

Discovery

Geotechnical & Environmental Engineers

REMEDIATION WORKS VERIFICATION REPORT HORTON ROAD, WEST DRAYTON

Carried Out For:

PDR CONSTRUCTION LTD

May 2021

Report Reference: 21028J-01

REMEDIATION WORKS VERIFICATION REPORT HORTON ROAD, WEST DRAYTON

Carried Out For: **PDR CONSTRUCTION LTD**

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REMEDIAL WORKS VERIFICATION REPORT HORTON ROAD, WEST DRAYTON

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**REMEDIATION WORKS VERIFICATION REPORT
HORTON ROAD, WEST DRAYTON**

1 INTRODUCTION

1.1 Engagement of Discovery CE Limited

Discovery CE Limited (DCE) was instructed by PDR Construction Ltd (PDR) to provide verification of remediation works undertaken at a site known as Horton Road, West Drayton.

The offer to carry out the works is contained in DCE proposal reference 21028J-QLO01 dated 09 March 2021 and the instruction to proceed with the work was contained in an e-mail from PDR dated 17 March 2021.

1.2 Objectives and Limitations

This report follows on from DCE report Ref. 16088J-03, titled 'Additional Site Investigation, Assessment and Remediation Strategy Horton Road, West Drayton', dated 30th November 2018. The overall objectives of the work presented herein were to verify that the remediation objectives have been met.

The conclusions and recommendations provided in this report are based on the conditions encountered at the exploratory hole locations and intrusive work has been restricted to the level of detail considered necessary to achieve the stated objectives. The possibility of significant variations occurring between exploratory holes cannot be discounted and additional assessment may be necessary should such variation be revealed subsequent to preparation of this report.

1.3 Sources of Information

The following sources of information have been used in the preparation of this report.

1. DCE report ref 16088J "Geotechnical Desk Study, Horton Road, West Drayton", dated August 2016;
2. DCE report ref 16088J-02 "Geotechnical and Geoenvironmental Investigation, Horton Road, West Drayton", dated June 2017;
3. DCE report ref 16088J-03 "Additional Site Investigation, Assessment and Remediation Strategy Horton Road, West Drayton" dated 30th November 2018;
4. DCE report ref 16088J-LO03 "Horton Road West Drayton – Gas Assessment Update, Basement Excavation Information", dated December 2019;

5. Hillingdon Council Grant of Planning Permission, Application Ref. 71582/APP/2016/4582, dated 31 August 2017;
6. Vector Design Concepts drawing No. V15344 L01, "Landscape Plan", dated May 2018;
7. JPG drawing No. 5383-SP1, "Site Preparation", dated 06/12/2018, and;
8. Hillingdon Council Planning Approval of Details letter, Application Ref. 71582/APP/2019/1741, dated 18th July 2019.

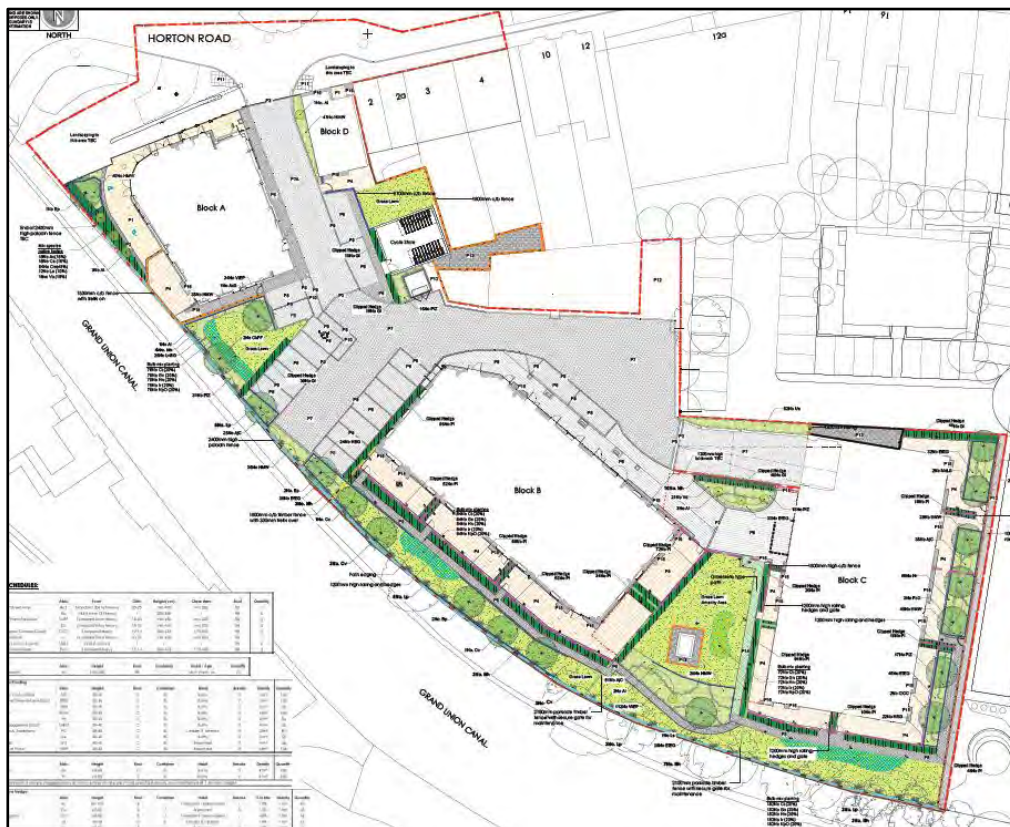
2 SITE DESCRIPTION & BCKGROUND

2.1 Site

The site is located off Horton Road, West Drayton, UB7 8EP, at approximate national grid co-ordinates 506110, 180224, as shown in Figure A1 in Appendix A.

The site is currently being developed into 4 No. blocks of residential flats. These blocs are separated by grassed landscaped areas and block paved parking areas, with pedestrian walkways around and between the buildings. The as built layout is shown in Figure 1 and Vector Design Concepts drawing No. V15344 L01 in Appendix B. Formerly the site was occupied by 5 No. brick-built buildings, comprising a print works, 2 No. office buildings and 2 No. shops, separated by bituminous hardstanding.

Figure 1 As built site layout following redevelopment



Along with construction of the new residential flats, an underground parking structure was constructed beneath the central and eastern blocks (Block B & C), as shown in JPG drawing No. 5383-SP1 in Appendix B.

2.2 Background

DCE undertook investigation works across the site before and during demolition works. Contamination was identified during these investigations as detailed in the following sections.

3 PREVIOUS REPORT SUMMARY

3.1 DCE Report Ref. 16088J, 'Geotechnical Desk Study, Horton Road, West Drayton', dated August 2016

DCE carried out a geotechnical phase 1 desk study for the site in 2016. This involved a site walkover and assessment of relevant information contained within a geo-environmental desk study produced by Capita in 2015, along with publicly available British Geological Survey maps and historical borehole records.

The desk study determined that the site was possibly part of the Victoria Oil Works in the late 19th century, and remained unchanged until between 1935 and 1964, when the site layout changed to as shown in Figure 1. The surrounding area was developed from a mainly industrial land use to mainly residential throughout the 20th century.

Geotechnical hazards on site were identified as relating to existing and former foundations, Made Ground associated with historic land use on site, the existing Grand Union Canal structure and groundwater beneath the site. No environmental hazards were considered.

A ground investigation was recommended to confirm the ground conditions on site and allow refinement of the preliminary engineering assessment given in the desk study.

3.2 DCE Report Ref. 16088J-02, 'Geotechnical and Geoenvironmental Investigation, Horton Road, West Drayton', dated June 2017

Based on the recommendations of the phase 1 desk study, DCE undertook an intrusive investigation on site in 2017. This comprised 3 No. cable percussion boreholes, 5 No. dynamic sample boreholes, 4 No. machine excavated trial pits and installation of 9 No. gas and groundwater monitoring wells.

Encountered ground conditions on site comprised Made Ground to a maximum depth of 1.6 m bgl over Langley Silt Member CLAY and SILT, underlain by Lynch Hill Gravel Member SAND and GRAVEL at between 1.13 and 2.1 m bgl. This was underlain at between 4 and 5.7 m bgl by London Clay Formation CLAY.

Assessment of soil samples recovered during the works indicated 8 No. exceedances of generic human health screening criteria with in the Made Ground for lead (4 No.), asbestos (3 No.) and arsenic (1 No.). Statistical assessment of the data indicated the site is contaminated with regard to lead but not contaminated with regard to arsenic. Additional delineation works and use of clean cover systems were recommended to mitigate the presence of lead and arsenic. Assessment of water

samples recovered from the monitoring wells showed no exceedances and it was concluded the risk to controlled waters is LOW.

A preliminary gas assessment using a modified Wilson and Card classification scheme indicated the site would classify as Characteristic Situation 2, and as a result suitable gas protection measures would be required. Further monitoring was recommended to delineate the affected area.

3.3 DCE Report Ref. 16088J-03, 'Additional Site Investigation, Assessment and Remediation Strategy, Horton Road, West Drayton', dated November 2018

Additional investigation was undertaken by DCE in 2018 during demolition works, which allowed greater coverage across site once the buildings had been removed. The additional work comprised 5 No. dynamic sample boreholes, 8 No. machine excavated trial pits, and the installation of 5 No. gas and groundwater monitoring wells.

Ground conditions were similar to those encountered in 2017, with Made Ground locally up to 3.5 m thick towards the north of the site.

Additional exceedances were recorded across the site for lead (3 No.), asbestos (2 No.), PAH (13 No.) and TPHs (3 No.). Due to the presence of exceedances across the site the use of clean cover was recommended. Assessment of water samples recovered from the monitoring wells showed no exceedances and it was concluded the risk to controlled waters is LOW.

An updated ground gas assessment was undertaken which indicated the site would be classified as Characteristic Situation 2, and that suitable gas protection measures would be required. It was noted however that the worst elevated gas concentrations were in the centre of the site, in an area which was to be excavated to allow construction of an underground basement. It was recommended that this be discussed with the local planning authority, as removal of the affected material may allow the rest of the site to be classified as Characteristic Situation 1.

The remediation strategy within the report recommended the use of geotextile marker membrane and 600 mm thickness of clean cover in all landscaped areas to mitigate the presence of contamination across the site. It was considered likely that during site development works bulk asbestos containing materials would be encountered and that specialist advice should be sought in dealing with these materials.

This remediation strategy was submitted to Hillingdon Council for approval, the approval response is presented in Appendix C.

3.4 DCE Report Ref. 16088J-LO03, 'Horton Road West Drayton – Gas Assessment Update, Basement Excavation Information', dated December 2019

Following excavation of material to allow for construction of the Block B & C parking basement (7087 m³ in total) and due to the design of the basement as a well-ventilated waterproof structure, DCE concluded that the gas risk to the whole development was reduced from Characteristic Situation 2 to Characteristic Situation 1, and that none of the buildings on site require gas protection measures.

This report was submitted to Hillingdon Council for approval, the approval response is presented in Appendix C.

4 REMEDIATION WORKS

4.1 Objectives

As detailed in DCE report ref. 16088J-03, the objectives of the remediation were to mitigate the presence of recorded exceedances of contaminants of concern. This mitigation was to be through either removal of the sources of contamination from site or to reduce, block or remove the exposure pathway from the source material.

Based on the proposed development layout, the majority of the contaminated soils would be removed from site as part of the basement construction. Any material removed from site would likely NOT classify as hazardous waste as the asbestos recorded was at a concentration below the laboratory limit of detection. Any asbestos fragments encountered should be treated as hazardous waste.

In areas of soft landscaping across the site, clean imported soils and a marker membrane should be employed. The clean cover should be at least 600 mm thick and following placement should be tested at a rate of approximately 1 No. sample per 500 m³ of placed material. Remediation Target Criteria (RTCs) for the clean cover materials are given in Table 1 and included in the clean cover reports within Appendix D.

Table 1 Remediation target criteria

Determinand	Units	Screening Value	Source of Screen
Asbestos in Soil	Type	Present	
pH	pH Units	<5 or >10	
Total Cyanide	mg/kg	1600	USEPA Region 9
Total Phenols (monohydric)	mg/kg	750	S4UL
Naphthalene	mg/kg	2.3	S4UL
Acenaphthylene	mg/kg	86.1	S4UL
Acenaphthene	mg/kg	57	S4UL
Fluorene	mg/kg	30.9	S4UL
Phenanthrene	mg/kg	36	S4UL
Anthracene	mg/kg	1.17	S4UL
Fluoranthene	mg/kg	1500	S4UL
Pyrene	mg/kg	3700	S4UL
Benzo(a)anthracene	mg/kg	11	S4UL
Chrysene	mg/kg	30	S4UL
Benzo(b)fluoranthene	mg/kg	3.9	S4UL
Benzo(k)fluoranthene	mg/kg	110	S4UL
Benzo(a)pyrene	mg/kg	3.2	S4UL
Indeno(1,2,3cd)pyrene	mg/kg	45	S4UL
Dibenz(a,h)anthracene	mg/kg	0.31	S4UL
Benzo(ghi)perylene	mg/kg	360	S4UL
Arsenic	mg/kg	40	S4UL
Cadmium	mg/kg	85	S4UL
Chromium (hexavalent)	mg/kg	6	S4UL
Chromium	mg/kg	910	S4UL
Copper	mg/kg	7100	S4UL
Lead	mg/kg	310	C4SL
Mercury	mg/kg	56	S4UL
Nickel	mg/kg	180	S4UL
Silver	mg/kg	390	USEPA Region 9

Determinand	Units	Screening Value	Source of Screen
Selenium	mg/kg	430	S4UL
Vanadium	mg/kg	1200	S4UL
Zinc	mg/kg	40000	S4UL
Benzene	µg/kg	380	S4UL
Toluene	µg/kg	869000	S4UL
Ethylbenzene	µg/kg	83000	S4UL
p & m-xylene	µg/kg	79000	S4UL
o-xylene	µg/kg	88000	S4UL
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	49000	EIC/AGS/CL:AIRE
TPH4 (C10 - C20)	mg/kg	4022	S4UL
TPH4 (C20 - C30)	mg/kg	1908	S4UL
TPH4 (C30 - C40)	mg/kg	1917	S4UL
TPHCWG Aliphatic >EC5 EC6	mg/kg	42	S4UL
TPHCWG Aliphatic >EC6 EC8	mg/kg	100	S4UL
TPHCWG Aliphatic >EC8 EC10	mg/kg	27	S4UL
TPHCWG Aliphatic >EC10 EC12	mg/kg	130	S4UL
TPHCWG Aliphatic >EC12 EC16	mg/kg	1100	S4UL
TPHCWG Aliphatic >EC16 EC21	mg/kg	65000	S4UL
TPHCWG Aliphatic >EC21 EC35	mg/kg	65000	S4UL
TPHCWG Aromatic >EC5 EC7	mg/kg	370	S4UL
TPHCWG Aromatic >EC7 EC8	mg/kg	860	S4UL
TPHCWG Aromatic >EC8 EC10	mg/kg	47	S4UL
TPHCWG Aromatic >EC10 EC12	mg/kg	250	S4UL
TPHCWG Aromatic >EC12 EC16	mg/kg	1800	S4UL
TPHCWG Aromatic >EC16 EC21	mg/kg	1900	S4UL
TPHCWG Aromatic >EC21 EC35	mg/kg	1900	S4UL

4.2 Basement Excavation

The basement area was excavated to a level of approximately 25 m AOD (finished floor level of 25.675 m AOD). A total of 7087 m³ of material was excavated and removed from site, this included all Made Ground and some underlying natural material within the basement footprint. Plates 1 and 2 give general views of the excavation and waste carrier tickets for the excavated materials are available from PDR on request.

Plate 1 Basement excavation looking rough south east



Plate 2 Basement excavation looking roughly north



4.3 Clean Cover

In areas of soft landscaping across the site, clean cover was placed to a minimum thickness of 600 mm, with an orange high visibility membrane present beneath the clean cover.

It should be noted that in areas of soft landscaping above the basement, less than 600 mm of material was placed (VP105). This is considered acceptable as this material is placed wholly on top of the structure of the basement, therefore the exposure pathway from the source soil is mitigated by the presence of the basement.

Following placement of the clean cover, DCE undertook verification pits in 4 No. locations across the site and laboratory testing of samples recovered from these pits to confirm the thickness and chemical suitability of the placed material. An additional 2 No. pits were undertaken on completion of placement of the clean cover to confirm thickness. Samples were also taken from supplied material to supplement source testing data. Results for all samples are contained within the clean cover certificates in Appendix D.

In 3 No. locations clean cover was found to be at least 600 mm thick. In the fourth location (VP104), clean cover was found to be 540 mm thick, however it is understood an additional 70 mm of material is to be placed, which will increase the thickness to greater than the minimum.

Laboratory testing of the samples indicated the RTC values had been met in all except 1 No. location, where asbestos fibres were encountered in the subsoil (VP103). The clean cover material in this area was removed, replaced with fresh material and retested. The retested material passed the RTC values.

Details of the clean cover verification sampling and testing are given in Appendix D.

4.4 Residual Contamination

Contamination which was encountered within the site investigation works has either been removed from site or covered with a suitable thickness of clean material and marker membrane. Therefore it may be considered that exposure pathways between future site users and residual contamination are unlikely to be realised.

5 SUMMARY AND RECOMMENDATIONS

A remediation strategy was prepared by DCE following investigation and assessment of the site at Horton Road, West Drayton. The remediation strategy included recommendations and actions to mitigate the risks of identified contamination. Remediation works have been carried out in accordance with the remediation strategy, with subsequent verification and testing presented herein. No post remediation monitoring measures are required following completion of the works.

For **Discovery CE Limited**

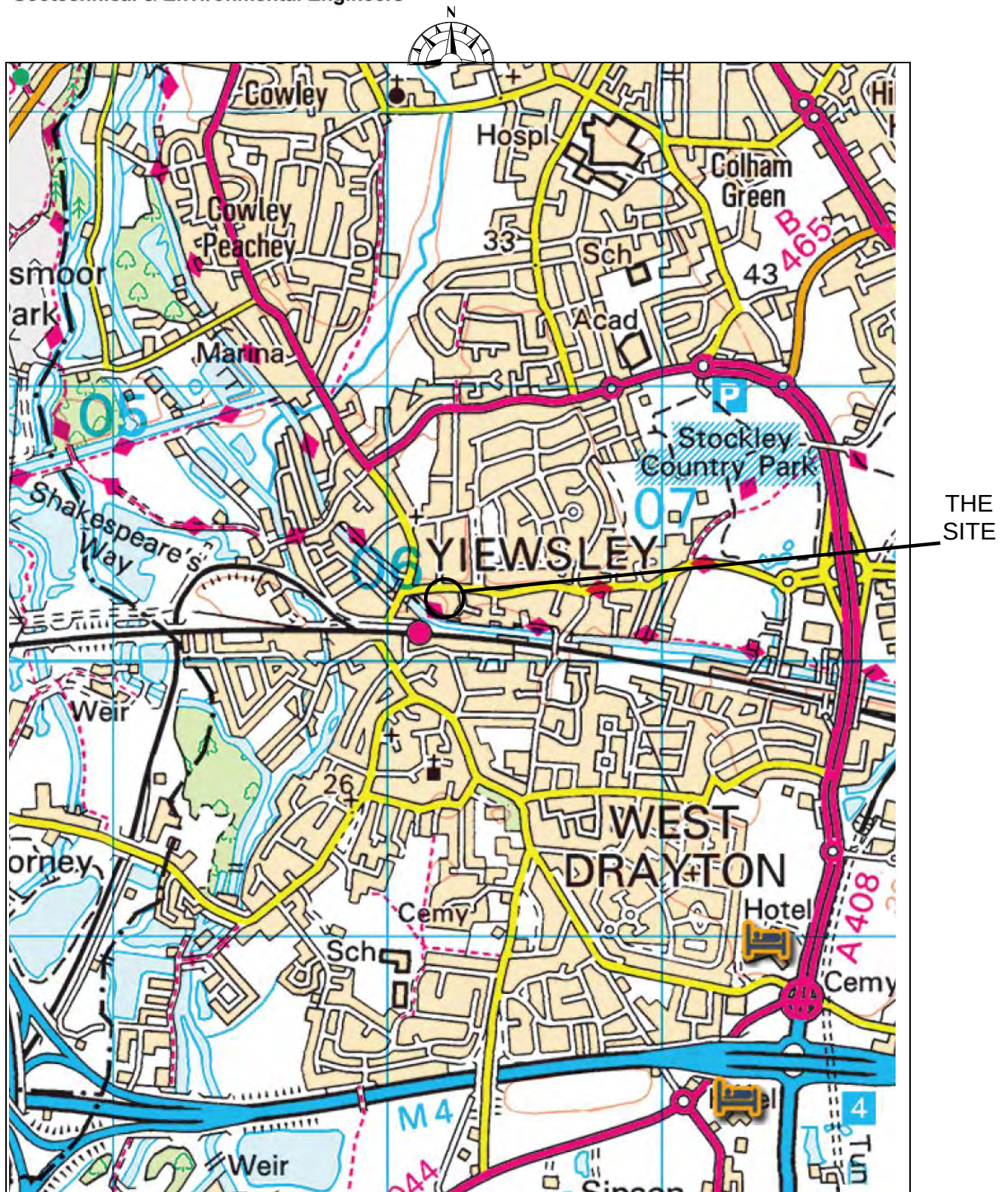


Mike Forrester
BSc (Hons) FGS
Senior Geo-Environmental Engineer



Cathal Gillespie
BEng, MSc (Eng)
Director

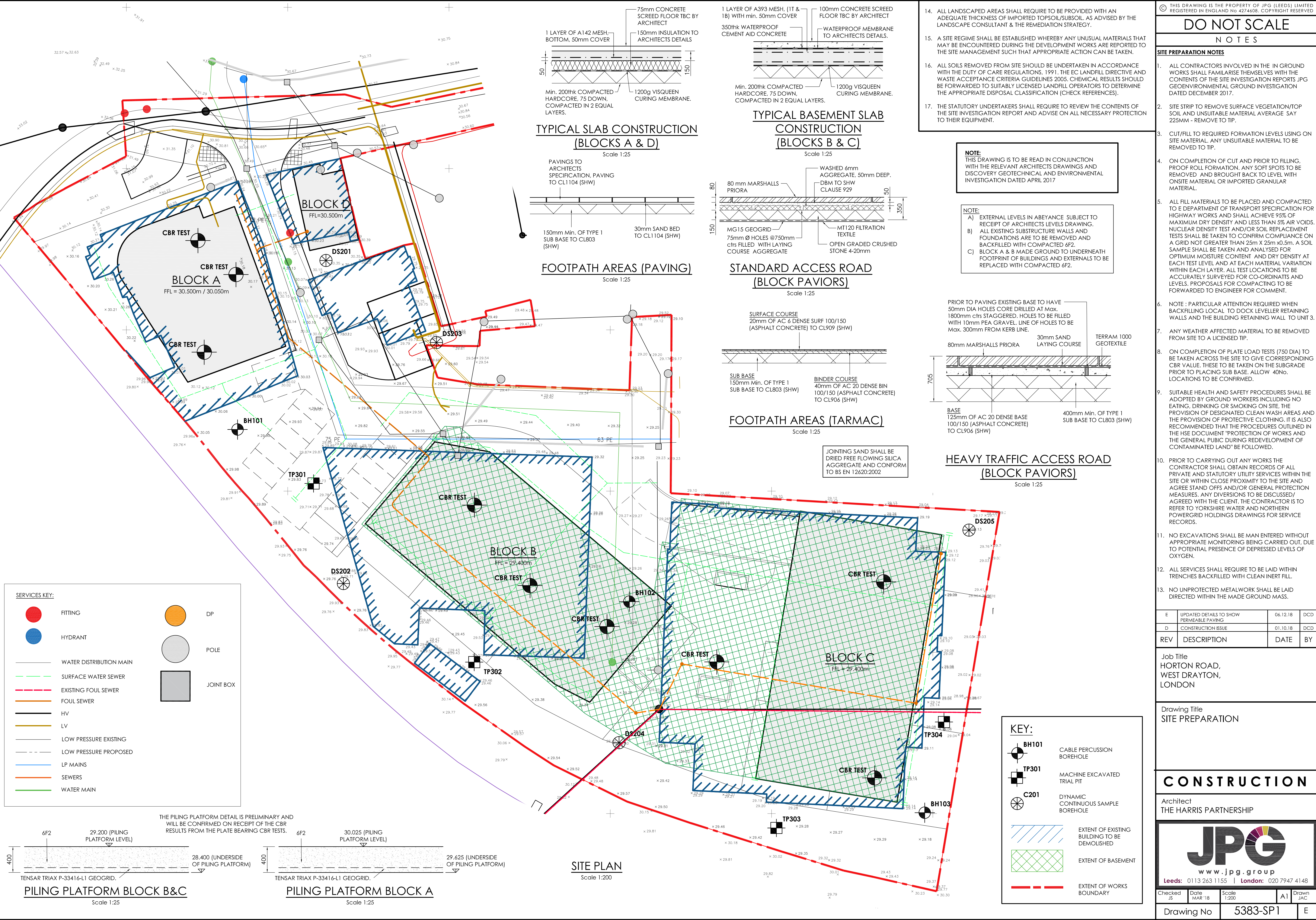
APPENDIX A - FIGURES



Reproduced from the Ordnance Survey 1:50,000 scale Landranger with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office,
© Crown Copyright, Discovery CE Limited, Licence No. 100044548.

Figure A1
Key Plan
Site: Horton Road, West Drayton
Client: PDR Construction
Report No: 21028J

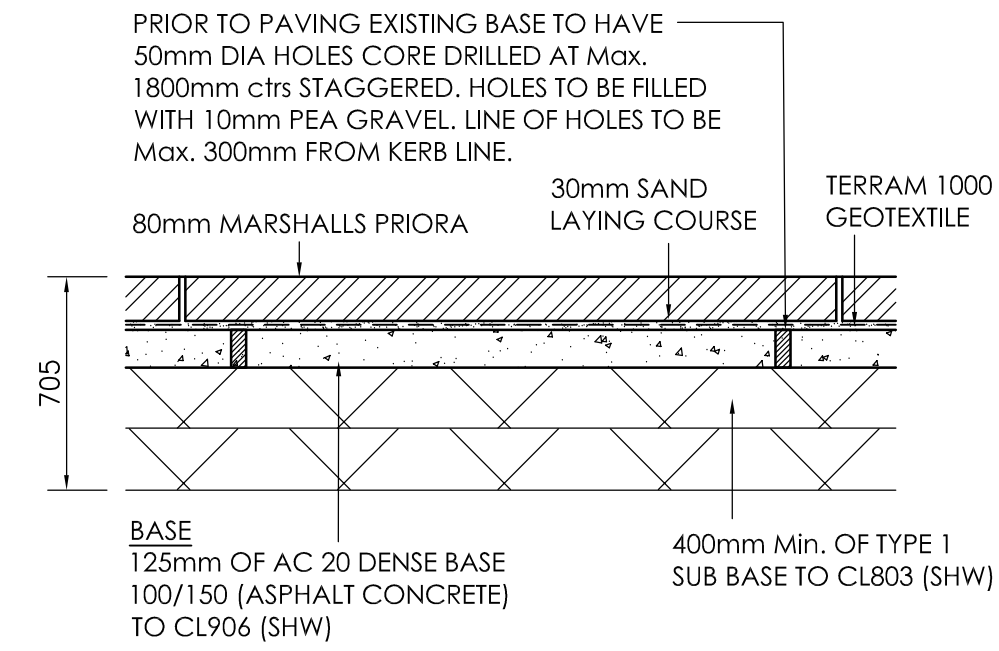
APPENDIX B - DRAWINGS



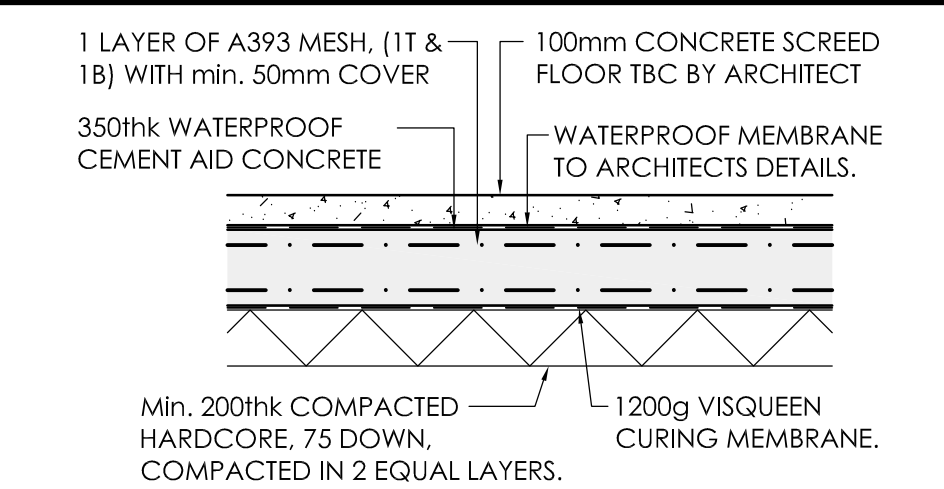
- 14. ALL LANDSCAPED AREAS SHALL REQUIRE TO BE PROVIDED WITH AN ADEQUATE THICKNESS OF IMPORTED TOPSOIL/SUBSOIL, AS ADVISED BY THE LANDSCAPE CONSULTANT & THE REMEDIATION STRATEGY.
- 15. A SITE REGIME SHALL BE ESTABLISHED WHEREBY ANY UNUSUAL MATERIALS THAT MAY BE ENCOUNTERED DURING THE DEVELOPMENT WORKS ARE REPORTED TO THE SITE MANAGEMENT SUCH THAT APPROPRIATE ACTION CAN BE TAKEN.
- 16. ALL SOILS REMOVED FROM SITE SHOULD BE UNDERTAKEN IN ACCORDANCE WITH THE DUTY OF CARE REGULATIONS, 1991. THE EC LANDFILL DIRECTIVE AND WASTE ACCEPTANCE CRITERIA GUIDELINES 2005. CHEMICAL RESULTS SHOULD BE FORWARDED TO SUITABLY LICENSED LANDFILL OPERATORS TO DETERMINE THE APPROPRIATE DISPOSAL CLASSIFICATION (CHECK REFERENCES).
- 17. THE STATUTORY UNDERTAKERS SHALL REQUIRE TO REVIEW THE CONTENTS OF THE SITE INVESTIGATION REPORT AND ADVISE ON ALL NECESSARY PROTECTION TO THEIR EQUIPMENT.

NOTE:
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTS DRAWINGS AND DISCOVERY GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION DATED APRIL 2017

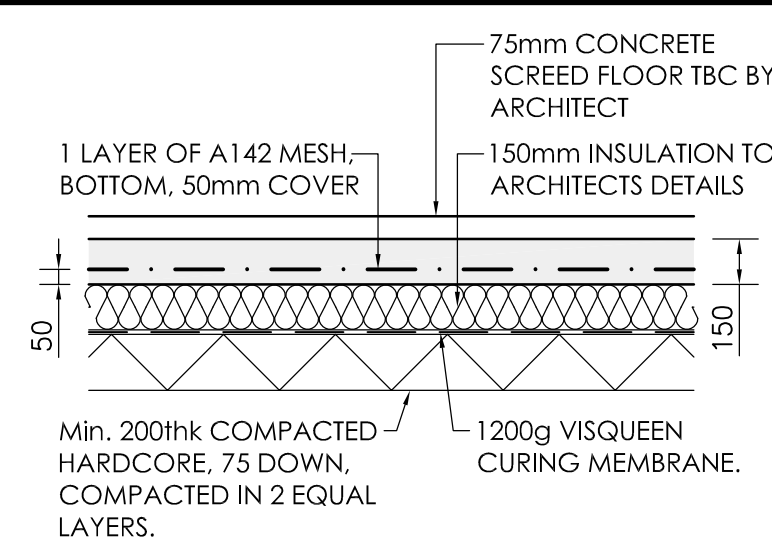
NOTE:
A) EXTERNAL LEVELS IN ABEYANCE SUBJECT TO RECEIPT OF ARCHITECTS LEVELS DRAWING.
B) ALL EXISTING SUBSTRUCTURE WALLS AND FOUNDATIONS ARE TO BE REMOVED AND BACKFILLED WITH COMPACTED 6F2.
C) BLOCK A & B MADE GROUND TO UNDERNEATH FOOTPRINT OF BUILDINGS AND EXTERNALS TO BE REPLACED WITH COMPACTED 6F2.



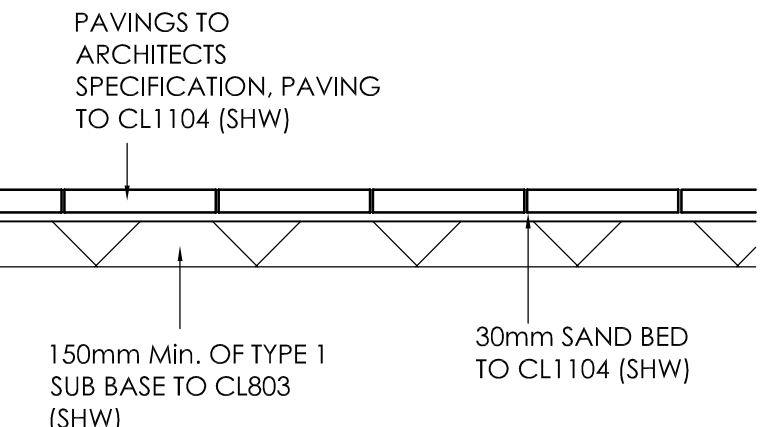
HEAVY TRAFFIC ACCESS ROAD (BLOCK PAVIORS)
Scale 1:25



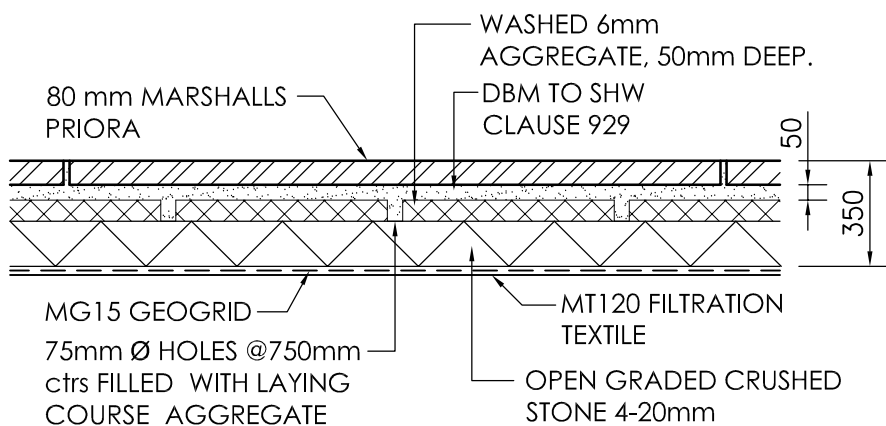
TYPICAL BASEMENT SLAB CONSTRUCTION (BLOCKS B & C)
Scale 1:25



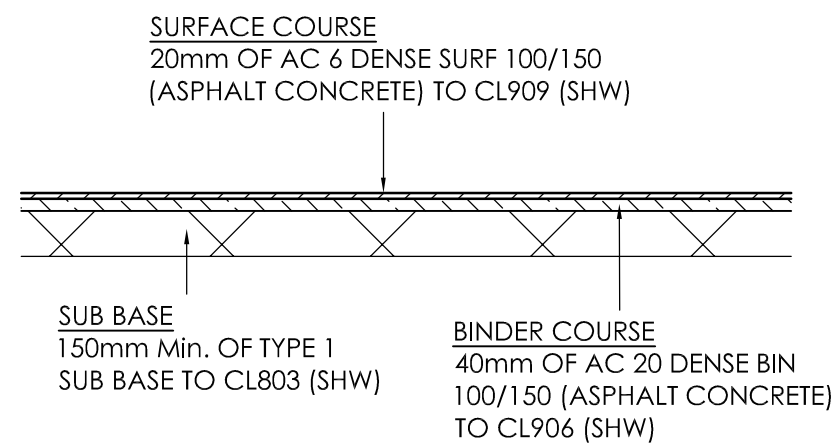
TYPICAL SLAB CONSTRUCTION (BLOCKS A & D)
Scale 1:25



FOOTPATH AREAS (PAVING)
Scale 1:25



STANDARD ACCESS ROAD (BLOCK PAVIORS)
Scale 1:25



FOOTPATH AREAS (TARMAC)
Scale 1:25

JOINTING SAND SHALL BE DRIED FREE FLOWING SILICA AGGREGATE AND CONFORM TO BS EN 12620:2002

DO NOT SCALE

NOTES

SITE PREPARATION NOTES

- 1. ALL CONTRACTORS INVOLVED IN THE IN GROUND WORKS SHALL FAMILIARISE THEMSELVES WITH THE CONTENTS OF THE SITE INVESTIGATION REPORTS JPG GEOENVIRONMENTAL GROUND INVESTIGATION DATED DECEMBER 2017.
- 2. SITE STRIP TO REMOVE SURFACE VEGETATION/TOP SOIL AND UNSUITABLE MATERIAL AVERAGE SAY 225MM - REMOVE TO TIP.
- 3. CUT/FILL TO REQUIRED FORMATION LEVELS USING ON SITE MATERIAL. ANY UNSUITABLE MATERIAL TO BE REMOVED TO TIP.
- 4. ON COMPLETION OF CUT AND PRIOR TO FILLING, PROOF ROLL FORMATION. ANY SOFT SPOTS TO BE REMOVED AND BROUGHT BACK TO LEVEL WITH ONSITE MATERIAL OR IMPORTED GRANULAR MATERIAL.
- 5. ALL FILL MATERIALS TO BE PLACED AND COMPACTED TO E DEPARTMENT OF TRANSPORT SPECIFICATION FOR HIGHWAY WORKS AND SHALL ACHIEVE 95% OF MAXIMUM DRY DENSITY AND LESS THAN 5% AIR VOIDS. NUCLEAR DENSITY TEST AND/OR SOIL REPLACEMENT TESTS SHALL BE TAKEN TO CONFIRM COMPLIANCE ON A GRID NOT GREATER THAN 25m X 25m X 0.5m. A SOIL SAMPLE SHALL BE TAKEN AND ANALYSED FOR OPTIMUM MOISTURE CONTENT AND DRY DENSITY AT EACH TEST LEVEL AND AT EACH MATERIAL VARIATION WITHIN EACH LAYER. ALL TEST LOCATIONS TO BE ACCURATELY SURVEYED FOR CO-ORDINATS AND LEVELS. PROPOSALS FOR COMPACTING TO BE FORWARDED TO ENGINEER FOR COMMENT.
- 6. NOTE : PARTICULAR ATTENTION REQUIRED WHEN BACKFILLING LOCAL TO DOCK LEVeller RETAINING WALLS AND THE BUILDING RETAINING WALL TO UNIT 3.
- 7. ANY WEATHER AFFECTED MATERIAL TO BE REMOVED FROM SITE TO A LICENSED TIP.
- 8. ON COMPLETION OF PLATE LOAD TESTS (750 DIA) TO BE TAKEN ACROSS THE SITE TO GIVE CORRESPONDING CBR VALUE. THESE TO BE TAKEN ON THE SUBGRADE PRIOR TO PLACING SUB BASE. ALLOW 40No. LOCATIONS TO BE CONFIRMED.
- 9. SUITABLE HEALTH AND SAFETY PROCEDURES SHALL BE ADOPTED BY GROUND WORKERS INCLUDING NO EATING, DRINKING OR SMOKING ON SITE, THE PROVISION OF DESIGNATED CLEAN WASH AREAS AND THE PROVISION OF PROTECTIVE CLOTHING. IT IS ALSO RECOMMENDED THAT THE PROCEDURES OUTLINED IN THE HSE DOCUMENT "PROTECTION OF WORKS AND THE GENERAL PUBLIC DURING REDEVELOPMENT OF CONTAMINATED LAND" BE FOLLOWED.
- 10. PRIOR TO CARRYING OUT ANY WORKS THE CONTRACTOR SHALL OBTAIN RECORDS OF ALL PRIVATE AND STATUTORY UTILITY SERVICES WITHIN THE SITE OR WITHIN CLOSE PROXIMITY TO THE SITE AND AGREE STAND OFFS AND/OR GENERAL PROTECTION MEASURES. ANY DIVERSIONS TO BE DISCUSSED/ AGREED WITH THE CLIENT. THE CONTRACTOR IS TO REFER TO YORKSHIRE WATER AND NORTHERN POWERGRID HOLDINGS DRAWINGS FOR SERVICE RECORDS.
- 11. NO EXCAVATIONS SHALL BE MAN ENTERED WITHOUT APPROPRIATE MONITORING BEING CARRIED OUT, DUE TO POTENTIAL PRESENCE OF DEPRESSED LEVELS OF OXYGEN.
- 12. ALL SERVICES SHALL REQUIRE TO BE LAID WITHIN TRENCHES BACKFILLED WITH CLEAN INERT FILL.
- 13. NO UNPROTECTED METALWORK SHALL BE LAID DIRECTED WITHIN THE MADE GROUND MASS.

E	UPDATED DETAILS TO SHOW PERMEABLE PAVING	06.12.18	DCD
D	CONSTRUCTION ISSUE	01.10.18	DCD
REV	DESCRIPTION	DATE	BY

Job Title
HORTON ROAD,
WEST DRAYTON,
LONDON

Drawing Title
SITE PREPARATION

CONSTRUCTION

Architect
THE HARRIS PARTNERSHIP

JPG
www.jpg.group
Leeds: 0113 263 1155 | London: 020 7947 4148

Checked JS	Date MAR '18	Scale 1:200	A1	Drawn JAC
Drawing No		5383-SP1		E

APPENDIX C - PLANNING CONDITIONS



Mr Richard Conroy
Progress Planning
20-22 Aylesbury End
Beaconsfield
HP9 1LW

Application Ref:
71582/APP/2016/4582

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)

GRANT OF PLANNING PERMISSION

The Council of the London Borough of Hillingdon as the Local Planning Authority within the meaning of the above Act and associated Orders **GRANTS** permission for the following:-

Description of development:

Demolition of existing buildings and redevelopment to provide 86 residential units in three buildings of 4-6 storeys with private balconies together with one three-bed dwelling, Class A1/A2 or A3 unit, associated car parking at basement and surface level, cycle parking, communal amenity areas, landscaping, improved access and relocated sub-station.

Location of development: Land Rear Of 2-24 Horton Road Yiewsley

Date of application: 23 December 2016

Plan Numbers: See attached Schedule of plans

Permission is subject to the condition(s) listed on the attached schedule:-

Head of Planning and Enforcement

Date: 31 August 2017

- NOTES:
- (i) Please also see the informatives included in the Schedule of Conditions.
 - (ii) Should you wish to appeal against any of the conditions please read the attached sheet which explains the procedure.
 - (iii) This decision does not convey any approval or consent which may be required under any by-laws, building regulations or under any Act other than the Town and Country Planning Act 1990 (as amended).

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)

GRANT OF PLANNING PERMISSION

Application Ref: 71582/APP/2016/4582

SCHEDULE OF CONDITIONS

- 1 · The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

REASON

To comply with Section 91 of the Town and Country Planning Act 1990

- 2 · The development hereby permitted shall not be carried out except in complete accordance with the details shown on the submitted plans,

15.214/D01 Rev A Location Plan
15.214/D02 Rev A Topographical Survey
15.214/D10 Rev A Existing Block Plan
15.214/D11 Rev B Proposed Block Plan
15.214/D49 Rev A Proposed Site Plan - Basement Level
15.214/D50 Rev B Proposed Site Plan - Ground Level
15.214/D51 Rev B Proposed Site Plan - 1st Floor
15.214/D52 Rev B Proposed Site Roof Plan
15.214/D100 Rev A Block A - Proposed Plans
15.214/D110 Rev B Block B - Proposed Plans
15.214/D120 Rev A Block C - Proposed Plans
15.214/D130 Rev A Block D - Proposed Plans
15.214/D200 Rev A Block A - Proposed Elevations
15.214/D210 Rev B Block B - Proposed Elevations
15.214/D220 Rev A Block C - Proposed Elevations
15.214/D230 Rev A Block D - Proposed Elevations
15.214/D300 Rev B Proposed Sectional Elevations 01, 02
15.214/D301 Rev B Proposed Sectional Elevations 03, 04
15.214/D302 Rev A Proposed Section 05
15-214/D500 Rev A Block A Bay Study
15-214/D501 Rev A Block B Bay Study
15-214/D502 Rev A Block C Bay Study
1452-01 Rev F Layout showing Proposed Hard and Soft Landscape General Arrangements
1453-02 Rev F Layout showing Proposed Landscaping Details

and shall thereafter be retained/maintained for as long as the development remains in existence.

REASON

To ensure the development complies with the provisions of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012) and the London Plan (2016).

SCHEDULE OF CONDITIONS

- 3 · No development shall take place until details of the following materials and external surfaces have been submitted to and approved in writing by the Local Planning Authority:

- (a) materials for the buildings
- (b) brick detailing
- (c) detail of balconies and balustrades
- (d) PVs, windows and doors
- (e) materials for the roofs
- (f) roof lights
- (g) lift over runs
- (h) roof top plant

Thereafter the development shall be constructed in accordance with the approved details and be retained as such.

Details should include information relating to make, product/type, colour and photographs/images.

REASON

To ensure that the development presents a satisfactory appearance in accordance with Policy BE13 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

SCHEDULE OF CONDITIONS

- 4 · No site clearance or construction work shall take place until the details have been submitted to, and approved in writing by, the Local Planning Authority with respect to:

1. A method statement outlining the sequence of development on the site including demolition, building works and tree protection measures.

2. Detailed drawings showing the position and type of fencing to protect the entire root areas/crown spread of off-site trees, hedges and other vegetation along the Canal boundary to be retained shall be submitted to the Local Planning Authority for approval. No site clearance works or development shall be commenced until these drawings have been approved and the fencing has been erected in accordance with the details approved. Unless otherwise agreed in writing by the Local Planning Authority such fencing should be a minimum height of 1.5 metres.

Thereafter, the development shall be implemented in accordance with the approved details. The fencing shall be retained in position until development is completed.

The area within the approved protective fencing shall remain undisturbed during the course of the works and in particular in these areas:

2.a There shall be no changes in ground levels;

2.b No materials or plant shall be stored;

2.c No buildings or temporary buildings shall be erected or stationed.

2.d No materials or waste shall be burnt; and.

2.e No drain runs or other trenches shall be dug or otherwise created, without the prior written consent of the Local Planning Authority.

REASON

To ensure that trees and other vegetation can and will be retained on site and not damaged during construction work and to ensure that the development conforms with Policy BE38 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

SCHEDULE OF CONDITIONS

- 5 · Before the development reaches damp proof level a landscape scheme shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include: -
 1. Details of Soft Landscaping
 - 1.a Planting plans (at not less than a scale of 1:100),
 - 1.b Written specification of planting and cultivation works to be undertaken,
 - 1.c Schedule of plants giving species, plant sizes, and proposed numbers/densities where appropriate (to include the full list of species to be planted along the site's boundary with the Grand Union Canal corridor and details of any measures necessary to protect the structural integrity of the waterway, as a result of such planting).
 2. Details of Hard Landscaping
 - 2.a Refuse Storage (including for the commercial unit)
 - 2.b Cycle Storage for 134 cycles
 - 2.c Means of enclosure/boundary treatments (including the treatment of the site's boundary with the Grand Union Canal corridor (the canal, towpath and adjacent vegetation).
 - 2.d Car Parking Layouts (including four motorcycle parking spaces and demonstration of 20% active and 20% passive electrical vehicle charging points)
 - 2.e Hard Surfacing Materials (details to include the design, appearance and materials to be used on the hard landscaped area at the west of the site, to be used for access to the towpath of the Grand Union Canal and an outdoor seating area)
 - 2.f External Lighting
 - 2.g Details of the children's play area equipment and furniture.
 3. Schedule for Implementation
 4. Other
 - 4.a Existing and proposed functional services above and below ground
 - 4.b Proposed finishing levels or contours

Thereafter the development shall be carried out and maintained in full accordance with the approved details.

REASON

To ensure that the proposed development will preserve and enhance the visual amenities of the locality and provide adequate facilities in compliance with Policies BE13, BE38 and AM14 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012) and Policies 5.11 (living walls and roofs) and 5.17 (refuse storage) of the London Plan (2016).

In the interests of visual amenity of, access to, and structural integrity of the Blue Ribbon Network in accordance with Policy EM3 of the Hillingdon Local Plan: Part One - Strategic Policies (November 2012).

SCHEDULE OF CONDITIONS

- 6 · Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (England) Order 2015 (or any order revoking and re-enacting that Order with or without modification); no garage(s), shed(s) or other outbuilding(s), nor extension or roof alteration to the dwellinghouse shall be erected without the grant of further specific permission from the Local Planning Authority.

REASON

To protect the character and appearance of the area and amenity of residential occupiers in accordance with Policies BE13, BE21, BE23 and BE24 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

SCHEDULE OF CONDITIONS

- 7 · Prior to commencement, a scheme for the provision of sustainable water management shall be submitted to, and approved in writing by the Local Planning Authority. The scheme shall follow the strategy set out in 'Flood Risk Assessment' and 'Surface Water Drainage Strategy', produced by Tomasons dated December 2016 Ref G22018.

The scheme shall clearly demonstrate how it manages water and demonstrate ways of controlling the surface water on site by providing information on:

a) Suds features:

- i. incorporating sustainable urban drainage (SuDs) in accordance with the hierarchy set out in Policy 5.15 of the London Plan. Where the proposal does not utilise the most sustainable solution, justification must be provided,
- ii. calculations showing storm period and intensity and volume of storage required to control surface water and size of features to control that volume to Greenfield run off rates at a variety of return periods including 1 in 1 year, 1 in 30, 1 in 100, and 1 in 100 plus Climate change,
- iii. where identified in an area at risk of surface water flooding, include additional provision within calculations for surface water from off site
- iv. where it is intended to have above ground storage, overland flooding should be mapped, both designed and exceedance routes above the 100, plus climate change, including flow paths depths and velocities identified as well as any hazards, (safe access and egress must be demonstrated).

b) Capacity of Receptors

- i. Capacity demonstrated for Thames Water foul and surface water network, and provide confirmation of any upgrade work required having been implemented and receiving watercourse as appropriate.
- ii. Where infiltration techniques (soakaway) or a basement are proposed a site investigation must be provided to establish the level of groundwater on the site, and to demonstrate the suitability of infiltration techniques proposed on the site. (This should be undertaken at the appropriate time of year as groundwater levels fluctuate).
- iii. Where groundwater is found within the site and a basement is proposed suitable mitigation methods must be provided to ensure the risk to others is not increased.
- iv. identify vulnerable receptors, ie WFD status and prevent pollution of the receiving groundwater and/or surface waters through appropriate methods;

c) Minimise water use.

- i. incorporate water saving measures and equipment.
- ii. provide details of how rain and grey water will be recycled and reused in the development.

d) Long Term Management and Maintenance of the drainage system.

- i. Provide a management and maintenance plan
- ii Include details of Inspection regimes, performance specification, (remediation and timescales for the resolving of issues where a PMC).
- iii. Where overland flooding is proposed, the plan should include the appropriate actions to define those areas and actions required to ensure the safety of the users of the site should that be required.
- iv. Clear plans showing all of the drainage network above and below ground. The responsibility of different parties such as the landowner, PMC, sewers offered for adoption and that to be adopted by the Council Highways services.

f) From commencement on site

SCHEDULE OF CONDITIONS

- 7 · i. How temporary measures will be implemented to ensure no increase in flood risk from commencement on site including any clearance or demolition works.

Thereafter the development shall be implemented and retained/maintained in accordance with these details for as long as the development remains in existence.

REASON

To ensure that surface water run off is controlled to ensure the development does not increase the risk of flooding contrary to Policy EM6 Flood Risk Management in Hillingdon Local Plan: Part 1 - Strategic Policies (Nov 2012), Policy 5.12 Flood Risk Management of the London Plan (March 2016); and

To be handled as close to its source as possible in compliance with Policy 5.13 Sustainable Drainage of the London Plan (March 2016), and Conserve water supplies in accordance with Policy 5.15 Water use and supplies of the London Plan (March 2016); National Planning Policy Framework (March 2012), and the Planning Practice Guidance (March 2014).

- 8 · Prior to the commencement of development a scheme for the protection, creation of biodiversity features and enhancement of opportunities for wildlife shall be submitted to and approved in writing by the Local Planning Authority. The plans shall detail measures to promote, encourage and support wildlife through the use of, but not limited to, bat and bird boxes, specific wildlife areas within the landscape schemes and the inclusion of living walls/screens and living roofs. The development must proceed in accordance with the approved plans.

REASON

To ensure the development makes a positive contribution to the protection and enhancement of flora and fauna in an urban setting in accordance with Policy BE1 of the Hillingdon Local Plan - Strategic Policies (November 2012), Policy EC5 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012) and London Plan (2016) Policy 7.19.

- 9 · No unit hereby approved shall be occupied until a parking allocation scheme has been submitted to, and approved in writing by, the Local Planning Authority. Thereafter the parking shall remain allocated for the use of the units in accordance with the approved scheme and remain under this allocation for the life of the development.

REASON

To ensure that an appropriate level of car parking provision is provided on site in accordance with Policy AM14 of the Hillingdon Local Plan: Part Two Saved UDP Policies (November 2012) and Chapter 6 of the London Plan (2016).

SCHEDULE OF CONDITIONS

- 10 · (i) The development hereby permitted shall not commence until a scheme to deal with contamination has been submitted in accordance with the Supplementary Planning Guidance on Land Contamination and approved by the Local Planning Authority (LPA). The scheme shall include all of the following measures unless the LPA dispenses with any such requirement specifically and in writing:
- (a) A desk-top study carried out by a competent person to characterise the site and provide information on the history of the site/surrounding area and to identify and evaluate all potential sources of contamination and impacts on land and water and all other identified receptors relevant to the site;
 - (b) A site investigation, including where relevant soil, soil gas, surface and groundwater sampling, together with the results of analysis and risk assessment shall be carried out by a suitably qualified and accredited consultant/contractor. The report should also clearly identify all risks, limitations and recommendations for remedial measures to make the site suitable for the proposed use.
 - (c) A written method statement providing details of the remediation scheme and how the completion of the remedial works will be verified shall be agreed in writing with the LPA prior to commencement.
- (ii) If during development or works contamination not addressed in the submitted remediation scheme is identified, an addendum to the remediation scheme must be agreed with the LPA prior to implementation; and
- (iii) All works which form part of the remediation scheme shall be completed and a verification report submitted to the Council's Environmental Protection Unit before any part of the development is occupied or brought into use unless the LPA dispenses with any such requirement specifically and in writing.
- iv) No contaminated soils or other materials shall be imported to the site. All imported soils for landscaping purposes shall be clean and free of contamination. Before any part of the development is occupied, all imported soils shall be independently tested for chemical contamination, and the results of this testing shall be submitted and approved in writing by the Local Planning Authority. All soils used for gardens and/or landscaping purposes shall be clean and free of contamination.

REASON:

To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems and the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors in accordance with Policy OE11 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

SCHEDULE OF CONDITIONS

- 11 · Before the development reaches damp proof level full specification of the PVs shall be submitted in writing to the Local Planning Authority. The specification shall include the type of PV and full details of their position and fitting to the roofs of the development. The specifications shall be accompanied by a roof plan and elevations showing the panels on the roof. Details including specifications and location of the air source heat pumps shall also be submitted to and approved in writing by the Local Planning Authority. The development shall proceed in accordance with the approved designs.

REASON

To ensure the development delivers the CO2 savings as set out in the energy strategy and in accordance with the London Plan Policy 5.2.

- 12 · The rating level of noise emitted from the plant and/or machinery for the commercial unit and the undercroft parking extraction hereby approved shall be at least 5dB below the existing background noise level. The noise levels shall be determined at the nearest residential property. The measurements and assessment shall be made in accordance to the 2014 British Standard 4142, 'Methods for rating and assessing industrial and commercial sound'

REASON

To safeguard the amenity of the surrounding area in accordance with Policy OE1 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

- 13 · No air extraction system shall be used on the premises until a scheme for the control of noise and odour emanating from the commercial unit and the undercroft parking extraction has been submitted to and approved in writing by the Local Planning Authority. The scheme shall include such combination of measures as may be approved by the LPA. Thereafter, the scheme shall be implemented and maintained in full compliance with the approved measures.

REASON

To safeguard the amenity of the occupants of surrounding properties in accordance with Policy OE1 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

- 14 · The development shall not begin until a scheme for the control of noise transmission from the commercial unit to the adjoining dwellings/premises has been submitted to and approved in writing by the Local Planning Authority. The scheme shall include such combination of sound insulation and other measures as may be approved by the LPA. Thereafter, the scheme shall be implemented and maintained in full compliance with the approved measures.

REASON

To safeguard the amenity of the occupants of surrounding properties in accordance with Policy OE1 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

SCHEDULE OF CONDITIONS

- 15 · Deliveries and loading or unloading of goods in respect of the commercial unit hereby approved shall only take place between the hours of 07:00 and 22:00, Monday to Friday, and between 08:00 and 22:00 on Saturdays. No deliveries or loading/unloading shall take place on Sundays or Bank Holidays.

REASON

To safeguard the residential amenity of the occupiers of adjoining and nearby properties in accordance with Policy OE3 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

- 16 · Prior to demolition, the buildings should be recorded to Level 1 as defined by Historic England and following agreement with London Borough of Hillingdon and where appropriate Historic England, copies of the document sent to the Uxbridge Local History Library archive and English Heritage for inclusion in the London Heritage Environment Record.

REASON

To safeguard the special architectural and/or historic interest of the building in accordance with Policy BE8 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012)

- 17 · Before the development hereby approved commences, a Construction Environmental Management Plan (CEMP) shall be submitted to, and approved in writing by, the Local Planning Authority. The CEMP shall comprise such combination of measures for controlling the effects of demolition, construction and enabling works associated with the development as may be approved by the Local Planning Authority.

The Construction Environmental Management Plan (CEMP) shall address issues including the phasing of the works; hours of work; noise and vibration; air quality; waste management; site remediation; plant and equipment; site transportation and traffic management including routing, signage, permitted hours for construction traffic and construction materials deliveries. It will ensure appropriate communication with, and the distribution of information to, the local community and the Local Planning Authority relating to relevant aspects of construction.

Appropriate arrangement should be made for monitoring and responding to complaints relating to demolition and construction. The Construction Environmental Management Plan (CEMP) shall also include details of the measures to be taken to protect the Grand Union Canal from contamination during construction.

All demolition, construction and enabling work at the development shall be carried out in accordance with the approved Construction Environmental Management Plan (CEMP) unless otherwise agreed in writing by the Local Planning Authority.

REASON

To safeguard the amenity of surrounding areas in accordance with Policy OE5 of the Hillingdon Local Plan: Part Two - Saved UDP Policies (November 2012) and to protect the water quality, ecology and users of the canal during construction of the development in accordance with Policy EM3 of the Hillingdon Local Plan: Part One - Strategic Policies (November 2012).

SCHEDULE OF CONDITIONS

- 18 · Prior to the installation of any external lighting, a lighting plan shall be submitted to and approved in writing by the Local Planning Authority. Only external lighting agreed in that plan shall be installed, unless otherwise agreed in writing by the Local Planning Authority.

REASON

In the interests of the ecology of the Blue Ribbon Network in accordance with Policy EM3 of the Hillingdon Local Plan: Part One - Strategic Policies (November 2012)

- 19 · The dwelling(s) shall achieve 'Secured by Design' accreditation awarded by the Hillingdon Metropolitan Police Crime Prevention Design Adviser (CPDA) on behalf of the Association of Chief Police Officers (ACPO). No dwelling shall be occupied until accreditation has been achieved.

REASON

In pursuance of the Council's duty under section 17 of the Crime and Disorder Act 1998 to consider crime and disorder implications in exercising its planning functions; to promote the well being of the area in pursuance of the Council's powers under section 2 of the Local Government Act 2000, to reflect the guidance contained in the Council's SPG on Community Safety By Design and to ensure the development provides a safe and secure environment in accordance with London Plan (2015) Policies 7.1 and 7.3.

- 20 · Prior to the commencement of development, a Residential Travel Plan shall be submitted to and approved in writing by the Local Planning Authority. The Travel Plan shall follow the current Travel Plan Development Control Guidance issued by Transport for London.

REASON

To promote sustainable transport and reduce the impact of the development on the surrounding road network in accordance with London Plan (2016) Policies 6.1 and 6.3.

- 21 · Before the development reaches damp proof level details of screens to the balconies located on the eastern corner of Block B closest to Block C shall be submitted to and approved in writing by the Local Planning Authority. Thereafter, the scheme shall be implemented and maintained in full compliance with the approved measures.

REASON

To prevent overlooking to adjoining properties in accordance with policy BE24 of the Hillingdon Unitary Development Plan Saved Policies (September 2007).

INFORMATIVES:

- 1 · The decision to GRANT planning permission has been taken having regard to all relevant planning legislation, regulations, guidance, circulars and Council policies, including The Human Rights Act (1998) (HRA 1998) which makes it unlawful for the Council to act incompatibly with Convention rights, specifically Article 6 (right to a fair hearing); Article 8 (right to respect for private and family life); Article 1 of the First Protocol (protection of property) and Article 14 (prohibition of discrimination).

SCHEDULE OF CONDITIONS

- 2 . The decision to GRANT planning permission has been taken having regard to the policies and proposals in the Hillingdon Unitary Development Plan Saved Policies (September 2007) as incorporated into the Hillingdon Local Plan (2012) set out below, including Supplementary Planning Guidance, and to all relevant material considerations, including The London Plan - The Spatial Development Strategy for London consolidated with alterations since 2011 (2016) and national guidance.

Part 1 Policies:

PT1.BE1	(2012) Built Environment
PT1.EM3	(2012) Blue Ribbon Network
PT1.EM6	(2012) Flood Risk Management
PT1.EM7	(2012) Biodiversity and Geological Conservation
PT1.EM8	(2012) Land, Water, Air and Noise
PT1.H2	(2012) Affordable Housing

Part 2 Policies

AM7	Consideration of traffic generated by proposed developments.
AM14	New development and car parking standards.
BE13	New development must harmonise with the existing street scene.
BE15	Alterations and extensions to existing buildings
BE19	New development must improve or complement the character of the area.
BE20	Daylight and sunlight considerations.
BE21	Siting, bulk and proximity of new buildings/extensions.
BE22	Residential extensions/buildings of two or more storeys.
BE23	Requires the provision of adequate amenity space.
BE24	Requires new development to ensure adequate levels of privacy to neighbours.
BE32	Development proposals adjacent to or affecting the Grand Union Canal
BE38	Retention of topographical and landscape features and provision of new planting and landscaping in development proposals.
EC1	Protection of sites of special scientific interest, nature conservation importance and nature reserves Replaced by PT1.EM7 (2012)
EC2	Nature conservation considerations and ecological assessments
EC5	Retention of ecological features and creation of new habitats
H4	Mix of housing units
H8	Change of use from non-residential to residential
LE4	Loss of existing industrial floorspace or land outside designated Industrial and Business Areas
OE1	Protection of the character and amenities of surrounding properties and the local area

SCHEDULE OF CONDITIONS

OE3	Buildings or uses likely to cause noise annoyance - mitigation measures
OE5	Siting of noise-sensitive developments
OE11	Development involving hazardous substances and contaminated land - requirement for ameliorative measures
HDAS-LAY	Residential Layouts, Hillingdon Design & Access Statement, Supplementary Planning Document, adopted July 2006
LPP 3.4	(2015) Optimising housing potential
LPP 3.5	(2016) Quality and design of housing developments
LPP 5.2	(2016) Minimising Carbon Dioxide Emissions
LPP 5.11	(2016) Green roofs and development site environs
LPP 5.12	(2016) Flood risk management
LPP 5.13	(2016) Sustainable drainage
LPP 5.15	(2016) Water use and supplies
LPP 5.17	(2016) Waste capacity
LPP 7.19	(2016) Biodiversity and access to nature
NPPF	National Planning Policy Framework

- 3 . Nuisance from demolition and construction works is subject to control under The Control of Pollution Act 1974, the Clean Air Acts and other related legislation. In particular, you should ensure that the following are complied with:-

A. Demolition and construction works which are audible at the site boundary shall only be carried out between the hours of 08.00 and 18.00 hours Monday to Friday and between the hours of 08.00 hours and 13.00 hours on Saturday. No works shall be carried out on Sundays, Bank or Public Holidays.

B. All noise generated during such works shall be controlled in compliance with British Standard Code of Practice BS 5228:2009.

C. Dust emissions shall be controlled in compliance with the Mayor of London's Best Practice Guidance 'The Control of dust and emissions from construction and demolition.

D. No bonfires that create dark smoke or nuisance to local residents.

You are advised to consult the Council's Environmental Protection Unit (www.hillingdon.gov.uk/noise Tel. 01895 250155) or to seek prior approval under Section 61 of the Control of Pollution Act if you anticipate any difficulty in carrying out construction other than within the normal working hours set out in (A) above, and by means that would minimise disturbance to adjoining premises.

- 4 . The Council will recover from the applicant the cost of highway and footway repairs, including damage to grass verges.

SCHEDULE OF CONDITIONS

Care should be taken during the building works hereby approved to ensure no damage occurs to the verge or footpaths during construction. Vehicles delivering materials to this development shall not override or cause damage to the public footway. Any damage will require to be made good to the satisfaction of the Council and at the applicant's expense.

For further information and advice contact - Highways Maintenance Operations, Central Depot - Block K, Harlington Road Depot, 128 Harlington Road, Hillingdon, Middlesex, UB3 3EU (Tel: 01895 277524).

- 5 . The applicant/developer is advised to review the Canal & River Trust's "Code of Practice for Works affecting the Canal & River Trust and contact the Trust's Works Engineer (toby.pearce@canalrivertrust.org.uk) in order to ensure that any necessary consents are obtained and that the works are compliant (<https://canalrivertrust.org.uk/business-andtrade/undertaking-works-on-our-propertyandour-code-of-practice>)".
- 6 . The applicant/developer is advised that any oversail, encroachment or access to the waterway requires written consent from the Canal & River Trust, and they should contact the Canal & River Trust (Jonathan.Young@canalrivertrust.org.uk) regarding the required access agreement.

END OF SCHEDULE

Address:

Residents Services
London Borough of Hillingdon
3 North Civic Centre, High Street, Uxbridge UB8 1UW
Tel: 01895 250230
www.hillingdon.gov.uk

GRANT OF PLANNING PERMISSION

Application Ref.No.: 71582/APP/2016/4582

SCHEDULE OF PLANS

Landscape Design Statement Rev C 12 December 2016 - received 21 Dec 2016
Noise Assessment December 2016 - received 21 Dec 2016
Statement of Community Involvement December 2016 - received 21 Dec 2016
Drainage Design Strategy December 2016 - received 21 Dec 2016
Planning Statement December 2016 - received 21 Dec 2016
Drawing Issue Schedule April 2017 - received 28 Apr 2017
Flood Risk Assessment G22018 December 2016 - received 21 Dec 2016
Air Quality Assessment - received 21 Dec 2016
15-214/D500 Rev A Block A Bay Study - received 21 Dec 2016
15-214/D502 Rev A Block C Bay Study - received 21 Dec 2016
15-214/D501 Rev A Block B Bay Study - received 21 Dec 2016
1452-01 Rev F Layout showing Proposed Hard and Soft Landscape General Arrangements - received 21 Dec 2016
1453-02 Rev F Layout showing Proposed Landscaping Details - received 21 Dec 2016
Geotechnical Desk Study Report December 2016 - received 21 Dec 2016
15.214/D02 Rev A Topographical Survey - received 21 Dec 2016
15.214/D10 Rev A Existing Block Plan - received 21 Dec 2016
15.214/D49 Rev A Proposed Site Plan - Basement Level - received 21 Dec 2016
15.214/D130 Rev A Block D - Proposed Plans - received 21 Dec 2016
15.214/D100 Rev A Block A - Proposed Plans - received 21 Dec 2016
15.214/D120 Rev A Block C - Proposed Plans - received 21 Dec 2016
15.214/D230 Rev A Block D - Proposed Elevations - received 21 Dec 2016
15.214/D200 Rev A Block A - Proposed Elevations - received 21 Dec 2016
15.214/D220 Rev A Block C - Proposed Elevations - received 21 Dec 2016
15.214/D01 Rev A Location Plan - received 21 Dec 2016
Extended Phase 1 Habitat Survey & Bat Assessment Rev B 01 September 2016 - received 21 Dec 2016
15.214/D302 Rev A Proposed Section 05 - received 09 May 2017
Commercial Viability Report 08 December 2016 - received 11 Jan 2017
Statement of Principles in relation to the Scheme-Towpath Boundary - received 10 Feb 2017

Design and Access Statement (Revised Feb 2017) - received 13 Feb 2017

Residential Travel Plan December 2016 - received 21 Dec 2016

Arboricultural Survey & Arboricultural Impact Assessment Rev D 12 December 2016
- received 21 Dec 2016

Viability Report - received 21 Dec 2016

Energy Statement and Sustainability Report Issue 3 December 2016 - received 03
Jan 2017

Transport Assessment December 2016 - received 21 Dec 2016

15.214/D300 Rev B Proposed Sectional Elevations 01, 02 - received 28 Apr 2017

15.214/D210 Rev B Block B - Proposed Elevations - received 28 Apr 2017

15.214/D110 Rev B Block B - Proposed Plans - received 28 Apr 2017

15.214/D52 Rev B Proposed Site Roof Plan - received 28 Apr 2017

15.214/D51 Rev B Proposed Site Plan - 1st Floor - received 28 Apr 2017

15.214/D50 Rev B Proposed Site Plan - Ground Level - received 28 Apr 2017

15.214/D11 Rev B Proposed Block Plan - received 28 Apr 2017

15.214/D301 Rev B Proposed Sectional Elevations 03, 04 - received 28 Apr 2017

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)

If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the office of the First Secretary of State under Section 78 of the Town and Country Planning Act 1990.

If you want to appeal, then you must do so within six months of the date of this notice, using a form which you can get from the Planning Inspectorate at Customer Support Unit, Room 3/15 Eagle Wing, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN (Tel 0117 372 8424). Appeal forms can be downloaded from the Planning Inspectorate's website at <http://Planning-inspectorate.gov.uk>

The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances, which excuse the delay in giving notice of an appeal.

The Secretary of State need not consider an appeal if it seems to him that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

In practice, the Secretary of State does not refuse to consider appeals solely because the local planning authority based their decision on a direction given by him.

Purchase Notices.

If either the local planning authority or the officer of the First Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use by carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (District Council, London Borough Council or Common Council of the City of London) in whose area the land is situated. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.



TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)

APPROVAL OF DETAILS

Ms Tanya Trayner
101 London Road
Reading
RG1 5BY

Ref: 71582/APP/2019/1741

The Council of the London Borough of Hillingdon as the Local Planning Authority within the meaning of the above-mentioned Act and Orders made thereunder hereby **GRANT APPROVAL** of the following received on 23 May 2019:-

Details pursuant to condition 10 parts (i)(a), (b) and (c) (Contamination) of planning permission ref: 71582/APP/2016/4582, dated 31/08/2017 (Demolition of existing buildings and redevelopment to provide 86 residential units in three buildings of 4-6 storeys with private balconies together with one three-bed dwelling, Class A1/A2 or A3 unit, associated car parking at basement and surface level, cycle parking, communal amenity areas, landscaping, improved access and relocated sub-station).

Drawing/Plan Nos: See Attached Schedule of Plans

At: LAND TO THE REAR OF 2-24, HORTON ROAD, YIEWSLEY,

Head of Planning, Transportation and Regeneration

Date: 18 July 2019

NOTE: This notice does NOT relate to any approvals, which may be required under any conditions of the notice of planning permission except the condition(s) referred to herein.

INFORMATIVES
END OF SCHEDULE

Address:

Residents Services
London Borough of Hillingdon
3 North Civic Centre, High Street, Uxbridge UB8 1UW
Tel: 01895 250230
www.hillingdon.gov.uk

SCHEDULE OF PLANS

15344-100 (Location Plan) - received 23 May 2019

Geotechnical and Geoenvironmental Investigation, June 2017, Report Ref. 16088J-02, -
received 23 May 2019

Phase 1 Geo-Environmental Desk Study, October 2015, Document Ref. CS082259-P1 Rev. 02
- received 23 May 2019

Additional Site Investigation, Assessment and Remediation Strategy, November 2018, Report
Ref. 16088J-03 - received 23 May 2019

Geotechnical Desk Study, December 2016, Report Ref. 16088J - received 23 May 2019

**RIGHTS OF APPLICANTS AGGRIEVED BY DECISION OF
LOCAL PLANNING AUTHORITY
TOWN & COUNTRY PLANNING ACT 1990**

Appeals to the Secretary of State.

If you are aggrieved by the decision of your Local Planning Authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State for Transport, Local Government and The Regions under Section 78 of the Town and Country Planning Act 1990.

If you want to appeal, then you must do so within six months of the date of this notice, using a form which you can get from The Planning Inspectorate, 3/02 Kite Wing, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN (Tel. 0117 372 8428). Appeal forms can be downloaded from the Planning Inspectorate's website at <http://www.planning-inspectorate.gov.uk>.

The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstance which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to him that the Local Planning Authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

In practice, the Secretary of State does not refuse to consider appeals solely because the Local Planning Authority based their decision on a direction given by him.

Purchase Notices.

If either the Local Planning Authority or the Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (District Council, London Borough Council or Common Council of the City of London) in whose area the land is situated. T

Address:
Residents Services
London Borough of Hillingdon
3 North Civic Centre, High Street, Uxbridge UB8 1UW
Tel: 01895 250400 / 250401
www.hillingdon.gov.uk

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)

APPROVAL OF DETAILS

Ms Tanya Trayner
101 London Road
Reading
RG1 5BY

Ref: 71582/APP/2019/4052

The Council of the London Borough of Hillingdon as the Local Planning Authority within the meaning of the above-mentioned Act and Orders made thereunder hereby **GRANT APPROVAL** of the following received on 16 December 2019:-

Details pursuant to Conditions 10 (i) a, 10b and 10c (ground gas contamination) of planning permission ref: 71582/APP/2018/2871, dated 17-07-19 (Variation of Condition 2 (approved plans) of planning permission ref: 71582/APP/2016/4582, dated 31/08/2017 (Demolition of existing buildings and redevelopment to provide 86 residential units in three buildings of 4-6 storeys with private balconies together with one three-bed dwelling, Class A1/A2 or A3 unit, associated car parking at basement and surface level, cycle parking, communal amenity areas, landscaping, improved access and relocated sub-station) for improved fire safety, circulation and ventilation, alterations to sub-station and cycle store, revised feature brick work and increase in building height).

Drawing/Plan Nos: **See Attached Schedule of Plans**

At: LAND TO THE REAR OF 2-24, HORTON ROAD, YIEWSLEY,



Head of Planning, Transportation and Regeneration

Date: 12 February 2020

NOTE: This notice does NOT relate to any approvals, which may be required under any conditions of the notice of planning permission except the condition(s) referred to herein.

SCHEDULE OF CONDITIONS

- 1 · This condition is for the partial approval of Condition 10 (i) a,b and c. The applicant is therefore required to fully discharge the remainder of this condition.

INFORMATIVES

END OF SCHEDULE

Address:

Residents Services
London Borough of Hillingdon
3 North Civic Centre, High Street, Uxbridge UB8 1UW
Tel: 01895 250230
www.hillingdon.gov.uk

SCHEDULE OF PLANS

Phase 1 Geo-Environmental Desk Study, October 2015 - received 10 Feb 2020

Additional Site Investigation, Assessment and Remediation Strategy, November 2018 - received 10 Feb 2020

Geotechnical Desk Study, December 2016 - received 10 Feb 2020

Geotechnical and Geoenvironmental Investigation, June 2017 - received 10 Feb 2020

15344-100 Location Plan - received 16 Dec 2019

Gas Assessment Update, Basement Excavation Information December 2019 - received 16 Dec 2019

**RIGHTS OF APPLICANTS AGGRIEVED BY DECISION OF
LOCAL PLANNING AUTHORITY
TOWN & COUNTRY PLANNING ACT 1990**

Appeals to the Secretary of State.

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In practice, the Secretary of State does not refuse to consider appeals solely because the Local Planning Authority based their decision on a direction given by him.

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In these circumstances, the owner may serve a purchase notice on the Council (District Council, London Borough Council or Common Council of the City of London) in whose area the land is situated. T

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www.hillingdon.gov.uk

APPENDIX D - CLEAN COVER CERTIFICATES

CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP103
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP103: 0 – 0.2 m: Dark brown slightly clayey fine and medium SAND with frequent root and rootlet fragments.
0.2 – 0.75 m: Greyish yellowish brown slightly clayey fine and medium SAND.

Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

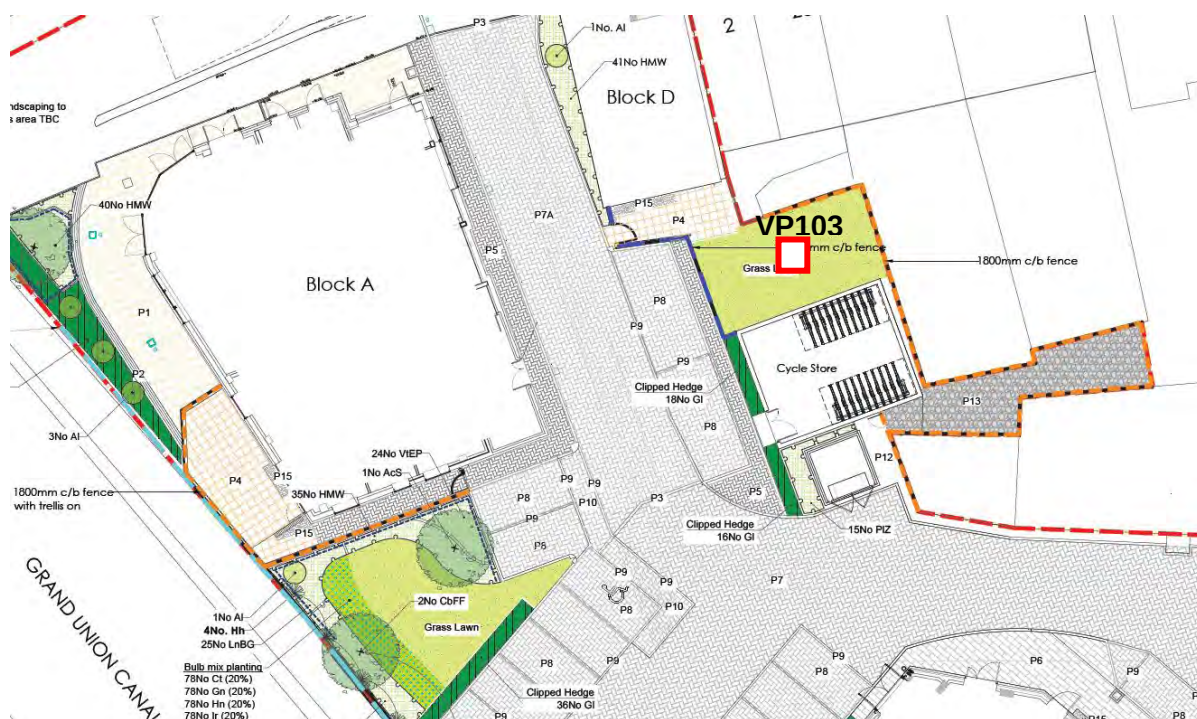
A soil sample was taken from the topsoil/sub-soil horizon at 0.50 m bgl and sent to the laboratory for the full suite of testing as specified within the remediation Strategy (RS). The results are provided in Appendix B. The chemical results indicated the presence of asbestos within the subsoil.

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP103 (sample at 0.50 m bgl)	750	YES

Clean Cover Verification Location:



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP103
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP103 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP103
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP103 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be greater than the minimum required. However, asbestos fibres have been encountered within the subsoil, as a result all the material within the area of VP103 will need to be removed and replaced with fresh clean cover material.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date

MIKE FORRESTER
11/05/2021

CATHAL GILLESPIE
11/05/2021

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP104
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP104: 0 – 0.54 m: Dark brown slightly clayey fine and medium SAND with frequent root and rootlet fragments.
Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

A soil sample was taken from the topsoil/sub-soil horizon at 0.30 m bgl and sent to the laboratory for the full suite of testing as specified within the remediation Strategy (RS). The results are provided in Appendix B. The chemical results were all less than the agreed criteria as set out in the RS.

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP104 (sample at 0.30 m bgl)	540	NO

Clean Cover Verification Location:



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP104
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP104 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP104
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP104 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

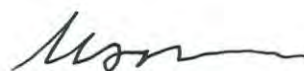
Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be less than the minimum required, however it is understood that an additional 70 mm of material is to be placed which will meet the minimum thickness requirement. All chemical test results are less than the limiting criteria defined in the Remediation Strategy.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date



MIKE FORRESTER
11/05/2021



CATHAL GILLESPIE
11/05/2021

CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP105
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: “*Additional Site Investigation, Assessment and Remediation Strategy*”, Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP105: 0 – 0.14 m: Dark brown slightly clayey fine and medium SAND with frequent root and rootlet fragments.
0.14 – 0.5 m: Dark red and light grey SAND and GRAVEL. Sand is fine and medium. Gravel is subangular and subrounded fine and medium of brick and quartzite.

Woven geotextile overlying plastic drainage at top of concrete noted at base of inspection pit.

Associated Chemical Testing:

No chemical testing was undertaken from VP105 due to the proximity of VP104.

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP105	500	YES

Clean Cover Verification Location:



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP105
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP105 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP105
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP105 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. Due to the area of VP105 being on top of the underground parking basement, the thickness of clean cover is considered to be suitable to prevent exposure pathway as defined in the Remediation Strategy.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date

MIKE FORRESTER
11/05/2021

CATHAL GILLESPIE
11/05/2021

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP106
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP106: 0 – 0.2 m: Dark brown slightly clayey fine and medium SAND with frequent root and rootlet fragments.
0.2 – 0.9 m: Greyish yellowish brown fine to coarse SAND.

Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

A soil sample was taken from the topsoil/sub-soil horizon at 0.40 m bgl and sent to the laboratory for the full suite of testing as specified within the remediation Strategy (RS). The results are provided in Appendix B. The chemical results were all less than the agreed criteria as set out in the RS.

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP106 (sample at 0.40 m bgl)	900	YES

Clean Cover Verification Location:



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP106
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP106 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP106
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP106 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

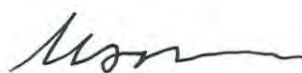
Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be greater than the minimum required and all chemical test results are less than the limiting criteria defined in the Remediation Strategy.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date



MIKE FORRESTER
11/05/2021



CATHAL GILLESPIE
11/05/2021

CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP107
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP107: 0 – 0.23 m: Dark brown slightly clayey fine and medium SAND with frequent root and rootlet fragments.
0.23 – 0.75 m: Greyish yellowish brown slightly clayey fine and medium SAND.

Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

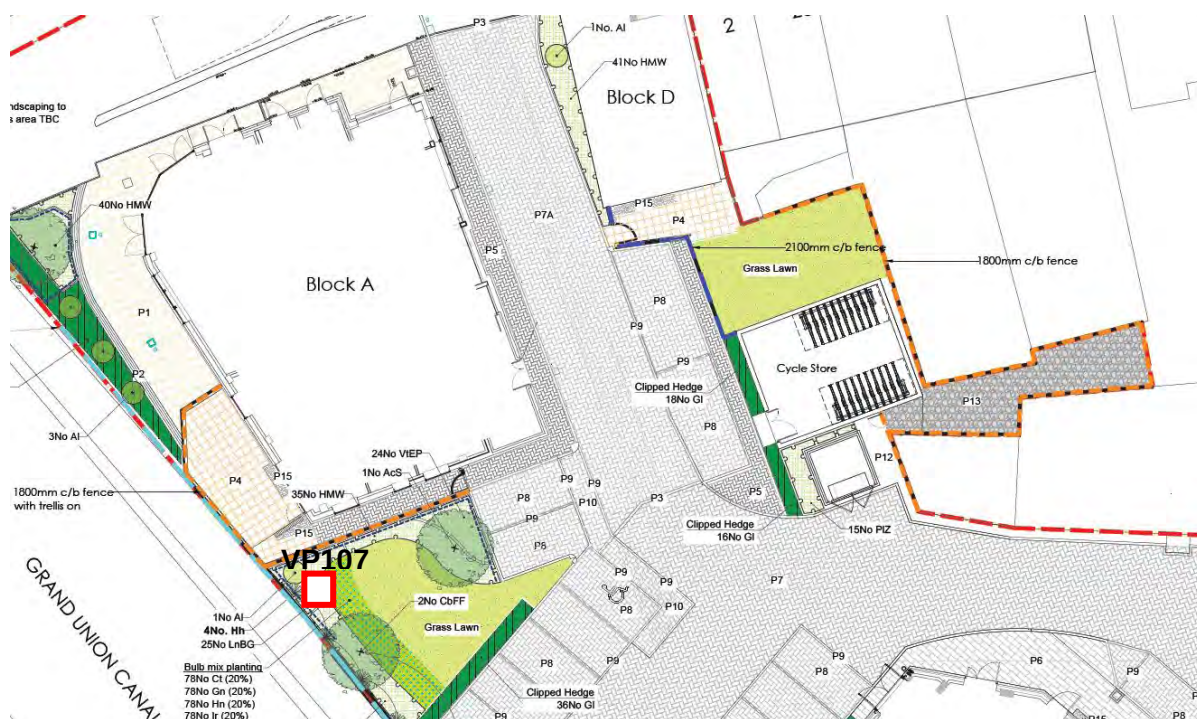
A soil sample was taken from the topsoil/sub-soil horizon at 0.10 m bgl and sent to the laboratory for the full suite of testing as specified within the remediation Strategy (RS). The results are provided in Appendix B. The chemical results were all less than the agreed criteria as set out in the RS.

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP107 (sample at 0.10 m bgl)	750	YES

Clean Cover Verification Location:



Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP107
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP107 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP107
Project Number : 21028J	Inspection Dates : 04/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP107 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be greater than the minimum required and all chemical test results are less than the limiting criteria defined in the Remediation Strategy.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date

MIKE FORRESTER
11/05/2021

CATHAL GILLESPIE
11/05/2021

APPENDIX A
CLEAN COVER REQUIREMENTS

As a minimum ANY staff working with soils with low concentrations of asbestos will need to work in conditions including dust control and be provided with appropriate training and PPE/RPE (e.g., FFP3 masks and Cat3 Type 5/6 overalls). The details of the controls should be provided by the contractor and agreed prior to any excavations starting.

If there is any doubt over the nature of the material or best way to proceed, or quantification indicates that asbestos concentrations are greater than the hazardous waste criteria, the advice of a specialist asbestos contractor should be sought. This may require specialist training, specialist protective equipment, licences and notifications to the regulators.

8.2.2 Clean Cover

In areas of soft landscaping across the site and in the private garden (Block D), clean imported soils should be used. The soils should be clean and not exceed the criteria set out in Appendix G. A thickness of at least 600 mm is recommended in general accordance with BRE 465.

Testing of clean cover materials in landscaped areas will be undertaken on the basis of approximately 1 No. sample location (hand dug pit) per 500 m³ of placed material. At least one pit will be dug in the garden of Block D with a sample being tested. Samples will be taken from the hand dug pit and tested to confirm the soil quality to comply with the screening criteria used in Appendix G. Materials which fail will be excavated and removed from site and replaced with new clean fill materials. These replaced areas will then be subject to the same validation process as above.

The quantities, thicknesses and locations where clean cover is used will be recorded and presented in a verification report at the end of the redevelopment project. Verification of clean cover thickness will be undertaken by the excavation of confirmatory, hand-dug pits. Photographs with depth measurements will be taken and soils samples taken for testing to confirm the thickness and quality of the cover as shown in Plate 2 below.

Plate 2 **Clean Cover Verification Hand-Dug Pit**



8.2.3 Ground Gas

Based on a CS2 classification, under BS8485:2015, all the buildings at the site can be considered as Type A or B. These have a gas protection score of 3.5 points. Such a score may be provided by a combination of structural barriers such as ground-bearing cast in-situ monolithic slabs, suspended slabs, sub-floor venting layers, gas protection membranes, open ventilated basements, etc. This is risk mitigation/remediation by pathway removal.

It should be noted that removal of much of the Made Ground (likely source of ground gas) during the development would go some way to improving the ground gas regime at the site. This should be discussed with the regulator. This may allow the site to be reconsidered as CS1 where no specific gas protection would be necessary.

The detailed design will have to be agreed with the local planning authority building control department and all gas protection measures will be verified in accordance with CIRIA C735. The responsibility for the design and agreement of any gas protection measures will be with the principal contractor and/or the principal designer.

It may become evident following further investigation and analysis that additional CoCs come to light that are not present in the current list which may require screening criteria to be applied. If this becomes the case additional criteria shall be selected/derived and submitted to the regulators for comment and agreement.

The screening criteria for human health assessment are presented below in Table G1 (RWOHP) with the screening criteria for controlled waters presented in Table G2.

Table G1 Human Health Generic Screening Criteria at 1% SOM for RWOHP

Determinand	Units	Screening Value (RWOHP @1% SOM)	Source of Screen
Asbestos in Soil	Type	Present	
pH	pH Units	<5 or >10	
Total Cyanide	mg/kg	1600	USEPA Region 9
Total Phenols (monohydric)	mg/kg	750	S4UL
Naphthalene	mg/kg	2.3	S4UL
Acenaphthylene	mg/kg	86.1	S4UL
Acenaphthene	mg/kg	57	S4UL
Fluorene	mg/kg	30.9	S4UL
Phenanthrene	mg/kg	36	S4UL
Anthracene	mg/kg	1.17	S4UL
Fluoranthene	mg/kg	1500	S4UL
Pyrene	mg/kg	3700	S4UL
Benzo(a)anthracene	mg/kg	11	S4UL
Chrysene	mg/kg	30	S4UL
Benzo(b)fluoranthene	mg/kg	3.9	S4UL
Benzo(k)fluoranthene	mg/kg	110	S4UL
Benzo(a)pyrene	mg/kg	3.2	S4UL
Indeno(1,2,3cd)pyrene	mg/kg	45	S4UL
Dibenz(a,h)anthracene	mg/kg	0.31	S4UL
Benzo(ghi)perylene	mg/kg	360	S4UL
Arsenic	mg/kg	40	S4UL
Cadmium	mg/kg	85	S4UL
Chromium (hexavalent)	mg/kg	6	S4UL
Chromium	mg/kg	910	S4UL
Copper	mg/kg	7100	S4UL
Lead	mg/kg	310	C4SL
Mercury	mg/kg	56	S4UL
Nickel	mg/kg	180	S4UL
Silver	mg/kg	390	USEPA Region 9
Selenium	mg/kg	430	S4UL
Vanadium	mg/kg	1200	S4UL
Zinc	mg/kg	40000	S4UL
Benzene	µg/kg	380	S4UL
Toluene	µg/kg	869000	S4UL
Ethylbenzene	µg/kg	83000	S4UL
p & m-xylene	µg/kg	79000	S4UL
o-xylene	µg/kg	88000	S4UL
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	49000	EIC/AGS/CL:AIRE
TPH4 (C10 - C20)	mg/kg	4022	S4UL
TPH4 (C20 - C30)	mg/kg	1908	S4UL
TPH4 (C30 - C40)	mg/kg	1917	S4UL
TPHCWG Aliphatic >EC5 EC6	mg/kg	42	S4UL
TPHCWG Aliphatic >EC6 EC8	mg/kg	100	S4UL
TPHCWG Aliphatic >EC8 EC10	mg/kg	27	S4UL
TPHCWG Aliphatic >EC10 EC12	mg/kg	130	S4UL
TPHCWG Aliphatic >EC12 EC16	mg/kg	1100	S4UL
TPHCWG Aliphatic >EC16 EC21	mg/kg	65000	S4UL
TPHCWG Aliphatic >EC21 EC35	mg/kg	65000	S4UL
TPHCWG Aromatic >EC5 EC7	mg/kg	370	S4UL
TPHCWG Aromatic >EC7 EC8	mg/kg	860	S4UL
TPHCWG Aromatic >EC8 EC10	mg/kg	47	S4UL
TPHCWG Aromatic >EC10 EC12	mg/kg	250	S4UL
TPHCWG Aromatic >EC12 EC16	mg/kg	1800	S4UL
TPHCWG Aromatic >EC16 EC21	mg/kg	1900	S4UL
TPHCWG Aromatic >EC21 EC35	mg/kg	1900	S4UL

APPENDIX B

CHEMICAL TESTING OF VALIDATION SAMPLES

Mike Forrester

Discovery CE
The Granary
Broadwell House Farm
Broadwell
Rugby
Warwickshire
CV23 8HF

t: 01926 813909

e: m.forrester@dce-services.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
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Analytical Report Number : 21-72927

Project / Site name:	Horton Road	Samples received on:	05/05/2021
Your job number:	21028J	Samples instructed on/ Analysis started on:	05/05/2021
Your order number:		Analysis completed by:	11/05/2021
Report Issue Number:	1	Report issued on:	11/05/2021
Samples Analysed:	4 soil samples		



Signed:

Rachel Bradley
Deputy Quality Manager
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: 21-72927
Project / Site name: Horton Road

Lab Sample Number				1859870	1859871	1859872	1859873
Sample Reference				VP103	VP104	VP106	VP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.30	0.40	0.10
Date Sampled				04/05/2021	04/05/2021	04/05/2021	04/05/2021
Time Taken				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
Moisture Content	%	0.01	NONE	15	24	15	25
Total mass of sample received	kg	0.001	NONE	0.50	0.40	0.50	0.40

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	7.8	8.3	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.1	6.0	0.9	6.9

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.74	0.62	0.55	0.63
Anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.3	1.5	1.6	1.4
Pyrene	mg/kg	0.05	MCERTS	2.2	1.4	1.5	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.9	0.81	0.94	0.80
Chrysene	mg/kg	0.05	MCERTS	1.8	0.85	0.82	0.71
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.7	1.1	1.2	1.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.94	0.47	0.46	0.41
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.1	0.92	1.0	0.88
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	0.58	0.63	0.58
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.43	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	0.72	0.64	0.58

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	17.8	8.89	9.35	8.38
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Analytical Report Number: 21-72927
Project / Site name: Horton Road

Lab Sample Number	1859870	1859871	1859872	1859873
Sample Reference	VP103	VP104	VP106	VP107
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.30	0.40	0.10
Date Sampled	04/05/2021	04/05/2021	04/05/2021	04/05/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	14	11	13
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	1.8	0.8	4.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.5	0.5	0.6
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	20	15	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	99	39	110	140
Lead (aqua regia extractable)	mg/kg	1	MCERTS	68	200	55	170
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	14	12	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.1
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	26	25	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	180	130	180

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.6	< 1.0	3.3
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	5.6	< 2.0	6.4
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	25	< 8.0	22
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	38	< 10	36

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	14	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	32	26	57	38
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	41	30	71	46

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-72927
Project / Site name: Horton Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1859870	VP103	0.50	127	Loose Fibres	Chrysotile	< 0.001	< 0.001

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



Analytical Report Number : 21-72927

Project / Site name: Horton Road

* 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 *
1859870	VP103	None Supplied	0.5	Brown sandy clay with gravel.
1859871	VP104	None Supplied	0.3	Brown loam and clay with gravel and vegetation.
1859872	VP106	None Supplied	0.4	Brown sandy clay with gravel.
1859873	VP107	None Supplied	0.1	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-72927

Project / Site name: Horton Road

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
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 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
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 and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE



Analytical Report Number : 21-72927
Project / Site name: Horton Road

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.

APPENDIX C

CHEMICAL TESTING OF CLEAN PLACED SOILS



Final Report

Report No.:	20-34138-1		
Initial Date of Issue:	24-Dec-2020		
Client	Springbridge Direct Ltd		
Client Address:	Oxford Road Denham Middlesex UB9 4DF		
Contact(s):	Katie East Tom Hawkins		
Project	Springbridge Yard		
Quotation No.:	Q20-21261	Date Received:	11-Dec-2020
Order No.:	105715	Date Instructed:	11-Dec-2020
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	24-Dec-2020
Date Approved:	24-Dec-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34138
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112427
	Client Sample ID.:				TOPSOIL
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	13
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	None
Soil Texture	N	2040		N/A	Sandy Loam
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.3
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	12
Cadmium	M	2450	mg/kg	0.10	0.20
Chromium	M	2450	mg/kg	1.0	12
Copper	M	2450	mg/kg	0.50	13
Mercury	M	2450	mg/kg	0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	11
Lead	M	2450	mg/kg	0.50	19
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	46
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	N	2700	mg/kg	0.010	< 0.010

Results - Soil

Project: Springbridge Yard

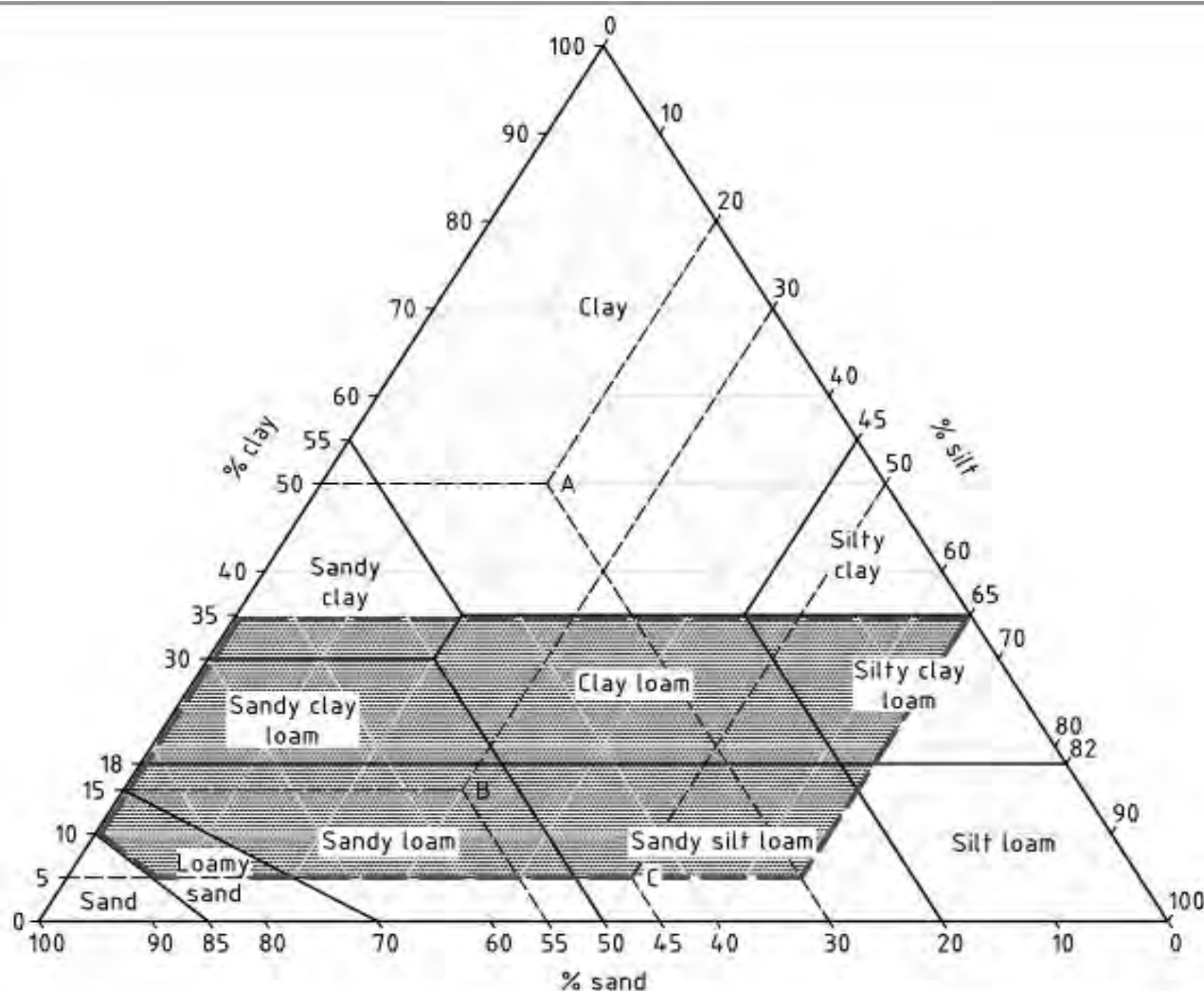
Client: Springbridge Direct Ltd	Chemtest Job No.:		20-34138		
Quotation No.: Q20-21261	Chemtest Sample ID.:		1112427		
	Client Sample ID.:		TOPSOIL		
	Sample Type:		SOIL		
	Date Sampled:		08-Dec-2020		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Acenaphthylene	N	2700	mg/kg	0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	< 0.010
Fluorene	N	2700	mg/kg	0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	1.0
Anthracene	N	2700	mg/kg	0.010	0.12
Fluoranthene	N	2700	mg/kg	0.010	0.26
Pyrene	N	2700	mg/kg	0.010	0.37
Benzo[a]anthracene	N	2700	mg/kg	0.010	0.89
Chrysene	N	2700	mg/kg	0.010	0.42
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	3.1
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.30	< 0.30

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 20-34138
 Chemtest Sample ID.: 1112427
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: TOPSOIL
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 08-Dec-2020
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content	%		5.0				
Silt content	%		10				
Sand content	%		85				
Soil texture class		See Attached Chart	Sandy Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	5.8	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	18	YES			
>20mm		0-10	< 0.020	YES			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	8.4	YES	NO	YES	YES
Carbonate (Calcareous only)	%		1.0				YES
Electrical Conductivity	µS/cm	If >3300 do ESP	2900	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.16	YES	YES		YES
Extractable phosphorus	mg/l	16-140	57	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	1500	YES	YES		YES
Extractable magnesium	mg/l	51-600	310	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	18/1	YES	N/A	N/A	N/A
Exchangeable sodium	%	<15	7.4				
Available Calcium	mg/l		2700				
Available Sodium	mg/l		360				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0			
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	34	YES	
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	12	YES	
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	9.5	YES	
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Texture Classification Chart**Key**

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

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

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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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



Final Report

Report No.:	20-34139-1	
Initial Date of Issue:	24-Dec-2020	
Client	Springbridge Direct Ltd	
Client Address:	Oxford Road Denham Middlesex UB9 4DF	
Contact(s):	Katie East Tom Hawkins	
Project	Springbridge Yard	
Quotation No.:	Q20-21261	Date Received: 11-Dec-2020
Order No.:	105715	Date Instructed: 11-Dec-2020
No. of Samples:	1	
Turnaround (Wkdays):	10	Results Due: 24-Dec-2020
Date Approved:	24-Dec-2020	
Approved By:		
Details:	Glynn Harvey, Technical Manager	

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	9.3
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	None
Soil Texture	N	2040		N/A	Sandy Loam
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	23
Cadmium	M	2450	mg/kg	0.10	< 0.10
Chromium	M	2450	mg/kg	1.0	28
Copper	M	2450	mg/kg	0.50	7.0

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Mercury	M	2450	mg/kg	0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	18
Lead	M	2450	mg/kg	0.50	26
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	36
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	N	2700	mg/kg	0.010	< 0.010
Acenaphthylene	N	2700	mg/kg	0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	< 0.010

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Fluorene	N	2700	mg/kg	0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	< 0.010
Anthracene	N	2700	mg/kg	0.010	< 0.010
Fluoranthene	N	2700	mg/kg	0.010	0.38
Pyrene	N	2700	mg/kg	0.010	0.42
Benzo[a]anthracene	N	2700	mg/kg	0.010	0.18
Chrysene	N	2700	mg/kg	0.010	0.25
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	1.2

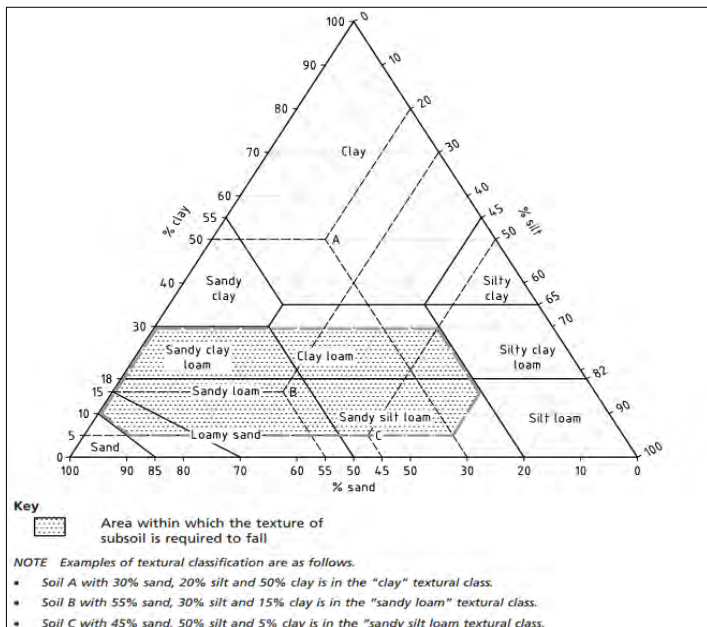
Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.30	< 0.30

Chemtest Job No.: 20-34139
 Chemtest Sample ID.: 1112428
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: Subsoil
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 08-Dec-2020
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)	
Texture					Acid	Calc.
Clay content	%		6.0			
Silt content	%		11.0			
Sand content	%		83			
Soil texture class		See Attached Chart	Sandy Loam	YES		
Mass Loss on Ignition						
	%	<2	1.2	YES		
Stone Content	% m/m					
>2mm		0-40	22	YES		
>20mm		0-20	< 0.020	YES		
>50mm		0	< 0.020	YES		
Soil pH value		5.5-8.5	8.5	YES	NO	YES
Carbonate (Calcareous only)	%		< 0.10			NO
Electrical Conductivity	µS/cm	If >2800 do ESP	2200	YES		
Exchangeable sodium	%	<15	1.9	YES		
Available Calcium	mg/l		1600			
Available Sodium	mg/l		38			
Phytotoxic Contaminants (by soil pH)		< 6.0 6.0-7.0 > 7.0				
Zinc (Nitric Acid extract)	mg/kg	<200 <200 <300	21	YES		
Copper (Nitric Acid extract)	mg/kg	<100 <135 <200	< 5.0	YES		
Nickel (Nitric Acid extract)	mg/kg	<60 <75 <110	11	YES		
Visible Contaminants	%mm					
>2mm		<0.5	0.000	YES		
..... of which plastics		<0.25	0.000	YES		
..... man-made sharps		zero in 1kg	0.000	YES		

Texture Classification Chart

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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16– C21, >C21–C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
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N	Unaccredited
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>	"greater than"

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

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

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

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



Final Report

Report No.: 21-13793-1
Initial Date of Issue: 05-May-2021
Client Discovery CE Ltd
Client Address: The Granary
Broadwell House Farm
Broadwell
Rugby
Warwickshire
CV23 8HF

Contact(s): Mike Forrester

Project 21028J Horton Road

Quotation No.: **Date Received:** 28-Apr-2021

Order No.: 21028J **Date Instructed:** 28-Apr-2021

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 05-May-2021

Date Approved: 05-May-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 21028J Horton Road

Client: Discovery CE Ltd	Chemtest Job No.:				21-13793	21-13793
Quotation No.:	Chemtest Sample ID.:				1188464	1188465
	Sample Location:				VP101	VP102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.10
	Date Sampled:				23-Apr-2021	23-Apr-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	25	10
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Sand	Sand
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	16	15
Cadmium	M	2450	mg/kg	0.10	0.39	0.32
Chromium	M	2450	mg/kg	1.0	24	25
Copper	M	2450	mg/kg	0.50	50	27
Mercury	M	2450	mg/kg	0.10	0.24	0.19
Nickel	M	2450	mg/kg	0.50	16	21
Lead	M	2450	mg/kg	0.50	170	74
Selenium	M	2450	mg/kg	0.20	0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	28	27
Zinc	M	2450	mg/kg	0.50	140	80
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	3.8	0.69
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	110	45
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	110	45
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	35	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	550	220

Results - Soil

Project: 21028J Horton Road

Client: Discovery CE Ltd	Chemtest Job No.:				21-13793	21-13793
Quotation No.:	Chemtest Sample ID.:				1188464	1188465
	Sample Location:				VP101	VP102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.10
	Date Sampled:				23-Apr-2021	23-Apr-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	45	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	630	220
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	740	270
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	0.84
Anthracene	M	2700	mg/kg	0.10	< 0.10	0.28
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	2.8
Pyrene	M	2700	mg/kg	0.10	< 0.10	2.0
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	1.2
Chrysene	M	2700	mg/kg	0.10	< 0.10	1.3
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	8.4
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	0.33

Test Methods

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

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com

Standard Geotextiles

DESCRIPTION:

Nonwoven geotextile manufactured from UV stabilised, high tenacity, virgin polypropylene fibres that have been both mechanically and thermally bonded to provide a highly permeable yet durable separation and filtration layer.

APPLICATIONS:

With 50 years of unrivalled expertise and experience Terram standard geotextiles are the original nonwoven geotextiles for separation and filtration applications.

Typical uses include the prevention of intermixing of sub-base and subgrade layers, drainage and bedding materials. Terram filters/separators are used extensively in the construction of:

- Paved and unpaved roads
- Railways
- Car parks and hardstandings
- Cycleways and footpaths
- Sustainable Drainage Systems (SuDS)

FEATURES & BENEFITS:

- Manufactured from inert high tenacity virgin polypropylene fibres giving excellent long term durability in all soil types.
- High static and dynamic puncture resistance ensures a low risk of damage during construction.
- Random orientated web with isotropic properties provide the same strength, permeability and filtration in all directions.
- High elongation at break maintains separation and filtration function under load particularly in soft and variable ground conditions.

**APPROVAL:**

Network Rail PADS certificate numbers; T1000 057/100703, T2000 57/100705 and T3000 57/100706 (4.5m wide x 100m long rolls).



			Mean Value									
MECHANICAL PROPERTIES	Test Method	Unit	T700	T900	T1000	T1000 Orange	T1300	T1500	T2000	T3000	T4000	T4500
Tensile Strength	EN ISO 10319	kN/m	6	7.5	8	8	10	12.5	14.5	18	22	30
Tensile Elongation	EN ISO 10319	%	60	60	60	60	60	60	60	60	60	60
CBR Puncture Resistance	EN ISO 12236	N	1050	1350	1500	1500	2000	2250	2750	3250	4300	5350
Cone Drop	EN ISO 13433	mm	42	40	38	38	34	32	26	24	22	14
HYDRAULIC PROPERTIES												
Pore Size - Mean AOS	EN ISO 12956	µm	95	95	90	90	65	65	65	60	60	60
Permeability—(H50)	EN ISO 11058	l/m ² s	100	95	90	90	65	65	55	50	30	30
DURABILITY PROPERTIES												
Weathering (UV Exposure)	EN 12224	Days	30	30	30	30	30	30	30	30	30	30
Combined ageing (Oxidation, temperature & moisture)	EN ISO 13438	Service Life (Years)	50	50	100	100	100	100	100	100	100	100
PHYSICAL PROPERTIES												
Thickness @ 2kPa (Nominal)	EN ISO 9863-1	mm	0.9	1.0	1.1	1.1	1.4	1.6	1.7	1.8	2.0	2.4
MATERIAL DIMENSIONS												
Standard Roll Length		m	150	150	100	100	100	100	100	100	50	50
Standard Roll Width		m	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Maximum Roll Width		m	6	6	6	6	6	6	6	6	6	6
Gross Roll Weight (Nominal)		kg	65	85	60	60	75	85	100	120	80	95

PACKAGING & IDENTIFICATION

Terram Standard Geotextiles are supplied on cardboard cores and wrapped in Polyethylene sheeting with identification labels in accordance with ISO 10320.

STORAGE

The rolls of geotextile shall be stored on stable/ level ground and stacked not more than five rolls high and no other materials shall be stacked on top. The rolls can be stored outdoors when packaged, but should be protected from exposure to UV. All materials should be stored in accordance with good health and safety practice and in accordance with local laws. For additional information please refer to Terram Geotextiles MSDS.

QUALITY

Terram Standard Geotextiles are supplied having met internal quality requirements in accordance with our Quality Management system which is certified to BS EN ISO 9001:2015.

NOTES

Reported values are arithmetic mean values unless otherwise stated. For further details on physical parameters please refer to the individual Declaration of Performance certificates available for download from www.terram.com

Reported values related to durability testing are generally based on the lowest grade product within a family.

A Nominal value indicates that the value is not part of the performance specification and is provided for guidance only.

Gross roll weight is based on 4.5m wide rolls at standard length; information provided is for lifting guidance only and does not for part of quality control.

ADDITIONAL INFORMATION

Refer to the Terram Jointing Methods (downloadable from www.terram.com) for when simple overlaps are required for subsequent and adjacent roll lengths. However, pegging, sewing, stapling or gluing can also be used depending upon the application, the sub-grade conditions, the loading, the convenience and the cost.

These figures relate to standard product weights and roll sizes. Other weights, sizes and colours may be available on request. For further information please contact Terram Technical Support.

As part of its continued improvement process Terram® Ltd reserve the right to change the properties listed on this data sheet without prior notice.

Terram® is a trademark of Berry Global, Inc. or one of its affiliates.

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP108
Project Number : 21028J	Inspection Dates : 10/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP108: 0 – 0.29 m: Dark brown slightly gravelly clayey fine and medium SAND with frequent root and rootlet fragments.
Gravel is subrounded fine and medium of quartzite.
0.29 – 0.64 m: Yellowish brown slightly clayey fine and medium SAND.

Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

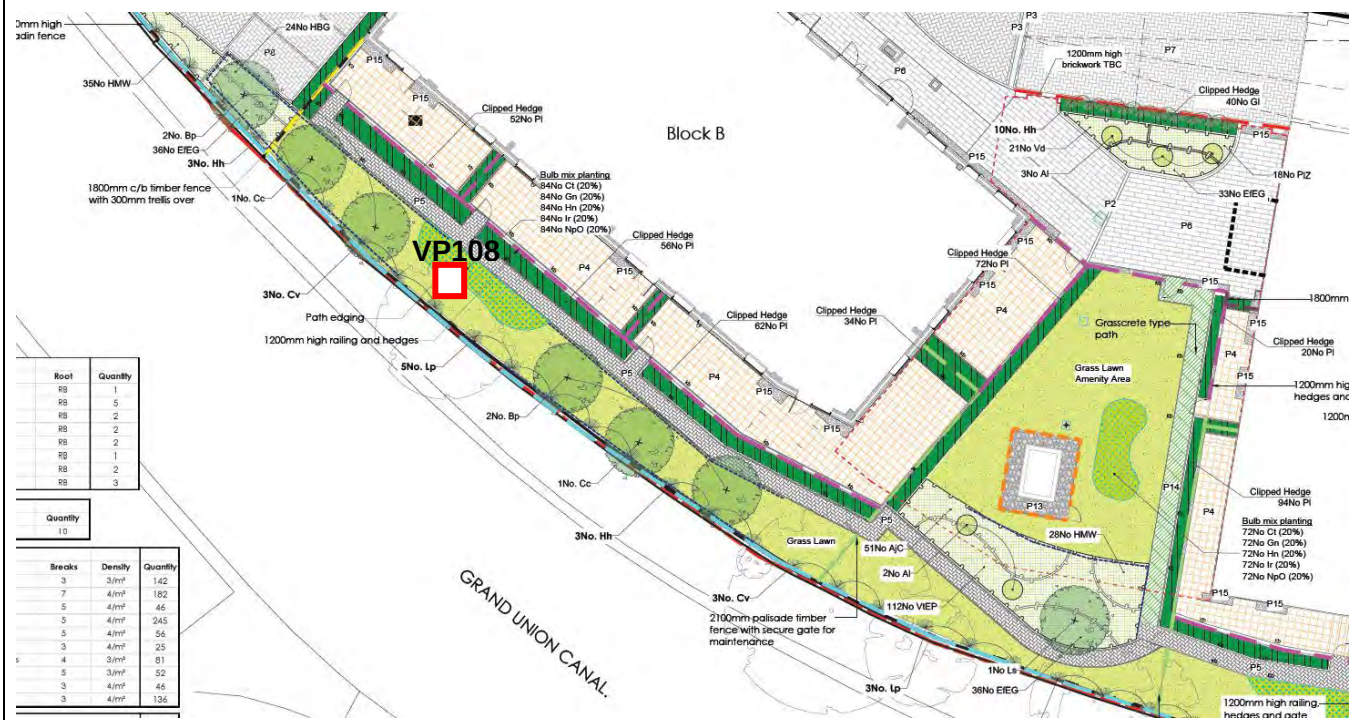
No samples were taken from the verification pit due to the proximity of VP104

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP108	640	YES

Clean Cover Verification Location:



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP108
Project Number : 21028J	Inspection Dates : 10/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP108 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP108
Project Number : 21028J	Inspection Dates : 10/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP108 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

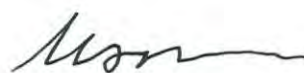
Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be greater than the minimum required.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date



MIKE FORRESTER
11/05/2021



CATHAL GILLESPIE
11/05/2021

CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP109
Project Number : 21028J	Inspection Dates : 10/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP109: 0 – 0.17 m: Dark brown slightly clayey fine and medium SAND with frequent root and rootlet fragments.
0.17 – 0.75 m: Brownish yellow slightly clayey fine and medium SAND.

Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

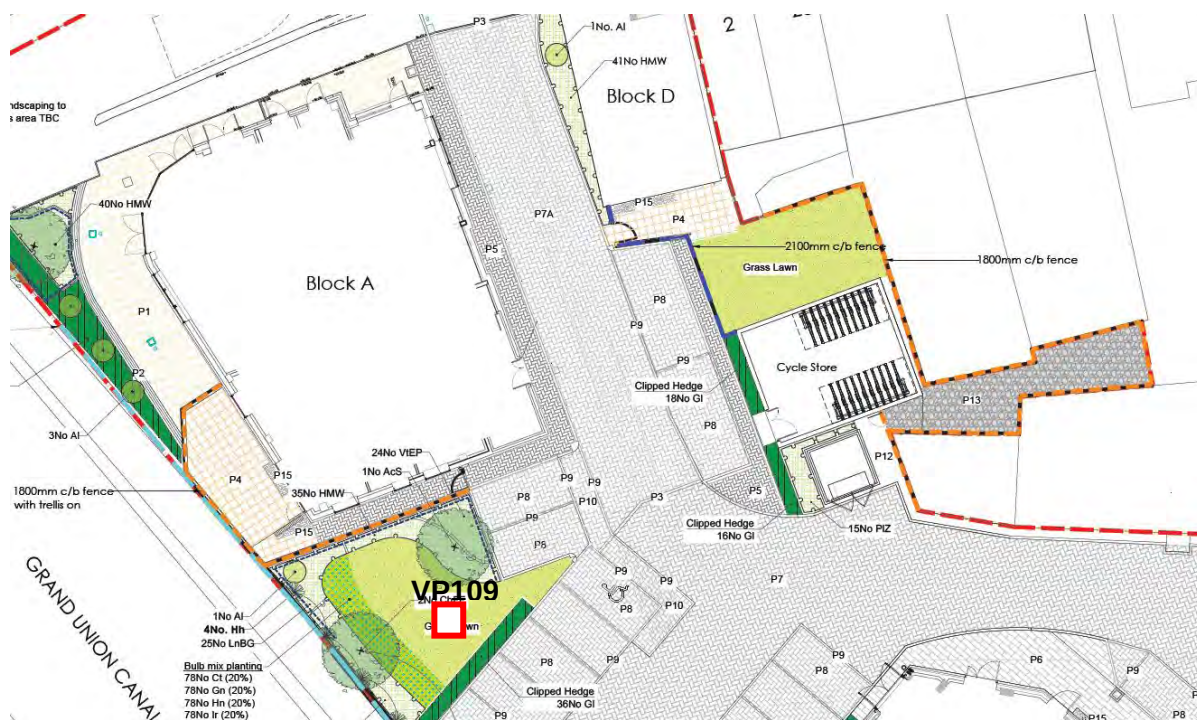
No samples were taken from the verification pit due to the proximity of VP107

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP109	750	YES

Clean Cover Verification Location:



Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP109
Project Number : 21028J	Inspection Dates : 10/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP109 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP109
Project Number : 21028J	Inspection Dates : 10/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP109 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

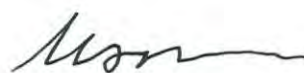
Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be greater than the minimum required.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date



MIKE FORRESTER
11/05/2021



CATHAL GILLESPIE
11/05/2021

APPENDIX A
CLEAN COVER REQUIREMENTS

As a minimum ANY staff working with soils with low concentrations of asbestos will need to work in conditions including dust control and be provided with appropriate training and PPE/RPE (e.g., FFP3 masks and Cat3 Type 5/6 overalls). The details of the controls should be provided by the contractor and agreed prior to any excavations starting.

If there is any doubt over the nature of the material or best way to proceed, or quantification indicates that asbestos concentrations are greater than the hazardous waste criteria, the advice of a specialist asbestos contractor should be sought. This may require specialist training, specialist protective equipment, licences and notifications to the regulators.

8.2.2 Clean Cover

In areas of soft landscaping across the site and in the private garden (Block D), clean imported soils should be used. The soils should be clean and not exceed the criteria set out in Appendix G. A thickness of at least 600 mm is recommended in general accordance with BRE 465.

Testing of clean cover materials in landscaped areas will be undertaken on the basis of approximately 1 No. sample location (hand dug pit) per 500 m³ of placed material. At least one pit will be dug in the garden of Block D with a sample being tested. Samples will be taken from the hand dug pit and tested to confirm the soil quality to comply with the screening criteria used in Appendix G. Materials which fail will be excavated and removed from site and replaced with new clean fill materials. These replaced areas will then be subject to the same validation process as above.

The quantities, thicknesses and locations where clean cover is used will be recorded and presented in a verification report at the end of the redevelopment project. Verification of clean cover thickness will be undertaken by the excavation of confirmatory, hand-dug pits. Photographs with depth measurements will be taken and soils samples taken for testing to confirm the thickness and quality of the cover as shown in Plate 2 below.

Plate 2 **Clean Cover Verification Hand-Dug Pit**



8.2.3 Ground Gas

Based on a CS2 classification, under BS8485:2015, all the buildings at the site can be considered as Type A or B. These have a gas protection score of 3.5 points. Such a score may be provided by a combination of structural barriers such as ground-bearing cast in-situ monolithic slabs, suspended slabs, sub-floor venting layers, gas protection membranes, open ventilated basements, etc. This is risk mitigation/remediation by pathway removal.

It should be noted that removal of much of the Made Ground (likely source of ground gas) during the development would go some way to improving the ground gas regime at the site. This should be discussed with the regulator. This may allow the site to be reconsidered as CS1 where no specific gas protection would be necessary.

The detailed design will have to be agreed with the local planning authority building control department and all gas protection measures will be verified in accordance with CIRIA C735. The responsibility for the design and agreement of any gas protection measures will be with the principal contractor and/or the principal designer.

It may become evident following further investigation and analysis that additional CoCs come to light that are not present in the current list which may require screening criteria to be applied. If this becomes the case additional criteria shall be selected/derived and submitted to the regulators for comment and agreement.

The screening criteria for human health assessment are presented below in Table G1 (RWOHP) with the screening criteria for controlled waters presented in Table G2.

Table G1 Human Health Generic Screening Criteria at 1% SOM for RWOHP

Determinand	Units	Screening Value (RWOHP @1% SOM)	Source of Screen
Asbestos in Soil	Type	Present	
pH	pH Units	<5 or >10	
Total Cyanide	mg/kg	1600	USEPA Region 9
Total Phenols (monohydric)	mg/kg	750	S4UL
Naphthalene	mg/kg	2.3	S4UL
Acenaphthylene	mg/kg	86.1	S4UL
Acenaphthene	mg/kg	57	S4UL
Fluorene	mg/kg	30.9	S4UL
Phenanthrene	mg/kg	36	S4UL
Anthracene	mg/kg	1.17	S4UL
Fluoranthene	mg/kg	1500	S4UL
Pyrene	mg/kg	3700	S4UL
Benzo(a)anthracene	mg/kg	11	S4UL
Chrysene	mg/kg	30	S4UL
Benzo(b)fluoranthene	mg/kg	3.9	S4UL
Benzo(k)fluoranthene	mg/kg	110	S4UL
Benzo(a)pyrene	mg/kg	3.2	S4UL
Indeno(1,2,3cd)pyrene	mg/kg	45	S4UL
Dibenz(a,h)anthracene	mg/kg	0.31	S4UL
Benzo(ghi)perylene	mg/kg	360	S4UL
Arsenic	mg/kg	40	S4UL
Cadmium	mg/kg	85	S4UL
Chromium (hexavalent)	mg/kg	6	S4UL
Chromium	mg/kg	910	S4UL
Copper	mg/kg	7100	S4UL
Lead	mg/kg	310	C4SL
Mercury	mg/kg	56	S4UL
Nickel	mg/kg	180	S4UL
Silver	mg/kg	390	USEPA Region 9
Selenium	mg/kg	430	S4UL
Vanadium	mg/kg	1200	S4UL
Zinc	mg/kg	40000	S4UL
Benzene	µg/kg	380	S4UL
Toluene	µg/kg	869000	S4UL
Ethylbenzene	µg/kg	83000	S4UL
p & m-xylene	µg/kg	79000	S4UL
o-xylene	µg/kg	88000	S4UL
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	49000	EIC/AGS/CL:AIRE
TPH4 (C10 - C20)	mg/kg	4022	S4UL
TPH4 (C20 - C30)	mg/kg	1908	S4UL
TPH4 (C30 - C40)	mg/kg	1917	S4UL
TPHCWG Aliphatic >EC5 EC6	mg/kg	42	S4UL
TPHCWG Aliphatic >EC6 EC8	mg/kg	100	S4UL
TPHCWG Aliphatic >EC8 EC10	mg/kg	27	S4UL
TPHCWG Aliphatic >EC10 EC12	mg/kg	130	S4UL
TPHCWG Aliphatic >EC12 EC16	mg/kg	1100	S4UL
TPHCWG Aliphatic >EC16 EC21	mg/kg	65000	S4UL
TPHCWG Aliphatic >EC21 EC35	mg/kg	65000	S4UL
TPHCWG Aromatic >EC5 EC7	mg/kg	370	S4UL
TPHCWG Aromatic >EC7 EC8	mg/kg	860	S4UL
TPHCWG Aromatic >EC8 EC10	mg/kg	47	S4UL
TPHCWG Aromatic >EC10 EC12	mg/kg	250	S4UL
TPHCWG Aromatic >EC12 EC16	mg/kg	1800	S4UL
TPHCWG Aromatic >EC16 EC21	mg/kg	1900	S4UL
TPHCWG Aromatic >EC21 EC35	mg/kg	1900	S4UL

APPENDIX B

CHEMICAL TESTING OF VALIDATION SAMPLES

APPENDIX C

CHEMICAL TESTING OF CLEAN PLACED SOILS



Final Report

Report No.: 20-34138-1

Initial Date of Issue: 24-Dec-2020

Client Springbridge Direct Ltd

Client Address: Oxford Road
Denham
Middlesex
UB9 4DF

Contact(s): Katie East
Tom Hawkins

Project Springbridge Yard

Quotation No.: Q20-21261 **Date Received:** 11-Dec-2020

Order No.: 105715 **Date Instructed:** 11-Dec-2020

No. of Samples: 1

Turnaround (Wkdays): 10 **Results Due:** 24-Dec-2020

Date Approved: 24-Dec-2020

Approved By:


Details: Glynn Harvey, Technical Manager

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34138
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112427
	Client Sample ID.:				TOPSOIL
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	13
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	None
Soil Texture	N	2040		N/A	Sandy Loam
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.3
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	12
Cadmium	M	2450	mg/kg	0.10	0.20
Chromium	M	2450	mg/kg	1.0	12
Copper	M	2450	mg/kg	0.50	13
Mercury	M	2450	mg/kg	0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	11
Lead	M	2450	mg/kg	0.50	19
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	46
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	N	2700	mg/kg	0.010	< 0.010

Results - Soil

Project: Springbridge Yard

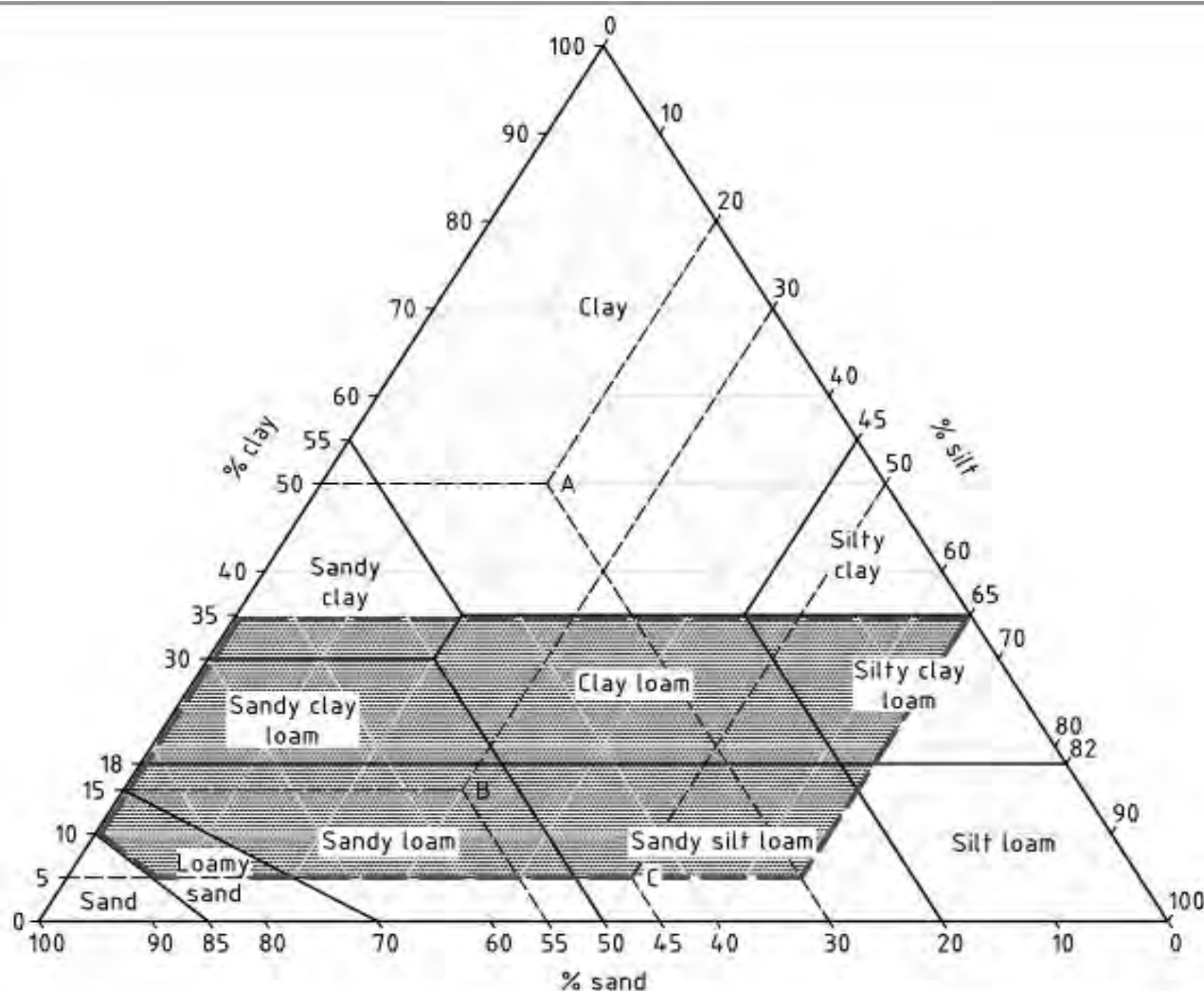
Client: Springbridge Direct Ltd	Chemtest Job No.:		20-34138		
Quotation No.: Q20-21261	Chemtest Sample ID.:		1112427		
	Client Sample ID.:		TOPSOIL		
	Sample Type:		SOIL		
	Date Sampled:		08-Dec-2020		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Acenaphthylene	N	2700	mg/kg	0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	< 0.010
Fluorene	N	2700	mg/kg	0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	1.0
Anthracene	N	2700	mg/kg	0.010	0.12
Fluoranthene	N	2700	mg/kg	0.010	0.26
Pyrene	N	2700	mg/kg	0.010	0.37
Benzo[a]anthracene	N	2700	mg/kg	0.010	0.89
Chrysene	N	2700	mg/kg	0.010	0.42
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	3.1
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.30	< 0.30

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 20-34138
 Chemtest Sample ID.: 1112427
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: TOPSOIL
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 08-Dec-2020
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content	%		5.0				
Silt content	%		10				
Sand content	%		85				
Soil texture class		See Attached Chart	Sandy Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	5.8	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	18	YES			
>20mm		0-10	< 0.020	YES			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	8.4	YES	NO	YES	YES
Carbonate (Calcareous only)	%		1.0				YES
Electrical Conductivity	µS/cm	If >3300 do ESP	2900	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.16	YES	YES		YES
Extractable phosphorus	mg/l	16-140	57	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	1500	YES	YES		YES
Extractable magnesium	mg/l	51-600	310	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	18/1	YES	N/A	N/A	N/A
Exchangeable sodium	%	<15	7.4				
Available Calcium	mg/l		2700				
Available Sodium	mg/l		360				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0			
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	34	YES	
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	12	YES	
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	9.5	YES	
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Texture Classification Chart**Key**

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

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

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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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



Final Report

Report No.:	20-34139-1		
Initial Date of Issue:	24-Dec-2020		
Client	Springbridge Direct Ltd		
Client Address:	Oxford Road□ Denham□ Middlesex□ UB9 4DF		
Contact(s):	Katie East□ Tom Hawkins		
Project	Springbridge Yard		
Quotation No.:	Q20-21261	Date Received:	11-Dec-2020
Order No.:	105715	Date Instructed:	11-Dec-2020
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	24-Dec-2020
Date Approved:	24-Dec-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager□		

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	9.3
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	None
Soil Texture	N	2040		N/A	Sandy Loam
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	23
Cadmium	M	2450	mg/kg	0.10	< 0.10
Chromium	M	2450	mg/kg	1.0	28
Copper	M	2450	mg/kg	0.50	7.0

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Mercury	M	2450	mg/kg	0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	18
Lead	M	2450	mg/kg	0.50	26
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	36
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	N	2700	mg/kg	0.010	< 0.010
Acenaphthylene	N	2700	mg/kg	0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	< 0.010

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Fluorene	N	2700	mg/kg	0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	< 0.010
Anthracene	N	2700	mg/kg	0.010	< 0.010
Fluoranthene	N	2700	mg/kg	0.010	0.38
Pyrene	N	2700	mg/kg	0.010	0.42
Benzo[a]anthracene	N	2700	mg/kg	0.010	0.18
Chrysene	N	2700	mg/kg	0.010	0.25
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	1.2

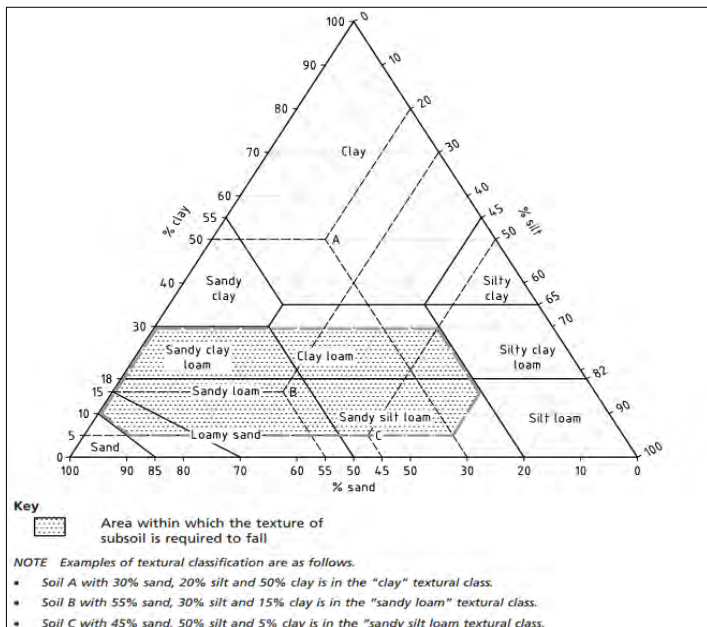
Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.30	< 0.30

Chemtest Job No.: 20-34139
 Chemtest Sample ID.: 1112428
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: Subsoil
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 08-Dec-2020
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)	
Texture					Acid	Calc.
Clay content	%		6.0			
Silt content	%		11.0			
Sand content	%		83			
Soil texture class		See Attached Chart	Sandy Loam	YES		
Mass Loss on Ignition						
	%	<2	1.2	YES		
Stone Content	% m/m					
>2mm		0-40	22	YES		
>20mm		0-20	< 0.020	YES		
>50mm		0	< 0.020	YES		
Soil pH value		5.5-8.5	8.5	YES	NO	YES
Carbonate (Calcareous only)	%		< 0.10			NO
Electrical Conductivity	µS/cm	If >2800 do ESP	2200	YES		
Exchangeable sodium	%	<15	1.9	YES		
Available Calcium	mg/l		1600			
Available Sodium	mg/l		38			
Phytotoxic Contaminants (by soil pH)		< 6.0 6.0-7.0 > 7.0				
Zinc (Nitric Acid extract)	mg/kg	<200 <200 <300	21	YES		
Copper (Nitric Acid extract)	mg/kg	<100 <135 <200	< 5.0	YES		
Nickel (Nitric Acid extract)	mg/kg	<60 <75 <110	11	YES		
Visible Contaminants	%mm					
>2mm		<0.5	0.000	YES		
..... of which plastics		<0.25	0.000	YES		
..... man-made sharps		zero in 1kg	0.000	YES		

Texture Classification Chart

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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2680	TPH A/A Split	Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21- C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16- C21, >C21-C35, >C35- C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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<	"less than"
>	"greater than"

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Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com



Final Report

Report No.: 21-13793-1
Initial Date of Issue: 05-May-2021
Client Discovery CE Ltd
Client Address: The Granary
Broadwell House Farm
Broadwell
Rugby
Warwickshire
CV23 8HF

Contact(s): Mike Forrester

Project 21028J Horton Road

Quotation No.: **Date Received:** 28-Apr-2021

Order No.: 21028J **Date Instructed:** 28-Apr-2021

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 05-May-2021

Date Approved: 05-May-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 21028J Horton Road

Client: Discovery CE Ltd	Chemtest Job No.:				21-13793	21-13793
Quotation No.:	Chemtest Sample ID.:				1188464	1188465
	Sample Location:				VP101	VP102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.10
	Date Sampled:				23-Apr-2021	23-Apr-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	25	10
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Sand	Sand
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	16	15
Cadmium	M	2450	mg/kg	0.10	0.39	0.32
Chromium	M	2450	mg/kg	1.0	24	25
Copper	M	2450	mg/kg	0.50	50	27
Mercury	M	2450	mg/kg	0.10	0.24	0.19
Nickel	M	2450	mg/kg	0.50	16	21
Lead	M	2450	mg/kg	0.50	170	74
Selenium	M	2450	mg/kg	0.20	0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	28	27
Zinc	M	2450	mg/kg	0.50	140	80
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	3.8	0.69
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	110	45
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	110	45
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	35	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	550	220

Results - Soil

Project: 21028J Horton Road

Client: Discovery CE Ltd	Chemtest Job No.:				21-13793	21-13793
Quotation No.:	Chemtest Sample ID.:				1188464	1188465
	Sample Location:				VP101	VP102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.10
	Date Sampled:				23-Apr-2021	23-Apr-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	45	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	630	220
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	740	270
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	0.84
Anthracene	M	2700	mg/kg	0.10	< 0.10	0.28
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	2.8
Pyrene	M	2700	mg/kg	0.10	< 0.10	2.0
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	1.2
Chrysene	M	2700	mg/kg	0.10	< 0.10	1.3
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	8.4
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	0.33

Test Methods

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

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com

Standard Geotextiles

DESCRIPTION:

Nonwoven geotextile manufactured from UV stabilised, high tenacity, virgin polypropylene fibres that have been both mechanically and thermally bonded to provide a highly permeable yet durable separation and filtration layer.

APPLICATIONS:

With 50 years of unrivalled expertise and experience Terram standard geotextiles are the original nonwoven geotextiles for separation and filtration applications.

Typical uses include the prevention of intermixing of sub-base and subgrade layers, drainage and bedding materials. Terram filters/separators are used extensively in the construction of:

- Paved and unpaved roads
- Railways
- Car parks and hardstandings
- Cycleways and footpaths
- Sustainable Drainage Systems (SuDS)

FEATURES & BENEFITS:

- Manufactured from inert high tenacity virgin polypropylene fibres giving excellent long term durability in all soil types.
- High static and dynamic puncture resistance ensures a low risk of damage during construction.
- Random orientated web with isotropic properties provide the same strength, permeability and filtration in all directions.
- High elongation at break maintains separation and filtration function under load particularly in soft and variable ground conditions.

**APPROVAL:**

Network Rail PADS certificate numbers; T1000 057/100703, T2000 57/100705 and T3000 57/100706 (4.5m wide x 100m long rolls).



			Mean Value									
MECHANICAL PROPERTIES	Test Method	Unit	T700	T900	T1000	T1000 Orange	T1300	T1500	T2000	T3000	T4000	T4500
Tensile Strength	EN ISO 10319	kN/m	6	7.5	8	8	10	12.5	14.5	18	22	30
Tensile Elongation	EN ISO 10319	%	60	60	60	60	60	60	60	60	60	60
CBR Puncture Resistance	EN ISO 12236	N	1050	1350	1500	1500	2000	2250	2750	3250	4300	5350
Cone Drop	EN ISO 13433	mm	42	40	38	38	34	32	26	24	22	14
HYDRAULIC PROPERTIES												
Pore Size - Mean AOS	EN ISO 12956	µm	95	95	90	90	65	65	65	60	60	60
Permeability—(H50)	EN ISO 11058	l/m ² s	100	95	90	90	65	65	55	50	30	30
DURABILITY PROPERTIES												
Weathering (UV Exposure)	EN 12224	Days	30	30	30	30	30	30	30	30	30	30
Combined ageing (Oxidation, temperature & moisture)	EN ISO 13438	Service Life (Years)	50	50	100	100	100	100	100	100	100	100
PHYSICAL PROPERTIES												
Thickness @ 2kPa (Nominal)	EN ISO 9863-1	mm	0.9	1.0	1.1	1.1	1.4	1.6	1.7	1.8	2.0	2.4
MATERIAL DIMENSIONS												
Standard Roll Length		m	150	150	100	100	100	100	100	100	50	50
Standard Roll Width		m	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Maximum Roll Width		m	6	6	6	6	6	6	6	6	6	6
Gross Roll Weight (Nominal)		kg	65	85	60	60	75	85	100	120	80	95

PACKAGING & IDENTIFICATION

Terram Standard Geotextiles are supplied on cardboard cores and wrapped in Polyethylene sheeting with identification labels in accordance with ISO 10320.

STORAGE

The rolls of geotextile shall be stored on stable/ level ground and stacked not more than five rolls high and no other materials shall be stacked on top. The rolls can be stored outdoors when packaged, but should be protected from exposure to UV. All materials should be stored in accordance with good health and safety practice and in accordance with local laws. For additional information please refer to Terram Geotextiles MSDS.

QUALITY

Terram Standard Geotextiles are supplied having met internal quality requirements in accordance with our Quality Management system which is certified to BS EN ISO 9001:2015.

NOTES

Reported values are arithmetic mean values unless otherwise stated. For further details on physical parameters please refer to the individual Declaration of Performance certificates available for download from www.terram.com

Reported values related to durability testing are generally based on the lowest grade product within a family.

A Nominal value indicates that the value is not part of the performance specification and is provided for guidance only.

Gross roll weight is based on 4.5m wide rolls at standard length; information provided is for lifting guidance only and does not for part of quality control.

ADDITIONAL INFORMATION

Refer to the Terram Jointing Methods (downloadable from www.terram.com) for when simple overlaps are required for subsequent and adjacent roll lengths. However, pegging, sewing, stapling or gluing can also be used depending upon the application, the sub-grade conditions, the loading, the convenience and the cost.

These figures relate to standard product weights and roll sizes. Other weights, sizes and colours may be available on request. For further information please contact Terram Technical Support.

As part of its continued improvement process Terram® Ltd reserve the right to change the properties listed on this data sheet without prior notice.

Terram® is a trademark of Berry Global, Inc. or one of its affiliates.

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP110
Project Number : 21028J	Inspection Dates : 17/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 1 of 3

Remediation Requirements:

The remediation strategy (RS) for the site is presented in Discovery CE Limited Report: "Additional Site Investigation, Assessment and Remediation Strategy", Ref: 16088J-03, Dated: November 2018, which has been approved by the Local Authority (Appendix A). The relevant clean cover requirements are stated within Section 8 of the RS (Appendix A) and are summarised below.

Zone reference:	– All soft landscaping.
Min clean cover thickness:	– 600 mm (including subsoil and Topsoil)+ geotextile.
Base liner:	– Geotextile indicator layer
Chemical Test limiting criteria and frequency:	– as attached (Appendix A) min frequency 1 test per 500 m ³ .

Cover Material Description (to BS5930):

VP110: 0 – 0.27 m: Dark brown very clayey fine and medium SAND with frequent root and rootlet fragments.
0.27 – 0.725 m: Brownish yellow slightly clayey fine and medium SAND.

Woven geotextile noted at base of inspection pit.

Associated Chemical Testing:

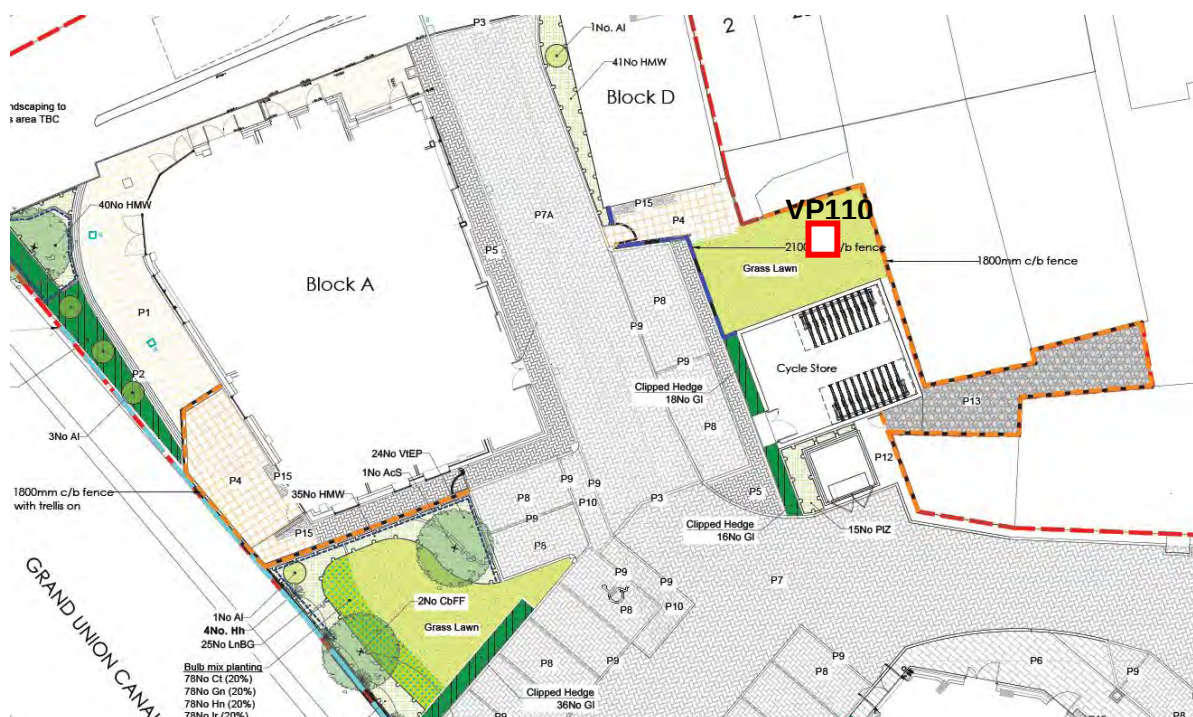
A soil sample was taken from the topsoil/sub-soil horizon at 0.40 m bgl and sent to the laboratory for the full suite of testing as specified within the remediation Strategy (RS). The results are provided in Appendix B. The chemical results were all less than the agreed criteria as set out in the RS.

Chemical test results of clean placed soils are presented in Appendix C.

Verification Dig Data:

Verification Location	Cover Thickness Dig (mm)	Compliant (Yes/ No)
VP110 (sample at 0.40 m bgl)	725	YES

Clean Cover Verification Location:



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP110
Project Number : 21028J	Inspection Dates : 17/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 2 of 3

Plate 1: VP110 – General View



CLEAN COVER VERIFICATION CERTIFICATE

Project : HORTON ROAD WEST DRAYTON		Client: PDR CONSTRUCTION		Plot Nos. : VP110
Project Number : 21028J	Inspection Dates : 17/05/2021	Eastings : See Clean Cover Verification Locations Section.	Northings :	Sheet : 3 of 3

Plates 2 and 3, VP110 - Clean Cover Thickness to Base of Topsoil and Base of Clean Cover Validation Pit.



Declaration

Inspection and testing of the clean cover system has been carried out in accordance with the requirements of the approved Remediation Strategy for this site. The thickness of clean cover has been found to be greater than the minimum required and all chemical test results are less than the limiting criteria defined in the Remediation Strategy.

Signature

Qualified Engineer/Scientist (Print Name)
Date

Signature

Checked By (Print Name)
Date



MIKE FORRESTER
20/05/2021



CATHAL GILLESPIE
20/05/2021

APPENDIX A

CLEAN COVER REQUIREMENTS

As a minimum ANY staff working with soils with low concentrations of asbestos will need to work in conditions including dust control and be provided with appropriate training and PPE/RPE (e.g., FFP3 masks and Cat3 Type 5/6 overalls). The details of the controls should be provided by the contractor and agreed prior to any excavations starting.

If there is any doubt over the nature of the material or best way to proceed, or quantification indicates that asbestos concentrations are greater than the hazardous waste criteria, the advice of a specialist asbestos contractor should be sought. This may require specialist training, specialist protective equipment, licences and notifications to the regulators.

8.2.2 Clean Cover

In areas of soft landscaping across the site and in the private garden (Block D), clean imported soils should be used. The soils should be clean and not exceed the criteria set out in Appendix G. A thickness of at least 600 mm is recommended in general accordance with BRE 465.

Testing of clean cover materials in landscaped areas will be undertaken on the basis of approximately 1 No. sample location (hand dug pit) per 500 m³ of placed material. At least one pit will be dug in the garden of Block D with a sample being tested. Samples will be taken from the hand dug pit and tested to confirm the soil quality to comply with the screening criteria used in Appendix G. Materials which fail will be excavated and removed from site and replaced with new clean fill materials. These replaced areas will then be subject to the same validation process as above.

The quantities, thicknesses and locations where clean cover is used will be recorded and presented in a verification report at the end of the redevelopment project. Verification of clean cover thickness will be undertaken by the excavation of confirmatory, hand-dug pits. Photographs with depth measurements will be taken and soils samples taken for testing to confirm the thickness and quality of the cover as shown in Plate 2 below.

Plate 2 **Clean Cover Verification Hand-Dug Pit**



8.2.3 Ground Gas

Based on a CS2 classification, under BS8485:2015, all the buildings at the site can be considered as Type A or B. These have a gas protection score of 3.5 points. Such a score may be provided by a combination of structural barriers such as ground-bearing cast in-situ monolithic slabs, suspended slabs, sub-floor venting layers, gas protection membranes, open ventilated basements, etc. This is risk mitigation/remediation by pathway removal.

It should be noted that removal of much of the Made Ground (likely source of ground gas) during the development would go some way to improving the ground gas regime at the site. This should be discussed with the regulator. This may allow the site to be reconsidered as CS1 where no specific gas protection would be necessary.

The detailed design will have to be agreed with the local planning authority building control department and all gas protection measures will be verified in accordance with CIRIA C735. The responsibility for the design and agreement of any gas protection measures will be with the principal contractor and/or the principal designer.

It may become evident following further investigation and analysis that additional CoCs come to light that are not present in the current list which may require screening criteria to be applied. If this becomes the case additional criteria shall be selected/derived and submitted to the regulators for comment and agreement.

The screening criteria for human health assessment are presented below in Table G1 (RWOHP) with the screening criteria for controlled waters presented in Table G2.

Table G1 Human Health Generic Screening Criteria at 1% SOM for RWOHP

Determinand	Units	Screening Value (RWOHP @1% SOM)	Source of Screen
Asbestos in Soil	Type	Present	
pH	pH Units	<5 or >10	
Total Cyanide	mg/kg	1600	USEPA Region 9
Total Phenols (monohydric)	mg/kg	750	S4UL
Naphthalene	mg/kg	2.3	S4UL
Acenaphthylene	mg/kg	86.1	S4UL
Acenaphthene	mg/kg	57	S4UL
Fluorene	mg/kg	30.9	S4UL
Phenanthrene	mg/kg	36	S4UL
Anthracene	mg/kg	1.17	S4UL
Fluoranthene	mg/kg	1500	S4UL
Pyrene	mg/kg	3700	S4UL
Benzo(a)anthracene	mg/kg	11	S4UL
Chrysene	mg/kg	30	S4UL
Benzo(b)fluoranthene	mg/kg	3.9	S4UL
Benzo(k)fluoranthene	mg/kg	110	S4UL
Benzo(a)pyrene	mg/kg	3.2	S4UL
Indeno(1,2,3cd)pyrene	mg/kg	45	S4UL
Dibenz(a,h)anthracene	mg/kg	0.31	S4UL
Benzo(ghi)perylene	mg/kg	360	S4UL
Arsenic	mg/kg	40	S4UL
Cadmium	mg/kg	85	S4UL
Chromium (hexavalent)	mg/kg	6	S4UL
Chromium	mg/kg	910	S4UL
Copper	mg/kg	7100	S4UL
Lead	mg/kg	310	C4SL
Mercury	mg/kg	56	S4UL
Nickel	mg/kg	180	S4UL
Silver	mg/kg	390	USEPA Region 9
Selenium	mg/kg	430	S4UL
Vanadium	mg/kg	1200	S4UL
Zinc	mg/kg	40000	S4UL
Benzene	µg/kg	380	S4UL
Toluene	µg/kg	869000	S4UL
Ethylbenzene	µg/kg	83000	S4UL
p & m-xylene	µg/kg	79000	S4UL
o-xylene	µg/kg	88000	S4UL
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	49000	EIC/AGS/CL:AIRE
TPH4 (C10 - C20)	mg/kg	4022	S4UL
TPH4 (C20 - C30)	mg/kg	1908	S4UL
TPH4 (C30 - C40)	mg/kg	1917	S4UL
TPHCWG Aliphatic >EC5 EC6	mg/kg	42	S4UL
TPHCWG Aliphatic >EC6 EC8	mg/kg	100	S4UL
TPHCWG Aliphatic >EC8 EC10	mg/kg	27	S4UL
TPHCWG Aliphatic >EC10 EC12	mg/kg	130	S4UL
TPHCWG Aliphatic >EC12 EC16	mg/kg	1100	S4UL
TPHCWG Aliphatic >EC16 EC21	mg/kg	65000	S4UL
TPHCWG Aliphatic >EC21 EC35	mg/kg	65000	S4UL
TPHCWG Aromatic >EC5 EC7	mg/kg	370	S4UL
TPHCWG Aromatic >EC7 EC8	mg/kg	860	S4UL
TPHCWG Aromatic >EC8 EC10	mg/kg	47	S4UL
TPHCWG Aromatic >EC10 EC12	mg/kg	250	S4UL
TPHCWG Aromatic >EC12 EC16	mg/kg	1800	S4UL
TPHCWG Aromatic >EC16 EC21	mg/kg	1900	S4UL
TPHCWG Aromatic >EC21 EC35	mg/kg	1900	S4UL

APPENDIX B

CHEMICAL TESTING OF VALIDATION SAMPLES

Mike Forrester

Discovery CE
The Granary
Broadwell House Farm
Broadwell
Rugby
Warwickshire
CV23 8HF

t: 01926 813909

e: m.forrester@dce-services.co.uk

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 : 21-75074

Project / Site name:	Horton Road	Samples received on:	17/05/2012
Your job number:	21028J	Samples instructed on/ Analysis started on:	17/05/2021
Your order number:		Analysis completed by:	19/05/2021
Report Issue Number:	1	Report issued on:	19/05/2021
Samples Analysed:	1 soil sample		



Signed:

Rachel Bradley
Deputy Quality Manager
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

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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: 21-75074
Project / Site name: Horton Road

Lab Sample Number				1871650
Sample Reference				VP110
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				17/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	11
Total mass of sample received	kg	0.001	NONE	0.50

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
----------------------------	-------	---	--------	-------

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
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.5
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.0
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	16
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	27

Analytical Report Number: 21-75074

Project / Site name: Horton Road

Lab Sample Number				1871650
Sample Reference				VP110
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				17/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 21-75074
Project / Site name: Horton Road

* 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 *
1871650	VP110	None Supplied	0.4	Light brown sand with gravel.

Analytical Report Number : 21-75074

Project / Site name: Horton Road

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
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 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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
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 cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
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 and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

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.



Analytical Report Number : 21-75074
Project / Site name: Horton Road

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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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.

Sample Deviation Report



Analytical Report Number : 21-75074

Project / Site name: Horton Road

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
VP110	None Supplied	S	1871650	c	Free cyanide in soil	L080-PL	c
VP110	None Supplied	S	1871650	c	Hexavalent chromium in soil	L080-PL	c
VP110	None Supplied	S	1871650	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
VP110	None Supplied	S	1871650	c	Monohydric phenols in soil	L080-PL	c
VP110	None Supplied	S	1871650	c	Organic matter (Automated) in soil	L009-PL	c
VP110	None Supplied	S	1871650	c	Speciated EPA-16 PAHs in soil	L064-PL	c
VP110	None Supplied	S	1871650	c	TPHCWG (Soil)	L088/76-PL	c
VP110	None Supplied	S	1871650	c	Total cyanide in soil	L080-PL	c
VP110	None Supplied	S	1871650	c	Total organic carbon (Automated) in soil	L009-PL	c
VP110	None Supplied	S	1871650	c	pH in soil (automated)	L099-PL	c

APPENDIX C

CHEMICAL TESTING OF CLEAN PLACED SOILS



Final Report

Report No.:	20-34138-1		
Initial Date of Issue:	24-Dec-2020		
Client	Springbridge Direct Ltd		
Client Address:	Oxford Road Denham Middlesex UB9 4DF		
Contact(s):	Katie East Tom Hawkins		
Project	Springbridge Yard		
Quotation No.:	Q20-21261	Date Received:	11-Dec-2020
Order No.:	105715	Date Instructed:	11-Dec-2020
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	24-Dec-2020
Date Approved:	24-Dec-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34138
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112427
	Client Sample ID.:				TOPSOIL
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	13
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	None
Soil Texture	N	2040		N/A	Sandy Loam
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.3
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	12
Cadmium	M	2450	mg/kg	0.10	0.20
Chromium	M	2450	mg/kg	1.0	12
Copper	M	2450	mg/kg	0.50	13
Mercury	M	2450	mg/kg	0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	11
Lead	M	2450	mg/kg	0.50	19
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	46
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	N	2700	mg/kg	0.010	< 0.010

Results - Soil

Project: Springbridge Yard

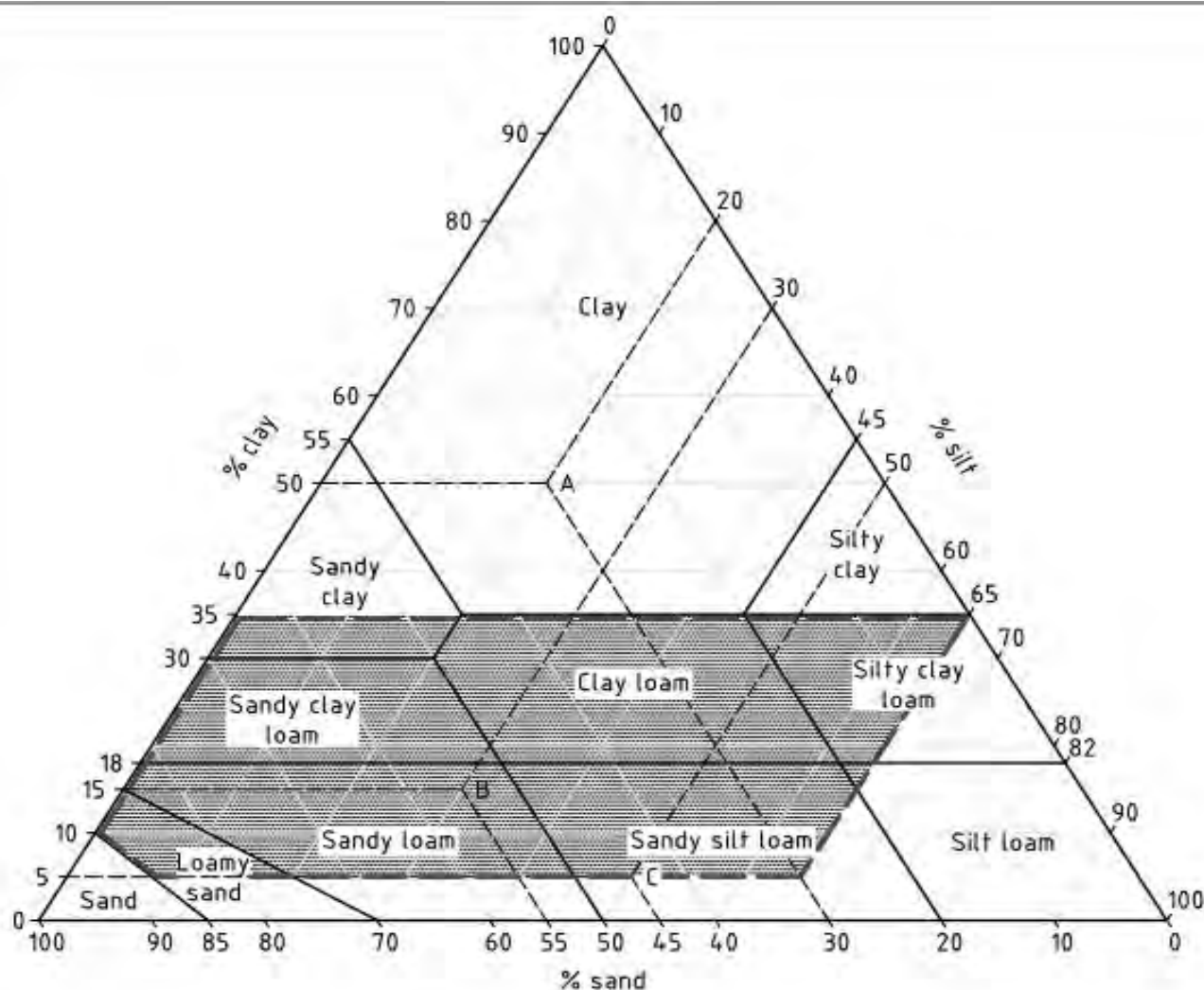
Client: Springbridge Direct Ltd	Chemtest Job No.:		20-34138		
Quotation No.: Q20-21261	Chemtest Sample ID.:		1112427		
	Client Sample ID.:		TOPSOIL		
	Sample Type:		SOIL		
	Date Sampled:		08-Dec-2020		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Acenaphthylene	N	2700	mg/kg	0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	< 0.010
Fluorene	N	2700	mg/kg	0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	1.0
Anthracene	N	2700	mg/kg	0.010	0.12
Fluoranthene	N	2700	mg/kg	0.010	0.26
Pyrene	N	2700	mg/kg	0.010	0.37
Benzo[a]anthracene	N	2700	mg/kg	0.010	0.89
Chrysene	N	2700	mg/kg	0.010	0.42
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	3.1
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.30	< 0.30

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 20-34138
 Chemtest Sample ID.: 1112427
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: TOPSOIL
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 08-Dec-2020
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content	%		5.0				
Silt content	%		10				
Sand content	%		85				
Soil texture class		See Attached Chart	Sandy Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	5.8	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	18	YES			
>20mm		0-10	< 0.020	YES			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	8.4	YES	NO	YES	YES
Carbonate (Calcareous only)	%		1.0				YES
Electrical Conductivity	µS/cm	If >3300 do ESP	2900	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.16	YES	YES		YES
Extractable phosphorus	mg/l	16-140	57	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	1500	YES	YES		YES
Extractable magnesium	mg/l	51-600	310	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	18/1	YES	N/A	N/A	N/A
Exchangeable sodium	%	<15	7.4				
Available Calcium	mg/l		2700				
Available Sodium	mg/l		360				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0			
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	34	YES	
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	12	YES	
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	9.5	YES	
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Texture Classification Chart**Key**

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

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

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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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



Final Report

Report No.:	20-34139-1		
Initial Date of Issue:	24-Dec-2020		
Client	Springbridge Direct Ltd		
Client Address:	Oxford Road□ Denham□ Middlesex□ UB9 4DF		
Contact(s):	Katie East□ Tom Hawkins		
Project	Springbridge Yard		
Quotation No.:	Q20-21261	Date Received:	11-Dec-2020
Order No.:	105715	Date Instructed:	11-Dec-2020
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	24-Dec-2020
Date Approved:	24-Dec-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager□		

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	9.3
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	None
Soil Texture	N	2040		N/A	Sandy Loam
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	23
Cadmium	M	2450	mg/kg	0.10	< 0.10
Chromium	M	2450	mg/kg	1.0	28
Copper	M	2450	mg/kg	0.50	7.0

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Mercury	M	2450	mg/kg	0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	18
Lead	M	2450	mg/kg	0.50	26
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	36
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	N	2700	mg/kg	0.010	< 0.010
Acenaphthylene	N	2700	mg/kg	0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	< 0.010

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Fluorene	N	2700	mg/kg	0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	< 0.010
Anthracene	N	2700	mg/kg	0.010	< 0.010
Fluoranthene	N	2700	mg/kg	0.010	0.38
Pyrene	N	2700	mg/kg	0.010	0.42
Benzo[a]anthracene	N	2700	mg/kg	0.010	0.18
Chrysene	N	2700	mg/kg	0.010	0.25
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	1.2

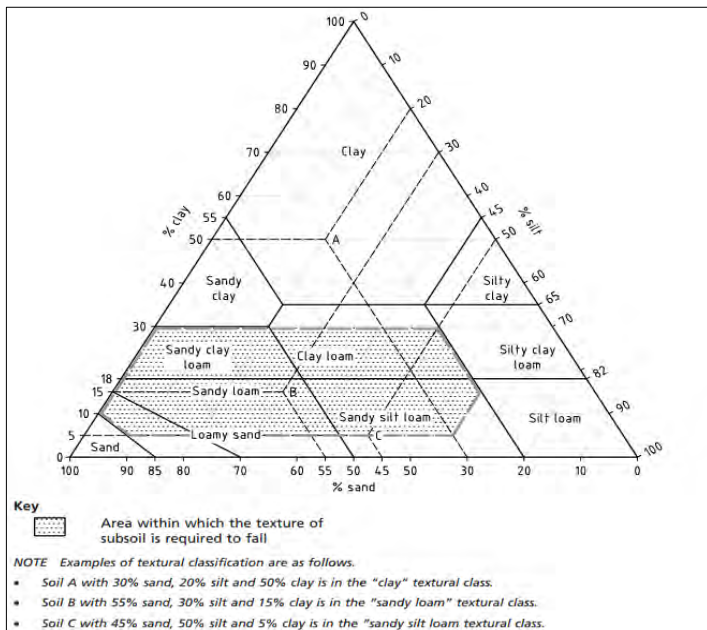
Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd	Chemtest Job No.:				20-34139
Quotation No.: Q20-21261	Chemtest Sample ID.:				1112428
	Client Sample ID.:				Subsoil
	Sample Type:				SOIL
	Date Sampled:				08-Dec-2020
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Benzene	M	2760	µg/kg	1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.30	< 0.30

Chemtest Job No.: 20-34139
 Chemtest Sample ID.: 1112428
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: Subsoil
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 08-Dec-2020
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)	
Texture					Acid	Calc.
Clay content	%		6.0			
Silt content	%		11.0			
Sand content	%		83			
Soil texture class		See Attached Chart	Sandy Loam	YES		
Mass Loss on Ignition						
	%	<2	1.2	YES		
Stone Content	% m/m					
>2mm		0-40	22	YES		
>20mm		0-20	< 0.020	YES		
>50mm		0	< 0.020	YES		
Soil pH value		5.5-8.5	8.5	YES	NO	YES
Carbonate (Calcareous only)	%		< 0.10			NO
Electrical Conductivity	µS/cm	If >2800 do ESP	2200	YES		
Exchangeable sodium	%	<15	1.9	YES		
Available Calcium	mg/l		1600			
Available Sodium	mg/l		38			
Phytotoxic Contaminants (by soil pH)		< 6.0 6.0-7.0 > 7.0				
Zinc (Nitric Acid extract)	mg/kg	<200 <200 <300	21	YES		
Copper (Nitric Acid extract)	mg/kg	<100 <135 <200	< 5.0	YES		
Nickel (Nitric Acid extract)	mg/kg	<60 <75 <110	11	YES		
Visible Contaminants	%mm					
>2mm		<0.5	0.000	YES		
..... of which plastics		<0.25	0.000	YES		
..... man-made sharps		zero in 1kg	0.000	YES		

Texture Classification Chart

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British Standards can be obtained in PDF or hard copy formats from the BSI online shop: www.bsigroup.com/Shop or by contacting BSI Customer Services for hardcopies only: Tel: +44 (0)20 8996 9001, Email: cservices@bsigroup.com.

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2680	TPH A/A Split	Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21- C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16- C21, >C21-C35, >C35- C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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



Final Report

Report No.: 21-13793-1
Initial Date of Issue: 05-May-2021
Client Discovery CE Ltd
Client Address: The Granary
Broadwell House Farm
Broadwell
Rugby
Warwickshire
CV23 8HF

Contact(s): Mike Forrester

Project 21028J Horton Road

Quotation No.: **Date Received:** 28-Apr-2021

Order No.: 21028J **Date Instructed:** 28-Apr-2021

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 05-May-2021

Date Approved: 05-May-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 21028J Horton Road

Client: Discovery CE Ltd	Chemtest Job No.:				21-13793	21-13793
Quotation No.:	Chemtest Sample ID.:				1188464	1188465
	Sample Location:				VP101	VP102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.10
	Date Sampled:				23-Apr-2021	23-Apr-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	25	10
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Sand	Sand
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	16	15
Cadmium	M	2450	mg/kg	0.10	0.39	0.32
Chromium	M	2450	mg/kg	1.0	24	25
Copper	M	2450	mg/kg	0.50	50	27
Mercury	M	2450	mg/kg	0.10	0.24	0.19
Nickel	M	2450	mg/kg	0.50	16	21
Lead	M	2450	mg/kg	0.50	170	74
Selenium	M	2450	mg/kg	0.20	0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	28	27
Zinc	M	2450	mg/kg	0.50	140	80
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	3.8	0.69
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	110	45
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	110	45
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	35	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	550	220

Results - Soil

Project: 21028J Horton Road

Client: Discovery CE Ltd	Chemtest Job No.:				21-13793	21-13793
Quotation No.:	Chemtest Sample ID.:				1188464	1188465
	Sample Location:				VP101	VP102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.10
	Date Sampled:				23-Apr-2021	23-Apr-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	45	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	630	220
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	740	270
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	0.84
Anthracene	M	2700	mg/kg	0.10	< 0.10	0.28
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	2.8
Pyrene	M	2700	mg/kg	0.10	< 0.10	2.0
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	1.2
Chrysene	M	2700	mg/kg	0.10	< 0.10	1.3
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	8.4
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	0.33

Test Methods

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

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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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Standard Geotextiles

Issue 7—May 2019

DESCRIPTION:

Nonwoven geotextile manufactured from UV stabilised, high tenacity, virgin polypropylene fibres that have been both mechanically and thermally bonded to provide a highly permeable yet durable separation and filtration layer.

APPLICATIONS:

With 50 years of unrivalled expertise and experience Terram standard geotextiles are the original nonwoven geotextiles for separation and filtration applications.

Typical uses include the prevention of intermixing of sub-base and subgrade layers, drainage and bedding materials. Terram filters/separators are used extensively in the construction of:

- Paved and unpaved roads
- Railways
- Car parks and hardstandings
- Cycleways and footpaths
- Sustainable Drainage Systems (SuDS)

FEATURES & BENEFITS:

- Manufactured from inert high tenacity virgin polypropylene fibres giving excellent long term durability in all soil types.
- High static and dynamic puncture resistance ensures a low risk of damage during construction.
- Random orientated web with isotropic properties provide the same strength, permeability and filtration in all directions.
- High elongation at break maintains separation and filtration function under load particularly in soft and variable ground conditions.

**APPROVAL:**

Network Rail PADS certificate numbers; T1000 057/100703, T2000 57/100705 and T3000 57/100706 (4.5m wide x 100m long rolls).



			Mean Value									
MECHANICAL PROPERTIES	Test Method	Unit	T700	T900	T1000	T1000 Orange	T1300	T1500	T2000	T3000	T4000	T4500
Tensile Strength	EN ISO 10319	kN/m	6	7.5	8	8	10	12.5	14.5	18	22	30
Tensile Elongation	EN ISO 10319	%	60	60	60	60	60	60	60	60	60	60
CBR Puncture Resistance	EN ISO 12236	N	1050	1350	1500	1500	2000	2250	2750	3250	4300	5350
Cone Drop	EN ISO 13433	mm	42	40	38	38	34	32	26	24	22	14
HYDRAULIC PROPERTIES												
Pore Size - Mean AOS	EN ISO 12956	µm	95	95	90	90	65	65	65	60	60	60
Permeability—(H50)	EN ISO 11058	l/m ² s	100	95	90	90	65	65	55	50	30	30
DURABILITY PROPERTIES												
Weathering (UV Exposure)	EN 12224	Days	30	30	30	30	30	30	30	30	30	30
Combined ageing (Oxidation, temperature & moisture)	EN ISO 13438	Service Life (Years)	50	50	100	100	100	100	100	100	100	100
PHYSICAL PROPERTIES												
Thickness @ 2kPa (Nominal)	EN ISO 9863-1	mm	0.9	1.0	1.1	1.1	1.4	1.6	1.7	1.8	2.0	2.4
MATERIAL DIMENSIONS												
Standard Roll Length		m	150	150	100	100	100	100	100	100	50	50
Standard Roll Width		m	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Maximum Roll Width		m	6	6	6	6	6	6	6	6	6	6
Gross Roll Weight (Nominal)		kg	65	85	60	60	75	85	100	120	80	95

PACKAGING & IDENTIFICATION

Terram Standard Geotextiles are supplied on cardboard cores and wrapped in Polyethylene sheeting with identification labels in accordance with ISO 10320.

STORAGE

The rolls of geotextile shall be stored on stable/ level ground and stacked not more than five rolls high and no other materials shall be stacked on top. The rolls can be stored outdoors when packaged, but should be protected from exposure to UV. All materials should be stored in accordance with good health and safety practice and in accordance with local laws. For additional information please refer to Terram Geotextiles MSDS.

QUALITY

Terram Standard Geotextiles are supplied having met internal quality requirements in accordance with our Quality Management system which is certified to BS EN ISO 9001:2015.

NOTES

Reported values are arithmetic mean values unless otherwise stated. For further details on physical parameters please refer to the individual Declaration of Performance certificates available for download from www.terram.com

Reported values related to durability testing are generally based on the lowest grade product within a family.

A Nominal value indicates that the value is not part of the performance specification and is provided for guidance only.

Gross roll weight is based on 4.5m wide rolls at standard length; information provided is for lifting guidance only and does not for part of quality control.

ADDITIONAL INFORMATION

Refer to the Terram Jointing Methods (downloadable from www.terram.com) for when simple overlaps are required for subsequent and adjacent roll lengths. However, pegging, sewing, stapling or gluing can also be used depending upon the application, the sub-grade conditions, the loading, the convenience and the cost.

These figures relate to standard product weights and roll sizes. Other weights, sizes and colours may be available on request. For further information please contact Terram Technical Support.

As part of its continued improvement process Terram® Ltd reserve the right to change the properties listed on this data sheet without prior notice.

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