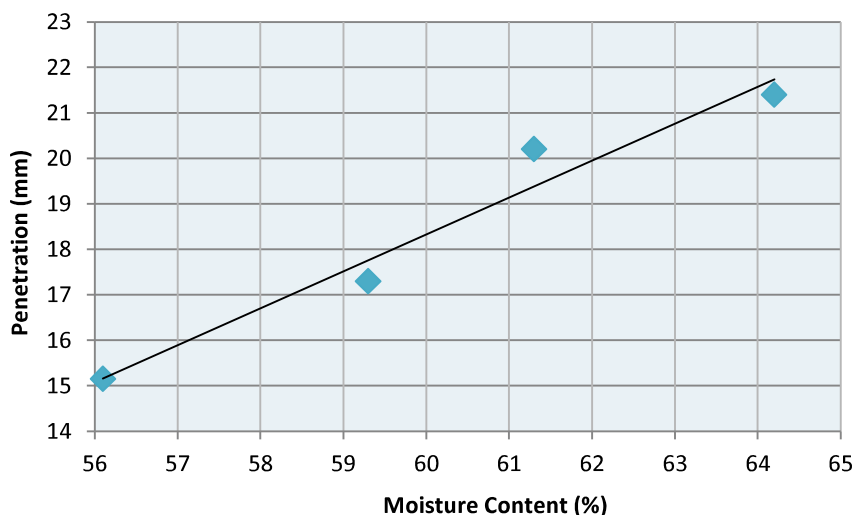
Test Details

Sample Location: WS2 4.00m
Client Identification: Class 2
Type of Sample: Bulk
Soil Description: Brown CLAY

Laboratory Sample No.: L4021
Date Sample Received: 14/06/2021
% Retained on 425 μ m sieve: 0

Test Results

Liquid Limit (%): 62
Plastic Limit (%): 21
Plasticity Index (%): 41



Sample preparation: BS 1377 Part 2 Clause 4.2.3 : 1990 - Specimen from natural soil

Liquid limit: BS 1377 Part 2 Clause 4.3 : 1990 - Determination of liquid limit - Cone penetrometer method

Plastic limit: BS 1377 Part 2 Clause 5.3 : 1990 - Determination of plastic limit

Plasticity index: BS 1377 Part 2 Clause 5.4 : 1990 - Derivation of plasticity index

Test variations: None

Name: Andrew Titcomb
For and on behalf of Eurotest Ltd



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Report on the Determination of the Plastic Limit and Plasticity Index of Soil to BS 1377 Part 2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Milton Keynes
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-L4023
Date of Report: 06-Jul-21
Date of Test: 03-Jul-21

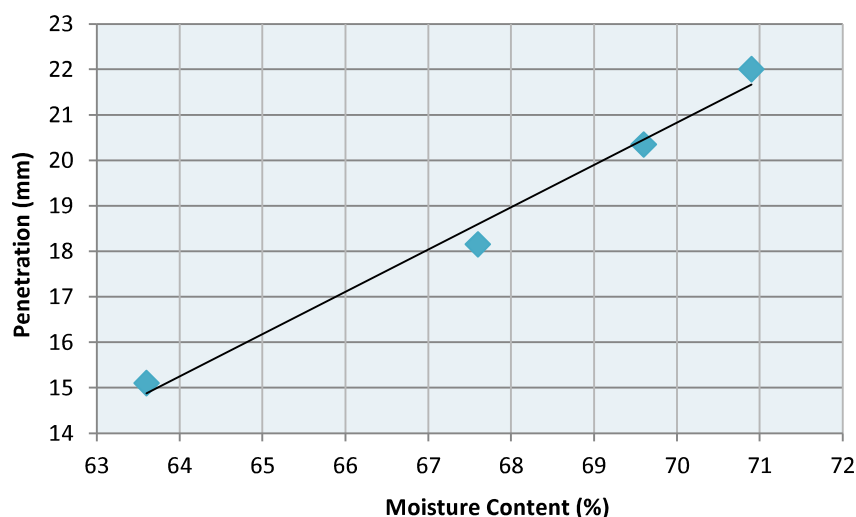
Test Details

Sample Location: WS3 1.00m
Client Identification: Class 2
Type of Sample: Bulk
Soil Description: Brown CLAY

Laboratory Sample No.: L4023
Date Sample Received: 14/06/2021
% Retained on 425 μ m sieve: 0

Test Results

Liquid Limit (%): 69
Plastic Limit (%): 20
Plasticity Index (%): 49



Sample preparation: BS 1377 Part 2 Clause 4.2.3 : 1990 - Specimen from natural soil

Liquid limit: BS 1377 Part 2 Clause 4.3 : 1990 - Determination of liquid limit - Cone penetrometer method

Plastic limit: BS 1377 Part 2 Clause 5.3 : 1990 - Determination of plastic limit

Plasticity index: BS 1377 Part 2 Clause 5.4 : 1990 - Derivation of plasticity index

Test variations: None

Name: Andrew Titcomb
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Report on the Determination of the Plastic Limit and Plasticity Index of Soil to BS 1377 Part 2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Milton Keynes
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-L4028
Date of Report: 06-Jul-21
Date of Test: 03-Jul-21

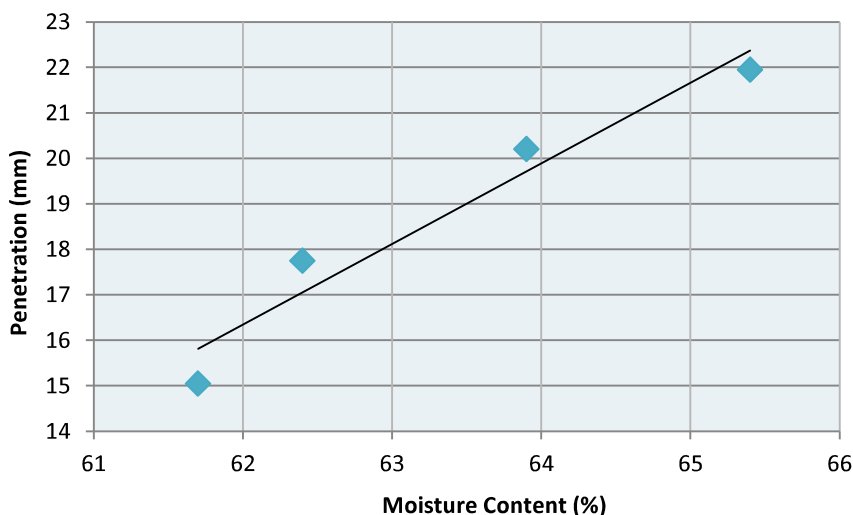
Test Details

Sample Location: WS3 3.80m
Client Identification: Class 2
Type of Sample: Bulk
Soil Description: Brown CLAY

Laboratory Sample No.: L4028
Date Sample Received: 14/06/2021
% Retained on 425 μ m sieve: 0

Test Results

Liquid Limit (%): 64
Plastic Limit (%): 21
Plasticity Index (%): 43



Sample preparation: BS 1377 Part 2 Clause 4.2.3 : 1990 - Specimen from natural soil

Liquid limit: BS 1377 Part 2 Clause 4.3 : 1990 - Determination of liquid limit - Cone penetrometer method

Plastic limit: BS 1377 Part 2 Clause 5.3 : 1990 - Determination of plastic limit

Plasticity index: BS 1377 Part 2 Clause 5.4 : 1990 - Derivation of plasticity index

Test variations: None

Name: Andrew Titcomb
For and on behalf of Eurotest Ltd



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Report on the Determination of the Plastic Limit and Plasticity Index of Soil to BS 1377 Part 2: 1990

Client: Paddock Geo Engineering Ltd
Address: The Log Cabin, Milton Keynes
Project Name: 51A The Drive, Ickenham

Report No: EJ1099-L4032
Date of Report: 06-Jul-21
Date of Test: 03-Jul-21

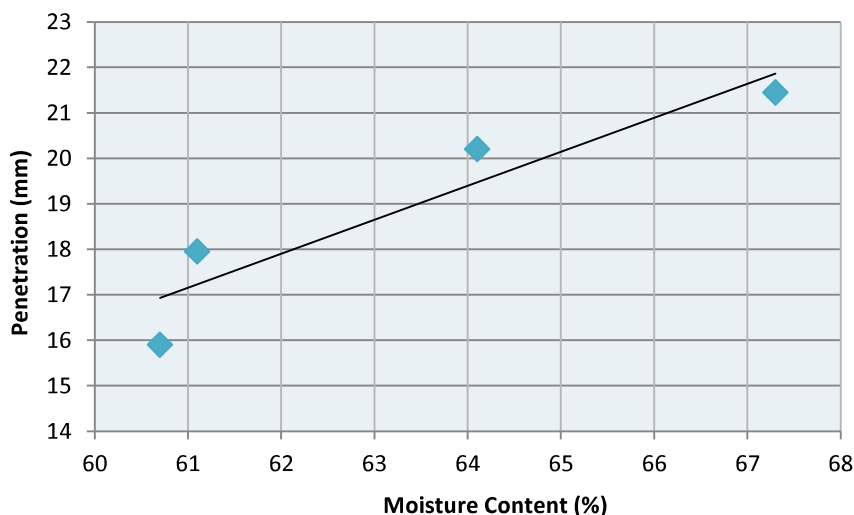
Test Details

Sample Location: WS3 5.80m
Client Identification: Class 2
Type of Sample: Bulk
Soil Description: Brown CLAY

Laboratory Sample No.: L4032
Date Sample Received: 14/06/2021
% Retained on 425 μ m sieve: 0

Test Results

Liquid Limit (%): 65
Plastic Limit (%): 23
Plasticity Index (%): 42



Sample preparation: BS 1377 Part 2 Clause 4.2.3 : 1990 - Specimen from natural soil

Liquid limit: BS 1377 Part 2 Clause 4.3 : 1990 - Determination of liquid limit - Cone penetrometer method

Plastic limit: BS 1377 Part 2 Clause 5.3 : 1990 - Determination of plastic limit

Plasticity index: BS 1377 Part 2 Clause 5.4 : 1990 - Derivation of plasticity index

Test variations: None

Name: Andrew Titcomb
For and on behalf of Eurotest Ltd

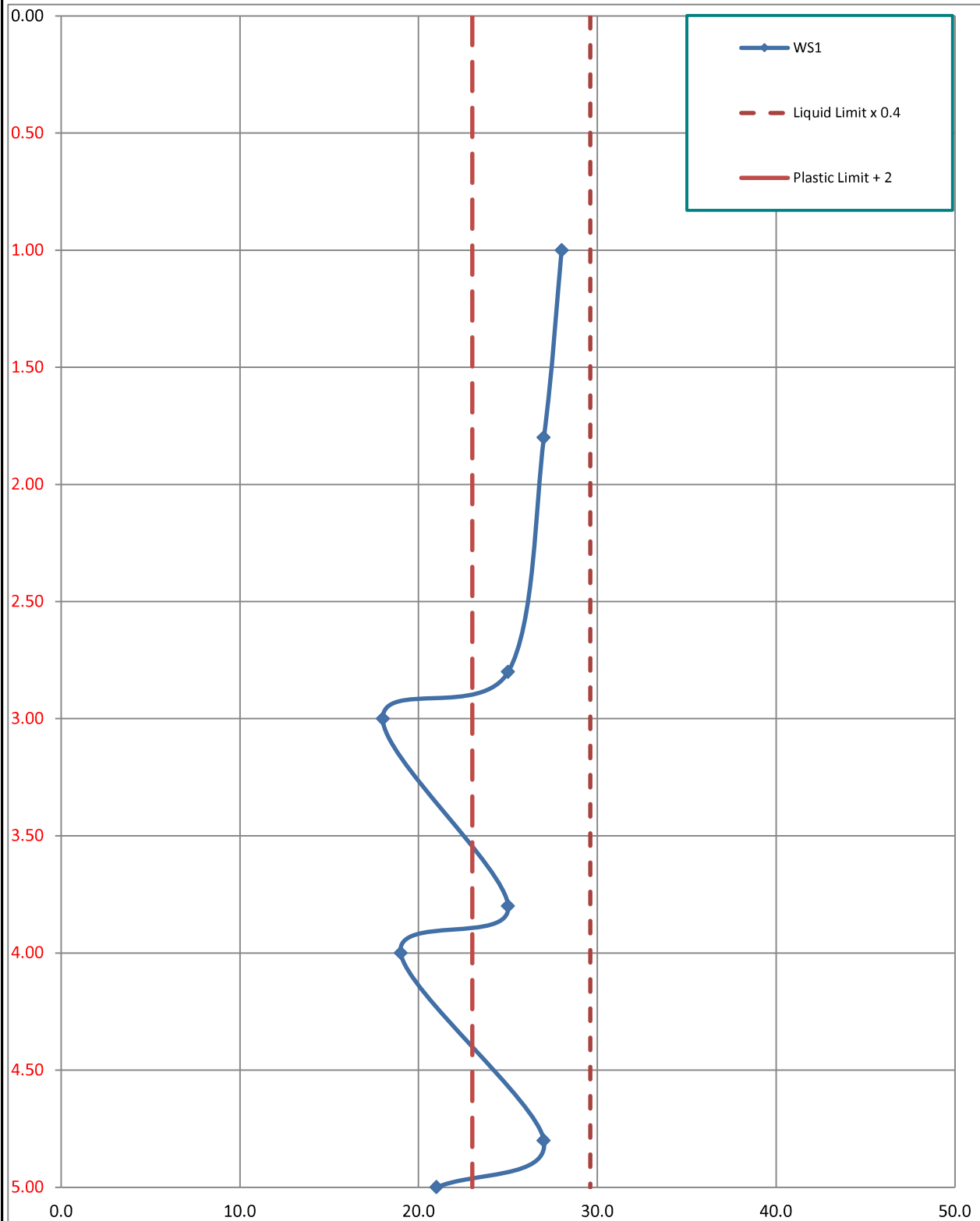


2646

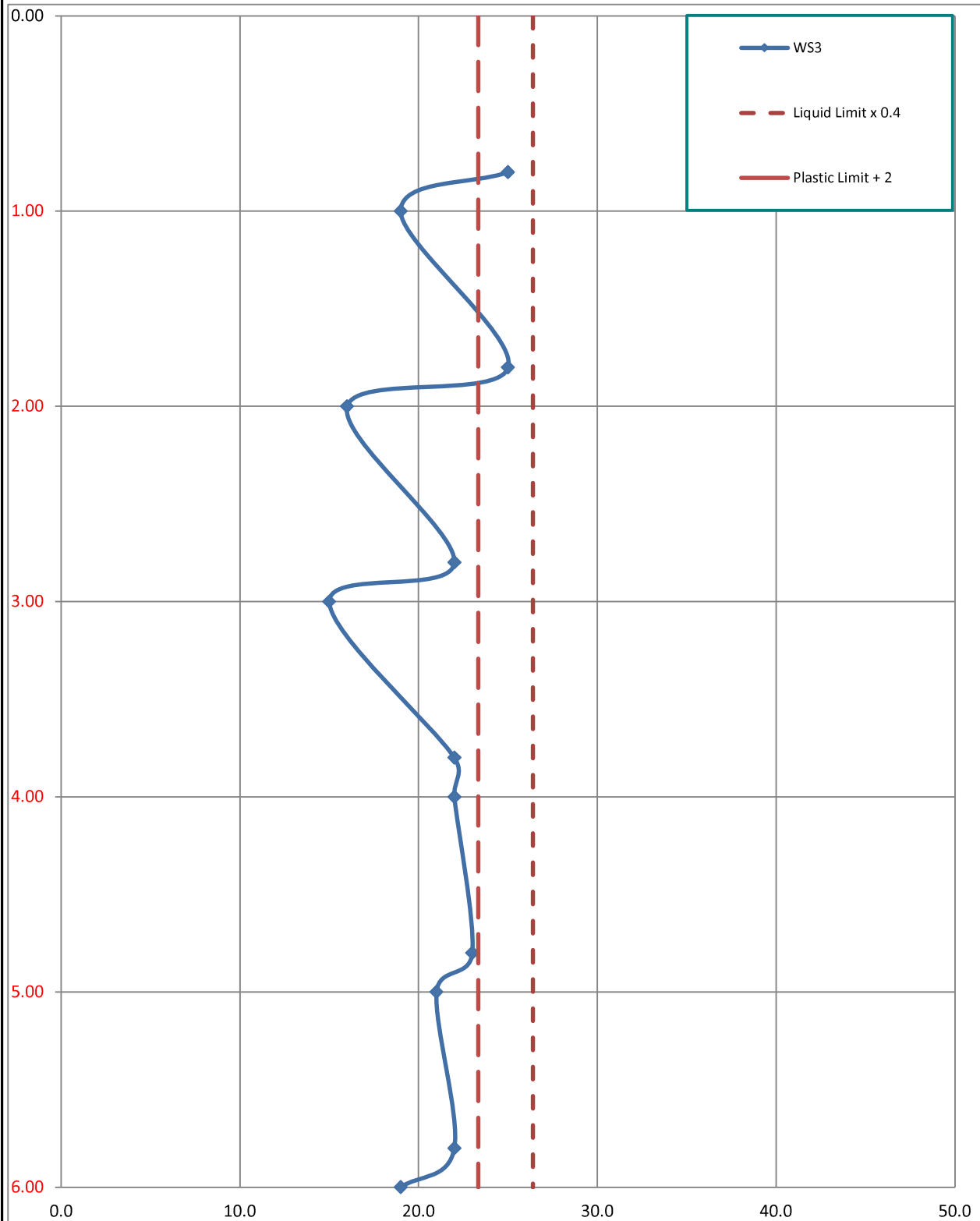
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WATER CONTENT versus DEPTH - WS1



WATER CONTENT versus DEPTH - WS3



APPENDIX D – GEOCHEMICAL DATA

Chemical Laboratory Testing Results

Hazwaste Online Classification Report

Matt Paddock
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MK3 5AL

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e: Paddock Engineering

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-81002

Project / Site name:	51A The Drive Ickenham Uxbridge UB10 8AG	Samples received on:	14/06/2021
Your job number:	G 01	Samples instructed on/ Analysis started on:	14/06/2021
Your order number:	P21 178 G 01	Analysis completed by:	23/06/2021
Report Issue Number:	1	Report issued on:	23/06/2021
Samples Analysed:	5 soil samples		

Signed: *A. Czerwińska*

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 21-81002

Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

Your Order No: P21 178 G 01

Lab Sample Number				1902697	1902698	1902699	1902700	1903584
Sample Reference				WS1	WS1	WS2	WS3	WS1+WS2+WS3
Sample Number				ES	D	ES	ES	None Supplied
Depth (m)				0.80	2.00	1.50	0.80	0.80
Date Sampled				09/06/2021	09/06/2021	09/06/2021	09/06/2021	09/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	11	14	13	48
Total mass of sample received	kg	0.001	NONE	0.50	0.40	0.40	0.40	1.4

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

pH - Automated	pH Units	N/A	MCERTS	7.2	8.4	8.4	8.0	7.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	340	490	400	1800	730
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.12	0.14	0.77	-
Loss on Ignition @ 450oC	%	0.2	MCERTS	-	-	-	-	4.6

Speciated PAHs

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

Total PAH

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

Analytical Report Number: 21-81002

Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

Your Order No: P21 178 G 01

Lab Sample Number				1902697	1902698	1902699	1902700	1903584
Sample Reference				WS1	WS1	WS2	WS3	WS1+WS2+WS3
Sample Number				ES	D	ES	ES	None Supplied
Depth (m)				0.80	2.00	1.50	0.80	0.80
Date Sampled				09/06/2021	09/06/2021	09/06/2021	09/06/2021	09/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	-	-	-	-	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	< 4.0
Chromium (III)	mg/kg	1	NONE	-	-	-	-	47
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	47
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	21
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	220
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	-	-	-	-	0.77
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	82
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	88

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	-	-	-	-	< 10
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-81002
Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1902697	WS1	ES	0,8	Brown clay.
1902698	WS1	D	2	Brown clay.
1902699	WS2	ES	1,5	Brown clay.
1902700	WS3	ES	0,8	Brown clay with gravel.
1903584	WS1+WS2+WS3	None Supplied	0,8	Brown clay.

Analytical Report Number : 21-81002

Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS

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

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

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

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Matt Paddock
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Analytical Report Number : 21-81007

Project / Site name:	51A The Drive Ickenham Uxbridge UB10 8AG	Samples received on:	14/06/2021
Your job number:	G 01	Samples instructed on/ Analysis started on:	14/06/2021
Your order number:	P21 178 G 01	Analysis completed by:	28/06/2021
Report Issue Number:	1	Report issued on:	28/06/2021
Samples Analysed:	1 10:1 WAC sample		

Signed: *Karolina Marek*

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

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

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

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

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

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

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

i2 Analytical

7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
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email: reception@i2analytical.com

Waste Acceptance Criteria Analytical Results							
Report No:	21-81007						
					Client: PADDOCK		
Location	51A The Drive Ickenham Uxbridge UB10 8AG						
Lab Reference (Sample Number)	1902722 / 1903562				Landfill Waste Acceptance Criteria		
Sampling Date	09/06/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS1+WS2+WS3						
Depth (m)	0.80						
Solid Waste Analysis							
TOC (%)**	1,2				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0,007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0,85				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0,0010			< 0,0100	0,5	2	25
Barium *	0,0245			0,212	20	100	300
Cadmium *	< 0,0001			< 0,0008	0,04	1	5
Chromium *	< 0,0004			< 0,0040	0,5	10	70
Copper *	0,0059			0,051	2	50	100
Mercury *	< 0,0005			< 0,0050	0,01	0,2	2
Molybdenum *	< 0,0004			< 0,0040	0,5	10	30
Nickel *	0,0032			0,028	0,4	10	40
Lead *	< 0,0010			< 0,010	0,5	10	50
Antimony *	< 0,0017			< 0,017	0,06	0,7	5
Selenium *	< 0,0040			< 0,040	0,1	0,5	7
Zinc *	0,0067			0,059	4	50	200
Chloride *	19			170	800	15000	25000
Fluoride	0.65			5.7	10	150	500
Sulphate *	47			410	1000	20000	50000
TDS*	160			1400	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0,010			< 0.10	1	-	-
DOC	11.9			103	500	800	1000
Leach Test Information							
Stone Content (%)	< 0,1						
Sample Mass (kg)	1,4						
Dry Matter (%)	52						
Moisture (%)	48						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.							
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.							



Analytical Report Number : 21-81007

Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

* These descriptions are only intended to act as a cross check if sample identities are questioned, The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types, Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1902722	WS1+WS2+WS3	None Supplied	0.8	Brown clay.

Analytical Report Number : 21-81007

Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1 ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE



Analytical Report Number : 21-81007

Project / Site name: 51A The Drive Ickenham Uxbridge UB10 8AG

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Waste Classification Report

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

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



XDSH8-CJ4TT-S2RM4

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

Job name

51A The Drive

Description/Comments

Project

P21-178

Site

51A The Drive, Ickenham, Uxbridge, UB10 8AG

Classified by

Name:
Matthew Paddock
Date:
19 Jul 2021 09:22 GMT
Telephone:
01908 271366

Company:
Paddock Geo Engineering
The Annex, 14 Burns Road,
Milton Keynes,
MK3 5A

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

HazWasteOnline™ Certification:

-

Course

Hazardous Waste Classification

Date

-

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS1+WS2+WS3	0.80	Non Hazardous		2

Related documents

#	Name	Description
1	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Matthew Paddock

Created date: 19 Jul 2021 09:22 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	4
Appendix B: Rationale for selection of metal species	5
Appendix C: Version	6

Classification of sample: WS1+WS2+WS3

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

Sample details

Sample name:	LoW Code:	
WS1+WS2+WS3	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.80 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No 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	antimony { antimony trioxide }				<1 mg/kg	1.197	<1.197 mg/kg	<0.00012 %			<LOD
	051-005-00-X	215-175-0	1309-64-4								
2	arsenic { arsenic trioxide }				14 mg/kg	1.32	18.485 mg/kg	0.00185 %			
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				1.2 mg/kg	2.775	3.33 mg/kg	0.000333 %			
	004-003-00-8	215-133-1	1304-56-9								
4	boron { diboron trioxide; boric oxide }				2.3 mg/kg	3.22	7.406 mg/kg	0.000741 %			
	005-008-00-8	215-125-8	1303-86-2								
5	cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %			<LOD
	048-002-00-0	215-146-2	1306-19-0								
6	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				47 mg/kg	1.462	68.693 mg/kg	0.00687 %			
		215-160-9	1308-38-9								
7	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<4 mg/kg	2.27	<9.08 mg/kg	<0.000908 %			<LOD
	024-017-00-8										
8	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	24.77 mg/kg	0.00248 %			
	029-002-00-X	215-270-7	1317-39-1								
9	lead { lead chromate }			1	21 mg/kg	1.56	32.756 mg/kg	0.0021 %			
	082-004-00-2	231-846-0	7758-97-6								
10	manganese { manganese sulphate }				220 mg/kg	2.749	604.684 mg/kg	0.0605 %			
	025-003-00-4	232-089-9	7785-87-7								
11	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
12	molybdenum { molybdenum(VI) oxide }				0.77 mg/kg	1.5	1.155 mg/kg	0.000116 %			
	042-001-00-9	215-204-7	1313-27-5								
13	nickel { nickel chromate }				32 mg/kg	2.976	95.24 mg/kg	0.00952 %			
	028-035-00-7	238-766-5	14721-18-7								
14	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	028-031-00-5	239-125-2	15060-62-5								
15	zinc { zinc chromate }				88 mg/kg	2.774	244.125 mg/kg	0.0244 %			
	024-007-00-3	236-878-9	13530-65-9								
16	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
17	pH		PH		7 pH		7 pH	7pH			

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
18	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
19	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-917-1	208-96-8								
20	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
21	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-695-5	86-73-7								
22	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-581-5	85-01-8								
23	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		204-371-1	120-12-7								
24	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-912-4	206-44-0								
25	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		204-927-3	129-00-0								
26	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
27	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
28	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
29	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
30	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
31	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-893-2	193-39-5								
32	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
33	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-883-8	191-24-2								
Total:									0.111 %		

Key

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

Appendix A: Classifier defined and non CLP determinands

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

■ **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

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **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

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

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)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (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) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (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)

manganese {manganese sulphate}

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)

molybdenum {molybdenum(VI) oxide}

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 {nickel selenate}

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

zinc {zinc chromate}

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

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2021.197.4823.9172 (16 Jul 2021)

HazWasteOnline Database: 2021.197.4823.9172 (16 Jul 2021)

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 Waste 2014 - Decision 2014/955/EU of 18 December 2014

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

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

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

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

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

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

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

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

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

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

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

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

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019