

GROUND ENGINEERING

Newark Road
Peterborough PE1 5UA
Tel: 01733 566566

GROUND INVESTIGATION REPORT

NATIONAL HOLOCAUST MUSEUM

VICTORIA TOWER GARDENS

LONDON SW1

(Factual)

Report Reference No. C14757

On behalf of:-

**WSP
WSP House
70 Chancery Lane
London
WC2A 1AF**

Final - August 2019

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WSP
CONSULTING ENGINEERS

FACTUAL REPORT ON A GROUND INVESTIGATION

AT

NATIONAL HOLOCAUST MUSEUM

VICTORIA TOWER GARDENS

LONDON SW1

Report Reference No. C14757

August 2019

INTRODUCTION

WSP, the client, is involved in the assessment of the proposed site of the National Holocaust Museum (NHM) within Victoria Tower Gardens, London SW1. Details of the proposed structure were not confirmed at the time of report preparation.

Ground Engineering Limited was instructed by the client to carry out a ground investigation to determine the nature and characteristics of the soils, and the presence of buried obstructions, beneath the site in relation to the proposed development and produce a factual report. In addition, geotechnical and chemical laboratory testing, and gas/groundwater monitoring was included within the scope of works.

After a subsequent instruction, foundation inspection pits on two memorials within the gardens and additional boreholes were undertaken. The records for these supplementary exploratory holes have been included in this finalised report.

LOCATION, TOPOGRAPHY AND GEOLOGY OF THE SITE

Victoria Tower Gardens, a Royal Park, is situated on the western bank of the River Thames immediately to the south of the Palace of Westminster, within the London Borough of Westminster, London SW1. The position of the proposed National Holocaust Museum is located within the southern half of Victoria Tower Gardens and is centred at National Grid Reference TQ 3025 7915.

The 35m to 90m wide and 300m long Royal Park is bounded to the west by Abington Street/Millbank.

At the time of the investigation, the site was within the open grass of Victoria Tower Gardens, which is locally traversed by asphalt paths, and contains the Buxton Memorial Fountain and Spicer Memorial near its southern end. The northern end of the Gardens is bounded by an Education Centre associated with the Palace of Westminster, whilst the southern end of the Gardens contains a children's playground. Victoria Tower Gardens are bounded to the east by the tidal River Thames, from which the park is separated by a granite-faced river wall.

The western and eastern edges of the Gardens are lined with mature London Plane trees. The Gardens are known to be traversed by several buried services, including drainage, electricity cables and TV transmission cables.

The Royal Park stands at an approximate elevation of 4.5mOD to 5.0mOD on level ground.

The 1936 geological map for the area at 1:10,560 scale is based on the 1920 Ordnance Survey London Sheet V SW and shows the site to be covered by Alluvium and Flood Plain Gravel, and underlain by the solid geology of the London Clay. To the north of the site the former course (now culverted) of the River Tyburn is shown, flowing east across the Gardens into the River Thames.

Well records on this map some 60m west and 100m south of the site indicate made ground, 'drift'/Alluvium/gravel to about 7m depth, London Clay to about 39m, Reading

Beds (now renamed Lambeth Group) to about 57m, and Thanet Sand to about 67m depth covering Chalk to at least 137.2m below ground level.

The 1998 geological map for the area at 1:50,000 scale, Sheet 270, also shows the site to be covered by Alluvium and the renamed Kempton Park Gravel and underlain by the solid geology of the London Clay Formation.

Previous work by Ground Engineering Limited in 2013 for the adjacent Education Centre, at the northern end of the Gardens, found a 3.80m to 5.30m thick mantle of made ground underlain by a remnant of Alluvium and then the expected Kempton Park Gravel at about 7m below ground level. The latter was proved to between 10m and 11m depth, where the solid geology of the London Clay was met. Two boreholes were completed within this latter stratum at 20m below ground level. Groundwater was generally recorded within the Alluvium/Kempton Park Gravel at 5.5m to 6.5m below ground level. A diurnal tidal fluctuation in groundwater level associated with the nearby River Thames was in the order of 150mm in a borehole installation some 25m from the river, but less than 30mm was detected in a borehole some 60m from the Thames.

SITE WORK

Five cable percussion boreholes (BHs 1 to 5), eight window sample boreholes (WS1 to WS8), six trial pits (TPs 1 to 6), and forty-five dynamic probe tests (DPs 1 to 45) were scheduled to be undertaken at positions determined by the Engineer. These positions had previously been agreed with the Engineer and a representative of Royal Parks at a pre-start site meeting.

The works within Victoria Tower Gardens were undertaken under licence from Royal Parks. In addition, the proximity of several of the exploratory holes to the River Thames meant that it was necessary to obtain a Flood Risk Activity Permit (FRAP) from the Environment Agency.

The exploratory hole positions are depicted on the site plan at the rear of this report. The site work was undertaken under the supervision of a Geo-environmental Engineer from Ground Engineering Limited. The works were carried out making due reference to generic and site specific risk assessments, and method statements. The intrusive works were undertaken within working areas delineated by Heras fencing and barriers. In order to comply with the Royal Parks licence the ground surface within each working area was protected using Trackmats and heavy duty plastic sheeting.

The investigation was undertaken following the WSP specification and the protocols detailed in British Standards (BS) 'Code of Practice for Site Investigations' (BS5930:1999), 'Methods of test for soils for engineering purposes' (BS1377:1990), and 'Investigation of Potentially Contaminated Sites' (BS10175:2001). The exploratory hole records and the results of in-situ tests are presented in Appendix 1.

Services information was provided prior to the start of the investigation and was referenced in relation to the exploratory hole positions prior to boring and a scan was undertaken using a cable avoidance tool (CAT). The National Grid Coordinates and elevation of each

exploratory hole position was determined by a surveyor using on-site measurements and a topographical site survey plan provided by the Engineer.

Unexploded Ordnance

The site area is classed as having a high probability of encounter with unexploded World War II ordnance (Appendix 8). Consequently a UXO specialist attended site during the intrusive works to advise personnel during a pre-start briefing of the potential risks from encountering UXO and appropriate safe systems of work. In addition, the UXO specialist carried out regular magnetometer checks as the cable percussive and window sample boreholes, dynamic probe tests, and trial pits were advanced through the near surface made ground and underlying soils.

Cable Percussive Boreholes

Five boreholes (BH 1 to BH 5) were undertaken by a standard cable percussive boring rig between 29th April and 14th May 2019. Prior to boring, at each position starter pits were dug to 1.20m below ground level using hand tools, in order to ensure the absence of buried services. The boreholes were then advanced using weighted shell and claycutter tools, working initially within 150mm diameter casing.

Boreholes BH 1, BH 2 and BH 5 were completed respectively at 25.00m, 35.00m and 11.30m depth, as instructed. Chiselling techniques were employed for three hours to advance borehole BH 3 through brickwork between 1.80m and 2.80m depth, after which the hole was abandoned on concrete at 3.00m below ground level, following instruction by the Engineer. Borehole BH 4 was aborted at 42.70m below ground level after half an hour of chiselling, following instruction by the Engineer. Chiselling was also necessary to penetrate 'claystone' nodules/layers within the London Clay in the deep boreholes.

Standard penetration tests were undertaken in order to give an indication of the in-situ relative density/shear strength of the soils encountered at the instructed intervals. The test

was made by driving a 50mm diameter solid cone point (C) or similar diameter open shoe and split spoon sampler (S) into the soil at the base of the borehole by means of an automatic trip hammer weighing 63.50kg falling freely through 760mm. The penetration resistance was determined as the number of blows (N) required to drive the tool the final 300mm of a total penetration of 450mm into the soil ahead of the borehole. Where the full penetration was not achieved the actual penetration and the number of blows was recorded. The SPT results are tabulated to the rear of each borehole record. The calibration certificate for the SPT hammer used by the cable percussion rig is also presented to the rear of the borehole records.

Undisturbed samples nominally 100mm in diameter were taken in clay, using thin wall steel samplers (UT100s), at the instructed intervals. The ends of the samples were capped and sealed to maintain them in as representative condition as possible during transit to the laboratory.

Falling head tests were undertaken in BHs 1, 2 and 4, as directed. The results of the falling head tests are presented to the rear of the relevant borehole records in Appendix 1.

Representative small (D) and bulk (B) disturbed samples of soil were taken from the boring tools at regular intervals throughout the depth of the boreholes. The supervising Geo-environmental Engineer also took environmental samples (ES) in polycarbonate pots, glass jars and vials at regular intervals within made ground and in the underlying naturally deposited soils, and from the bulk disturbed samples recovered by the driller.

Samples of groundwater (W) were recovered from the boreholes once sufficient water had accumulated for collection.

A photo-ionisation detector (PID) was used by the supervising Geo-environmental Engineer to screen the environmental samples recovered for volatile organic compounds (VOCs). The results have all been tabulated and are presented to the rear of the individual exploratory hole records.

On completion, 50mm diameter HDPE gas and groundwater monitoring standpipes were installed to depths of 11.70m in BH 1, 10.50m in BH2, 11.00m in BH 4, and to

7.50m and 11.00m in BH 5. In boreholes BH 1, BH 2 and BH 4, 19mm diameter Casagrande type standpipe piezometers were installed to 24.00m, 34.00m and 42.50m below ground level, respectively. These installations had associated gravel response zones that were separated by bentonite backfill, the top of the shallow standpipes had gas valves inserted in them, and steel protective covers were concreted into the ground flush with the surface over each installation. The depths and types of installations are detailed on each borehole record, where they are also illustrated pictorially.

The borehole records give the descriptions and depths of the various strata encountered, details of all in-situ tests, the samples taken and the groundwater conditions observed during boring, on completion and subsequently within the standpipes/piezometers. Excess spoil was removed from site in skips and disposed of at a licensed facility (see Waste Transfer Notes in Appendix 7). The working areas were reinstated following completion to the satisfaction of Royal Parks.

Window Sample Boreholes

Eight window sample boreholes (WS1 to WS8), and then two further boreholes (WS 3A and 3B), were undertaken by a standard dynamic sampling rig between 9th and 15th May 2019.

The surface asphalt at position WS 2 was cored at 230mm diameter using diamond drilling equipment. Starter pits were dug to 1.20m below ground level using hand tools, in order to ensure the absence of buried services.

The dynamic/window sampling equipment consisted of 1.00m long drive-in samplers of specially constructed and strengthened 87mm to 57mm diameter steel sample tubes with a plastic core-liner. The samplers were driven into the ground by an automatic trip hammer weighing 63.50kg falling freely through 750mm. Upon extraction a continuous profile of the soil was obtained in the plastic liners (U) inserted in the samplers.

Five of the eight scheduled boreholes were completed at the intended depth of 6.00m, whilst the remaining holes were abandoned at depths between 1.40m and 2.50m due to obstructions.

The window sample liners were split, sub-sampled and described on site by the supervising Geo-environmental Engineer. In made ground and the top of the underlying natural strata, representative disturbed samples were taken from the starter pits and liners, and placed in polycarbonate pots, glass vials and amber glass jars (ES samples), or sealed in small or large plastic bags (D and B samples, respectively).

A hand held pocket penetrometer was used by the supervising Geo-environmental Engineer in order to assess the shear strength of clay soils within boreholes WS 1, WS 2, WS 3 and WS 7. The results are presented on the relevant borehole records in kilopascals (kPa).

In boreholes WS 4, WS 5, WS 6 and WS 8, a photo-ionisation detector (PID) was used by the supervising Geo-environmental Engineer to screen the environmental samples recovered for volatile organic compounds (VOCs). The results have all been tabulated and are presented to the rear of the individual exploratory hole records.

On completion of boring at WS 1, WS 3B, WS 5, WS 6, WS 7 and WS 8, 50mm diameter HDPE standpipe piezometers were installed to instructed depths between 2.35m and 6.00m. The annulus around each pipe was backfilled with pea gravel and a bentonite seal placed around the top of the installations within 1.00m of ground level. A protective stopcock cover was concreted into the ground flush with the surface over each installation. The remaining window sample boreholes were backfilled with bentonite and the surface layers were reinstated.

The window sample borehole records give the descriptions and depths of the various strata encountered, details of all in-situ tests, the samples taken and the groundwater conditions observed during boring, on completion and subsequently within the standpipes.

Dynamic Probes

Forty-five dynamic probe tests (DP 1 to DP 45) and three additional probes (DP 5A, DP 5B and DP 44A) were undertaken by a standard dynamic sampling rig between 29th April and 17th May 2019. These were included within the scope of works, following the results of a geophysical survey obtained by the Client, in order to establish the location and depth of the buried former river wall beneath the eastern half of the Gardens; other potential below ground obstructions within the western half of the site; and determine the profile of the foundation of the existing river wall forming the boundary with the River Thames.

Four rows of probe positions, at 1.00m lateral spacing, were undertaken east to west across the interpreted buried former river wall, and two south to north aligned rows of 2.00m laterally spaced. On occasion, across the buried former river wall, probe tests were undertaken between positions (0.50m spacing) where significantly contrasting probe test refusal depths were determined. A similar iterative process was undertaken at the existing river wall where the row of probe tests were undertaken at increasing distances aligned perpendicular to the wall.

The surface asphalt at positions DP 42 to DP 45 was cored at 150mm diameter using diamond drilling equipment. Starter pits were dug to 1.20m below ground level using hand tools, in order to ensure the absence of buried services. Probe test DP 11 was abandoned when an obstruction was encountered at 1.10m depth within the starter pit.

The probe tests were driven using the super heavy dynamic probing rig and either completed at 8.00m or 11.00m (DP 45) depth, where obstructions were not met, or abandoned on refusal at shallower depths either where the buried river wall/foundations/obstructions were met, and where the stepped existing river wall foundation was struck. The test comprised driving a 90° cone, 150mm² in area, on 35mm diameter rods using a 63.5kg hammer falling through 750mm. The blow count was recorded for every 100mm of penetration (N100). The results are presented as a plot of hammer blow counts against depth.

A postulated section of the interpreted existing river wall profile follows the trial pit TP 6 record.

Trial Pits

Six trial pits were undertaken using hand tools between 29th April and 17th May 2019 following careful removal of the existing surfacing. Trial pits TP 1, TP 2 and TP 5 were located over the location of the buried former river wall, as estimated from the results of the dynamic probe tests, specifically where the greatest contrast between refusal depths was noted. Trial pits TP 3 and TP 4 were positioned over the locations of the shallowest refusal depths determined during the two north to south probe runs within the western part of the site. Trial pit TP 6 was located adjacent the existing River Thames river wall.

The exposed strata and foundations were logged and the soils sampled by the supervising Geo-environmental Engineer.

In light of the proximity of protected trees, and the likely presence of live tree roots within the six excavations, the soils were carefully excavated and tree roots greater than 25mm diameter were recorded/protected to the satisfaction of the client's visiting arboricultural specialist, and a representative of Westminster City Council. The trial pits were completed at depths between 1.20m and 3.00m below ground level.

Disturbed samples of soil were taken at regular intervals throughout the pits and placed in polycarbonate pots and amber glass jars (ES samples) and plastic bags (D samples).

The trial pit records give descriptions and depths of the various strata encountered, the details of all samples and the groundwater conditions observed during excavation. Sketch sections, plans and photographs of the exposed footings are presented on the pages following the record for each excavation.

Following site inspections by the Engineer, the spoil was returned to the pits and placed in layers, which were recompact, and the surface layers reinstated.

Monitoring

The borehole installations were checked and purged on 22nd May 2019, after which the standpipes were monitored for methane, carbon dioxide and oxygen gas levels on six occasions between then and 14th June 2019. Ambient pressures and flow rates were recorded together with the depth to groundwater. The water levels in the standpipes were also recorded, and together with the gas levels are presented in Appendix 2.

Samples of groundwater were recovered from the standpipes, where sufficient water was present, using nominated bailers on 29th May and 4th June 2019. These samples were taken in plastic and amber glass bottles, and glass vials, and taken directly to the analysing laboratory pending scheduling by the Engineer.

In addition, the monitoring technician used a Mini-Rae 3000 photo-ionisation detector (PID) meter to determine levels of volatile organic compounds (VOCs) in the standpipes during the six return visits. These results are also presented on the gas monitoring records tables in Appendix 2.

Dataloggers were installed in the standpipe in BH 2, both standpipes in BH 5 and the window sample borehole WS 5, on 27th June 2019, following instruction by the Engineer, in order to record potential variations in groundwater level associated with tidal fluctuations within the nearby River Thames. Details are tabulated in Appendix 2. In addition, a Barotroll was installed in borehole WS 7 in order to determine barometric pressures during the monitoring period. The results, which will have been corrected for barometric pressure, will be presented separately.

Foundation Inspection Pits

Three trial pits were undertaken using hand tools on 31st July and 1st August 2019 following careful removal of the existing surfacing. Trial pits TP 101 and TP 102 were excavated alongside the Buxton Memorial and TP 103 was dug beside the Spicer Memorial.

The exposed strata and foundations were logged and the soils sampled by the supervising Geo-environmental Engineer.

In light of the proximity of protected trees, and the likely presence of live tree roots within these excavations, the soils were carefully excavated and tree roots greater than 25mm diameter were recorded/protected. The trial pits were completed at depths between 0.80m and 1.05m below ground level.

Disturbed samples of soil were taken at regular intervals throughout the pits and placed in polycarbonate pots and amber glass jars (ES samples) and plastic bags (D samples).

The trial pit records give descriptions and depths of the various strata encountered, the details of all samples and the groundwater conditions observed during excavation. Sketch sections, plans and photographs of the exposed footings are presented on the pages following the record for each excavation.

Following site inspections by the Engineer, the spoil was returned to the pits and placed in layers, which were recompact, and the surface layers reinstated.

MOLA Boreholes

Three window sample boreholes (MOLA BH 1 to MOLA BH 3), and then four further boreholes (MOLA BH 1A, MOLA BH 1B, MOLA BH 3A and MOLA BH 3B), were undertaken by a standard dynamic sampling rig between 29th and 31st July 2019.

Starter pits were dug to 1.20m below ground level using hand tools, in order to ensure the absence of buried services.

The dynamic/window sampling equipment consisted of 1.00m long drive-in samplers of specially constructed and strengthened 87mm to 57mm diameter steel sample tubes with a plastic core-liner. The samplers were driven into the ground by an automatic trip hammer weighing 63.50kg falling freely through 750mm. Upon extraction a continuous profile of the soil was obtained in the plastic liners (U) inserted in the samplers.

Four of the seven boreholes were abandoned at depths between 1.60m and 2.70m due to obstructions, whilst the successfully relocated boreholes were completed at depths of 6.00m (MOLA BH 1B), 6.70m (MOLA BH 2) and 9.00m (MOLA BH 2B).

The window sample liners were described on site by the supervising Geo-environmental Engineer, and handed over to MOLA for their purposes.

The borehole records give the descriptions and depths of the various strata encountered, the samples taken and the groundwater conditions observed during boring and on completion.

LABORATORY TESTING

The samples were inspected in the laboratory and assessments of the soil characteristics have been taken into account during preparation of the exploratory borehole records. The soil sample descriptions are in accordance with BS5930:2015. The geotechnical and chemical testing schedules were devised by WSP. The testing was completed within UKAS accredited laboratories.

The geotechnical tests were conducted to BS1377:1990 and other relevant industry standards, and the results are presented in Appendix 3. The results of the chemical tests are presented in Appendices 4 (soil), 5 (groundwater) and 6 (sulphates), and are presented within each appendix broadly, but not entirely, in borehole order (BH 1 to BH 5, WS 1 to WS 8).

Geotechnical Testing

The moisture content and index properties of selected soil samples were determined as a guide to soil classification and behaviour. The liquid limit was determined by the cone penetrometer method. At the request of the Engineer a number of these tests were undertaken within 48 hours of sampling.

The organic content of selected soil samples was determined in a muffle furnace using the 'loss on ignition' method. The results are expressed as a percentage of the dry weight.

The particle size distributions of selected samples were obtained by sieve analysis. The particle size distribution passing the 63 μ m sieve was obtained for selected samples using a hydrometer. Results of these tests are given as particle size distribution curves at the end of this report. Where sieve analysis and sedimentation were carried out on the same sample the results are presented as a single combined distribution curve.

Test specimens were prepared at full diameter from the thin wall undisturbed samples from the cable percussive boreholes, and where possible from sub-samples taken from the window sample liners. Immediate undrained triaxial compression tests were made on each

sample at full diameter and at the instructed cell pressures. The moisture content and bulk densities of the specimens were also determined.

An indication of the settlement characteristics of selected samples were obtained from tests in the consolidation apparatus or oedometer. Each test was performed on a 75mm diameter sample, about 19mm thick, contained in a steel ring. The sample was saturated and the swelling pressure balanced prior to applying a constant load with drainage at both ends. When primary compression was complete, the load was increased and this repeated for several increments of load, as instructed by the Engineer. The sample was then unloaded in two stages. The rate and total amount of consolidation were continually monitored using a computer controlled E.L.E. Datasystem 7 Unit. The results were plotted and analysed by the computer for each increment of load to obtain the coefficients of compressibility (m_v), and of consolidation (c_v), which govern the amount and rate of settlement, respectively.

Samples of groundwater recovered from the boreholes during drilling were analysed to determine the concentration of soluble sulphates. The pH values were also determined using an electrometric method.

Chemical Testing

A number of soil samples recovered from the exploratory holes were tested for total concentrations of arsenic, boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, pH, soluble sulphate, organic matter, speciated total petroleum hydrocarbons (TPH) Criteria Working Group (CWG), speciated polyaromatic hydrocarbons (PAH), total and monohydric phenols, and free/total/complex cyanides. These samples were also screened for the presence/absence of asbestos containing material (ACM). Where asbestos was found it was identified by the analysing chemist using optical microscopy and, where appropriate, quantified (Appendix 4). Some of these soil samples were also tested for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

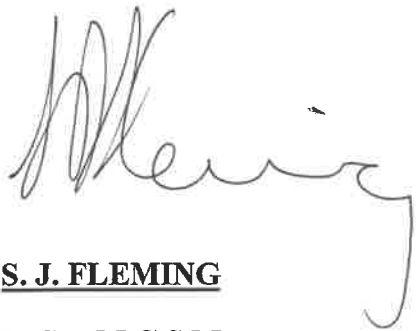
Leachates were derived from a number of these soil samples, and tests for a similar suite of contaminants was then undertaken on the resultant leachate (Appendix 4).

Selected samples of soil were also scheduled for a full Waste Acceptance Criteria (WAC) CEN Leachate Suite at 10l/kg (Appendix 4).

Water samples recovered from eight standpipes on 29th May and 4th June 2019, were tested for a similar suite of metals, compounds and hydrocarbons as detailed above for the soil samples. In addition, alkalinity, hardness, and concentrations of ammonium as nitrogen, complex and free cyanides (low level), calcium ions, and VOCs were also determined for these sets of water samples (Appendix 5).

Selected samples of soil were analysed to determine the concentration of soluble sulphates, total sulphur and acid soluble sulphate. The pH values were also determined using an electrometric method (Appendix 6).

GROUND ENGINEERING LIMITED



S. J. FLEMING

M.Sc., M.C.S.M.,

C.Geol., F.G.S.,

Director



J. E. M. DAVIES

B.Sc.(Hons.), M.Sc.,

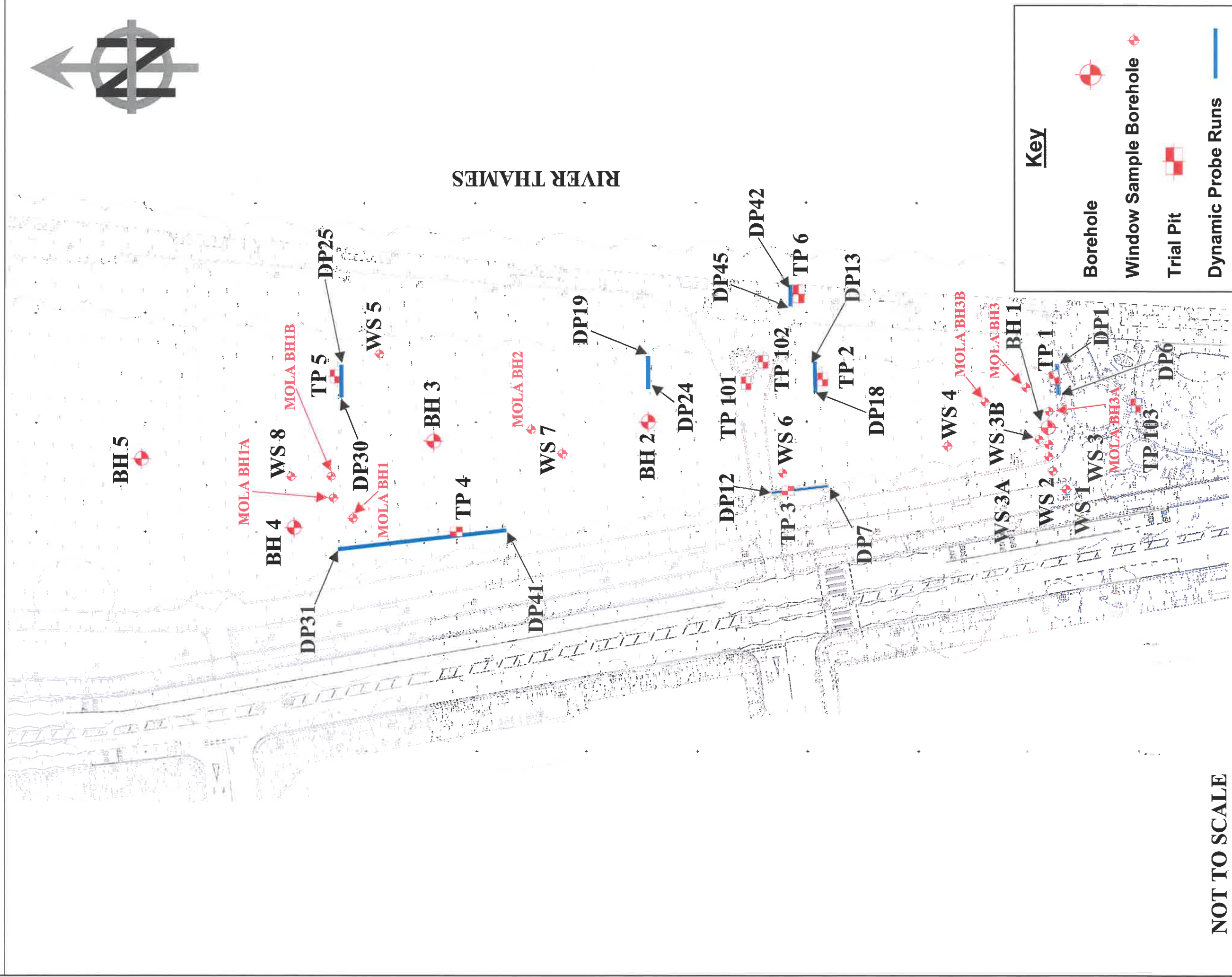
C.Geol., F.G.S.,

Senior Geotechnical Engineer

EXPLORATORY HOLE LOCATION PLAN
& CO-ORDINATES/ELEVATION

Exploratory Hole Location Plan

Based on a topographical survey plan provided by the Client



NOT TO SCALE

Project: NHM, Victoria Tower Gardens, London SW1	Project No.
Client: WSP	C14757
GROUND ENGINEERING LIMITED	
Peterborough Tel : 01733 566566	

PROJECT TITLE**NHM, VICTORIA TOWER GARDENS
LONDON SW1****JOB NUMBER****C14757**

	E	N	L (mOD)
BH1	530259	179077	5.03
BH2	530260	179148	4.54
BH3	530256	179188	4.51
BH4	530240	179213	4.40
BH5	530253	179240	4.54
WS1	530248	179073	5.21
WS2	530251	179075	4.95
WS3	530256	179076	5.04
WS3A	530253	179075	5.03
WS3B	530257	179077	5.00
WS4	530255	179094	4.79
WS5	530272	179197	4.37
WS6	530250	179124	4.69
WS7	530253	179164	4.47
WS8	530250	179214	4.50
TP1	530268	179075	4.80
TP2	530268	179117	4.67
TP3	530247	179124	4.70
TP4	530240	179184	4.65
TP5	530268	179205	4.43
TP6	530284	179121	4.60
DP1	530270	179074	4.68
DP2	530269	179074	4.72
DP3	530268	179074	4.78
DP4	530267	179074	4.78
DP5	530266	179074	4.80
DP5A	530266	179074	4.81

PROJECT TITLE**NHM, VICTORIA TOWER GARDENS****LONDON SW1****JOB NUMBER****C14757**

	E	N	L (mOD)
DP5B	530265	179075	4.84
DP6	530265	179074	4.82
DP7	530248	179116	4.79
DP8	530248	179118	4.79
DP9	530248	179120	4.80
DP10	530248	179122	4.80
DP11	530247	179124	4.70
DP12	530247	179126	4.56
DP13	530271	179118	4.59
DP14	530270	179118	4.60
DP15	530269	179118	4.67
DP16	530268	179118	4.67
DP17	530267	179118	4.69
DP18	530266	179118	4.71
DP19	530270	179149	4.49
DP20	530269	179149	4.51
DP21	530268	179148	4.53
DP22	530267	179148	4.55
DP23	530270	179149	4.50
DP24	530268	179148	4.53
DP25	530270	179205	4.41
DP26	530269	179205	4.43
DP27	530268	179205	4.43
DP28	530267	179205	4.45
DP29	530266	179205	4.47
DP30	530265	179205	4.48
DP31	530237	179204	4.57
DP32	530237	179201	4.59
DP33	530237	179198	4.58
DP34	530237	179195	4.61

PROJECT TITLE **NHM, VICTORIA TOWER GARDENS**
JOB NUMBER **LONDON SW1**
C14757

	E	N	L (mOD)
DP35	530238	179192	4.63
DP36	530238	179190	4.65
DP37	530239	179187	4.66
DP38	530239	179184	4.65
DP39	530239	179181	4.61
DP40	530240	179178	4.54
DP41	530240	179175	4.48
DP42	530284	179122	4.60
DP43	530284	179122	4.58
DP44	530283	179122	4.55
DP44A	530283	179122	4.52
DP45	530282	179122	4.48

Points on former river wall in trial pits/interpreted from probing

	E	N
TP 1 front face of former river wall	530268	179075
TP 1 front face of former river wall recess	530268	179075
TP 2 front face of former river wall	530269	179117
TP 5 front face of former river wall	530269	179205
Interpreted front face of former river wall between DP 20 and DP 23	530270	179149

PROJECT TITLE

**NHM, VICTORIA TOWER GARDENS
LONDON SW1**

JOB NUMBER

C14757

	E	N	L (mOD)
MOLA BH 1	530243	179202	4.58
MOLA BH 1A	530247	179207	4.54
MOLA BH 1B	530255	179208	4.55
MOLA BH 2	530259	179079	4.54
MOLA BH 3	530265	179079	4.93
MOLA BH 3A	530260	179076	5.01
MOLA BH 3B	530257	179089	4.76
TP 101	530268	179131	4.50
TP 102	530271	179128	4.50
TP 103	530263	179061	4.92

APPENDIX 1

EXPLORATORY HOLE RECORDS

GROUND ENGINEERING

L I M I T E D
Tel: 01733-566566
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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

BOREHOLE BH1

Date: 13/05/19 to 14/05/19

Hole Size: 150mm dia to 25.00m

530259 mE 179077 mN
Ground Level: 5.03m. O.D.

Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows	Casing					
10.20-10.70 10.35-10.65	B17 C	N15	10.20		Medium dense, grey and brown, silty SAND AND GRAVEL. Gravel of angular to rounded flint, and occasional quartzite and quartz. (KEMPTON PARK GRAVEL)		10.00	-4.97
11.50-11.70 11.65-11.95 11.70-12.00	B18 C B19	N15	11.50		Stiff, closely fissured, grey brown CLAY with rare light brown silt partings.		11.70	-6.67
12.70-13.10 13.10	U2 D3	60	12.00		(LONDON CLAY)		16.00	-10.97
14.00	D4							
14.50-15.00 14.65-14.95 14.95	B20 S D5	N28	12.00					
16.00-16.45 16.45	U3 D6	75	12.00 $\frac{3}{2}$					
17.00 17.50-18.00 17.65-17.95 17.95	D7 B21 S D8	N31	12.00		Stiff, locally very stiff, fissured, grey brown, silty CLAY with closely spaced light brown silt partings, and rare fossil shell debris.		20.00	-14.97
19.00-19.45 19.45	U4 D9	75	12.00		(LONDON CLAY)			
20.00	D10							

REMARKS 7. Gas monitoring standpipe installed to 11.70m depth

Project No
14757

Scale 1:50
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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
Water Strike
Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test
Cohesion () kPa
Level on completion
Level casing withdrawn
Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water	
					29/05/19	11.70	8.70	6.78	
					29/05/19	24.00	23.00	7.94	
					04/06/19	11.70	8.70	6.87	
					04/06/19	24.00	23.00	7.78	
					07/06/19	11.70	8.70	6.92	

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

BOREHOLE BH1

Date: **13/05/19**
to **14/05/19**

Hole Size: 150mm dia to 25.00m

530259 mE 179077 mN
Ground Level: **5.03m. O.D.**

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
20.50-21.00	B22		12.00		Very stiff, closely fissured, grey brown CLAY with rare light brown silt partings.		20.00	-14.97
20.65-20.95	S	N33						
20.95	D11							
22.00-22.45	U5	75	12.00		(LONDON CLAY)			
22.45	D12							
23.30-23.80	B23		12.00					
23.45-23.75	S	N41						
23.75	D13							
24.60-25.00	U6	80	12.00					
25.00	D14							
					Borehole completed at 25.00m depth		25.00	-19.97

REMARKS

Project No
14757

Scale
1:50

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KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▽ Water Rise

N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test
Cohesion () kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes

Depth m					
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Depth m		
	Hole	Casing	Water
07/06/19	24.00	23.00	7.72
11/06/19	11.70	8.70	6.86
11/06/19	24.00	23.00	7.65
14/06/19	11.70	8.70	6.78
14/06/19	24.00	23.00	7.58

Borehole Number	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows/ Penetration (mm)	Test Drive: 300mm Blows for each successive 75 mm Penetration				N Value	Extra-polated Value
BH1	1.20 - 1.65			C	2/150	2	2	2	2	8	
	2.20 - 2.65	2.20		C	20/150	17	14	13	5	49	
	3.30 - 3.75	3.00		C	4/150	2	2	3	2	9	
	4.00 - 4.45	4.00		C	1/150	2	0	0	0	2	
	5.00 - 5.45	4.50		C	1/150	1	0	1	0	2	
	6.00 - 6.45	6.00		S	2/150	1	1	2	1	5	
	7.30 - 7.75	7.30		S	3/150	1	1	1	2	5	
	10.20 - 10.65	10.20	6.90	C	6/150	4	3	4	4	15	
	11.50 - 11.95	11.50	6.80	C	3/150	4	3	3	5	15	
	14.50 - 14.95	12.00		S	7/150	5	6	7	10	28	
	17.50 - 17.95	12.00		S	7/150	5	7	9	10	31	
	20.50 - 20.95	12.00		S	7/150	6	7	9	11	33	
	23.30 - 23.75	12.00		S	7/150	7	10	11	13	41	

* C denotes test using a solid cone
S denotes test using a split barrel sampler

Results of Standard/Cone Penetration Tests

14757

Table No

NHM, VICTORIA TOWER GARDENS, LONDON SW1

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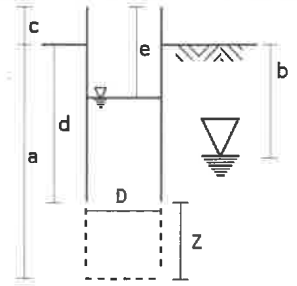
Site NHM, VICTORIA TOWER GARDENS, LONDON SW1

Client WSP

Date 13/05/19 Type of Test Falling Head

Level
mOD

Depth of borehole during test, a : 9.00 m
 Depth to equilibrium watertable, b : 7.30 m Measured
 Height of casing above ground level, c : 0.30 m
 Depth of casing below ground level, d : 8.70 m
 Length of response zone, Z : 0.30 m
 Diameter of response zone, D : 0.15 m
 Intake factor, F : 1.3057
 (From Condition D of fig. 7 BS5930:1981)



PERMEABILITY(after Hvorslev 1951)

Basic Time Lag Approach

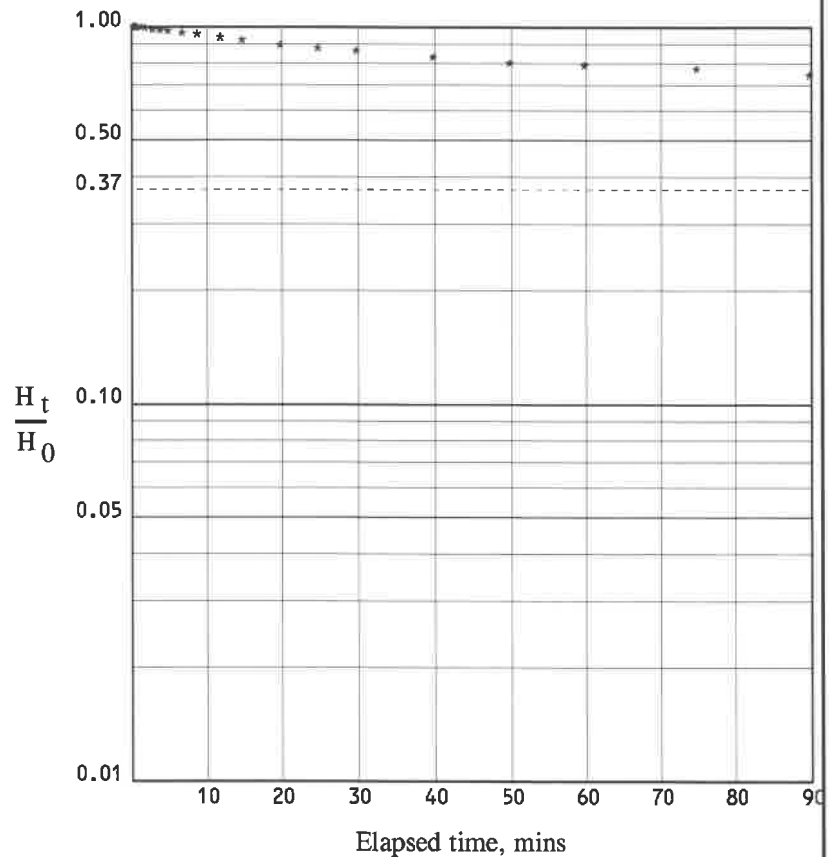
Plot log $\frac{H_t}{H_0}$ v t *-----*

then $k = \frac{A}{60FT} \text{ m/s}$

$k = 1.02E-6 \text{ m/s}$

Soil Type at test level
 Grey/brown SAND AND GRAVEL

Elapsed time, t mins	Depth to water, e m	Head of water, H m	Ht/Ho
0.50	0.05	7.55	1.000
0.75	0.09	7.51	0.995
1.00	0.09	7.51	0.995
1.50	0.10	7.50	0.993
2.00	0.12	7.48	0.991
3.00	0.20	7.40	0.980
4.00	0.23	7.37	0.976
5.00	0.28	7.32	0.970
7.00	0.34	7.26	0.962
9.00	0.42	7.18	0.951
12.00	0.56	7.04	0.932
15.00	0.65	6.95	0.921
20.00	0.86	6.74	0.893
25.00	1.00	6.60	0.874
30.00	1.10	6.50	0.861
40.00	1.35	6.25	0.828
50.00	1.56	6.04	0.800
60.00	1.66	5.94	0.787
75.00	1.78	5.82	0.771
90.00	1.99	5.61	0.743



REMARKS: Measured water level, prior to test = 7.30m

14757

In-Situ Permeability Test

Bh No
BH1.

Fig No

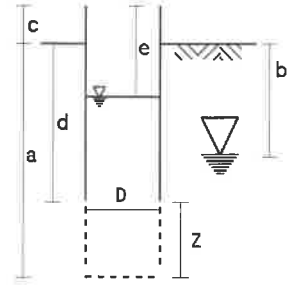
Site NHM, VICTORIA TOWER GARDENS, LONDON SW1

Client WSP

Date 14/05/19 Type of Test Falling Head

Level
MOD

Depth of borehole during test, a : 10.00 m
 Depth to equilibrium watertable, b : 7.30 m Measured
 Height of casing above ground level, c : 0.40 m
 Depth of casing below ground level, d : 10.00 m
 Length of response zone, Z : 0.00 m
 Diameter of response zone, D : 0.15 m
 Intake factor, F : 0.4125
 (From Condition B of fig. 7 BS5930:1981)



PERMEABILITY(after Hvorslev 1951)

Basic Time Lag Approach

Plot log $\frac{H_t}{H_0}$ v t *-----*

then

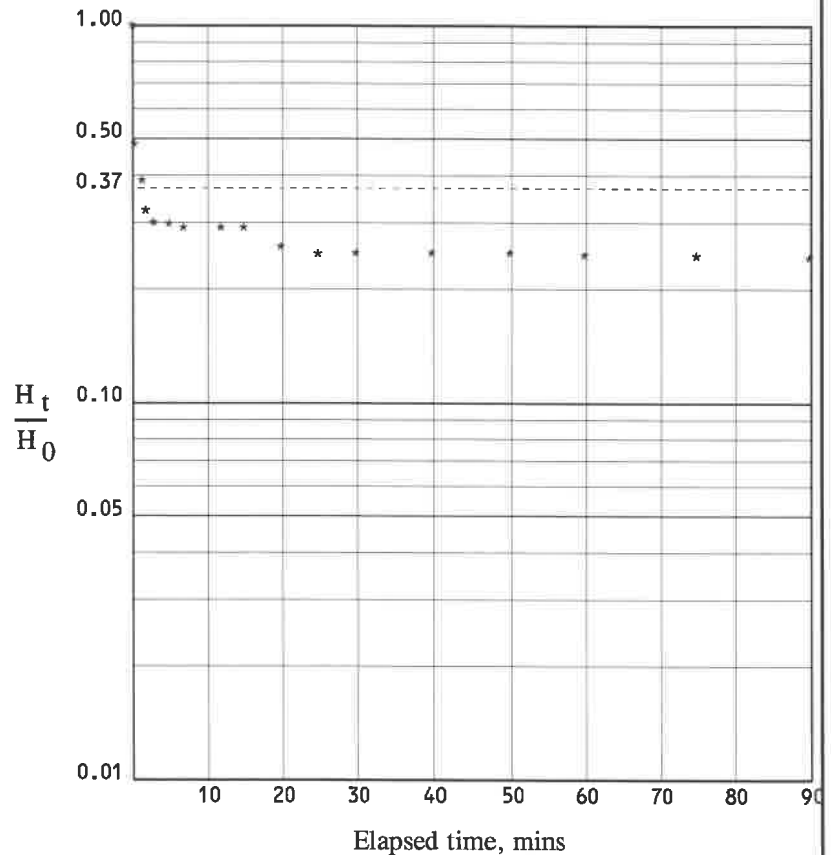
$$k = \frac{A}{60FT} \text{ m/s}$$

Soil Type at test level

Grey/brown SAND AND GRAVEL

$k = 4.08E-4 \text{ m/s}$

Elapsed time, t mins	Depth to water, e m	Head of water, H m	Ht/Ho
0.17	4.60	3.10	1.000
0.50	6.20	1.50	0.484
1.50	6.50	1.20	0.387
2.00	6.70	1.00	0.323
3.00	6.77	0.93	0.300
5.00	6.78	0.92	0.297
7.00	6.80	0.90	0.290
12.00	6.80	0.90	0.290
15.00	6.80	0.90	0.290
20.00	6.90	0.80	0.258
25.00	6.93	0.77	0.248
30.00	6.93	0.77	0.248
40.00	6.93	0.77	0.248
50.00	6.93	0.77	0.248
60.00	6.94	0.76	0.245
75.00	6.94	0.76	0.245
90.00	6.95	0.75	0.242



REMARKS: Measured water level, prior to test = 7.30m

14757

In-Situ Permeability Test

Bh No

Fig No

BH1

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NHM - Borehole BH 1

Sample	Depth (m)	PID (ppm)
B1	0.00-0.70	0.8
B2	0.70-1.20	0.4
B3	1.20-1.50	0.3
B4	1.50-2.00	1.0
B5	2.20-2.70	1.3
B6	2.70-3.20	1.1
B7	3.30-4.00	0.7
B8	4.00-5.00	0.3
B9	5.00-5.70	0.2
B10	5.70-6.00	0.3
B11	6.00-6.50	0.3
B12	6.50-7.00	0.1

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

BOREHOLE BH2

Date: **07/05/19 to 09/05/19**

Hole Size: 150mm dia to 35.00m

530260 mE 179148 mN
Ground Level: **4.54m O.D.**

Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows	Casing					
10.20-10.50	B18	N17	10.20		Medium dense, grey and brown, slightly silty SAND AND GRAVEL. Gravel of angular to rounded flint, and occasional quartzite and quartz. (KEMPTON PARK GRAVEL)		10.00	-5.46
10.35-10.65	C						10.50	-5.96
10.50-10.80	B19							
11.40-11.80	U2	N21	11.00		Stiff, closely fissured, locally to firm, grey brown CLAY. (LONDON CLAY)			
11.80	D2							
12.50	D3							
13.00-13.50	B20							
13.15-13.45	S							
13.45	D4							
14.50-14.95	U3							
14.95	D5							
15.50	D6							
16.00-16.50	B21						N26	11.00
16.15-16.45	S							
16.45	D7							
17.50-17.95	U4	55	11.00					
17.95	D8							
18.50	D9							
19.00-19.50	B22	N27	11.00		Stiff, grey brown, slightly sandy, silty CLAY with closely spaced light brown silt partings. (LONDON CLAY)		19.00	-14.46
19.15-19.45	S							
19.45	D10							
							20.00	-15.46

REMARKS

Project No
14757

Scale 1:50
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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
Water Strike
Water Rise

N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test
Cohesion () kPa
Level on completion
Level casing withdrawn
Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						22/05/19	10.50	7.50	6.38
						22/05/19	34.00	33.00	19.02
						29/05/19	10.50	7.50	6.33
						29/05/19	34.00	33.00	18.80
						04/06/19	10.50	7.50	6.43

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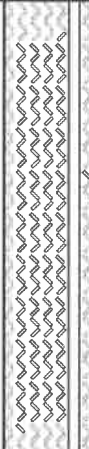

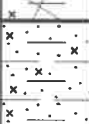
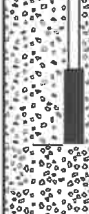
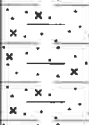





Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

BOREHOLE BH2

Date: **07/05/19 to 09/05/19**

Hole Size: 150mm dia to 35.00m

530260 mE 179148 mN
Ground Level: **4.54m. O.D.**

Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows	Casing					
30.40	D20				Very stiff, fissured, grey brown, silty CLAY. (LONDON CLAY)		30.00	-25.46
31.00	D21				Very stiff, grey brown, slightly sandy, silty CLAY with some light brown silt pockets.		31.00	-26.46
31.50-32.00	B27							
31.65-31.95	S	N47	11.00					
31.95	D22							
33.00-33.35	U9	80	11.00		(LONDON CLAY)			
33.35	D23							
34.00	D24							
34.50-35.00	B28							
34.65-34.95	S	N53	11.00					
35.00	D25						35.00	-30.46
Borehole completed at 35.00m depth								

REMARKS

Project No
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Scale
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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
✓ - Water Strike
✗ - Water Rise

N* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test
Cohesion () kPa
✓c Level on completion
c.✗w Level casing withdrawn
✗s Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						14/06/19	10.50	7.50	6.35
						14/06/19	34.00	33.00	18.60

Borehole Number	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows/ Penetration (mm)	Test Drive: 300mm Blows for each successive 75 mm Penetration				N Value	Extra-polated Value
BH2	1.20 - 1.65			C	3/150	2	2	1	2	7	
	2.00 - 2.45	1.50		C	4/150	3	4	4	4	15	
	3.00 - 3.45	3.00		C	3/150	2	3	3	3	11	
	4.00 - 4.45	3.00		C	3/150	2	1	1	1	5	
	6.00 - 6.45	6.00	5.50	C	3/150	3	2	4	6	15	
	7.00 - 7.45	7.00	5.70	C	4/150	5	5	6	8	24	
	8.20 - 8.65	8.20	6.00	C	7/150	4	4	7	8	23	
	9.00 - 9.45	9.00	6.00	C	6/150	4	5	7	8	24	
	10.20 - 10.65	10.20	6.90	C	4/150	3	3	4	7	17	
	13.00 - 13.45	11.00		S	5/150	4	4	6	7	21	
	16.00 - 16.45	11.00		S	5/150	5	5	7	9	26	
	19.00 - 19.45	11.00		S	6/150	5	5	8	9	27	
	22.00 - 22.45	11.00		S	7/150	6	6	8	9	29	
	25.50 - 25.95	11.00		S	7/150	6	7	7	8	28	
	28.50 - 28.95	11.00		S	10/150	8	8	9	13	38	
	31.50 - 31.95	11.00		S	12/150	12	10	12	13	47	
	34.50 - 34.95	11.00		S	13/150	10	12	15	16	53	

* C denotes test using a solid cone
S denotes test using a split barrel sampler

Results of Standard/Cone Penetration Tests

14757

Table No

NHM, VICTORIA TOWER GARDENS, LONDON SW1

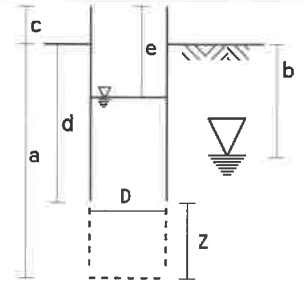
Site NATIONAL HOLOCAUST MEMORIAL, VICTORIA TOWER GARDENS, LONDON SW1

Client WSP

Date 07/05/19 Type of Test Falling Head

Level
mOD

Depth of borehole during test, a : 7.70 m
 Depth to equilibrium watertable, b : 6.00 m Measured
 Height of casing above ground level, c : 0.30 m
 Depth of casing below ground level, d : 7.20 m
 Length of response zone, Z : 0.50 m
 Diameter of response zone, D : 0.15 m
 Intake factor, F : 1.6372
 (From Condition D of fig. 7 BS5930:1981)



PERMEABILITY(after Hvorslev 1951)

Basic Time Lag Approach

Plot $\log \frac{H_t}{H_0}$ v t *-----*

then

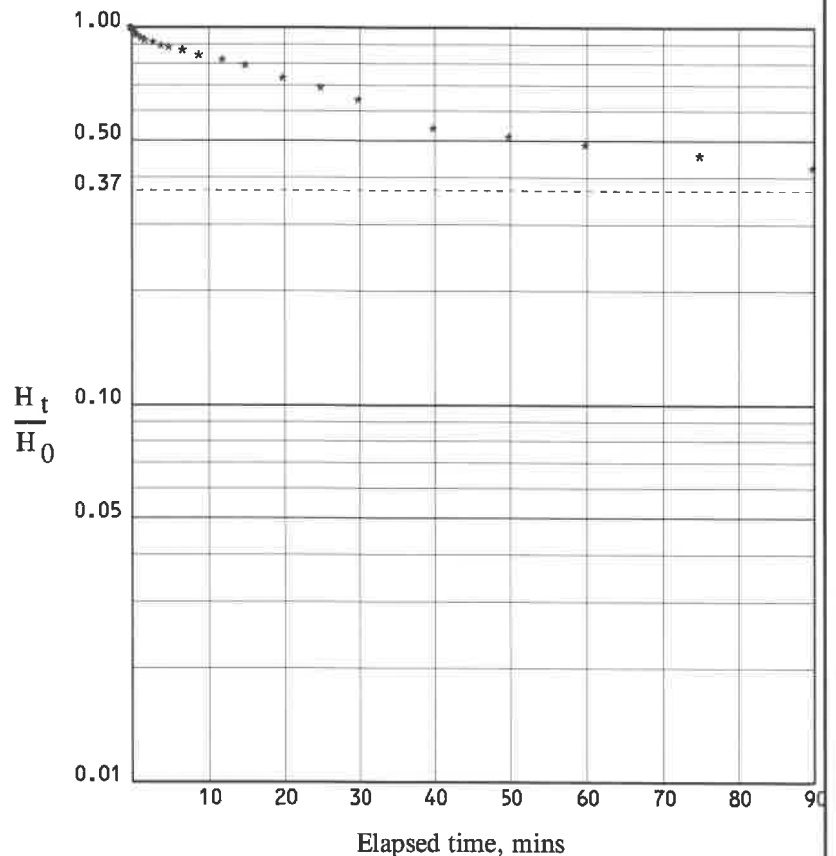
$$k = \frac{A}{60FT} \text{ m/s}$$

Soil Type at test level

Grey SAND AND GRAVEL

$k = 1.84E-6 \text{ m/s}$

Elapsed time, t mins	Depth to water, e m	Head of water, H m	Ht/Ho
0.00	0.15	6.15	1.000
0.20	0.20	6.10	0.992
0.50	0.30	6.00	0.976
0.75	0.39	5.91	0.961
1.00	0.47	5.83	0.948
1.50	0.56	5.74	0.933
2.00	0.62	5.68	0.924
3.00	0.70	5.60	0.911
4.00	0.81	5.49	0.893
5.00	0.88	5.43	0.883
7.00	0.97	5.33	0.867
9.00	1.12	5.18	0.842
12.00	1.27	5.03	0.818
15.00	1.44	4.86	0.790
20.00	1.81	4.49	0.730
25.00	2.06	4.24	0.689
30.00	2.36	3.94	0.641
40.00	3.00	3.30	0.537
50.00	3.16	3.14	0.511
60.00	3.32	2.98	0.485
75.00	3.50	2.80	0.455
90.00	3.71	2.59	0.421



REMARKS: Measured water level, prior to test = 6.00m

14757

In-Situ Permeability Test

Bh No

Fig No

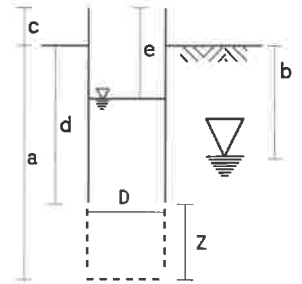
BH2

Site NATIONAL HOLOCAUST MEMORIAL, VICTORIA TOWER GARDENS, LONDON SW1

Client WSP

Date 08/05/19 Type of Test Falling Head Level MOD

Depth of borehole during test, a : 9.00 m
 Depth to equilibrium watertable, b : 6.30 m Measured
 Height of casing above ground level, c : 0.40 m
 Depth of casing below ground level, d : 8.60 m
 Length of response zone, Z : 0.40 m
 Diameter of response zone, D : 0.15 m
 Intake factor, F : 1.472
 (From Condition D of fig. 7 BS5930:1981)



PERMEABILITY(after Hvorslev 1951)

Basic Time Lag Approach

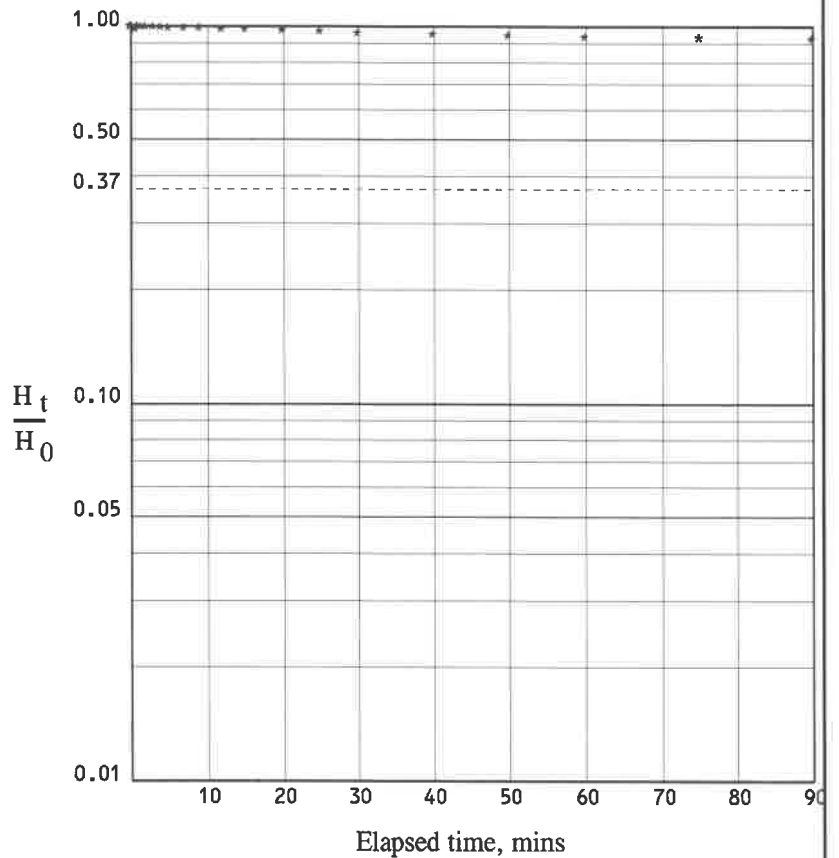
Plot log $\frac{H_t}{H_0}$ v t *-----*

then
 $k = \frac{A}{60FT} \text{ m/s}$

$k = 2.66E-7 \text{ m/s}$

Soil Type at test level
 Grey SAND AND GRAVEL

Elapsed time, t mins	Depth to water, e m	Head of water, H m	Ht/Ho
0.00	0.00	6.70	1.000
0.20	0.01	6.69	0.999
0.75	0.15	6.55	0.978
1.00	0.02	6.68	0.997
1.40	0.04	6.66	0.994
2.00	0.04	6.66	0.994
3.00	0.05	6.65	0.993
4.00	0.07	6.63	0.990
5.00	0.09	6.61	0.987
7.00	0.10	6.60	0.985
9.00	0.10	6.60	0.985
12.00	0.13	6.57	0.981
15.00	0.15	6.55	0.978
20.00	0.20	6.50	0.970
25.00	0.23	6.47	0.966
30.00	0.30	6.40	0.955
40.00	0.35	6.35	0.948
50.00	0.40	6.30	0.940
60.00	0.45	6.25	0.933
75.00	0.47	6.23	0.930
90.00	0.52	6.18	0.922



REMARKS: Measured water level, prior to test = 6.30m

14757

In-Situ Permeability Test

Bh No
 BH2.

Fig No

NHM - Borehole BH 2

Sample	Depth (m)	PID (ppm)
ES1	0.10	<0.1
ES2	0.40	<0.1
ES3	0.70	0.6
ES4	1.00	0.4
ES5	1.30	0.1
ES6	1.80	0.5
ES7	2.30	1.4
ES8	2.80	1.2
ES9	3.30	1.0
ES10	3.80	0.9
ES11	4.20	0.3
ES12	4.70	0.8

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				BOREHOLE BH3		
Samples and in-situ Tests			Date: 10/05/19	Hole Size: 150mm dia to 3.00m			530256 mE 179188 mN Ground Level: 4.51m. O.D.		
Depth m	Type	Blows	(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m	
0.00-0.40	B1				MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded flint, brick, ash, concrete and tile.		0.40	4.11	
0.20	D1								
0.40-0.80	B2				MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of brick, flint, concrete, mortar, shells, quartzite and smoker's clay pipe.		1.20	3.31	
0.60	D2								
0.80-1.20	B3				MADE GROUND - Firm, brown and dark brown mottled, slightly gravelly, silty CLAY with occasional light brown sand pockets. Gravel of angular to rounded brick, ash, mortar, flint, concrete and slate.		1.50	3.01	
1.00	D3								
1.20-1.50	B4	N8			MADE GROUND - Brown and dark grey, silty, sandy GRAVEL with occasional cobble size pockets of clay. Gravel of angular to rounded brick, flint, mortar, concrete and clinker.		2.00	2.51	
1.35-1.65	C								
1.50-1.70	B5				MADE GROUND - Recovered as red brown, silty, sandy GRAVEL of brick and mortar - suspected buried brick wall.		2.80	1.71	
1.50	D4								
1.80-2.10	B6				MADE GROUND - CONCRETE - suspected foundation.		3.00	1.51	
1.90	D5								
2.10-2.60	B7		2.10						
2.10	D6								
2.25-2.37	C	50*							
2.50	D7								
2.60-2.90	B8								
3.10	ES8								
3.02-3.03	C	50*	3.00		Borehole abandoned at 3.00m depth				

REMARKS 1. Excavating a pit from 0.00m to 1.20m for 1 hour 2. Borehole cased to 3.00m depth 3. Chiselling from 1.80m to 3.00m for 3 hours 4. Borehole abandoned on suspected foundation, following instruction from Engineer 5. Borehole backfilled with bentonite, and surface layers reinstated	Project No 14757	
	Scale 1:50	Page 1/1

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample S/C - SPT Spoon/Cone ∇ - Water Strike ∇ - Water Rise	N/* - SPT Blows for 0.3m or given penetration ES - Environmental Sample V - Vane Shear Test Cohesion () kPa ∇c Level on completion c∇w Level casing withdrawn ∇s Standpipe Level	Groundwater Strikes					Groundwater Observations			
		Depth m					Date	Depth m		
		No Struck	Rose to	Rate	Cased	Sealed		Hole	Casing	Water
						10/05/19	3.00	3.00	dry	
						10/05/19	3.00	0.00	dry	

Borehole Number	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows/ Penetration (mm)	Test Drive: 300mm Blows for each successive 75 mm Penetration				N Value	Extra-polated Value
BH3	1.20 - 1.65			C	2/150	2	2	2	2	8	
	2.10 - 2.37	2.10		C	40/150	30	20/40				
	3.00 - 3.03	3.00		C	25/15	50/15					

* C denotes test using a solid cone
S denotes test using a split barrel sampler

Results of Standard/Cone Penetration Tests

14757

Table No

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NHM, VICTORIA TOWER GARDENS, LONDON SW1

NHM - Borehole BH 3

Sample	Depth (m)	PID (ppm)
ES1	0.20	<0.1
ES2	0.60	1.0
ES3	1.00	0.7
ES4	1.50	<0.1
ES5	1.90	0.9
ES6	2.10	<0.1
ES7	2.50	2.5
ES8	3.10	3.1

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				BOREHOLE BH4		
Date: 30/04/19 to 03/05/19			Hole Size: 150mm dia to 42.70m				530240 mE 179213 mN Ground Level: 4.40m. O.D.		
Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Blows	Casing						
10.00 10.15-10.45	W1 C	N15	10.00		Medium dense, light brown, slightly silty, sandy GRAVEL. Gravel of angular to rounded flint, and occasional quartzite and quartz. (KEMPTON PARK GRAVEL)		10.00	-5.60	
11.30-11.80 11.45-11.75	B17 S	N20	11.30		Stiff, closely fissured, locally to firm, grey brown CLAY with occasional light brown silt partings. Cobble size nodule of medium strong, grey, concretionary limestone at 12.40m depth.		11.20	-6.80	
12.00	D1								
12.40-12.60 12.40-12.50 12.50	B18 U1 D2	80	11.50 $\frac{2}{\sphericalangle}$						
13.50-14.00 13.65-13.95 13.95	B19 S D3	N20	11.50		(LONDON CLAY)				
14.50	D4								
15.00-15.45 15.45	U2 D5	65	11.50						
16.00	D6						16.00	-11.60	
16.50-17.00 16.65-16.95 16.95	B20 S D7	N33	11.50		Very stiff, fissured, grey brown, silty CLAY with closely spaced light brown silt partings, and rare fossil shell debris. (LONDON CLAY)		17.00	-12.60	
18.00-18.45 18.45	U3 D8	65	11.50		Very stiff, closely fissured, locally to stiff, grey brown CLAY.				
19.00	D9								
19.50-20.00 19.65-19.95 19.95	B21 S D10	N38	11.50		(LONDON CLAY)		20.00	-15.60	
REMARKS							Project No 14757		
							Scale 1:50	Page 2/5	
KEY			Groundwater Strikes			Groundwater Observations			
N/* - SPT Blows for 0.3m or given penetration			Depth m			Date			
D - Disturbed Sample			No	Struck	Rose to	Rate	Cased	Sealed	
B - Bulk Sample						Hole			
U - Undisturbed Sample						Casing			
W - Water Sample						Water			
S/C - SPT Spoon/Cone									
\sphericalangle Level on completion									
\sphericalangle Water Strike									
\sphericalangle Water Rise									
ES - Environmental Sample									
V - Vane Shear Test									
Cohesion () kPa									
\sphericalangle c Level on completion									
c \sphericalangle w Level casing withdrawn									
\sphericalangle s Standpipe Level									
						03/05/19 37.00 11.50 30.00			
						03/05/19 42.70 11.50 38.50			
						22/05/19 11.00 8.00 6.26			
						22/05/19 42.50 41.00 16.62			
						29/05/19 11.00 8.00 6.22			

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

BOREHOLE BH4

Date: **30/04/19**
to **03/05/19**

Hole Size: 150mm dia to 42.70m

530240 mE 179213 mN
Ground Level: **4.40m. O.D.**

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m		
Depth m	Type	Blows								
21.00-21.40	U4	70	11.50		Very stiff, closely fissured, locally to stiff, grey brown CLAY with rare light brown silt partings.		20.00	-15.60		
21.40	D11				(LONDON CLAY)					
22.00	D12				11.50		Very stiff, fissured, grey brown, silty CLAY with closely spaced light brown silt partings.		22.00	-17.60
22.60-23.10 22.75-23.05	B22 S	N45					(LONDON CLAY)			
23.05	D13				11.50		Very stiff, closely fissured to stiff, grey brown CLAY with rare light brown silt partings.		24.00	-19.60
24.00-24.45	U5	70					(LONDON CLAY)			
24.45	D14				11.50		Very stiff, closely fissured, grey brown, silty CLAY with closely spaced light brown silt partings. Cobble size nodule of medium strong, grey, concretionary limestone at 26.20m depth.		25.00	-20.60
25.00	D15						(LONDON CLAY)			
25.50-26.00	B23				11.50		Very stiff, very closely fissured, grey brown CLAY. Cobble size nodules of medium strong, grey, concretionary limestone at 28.60m and 29.50m depth.		27.00	-22.60
25.65-25.95	S	N43					(LONDON CLAY)			
25.95	D16				11.50				30.00	-25.60
27.00-27.40	U6	75					(LONDON CLAY)			
27.40	D17				11.50				30.00	-25.60
28.00	D18						(LONDON CLAY)			
28.50-29.00	B24				11.50				30.00	-25.60
28.65-28.95	S	N58					(LONDON CLAY)			
28.95	D19		11.50				30.00	-25.60		
29.50-29.60	B25				(LONDON CLAY)					
30.00-30.20	B26		11.50				30.00	-25.60		

REMARKS

Project No
14757

Scale 1:50
Page 3/5

KEY		N/* - SPT Blows for 0.3m or given penetration	
D - Disturbed Sample		ES - Environmental Sample	
B - Bulk Sample		V - Vane Shear Test	
U - Undisturbed Sample		Cohesion () kPa	
W - Water Sample		Level on completion	
S/C - SPT Spoon/Cone		Level casing withdrawn	
	Water Strike		Standpipe Level
	Water Rise		

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						29/05/19	42.50	41.00	12.47
						04/06/19	11.00	8.00	6.28
						04/06/19	42.50	41.00	11.40
						07/06/19	11.00	8.00	6.35
						07/06/19	42.50	41.00	11.50

Borehole Number	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows/ Penetration (mm)	Test Drive: 300mm Blows for each successive 75 mm Penetration				N Value	Extra-polated Value
BH4	1.20 - 1.65			C	3/150	1	2	2	2	7	
	2.00 - 2.45	1.50		C	3/150	2	3	4	6	15	
	2.80 - 3.25	2.80		C	11/150	7	9	7	10	33	
	4.00 - 4.45	4.00		C	3/150	2	3	2	2	9	
	4.80 - 5.25	4.50		C	3/150	2	2	2	2	8	
	5.70 - 6.15	4.50		C	11/150	9	7	8	7	31	
	7.00 - 7.45	7.00	6.50	C	8/150	7	8	9	9	33	
	8.00 - 8.45	8.00	6.50	C	7/150	6	7	8	8	29	
	9.10 - 9.55	9.00	6.00	C	6/150	8	7	5	5	25	
	10.00 - 10.45	10.00	7.00	C	3/150	3	4	4	4	15	
	11.30 - 11.75	11.30		S	4/150	4	5	5	6	20	
	13.50 - 13.95	11.50		S	4/150	4	4	6	6	20	
	16.50 - 16.95	11.50		S	7/150	6	8	9	10	33	
	19.50 - 19.95	11.50		S	9/150	8	9	9	12	38	
	22.60 - 23.05	11.50		S	9/150	9	9	13	14	45	
	25.50 - 25.95	11.50		S	10/150	8	9	12	14	43	
	28.50 - 28.95	11.50		S	12/150	15	14	14	15	58	
	31.50 - 31.95	11.50		S	10/150	10	11	14	15	50	
	34.50 - 34.95	11.50		S	12/150	12	16	17	18	63	
	37.60 - 38.05	11.50		S	10/150	12	15	16	20	63	
40.50 - 40.88	11.50		S	12/150	15	20	20				
42.70 - 42.76	11.50		S	25/30	50/30						

* C denotes test using a solid cone
S denotes test using a split barrel sampler

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Results of Standard/Cone Penetration Tests

14757

Table No

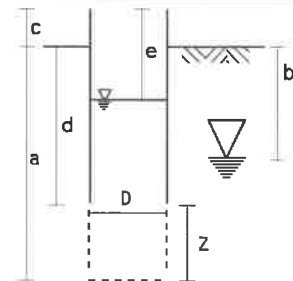
NHM, VICTORIA TOWER GARDENS, LONDON SW1

Site NHM, VICTORIA TOWER GARDENS, LONDON SW1

Client WSP

Date 01/05/19 Type of Test Falling Head Level mOD

Depth of borehole during test, a : 11.00 m
 Depth to equilibrium watertable, b : 7.30 m Measured
 Height of casing above ground level, c : 0.00 m
 Depth of casing below ground level, d : 10.50 m
 Length of response zone, Z : 0.50 m
 Diameter of response zone, D : 0.15 m
 Intake factor, F : 1.6372
 (From Condition D of fig. 7 BS5930:1981)



PERMEABILITY(after Hvorslev 1951)

Basic Time Lag Approach

Plot log $\frac{H_t}{H_0}$ v t *-----*

then

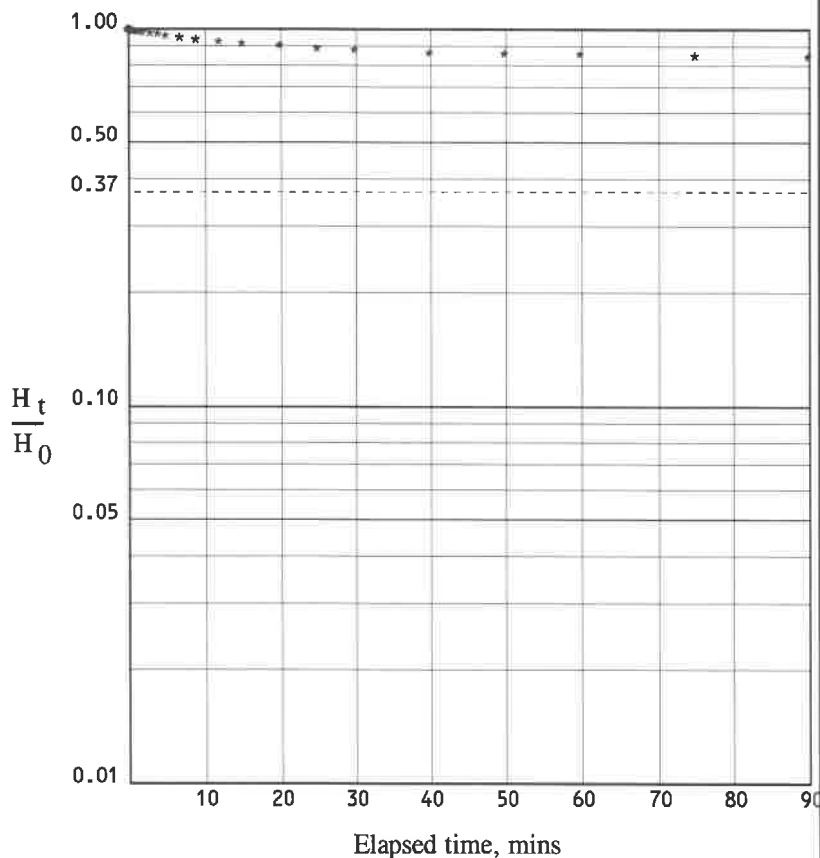
$$k = \frac{A}{60FT} \text{ m/s}$$

Soil Type at test level

Medium dense SAND AND GRAVEL

$k = 2.06E-7 \text{ m/s}$

Elapsed time, t mins	Depth to water, e m	Head of water, H m	Ht/Ho
0.00	0.00	7.30	1.000
0.20	0.03	7.27	0.996
0.50	0.05	7.25	0.993
0.75	0.09	7.21	0.988
1.00	0.12	7.18	0.984
1.50	0.15	7.15	0.979
2.00	0.17	7.13	0.977
3.00	0.22	7.08	0.970
4.00	0.23	7.07	0.968
5.00	0.31	6.99	0.958
7.00	0.38	6.92	0.948
9.00	0.45	6.85	0.938
12.00	0.56	6.74	0.923
15.00	0.63	6.67	0.914
20.00	0.71	6.59	0.903
25.00	0.85	6.45	0.884
30.00	0.90	6.40	0.877
40.00	1.02	6.28	0.860
50.00	1.05	6.25	0.856
60.00	1.07	6.23	0.853
75.00	1.11	6.19	0.848
90.00	1.16	6.14	0.841



REMARKS: Measured water level prior to test, 7.30m depth.

14757

In-Situ Permeability Test

Bh No
BH4

Fig No
.

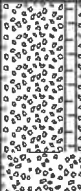

NHM - Borehole BH 4

Sample	Depth (m)	PID (ppm)
ES1	0.10	<0.1
ES2	0.40	<0.1
ES3	1.00	<0.1
ES4	1.15	<0.1
ES5	1.50	<0.1
ES6	1.80	3.4
ES7	2.30	18.4
ES8	2.90	0.7
ES9	3.30	2.9
ES10	4.20	0.2
ES11	4.90	0.4
ES12	5.30	<0.1
ES13	6.00	<0.1

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				BOREHOLE BH5		
Date: 29/04/19 to 30/04/19			Hole Size: 150mm dia to 11.30m				530253 mE 179240 mN Ground Level: 4.54m. O.D.		
Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Blows	Casing						
0.00-0.20 0.20-0.60	B1 B2				MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded brick, concrete, flint and quartzite.				
0.60-1.20	B3				MADE GROUND - Loose, brown and dark brown, slightly clayey, silty, very gravelly SAND with occasional brick cobbles. Gravel of angular to sub-rounded brick, concrete, ash, shell, flint, mortar and clinker.		0.60	3.94	
1.20-1.50 1.35-1.65 1.50-2.00	B4 C B5	N10			MADE GROUND - Medium dense, dark brown and dark grey, silty SAND AND GRAVEL. Gravel of angular to sub-rounded brick, ash, mortar, concrete, shell and chalk.		1.50	3.04	
2.00-2.50 2.15-2.45 2.50-3.00	B6 C B7	N22	1.50		MADE GROUND - Soft, locally firm, dark brown, black, orange brown and dark grey mottled, slightly gravelly, silty SAND/CLAY with occasional brick cobbles. Gravel fraction of brick, ash, shell, clinker, flint, limestone, mortar and bone.		2.50	2.04	
3.00-3.40 3.15-3.45 3.40-3.80	B8 C B9	N10	3.00						
3.80-4.10 4.10-4.60 4.25-4.55	B10 B11 C	N5	3.00						
5.00-5.50 5.15-5.45	B12 C	N2	5.00	1	Soft, locally very soft, grey, brown and dark grey mottled, slightly gravelly, sandy, slightly organic SILT/CLAY with occasional shell fragments. Gravel of angular to sub-rounded flint. Locally gravelly 5.50m to 6.00m depth.		4.90	-0.36	
6.00-6.50 6.15-6.45	B13 C	N10	6.00	2	(ALLUVIUM)				
7.20-7.60 7.35-7.65	B14 C	N24	7.20	2			7.50	-2.96	
8.00-8.50 8.00 8.15-8.45	B15 W1 C	N16	8.00	2	Medium dense, grey and brown, initially slightly clayey, slightly silty, sandy GRAVEL. Gravel of angular to sub-rounded flint, and occasional quartzite and quartz.				
					(KEMPTON PARK GRAVEL)				
9.50-10.00 9.65-9.95 10.00-10.70	B16 C B17	N21	9.50				10.00	-5.46	

REMARKS 1. Excavating a pit from 0.00m to 1.20m for 1 hour 2. Borehole cased to 10.80m depth 3. Gas monitoring standpipes installed to 7.50m and 11.00m depth 4. Further groundwater level monitoring results - see table following exploratory hole records	Project No 14757	
	Scale 1:50	Page 1/2

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample S/C - SPT Spoon/Cone ▽ Water Strike ▽ Water Rise	N/* - SPT Blows for 0.3m or given penetration ES - Environmental Sample V - Vane Shear Test Cohesion () kPa Level on completion Level casing withdrawn Standpipe Level	Groundwater Strikes					Groundwater Observations				
		Depth m					Depth m				
		No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
		1	4.90		seepage	4.50	not	29/04/19	8.00	8.00	7.50
		2	7.20	7.00	slow	7.20	not	30/04/19	8.00	8.00	7.20
								30/04/19	11.30	10.80	7.80
								22/05/19	7.50	5.30	6.23
								22/05/19	11.00	9.00	6.42

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				BOREHOLE BH5							
Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m						
Depth m	Type	Blows	Casing											
10.80-11.30	B18	N15	10.80		Medium dense, light brown, slightly silty SAND AND GRAVEL. Gravel of angular to sub-rounded flint, and occasional quartzite and quartz.		10.00	-5.46						
10.95-11.25	S				(KEMPTON PARK GRAVEL)									
11.25	D1						11.30	-6.76						
					Borehole completed at 11.30m depth									
REMARKS								Project No 14757						
								Scale 1:50	Page 2/2					
KEY		N/* - SPT Blows for 0.3m or given penetration			Groundwater Strikes			Groundwater Observations						
D - Disturbed Sample		ES - Environmental Sample			Depth m			Depth m						
B - Bulk Sample		V - Vane Shear Test			No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
U - Undisturbed Sample		Cohesion () kPa												
W - Water Sample		Level on completion									29/05/19	7.50	5.30	6.25
S/C - SPT Spoon/Cone		Level casing withdrawn									29/05/19	11.00	9.00	6.40
∇ Water Strike		Standpipe Level									04/06/19	7.50	5.30	6.27
∇ Water Rise											04/06/19	11.00	9.00	6.42
											07/06/19	7.50	5.30	6.25

Borehole Number	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows/ Penetration (mm)	Test Drive: 300mm Blows for each successive 75 mm Penetration				N Value	Extra-polated Value
BH5	1.20 - 1.65			C	1/150	2	2	2	4	10	
	2.00 - 2.45	1.50		C	6/150	4	5	6	7	22	
	3.00 - 3.45	3.00		C	2/150	2	2	2	4	10	
	4.10 - 4.55	3.00		C	1/150	1	2	1	1	5	
	5.00 - 5.45	5.00		C	1/150	1	0	1	0	2	
	6.00 - 6.45	6.00		C	5/150	1	3	3	3	10	
	7.20 - 7.65	7.20	7.00	C	6/150	5	7	7	5	24	
	8.00 - 8.45	8.00	7.50	C	4/150	3	3	4	6	16	
	9.50 - 9.95	9.50	7.50	C	6/150	3	5	5	8	21	
	10.80 - 11.25	10.80	7.80	S	4/150	3	3	4	5	15	

* C denotes test using a solid cone
S denotes test using a split barrel sampler

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Results of Standard/Cone Penetration Tests

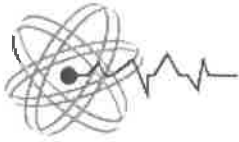
14757

Table No

NHM, VICTORIA TOWER GARDENS, LONDON SW1

NHM - Borehole BH 5

Sample	Depth (m)	PID (ppm)
B1	0.00-0.20	<0.1
B2	0.20-0.60	<0.1
B3	0.60-1.20	<0.1
B4	1.20-1.50	<0.1
B5	1.50-2.00	<0.1
B6	2.00-2.50	<0.1
B7	2.50-3.00	<0.1
B8	3.00-3.40	<0.1
B9	3.40-3.80	<0.1
B10	3.80-4.10	<0.1
B11	4.10-4.60	0.2
B12	5.00-5.50	<0.1
B13	6.00-6.50	<0.1
B14	7.20-7.70	<0.1



SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Borehole Calibration & Testing Ltd
Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref: GE02
Test Date: 25/04/2019
Report Date: 25/04/2019
File Name: GE02.spt
Test Operator: CR

Instrumented Rod Data

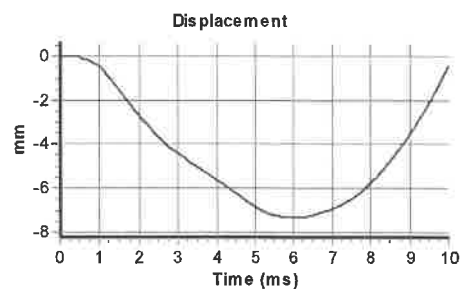
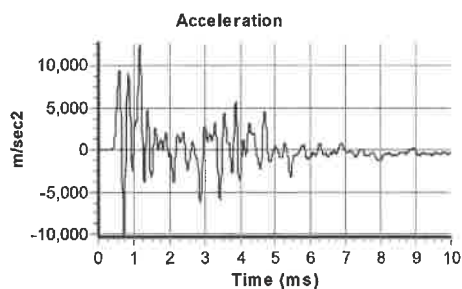
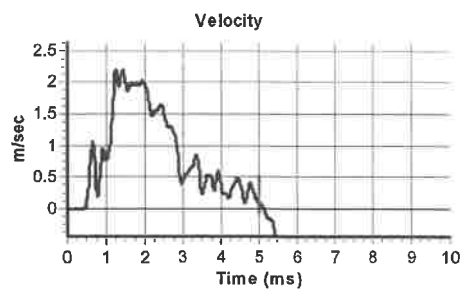
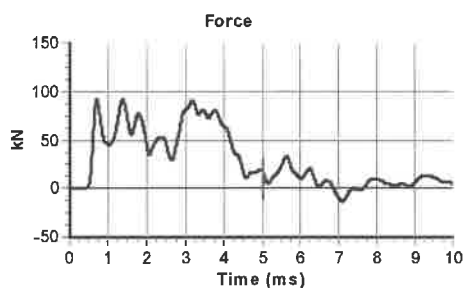
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.3
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11941
Accelerometer No.2: 11942

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 15.0

Comments / Location

Recommended calibration interval is 6 months



Calculations

Area of Rod A (mm^2): 944
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 367

Energy Ratio E_r (%): **78**

CR

Signed: CR

Title: Operator

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE WS1		
Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Result	Water						
0.25	D1				MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded brick, flint, concrete and ash.				
0.50	D2						0.60	4.61	
0.75	D3				MADE GROUND - Brown and dark brown, slightly clayey, gravelly, silty SAND with occasional gravel size pockets of firm, brown clay. Gravel of angular to sub-rounded brick, flint, concrete, ash, ceramic, pottery and bone.				
1.00	D4						1.00	4.21	
1.25 1.25	D5 P1	(45)			MADE GROUND - Firm, brown and grey brown mottled, slightly gravelly, silty CLAY with occasional gravel size sand pockets. Gravel of angular to sub-rounded flint, brick, concrete, clinker, mortar and ash.				
1.50 1.50	D6 P2	(53)					1.60	3.61	
1.75	D7				MADE GROUND - Brown, light brown and grey, silty, sandy GRAVEL. Gravel of angular to sub-rounded concrete, brick, ash and flint.				
							3.00	2.21	
3.30	D8				MADE GROUND - Brown, grey and dark brown, slightly clayey, silty, gravelly SAND. Gravel of sub-angular to sub-rounded flint, brick, mortar, concrete and ash.				
							3.50	1.71	
3.70	D9			MADE GROUND - Dark brown and black, silty, gravelly, ashy SAND. Gravel of angular to sub-rounded ash, flint, clinker, mortar, chalk and clay pipe fragments.					
						3.90	1.31		
4.30	D10			MADE GROUND - Grey, silty, sandy GRAVEL. Gravel of angular to sub-angular brick, concrete, chalk, ash and flint.					
						4.70	0.51		
4.80 4.80	D11 P3	(24)		MADE GROUND - Firm, brown and grey mottled, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded brick, concrete, flint and ash.					
						4.90	0.31		
5.00-6.00	U5			"See next page".		5.00	0.21		

REMARKS
 1. Starter pit excavated from 0.00m to 1.20m depth
 2. Live roots observed to 1.60m depth
 3. Hole sides unstable from 1.60m to 5.00m depth
 4. Gas monitoring standpipe installed to 6.00m depth

Project No
14757

Scale 1:25
Page 1/2

KEY	Groundwater Strikes					Groundwater Observations			
	Depth m					Depth m			
	No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample ∇ Water Strike ∇c Depth to Water on completion	J - Jar Sample M - Mackintosh Probe V - Vane Shear Test P () - Hand Penetrometer ∇s Standpipe Level								
		1	5.70	seepage					
						14/05/19	6.00		dry
						22/05/19	6.00	1.00	5.63
						29/05/19	6.00	1.00	5.64
						04/06/19	6.00	1.00	5.65
						07/06/19	6.00	1.00	5.65

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**WINDOW SAMPLE
WS1**

Date: **14/05/19**

Hole Size: **87mm dia to 2.00m
77mm dia to 4.00m
57mm dia to 6.00m**

530248 mE 179073 mN
Ground Level: **5.21m. O.D.**

Samples and in-situ Tests			(Date) Water	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result						
			1 ▽		Firm, brown and grey mottled, slightly sandy, slightly organic SILT/CLAY with occasional gastropod shells and reed stem fragments. (ALLUVIUM)		5.00	0.21
					Hole completed at 6.00m depth			6.00

REMARKS	Project No 14757
	Scale 1:25 Page 2/2

KEY	Groundwater Strikes					Groundwater Observations			
	Depth m					Date	Depth m		
	No Struck	Rose to	Rate	Cased	Sealed		Hole	Casing	Water
D - Disturbed Sample J - Jar Sample B - Bulk Sample M - Mackintosh Probe U - Undisturbed Sample V - Vane Shear Test W - Water Sample Cohesion () kPa ▽ Water Strike P () - Hand Penetrometer ▽c Depth to Water Cohesion () kPa on completion ▽s Standpipe Level						11/06/19	6.00	1.00	5.65
						14/06/19	6.00	1.00	5.65

GROUND ENGINEERING LIMITED Tel: 01733-666666 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE WS2			
			Date: 14/05/19		Hole Size: 87mm dia to 2.10m		530251 mE 179075 mN Ground Level: 4.95m. O.D.			
Samples and in-situ Tests			(Date)	Description of Strata			Legend	Depth m	O.D. Level m	
Depth m	Type	Result	Water							
0.10	D1			MADE GROUND - ASPHALT.				0.07	4.88	
0.40	D2			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly SAND. Gravel of angular to rounded flint, brick, mortar and ash.						
0.70	D3									
1.00	D4			MADE GROUND - Soft, locally firm, brown and grey brown silty CLAY with occasional gravel size pockets of sand. Gravel of flint, pottery, mortar, concrete, limestone and ash.				0.80	4.15	
1.20-2.00	U1									
1.25	D5									
1.25	P1	(36)								
1.50	D6									
1.50	P2	(68)								
1.75	D7									
1.75	P3	(51)								
2.00	D8									
2.00-2.10	U2									
2.00	P4	(38)						2.10	2.85	
				Hole abandoned at 2.10m depth						
REMARKS							Project No			
1. Starter pit excavated from 0.00m to 1.20m depth							14757			
2. Live roots observed to at least 2.10m depth							Scale		Page	
3. Hole sides stable							1:25		1/1	
4. Unable to advance sampler below 2.10m depth, hole abandoned										
KEY			Groundwater Strikes				Groundwater Observations			
D - Disturbed Sample			J - Jar Sample				Date			
B - Bulk Sample			M - Mackintosh Probe				Hole			
U - Undisturbed Sample			V - Vane Shear Test				Casing			
W - Water Sample			Cohesion () kPa				Water			
☒ Water Strike			P () - Hand Penetrometer				14/05/19			
☒c Depth to Water on completion			Cohesion () kPa				2.10			
			☒s Standpipe Level				dry			
			No							
			Struck							
			Rose to							
			Rate							
			Cased							
			Sealed							

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE WS3			
			Date: 13/05/19		Hole Size: 77mm dia to 2.40m		530256 mE 179076 mN Ground Level: 5.04m. O.D.			
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m			
Depth m	Type	Result	Water							
0.25	D1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded brick, concrete, flint and ash.	[Cross-hatched pattern]	0.70	4.34			
0.50	D2									
0.75	D3			MADE GROUND - Brown and dark brown, slightly clayey, silty, gravelly SAND. Gravel of angular to sub-rounded brick, flint, ash, concrete, chalk and shells.	[Cross-hatched pattern]	1.20	3.84			
1.00	D4									
1.20-2.00	U1			MADE GROUND - Soft, brown and light brown mottled, slightly sandy, slightly gravelly CLAY/SILT. Gravel of angular brick, flint, concrete, ash and mortar.	[Cross-hatched pattern]	1.70	3.34			
1.25	D5	(23)								
1.25	P1									
1.50	D6			MADE GROUND - Brown and grey, silty, sandy GRAVEL with occasional brick cobbles. Gravel of angular to sub-rounded brick, ash, flint and concrete.	[Cross-hatched pattern]	2.40	2.64			
1.50	P2	(30)								
2.00-2.40	U2			Hole abandoned at 2.40m depth						
REMARKS					Project No					
1. Starter pit excavated from 0.00m to 1.20m depth					14757					
2. Live roots observed to 1.60m depth					Scale					
3. Hole sides stable					1:25					
4. Unable to advance sampler below 2.40m depth, hole abandoned and relocated to position WS3A					Page					
					1/1					
KEY			Groundwater Strikes				Groundwater Observations			
D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample ☒ Water Strike ☒c Depth to Water on completion J - Jar Sample M - Mackintosh Probe V - Vane Shear Test Cohesion () kPa P () - Hand Penetrometer Cohesion () kPa ☒s Standpipe Level			Depth m				Depth m			
			No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole
							13/05/19	2.40		dry

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1			WINDOW SAMPLE WS3A					
			Date: 14/05/19	Hole Size: 87mm dia to 1.40m		530253 mE 179075 mN Ground Level: 5.03m. O.D.					
Samples and in-situ Tests			(Date)	Description of Strata			Legend	Depth m	O.D. Level m		
Depth m	Type	Result	Water								
0.25 0.30	D1 ASB1			MADE GROUND - Dark brown, slightly clayey, silty, gravelly, organic SAND. Gravel of angular to sub-rounded brick, flint, concrete, chalk, ash, slate and a single fragment of asbestos containing material at 0.30m depth.			[Cross-hatched pattern]	0.60	4.43		
0.50	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, gravelly SAND. Gravel of angular to sub-rounded brick, flint, concrete, chalk, ash and slate.							
0.75	D3			MADE GROUND - Firm, brown and dark brown mottled, slightly gravelly, silty CLAY with occasional gravel size sand pockets. Gravel of sub-angular brick, concrete, ash and flint.				0.90	4.13		
1.00	D4			Hole abandoned at 1.40m depth				1.40	3.63		
REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth 2. Live roots observed to at least 1.40m depth 3. Hole sides stable 4. Unable to advance sampler below 1.40m depth, hole abandoned and relocated to position WS3B								Project No 14757			
								Scale 1:25	Page 1/1		
KEY			Groundwater Strikes				Groundwater Observations				
D - Disturbed Sample J - Jar Sample B - Bulk Sample M - Mackintosh Probe U - Undisturbed Sample V - Vane Shear Test W - Water Sample Cohesion () kPa ☒ Water Strike P () - Hand Penetrometer ☒c Depth to Water Cohesion () kPa on completion ☒s Standpipe Level			Depth m				Date				
			No	Struck	Rose to	Rate	Cased	Sealed	Hole	Casing	Water
								14/05/19	1.40		dry

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE WS3B		
Samples and in-situ Tests			Date: 15/05/19	Hole Size: 87mm dia to 2.00m 77mm dia to 2.50m		530257 mE 179077 mN Ground Level: 5.00m. O.D.			
Depth m	Type	Result	(Date) Water	Inst.	Description of Strata	Legend	Depth m	O.D. Level m	
0.25	D1				MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded flint, brick, concrete, ash and pottery.				
0.50	D2						0.60	4.40	
0.75	D3					MADE GROUND - Brown and dark brown, slightly clayey, silty, gravelly SAND. Gravel of angular to sub-rounded brick, flint, concrete, ash, pottery, slate and chalk.		0.90	4.10
1.00	D4					MADE GROUND - Brown, dark brown and grey, slightly clayey, silty, gravelly SAND with occasional gravel size pockets of firm, brown clay. Gravel of angular to sub-angular brick, mortar, flint, shell and ash.		1.60	3.40
1.20-2.00	U1								
2.00-2.50	U2				MADE GROUND - Brown, dark brown and grey, slightly clayey, silty, sandy GRAVEL. Gravel of angular to sub-rounded brick, concrete, flint and ash.		2.50	2.50	
					Hole abandoned at 2.50m depth				
REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth 2. Live roots observed to 1.50m depth 3. Hole sides stable 4. Unable to advance sampler below 2.50m depth, hole abandoned 5. Gas monitoring standpipe installed to 2.50m depth							Project No 14757		
							Scale 1:25	Page 1/1	
KEY D - Disturbed Sample J - Jar Sample B - Bulk Sample M - Mackintosh Probe U - Undisturbed Sample V - Vane Shear Test W - Water Sample Cohesion () kPa ∇ Water Strike P () - Hand Penetrometer ∇c Depth to Water Cohesion () kPa on completion ∇s Standpipe Level				Groundwater Strikes Depth m No Struck Rose to Rate Cased Sealed			Groundwater Observations Date Hole Casing Water		
						15/05/19	2.50		dry
						22/05/19	2.50	1.00	dry
						29/05/19	2.50	1.00	dry
						04/06/19	2.50	1.00	dry
						07/06/19	2.50	1.00	dry

GROUND ENGINEERING

L I M I T E D
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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

WINDOW SAMPLE
WS4

Date: 09/05/19

Hole Size: 77mm dia to 3.00m
67mm dia to 4.00m
57mm dia to 6.00m

530255 mE 179094 mN
Ground Level: 4.79m. O.D.

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.05	D1			MADE GROUND - Dark brown, slightly clayey, silty, gravelly, organic SAND. Gravel of angular to sub-angular flint, brick, bone and wood fragments.		0.40	4.39
0.25	D2						
0.70	D3			MADE GROUND - Brown and dark brown, silty, gravelly SAND. Gravel of brick, concrete, ash, flint, glass and smoker's clay pipe.		1.20	3.59
1.10	D4			MADE GROUND - Firm, brown and grey mottled, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded flint, concrete, ash, brick and mortar.		1.40	3.39
1.20-2.00 1.30	U1 D5						
1.70	D6			MADE GROUND - Brown, grey and light grey, silty, gravelly SAND with occasional brick cobbles below 1.90m depth. Gravel of concrete, flint, metal, brick, coal and ash.		2.65	2.14
2.00-3.00	U2			MADE GROUND - White and grey, gravelly SILT of chalk.		2.80	1.99
2.20	D7						
2.70	D8			MADE GROUND - Brown, silty SAND AND GRAVEL. Gravel of angular to sub-angular brick and mortar.		3.20	1.59
2.95-4.00 3.00	D9 U3			MADE GROUND - Dark grey, silty, very gravelly SAND. Gravel of angular to sub-rounded brick, slate, flint, ash, mortar, coal and shells.		3.85	0.94
3.50	D10						
3.95-5.00 4.00	D11 U4			MADE GROUND - Soft, brown, slightly gravelly, sandy, organic SILT/CLAY with occasional reed stem fragments. Gravel of angular to sub-rounded chalk and brick.		4.50	0.29
5.00-6.00	U5			MADE GROUND - Brown, silty, gravelly SAND. Gravel of angular to sub-rounded brick, flint and mortar.		5.00	-0.21

REMARKS
1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 1.00m depth
3. Clay pipe (120mm diameter) uncovered at 1.00m depth
4. Hole collapsed below 4.30m depth
5. U4 sample = no recovery

Project No
14757

Scale 1:25
Page 1/2

KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
∇ Water Strike
∇c Depth to Water on completion
J - Jar Sample
M - Mackintosh Probe
V - Vane Shear Test
P () - Hand Penetrometer Cohesion () kPa
∇s Standpipe Level

Groundwater Strikes

Groundwater Observations

Depth m						Date			Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water		
						09/05/19	6.00		4.50		

NHM - Borehole WS 4

Sample	Depth (m)	PID (ppm)
D1	0.05	<0.1
D2	0.25	<0.1
D3	0.70	<0.1
D4	1.10	<0.1
D5	1.30	<0.1
D6	1.70	<0.1
D7	2.20	<0.1
D8	2.70	<0.1
D9	2.95	<0.1
D10	3.50	<0.1
D11	3.95	<0.1
D12	5.20	<0.1
D13	5.50	<0.1

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

WINDOW SAMPLE WS5

Date: 10/05/19

Hole Size: 87mm dia to 2.00m
77mm dia to 4.00m
57mm dia to 6.00m

530272 mE 179197 mN
Ground Level: 4.37m. O.D.

Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water					
0.20	D1				MADE GROUND - Dark brown and dark grey, slightly clayey, silty, gravelly, organic SAND. Gravel of angular to sub-rounded brick, flint, pottery, clay pipe and ash.		0.40	3.97
0.60	D2				MADE GROUND - Brown, silty, gravelly SAND. Gravel of angular to sub-rounded flint, chalk, coal, brick, mortar and ash.			
0.90	D3						1.15	3.22
1.20-2.00	U1				MADE GROUND - Orange brown, gravelly, very silty SAND. Gravel of angular to rounded concrete, brick, flint, ash, coal and mortar.			
1.30	D4							
1.60	D5						1.50	2.87
					MADE GROUND - Brown and orange brown, slightly gravelly, clayey, silty SAND. Gravel of angular brick, mortar, flint and shells.			
1.90	D6						1.75	2.62
2.00-3.00	U2				MADE GROUND - Brown, silty SAND AND GRAVEL. Gravel of angular to sub-rounded brick, flint, ash, mortar and slate.			
2.50	D7						3.30	1.07
3.00-4.00	U3							
3.15	D8							
3.60	D9			MADE GROUND - Firm, brown, orange brown and grey mottled, slightly sandy, slightly gravelly SILT/CLAY. Gravel of angular brick and flint.				
3.85	D10					3.80	0.57	
4.00-5.00	U4			MADE GROUND - Brown and grey, slightly clayey, silty, gravelly SAND. Gravel of angular to sub-rounded brick, ash, mortar, wood and flint.				
4.30	D11					4.90	-0.53	
4.80	D12							
5.00-6.00	U5			"See next page".				

REMARKS
1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 1.90m depth
3. Borehole cased to 3.00m depth
4. Gas monitoring standpipe installed to 5.50m depth





Project No
14757

Scale 1:25
Page 1/2

KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
∇ - Water Strike
∇c - Depth to Water on completion
J - Jar Sample
M - Mackintosh Probe
V - Vane Shear Test
Cohesion () kPa
P () - Hand Penetrometer
Cohesion () kPa
∇s - Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						10/05/19	6.00		dry
						29/05/19	5.50	1.00	3.57
						04/06/19	5.50	1.00	3.49
						07/06/19	5.50	1.10	3.46
						11/06/19	5.50	1.00	3.46

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE WS5	
			Date: 10/05/19	Hole Size: 87mm dia to 2.00m 77mm dia to 4.00m 57mm dia to 6.00m			530272 mE 179197 mN Ground Level: 4.37m. O.D.	
Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water					
5.30	D13				MADE GROUND - Firm, dark grey, slightly sandy, slightly gravelly, organic SILT/CLAY. Gravel of angular to sub-rounded brick, flint, shell and bone.		5.00	-0.63
					Soft, grey and dark grey mottled, sandy, organic SILT/CLAY with some gastropod shells.			5.20
					(ALLUVIUM)		6.00	-1.63
					Hole completed at 6.00m depth			

REMARKS	Project No 14757	
	Scale 1:25	Page 2/2

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample √ Water Strike √c Depth to Water on completion J - Jar Sample M - Mackintosh Probe V - Vane Shear Test Cohesion () kPa P() - Hand Penetrometer Cohesion () kPa √s Standpipe Level	Groundwater Strikes					Groundwater Observations		
	Depth m					Depth m		
	No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing
					14/06/19	5.50	1.00	3.43

NHM - Borehole WS 5

Sample	Depth (m)	PID (ppm)
D1	0.20	0.2
D2	0.60	<0.1
D3	0.90	<0.1
D4	1.30	<0.1
D5	1.60	<0.1
D6	1.90	<0.1
D7	2.50	<0.1
D8	3.15	<0.1
D9	3.60	<0.1
D10	3.85	0.2
D11	4.30	<0.1
D12	4.80	<0.1

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**WINDOW SAMPLE
WS6**

Date: **09/05/19**

Hole Size: 87mm dia to 2.00m
67mm dia to 4.00m
57mm dia to 6.00m

530250 mE 179124 mN
Ground Level: **4.69m. O.D.**

Samples and in-situ Tests			(Date) Water	Inst.	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Result							
0.10	D1				MADE GROUND - Dark brown, slightly clayey, silty, gravelly, organic SAND. Gravel of angular to sub-angular flint and brick.		0.30	4.39	
0.50	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, gravelly SAND. Gravel of angular to sub-rounded brick, flint, concrete, metal, coal and ash.					
0.80	D3								
1.10	D4			MADE GROUND - Brown and dark grey, silty SAND AND GRAVEL. Gravel of angular to sub-rounded flint, coal and ash.				1.00	3.69
1.20-2.00	U1							1.30	3.39
1.45	D5			MADE GROUND - Firm, brown, slightly gravelly, silty CLAY. Gravel of angular to rounded brick, mortar and flint.				1.55	3.14
1.70	D6			MADE GROUND - Grey and dark grey, silty SAND AND GRAVEL. Gravel of angular to sub-angular clinker, mortar, ash, coal and brick.					
1.95-2.00-3.00	D7 U2			MADE GROUND - Brown and grey, slightly silty SAND AND GRAVEL. Gravel of angular brick, mortar and ash.				2.00	2.69
2.40	D8								
2.90-3.00-4.00	D9 U3								
3.40	D10			MADE GROUND - Dark grey, slightly silty, gravelly SAND. Gravel of angular to sub-rounded ash, flint, brick and chalk.				3.10	1.59
3.90-4.00-5.00	D11 U4								
4.30	D12							4.40	0.29
4.80	D13		MADE GROUND - Soft, grey, slightly gravelly, sandy, organic SILT/CLAY. Gravel of angular brick and coal.				4.60	0.09	
5.00-6.00	U5		Firm, grey and dark grey mottled, slightly sandy, organic CLAY/SILT. (ALLUVIUM)				5.00	-0.31	

REMARKS
1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 2.30m depth
3. Gas monitoring standpipe installed to 3.30m depth



Project No
14757

Scale 1:25
Page 1/2

KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
∇ - Water Strike
∇c - Depth to Water on completion
J - Jar Sample
M - Mackintosh Probe
V - Vane Shear Test
Cohesion () kPa
P () - Hand Penetrometer
Cohesion () kPa
∇s - Standpipe Level

Groundwater Strikes					Groundwater Observations			
Depth m					Depth m			
No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
					09/05/19	6.00		4.10
					22/05/19	3.30	1.00	3.14
					29/05/19	3.30	1.00	3.16
					04/06/19	3.30	1.00	3.18
					07/06/19	3.30	1.00	3.14

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE WS6 530250 mE 179124 mN Ground Level: 4.69m. O.D.								
			Date: 09/05/19		Hole Size: 87mm dia to 2.00m 67mm dia to 4.00m 57mm dia to 6.00m										
Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m							
Depth m	Type	Result	Water												
5.30	D14			 Soft, grey, sandy, organic SILT/CLAY with rare angular flint gravel. (ALLUVIUM)		5.00	-0.31								
					Hole completed at 6.00m depth		6.00	-1.31							
REMARKS							Project No 14757								
							Scale 1:25	Page 2/2							
KEY D - Disturbed Sample J - Jar Sample B - Bulk Sample M - Mackintosh Probe U - Undisturbed Sample V - Vane Shear Test W - Water Sample Cohesion () kPa √ Water Strike P () - Hand Penetrometer √c Depth to Water Cohesion () kPa on completion √s Standpipe Level				Groundwater Strikes				Groundwater Observations							
								Depth m				Date			
				No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water		
						11/06/19	3.30	1.00	3.14						
						14/06/19	3.30	1.00	3.14						

NHM - Borehole WS 6

Sample	Depth (m)	PID (ppm)
D1	0.10	<0.1
D2	0.50	<0.1
D3	0.80	<0.1
D4	1.10	<0.1
D5	1.45	<0.1
D6	1.70	<0.1
D7	1.95	<0.1
D8	2.40	<0.1
D9	2.90	<0.1
D10	3.40	<0.1
D11	3.90	<0.1
D12	4.30	<0.1
D13	4.80	<0.1
D14	5.30	<0.1

Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water					
0.10-0.40	B1				MADE GROUND - Dark brown, clayey, silty, slightly gravelly, organic SAND. Gravel of angular to sub-angular brick, concrete, tile, ash and clinker.		0.40	4.07
0.25	D1							
0.50	D2				MADE GROUND - Brown and dark brown, slightly clayey, silty, gravelly SAND with occasional gravel size pockets of firm, brown clay. Gravel of angular to sub-rounded brick, flint, ash, chalk, concrete, ceramic and pottery.		1.20	3.27
0.75	D3							
0.80-1.20	B2							
1.00	D4				MADE GROUND - Firm becoming soft below 1.55m depth, brown and orange brown mottled, slightly gravelly, silty CLAY with a layer of ash, 1.60m to 1.70m depth. Gravel of angular to sub-rounded brick, concrete, flint and asphalt.		2.00	2.47
1.25	D5	(45)						
1.25	P1	(45)						
1.50	D6							
1.50	P2	(45)						
1.65	D7				MADE GROUND - Brown, dark brown and grey, slightly clayey, silty, gravelly SAND. Gravel of angular brick, mortar, ash, slate, concrete and chalk.		2.80	1.67
1.75	D8	(23)						
1.75	P3	(23)						
2.00	D9							
2.00	P4	(23)						
2.25	D10				MADE GROUND - Very soft, becoming soft, dark brown, orange brown and grey mottled, slightly gravelly, sandy, organic SILT/CLAY. Gravel of angular brick, ash, flint and chalk.		3.70	0.77
2.50	D11							
2.75	D12				Soft, locally very soft, grey, slightly sandy, organic SILT/CLAY with occasional reed stem fragments, and rare sand lenses.		4.60	-0.13
2.75	P5	(15)						
3.00	D13				(ALLUVIUM)		5.00	-0.53
3.25	D14	(15)						
3.25	P7	(15)						
3.50	D15			Very soft, grey and dark grey mottled, slightly sandy, organic SILT/CLAY with occasional gastropod shells. (ALLUVIUM)				
3.50	P8	(30)						
3.70	D16							
3.70	P9	(23)						
4.00	D17							
4.00	P10	(15)						
4.25	D18							
4.25	P11	(15)						
4.50	D19							
4.50	P12	(8)						
4.75	D20							
4.75	P13	(15)						
5.00	D21							

REMARKS
 1. Starter pit excavated from 0.00m to 1.20m depth
 2. Live roots observed to 2.60m depth
 3. Hole sides stable
 4. Gas monitoring standpipe installed to 4.20m depth

Project No
14757
 Scale **1:25** Page **1/2**

KEY

D - Disturbed Sample	J - Jar Sample
B - Bulk Sample	M - Mackintosh Probe
U - Undisturbed Sample	V - Vane Shear Test
W - Water Sample	Cohesion () kPa
∇ Water Strike	P () - Hand Penetrometer
∇c Depth to Water on completion	Cohesion () kPa
	∇s Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water	
					13/05/19	6.00		dry	
					22/05/19	4.20	1.00	dry	
					29/05/19	4.20	1.00	dry	
					04/06/19	4.20	1.00	dry	
					07/06/19	4.20	1.00	dry	

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**WINDOW SAMPLE
WS7**

Date: **13/05/19**

Hole Size: 77mm dia to 3.00m
67mm dia to 4.00m
57mm dia to 6.00m

530253 mE 179164 mN
Ground Level: **4.47m. O.D.**

Samples and in-situ Tests			(Date) Water	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
5.00	P14	(8)			Very soft, grey and dark grey mottled, slightly gravelly, sandy, organic CLAY/SILT. Gravel of angular to sub-rounded flint and quartzite. (ALLUVIUM)		5.00	-0.53
5.25	D22							
5.50	D23							
5.75	D24							
6.00	D25						6.00	-1.53
					Hole completed at 6.00m depth			

REMARKS

Project No
14757

Scale
1:25

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2/2

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- W - Water Sample
- ∇ - Water Strike
- ∇c - Depth to Water on completion
- J - Jar Sample
- M - Mackintosh Probe
- V - Vane Shear Test
- P() - Hand Penetrometer
- Cohesion () kPa
- Cohesion () kPa
- ∇s - Standpipe Level

Groundwater Strikes

Groundwater Observations

Depth m					Date	Depth m		
No Struck	Rose to	Rate	Cased	Sealed		Hole	Casing	Water
					01/06/19	4.20	1.00	dry
					14/06/19	4.20	1.00	dry

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**WINDOW SAMPLE
WS8**

Date: 10/05/19

Hole Size: 87mm dia to 2.40m

530250 mE 179214 mN

Ground Level: 4.50m. O.D.

Samples and in-situ Tests			(Date)	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water					
0.20	D1				MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded flint, brick, shell, metal, glass, clinker and pottery.		0.40	4.10
0.50	D2				MADE GROUND - Brown and dark brown, slightly clayey, silty, gravelly SAND. Gravel of angular to sub-rounded brick, flint, concrete, pottery and bone.		0.70	3.80
0.90	D3				MADE GROUND - Firm, brown, slightly gravelly, silty CLAY. Garvel of angular brick, flint, concrete and pottery.			
1.30	D4						1.40	3.10
1.70	D5				MADE GROUND - Brown, silty SAND AND GRAVEL. Gravel of angular brick, concrete and slate.		1.90	2.60
2.10	D6				MADE GROUND - Red brown, slightly sandy GRAVEL. Gravel of angular brick and mortar.		2.35	2.15
					MADE GROUND - CONCRETE - Suspected foundation.		2.40	2.10
					Hole abandoned at 2.40m depth			

REMARKS
1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 1.90m depth
3. Borehole cased to 2.40m depth
4. Unable to advance sampler below 2.40m depth, hole abandoned
5. Gas monitoring standpipe installed to 2.35m depth

Project No
14757

Scale 1:25
Page 1/1

KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
∇ - Water Strike
∇c - Depth to Water on completion
J - Jar Sample
M - Mackintosh Probe
V - Vane Shear Test
Cohesion () kPa
P () - Hand Penetrometer
Cohesion () kPa
∇s - Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						10/05/19	2.40		dry
						22/05/19	2.35	1.00	dry
						29/05/19	2.35	1.00	dry
						04/06/19	2.35	1.00	dry
						07/06/19	2.35	1.00	dry

NHM - Borehole WS 8

Sample	Depth (m)	PID (ppm)
D1	0.20	<0.1
D2	0.50	<0.1
D3	0.90	<0.1
D4	1.30	<0.1
D5	1.70	<0.1
D6	2.10	<0.1

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DYNAMIC PROBE PENETRATION TEST

Date 08/05/19

PROBE No

Project Number 14757

DP1

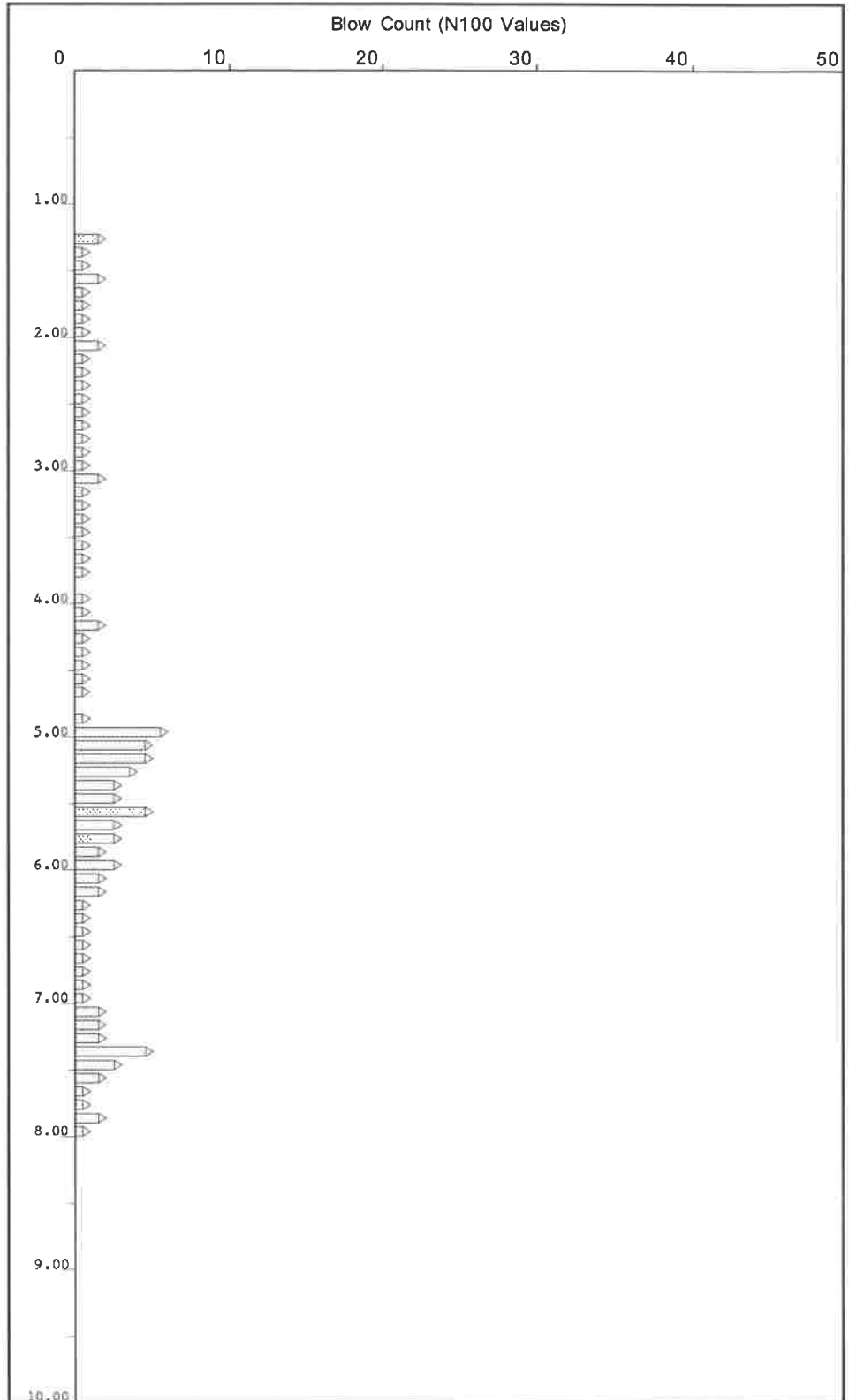
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		2
.4		1
.5		1
.6	2	1
.7	1	1
.8	1	1
.9	1	1
2.0	2	1
.1	2	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
3.0	2	1
.1	2	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
4.0	1	0
.1	1	1
.2	1	2
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	0
.9	1	1
5.0	5	6
.1	5	5
.2	5	4
.3	5	3
.4	5	3
.5	5	3
.6	5	3
.7	3	3
.8	3	2
.9	3	3
6.0	2	3
.1	2	2
.2	2	1
.3	2	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	2	1
7.0	2	1
.1	2	2
.2	2	2
.3	2	5
.4	2	3
.5	2	3
.6	2	1
.7	1	1
.8	1	2
.9	1	2
8.0	1	1



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 08/05/19

PROBE No
DP2

Project
Number 14757

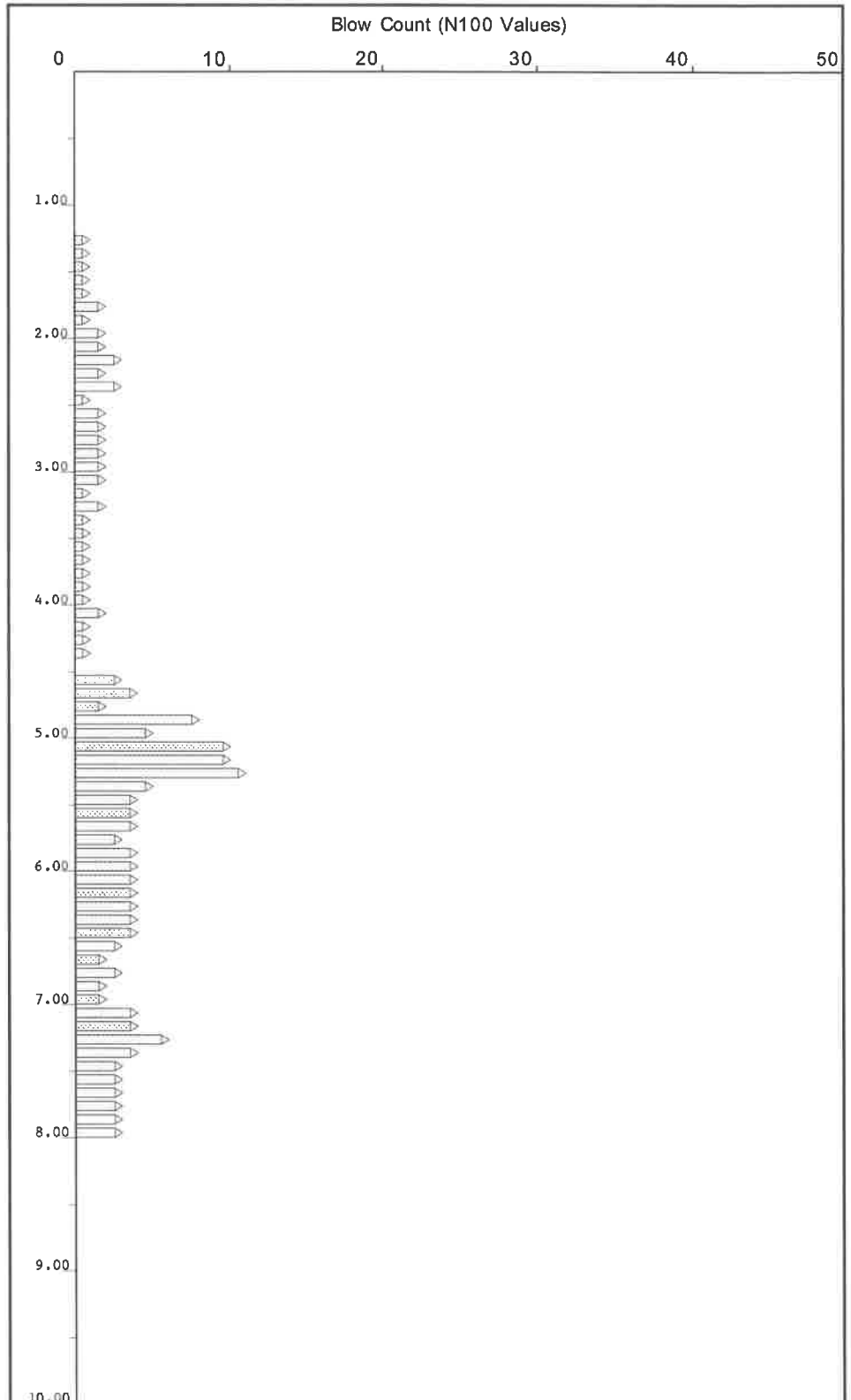
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6		1
.7		1
.8		2
.9		1
2.0		2
.1		2
.2		3
.3		2
.4		3
.5		3
.6		2
.7		2
.8		2
.9		2
3.0		2
.1		2
.2		1
.3		2
.4		1
.5		1
.6		1
.7		1
.8		1
.9		1
4.0		1
.1		2
.2		1
.3		1
.4		1
.5		0
.6		3
.7		4
.8		2
.9		8
5.0		5
.1	10	10
.2		10
.3		11
.4		5
.5		4
.6		4
.7		4
.8		3
.9		4
6.0		4
.1		4
.2		4
.3		4
.4		4
.5		4
.6		3
.7		2
.8		3
.9		2
7.0		2
.1		4
.2		4
.3		6
.4		4
.5		3
.6		3
.7		3
.8		3
.9		3
8.0		3



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 08/05/19

PROBE No

Project Number 14757

DP3

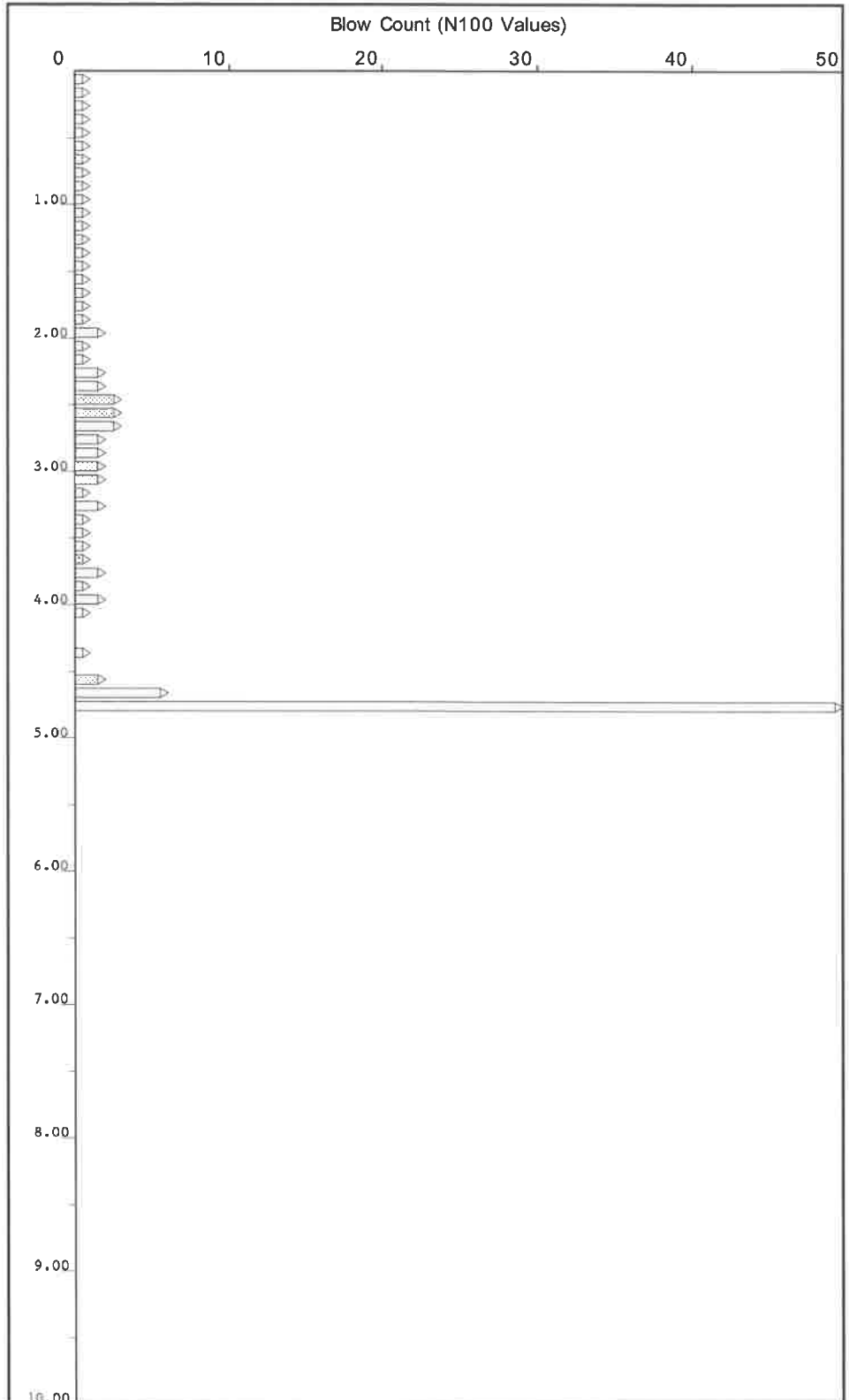
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		1
.2		1
.3		1
.4		1
.5		1
.6		1
.7		1
.8		1
.9		1
1.0		1
.1		1
.2		1
.3		1
.4		1
.5		1
.6		1
.7		1
.8		1
.9		1
2.0		2
.1		1
.2		1
.3		2
.4		2
.5		3
.6		3
.7		3
.8		2
.9		2
3.0		2
.1		2
.2		1
.3		2
.4		1
.5		1
.6		1
.7		1
.8		2
.9		1
4.0		2
.1		1
.2		0
.3		0
.4		1
.5		0
.6		2
.7		6
.8		50



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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DYNAMIC PROBE PENETRATION TEST

Date 08/05/19

PROBE No
DP4

Project
Number 14757

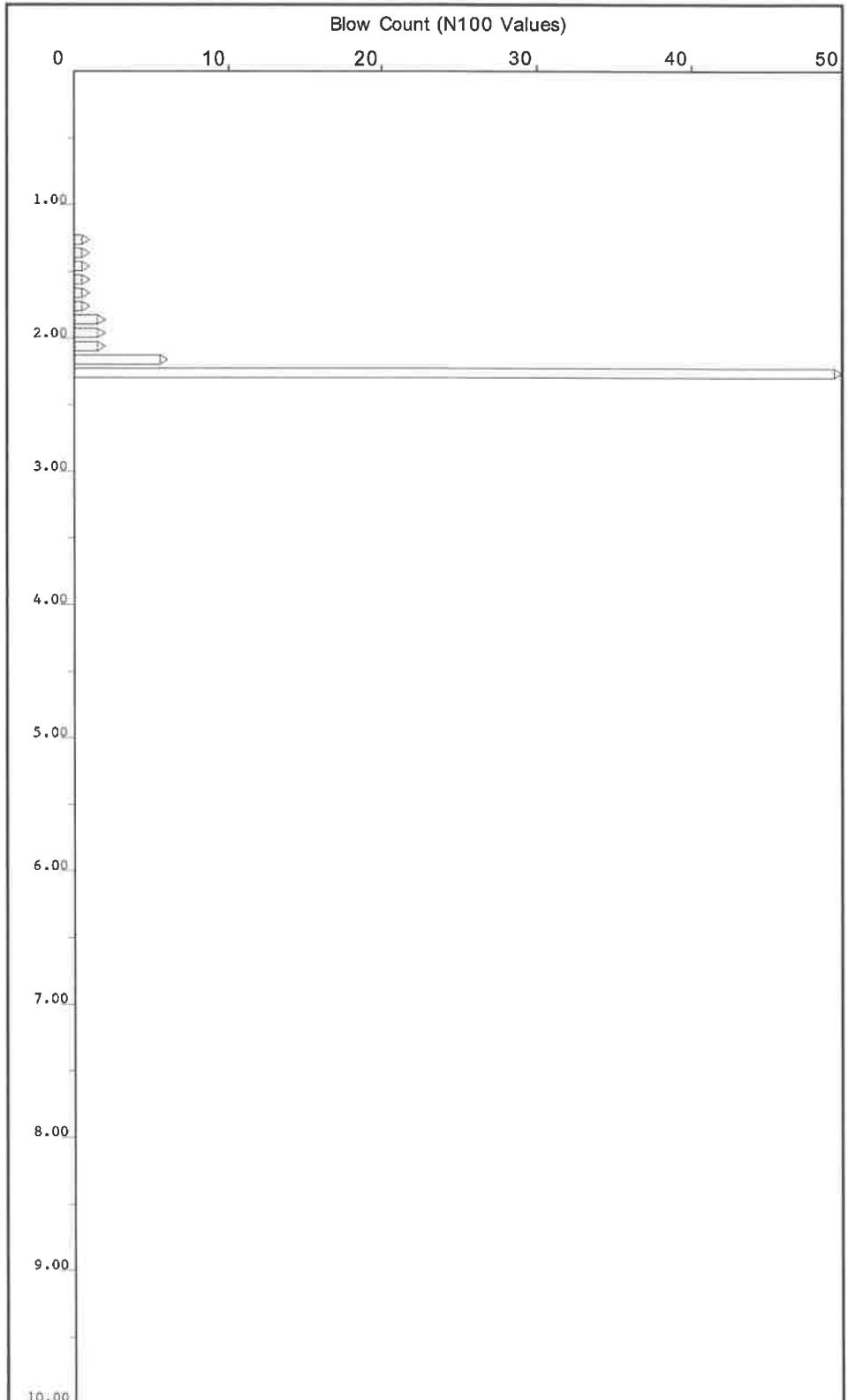
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6		1
.7		1
.8		1
.9		2
2.0		2
.1		2
.2		6
.3		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 08/05/19

PROBE No
DP5

Project Number 14757

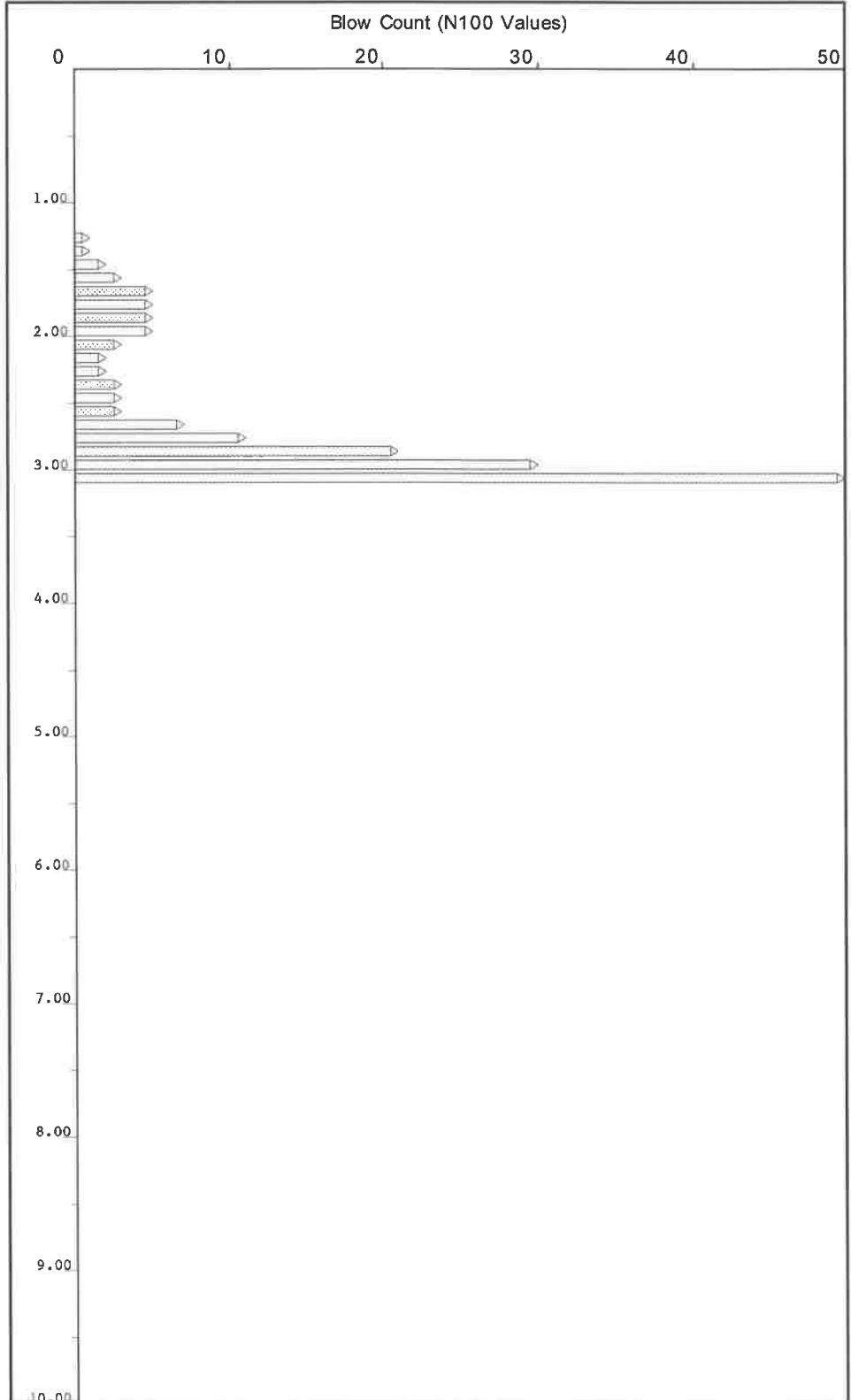
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		2
.6		3
.7		5
.8		5
.9		5
2.0		5
.1		3
.2		2
.3		2
.4		3
.5		3
.6		3
.7		7
.8		11
.9		21
3.0		30
.1		50



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No

DP5A

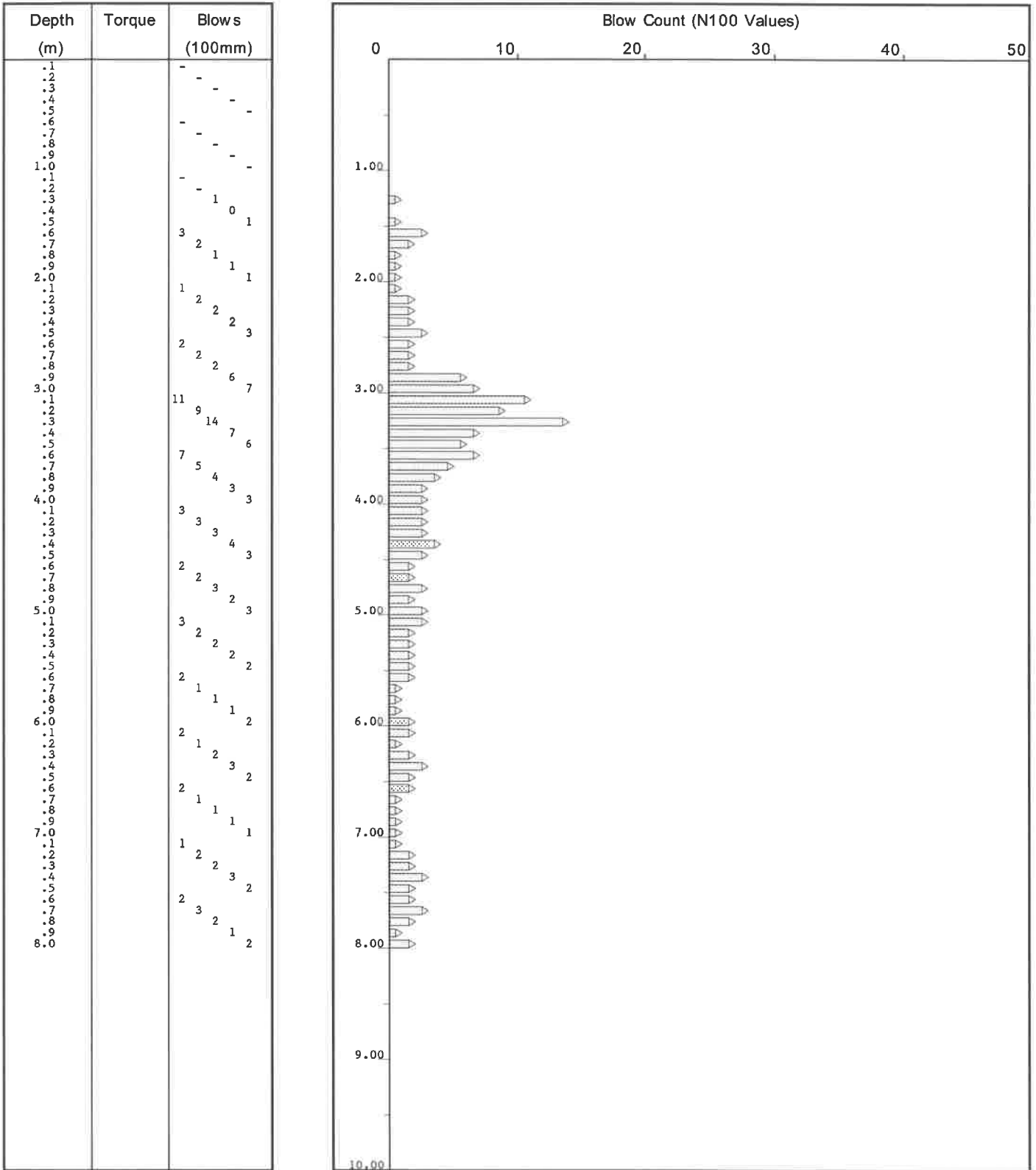
Project Number 14757

Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL, VICTORIA TOWER GARDENS, LONDON SW1



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 16/05/19

PROBE No
DP5B

Project
Number 14757

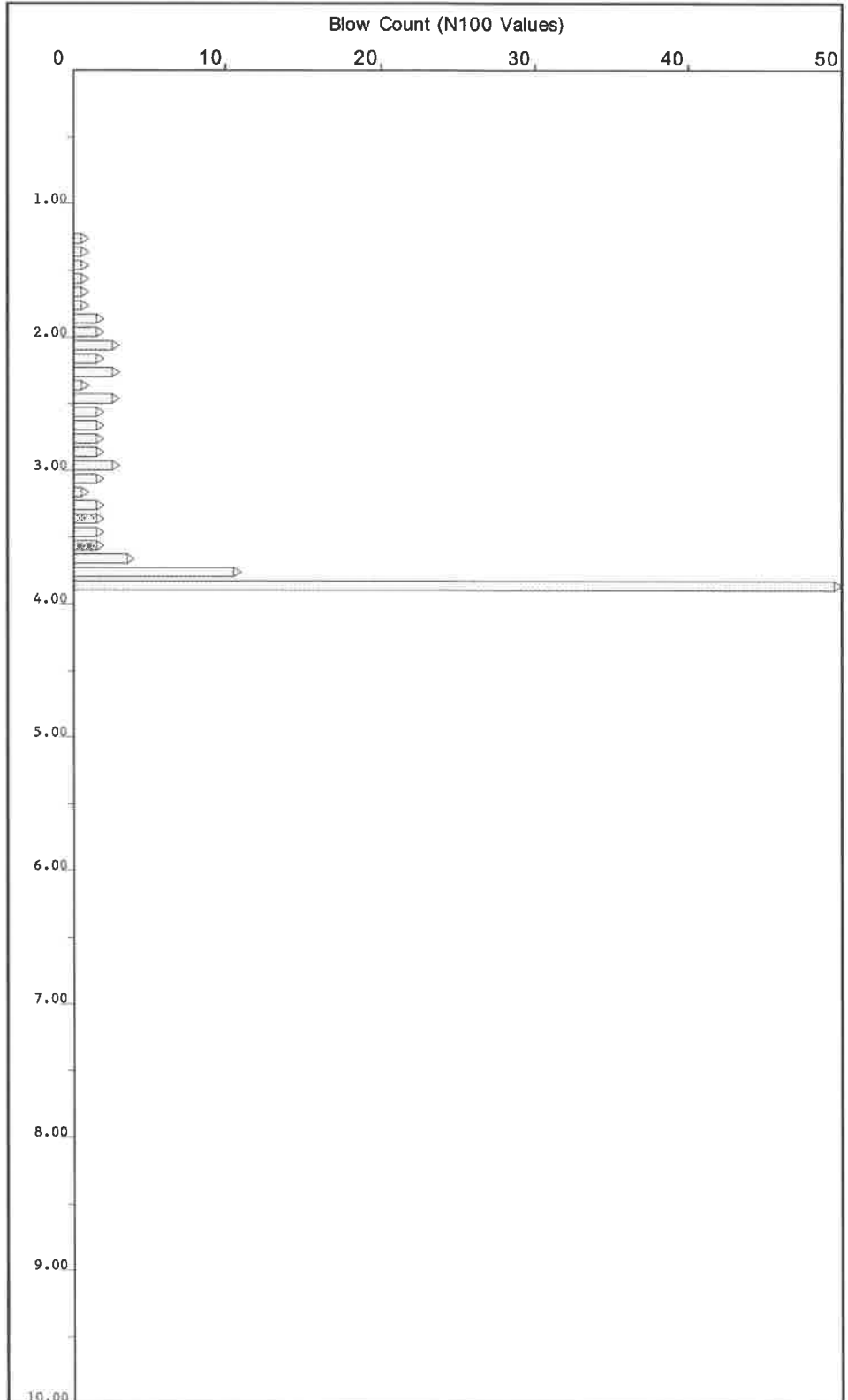
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
0.1		-
0.2		-
0.3		-
0.4		-
0.5		-
0.6		-
0.7		-
0.8		-
0.9		-
1.0		-
1.1		-
1.2		-
1.3		1
1.4		1
1.5		1
1.6		1
1.7		1
1.8		1
1.9		2
2.0		2
2.1		3
2.2		2
2.3		3
2.4		1
2.5		3
2.6		2
2.7		2
2.8		2
2.9		2
3.0		3
3.1		2
3.2		1
3.3		2
3.4		2
3.5		2
3.6		2
3.7		2
3.8		4
3.9		11
4.0		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 08/05/19

PROBE No
DP6

Project
Number 14757

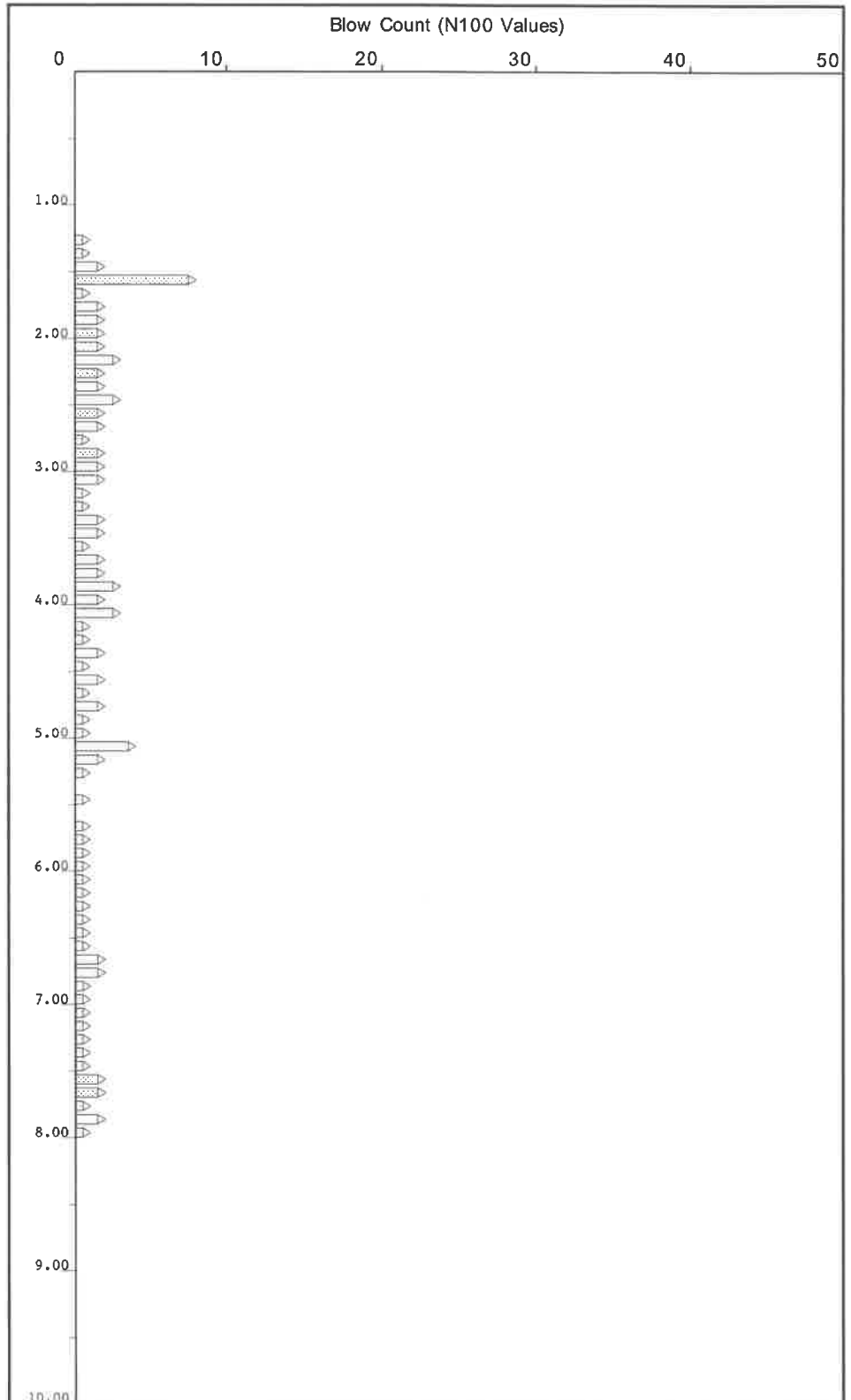
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		2
.6	8	
.7	1	2
.8	2	2
.9	2	2
2.0	2	2
.1	2	3
.2	3	2
.3	2	2
.4	2	3
.5	2	2
.6	2	1
.7	2	2
.8	2	1
.9	2	2
3.0	2	1
.1	1	1
.2	1	2
.3	1	2
.4	1	2
.5	1	2
.6	1	2
.7	2	3
.8	2	2
.9	3	2
4.0	3	1
.1	1	1
.2	1	2
.3	2	1
.4	1	2
.5	1	1
.6	2	1
.7	1	2
.8	1	1
.9	4	1
5.0	4	2
.1	2	1
.2	1	0
.3	0	1
.4	0	1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
6.0	1	1
.1	1	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	2	2
.8	2	1
.9	1	1
7.0	1	1
.1	1	1
.2	1	1
.3	1	1
.4	1	1
.5	2	1
.6	2	1
.7	2	1
.8	2	1
.9	2	1
8.0	2	1



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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DYNAMIC PROBE PENETRATION TEST

Date 01/05/19

PROBE No

DP7

Project Number 14757

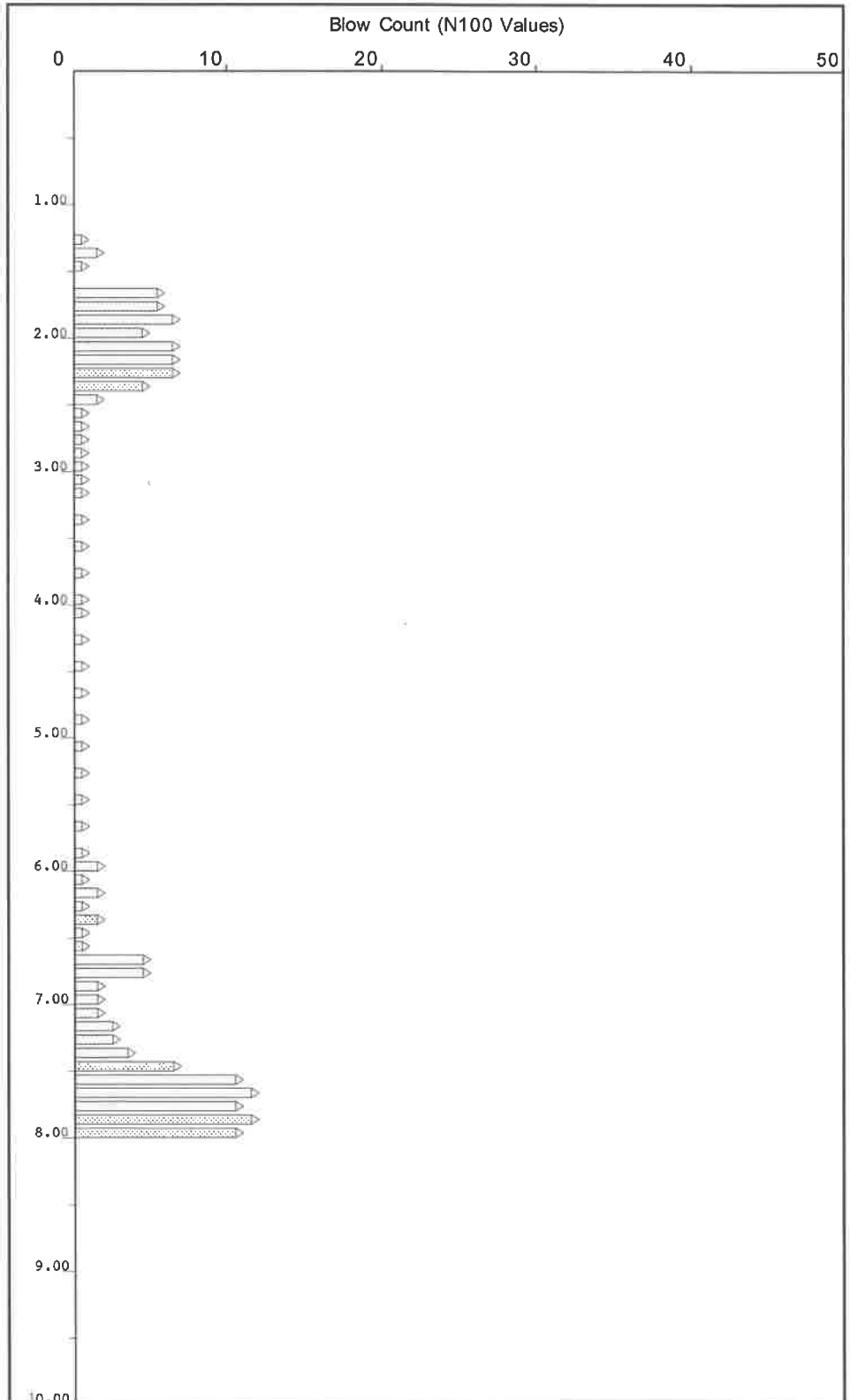
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		2
.5		1
.6	0	6
.7	6	6
.8	6	7
.9	7	5
2.0	7	7
.1	7	7
.2	7	7
.3	7	5
.4	5	2
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
3.0	1	1
.1	1	1
.2	1	0
.3	1	1
.4	1	0
.5	1	0
.6	1	0
.7	0	1
.8	0	1
.9	0	1
4.0	1	1
.1	1	0
.2	0	1
.3	0	1
.4	0	1
.5	0	1
.6	0	1
.7	0	1
.8	0	1
.9	0	1
5.0	1	0
.1	1	0
.2	0	1
.3	0	1
.4	0	1
.5	0	1
.6	0	1
.7	0	1
.8	0	1
.9	0	1
6.0	1	2
.1	1	2
.2	2	1
.3	2	1
.4	1	2
.5	1	1
.6	5	5
.7	5	2
.8	5	2
.9	2	2
7.0	2	3
.1	3	3
.2	3	4
.3	3	4
.4	3	7
.5	11	11
.6	12	11
.7	11	12
.8	11	11
.9	11	11
8.0		



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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DYNAMIC PROBE PENETRATION TEST

Date 02/05/19

PROBE No
DP8

Project
Number 14757

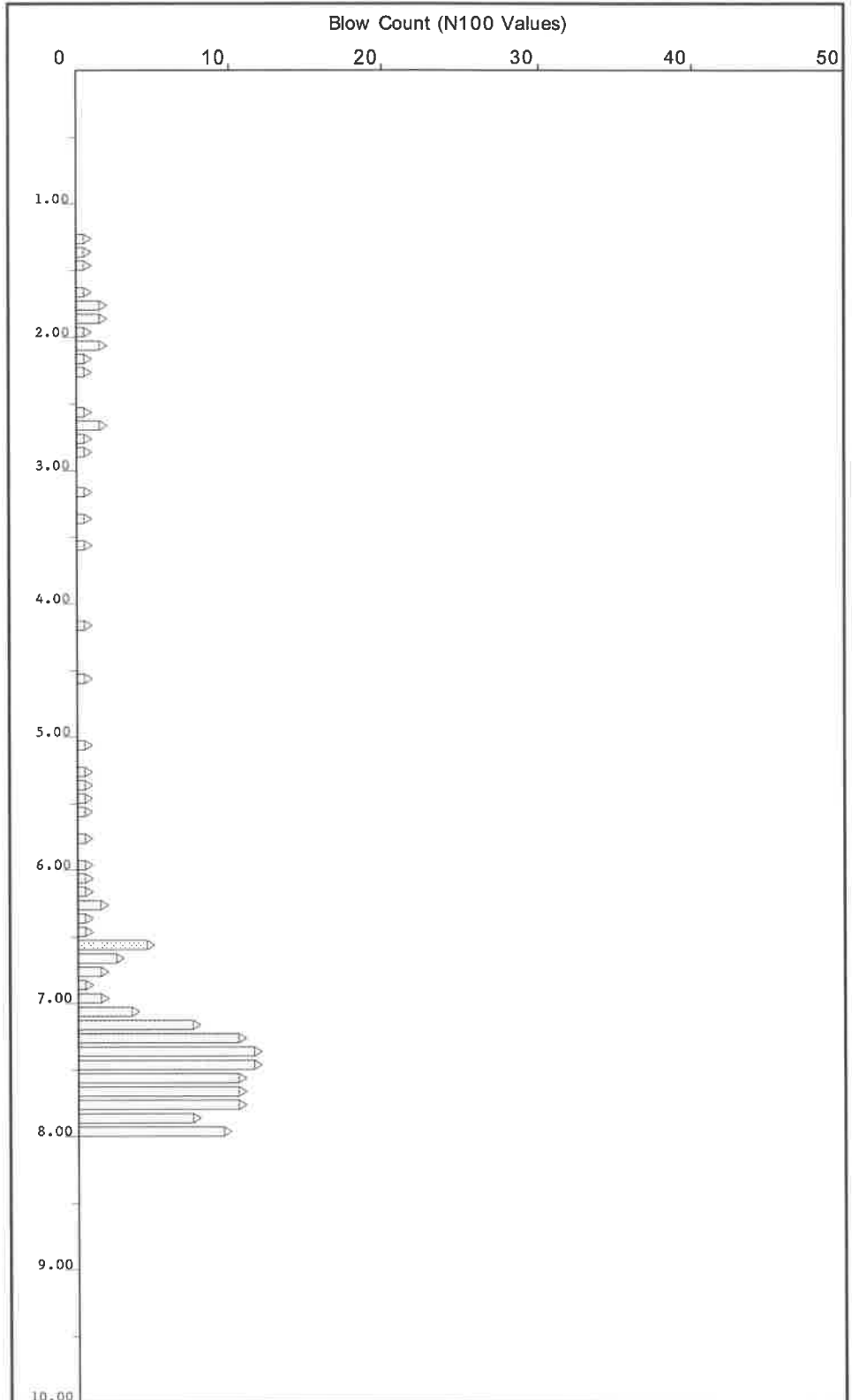
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6	0	1
.7	1	2
.8	2	2
.9	2	1
2.0	2	1
.1	2	1
.2	1	1
.3	1	0
.4	1	0
.5	1	0
.6	1	2
.7	2	1
.8	1	1
.9	0	1
3.0	0	0
.1	0	1
.2	1	0
.3	1	0
.4	1	1
.5	1	0
.6	1	0
.7	0	0
.8	0	0
.9	0	0
4.0	0	0
.1	0	1
.2	1	0
.3	1	0
.4	1	0
.5	1	0
.6	1	0
.7	0	0
.8	0	0
.9	0	0
5.0	1	0
.1	1	0
.2	0	1
.3	1	1
.4	1	1
.5	1	1
.6	1	0
.7	0	1
.8	1	0
.9	1	0
6.0	1	1
.1	1	1
.2	1	1
.3	1	2
.4	1	1
.5	5	1
.6	3	2
.7	3	1
.8	2	1
.9	1	2
7.0	4	8
.1	8	11
.2	11	12
.3	11	12
.4	11	12
.5	11	12
.6	11	11
.7	11	11
.8	11	8
.9	11	8
8.0	11	10



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 02/05/19

PROBE No

Project Number 14757

DP9

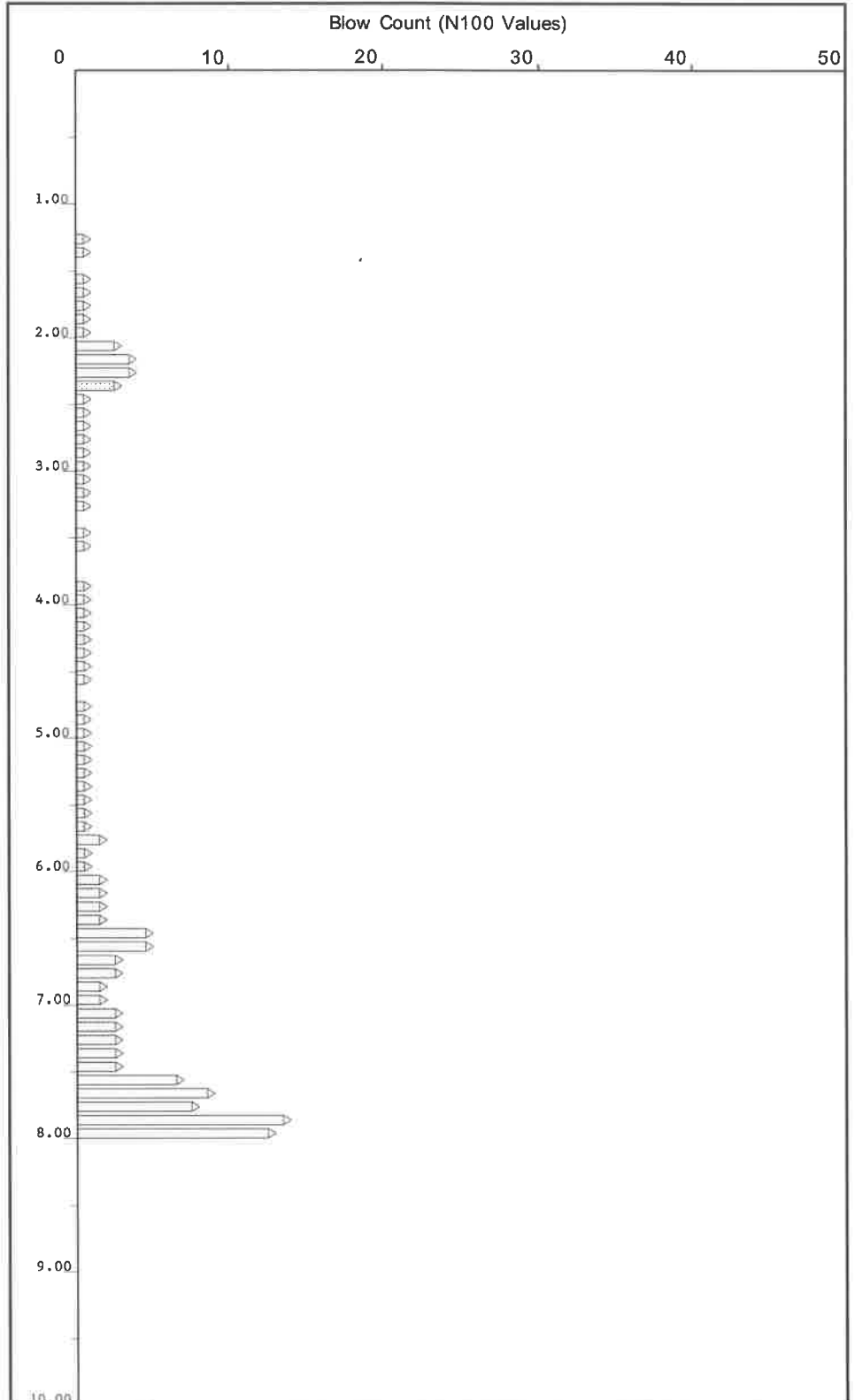
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		0
.6	1	1
.7	1	1
.8	1	1
.9	1	1
2.0		1
.1	3	4
.2	4	4
.3	4	3
.4		1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
3.0		1
.1	1	1
.2	1	1
.3	1	0
.4		1
.5	1	0
.6	1	0
.7	0	1
.8	0	1
.9	0	1
4.0		1
.1	1	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	0	1
.9	1	1
5.0		1
.1	1	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	2
.9	1	1
6.0		1
.1	2	2
.2	2	2
.3	2	2
.4		2
.5		5
.6	5	3
.7	3	3
.8	3	2
.9	3	2
7.0		2
.1	3	3
.2	3	3
.3	3	3
.4		3
.5		3
.6	7	9
.7		8
.8		14
.9		13
8.0		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 02/05/19

PROBE No
DP10

Project
Number 14757

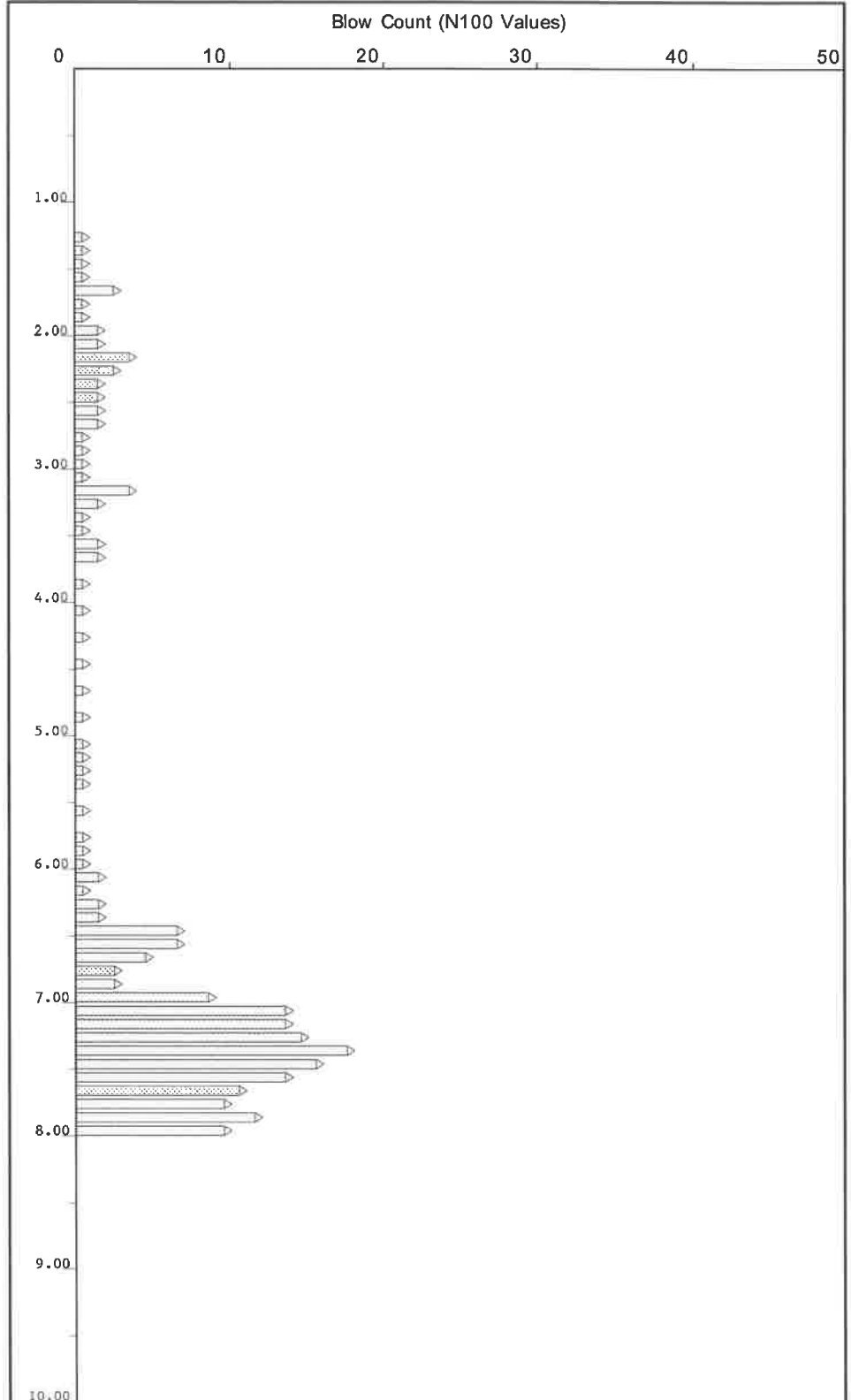
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

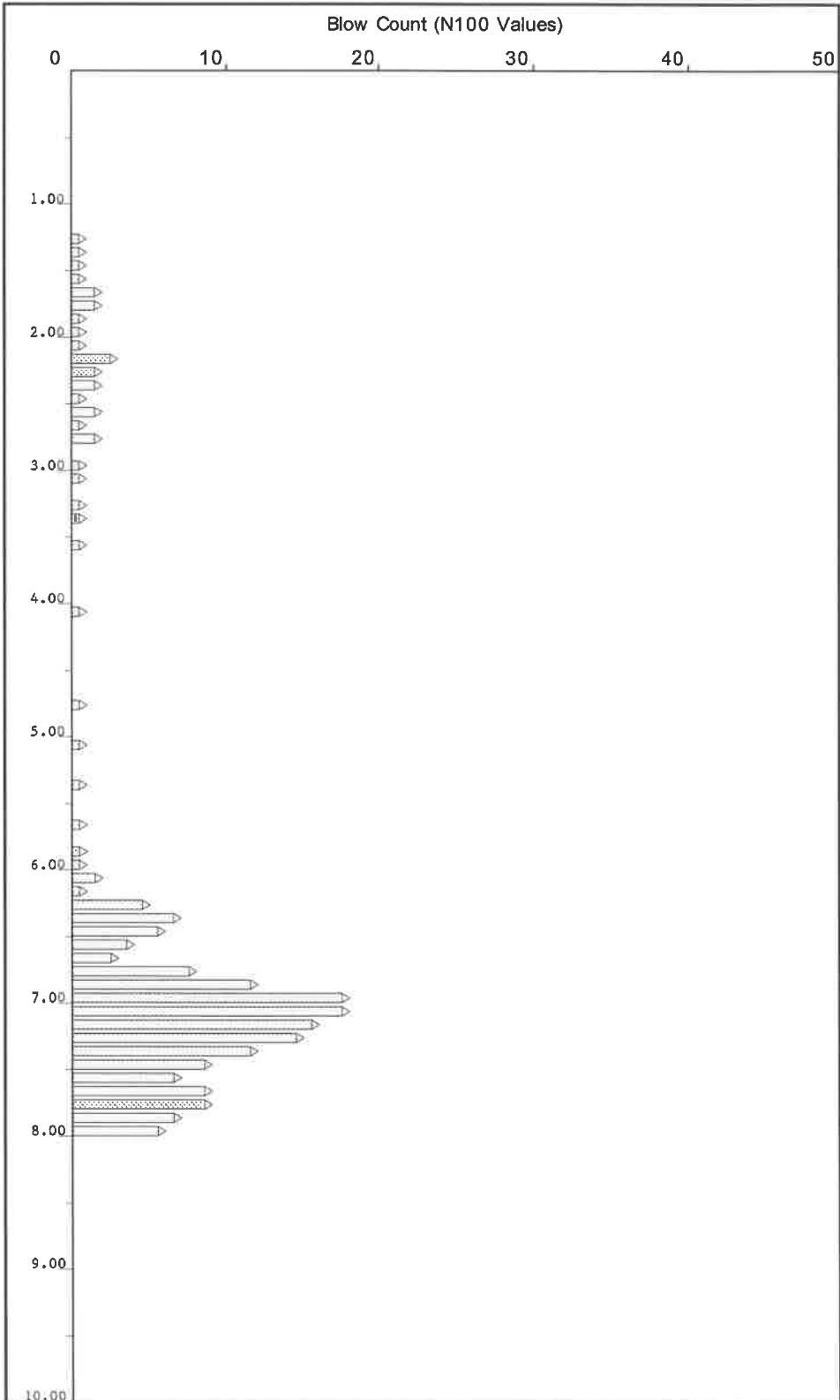
Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6	1	
.7	3	1
.8	1	1
.9	1	1
2.0		2
.1	2	
.2	4	
.3	3	2
.4		2
.5		2
.6	2	
.7	2	1
.8		1
.9		1
3.0		1
.1	1	
.2	4	
.3	2	1
.4		1
.5		1
.6	2	
.7	2	0
.8		1
.9		0
4.0		0
.1	1	
.2	0	1
.3		0
.4		1
.5	0	
.6	1	0
.7		1
.8		0
.9		1
5.0		0
.1	1	
.2	1	1
.3		1
.4		1
.5		0
.6	1	
.7	0	1
.8		1
.9		1
6.0		1
.1	2	
.2	1	
.3	2	2
.4		2
.5	7	7
.6	5	
.7		3
.8		3
.9		9
7.0		14
.1	14	
.2	14	15
.3		18
.4		16
.5	14	
.6		11
.7		10
.8		12
.9		
8.0		10



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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		Project Number 14757	
Method BS 1377 : Part 9 : Clause 3.2 (DPSH)	Client WSP	Site NATIONAL HOLOCAUST MEMORIAL, VICTORIA TOWER GARDENS, LONDON SW1	

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6		1
.7		1
.8		2
.9		2
2.0		1
.1		1
.2		3
.3		2
.4		2
.5		2
.6		1
.7		2
.8		1
.9		2
3.0		0
.1		1
.2		1
.3		1
.4		1
.5		0
.6		1
.7		0
.8		0
.9		0
4.0		0
.1		1
.2		0
.3		0
.4		0
.5		0
.6		0
.7		0
.8		1
.9		0
5.0		0
.1		1
.2		0
.3		0
.4		0
.5		1
.6		0
.7		1
.8		0
.9		1
6.0		1
.1		2
.2		1
.3		5
.4		7
.5		6
.6		4
.7		3
.8		8
.9		12
7.0		18
.1		18
.2		16
.3		15
.4		12
.5		9
.6		7
.7		9
.8		9
.9		7
8.0		6



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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DYNAMIC PROBE PENETRATION TEST

Date 07/05/19

PROBE No

DP13

Project Number 14757

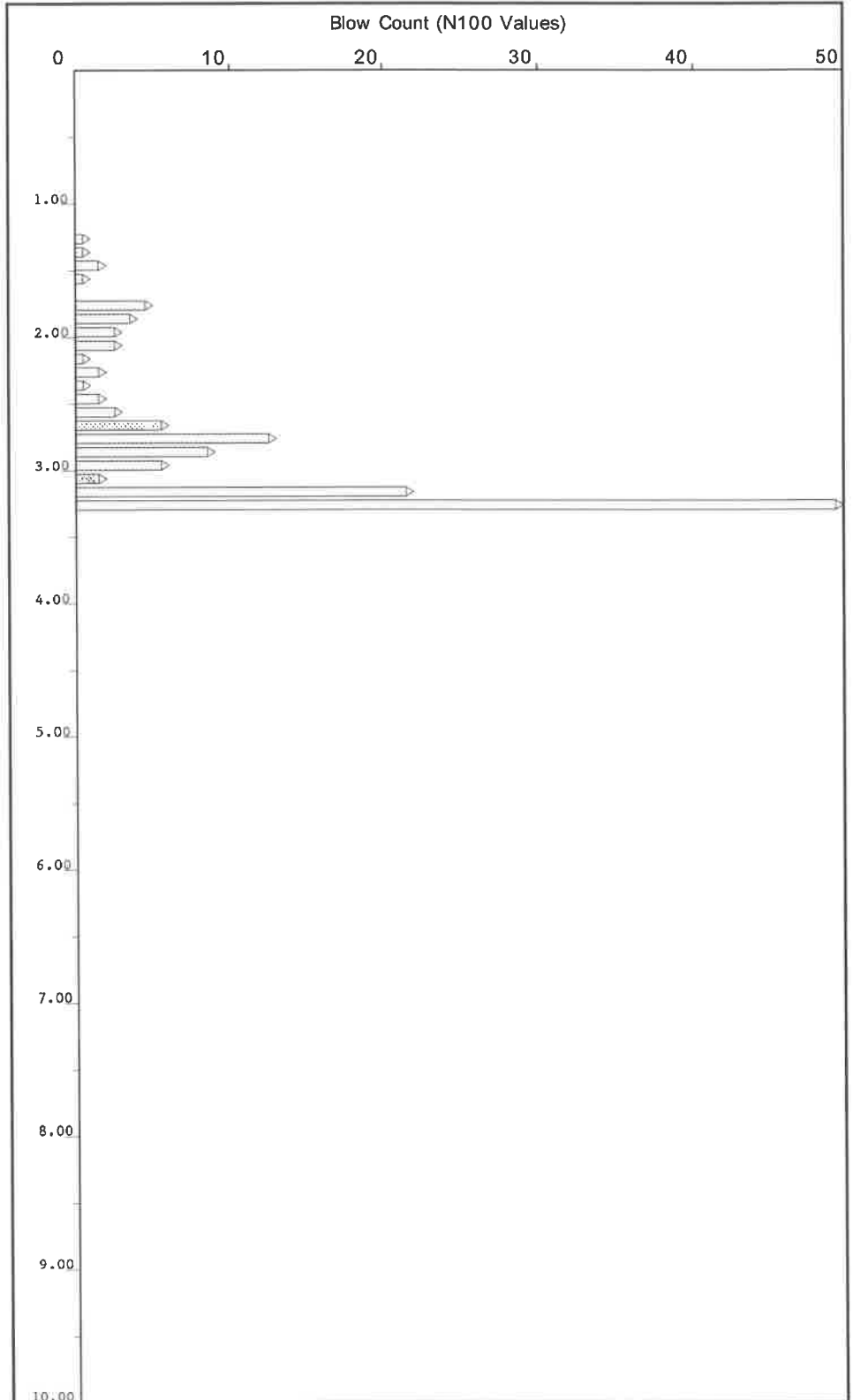
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		2
.5		2
.6	1	0
.7		5
.8		4
.9		3
2.0	3	1
.1		2
.2		1
.3		2
.4		3
.5		6
.6		13
.7		9
.8		6
3.0	2	22
.1		50
.2		
.3		



Remarks :

Hammer 63.5 kg

14757

Standard Drop 750 mm

Cone 50 mm dia

Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 07/05/19

PROBE No

Project
Number 14757

DP14

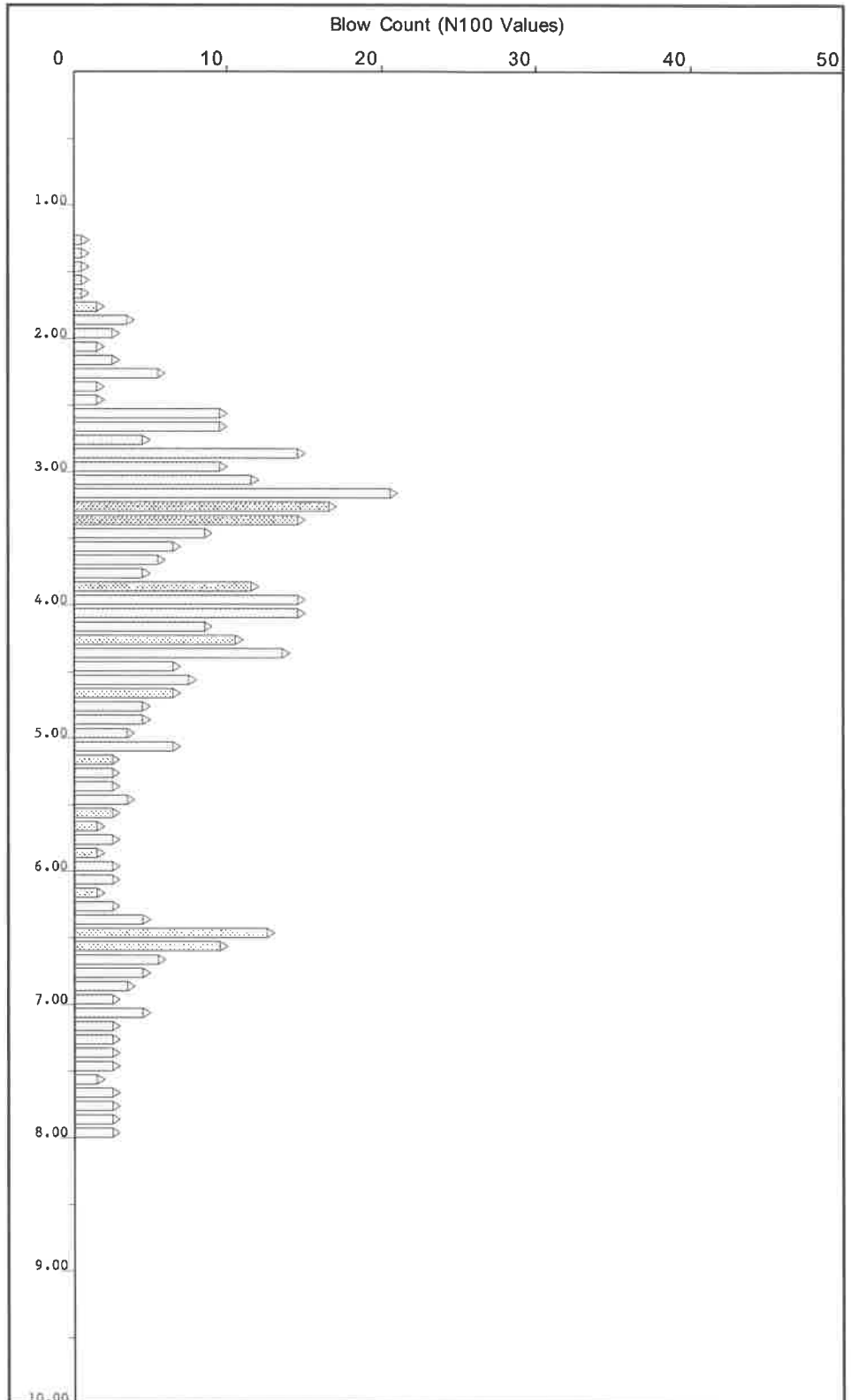
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6	1	1
.7	1	2
.8		4
.9		3
2.0	2	2
.1	2	3
.2	3	6
.3		2
.4		2
.5	10	10
.6	10	5
.7		15
.8		10
.9		12
3.0	12	21
.1		17
.2		15
.3		9
.4	7	6
.5		5
.6		12
.7		15
.8	15	15
.9	9	9
4.0	9	11
.1		14
.2		7
.3	8	7
.4		5
.5		5
.6		4
.7	7	7
.8		3
.9		3
5.0	7	3
.1		3
.2		3
.3		4
.4	3	3
.5		4
.6	3	2
.7		3
.8		2
.9		3
6.0	3	3
.1		3
.2		2
.3		3
.4		5
.5		13
.6	10	6
.7		5
.8		4
.9		3
7.0	5	3
.1		3
.2		3
.3		3
.4		3
.5		3
.6	2	3
.7		3
.8		3
.9		3
8.0		3



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 09/05/19

PROBE No
DP15

Project
Number 14757

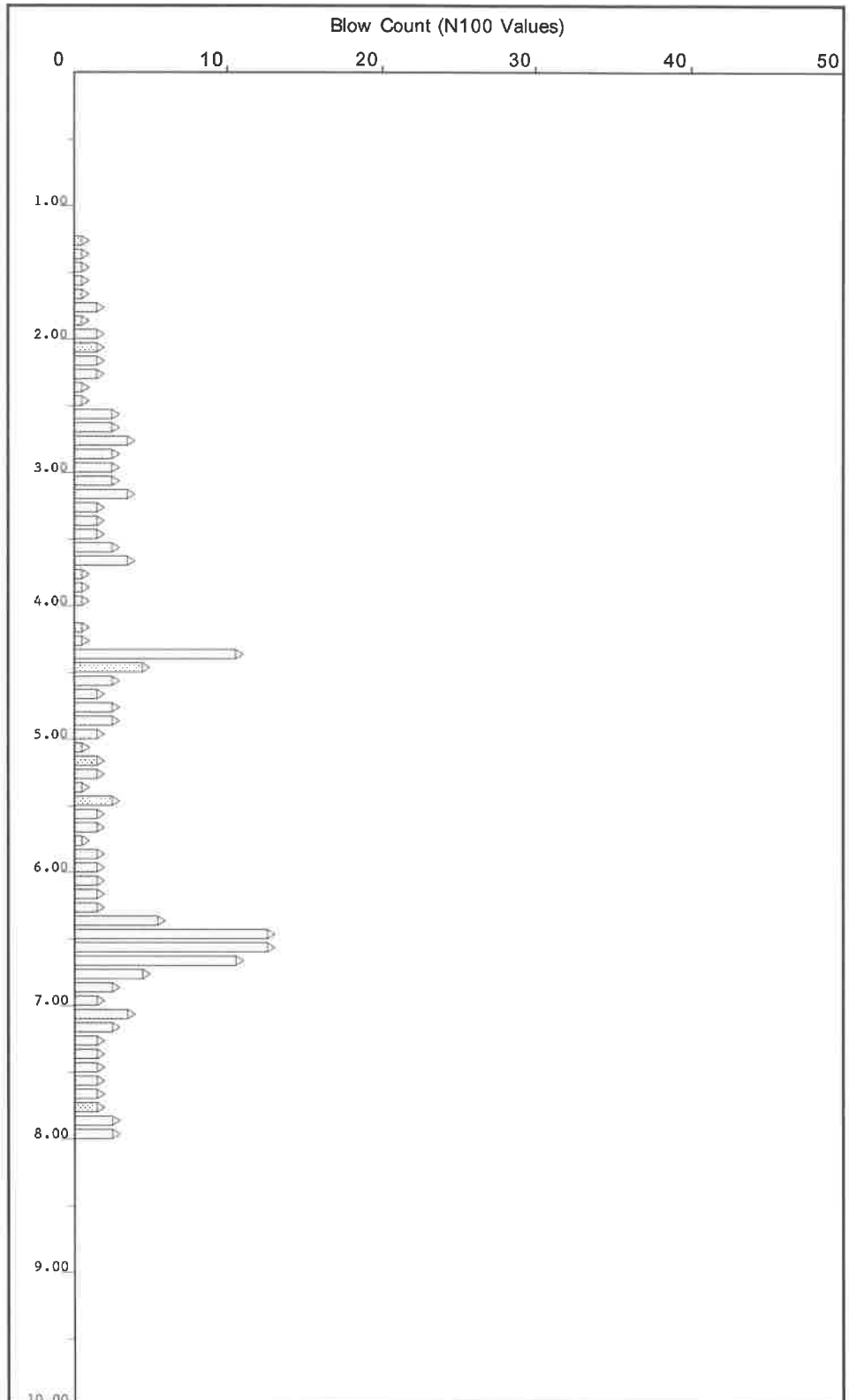
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6	1	1
.7	1	1
.8	2	1
.9	2	2
2.0	2	2
.1	2	2
.2	2	2
.3	2	1
.4	2	1
.5	3	3
.6	3	3
.7	3	4
.8	3	3
.9	3	3
3.0	3	3
.1	4	2
.2	4	2
.3	4	2
.4	4	2
.5	3	2
.6	3	4
.7	4	1
.8	4	1
.9	4	1
4.0	0	1
.1	1	1
.2	1	1
.3	1	11
.4	1	5
.5	3	3
.6	2	3
.7	2	3
.8	2	3
.9	2	2
5.0	1	2
.1	2	2
.2	2	1
.3	2	3
.4	2	1
.5	2	2
.6	2	2
.7	2	2
.8	2	2
.9	2	2
6.0	2	2
.1	2	2
.2	2	2
.3	2	2
.4	2	6
.5	2	13
.6	13	13
.7	11	11
.8	5	5
.9	3	3
7.0	2	2
.1	4	4
.2	3	3
.3	2	2
.4	2	2
.5	2	2
.6	2	2
.7	2	2
.8	2	2
.9	2	3
8.0	2	3



Remarks :	Hammer	63.5 kg	14757
	Standard Drop	750 mm	
	Cone	50 mm dia	
	Rod	8kg / 35 mm	

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DYNAMIC PROBE PENETRATION TEST

Date 09/05/19

PROBE No

DP16

Project Number 14757

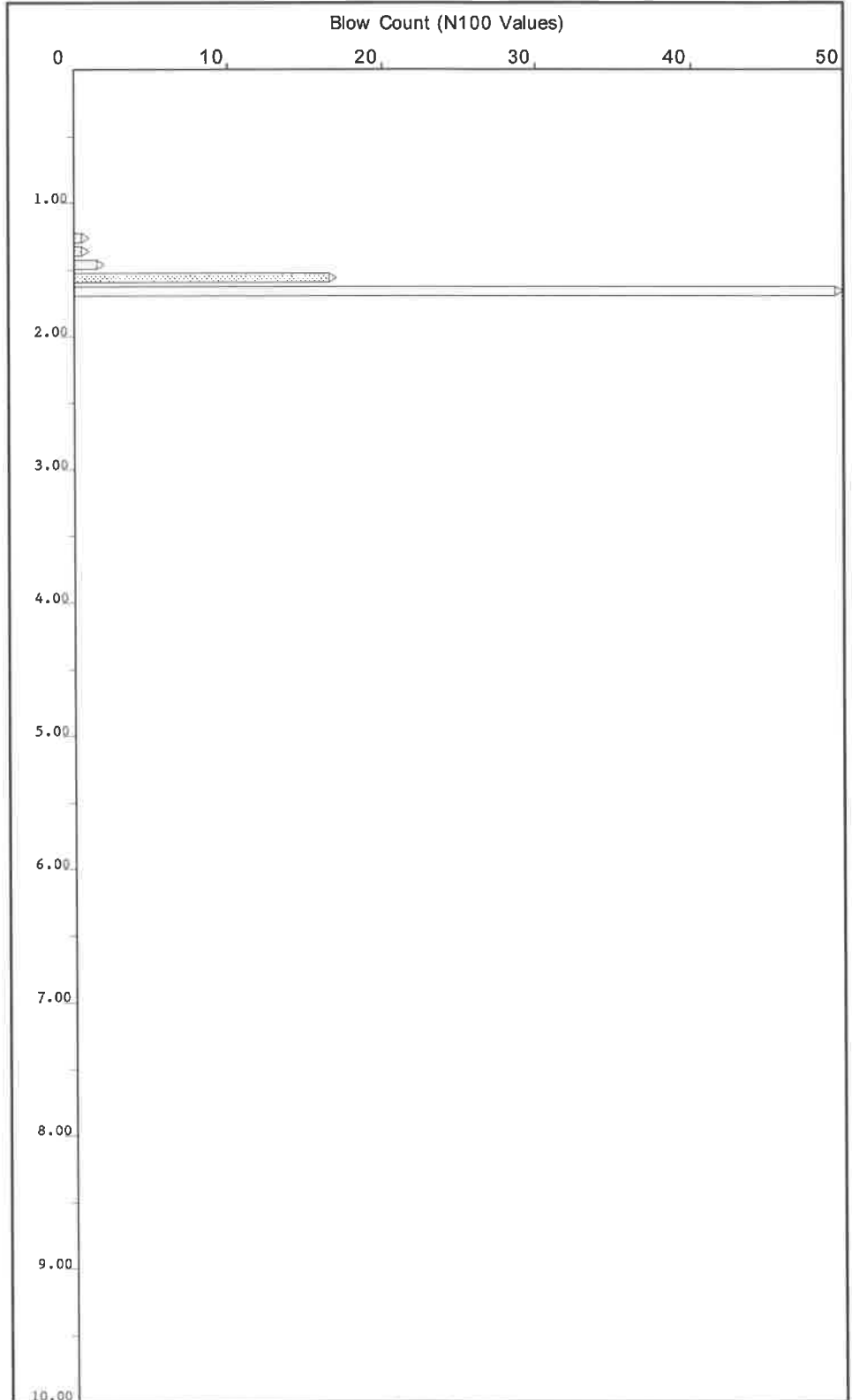
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		2
.6	17	50
.7		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 07/05/19

PROBE No

DP17

Project Number 14757

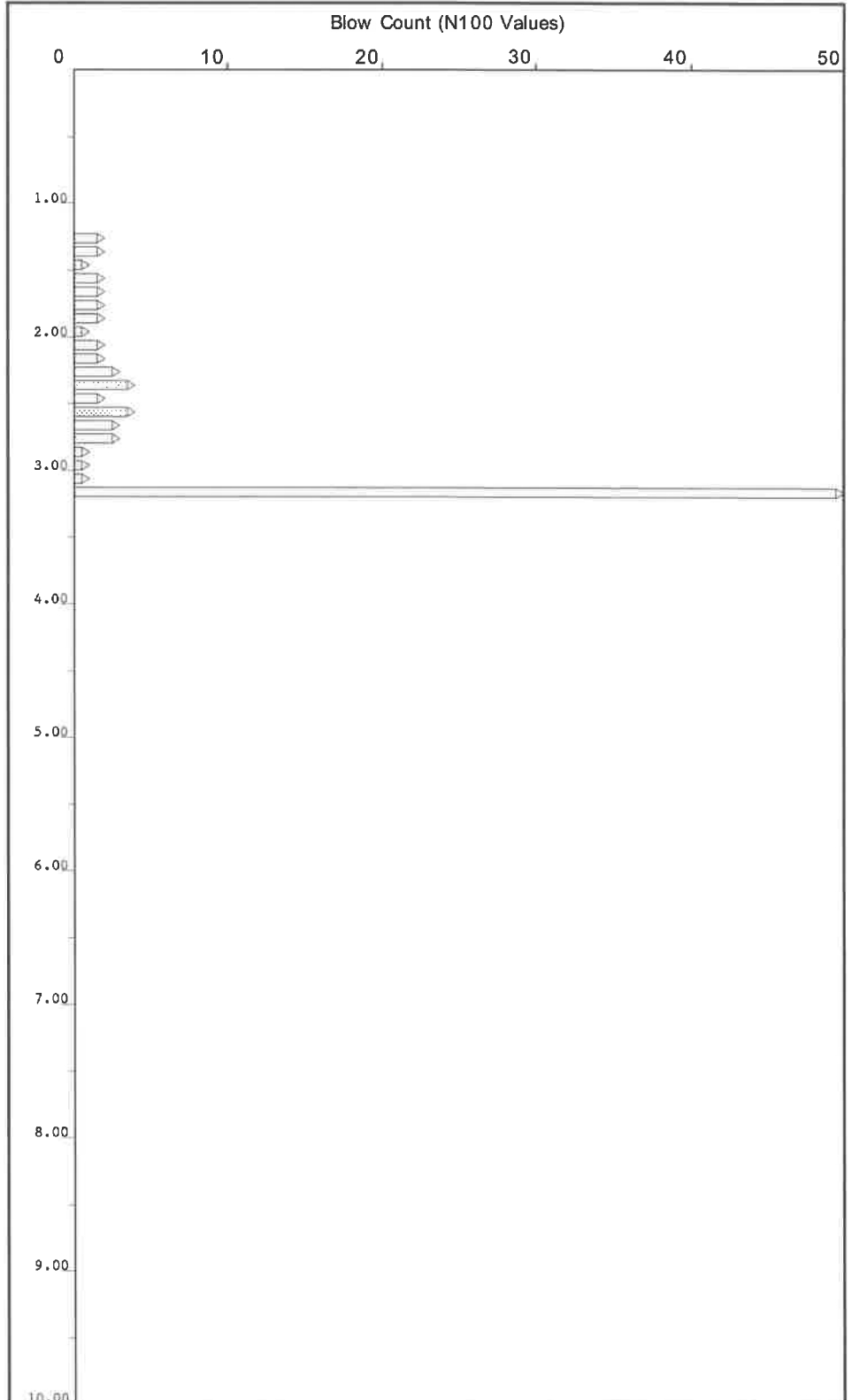
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		2
.4		2
.5		2
.6		2
.7		2
.8		2
.9		2
2.0		2
.1		2
.2		2
.3		3
.4		4
.5		4
.6		4
.7		3
.8		3
.9		1
3.0		1
.1		1
.2		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 07/05/19

PROBE No
DP18

Project
Number 14757

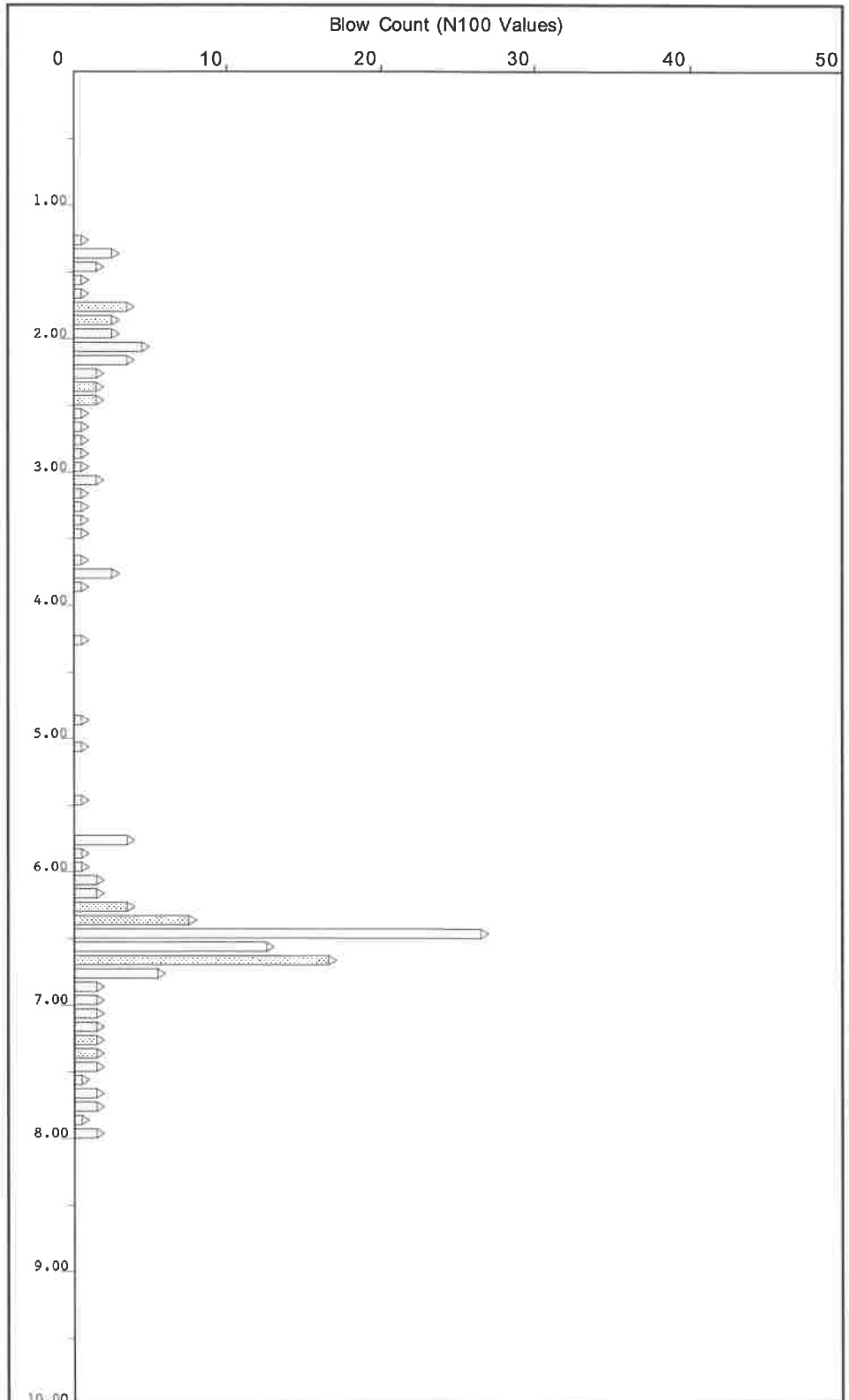
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		3
.5		2
.6	1	1
.7	1	4
.8		3
.9		3
2.0		5
.1		4
.2		2
.3		2
.4		2
.5		1
.6	1	1
.7	1	1
.8		1
.9		1
3.0		2
.1		1
.2		1
.3		1
.4		1
.5		1
.6		0
.7	0	1
.8		3
.9		1
4.0		0
.1		0
.2		0
.3		1
.4		0
.5		0
.6		0
.7		0
.8		0
.9		1
5.0		0
.1	1	0
.2		0
.3	0	0
.4		0
.5		0
.6	0	1
.7		0
.8	0	4
.9		1
6.0		1
.1	2	2
.2	2	4
.3		8
.4		27
.5		13
.6		17
.7		6
.8		2
.9		2
7.0		2
.1	2	2
.2	2	2
.3		2
.4		2
.5		2
.6	1	2
.7		2
.8		2
.9		1
8.0		2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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Date 03/05/19

PROBE No

Project
Number 14757

DP19

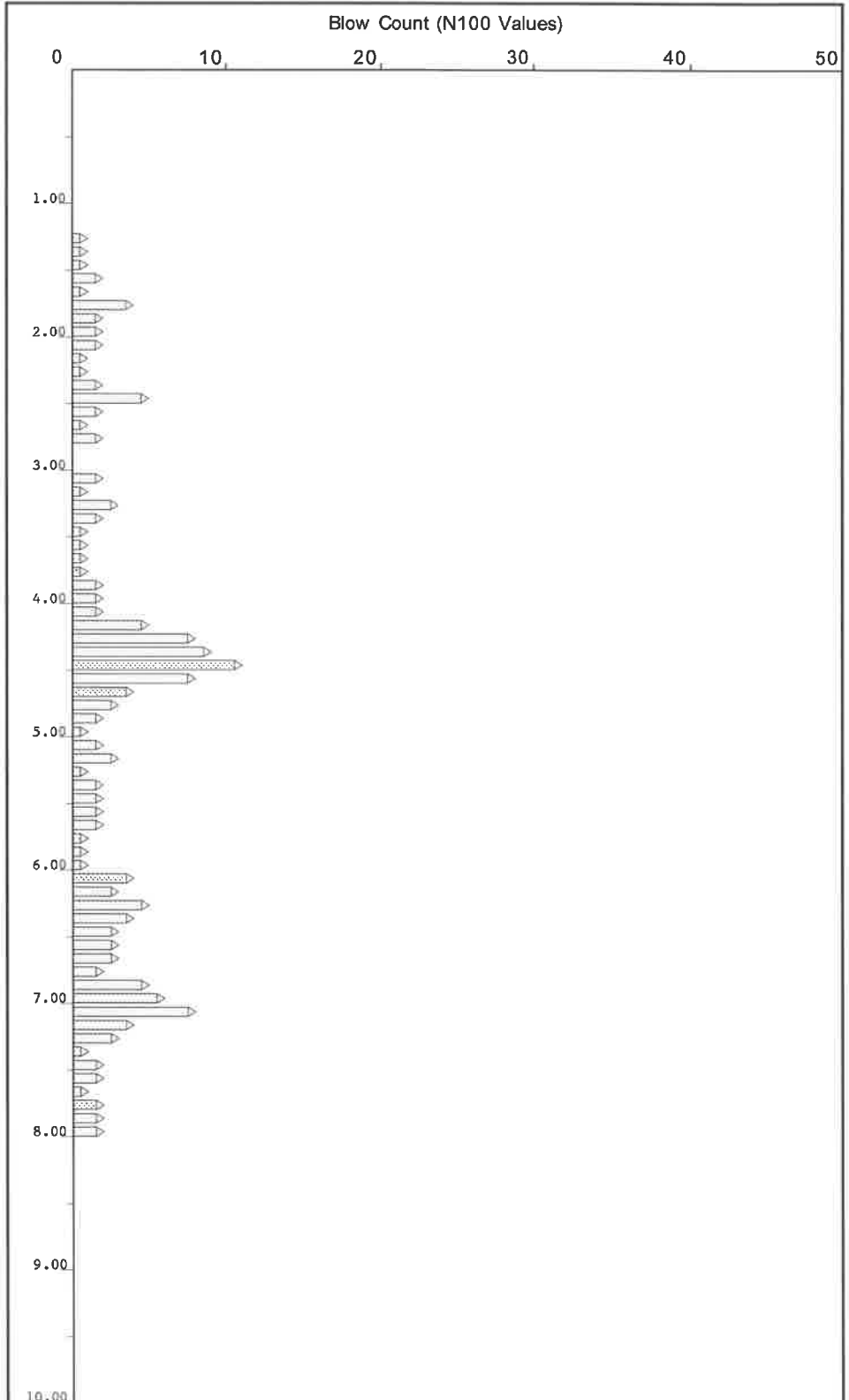
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6		2
.7		1
.8		4
.9		2
2.0		2
.1		2
.2		1
.3		1
.4		2
.5		5
.6		2
.7		1
.8		2
.9		0
3.0		0
.1		2
.2		1
.3		3
.4		2
.5		1
.6		1
.7		1
.8		1
.9		2
4.0		2
.1		2
.2		5
.3		8
.4		9
.5		11
.6		8
.7		4
.8		3
.9		2
5.0		1
.1		2
.2		3
.3		1
.4		2
.5		2
.6		2
.7		2
.8		1
.9		1
6.0		1
.1		4
.2		3
.3		5
.4		4
.5		3
.6		3
.7		3
.8		2
.9		5
7.0		6
.1		8
.2		4
.3		3
.4		1
.5		2
.6		2
.7		1
.8		2
.9		2
8.0		2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 03/05/19

PROBE No
DP20

Project
Number 14757

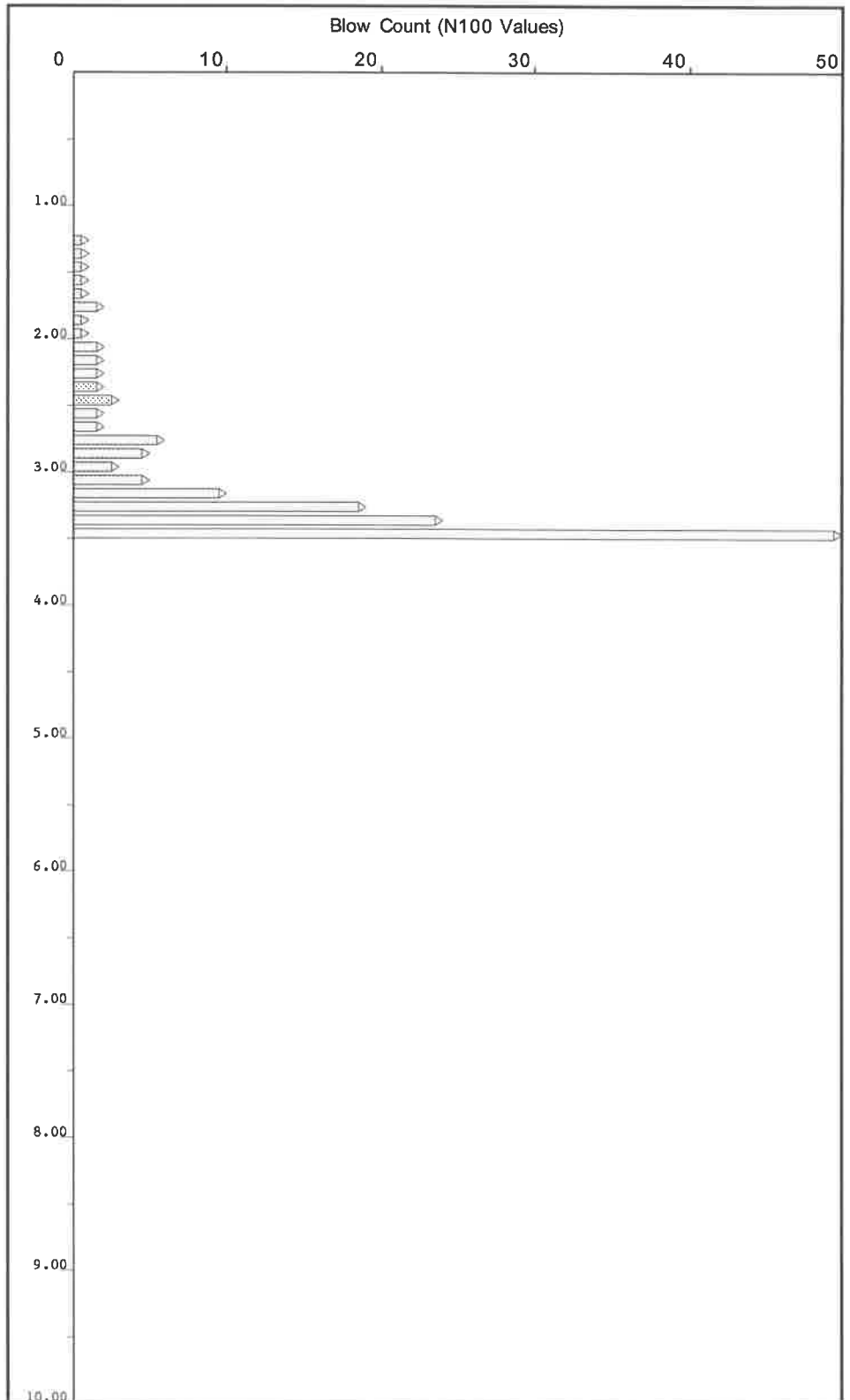
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6		1
.7		1
.8		2
.9		1
2.0		1
.1		2
.2		2
.3		2
.4		2
.5		3
.6		2
.7		2
.8		6
.9		5
3.0		3
.1		5
.2		10
.3		19
.4		24
.5		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DP21

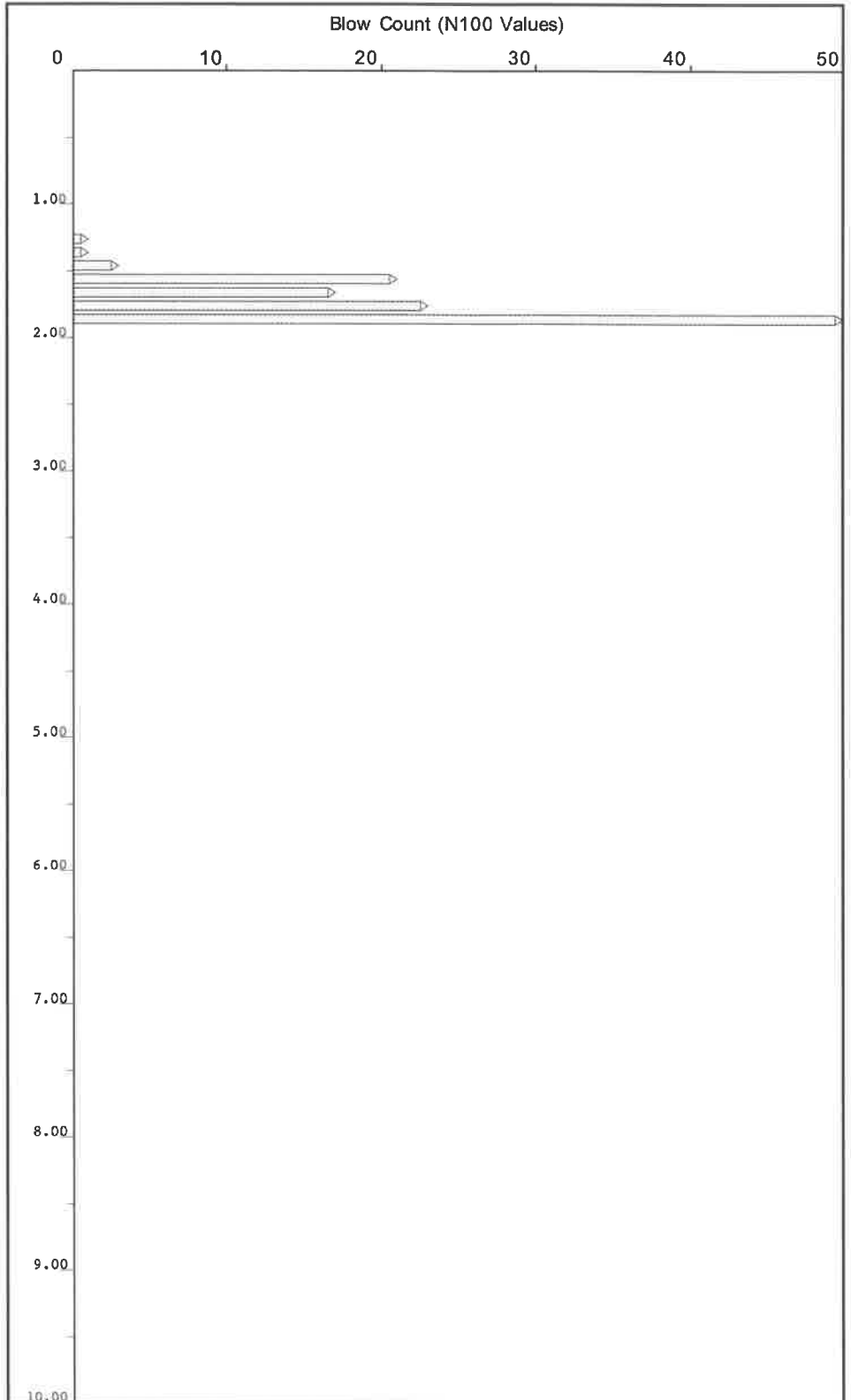
Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1 3
.5		21
.6		17
.7		23
.8		50
.9		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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Date 03/05/19

PROBE No
DP22

Project
Number 14757

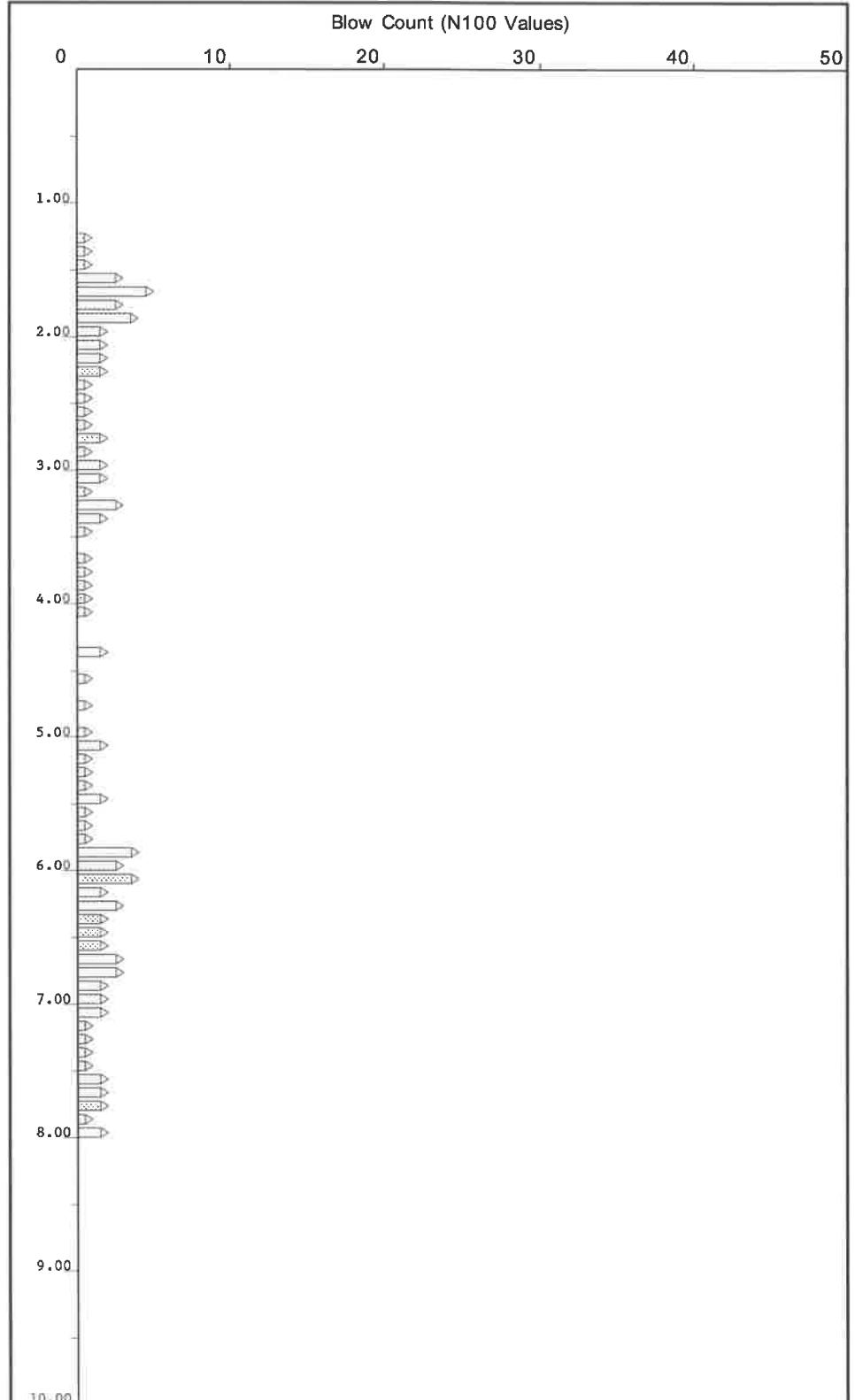
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6		3
.7		5
.8		3
.9		4
2.0		2
.1		2
.2		2
.3		1
.4		1
.5		1
.6		1
.7		1
.8		1
.9		2
3.0		2
.1		1
.2		3
.3		2
.4		1
.5		0
.6		1
.7		1
.8		1
.9		1
4.0		1
.1		0
.2		0
.3		2
.4		0
.5		1
.6		0
.7		1
.8		0
.9		1
5.0		2
.1		1
.2		1
.3		1
.4		1
.5		2
.6		1
.7		1
.8		1
.9		4
6.0		3
.1		4
.2		2
.3		3
.4		2
.5		2
.6		2
.7		3
.8		3
.9		2
7.0		2
.1		2
.2		1
.3		1
.4		1
.5		1
.6		2
.7		2
.8		2
.9		1
8.0		2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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PROBE No

DP23

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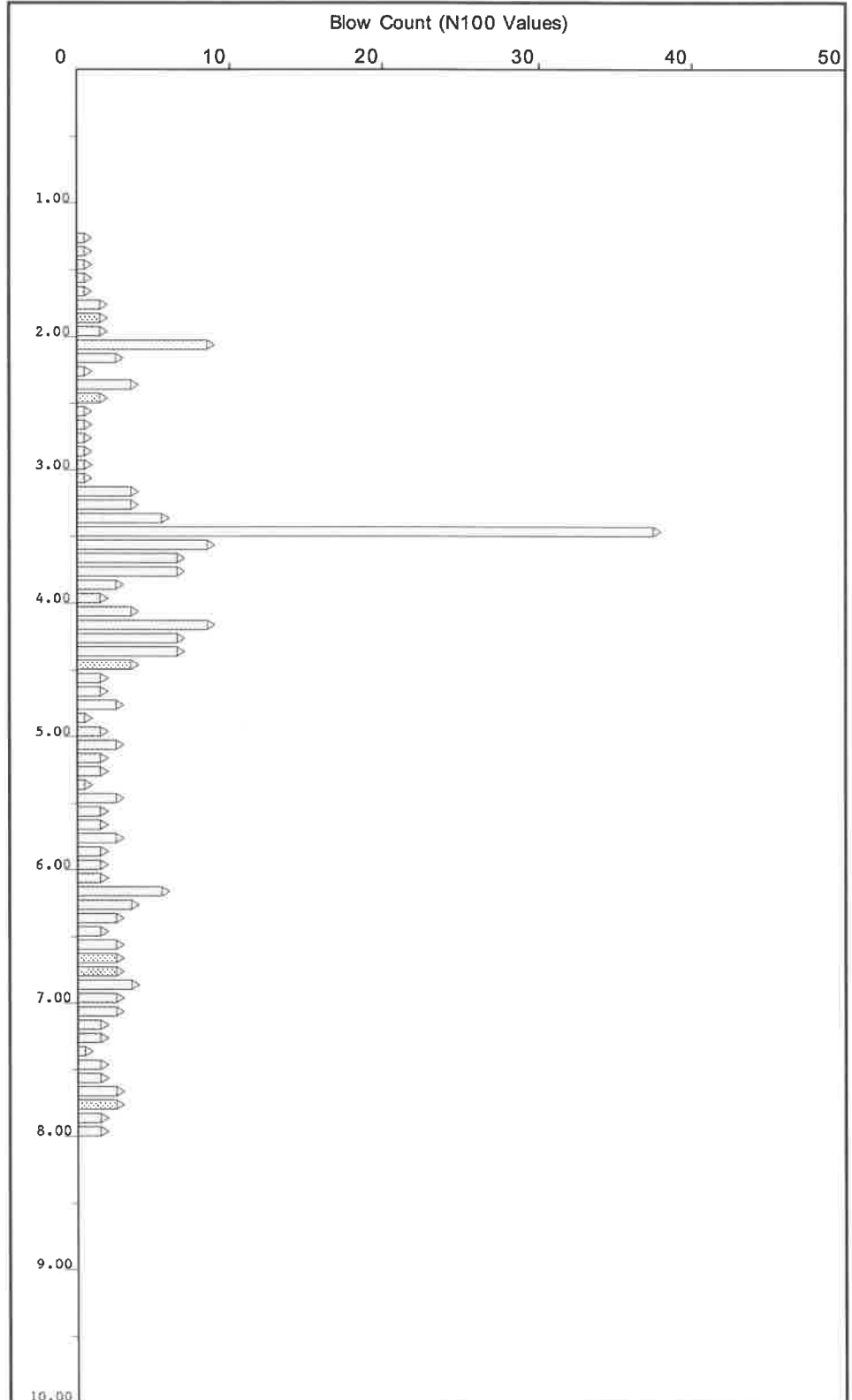
Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6		1
.7		1
.8		2
.9		2
2.0		2
.1		9
.2		3
.3		1
.4		4
.5		2
.6		1
.7		1
.8		1
.9		1
3.0		1
.1		1
.2		4
.3		4
.4		6
.5		38
.6		9
.7		7
.8		7
.9		3
4.0		2
.1		4
.2		9
.3		7
.4		7
.5		7
.6		4
.7		2
.8		2
.9		3
5.0		1
.1		2
.2		3
.3		2
.4		2
.5		1
.6		3
.7		2
.8		2
.9		2
6.0		2
.1		2
.2		6
.3		4
.4		3
.5		2
.6		3
.7		3
.8		3
.9		4
7.0		3
.1		3
.2		2
.3		2
.4		1
.5		2
.6		2
.7		3
.8		3
.9		2
8.0		2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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PROBE No

DP24

Project Number 14757

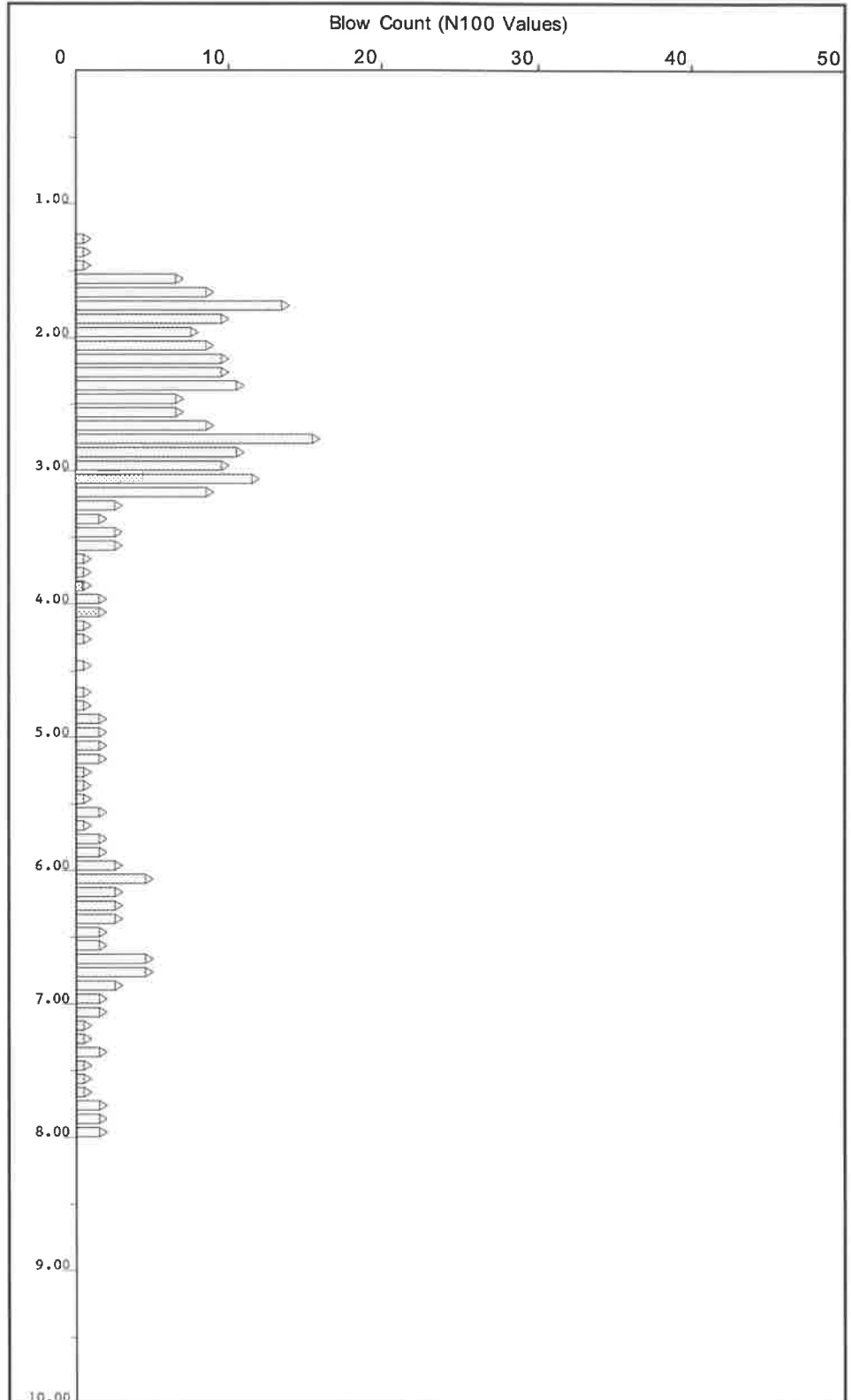
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6		7
.7		9
.8		14
.9		10
2.0		8
.1		9
.2		10
.3		10
.4		11
.5		7
.6		7
.7		9
.8		16
.9		11
3.0		10
.1		12
.2		9
.3		3
.4		2
.5		3
.6		3
.7		1
.8		1
.9		1
4.0		2
.1		2
.2		1
.3		1
.4		0
.5		1
.6		0
.7		1
.8		1
.9		2
5.0		2
.1		2
.2		2
.3		1
.4		1
.5		1
.6		2
.7		1
.8		2
.9		2
6.0		3
.1		5
.2		3
.3		3
.4		3
.5		2
.6		2
.7		5
.8		5
.9		3
7.0		2
.1		2
.2		1
.3		1
.4		2
.5		1
.6		1
.7		1
.8		2
.9		2
8.0		2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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PROBE No

Project
Number 14757

DP25

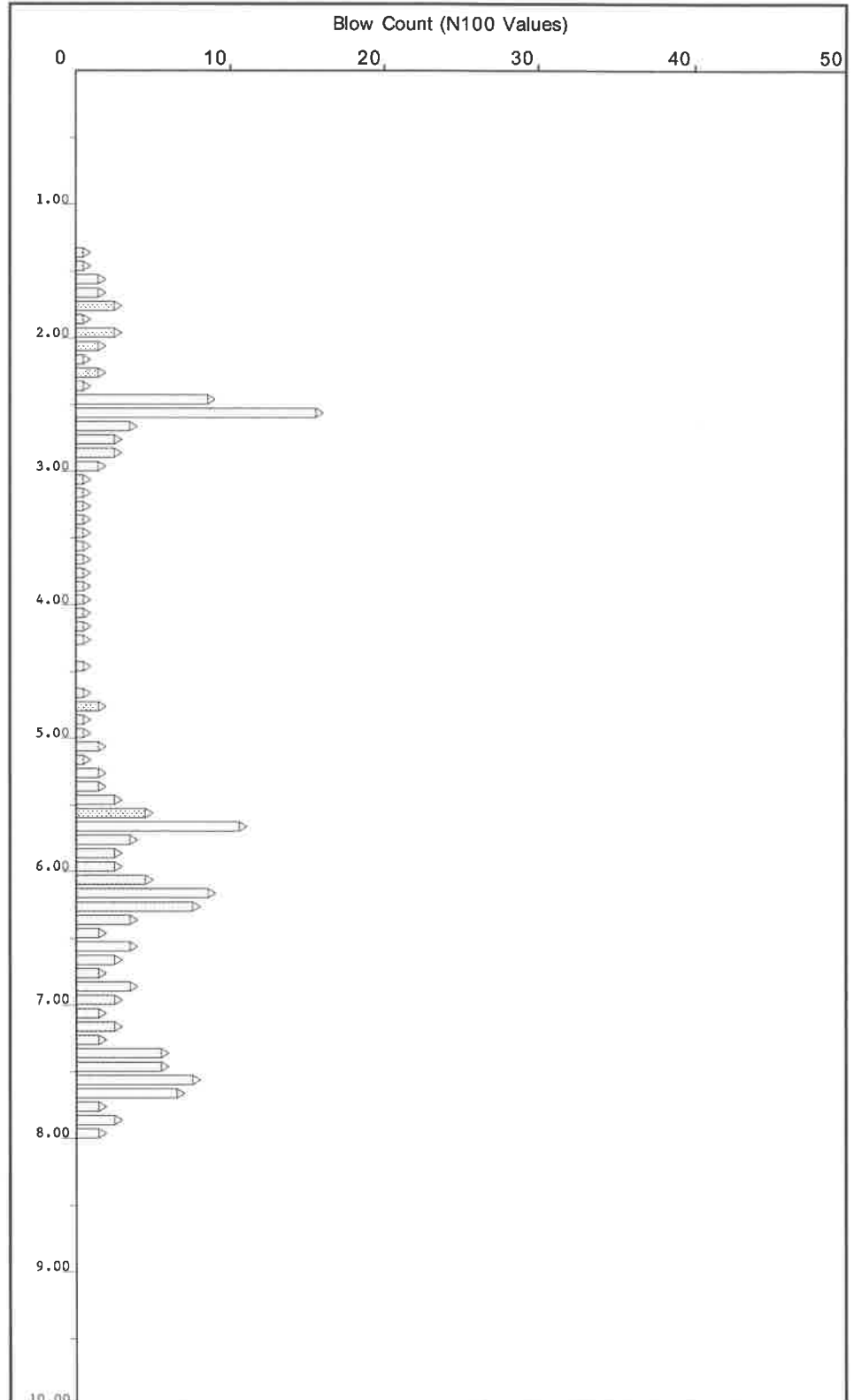
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		-
.4		1
.5		1
.6	2	1
.7	2	3
.8	2	1
.9	2	3
2.0	2	1
.1	2	1
.2	1	2
.3	1	2
.4	1	1
.5	16	9
.6	4	3
.7	4	3
.8	4	3
.9	1	2
3.0	1	1
.1	1	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
4.0	1	1
.1	1	1
.2	1	1
.3	1	1
.4	1	0
.5	0	1
.6	1	1
.7	1	2
.8	1	1
.9	2	1
5.0	2	1
.1	2	1
.2	1	2
.3	1	2
.4	1	2
.5	5	3
.6	11	3
.7	11	4
.8	4	3
.9	3	3
6.0	5	9
.1	9	8
.2	8	4
.3	8	4
.4	4	2
.5	4	3
.6	3	2
.7	2	4
.8	3	3
.9	2	3
7.0	2	3
.1	3	2
.2	3	6
.3	4	6
.4	8	6
.5	8	7
.6	7	2
.7	2	3
.8	3	2
.9	2	3
8.0	2	2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DP26

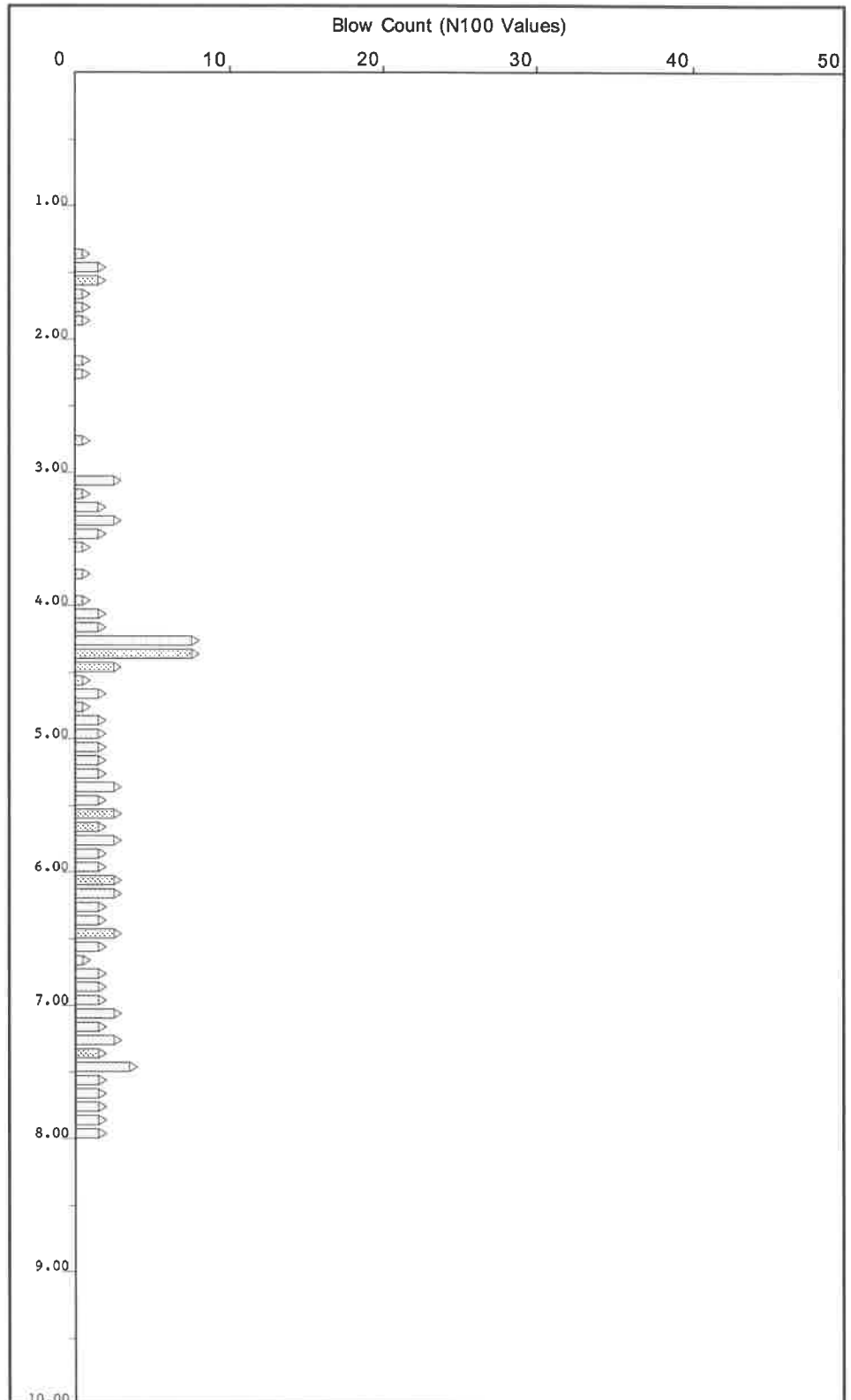
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		-
.4		1
.5		2
.6	2	
.7	1	1
.8	1	1
.9	1	0
2.0	0	0
.1	0	1
.2	1	1
.3	1	0
.4	0	0
.5	0	0
.6	0	0
.7	0	0
.8	0	1
.9	0	0
3.0	3	0
.1	1	1
.2	2	2
.3	3	3
.4	2	2
.5	1	0
.6	0	1
.7	0	0
.8	0	0
.9	0	1
4.0	2	0
.1	2	1
.2	2	2
.3	2	8
.4	2	8
.5	1	3
.6	1	2
.7	2	1
.8	1	2
.9	2	2
5.0	2	2
.1	2	2
.2	2	2
.3	2	2
.4	2	3
.5	2	2
.6	3	2
.7	2	2
.8	2	3
.9	2	2
6.0	3	2
.1	3	2
.2	3	2
.3	2	2
.4	2	3
.5	2	2
.6	1	2
.7	1	2
.8	2	2
.9	3	2
7.0	3	2
.1	2	2
.2	2	3
.3	2	2
.4	2	4
.5	2	2
.6	2	2
.7	2	2
.8	2	2
.9	2	2
8.0		2



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DP27

Project
Number 14757

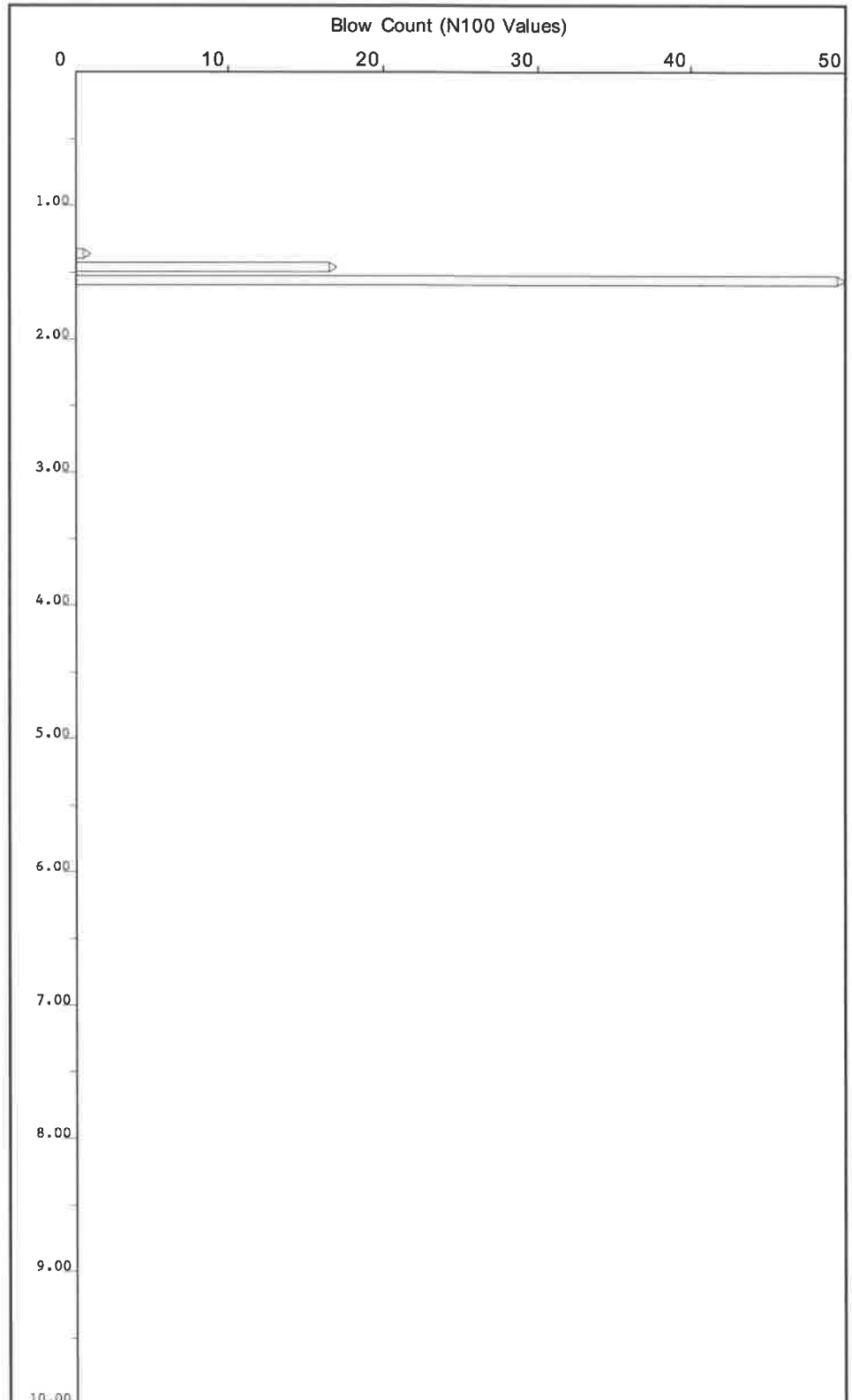
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		-
.4		1
.5		17
.6		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 29/04/19

PROBE No
DP28

Project
Number 14757

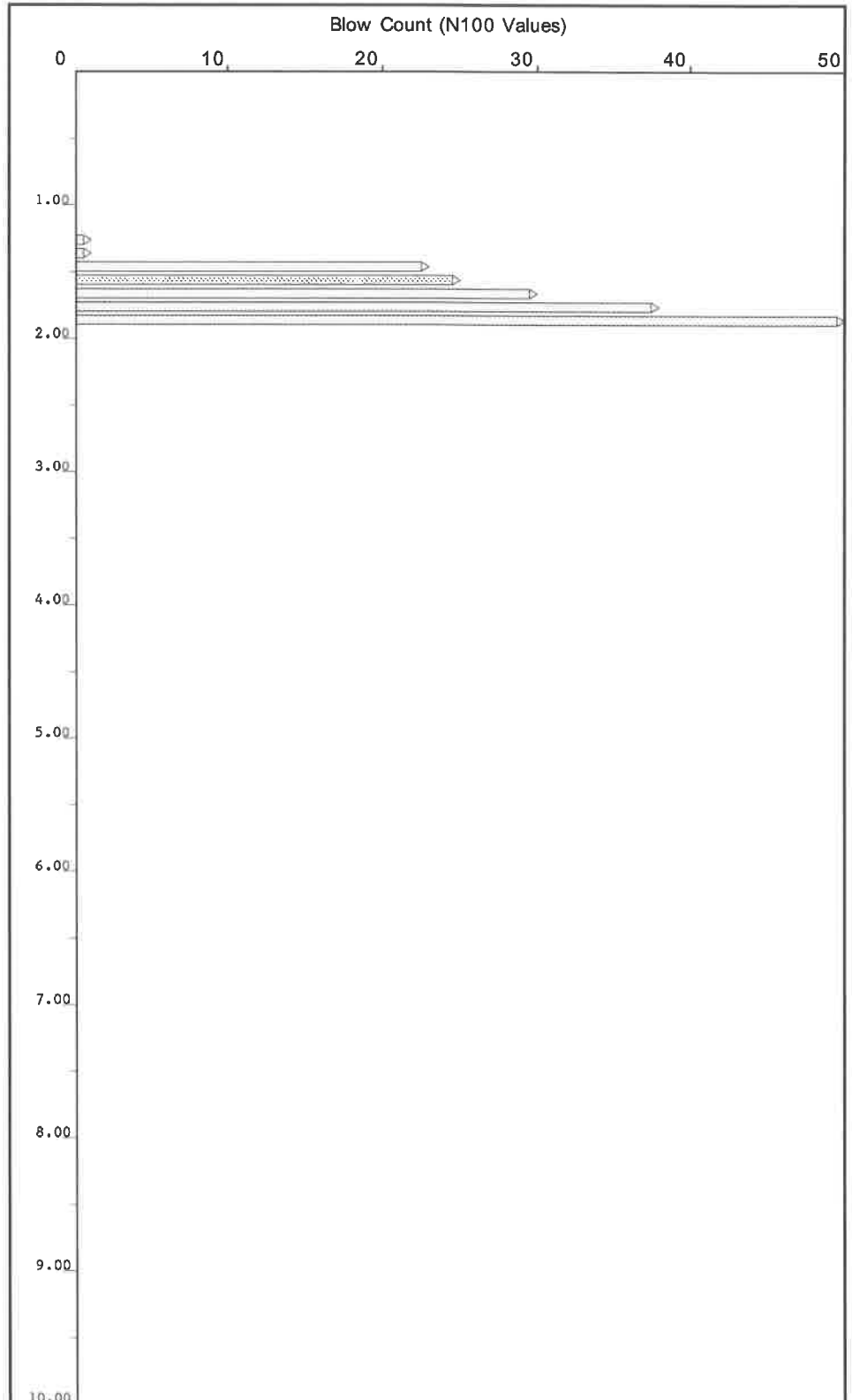
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		23
.6		25
.7		30
.8		38
.9		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 29/04/19

PROBE No
DP29

Project Number 14757

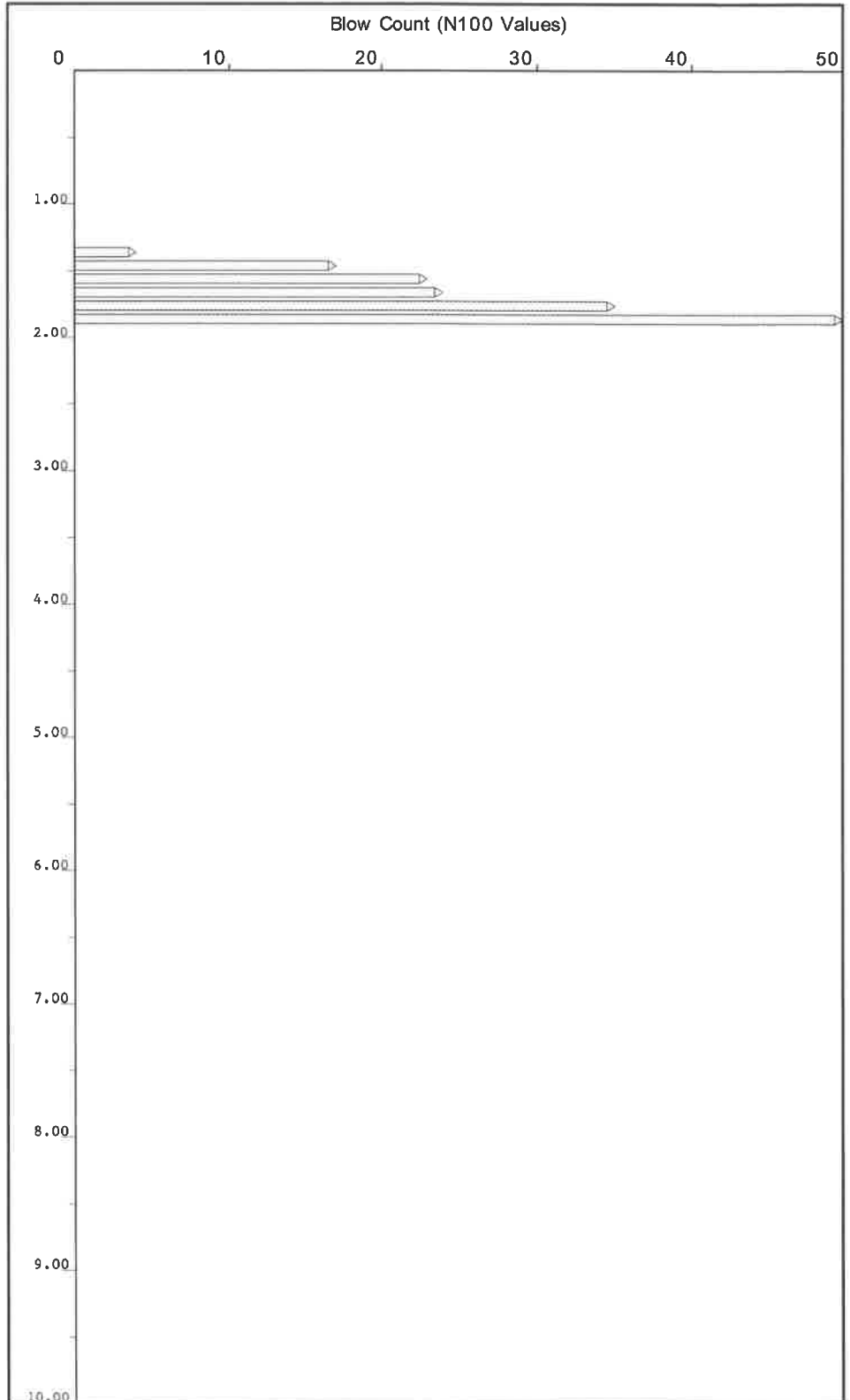
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		-
.4		4
.5		17
.6		23
.7		24
.8		35
.9		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 29/04/19

PROBE No
DP30

Project
Number 14757

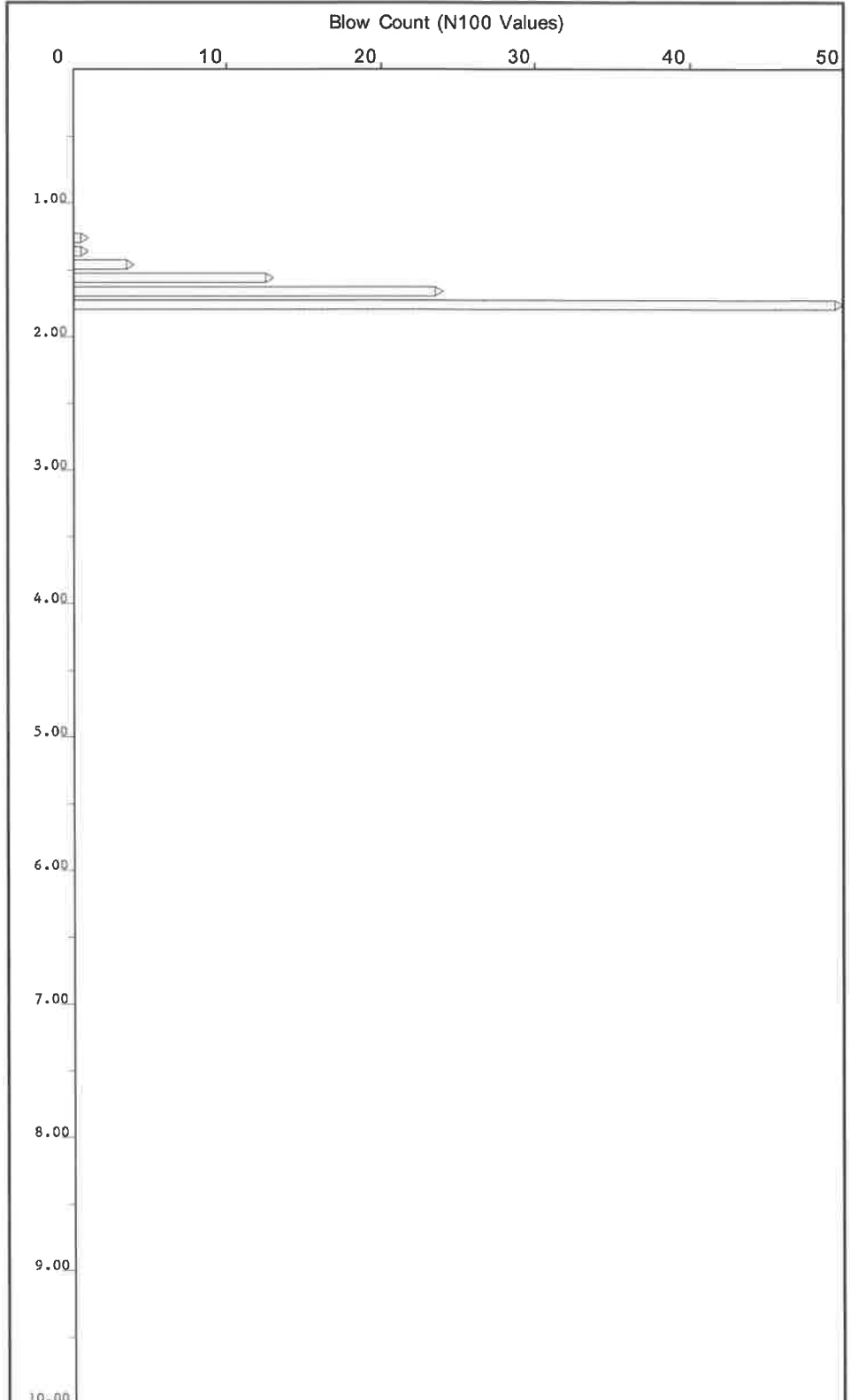
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1 4
.5		13
.6		24
.7		50
.8		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 30/04/19

PROBE No

Project Number 14757

DP31

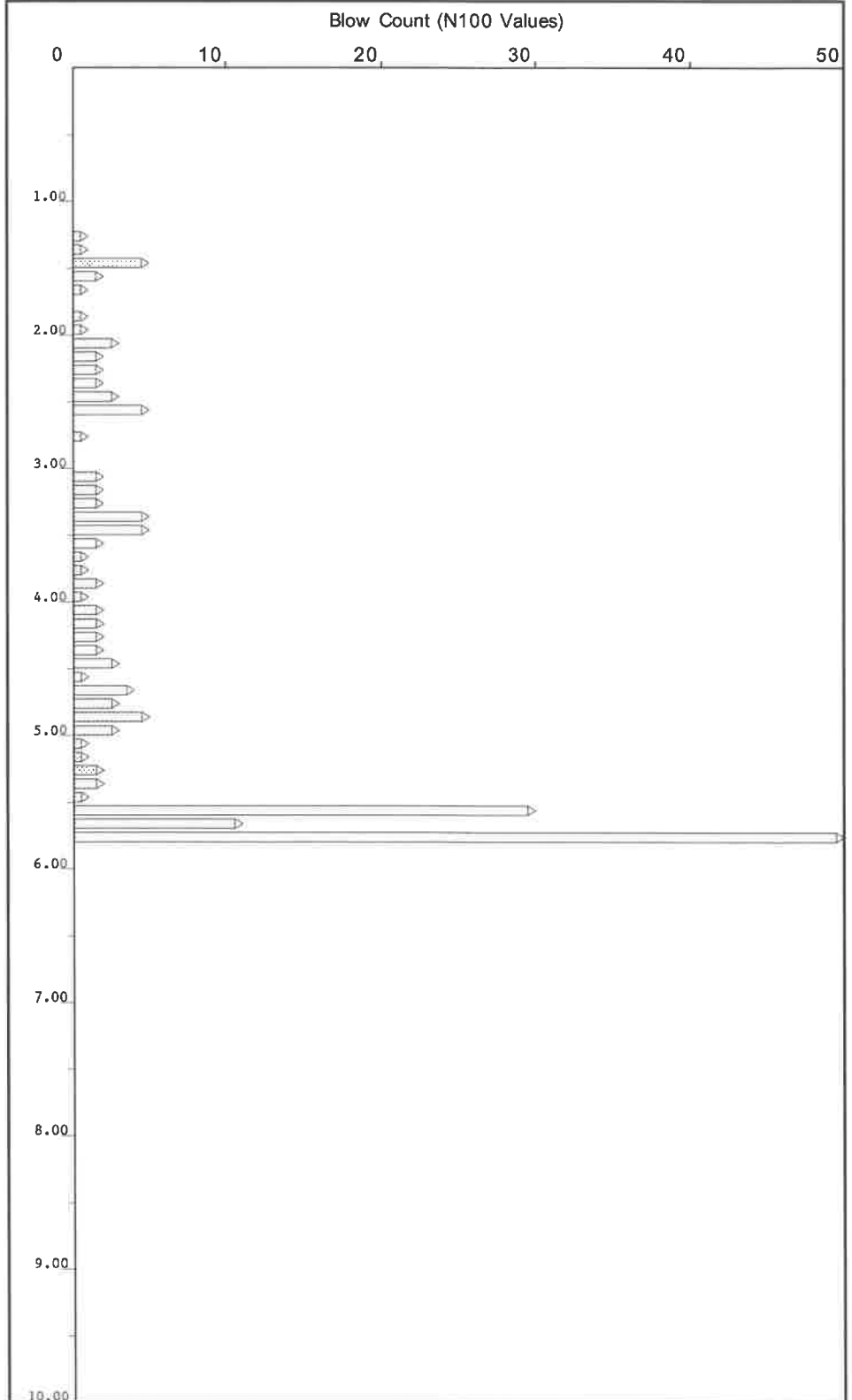
Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		5
.6		2
.7		1
.8		0
.9		1
2.0		1
.1		3
.2		2
.3		2
.4		2
.5		3
.6		5
.7		0
.8		1
.9		0
3.0		0
.1		2
.2		2
.3		2
.4		5
.5		5
.6		2
.7		1
.8		1
.9		2
4.0		1
.1		2
.2		2
.3		2
.4		2
.5		3
.6		1
.7		4
.8		3
.9		5
5.0		3
.1		1
.2		1
.3		2
.4		2
.5		1
.6		30
.7		11
.8		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 30/04/19

PROBE No

Project Number 14757

DP32

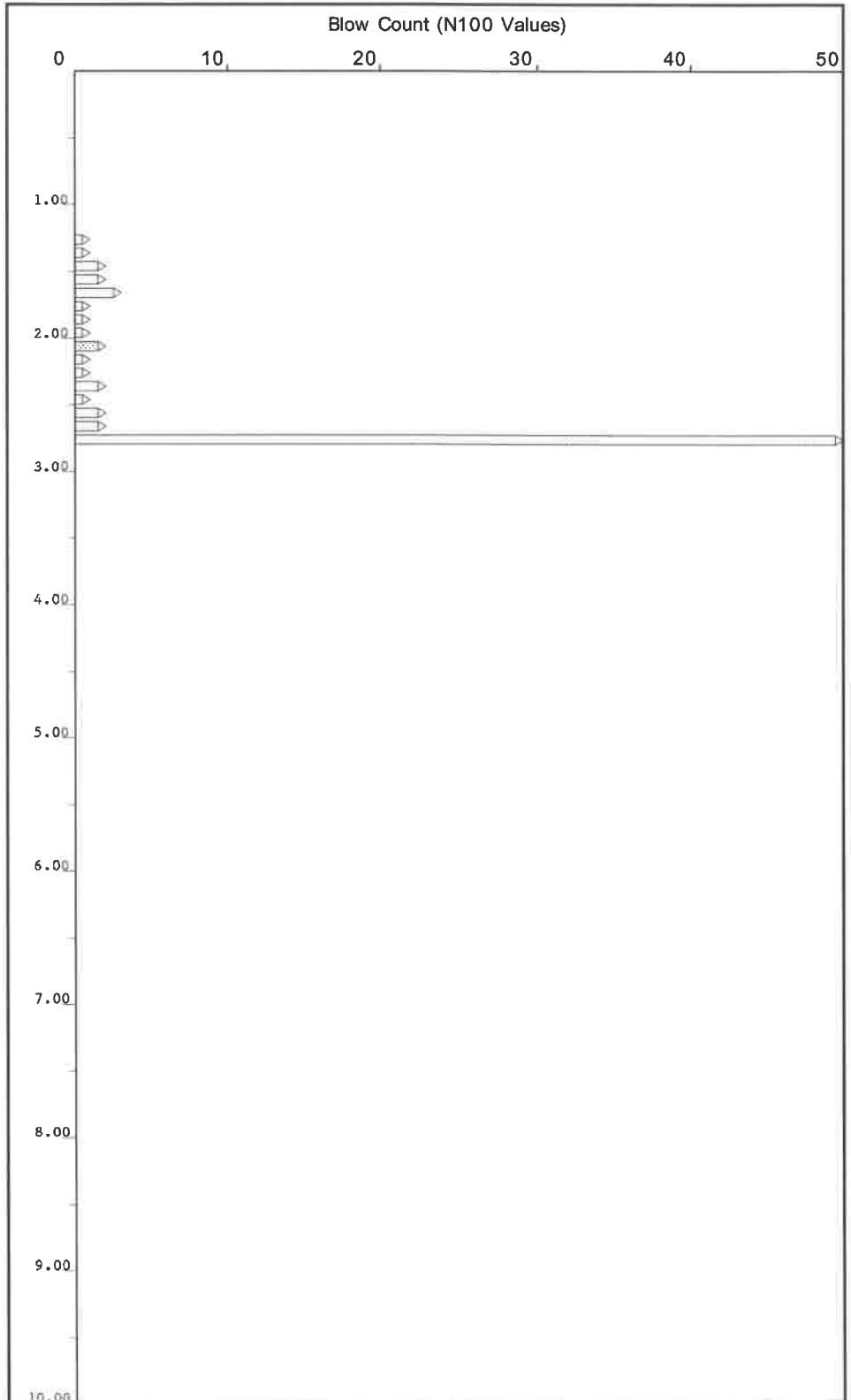
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		2
.6		2
.7		3
.8		1
.9		1
2.0		1
.1		2
.2		1
.3		1
.4		2
.5		1
.6		2
.7		2
.8		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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PROBE No

DP33

Project Number 14757

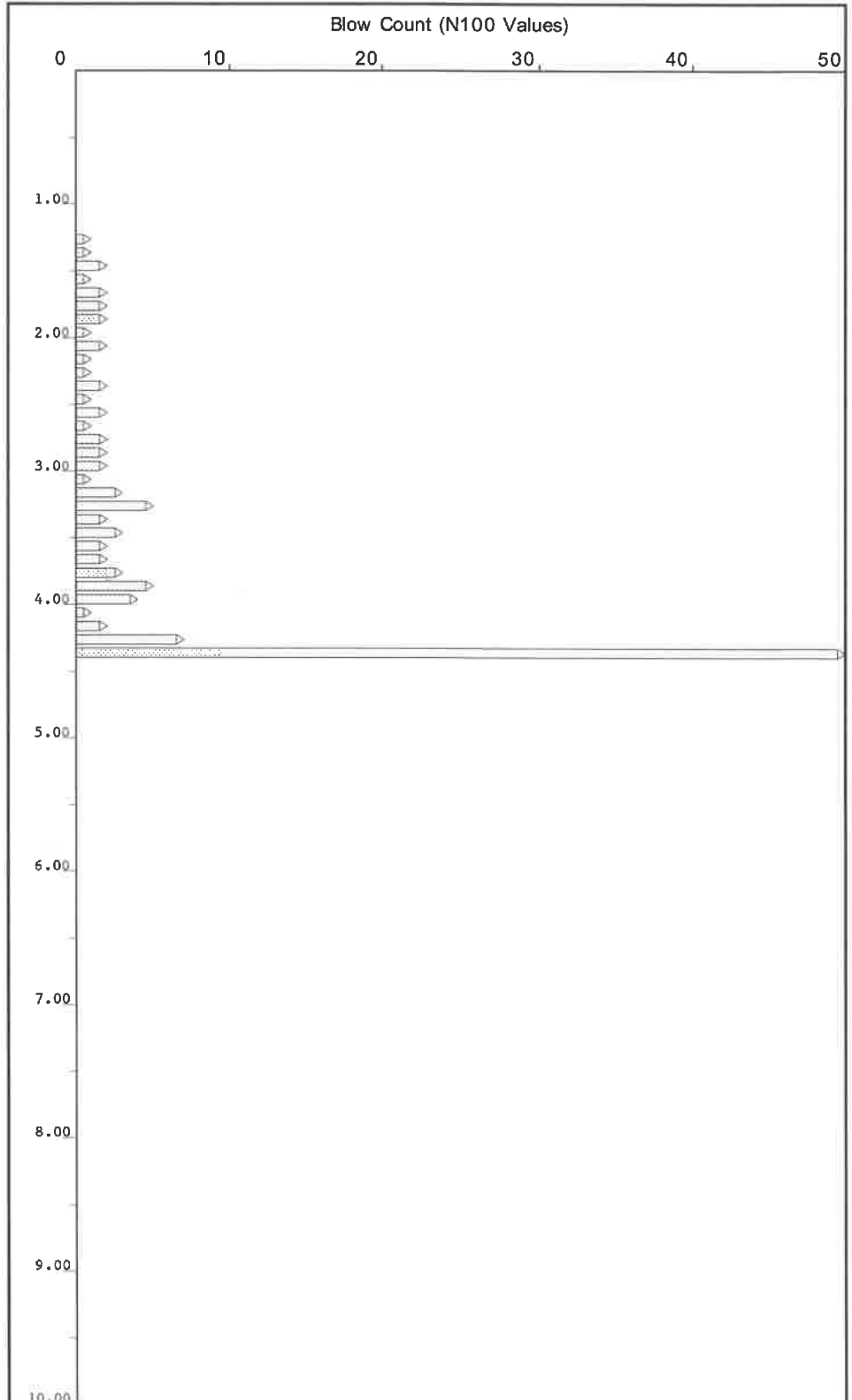
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		2
.6	1	2
.7	2	2
.8	2	2
.9	2	1
2.0	2	1
.1	2	1
.2	1	1
.3	1	2
.4	1	1
.5	2	1
.6	2	2
.7	1	2
.8	2	2
.9	2	2
3.0	1	2
.1	1	2
.2	3	5
.3	3	2
.4	3	3
.5	2	2
.6	2	2
.7	2	3
.8	2	5
.9	2	4
4.0	1	2
.1	2	7
.2	2	50
.3		
.4		



Remarks :

Hammer 63.5 kg

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Standard Drop 750 mm

Cone 50 mm dia

Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 30/04/19

PROBE No

DP34

Project Number 14757

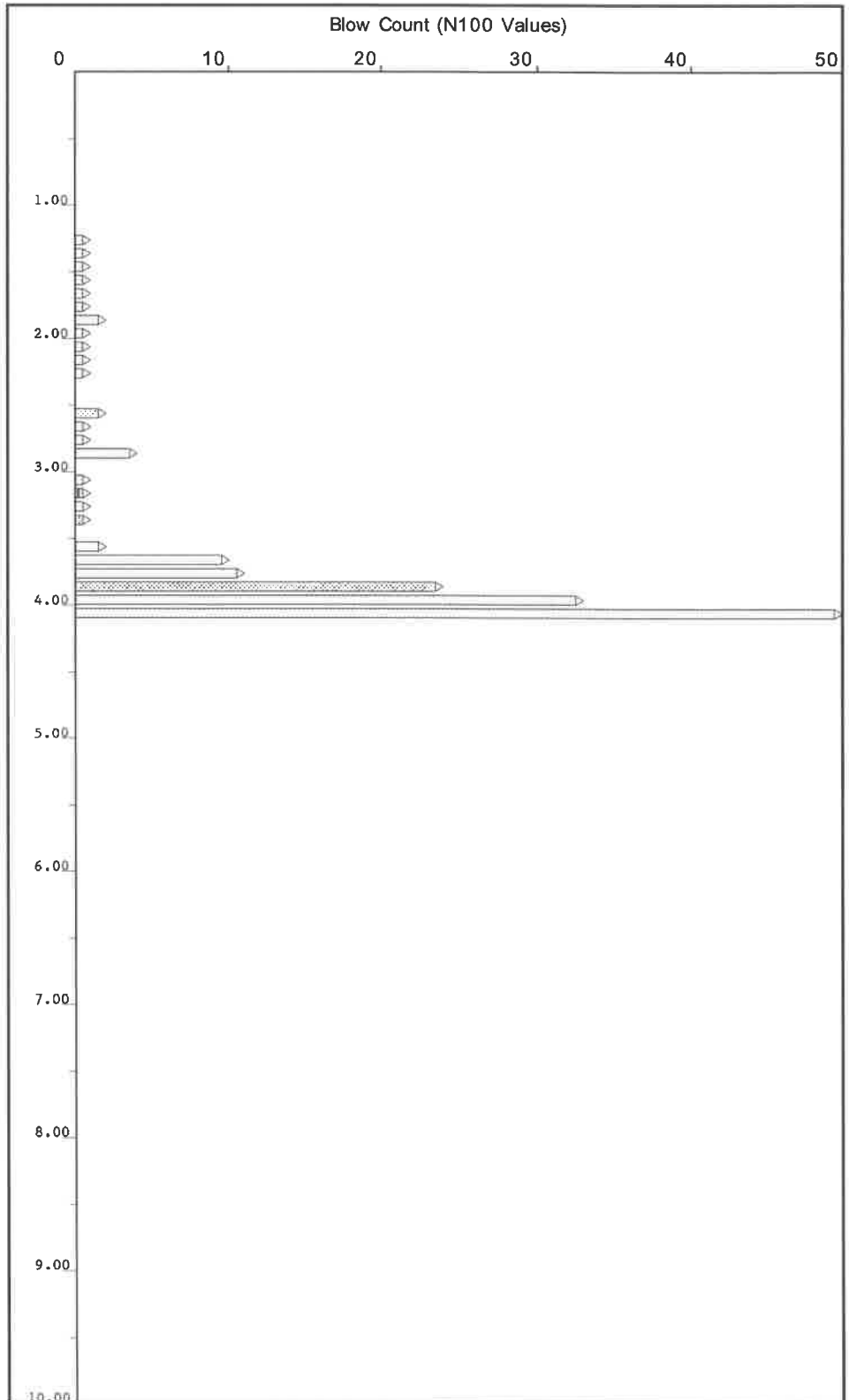
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6	1	1
.7	1	1
.8	1	2
.9	1	1
2.0	1	1
.1	1	1
.2	1	1
.3	1	0
.4	1	0
.5	2	0
.6	1	1
.7	1	1
.8	1	4
.9	1	0
3.0	1	1
.1	1	1
.2	1	1
.3	1	1
.4	1	0
.5	2	1
.6	10	11
.7	11	24
.8	11	33
.9	11	33
4.0	50	50
.1		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 30/04/19

PROBE No
DP35

Project
Number 14757

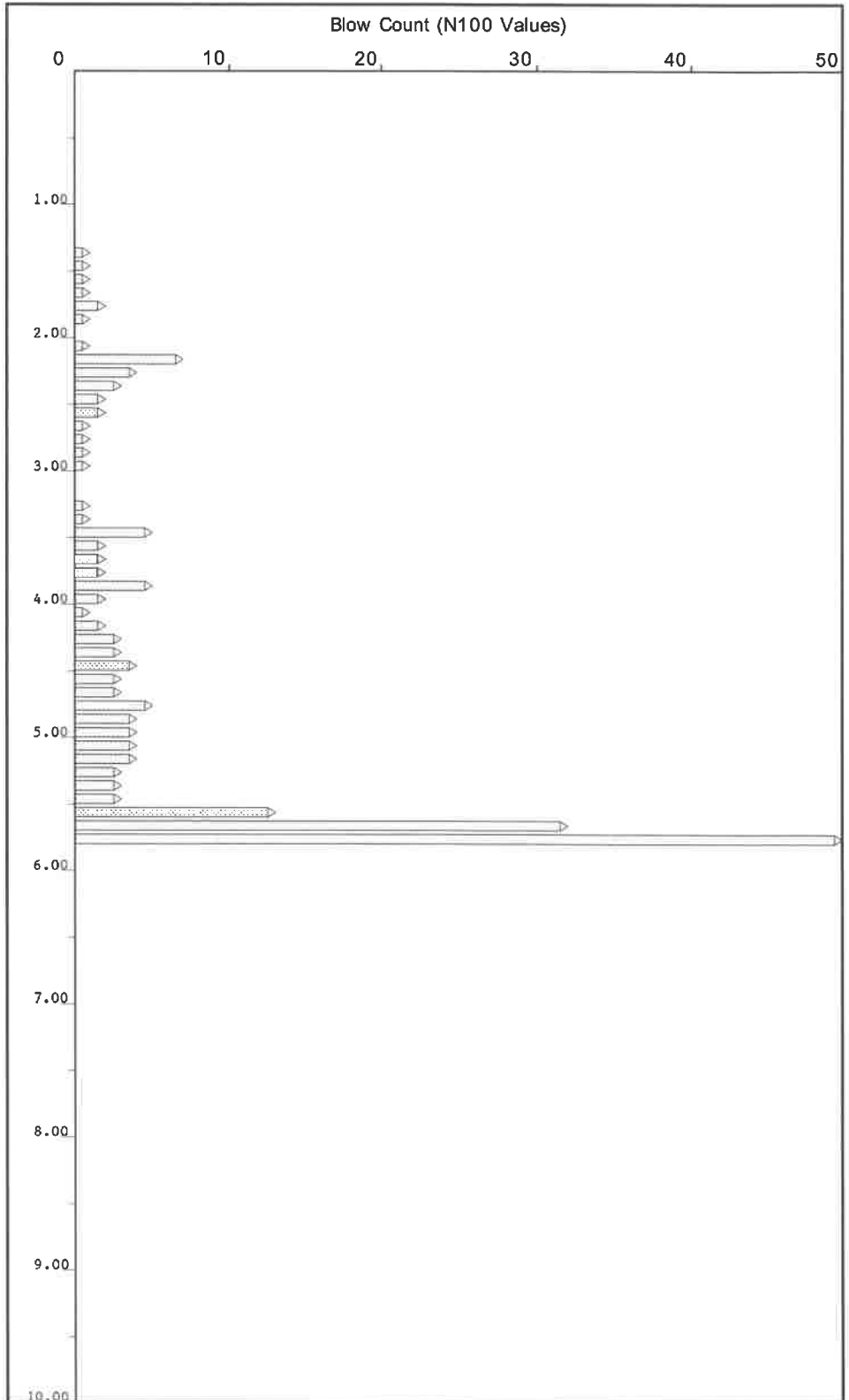
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		-
.4		1
.5		1
.6	1	1
.7	1	2
.8	1	1
.9	1	0
2.0	1	7
.1	7	4
.2	4	3
.3	3	2
.4	2	2
.5	2	1
.6	1	1
.7	1	1
.8	1	1
.9	0	0
3.0	0	0
.1	0	1
.2	0	1
.3	0	1
.4	0	1
.5	0	5
.6	2	2
.7	2	2
.8	2	5
.9	2	2
4.0	1	1
.1	2	2
.2	2	3
.3	2	3
.4	2	3
.5	3	3
.6	3	3
.7	3	5
.8	3	4
.9	3	4
5.0	4	4
.1	4	4
.2	4	3
.3	4	3
.4	4	3
.5	4	3
.6	13	3
.7	32	50
.8		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 30/04/19

PROBE No

Project Number 14757

DP36

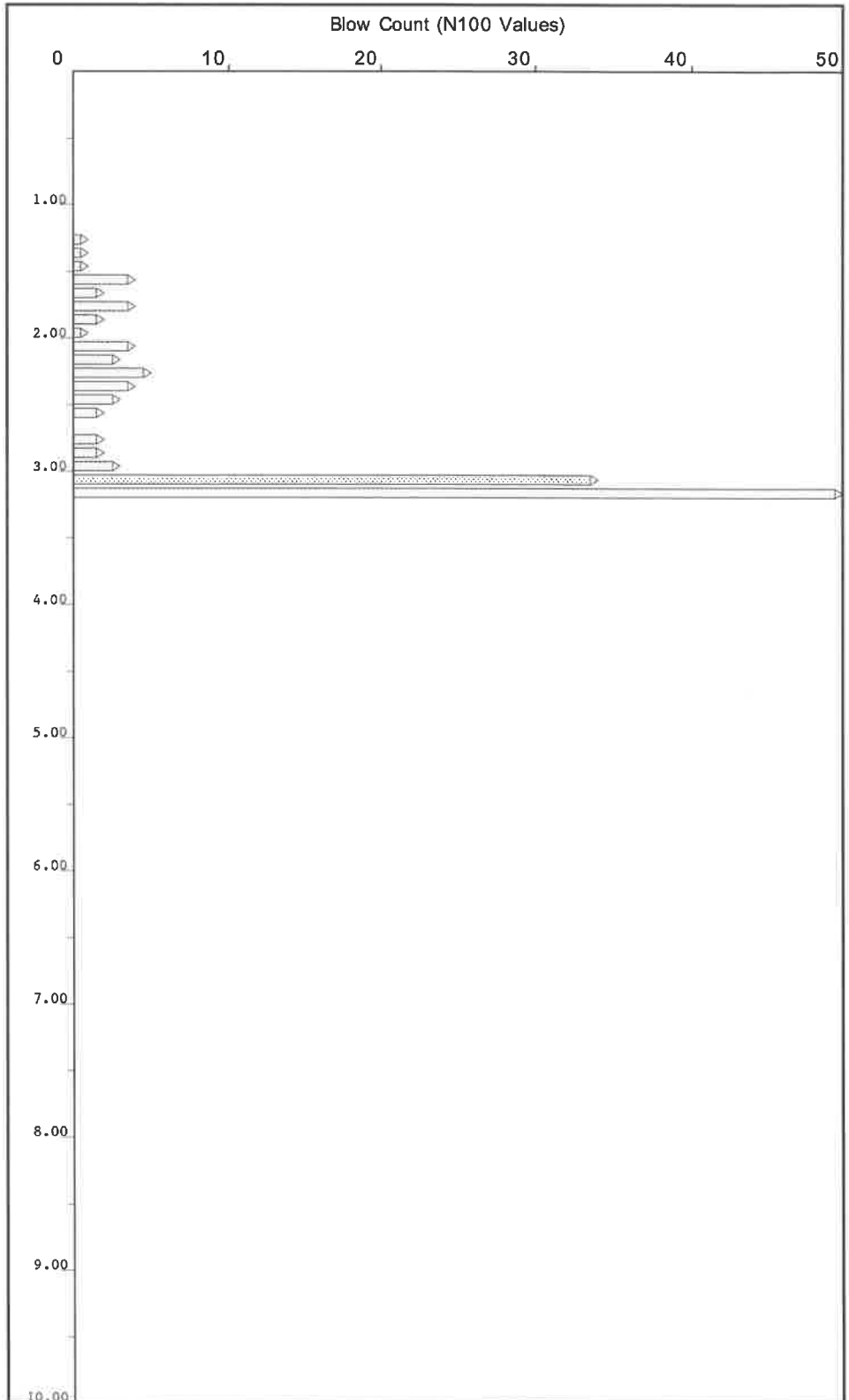
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
1.1		-
1.2		-
1.3		1
1.4		1
1.5		1
1.6	4	4
1.7	2	2
1.8	4	4
1.9	2	2
2.0	4	4
2.1	4	1
2.2	3	3
2.3	5	5
2.4	4	4
2.5	3	3
2.6	2	2
2.7	0	0
2.8	2	2
2.9	2	2
3.0	3	3
3.1	34	34
3.2	50	50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 01/05/19

PROBE No

DP37

Project Number 14757

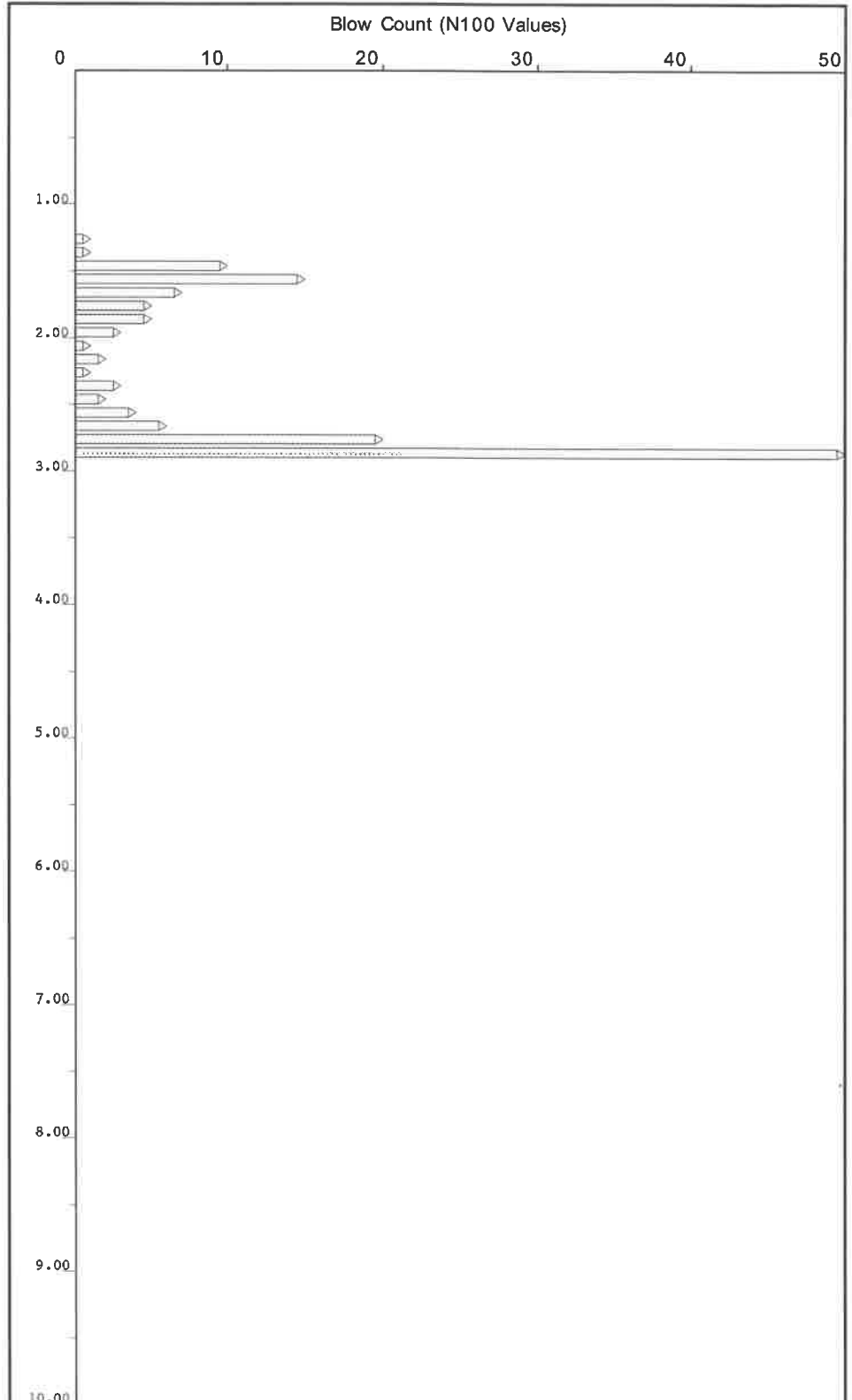
Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL, VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		10
.6	15	
.7	7	5
.8		5
.9		3
2.0	1	2
.1		1
.2		2
.3		1
.4		3
.5		2
.6	4	
.7		6
.8		20
.9		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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Date 01/05/19

PROBE No

Project
Number 14757

DP38

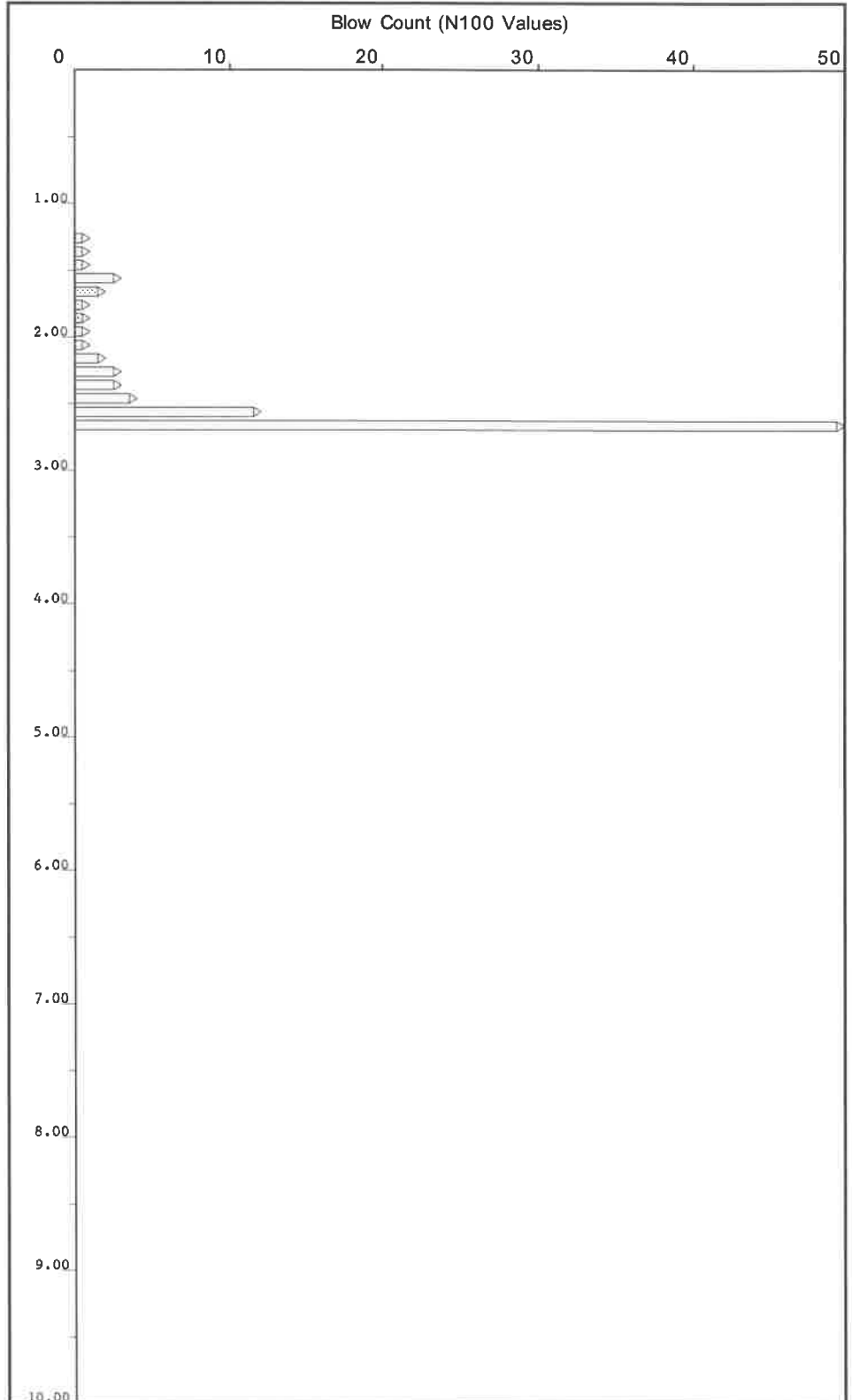
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
1.1		-
1.2		-
1.3		1
1.4		1
1.5		1
1.6		3
1.7		2
1.8		1
1.9		1
2.0		1
2.1		1
2.2		1
2.3		2
2.4		3
2.5		3
2.6		4
2.7		12
2.8		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

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Date 01/05/19

PROBE No

Project Number 14757

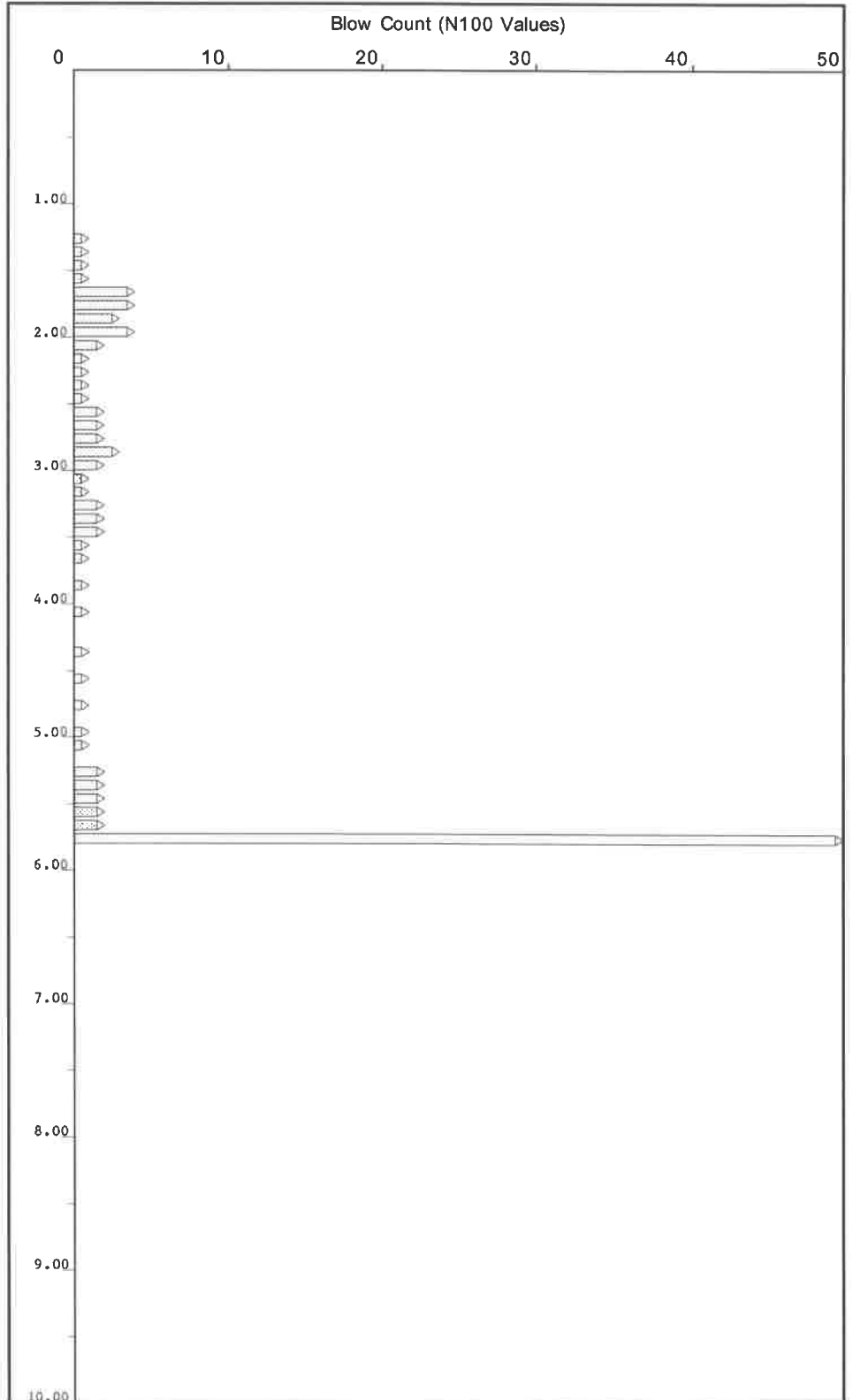
DP39
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6	1	4
.7	4	4
.8		3
.9		4
2.0	2	1
.1	1	1
.2	1	1
.3		1
.4		1
.5	2	2
.6	2	2
.7		3
.8		2
.9	1	1
3.0	1	2
.1	1	2
.2	1	2
.3		2
.4	1	1
.5	1	0
.6		1
.7		0
.8		1
.9		0
4.0	1	0
.1	0	0
.2	0	1
.3		0
.4	1	0
.5		0
.6	0	1
.7		0
.8		1
.9	1	0
5.0	1	2
.1	0	2
.2		2
.3		2
.4	2	2
.5		2
.6	2	50
.7		
.8		



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 01/05/19

PROBE No

Project
Number 14757

DP40

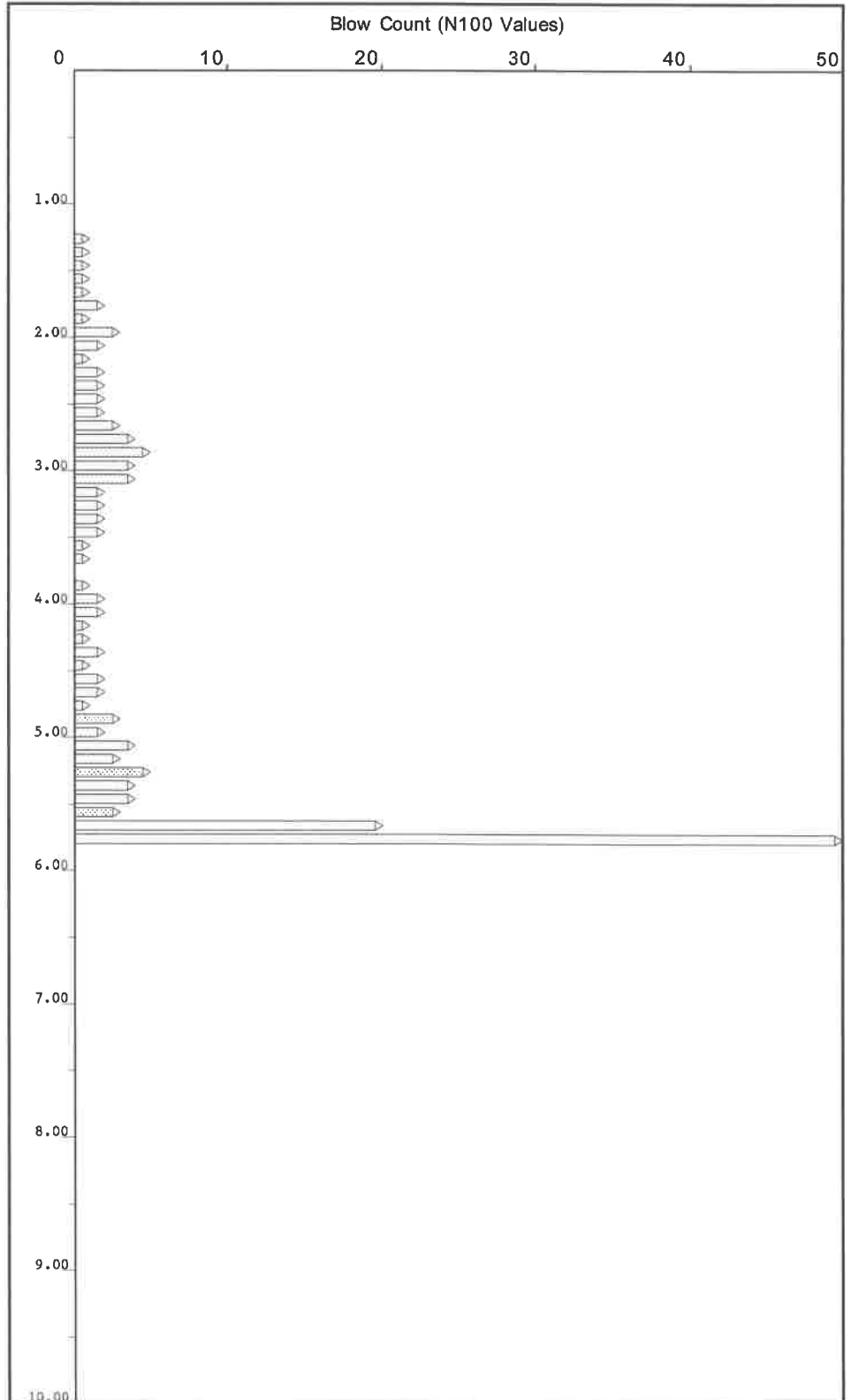
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		-
.3		1
.4		1
.5		1
.6		1
.7		1
.8		1
.9		2
2.0		1
.1		2
.2		1
.3		2
.4		2
.5		2
.6		2
.7		3
.8		4
.9		5
3.0		4
.1		4
.2		2
.3		2
.4		2
.5		2
.6		1
.7		1
.8		0
.9		1
4.0		2
.1		2
.2		1
.3		1
.4		2
.5		1
.6		2
.7		2
.8		1
.9		3
5.0		2
.1		4
.2		3
.3		5
.4		4
.5		4
.6		3
.7		20
.8		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 01/05/19

PROBE No

DP41

Project Number 14757

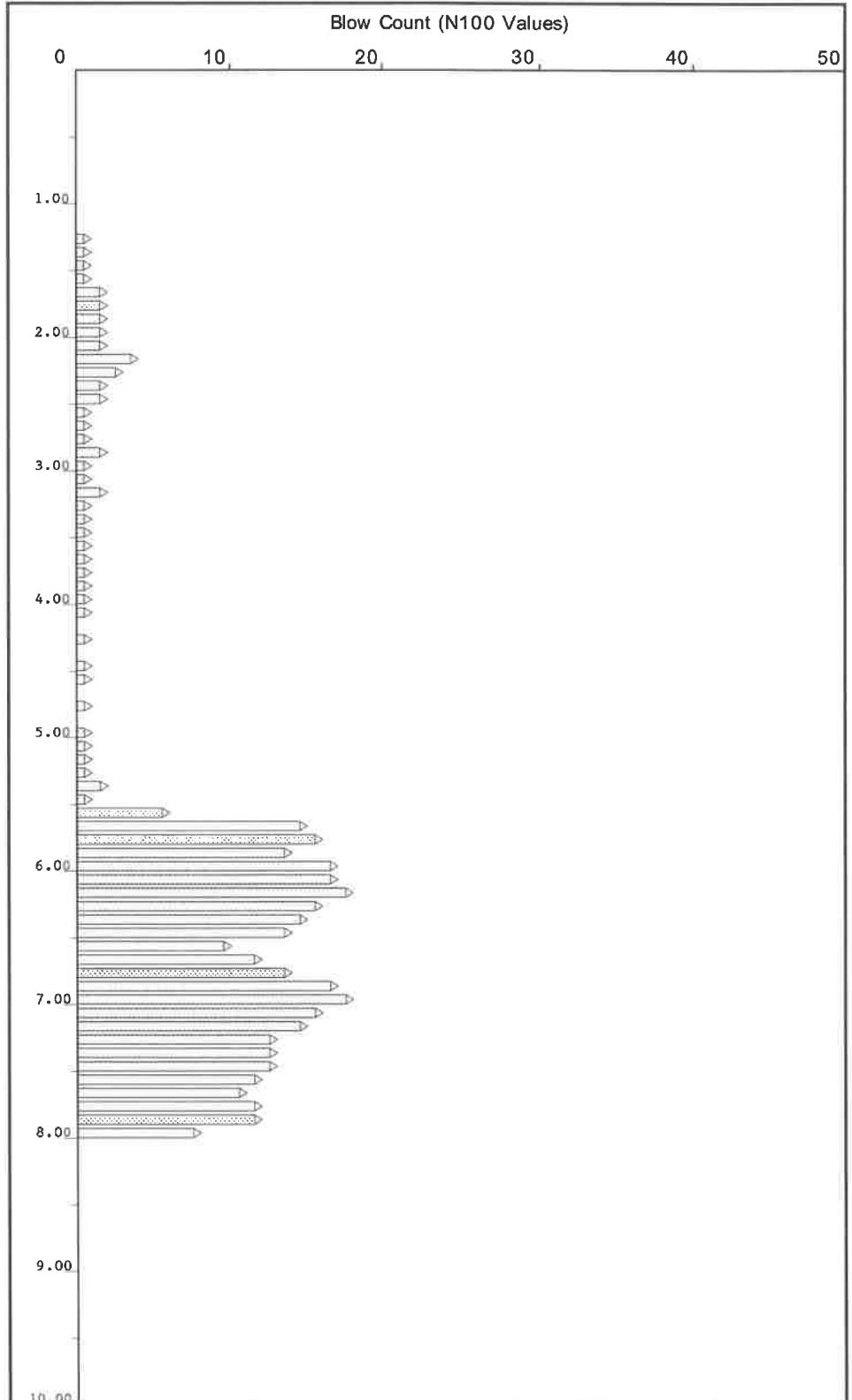
Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		-
.8		-
.9		-
1.0		-
.1		-
.2		1
.3		1
.4		1
.5		1
.6		1
.7		2
.8		2
.9		2
2.0		2
.1		2
.2		4
.3		3
.4		2
.5		2
.6		1
.7		1
.8		1
.9		2
3.0		1
.1		1
.2		2
.3		1
.4		1
.5		1
.6		1
.7		1
.8		1
.9		1
4.0		1
.1		1
.2		0
.3		1
.4		0
.5		1
.6		1
.7		0
.8		1
.9		0
5.0		1
.1		1
.2		1
.3		1
.4		2
.5		1
.6		6
.7		15
.8		16
.9		14
6.0		17
.1		17
.2		18
.3		16
.4		15
.5		14
.6		10
.7		12
.8		14
.9		17
7.0		18
.1		16
.2		15
.3		13
.4		13
.5		13
.6		12
.7		11
.8		12
.9		12
8.0		8



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

GROUND ENGINEERING

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DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No

DP42

Project Number 14757

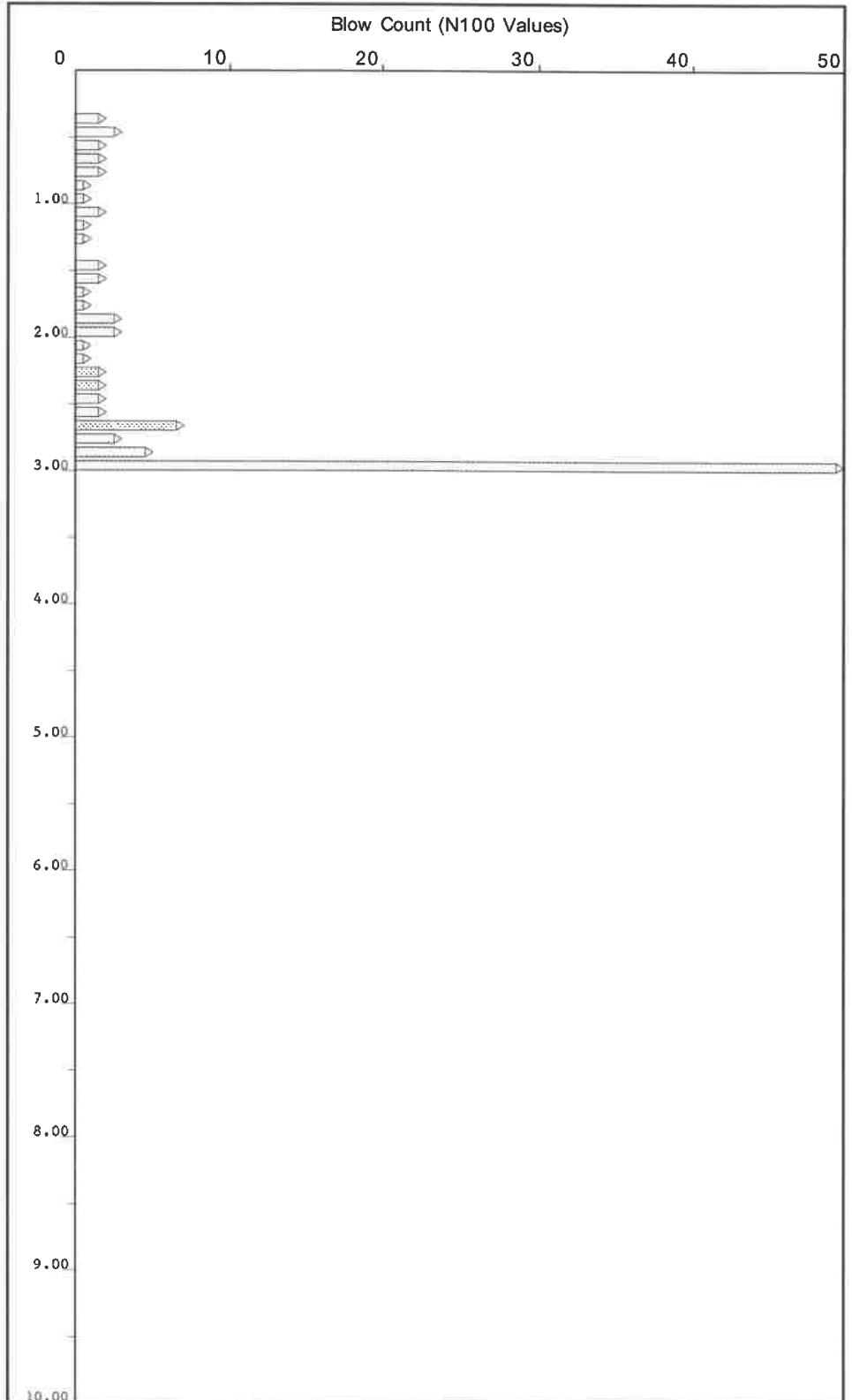
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		2
.5		3
.6		2
.7		2
.8		2
.9		1
1.0		1
1.1		2
1.2		1
1.3		1
1.4		0
1.5		2
1.6		2
1.7		1
1.8		1
1.9		3
2.0		3
2.1		1
2.2		1
2.3		2
2.4		2
2.5		2
2.6		2
2.7		7
2.8		3
2.9		5
3.0		50



Remarks :

Hammer 63.5 kg

14757

Standard Drop 750 mm

Cone 50 mm dia

Rod 8kg / 35 mm

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DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No

Project
Number 14757

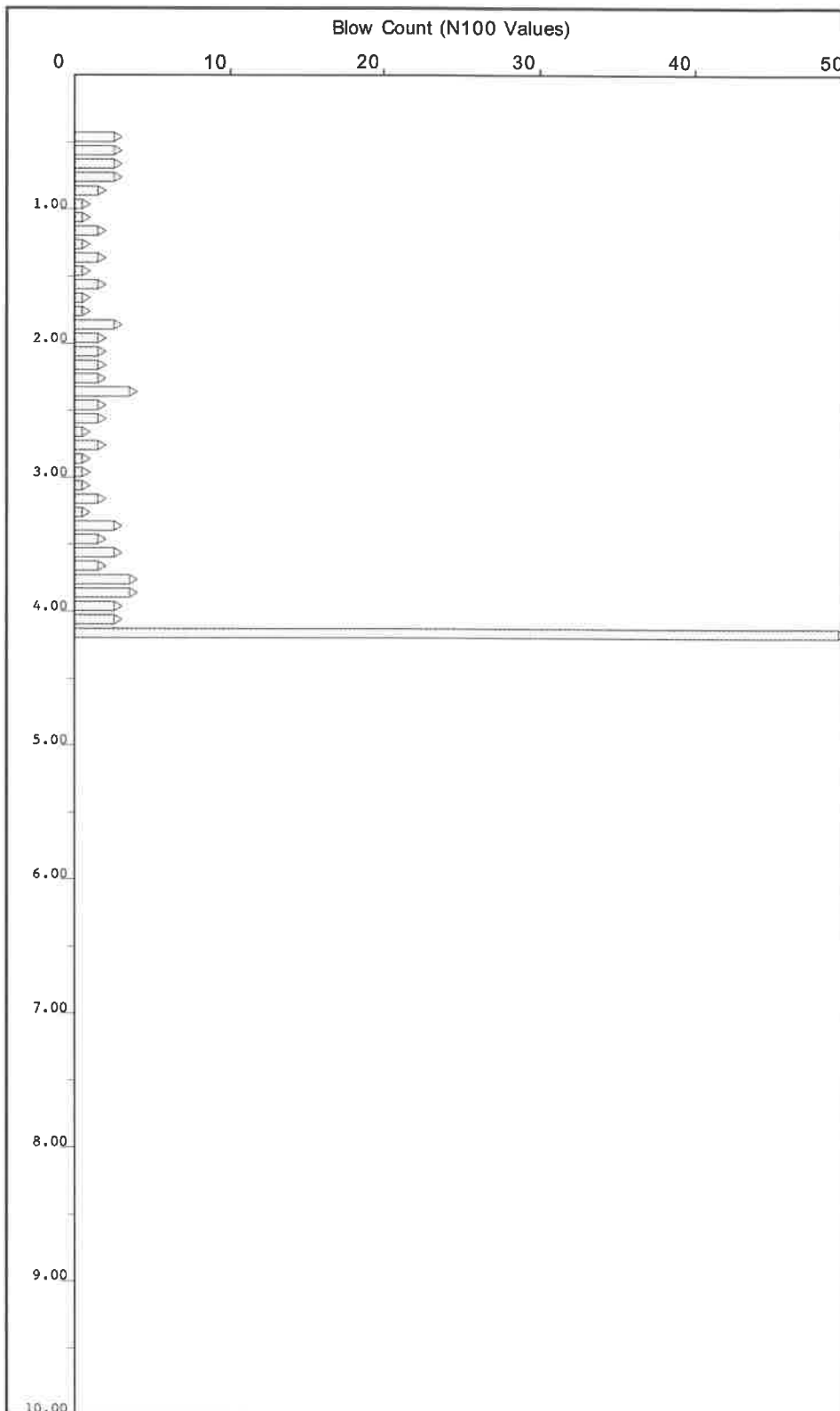
DP43
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		3
.7		3
.8		3
.9		2
1.0		1
.1		1
.2		2
.3		1
.4		2
.5		1
.6		2
.7		1
.8		1
.9		3
2.0		2
.1		2
.2		2
.3		2
.4		4
.5		2
.6		2
.7		1
.8		2
.9		1
3.0		1
.1		1
.2		2
.3		1
.4		3
.5		2
.6		3
.7		2
.8		4
.9		4
4.0		3
.1		3
.2		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

GROUND ENGINEERING

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DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No

Project Number 14757

DP44

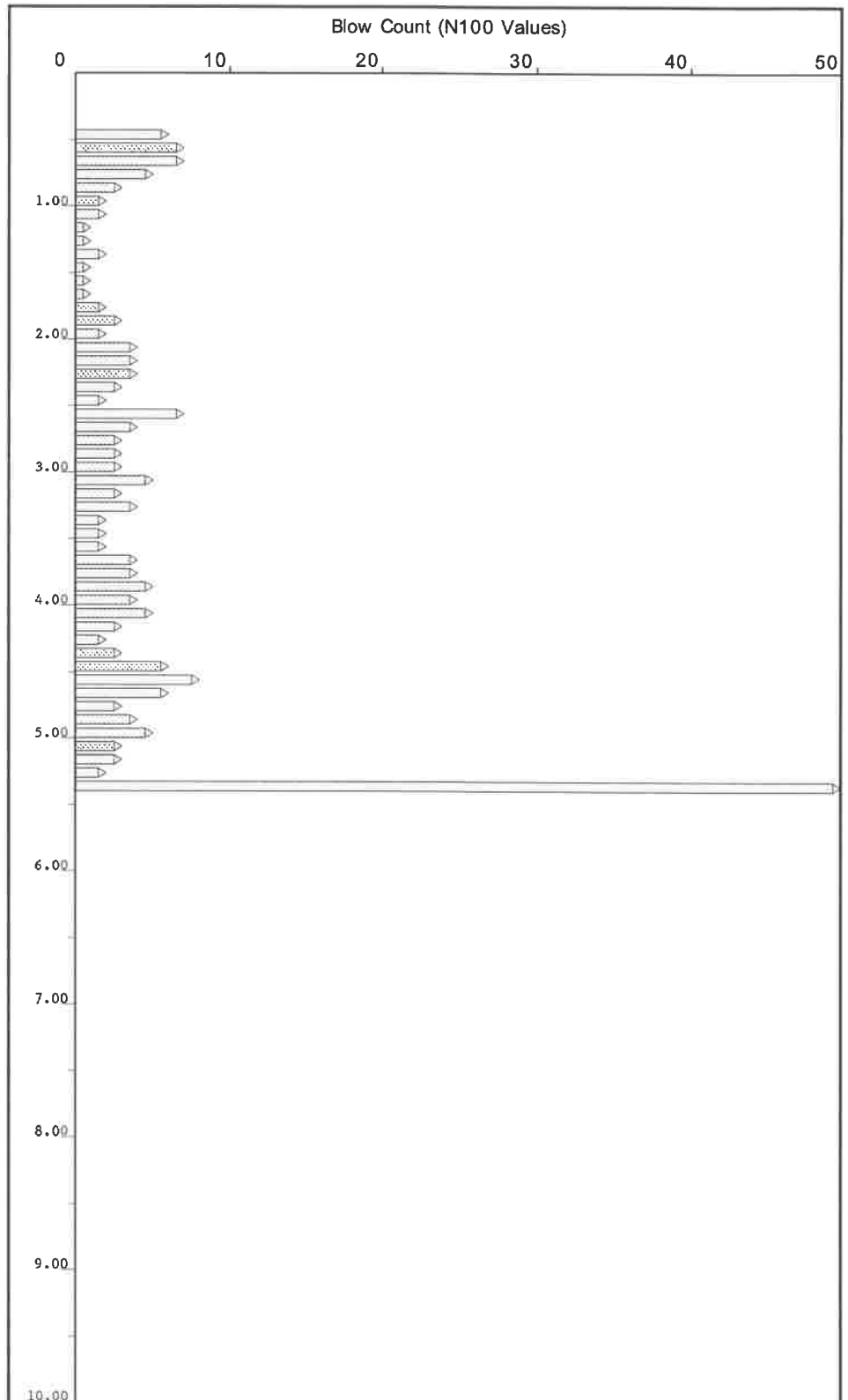
Sheet 1 of 1

Method BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		6
.6		7
.7		7
.8		5
.9		3
1.0		2
.1		2
.2		1
.3		1
.4		2
.5		1
.6		1
.7		1
.8		2
.9		3
2.0		2
.1		4
.2		4
.3		4
.4		3
.5		2
.6		7
.7		4
.8		3
.9		3
3.0		3
.1		5
.2		3
.3		4
.4		2
.5		2
.6		2
.7		2
.8		4
.9		4
4.0		5
.1		4
.2		5
.3		3
.4		2
.5		3
.6		6
.7		8
.8		6
.9		3
5.0		4
.1		5
.2		3
.3		2
.4		2
.5		50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

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DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No
DP44A

Project
Number 14757

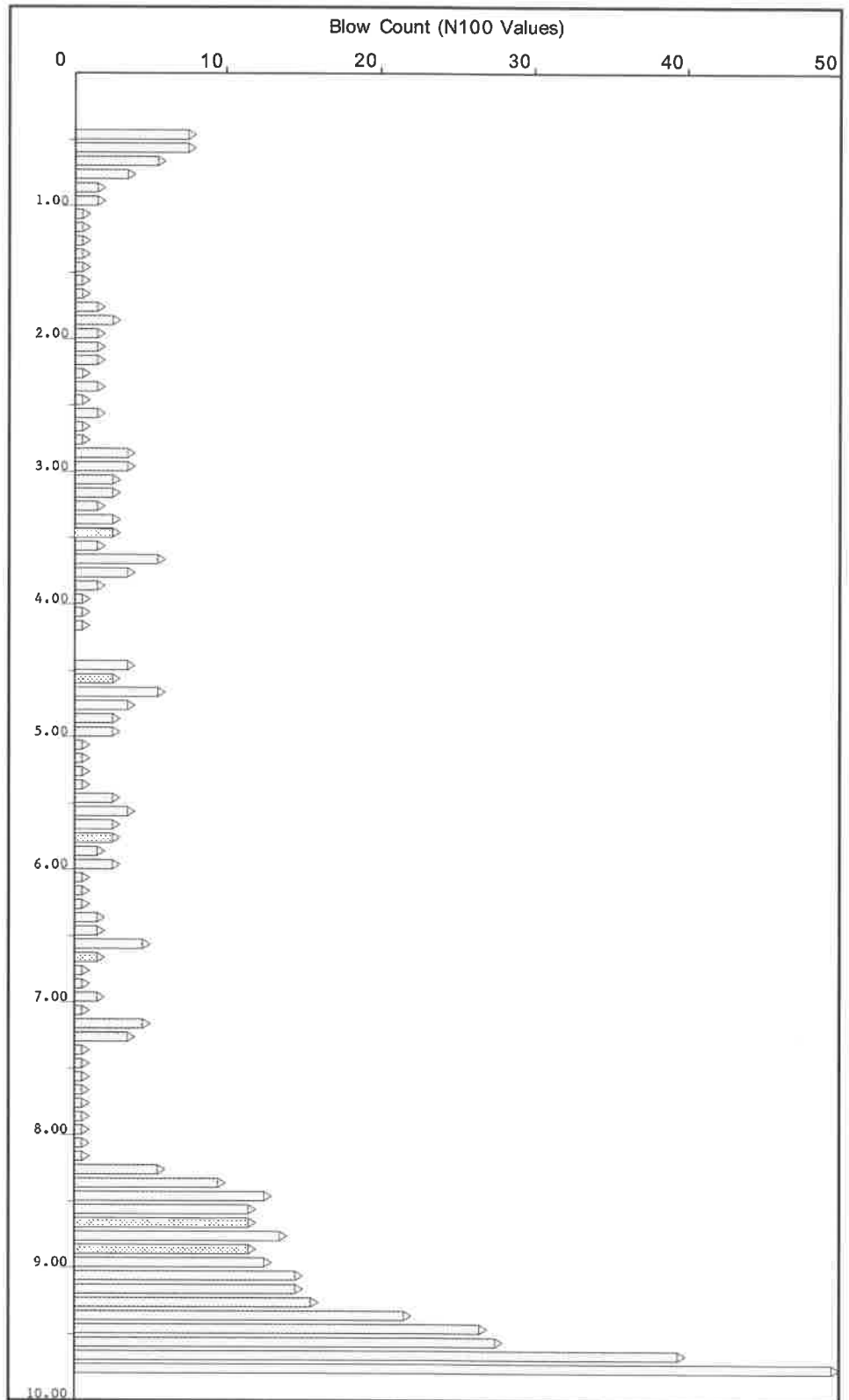
Sheet 1 of 1

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		8
.6		8
.7		6
.8		4
.9		2
1.0		2
.1	1	1
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	2
.8	1	3
.9	1	2
2.0	2	2
.1	2	2
.2	2	1
.3	2	2
.4	2	1
.5	2	1
.6	2	1
.7	2	1
.8	1	1
.9	1	4
3.0	3	4
.1	3	3
.2	3	2
.3	3	3
.4	2	3
.5	2	6
.6	2	4
.7	2	2
.8	2	1
.9	2	1
4.0	1	1
.1	1	1
.2	1	0
.3	1	0
.4	1	4
.5	3	6
.6	3	4
.7	3	3
.8	3	3
.9	3	3
5.0	1	1
.1	1	1
.2	1	1
.3	1	1
.4	1	3
.5	4	3
.6	3	3
.7	3	2
.8	3	3
.9	3	2
6.0	1	1
.1	1	1
.2	1	2
.3	1	2
.4	1	2
.5	5	2
.6	2	1
.7	2	1
.8	1	1
.9	1	2
7.0	1	5
.1	5	4
.2	1	1
.3	1	1
.4	1	1
.5	1	1
.6	1	1
.7	1	1
.8	1	1
.9	1	1
8.0	1	1
.1	1	1
.2	1	6
.3	1	10
.4	1	13
.5	12	12
.6	12	14
.7	12	12
.8	12	13
.9	15	15
9.0	15	16
.1	15	22
.2	15	27
.3	16	27
.4	22	27
.5	27	27
.6	28	40
.7	40	50
.8	50	50



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

GROUND ENGINEERING

L I M I T E D
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DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No
DP45

Project
Number 14757

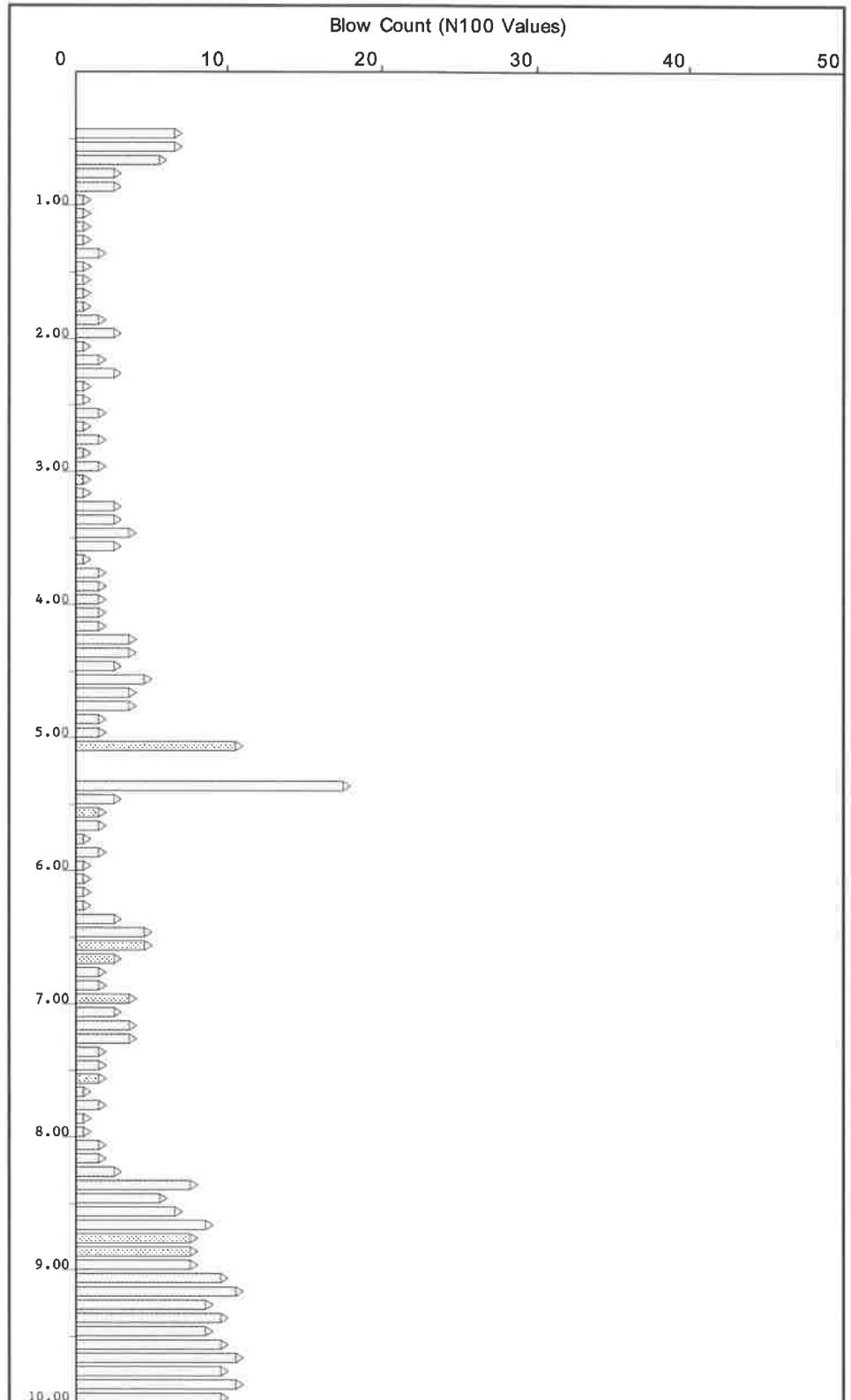
Sheet 1 of 2

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1

Depth (m)	Torque	Blows (100mm)
.1		-
.2		-
.3		-
.4		-
.5		-
.6		-
.7		7
.8		6
.9		3
1.0		3
1.1		1
1.2		1
1.3		1
1.4		2
1.5		1
1.6		1
1.7		1
1.8		1
1.9		2
2.0		3
2.1		1
2.2		2
2.3		3
2.4		1
2.5		1
2.6		2
2.7		1
2.8		2
2.9		1
3.0		2
3.1		1
3.2		1
3.3		3
3.4		3
3.5		4
3.6		3
3.7		1
3.8		2
3.9		2
4.0		2
4.1		2
4.2		2
4.3		4
4.4		4
4.5		3
4.6		5
4.7		4
4.8		4
4.9		2
5.0		2
5.1		11
5.2		0
5.3		0
5.4		18
5.5		3
5.6		2
5.7		2
5.8		1
5.9		2
6.0		1
6.1		1
6.2		1
6.3		3
6.4		5
6.5		5
6.6		3
6.7		2
6.8		2
6.9		4
7.0		3
7.1		4
7.2		4
7.3		2
7.4		2
7.5		2
7.6		1
7.7		2
7.8		1
7.9		1
8.0		2
8.1		2
8.2		2
8.3		3
8.4		8
8.5		6
8.6		7
8.7		9
8.8		8
8.9		8
9.0		8
9.1		10
9.2		11
9.3		9
9.4		10
9.5		9
9.6		10
9.7		11
9.8		10
9.9		11
10.0		10



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

GROUND ENGINEERING

L I M I T E D

Tel: 01733-566566 www.groundengineering.co.uk

DYNAMIC PROBE PENETRATION TEST

Date 17/05/19

PROBE No

DP45

Project

Number 14757

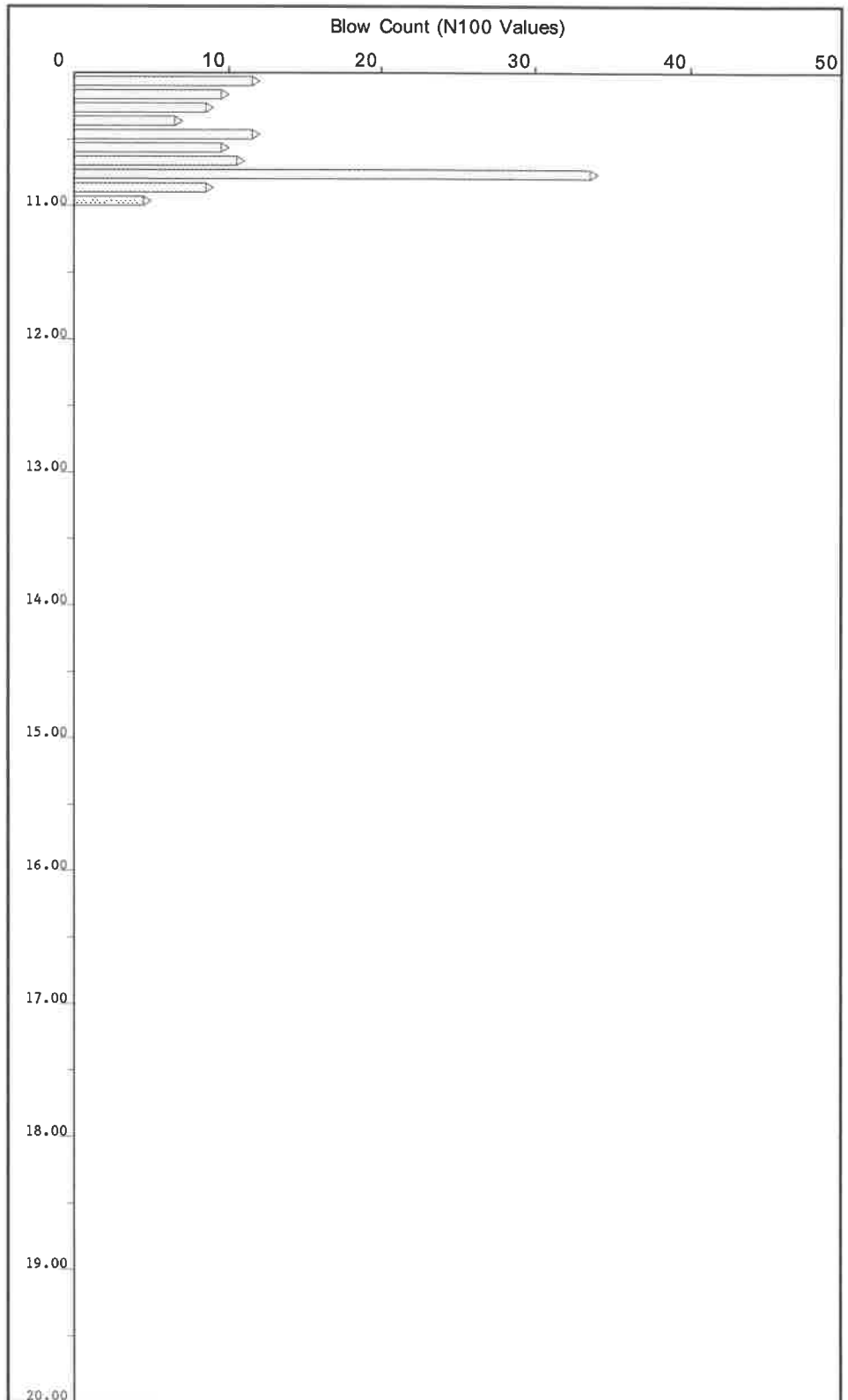
Sheet 2 of 2

Method
BS 1377 : Part 9 : Clause 3.2 (DPSH)

Client
WSP

Site NATIONAL HOLOCAUST MEMORIAL,
VICTORIA TOWER GARDENS, LONDON SW1






Depth (m)	Torque	Blows (100mm)
.1		12
.2		10
.3		9
.4		7
.5		12
.6		10
.7		11
.8		34
.9		9
11.0		5



Remarks :

Hammer 63.5 kg
Standard Drop 750 mm
Cone 50 mm dia
Rod 8kg / 35 mm

14757

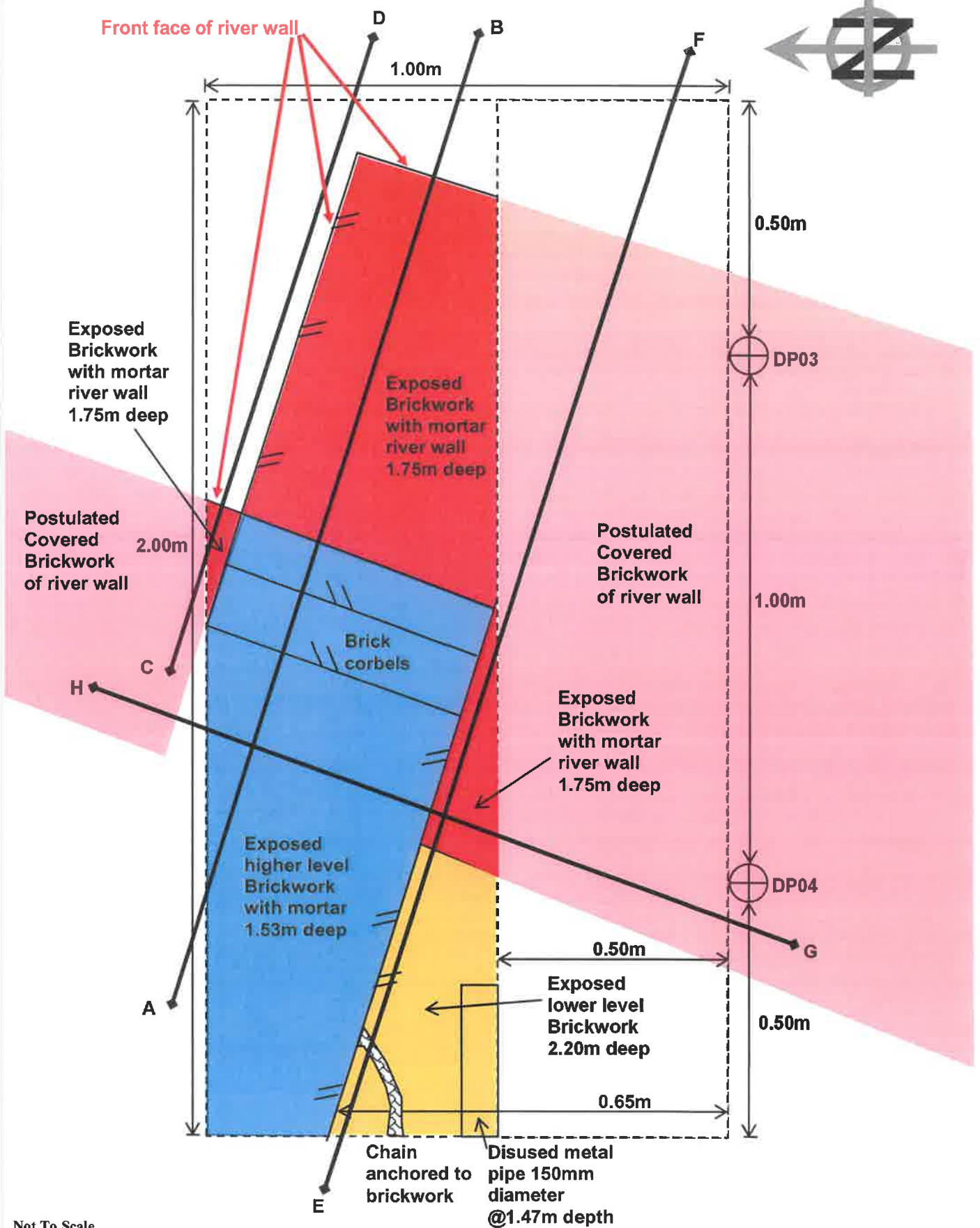
GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1		TRIAL PIT TP1		
Date: 15/05/19			Pit Size: 2.00m L x 1.00m W x 2.10m D.		530268 mE 179075 mN Ground Level: 4.80m. O.D.		
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.30	D1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded flint, brick, concrete, ash, pottery and ceramic.		0.50	4.30
0.70	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of angular to sub-rounded brick, concrete, flint, chalk, ash, ceramic and pottery.		0.80	4.00
0.90 0.90	D3 ES1			MADE GROUND - Light brown, silty SAND AND GRAVEL. Gravel of angular to sub-rounded brick, flint, chalk and ash.		1.00	3.80
1.20	D4			MADE GROUND - Firm, light brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded flint, brick, concrete, ash and chalk.		1.40	3.40
1.50	D5			MADE GROUND - Firm, friable, brown and grey mottled, slightly sandy, slightly gravelly SILT/CLAY. Gravel of angular to sub-rounded flint, concrete, brick, ash and shells.		2.10	2.70
2.00 2.00	D6 ES2			Pit completed at 2.10m depth			

- KEY**
- D - Disturbed Sample
 - B - Bulk Sample
 - U - Undisturbed Sample
 - R - Root Sample
 - W - Water Sample
 - ES - Environmental Sample
 - ∇ Water Strike
 - ∇ Water Rise
 - ∇c Level on completion
 - MP - Mackintosh Probe
 - P () - Hand Penetrometer
 - Cohesion () kPa
 - V - Vane Shear Test
 - Cohesion () kPa

- REMARKS**
1. Live roots observed to at least 2.10m depth
 2. Pit dry
 3. Pit sides stable

Project No 14757	
Scale 1:25	Page 1/1

Trial Pit TP01 Plan View



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens, London SW1

Client : WSP

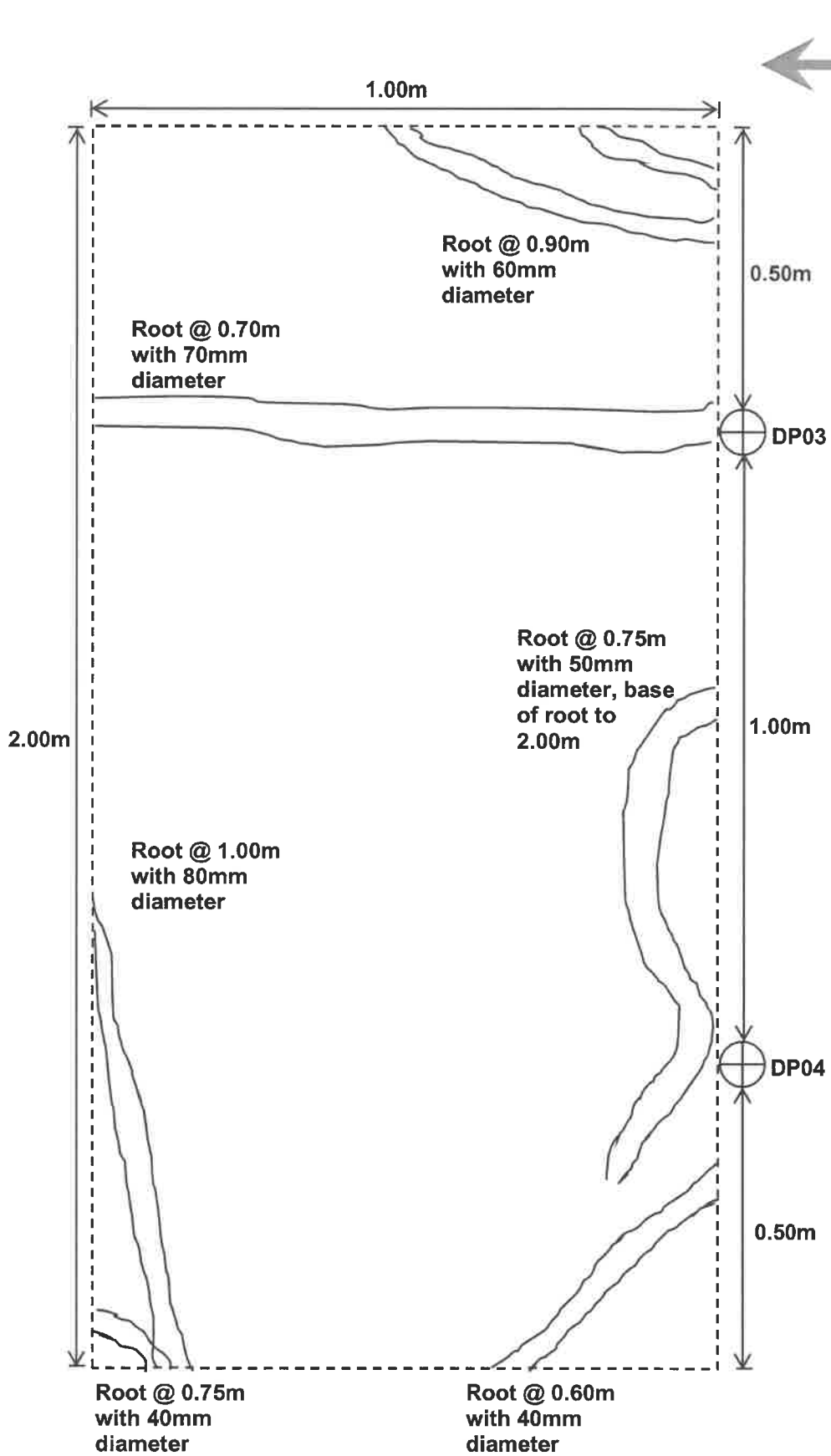
GROUND ENGINEERING LIMITED

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP01 Roots Plan View



Not To Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

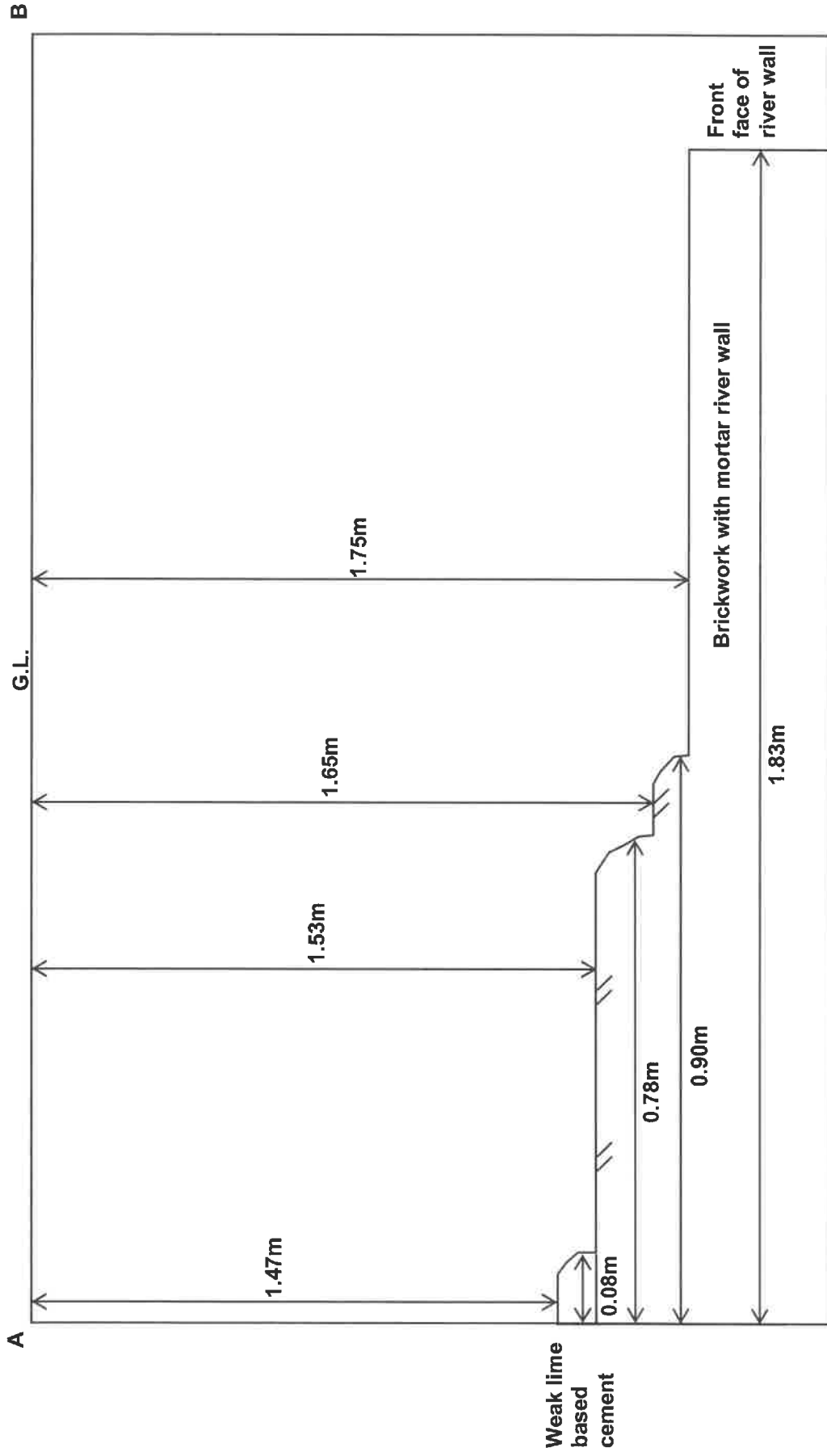
**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP01 Cross Section A-B



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1

**GROUND
ENGINEERING
LIMITED**

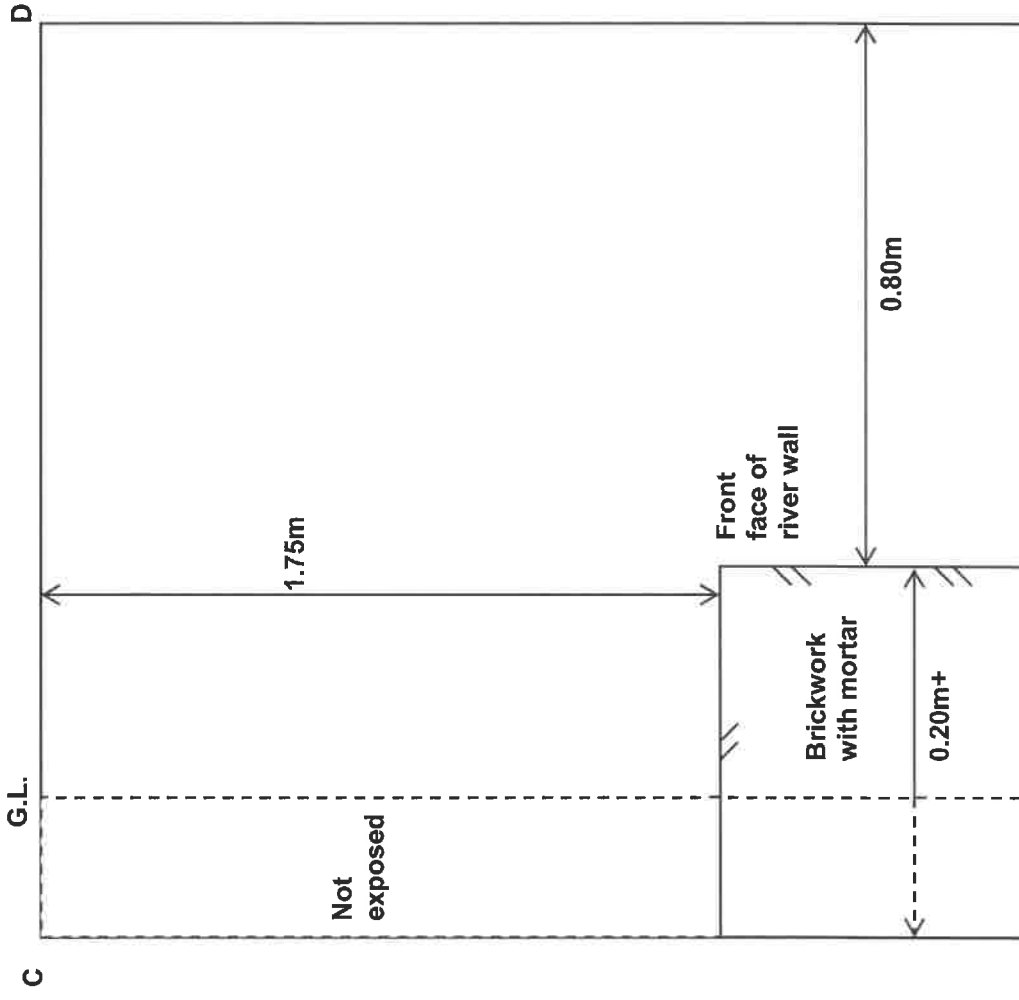
Peterborough Tel : 01733 566566

Project No.

C14757

Client : WSP

Trial Pit TP01 Cross Section C-D



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1

**GROUND
ENGINEERING
LIMITED**

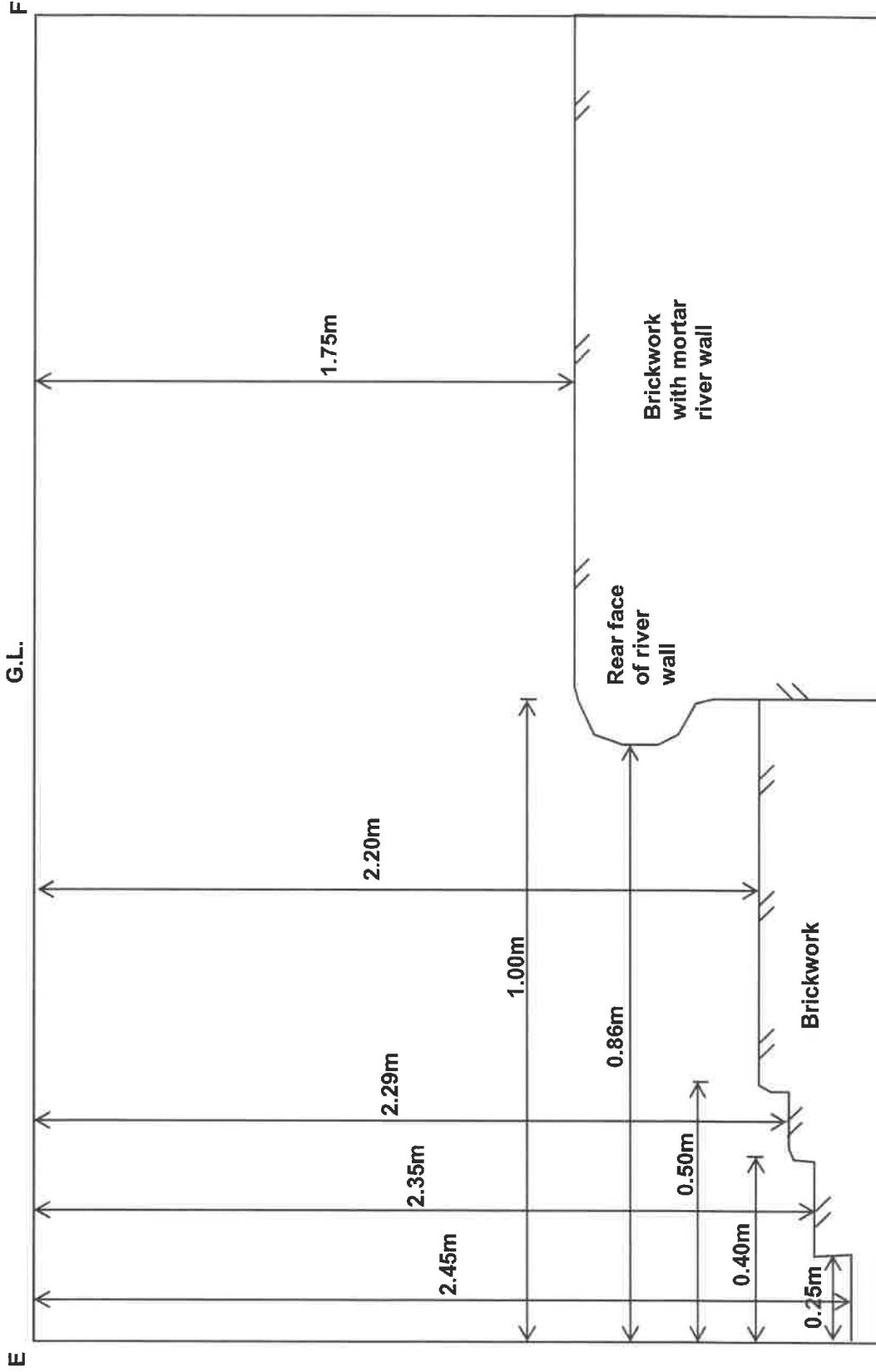
Peterborough Tel : 01733 566566

Project No.

C14757

Client : WSP

Trial Pit TP01 Cross Section E-F



Not To Scale

**Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1**

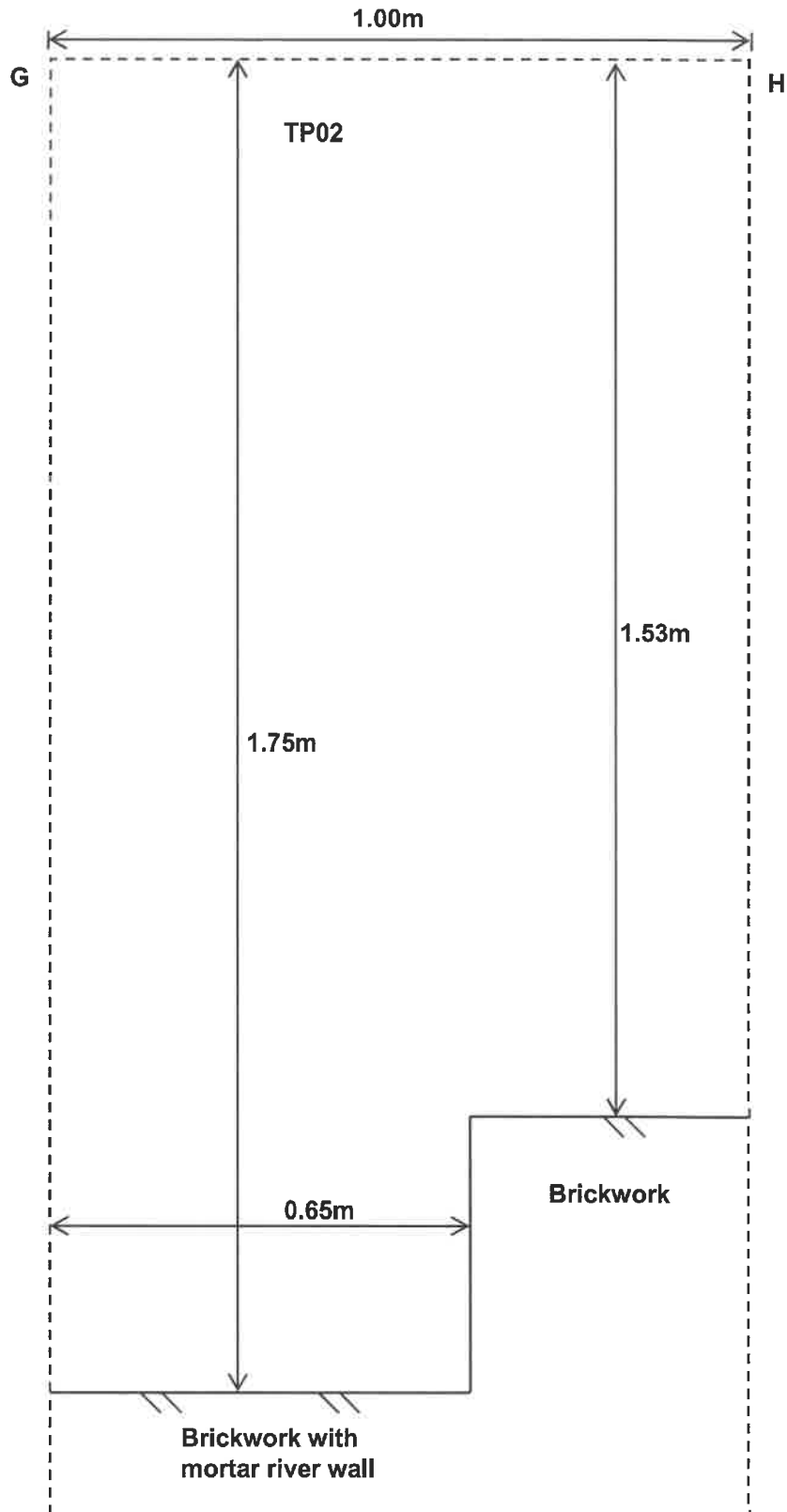
Client : WSP

**GROUND
ENGINEERING
LIMITED**
Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP01 Cross section G-H



Not To Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

**Trial Pit TP01
Photograph A (Looking East)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

**Trial Pit TP01
Photograph B (Looking West)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
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Peterborough Tel : 01733 566566

Project No.

C14757

GROUND ENGINEERING

L I M I T E D
Tel: 01733-566566
www.groundengineering.co.uk

Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

TRIAL PIT TP2

Date: 09/05/19

Pit Size: 2.00m L x 1.00m W x 2.00m D.

530268 mE 179117 mN
Ground Level: 4.67m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.20	D1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded flint, brick, concrete, ash, pottery and ceramic.		0.30	4.37
0.50 0.50	D2 ES1			MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of angular to sub-rounded brick, ash, concrete, flint, pottery and clinker.			
0.80	D3					0.95	3.72
1.10 1.10	D4 ES2			MADE GROUND - Light brown, silty SAND AND GRAVEL. Gravel of angular to rounded flint, brick, clinker, ash and sandstone.		1.25	3.42
1.40	D5			MADE GROUND - Firm, brown, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded brick, flint, ash and clinker.			
1.70 1.70	D6 ES3			MADE GROUND - Dark brown and brown, silty SAND AND GRAVEL with occasional brick cobbles. Gravel of angular to sub-rounded brick, flint, concrete and ash.		1.75	2.92
2.00 2.00	D7 ES4					2.00	2.67
Pit completed at 2.00m depth							

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- R - Root Sample
- W - Water Sample
- ES - Environmental Sample
- ▽ - Water Strike
- ▽ - Water Rise
- ▽c - Level on completion
- MP - Mackintosh Probe
- P() - Hand Penetrometer
Cohesion () kPa
- V - Vane Shear Test
Cohesion () kPa

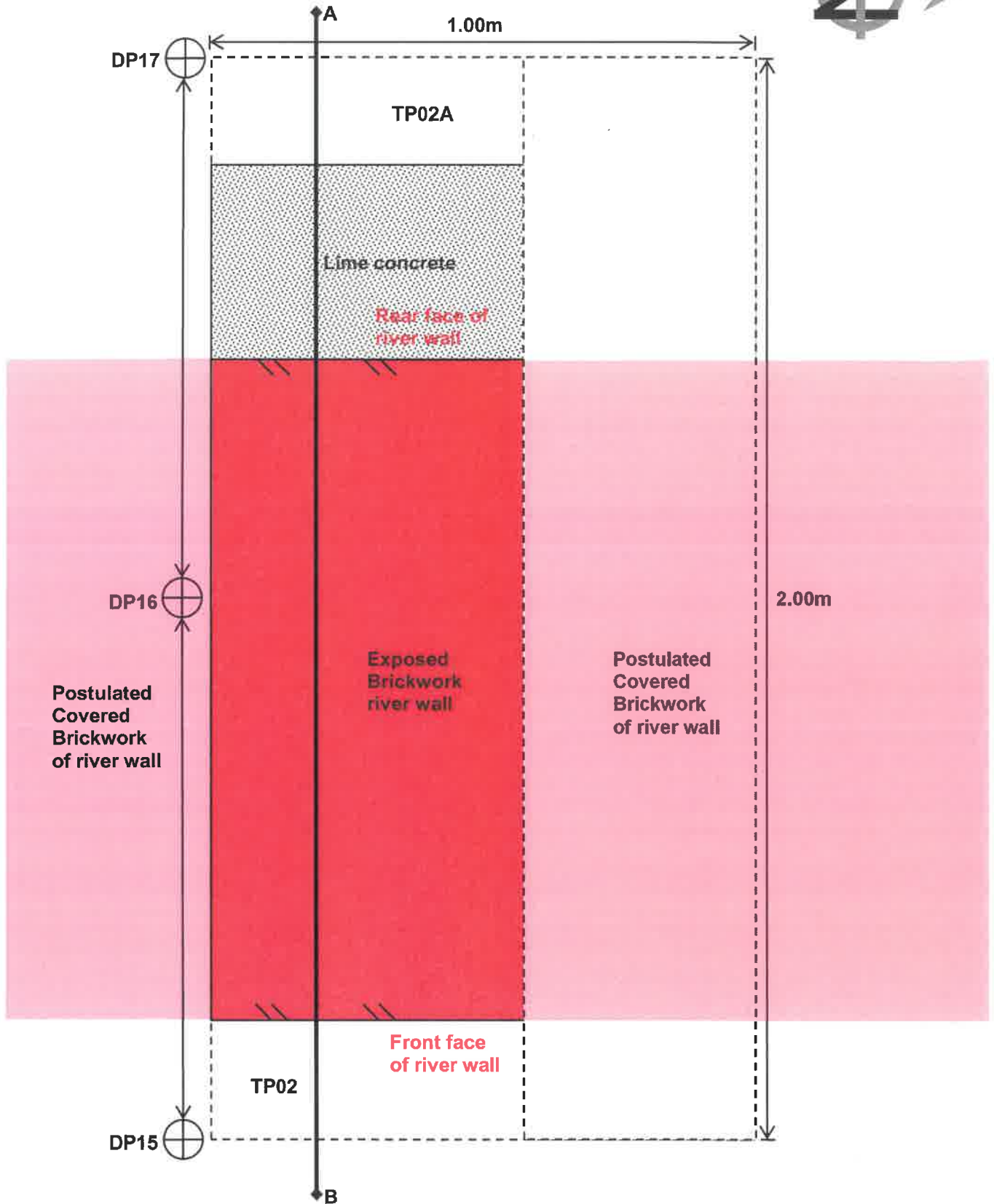
REMARKS

1. Live roots observed to at least 2.00m depth
2. Pit dry
3. Pit sides stable

Project No
14757

Scale | Page
1:25 | 1/1

Trial Pit TP02 Plan View



Not To Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

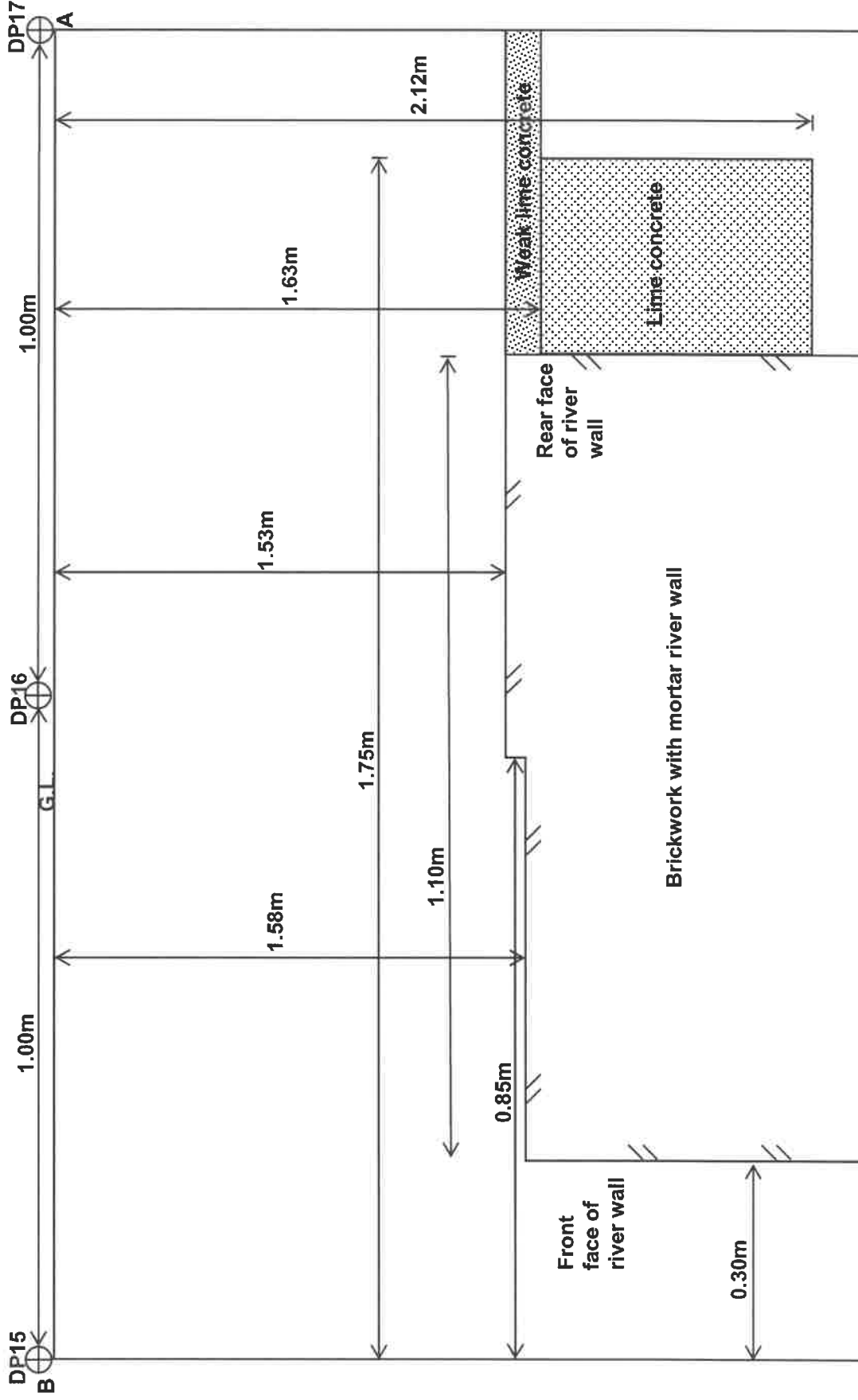
**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP02 Cross Section A-B



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1

**GROUND
ENGINEERING
LIMITED**
Peterborough Tel : 01733 566566

Project No.

C14757

Client : WSP

**Trial Pit TP02
Photograph A (Looking East)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

**Trial Pit TP02
Photograph B (Looking West)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

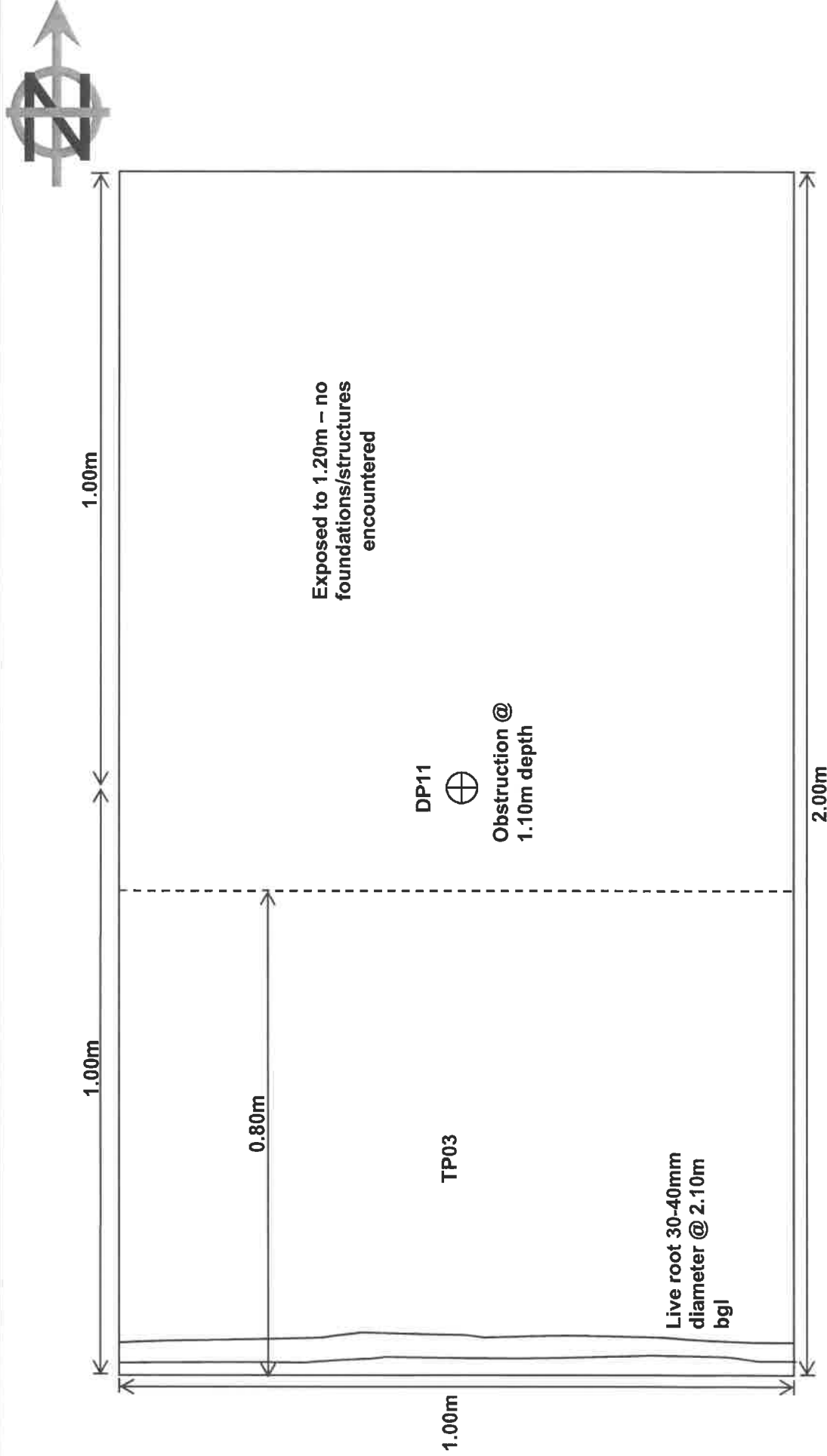
Project No.

C14757

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1		TRIAL PIT TP3		
			Date: 14/05/19	Pit Size: 2.00m L x 1.00m W x 3.00m D.		530247 mE 179124 mN Ground Level: 4.70m. O.D.	
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.10	D1			MADE GROUND - Dark brown, slight clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded brick, concrete, flint and chalk.		0.30	4.40
0.50	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of angular to sub-rounded brick, concrete, ash, flint, chalk, slate and ceramic.		1.10	3.60
1.00	D3					1.50	3.20
1.30	D4			MADE GROUND - Firm, brown, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded brick, flint, ash and chalk.			
1.70	D5			MADE GROUND - Dark brown, becoming grey, silty SAND AND GRAVEL with occasional gravel size pockets of firm, brown clay. Gravel of angular to sub-rounded brick, ash, chalk, mortar, concrete, flint, clinker, slate and shells.			
2.00	D6						
2.50	D7						
3.00	D8						3.00
				Pit completed at 3.00m depth			

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample R - Root Sample W - Water Sample ES - Environmental Sample ∇ - Water Strike ∇ - Water Rise ∇c - Level on completion MP - Mackintosh Probe P () - Hand Penetrometer Cohesion () kPa V - Vane Shear Test Cohesion () kPa	REMARKS 1. Live roots observed to at least 3.00m depth 2. Pit dry 3. Pit sides stable	Project No 14757	
		Scale 1:25	Page 1/1

Trial Pit TP03 Plan View



Not To Scale

**Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1**

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Client : WSP

Project No.

C14757

**Trial Pit TP03
Photograph A (Looking South)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

**Trial Pit TP03
Photograph B (Looking South)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**





Client : WSP




**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

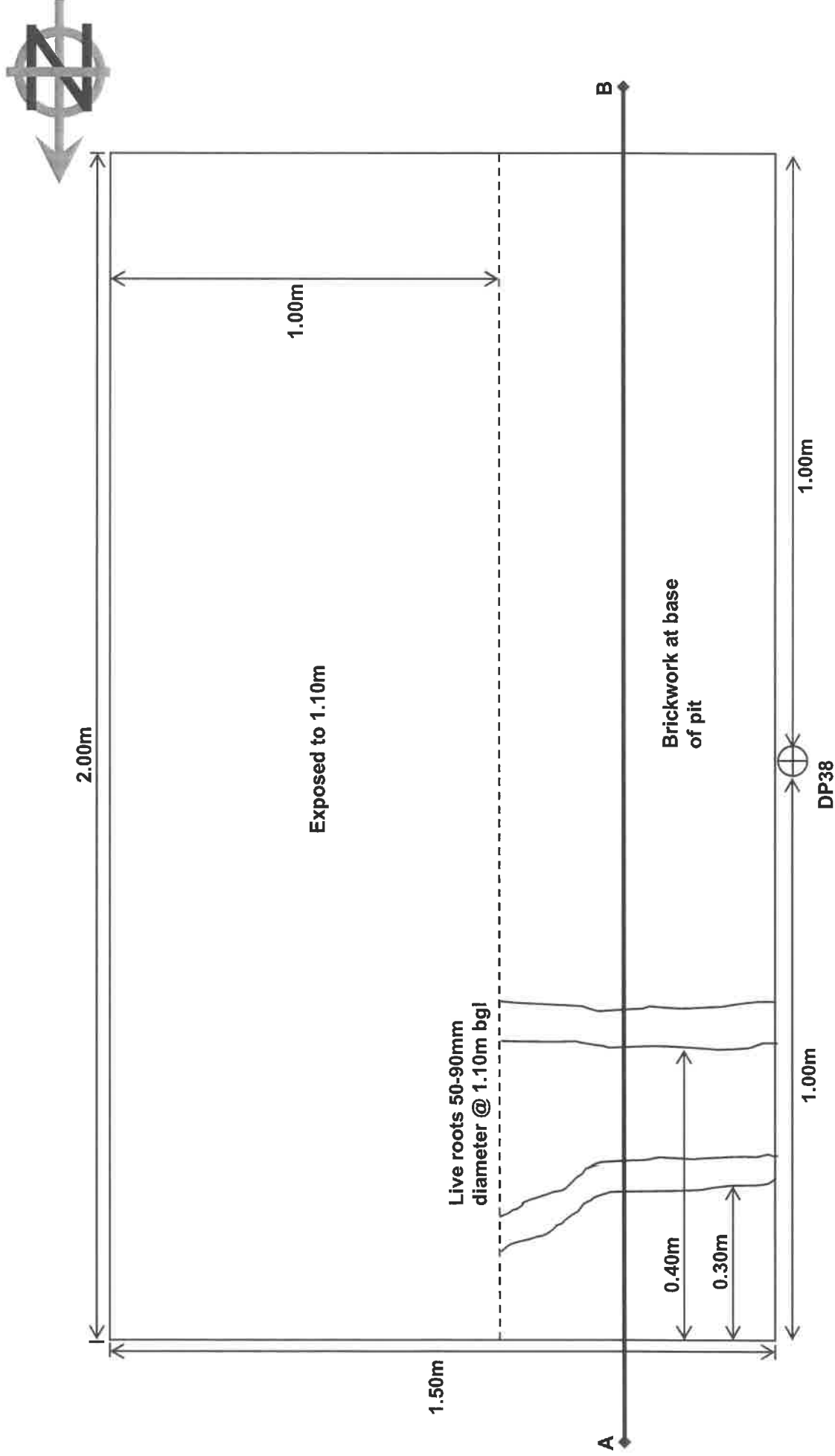
Project No.

C14757

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1		TRIAL PIT TP4		
Date: 02/05/19			Pit Size: 2.00m L x 1.50m W x 2.60m D.		530240 mE 179184 mN Ground Level: 4.65m. O.D.		
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.30	D1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to rounded brick, flint, chalk, ash and ceramic.		0.40	4.25
0.60	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of brick, flint, concrete, ash, chalk, clay pipe fragments and shell.			
0.80	ASB1					1.05	3.60
0.90	D3						
1.20	D4			MADE GROUND - Firm, brown, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded brick, flint and ash.		1.45	3.20
1.50	D5						
2.00	D6			MADE GROUND - Dark brown, slightly clayey, silty SAND AND GRAVEL with some brick cobbles. Gravel of angular to rounded brick, flint, quartzite, ash and concrete.		2.60	2.05
2.00	ES1						
2.50	D7						
			Pit completed at 2.60m depth				

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample R - Root Sample W - Water Sample ES - Environmental Sample  Water Strike  Water Rise  Level on completion MP - Mackintosh Probe P() - Hand Penetrometer Cohesion () kPa V - Vane Shear Test Cohesion () kPa	REMARKS 1. Live roots observed to 2.35m depth 2. Pit dry 3. Pit sides stable	Project No 14757
	Scale 1:25	Page 1/1

Trial Pit TP04 Plan View



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1

**GROUND
ENGINEERING
LIMITED**

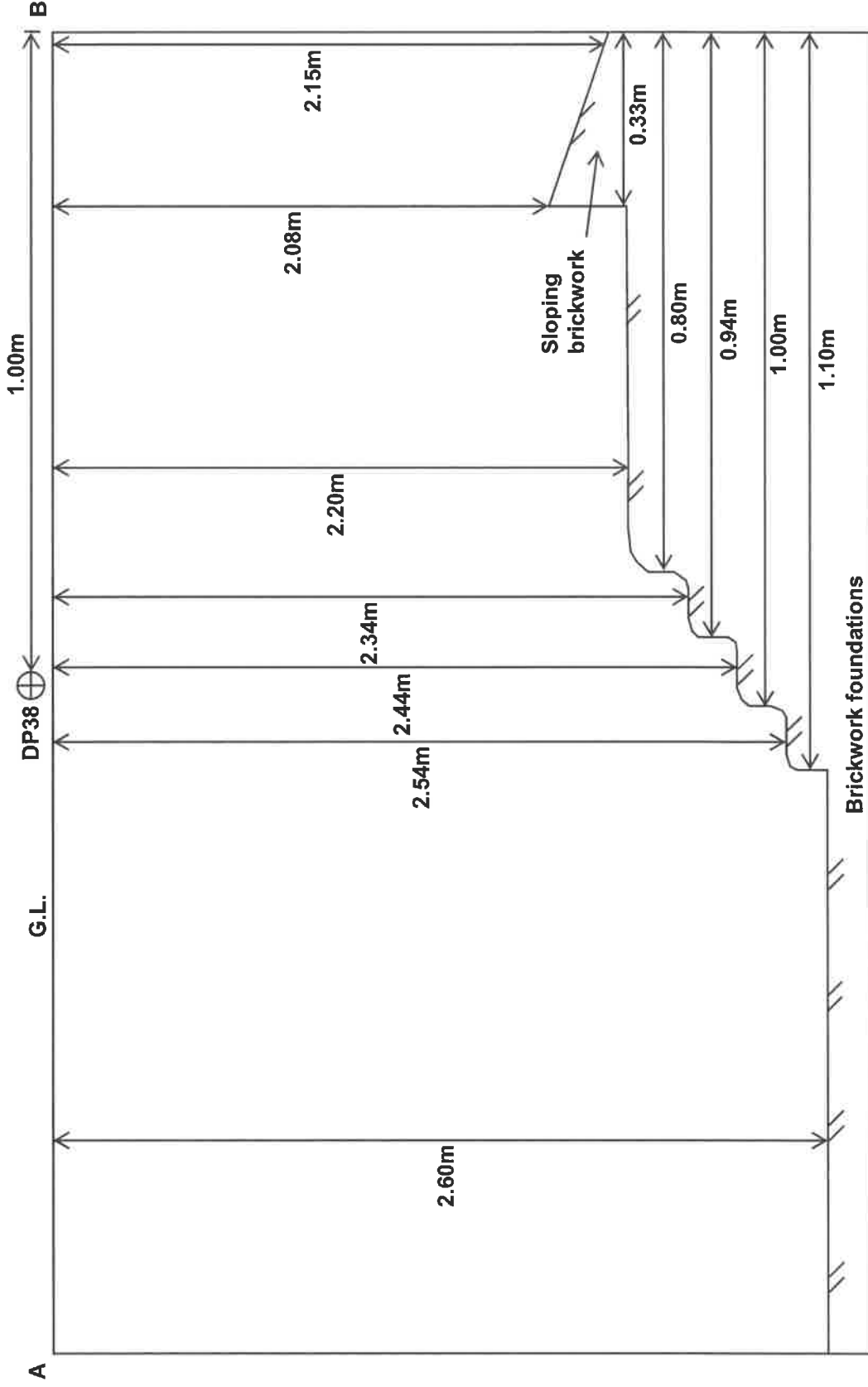
Peterborough Tel : 01733 566566

Project No.

C14757

Client : WSP

Trial Pit TP04 Cross Section A-B



Not To Scale

**Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1**

**GROUND
ENGINEERING
LIMITED**

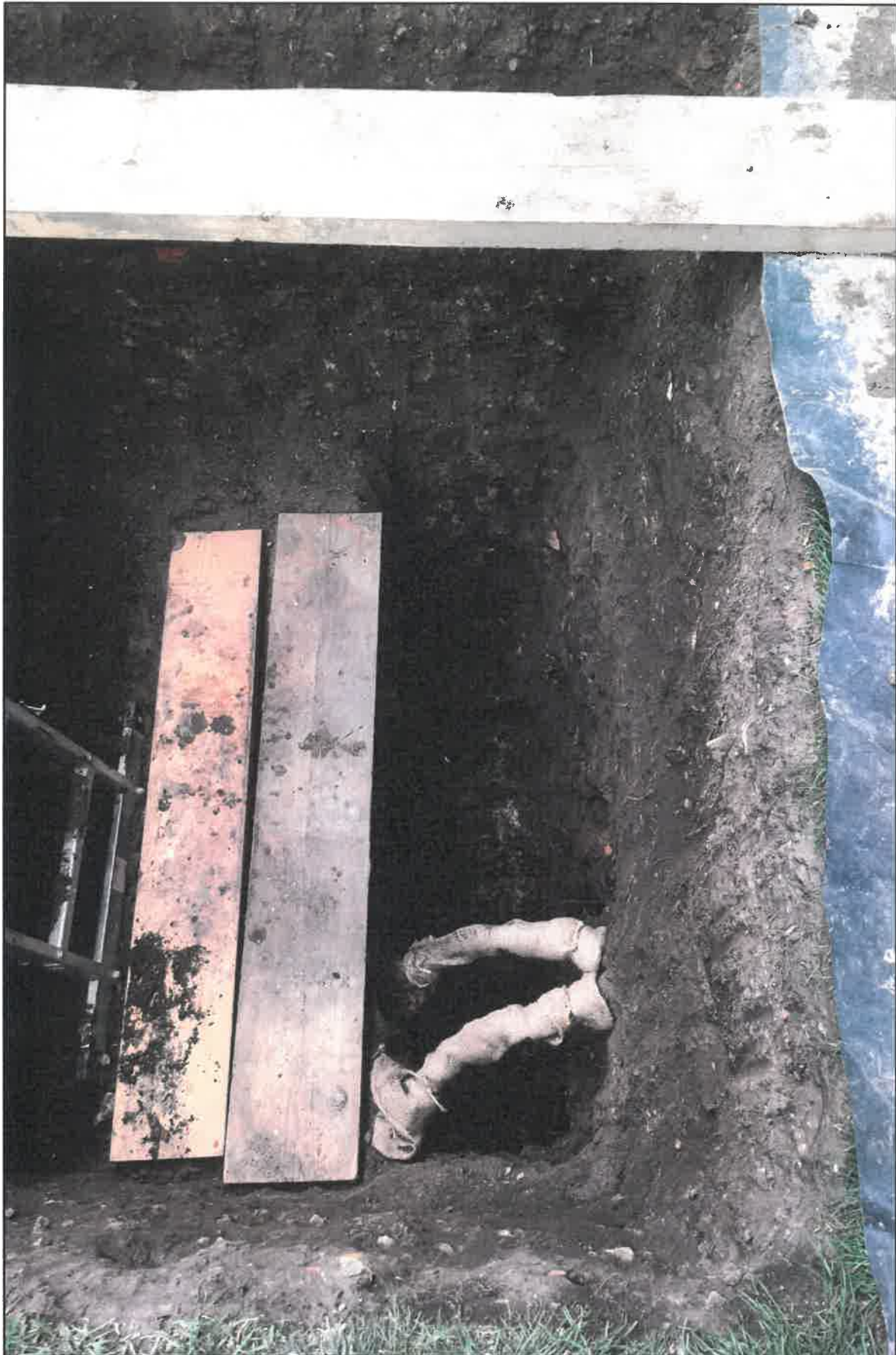
Peterborough Tel : 01733 566566

Project No.

C14757

Client : WSP

**Trial Pit TP04
Photograph A (Looking South)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
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Project No.

C14757

**Trial Pit TP04
Photograph B (Looking South)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**









Client : WSP

**GROUND
ENGINEERING
LIMITED**

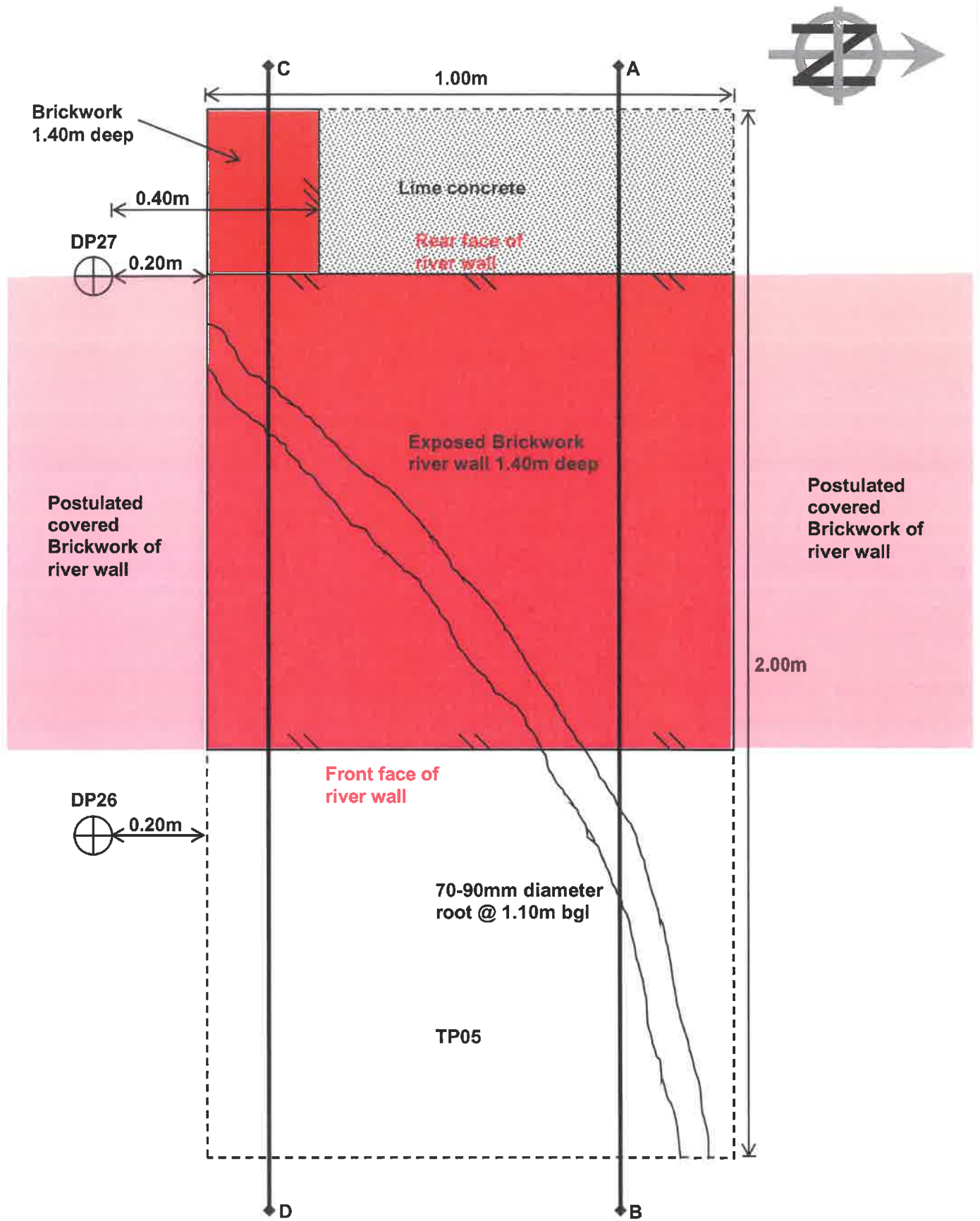
Peterborough Tel : 01733 566566

Project No.

C14757

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1		TRIAL PIT TP5			
Date: 30/04/19			Pit Size: 2.00m L x 1.00m W x 2.00m D.		530268 mE 179205 mN Ground Level: 4.43m. O.D.			
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Result	Water					
0.30	D1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of angular to sub-rounded flint, brick, ash, concrete and glass.		0.40	4.03	
0.70	D2			MADE GROUND - Brown and dark brown, slightly clayey, silty, very gravelly SAND. Gravel of angular to sub-rounded brick, flint, ash, concrete, ceramic and glass.		0.80	3.63	
1.00	D3			MADE GROUND - Light brown, silty SAND AND GRAVEL. Gravel of angular to sub-rounded brick, concrete, flint, ash and clay pipe fragments.		1.10	3.33	
1.30	D4			MADE GROUND - Firm, brown, slightly gravelly, silty CLAY. Gravel of angular brick, flint and ash.		1.50	2.93	
1.80	D5			MADE GROUND - Brown, clayey SAND AND GRAVEL with some brick cobbles. Gravel of angular to sub-angular brick, flint, concrete, ash and mortar.		2.00	2.43	
1.90	D6							
				Pit completed at 2.00m depth				
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample R - Root Sample W - Water Sample ES - Environmental Sample  Water Strike  Water Rise  Level on completion MP - Mackintosh Probe P () - Hand Penetrometer Cohesion () kPa V - Vane Shear Test Cohesion () kPa			REMARKS 1. Live roots observed to at least 2.00m depth 2. Pit dry 3. Pit sides stable				Project No 14757	
			Scale		Page			
			1:25		1/1			

Trial Pit TP05 Plan View



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens, London SW1

Client : WSP

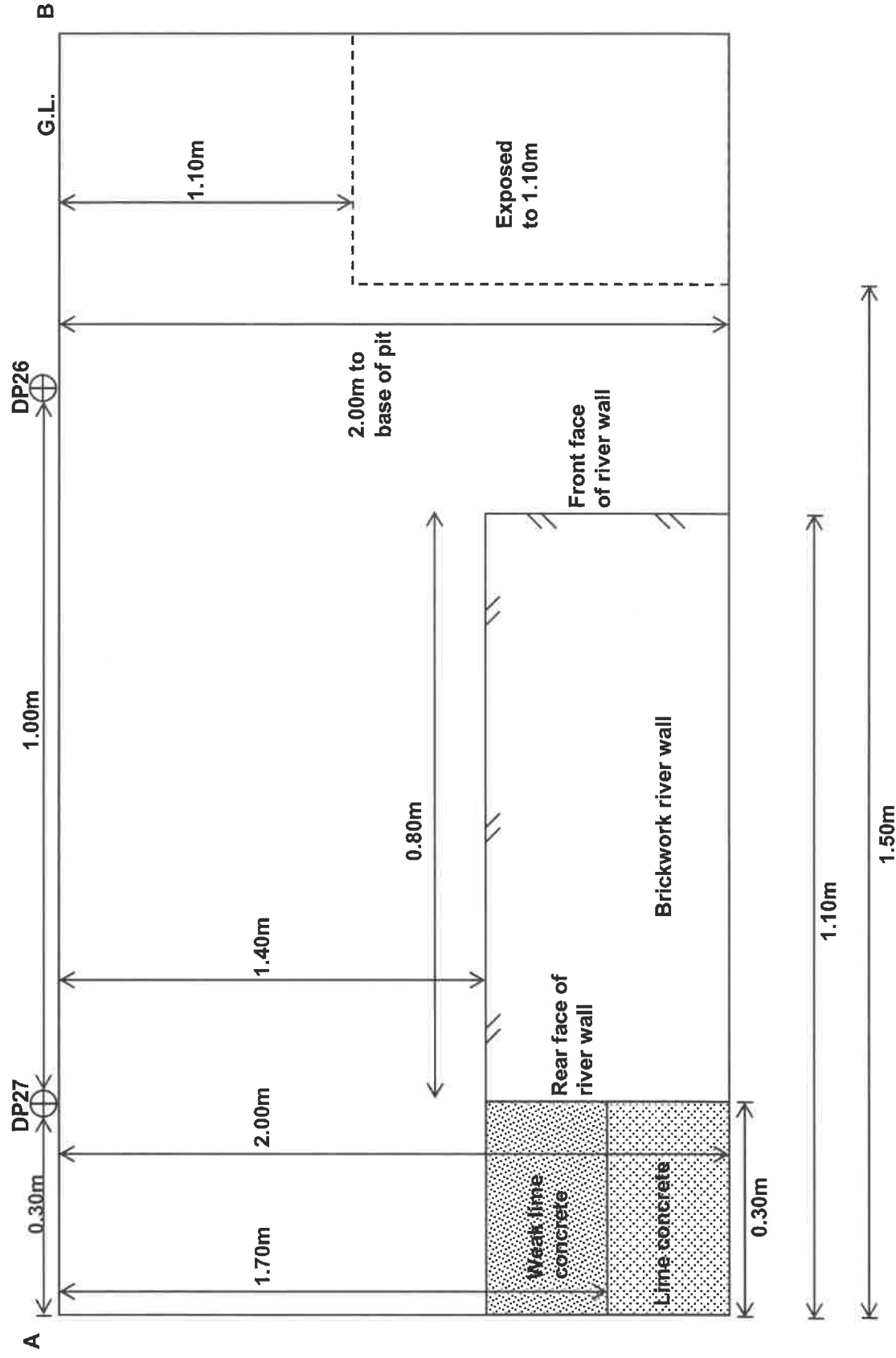
**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP05 Cross Section A-B



Not To Scale

**Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1**

**GROUND
ENGINEERING
LIMITED**

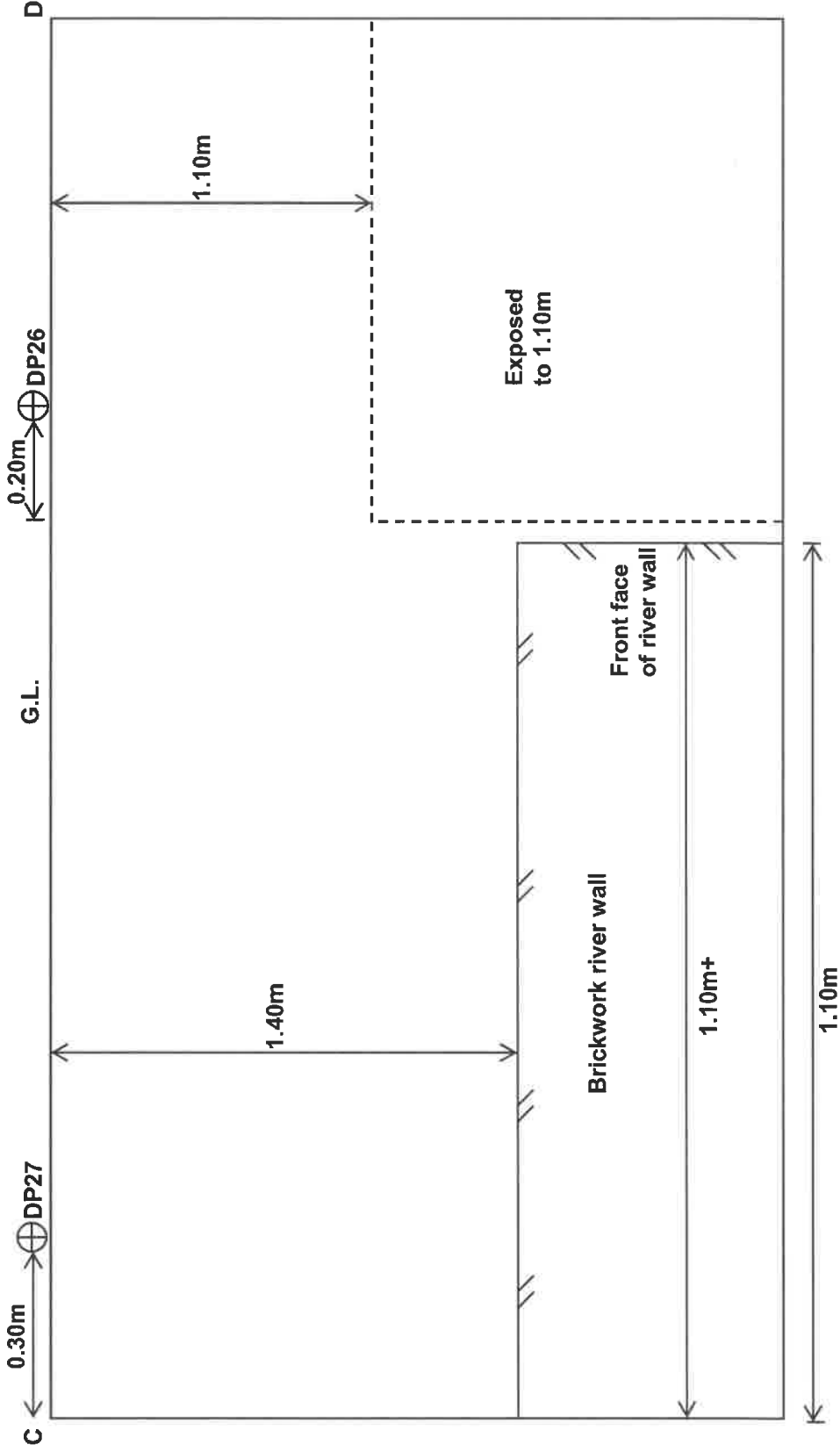
Peterborough Tel : 01733 566566

Project No.

C14757

Client : WSP

Trial Pit TP05 Cross Section C-D



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens,
London SW1

**GROUND
ENGINEERING
LIMITED**
Peterborough Tel : 01733 566566

Project No.
C14757

Client : WSP

**Trial Pit TP05
Photograph A (Looking East)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

**Trial Pit TP05
Photograph B (Looking West)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

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Project No.

C14757

GROUND ENGINEERING

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

TRIAL PIT TP6

Date: 17/05/19

Pit Size: 3.00m L x 1.00m W x 1.20m D.

530284 mE 179121 mN
Ground Level: 4.60m. O.D.

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
0.07	D1			MADE GROUND - ASPHALT.		0.05	4.55
0.30	D2			MADE GROUND - Grey, dark grey and brown SAND AND GRAVEL. Gravel of angular to sub-rounded igneous rock and brick.		0.10	4.50
0.60	D3			MADE GROUND - Brown, light brown and grey, clayey, sandy GRAVEL. Gravel of angular to sub-rounded concrete, brick, granite, flint and ash.			
0.60	ES1					0.75	3.85
0.80	D4			MADE GROUND - Soft, dark brown, slightly sandy, gravelly SILT/CLAY. Gravel of angular to sub-rounded brick, concrete, flint and ash.		0.90	3.70
1.10	D5			MADE GROUND - Brown and grey, slightly clayey, silty, very sandy GRAVEL with occasional brick cobbles. Gravel of angular to sub-rounded brick, concrete, ash and ceramic.			
1.10	ES2					1.20	3.40
				Pit completed at 1.20m depth			

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- R - Root Sample
- W - Water Sample
- ES - Environmental Sample
- ☒ Water Strike
- ☒ Water Rise
- ☒c Level on completion
- MP - Mackintosh Probe
- P() - Hand Penetrometer
- Cohesion () kPa
- V - Vane Shear Test
- Cohesion () kPa

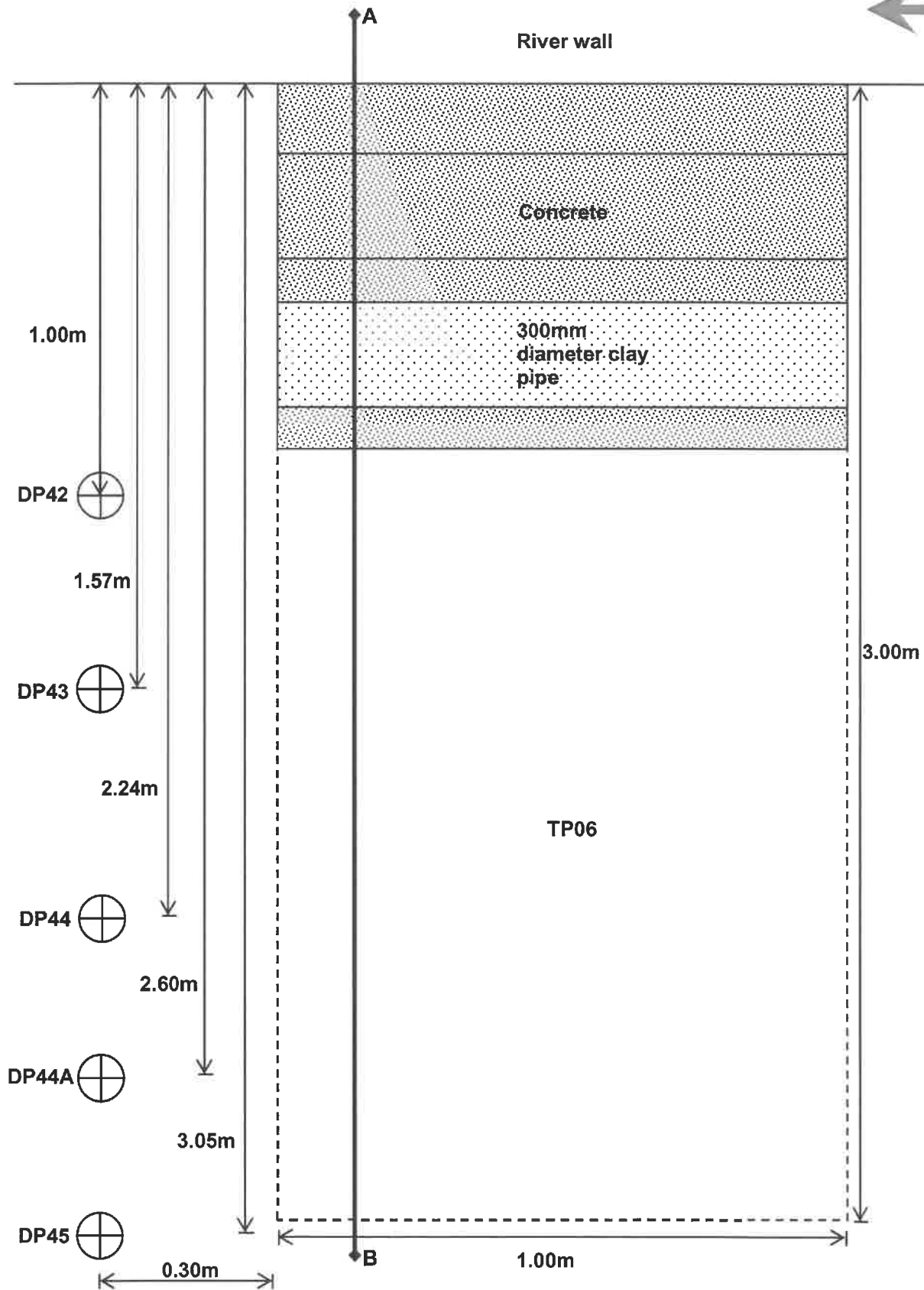
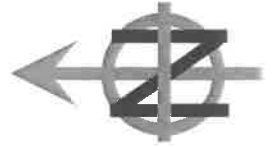
REMARKS

1. Live roots observed to at least 1.20m depth
2. Pit dry
3. Pit sides stable

Project No
14757

Scale Page
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Trial Pit TP06 Plan View



Not To Scale

Project : National Holocaust Memorial, Victoria Tower Gardens, London SW1

Client : WSP

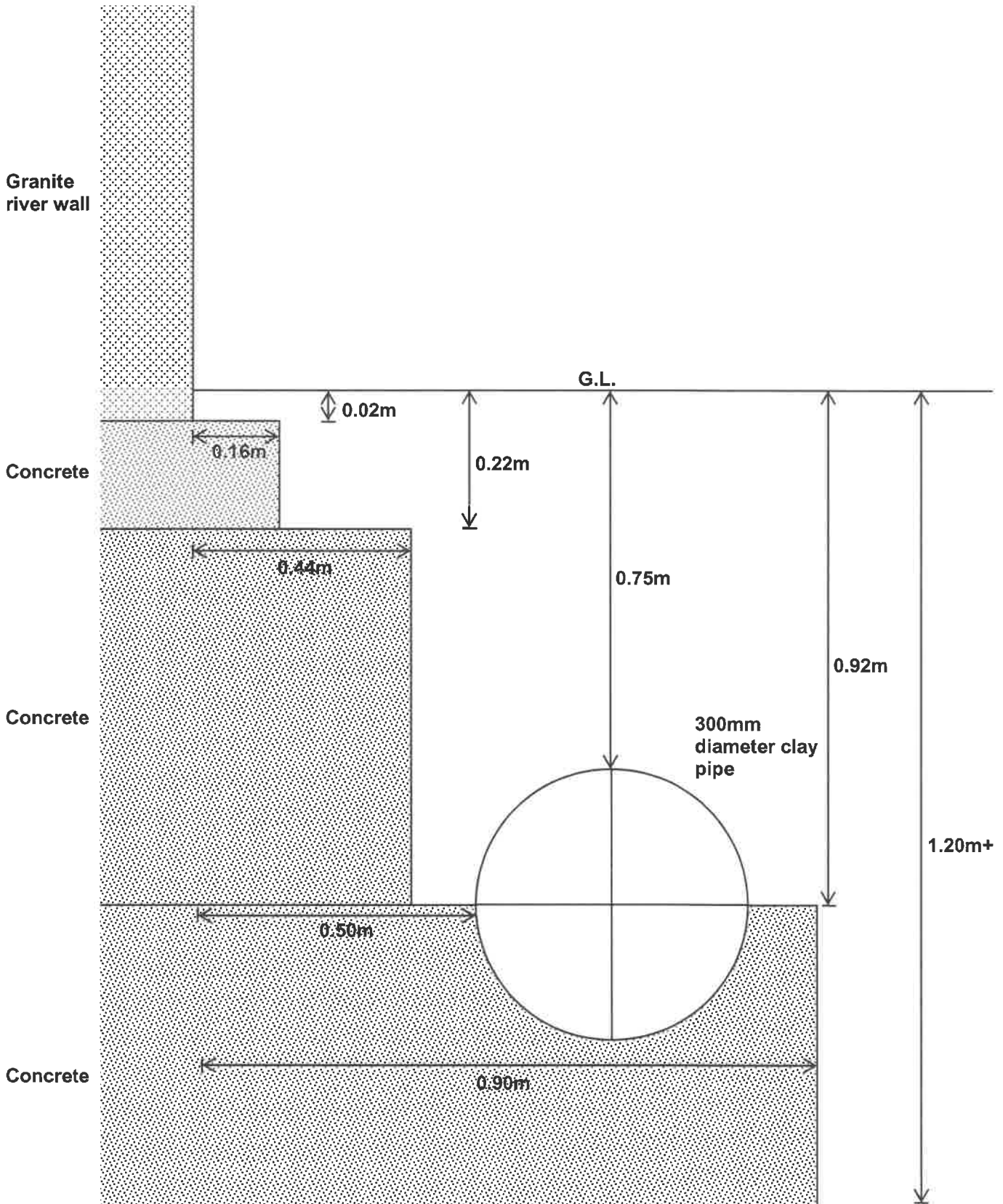
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Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP06 Cross Section A-B



Not To Scale

**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

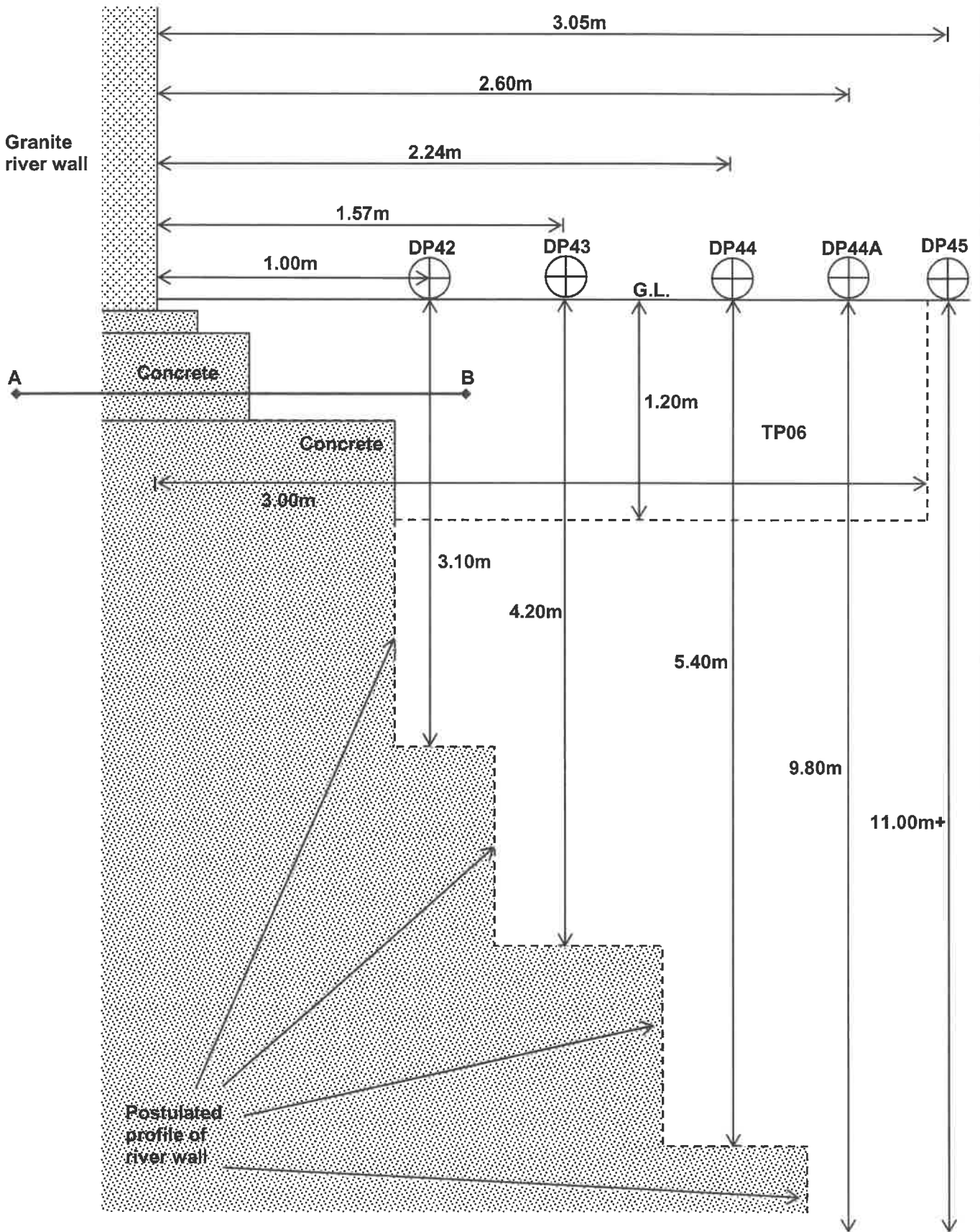
**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP06 Probes



Not To Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

**GROUND
ENGINEERING
LIMITED**

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Project No.

C14757

**Trial Pit TP06
Photograph (Looking East)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

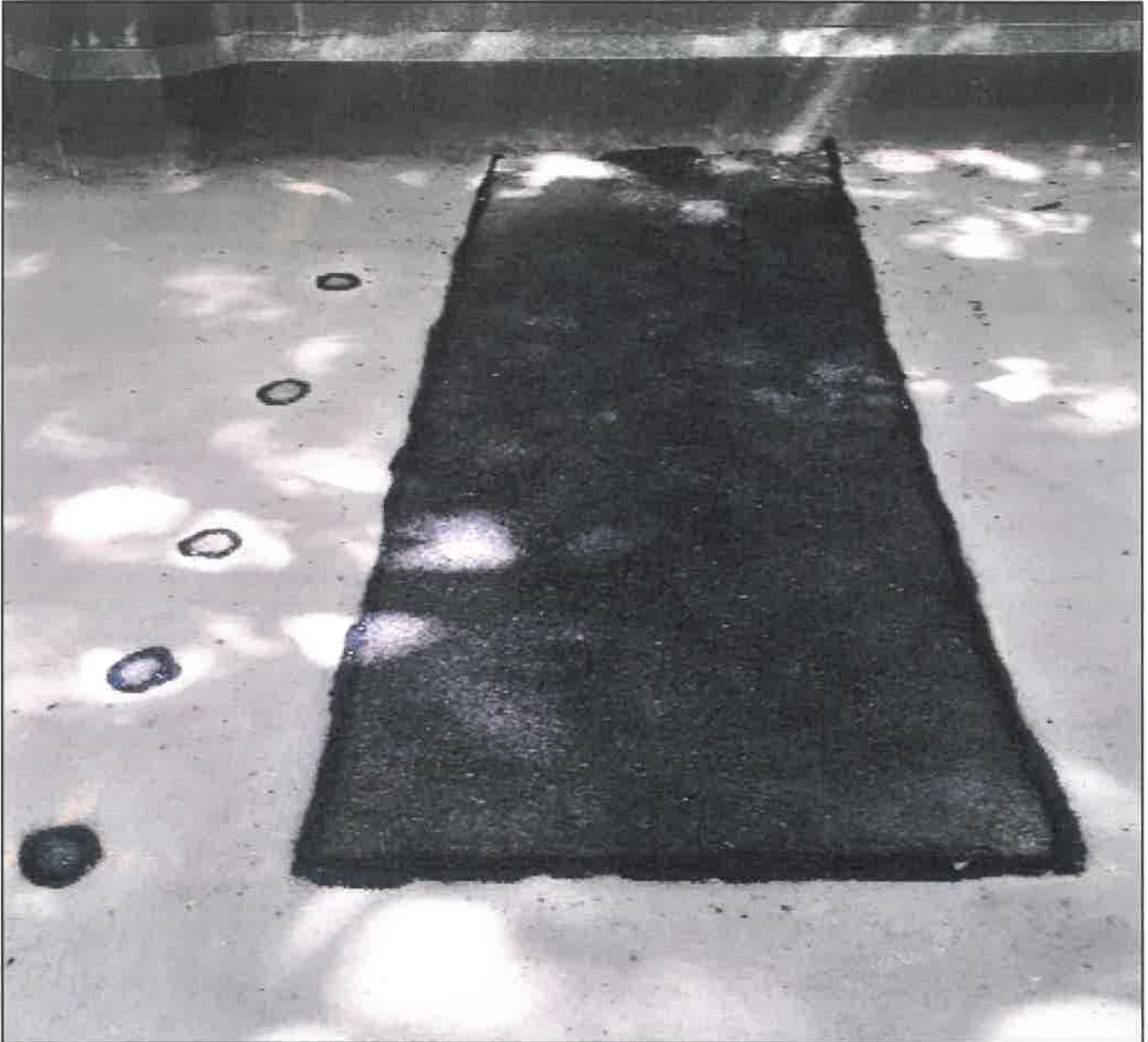
**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

**Trial Pit TP06
Reinstatement Photograph (Looking East)**



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
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Project No.

C14757

GROUND ENGINEERING

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**TRIAL PIT
TP101**

Date: **31/07/19**

Pit Size: **0.70m L x 0.55m W x 1.05m D.**

530268 mE 179131 mN
Ground Level: **4.50m. O.D.**

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
				MADE GROUND - ASPHALT.		0.20	4.30
				MADE GROUND - Brown, grey and orange brown, clayey SAND AND GRAVEL with occasional flint, brick, limestone and concrete cobbles, and occasional pockets of sandy clay. Gravel of brick, flint, concrete, mortar, limestone and ash.		1.05	3.45
				Pit completed at 1.05m depth			

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- R - Root Sample
- W - Water Sample
- ES - Environmental Sample
- ∇ - Water Strike
- ∇ - Water Rise
- ∇c - Level on completion
- MP - Mackintosh Probe
- P () - Hand Penetrometer
Cohesion () kPa
- V - Vane Shear Test
Cohesion () kPa

REMARKS

1. Live roots up to 50mm diameter observed to 0.85m depth
2. Pit dry
3. Pit sides stable

Project No
14757

Scale | Page
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Trial Pit TP101 Plan View



Buxton
Memorial

Granite step
for Buxton
Memorial

0.87m

Concrete
Footing

0.70m

TP101

40mm diameter live root @
0.63m

50mm diameter live root @
0.78m

0.52m

15mm diameter live root @
0.63m

Not to Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

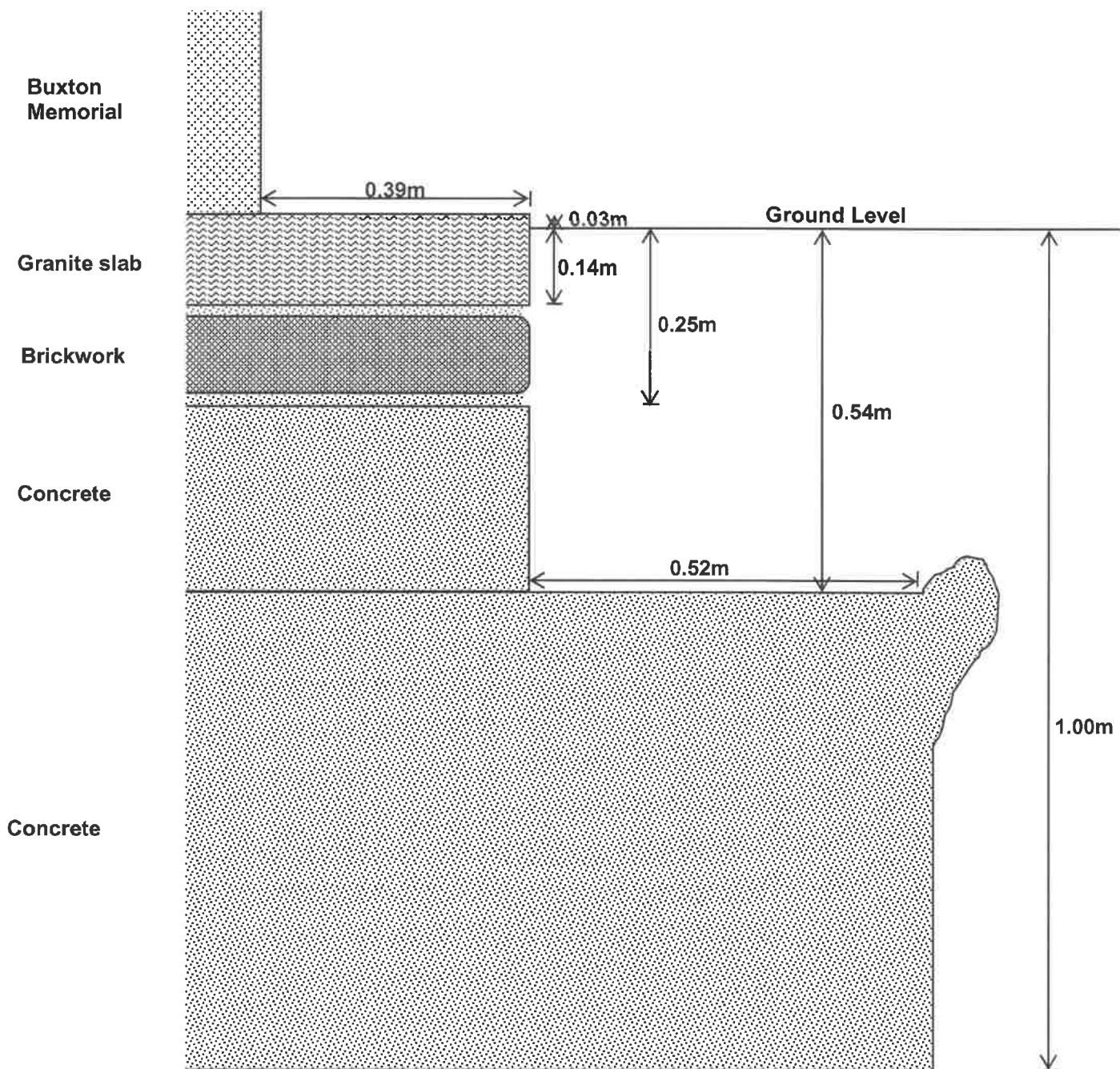
GROUND
ENGINEERING
LIMITED

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP101 Cross Section A-A



Not to Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP101 Photograph



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**





Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1		TRIAL PIT TP102			
Date: 01/08/19			Pit Size: 0.70m L x 0.55m W x 1.00m D.		530271 mE 179128 mN Ground Level: 4.50m. O.D.			
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Result	Water					
0.80	ASB1			MADE GROUND - ASPHALT.		0.12	4.38	
				MADE GROUND - Brown and light brown, silty SAND AND GRAVEL with occasional brick and limestone cobbles. Gravel of brick, flint, limestone, mortar, ash and igneous rock.		0.30	4.20	
				MADE GROUND - Brown and grey, clayey SAND AND GRAVEL with occasional brick, limestone and granite cobbles, and occasional pockets of sandy clay. Gravel of brick, flint, limestone, igneous rock, mortar, ash, glass and suspected asbestos containing material.		0.95	3.55	
				MADE GROUND - Soft, grey, sandy, gravelly, silty CLAY. Gravel of brick, flint and limestone. Pit completed at 0.95m depth		1.00	3.50	
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample R - Root Sample W - Water Sample ES - Environmental Sample ∇ Water Strike ▼ Water Rise ∇c Level on completion MP - Mackintosh Probe P () - Hand Penetrometer Cohesion () kPa V - Vane Shear Test Cohesion () kPa			REMARKS 1. Live roots up to 10mm diameter observed to 0.60m depth 2. Pit dry 3. Pit sides stable				Project No 14757 Scale Page 1:25 1/1	

Trial Pit TP102 Plan View



Buxton
Memorial

Granite step
for Buxton
Memorial

0.83m

Concrete
Footing

0.72m

TP101

0.56m

A

A

Not to Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

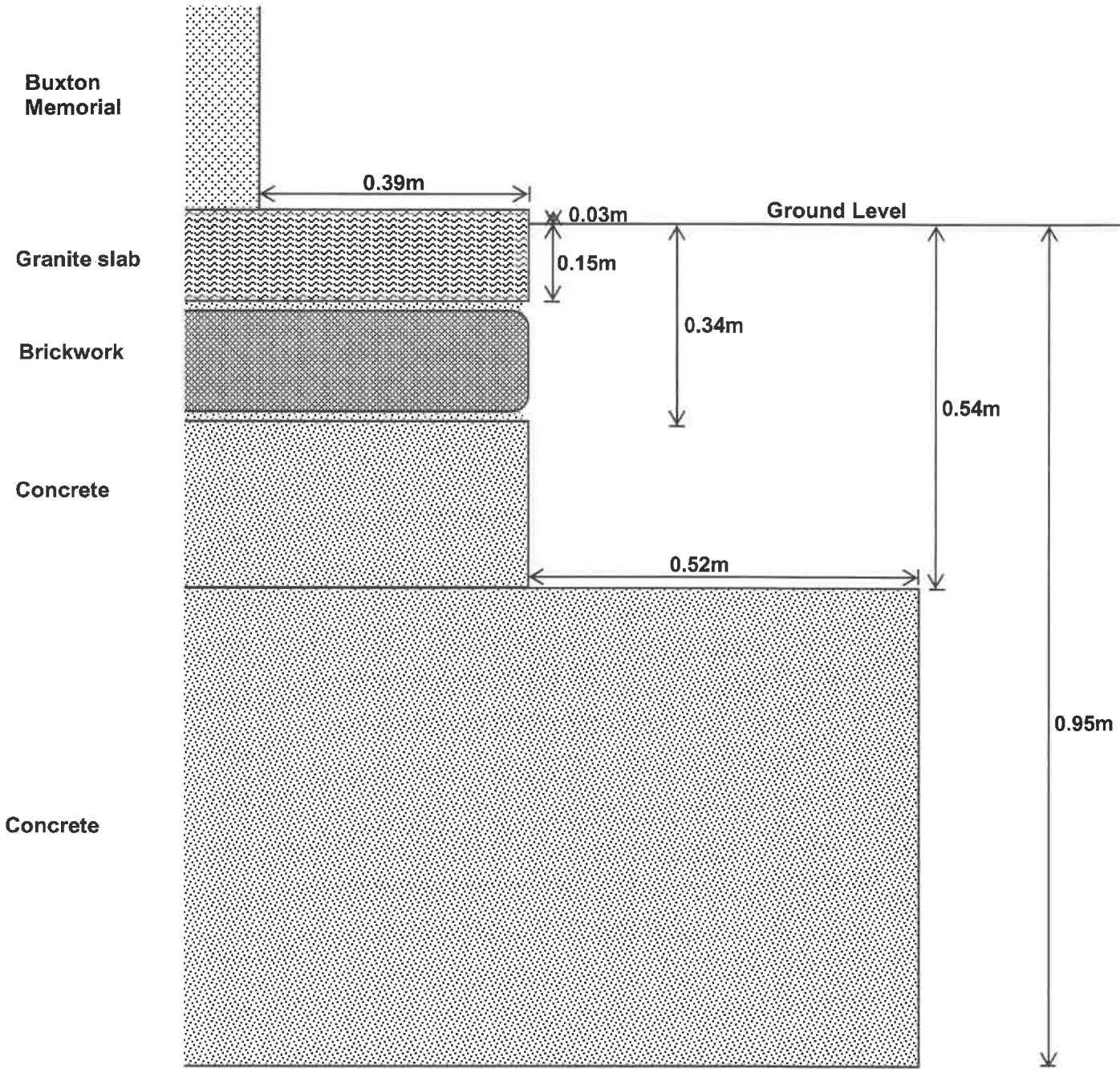
**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP102 Cross Section A-A



Not to Scale

Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

Trial Pit TP102 Photograph



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**

Client : WSP

**GROUND
ENGINEERING
LIMITED**

Peterborough Tel : 01733 566566

Project No.

C14757

GROUND ENGINEERING

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

TRIAL PIT TP103

Date: **31/07/19**

Pit Size: 1.25m L x 0.40m W x 0.80m D.

530263 mE 179061 mN
Ground Level: 4.92m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
				MADE GROUND - Stiff, friable, dark brown, gravelly, sandy, silty, organic CLAY. Gravel of flint, limestone, igneous rock, brick and quartzite. Organic odour.		0.25	4.67
				MADE GROUND - Brown, silty, gravelly SAND with occasional brick cobbles. Gravel of brick, limestone, flint, mortar, ceramic and quartzite.		0.80	4.12
				Pit completed at 0.80m depth			

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- R - Root Sample
- W - Water Sample
- ES - Environmental Sample
- ∇ - Water Strike
- ∇ - Water Rise
- ∇c - Level on completion
- MP - Mackintosh Probe
- P() - Hand Penetrometer
Cohesion () kPa
- V - Vane Shear Test
Cohesion () kPa

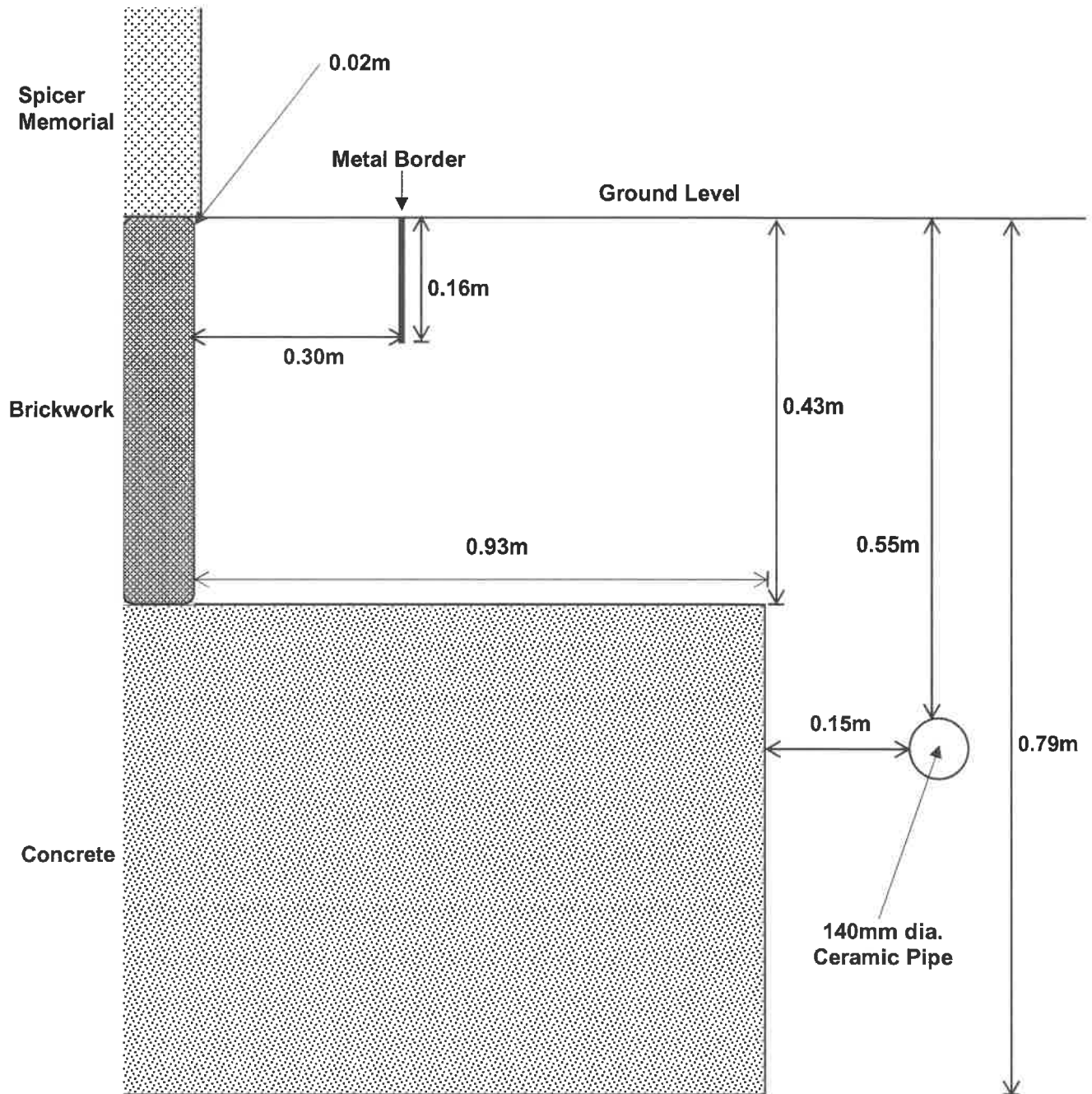
REMARKS

1. Live roots up to 20mm diameter observed to 0.64m depth
2. Pit dry
3. Pit sides stable

Project No
14757

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Trial Pit TP103 Cross Section A-A



Not to Scale

Project : National Holocaust Memorial, Victoria Tower Gardens

Client : WSP

**GROUND
ENGINEERING
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Project No.

C14757

Trial Pit TP103 Photograph



**Project : National Holocaust Memorial, Victoria Tower
Gardens, London SW1**


Client : WSP

**GROUND
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Project No.

C14757

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE MOLA BH1			
Date: 31/07/19			Hole Size: 87mm dia to 1.60m				530243 mE 179202 mN Ground Level: 4.58m. O.D.			
Samples and in-situ Tests			(Date)	Description of Strata				Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water							
1.20-1.60	U1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of brick, concrete, flint and chalk.					0.15	4.43
				MADE GROUND - Brown and grey, slightly sandy, slightly gravelly, clayey SILT. Gravel of brick, flint, chalk, concrete, slate and ceramic fragments.					0.50	4.08
				MADE GROUND - Soft, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of flint, brick and ceramic fragments.					1.00	3.58
				MADE GROUND - Firm, grey, slightly gravelly, silty CLAY. Gravel of flint and brick.					1.50	3.08
				MADE GROUND - Brown and grey, clayey SAND AND GRAVEL with brick cobbles. Gravel of brick and concrete.					1.60	2.98
Hole abandoned at 1.60m depth										
REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth 2. Live roots observed to 1.20m depth 3. Unable to advance sampler below 1.60m depth, hole abandoned and relocated to position MOLA BH1A								Project No 14757		
								Scale 1:25	Page 1/1	
KEY			Groundwater Strikes				Groundwater Observations			
D - Disturbed Sample J - Jar Sample B - Bulk Sample M - Mackintosh Probe U - Undisturbed Sample V - Vane Shear Test W - Water Sample ☒ Water Strike P () - Hand Penetrometer ☒c Depth to Water Cohesion () kPa on completion ☒s Standpipe Level			Depth m				Depth m			
			No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing
						31/07/19	1.60		dry	

GROUND ENGINEERING

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Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**WINDOW SAMPLE
MOLA BH1A**

Date: **31/07/19**

Hole Size: 87mm dia to 2.60m

530247 mE 179207 mN
Ground Level: **4.54m. O.D.**

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
1.20-2.00	U1			MADE GROUND - Dark brown, slightly clayey, silty, gravelly, organic SAND. gravel of flint, brick and concrete.		0.30	4.24
				MADE GROUND - Brown and grey, slightly sandy, slightly gravelly, clayey SILT. Gravel of brick, flint, concrete, chalk, ceramics, ash and bone fragments.		1.00	3.54
2.00-2.60	U2			MADE GROUND - Firm, grey and brown mottled, slightly gravelly, silty CLAY. Gravel of brick fragments.		1.40	3.14
				MADE GROUND - Brown and grey, clayey SAND AND GRAVEL with some brick cobbles. Gravel of brick, concrete, flint and ash.		2.60	1.94
				Hole abandoned at 2.60m depth			

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 1.20m depth
3. Unable to advance sampler below 2.60m depth, hole abandoned and relocated to position MOLA BH1B

Project No
14757

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KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- W - Water Sample
- ∇ Water Strike
- ∇c Depth to Water on completion
- J - Jar Sample
- M - Mackintosh Probe
- V - Vane Shear Test
- Cohesion () kPa
- R () - Hand Penetrometer Cohesion () kPa
- ∇s Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m						Depth m			
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						31/07/19	2.60		dry

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
1.20-2.00	U1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of flint, brick, ash and concrete.		0.30	4.25
				MADE GROUND - Brown and grey, slightly sandy, slightly gravelly, clayey SILT. Gravel of brick, concrete, flint, ash, ceramics, pottery and bone.		0.60	3.95
				MADE GROUND - Brown and light brown, slightly sandy, slightly gravelly, clayey SILT. Gravel of brick, concrete, flint and ash.		1.10	3.45
				MADE GROUND - Firm, brown and grey mottled, slightly gravelly, silty CLAY. Gravel of brick fragments.		1.50	3.05
				MADE GROUND - Grey and brown, clayey SAND AND GRAVEL with occasional brick and concrete cobbles. Gravel of flint, brick, concrete, limestone, chalk and ash.			
2.00-3.00	U2					2.90	1.65
3.00-4.00	U3			MADE GROUND - Firm, brown, orange brown, black and grey mottled, slightly sandy, slightly gravelly, silty CLAY. Gravel of clinker, ash, slag and granite.		3.60	0.95
4.00-5.00	U4			MADE GROUND - Soft, brown, grey and dark brown mottled, slightly sandy, slightly gravelly, silty CLAY. Gravel of brick, clinker, glass, ash and flint.		4.20	0.35
5.00-6.00	U5			Soft, grey, sandy, organic SILT/CLAY with occasional gastropod shells.			
				(ALLUVIUM)			
						5.00	-0.45

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 1.20m depth
3. Borehole cased to 6.00m depth

Project No
14757

Scale 1:25
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KEY


D - Disturbed Sample	J - Jar Sample
B - Bulk Sample	M - Mackintosh Probe
U - Undisturbed Sample	V - Vane Shear Test
W - Water Sample	Cohesion () kPa
∇ Water Strike	P () - Hand Penetrometer
∇c Depth to Water on completion	Cohesion () kPa
	∇s Standpipe Level

Groundwater Strikes					Groundwater Observations			
Depth m					Date	Depth m		
No Struck	Rose to	Rate	Cased	Sealed		Hole	Casing	Water
					30/07/19	6.00		dry

GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1			WINDOW SAMPLE MOLA BH2			
			Date: 30/07/19	Hole Size: 87mm dia to 6.70m			530259 mE 179079 mN Ground Level: 4.54m. O.D.		
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m		
Depth m	Type	Result	Water						
1.20-2.00	U1			MADE GROUND - Dark brown, clayey, silty, slightly gravelly, organic SAND. Gravel of brick, flint, chalk and concrete.		0.30	4.24		
				MADE GROUND - Firm, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of flint, brick, concrete, slate, ceramics and glass.		0.90	3.64		
				MADE GROUND - Soft, grey and brown mottled, slightly sandy, slightly gravelly, silty CLAY. Gravel of flint, concrete, ceramics, glass and coal.		1.40	3.14		
				MADE GROUND - Firm, brown and dark brown mottled, slightly gravelly, silty CLAY. Gravel of flint and brick.		1.70	2.84		
				MADE GROUND - Grey and brown, slightly clayey, sandy GRAVEL with occasional brick cobbles. Gravel of brick, concrete, slate and flint.		2.35	2.19		
2.00-3.00	U2			MADE GROUND - Dark brown and dark grey, silty, ashy SAND AND GRAVEL with occasional brick cobbles. Gravel of ash, brick and flint.		3.40	1.14		
				MADE GROUND - Brown SAND AND GRAVEL. Gravel of flint.		3.80	0.74		
				MADE GROUND - Soft, brown, grey and dark brown mottled, slightly gravelly, silty CLAY. Gravel of flint, glass and shell and coal.		4.50	0.04		
3.00-4.00	U3			Soft, grey, sandy, organic SILT/CLAY with occasional gastropod shells.		5.00	-0.46		
				(ALLUVIUM)					
4.00-5.00	U4								
5.00-6.00	U5								

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth 2. Live roots observed to 0.40m depth 3. Borehole cased to 6.70m depth	Project No 14757	
	Scale 1:25	Page 1/2

KEY D - Disturbed Sample J - Jar Sample B - Bulk Sample M - Mackintosh Probe U - Undisturbed Sample V - Vane Shear Test W - Water Sample ☒ Water Strike ☒c Depth to Water on completion ☒s Standpipe Level	Groundwater Strikes					Groundwater Observations			
	Depth m					Date	Depth m		
	No Struck	Rose to	Rate	Cased	Sealed		Hole	Casing	Water
						30/07/19	6.70	6.70	6.40

Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water				
1.20-2.00	U1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of flint and brick.		0.30	4.63
2.00-2.70	U2			MADE GROUND - Brown, locally clayey, silty SAND AND GRAVEL with occasional brick cobbles. Gravel of brick, flint and ceramics.			
				Hole abandoned at 2.70m depth		2.70	2.23

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth
 2. Live roots observed to 1.20m depth
 3. Borehole cased to 3.70m depth
 4. Unable to advance sampler below 2.70m depth, hole abandoned and relocated to position MOLA BH3A

Project No
14757
 Scale 1:25 Page 1/1

- KEY
 D - Disturbed Sample J - Jar Sample
 B - Bulk Sample M - Mackintosh Probe
 U - Undisturbed Sample V - Vane Shear Test
 W - Water Sample Cohesion () kPa
 ∇ Water Strike P () - Hand Penetrometer
 ∇c Depth to Water Cohesion () kPa
 on completion ∇s Standpipe Level

Groundwater Strikes					Groundwater Observations			
Depth m					Depth m			
No Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
					29/07/19	2.70		dry

GROUND ENGINEERING

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www.groundengineering.co.uk



Site: **NHM, VICTORIA TOWER GARDENS, LONDON SW1**

**WINDOW SAMPLE
MOLA BH3A**

Date: **29/07/19**

Hole Size: **87mm dia to 2.70m**

530260 mE 179076 mN
Ground Level: **5.01m. O.D.**

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
1.20-2.00	U1			MADE GROUND - Dark brown, slightly clayey, silty, very gravelly, organic SAND. Gravel of brick, flint and concrete.		0.30	4.71
				MADE GROUND - Brown and light brown, locally clayey, silty SAND AND GRAVEL. Gravel of brick, chalk, flint and ceramics.			
2.00-2.70	U2			MADE GROUND - Brown and grey, clayey, sandy GRAVEL with some brick cobbles. Gravel of brick and flint.		1.70	3.31
				Hole abandoned at 2.70m depth			
						2.70	2.31

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth
2. Live roots observed to 1.20m depth
3. Borehole cased to 2.70m depth
4. Unable to advance sampler below 2.70m depth, hole abandoned and relocated to position
MOLA BH3B

Project No
14757

Scale
1:25

Page
1/1

KEY

D - Disturbed Sample J - Jar Sample
B - Bulk Sample M - Mackintosh Probe
U - Undisturbed Sample V - Vane Shear Test
W - Water Sample
☒ Water Strike P () - Hand Penetrometer
☒c Depth to Water Cohesion () kPa
on completion ☒s Standpipe Level

Groundwater Strikes

Groundwater Observations

Depth m					Date	Depth m		
No Struck	Rose to	Rate	Cased	Sealed		Hole	Casing	Water
					29/07/19	2.70		dry

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: NHM, VICTORIA TOWER GARDENS, LONDON SW1				WINDOW SAMPLE MOLA BH3B		
			Date: 29/07/19		Hole Size: 87mm dia to 3.00m 77mm dia to 8.00m 67mm dia to 9.00m		530257 mE 179089 mN Ground Level: 4.76m. O.D.		
Samples and in-situ Tests			(Date)	Description of Strata			Legend	Depth m	O.D. Level m
Depth m	Type	Result	Water						
1.20-2.00	U1			MADE GROUND - Dark brown, slightly clayey, silty, gravelly, organic SAND. Gravel of brick, concrete, flint and ash.				0.40	4.36
				MADE GROUND - Brown, locally clayey, silty SAND AND GRAVEL. Gravel of brick, flint, concrete, chalk and ceramics.					
2.00-3.00	U2			MADE GROUND - Brown and grey, clayey, sandy GRAVEL with some brick and concrete cobbles. Gravel of brick and concrete.				1.90	2.86
3.00-4.00	U3			MADE GROUND - Soft, brown and dark brown mottled, slightly gravelly, silty CLAY. Gravel of brick, flint, ash, chalk and shell fragments.				3.20	1.56
4.00-5.00	U4			MADE GROUND - Soft, brown, slightly gravelly, silty CLAY. Gravel of brick and bone fragments.				4.70	0.06
5.00-6.00	U5							5.00	-0.24
REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth 2. Live roots observed to 1.20m depth 3. Borehole cased to 7.00m depth							Project No 14757		
							Scale 1:25	Page 1/2	
KEY			Groundwater Strikes				Groundwater Observations		
D - Disturbed Sample			Depth m				Date		
B - Bulk Sample			No Struck				Hole		
U - Undisturbed Sample			Rose to				Casing		
W - Water Sample			Rate				Water		
☒ Water Strike			Cased						
☒c Depth to Water on completion			Sealed						
J - Jar Sample			Date						
M - Mackintosh Probe			29/07/19						
V - Vane Shear Test			9.00						
P () - Hand Penetrometer									
Cohesion () kPa									
Cohesion () kPa									
☒s Standpipe Level									

APPENDIX 2

GROUNDWATER/GAS MONITORING RESULTS

Groundwater/Gas Monitoring Post Fieldwork Record

GROUND ENGINEERING LIMITED

Site: NHM, Victoria Tower Gardens, London SW1

Report Ref: C14757

Date	Borehole	Methane (% v/v)		Carbon Dioxide (% v/v)			Oxygen (% v/v)		VOC (ppm)	Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m)	Depth to Groundwater (m)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.							
22/05/19	BH 1 (stp)	<0.1	<0.1	0.1	0.1	20.7	20.7	20.7	<0.1	<0.1	1021	11.70	6.82	Purged
	BH 1 (pz)	-	-	-	-	-	-	-	-	-	-	24.00	8.30	
	BH 2 (stp)	<0.1	<0.1	2.3	2.3	17.5	17.5	17.5	3.8	<0.1	1021	10.50	6.38	Purged
	BH 2 (pz)	-	-	-	-	-	-	-	-	-	-	34.00	19.02	
	BH 4 (stp)	<0.1	<0.1	<0.1	<0.1	20.9	20.9	20.9	2.5	<0.1	1022	11.00	6.26	Purged
	BH 4 (pz)	-	-	-	-	-	-	-	-	-	-	42.50	16.62	
	BH 5 (stp)	5.9	5.9	6.2	6.2	13.0	13.0	13.0	<0.1	<0.1	1022	7.50	6.23	Purged
	BH 5 (stp)	<0.1	<0.1	0.1	0.1	20.5	20.5	20.5	1.3	<0.1	1022	11.00	6.42	Purged
	WS 1	<0.1	<0.1	1.1	1.1	19.7	19.7	19.7	1.5	<0.1	1021	6.00	5.63	Purged
	WS 3B	<0.1	<0.1	1.0	1.0	20.2	20.2	20.2	0.3	<0.1	1021	2.50	Dry	
	WS 5	-	-	-	-	-	-	-	-	-	-	5.50	-	Not checked
	WS 6	<0.1	<0.1	1.8	1.8	18.9	18.9	18.9	<0.1	<0.1	1021	3.30	3.14	Purged
	WS 7	<0.1	<0.1	1.8	1.8	19.2	19.2	19.2	1.4	<0.1	1022	4.20	Dry	
	WS 8	<0.1	<0.1	0.1	0.1	20.4	20.4	20.4	<0.1	<0.1	1022	2.35	Dry	

Groundwater/Gas Monitoring Post Fieldwork Record

GROUND ENGINEERING LIMITED

Site: NHM, Victoria Tower Gardens, London SW1

Report Ref: C14757

Date	Borehole	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		VOC (ppm)	Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m)	Depth to Groundwater (m)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.						
29/05/19	BH 1 (stp)	<0.1	<0.1	0.2	0.2	20.1	20.1	<0.1	<0.1	1019	11.70	6.78	Samples taken
	BH 1 (pz)	-	-	-	-	-	-	-	-	-	24.00	7.94	
	BH 2 (stp)	<0.1	<0.1	0.4	0.4	20.1	20.1	0.5	<0.1	1020	10.50	6.33	Samples taken
	BH 2 (pz)	-	-	-	-	-	-	-	-	-	34.00	18.80	
	BH 4 (stp)	<0.1	<0.1	0.4	0.4	20.1	20.1	4.0	<0.1	1022	11.00	6.22	Samples taken
	BH 4 (pz)	-	-	-	-	-	-	-	-	-	42.50	12.47	
	BH 5 (stp)	<0.1	<0.1	<0.1	<0.1	20.7	20.7	0.2	<0.1	1021	7.50	6.25	Samples taken
	BH 5 (stp)	0.1	0.1	0.7	0.7	19.9	19.9	1.5	<0.1	1021	11.00	6.40	Samples taken
	WS 1	<0.1	<0.1	0.6	0.6	20.2	20.2	0.1	<0.1	1019	6.00	5.64	Samples taken
	WS 3B	<0.1	<0.1	1.3	1.3	19.5	19.5	<0.1	<0.1	1019	2.50	Dry	
	WS 5	<0.1	<0.1	2.0	2.0	18.9	18.9	0.6	<0.1	1021	5.50	3.57	Samples taken, after purging
	WS 6	<0.1	<0.1	2.1	2.1	18.7	18.7	<0.1	<0.1	1020	3.30	3.16	Samples taken
	WS 7	<0.1	<0.1	1.8	1.8	18.7	18.7	0.7	<0.1	1021	4.20	Dry	
	WS 8	<0.1	<0.1	<0.1	<0.1	20.7	20.7	0.2	<0.1	1022	2.35	Dry	

Groundwater/Gas Monitoring Post Fieldwork Record

GROUND ENGINEERING LIMITED

Site: NHM, Victoria Tower Gardens, London SW1

Report Ref: C14757

Date	Borehole	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		VOC (ppm)	Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m)	Depth to Groundwater (m)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.						
04/06/19	BH 1 (stp)	<0.1	<0.1	0.2	0.2	20.4	20.4	0.2	<0.1	1011	11.70	6.87	Samples taken
	BH 1 (pz)	-	-	-	-	-	-	-	-	-	24.00	7.78	
	BH 2 (stp)	<0.1	<0.1	0.9	0.9	20.1	20.1	0.4	<0.1	1011	10.50	6.43	Samples taken
	BH 2 (pz)	-	-	-	-	-	-	-	-	-	34.00	18.69	
	BH 4 (stp)	<0.1	<0.1	0.6	0.6	20.3	20.3	2.0	<0.1	1010	11.00	6.28	Samples taken
	BH 4 (pz)	-	-	-	-	-	-	-	-	-	42.50	11.40	
	BH 5 (stp)	12.5	12.5	7.7	7.7	12.2	12.2	2.1	<0.1	1009	7.50	6.27	Samples taken
	BH 5 (stp)	0.6	0.6	1.2	1.2	18.9	18.9	1.7	<0.1	1009	11.00	6.42	Samples taken
	WS 1	<0.1	<0.1	0.2	0.2	20.7	20.7	<0.1	<0.1	1011	6.00	5.65	Samples taken
	WS 3B	<0.1	<0.1	1.3	1.3	19.6	19.6	<0.1	<0.1	1011	2.50	Dry	
	WS 5	<0.1	<0.1	2.7	2.7	18.2	18.2	0.3	<0.1	1009	5.50	3.49	Samples taken
	WS 6	<0.1	<0.1	0.2	0.2	20.5	20.5	<0.1	<0.1	1011	3.30	3.18	Samples taken
	WS 7	<0.1	<0.1	1.2	1.2	19.3	19.3	0.2	<0.1	1011	4.20	Dry	
	WS 8	<0.1	<0.1	2.5	2.5	18.7	18.7	0.4	<0.1	1010	2.35	Dry	

Groundwater/Gas Monitoring Post Fieldwork Record

GROUND ENGINEERING LIMITED

Site: NHM, Victoria Tower Gardens, London SW1

Report Ref: C14757

Date	Borehole	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		VOC (ppm)	Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m)	Depth to Groundwater (m)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.						
07/06/19	BH 1 (stp)	<0.1	<0.1	0.1	0.1	21.0	21.0	<0.1	<0.1	1006	11.70	6.92	
	BH 1 (pz)	-	-	-	-	-	-	-	-	-	24.00	7.72	
	BH 2 (stp)	<0.1	<0.1	0.4	0.4	20.1	20.1	0.4	<0.1	1005	10.50	6.46	
	BH 2 (pz)	-	-	-	-	-	-	-	-	-	34.00	18.64	
	BH 4 (stp)	<0.1	<0.1	0.4	0.4	20.0	20.0	0.6	<0.1	1005	11.00	6.35	
	BH 4 (pz)	-	-	-	-	-	-	-	-	-	42.50	11.50	
	BH 5 (stp)	7.8	7.8	5.4	5.4	16.2	16.2	0.1	<0.1	1004	7.50	6.25	
	BH 5 (stp)	<0.1	<0.1	0.6	0.6	19.8	19.8	0.5	<0.1	1004	11.00	6.46	
	WS 1	<0.1	<0.1	<0.1	<0.1	20.7	20.7	<0.1	<0.1	1006	6.00	5.65	
	WS 3B	<0.1	<0.1	1.1	1.1	19.9	19.9	<0.1	<0.1	1006	2.50	Dry	
	WS 5	<0.1	<0.1	2.6	2.6	18.4	18.4	0.4	<0.1	1005	5.50	3.46	
	WS 6	<0.1	<0.1	0.1	0.1	21.0	21.0	0.1	<0.1	1005	3.30	3.14	
	WS 7	<0.1	<0.1	1.0	1.0	19.5	19.5	0.2	<0.1	1005	4.20	Dry	
	WS 8	<0.1	<0.1	2.2	2.2	18.9	18.9	<0.1	<0.1	1004	2.35	Dry	

Groundwater/Gas Monitoring Post Fieldwork Record

GROUND ENGINEERING LIMITED

Site: NHM, Victoria Tower Gardens, London SW1

Report Ref: C14757

Date	Borehole	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		VOC (ppm)	Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m)	Depth to Groundwater (m)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.						
11/06/19	BH 1 (stp)	<0.1	<0.1	0.2	0.2	20.4	20.4	<0.1	<0.1	1012	11.70	6.86	
	BH 1 (pz)	-	-	-	-	-	-	-	-	-	24.00	7.65	
	BH 2 (stp)	<0.1	<0.1	0.6	0.6	19.5	19.5	<0.1	<0.1	1012	10.50	6.43	
	BH 2 (pz)	-	-	-	-	-	-	-	-	-	34.00	18.62	
	BH 4 (stp)	<0.1	<0.1	0.1	0.1	20.3	20.3	1.3	<0.1	1012	11.00	6.30	
	BH 4 (pz)	-	-	-	-	-	-	-	-	-	42.50	11.54	
	BH 5 (stp)	0.9	0.9	4.2	4.2	16.3	16.3	<0.1	<0.1	1012	7.50	6.22	
	BH 5 (stp)	0.3	0.3	0.6	0.6	19.6	19.6	0.4	<0.1	1012	11.00	6.46	
	WS 1	<0.1	<0.1	0.3	0.3	20.2	20.2	<0.1	<0.1	1012	6.00	5.65	
	WS 3B	<0.1	<0.1	1.1	1.1	19.8	19.8	<0.1	<0.1	1012	2.50	Dry	
	WS 5	<0.1	<0.1	1.9	1.9	18.7	18.7	0.3	<0.1	1012	5.50	3.46	
	WS 6	<0.1	<0.1	1.3	1.3	18.4	18.4	<0.1	<0.1	1012	3.30	3.14	
	WS 7	<0.1	<0.1	1.1	1.1	19.1	19.1	0.1	<0.1	1012	4.20	Dry	
	WS 8	<0.1	<0.1	2.3	2.3	18.2	18.2	<0.1	<0.1	1012	2.35	Dry	

Groundwater/Gas Monitoring Post Fieldwork Record

GROUND ENGINEERING LIMITED

Site: NHM, Victoria Tower Gardens, London SW1

Report Ref: C14757

Date	Borehole	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		VOC (ppm)	Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m)	Depth to Groundwater (m)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.						
14/06/19	BH 1 (stp)	<0.1	<0.1	0.1	0.1	20.3	20.3	<0.1	<0.1	1011	11.70	6.78	
	BH 1 (pz)	-	-	-	-	-	-	-	-	-	24.00	7.58	
	BH 2 (stp)	<0.1	<0.1	0.6	0.6	19.6	19.6	0.2	<0.1	1011	10.50	6.35	
	BH 2 (pz)	-	-	-	-	-	-	-	-	-	34.00	18.60	
	BH 4 (stp)	<0.1	<0.1	0.5	0.5	20.1	20.1	0.8	<0.1	1011	11.00	6.24	
	BH 4 (pz)	-	-	-	-	-	-	-	-	-	42.50	11.37	
	BH 5 (stp)	<0.1	<0.1	5.9	5.9	15.9	15.9	0.4	<0.1	1011	7.50	6.18	
	BH 5 (stp)	<0.1	<0.1	1.2	1.2	19.0	19.0	0.7	<0.1	1011	11.00	6.39	
	WS 1	<0.1	<0.1	0.5	0.5	20.0	20.0	<0.1	<0.1	1011	6.00	5.65	
	WS 3B	<0.1	<0.1	1.1	1.1	19.3	19.3	<0.1	<0.1	1011	2.50	Dry	
	WS 5	<0.1	<0.1	2.2	2.2	18.0	18.0	0.7	<0.1	1011	5.50	3.43	
	WS 6	<0.1	<0.1	0.6	0.6	19.5	19.5	<0.1	<0.1	1011	3.30	3.14	
	WS 7	<0.1	<0.1	2.7	2.7	17.2	17.2	1.1	<0.1	1011	4.20	Dry	
	WS 8	<0.1	<0.1	2.3	2.3	17.9	17.9	<0.1	<0.1	1011	2.35	Dry	

Groundwater Monitoring Post Fieldwork Record**GROUND ENGINEERING LIMITED****Site: NHM, Victoria Tower Gardens, London SW1****Report Ref: C14757**

Date	Borehole	Depth of Well (m)	Depth to Groundwater (m)	Comments
27/06/19	BH 1 (stp)	11.70	6.74	
	BH 1 (pz)	24.00	7.47	
	BH 2 (stp)	10.50	6.30	Datalogger installed
	BH 2 (pz)	34.00	18.53	
	BH 4 (stp)	11.00	6.19	
	BH 4 (pz)	42.50	9.41	
	BH 5 (stp)	7.50	6.18	Datalogger installed
	BH 5 (stp)	11.00	6.37	Datalogger installed
	WS 1	6.00	5.63	
	WS 3B	2.50	Dry	
	WS 5	5.50	3.53	Datalogger installed
	WS 6	3.30	3.16	
	WS 7	4.20	Dry	Barotroll installed
	WS 8	2.35	Dry	

APPENDIX 3 – GEOTECHNICAL LABORATORY TEST RESULTS

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression						Sulphates (SO ₄)			Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH1	B10	5.70 - 6.00	72	33	39	46												SOIL CLASSIFICATION = CV 0% retained on 425µm sieve Organic Content = 4.4%
	B12	6.50 - 7.00	78	30	48	60												
	B14	7.90 - 8.10	173	72	101	121												SOIL CLASSIFICATION = CV 29% retained on 425µm sieve
	U1	8.10 - 8.55				223	1.23	0.38	Q	114	162	57	0					
	W1	9.00																SOIL CLASSIFICATION = MEO 6% retained on 425µm sieve Organic Content = 21%
	W2	9.50														477	6.9	
	B19	11.70 - 12.00	75	26	49	30												SOIL CLASSIFICATION = CV 0% retained on 425µm sieve
	B20	14.50 - 15.00	83	29	54	30												
	U3	16.00 - 16.45				25	1.72	1.37	Q	153	480	76	0					SOIL CLASSIFICATION = CV 0% retained on 425µm sieve
	D6	16.45				22												

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks		
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l		pH	
BH1	B21	17.50 - 18.00				30													
	U4	19.00 - 19.45				21	2.03	1.68	Q	373	570	186	0						
	D9	19.45				21													
	U5	22.00 - 22.45				28	2.01	1.58	Q	459	660	229	0						
	D12	22.45		28	44	22													
	U6	24.60 - 25.00				26	1.97	1.57	Q	351	738	175	0						
	D14	25.00				23													

SOIL CLASSIFICATION = CV
0% retained on 425µm sieve

Aqueous Extract 2:1 Water:Soil

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE
C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mgr/m ³	Dry Mgr/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l		pH
BH2	B11	4.30 - 5.00				42												
	U1	5.00 - 5.45				59	1.80	1.13	Q	28	100	14	0					
	D1	5.45				3.5												
	B13	6.00 - 6.50	39	22	17	24												
	W2	10.00																
	B19	10.50 - 10.80				29												
	U2	11.40 - 11.80				30	1.97	1.51	Q	100	342	50	0					
	D3	12.50				30												
	D4	13.45				32												
	U3	14.50 - 14.95				30	1.96	1.51	Q	201	435	101	0					
	D6	15.50				29												
	D7	16.45				36												

SOIL CLASSIFICATION = CI
73% retained on 425µm sieve

Aqueous Extract 2:1 Water:Soil

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE
C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
G.M. - IMMEDIATE UNDRAINED MULTISTAGE

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH2	U4	17.50 - 17.95				22	2.03	1.67	Q	335	525	168	0					
	D9	18.50	61	22	39	24	2.01	1.59	Q	297	645	148	0					
	D10	19.45				26												
	U5	21.50 - 21.90				27												
	D12	21.50				25												
	D13	22.45				27												
	U6	24.00 - 24.40				26	1.97	1.56	Q	140	720	70	0					
	W3	26.00																
	U7	27.00 - 27.40				28	1.97	1.53	Q	163	810	81	0			420		7.5
	D17	27.40				27												
	U8	30.00 - 30.40				29	1.75	1.36	Q	147	900	73	0					
	D20	30.40				26												

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
G.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH2	U9	33.00 - 33.35				24	1.98	1.60	q	118	990	559	0					SOIL CLASSIFICATION = CH/CV 0% retained on 425µm sieve
	D23	33.35	70	26	44	23												
	D25	35.00				19												

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks		
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l		pH	
BH3	B1	0.00 - 0.40				18													
	B4	1.20 - 1.50	72	30	42	34													

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l		pH
BH4	B11	5.00 - 5.50	68	30	38	39												
	W1	10.00																
	U1	12.40 - 12.60				29	1.99	1.55	Q	103	372	51	0			239		7.5
	D4	14.50				28												
	U2	15.00 - 15.45				27	1.98	1.56	Q	157	450	79	0					
	D7	16.95				21												
	U3	18.00 - 18.45				25	1.98	1.58	Q	202	540	101	0					
	D10	19.95				25												
	U4	21.00 - 21.40				23	2.05	1.67	Q	151	630	75	0					
	D11	21.40				23												
	D13	23.05				24												
	U5	24.00 - 24.45				26	2.03	1.61	Q	156	720	78	0					

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification			Density		Triaxial Compression					Sulphates (SO ₄)			Remarks			
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total Dry Wt. %	Aqueous Extract mg/l		Water mg/l	pH	
BH4	D14	24.45				24													
	D16	25.95	66	25	41	24	2.02	1.61	Q	433	81	216	0						SOIL CLASSIFICATION = CH 0% retained on 425µm sieve
	J6	27.00 - 27.40				26													
	D18	28.00	75	29	46	22													SOIL CLASSIFICATION = CV 0% retained on 425µm sieve
	D19	28.95				30													
	U7	30.00 - 30.10				27													Unsuitable for triaxial testing
	B26	30.00 - 30.20				32													
	D20	31.95	73	28	45	25	1.93	1.54	Q	213	990	106	0						SOIL CLASSIFICATION = CV 0% retained on 425µm sieve
	J8	33.00 - 33.45				25													
	D23	34.00				21													
	D24	34.95				28													

Aqueous Extract 2:1 Water:Soil

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE
C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l		pH
BH4	U9	36.00 - 36.35				25	1.96	1.57	Q	1039	1080	520	0					
	D26	36.35			20										255		7.8	SOIL CLASSIFICATION = CV 0% retained on 425µm sieve
	W2	37.00																
	B29	37.60 - 38.10	77	24	53	29												
	U10	39.00 - 39.35				24	1.95	1.57	Q	333	1170	167	0					SOIL CLASSIFICATION = CH 2% retained on 425µm sieve
	D30	40.00	66	25	41	25												SOIL CLASSIFICATION = CH 8% retained on 425µm sieve
	B31	41.90 - 42.00	66	23	43	27												SOIL CLASSIFICATION = CI 3% retained on 425µm sieve
	W3	42.00													288		7.8	
	B32	42.00 - 42.50				45												
	B33	42.50 - 42.60	47	19	28	53												

Aqueous Extract 2:1 Water:Soil

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE
C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l		pH
BH5	B1	0.20 - 0.60																Organic Content = 8.9%
	B5	1.50 - 2.00	33	24	9	22												SOIL CLASSIFICATION = ML 51% retained on 425µm sieve
	B6	2.00 - 2.50	38	25	13	24												SOIL CLASSIFICATION = MI 44% retained on 425µm sieve
	B12	5.00 - 5.50				49												
	B13	6.00 - 6.50				32												
	W1	8.00													453		7.5	

Aqueous Extract 2:1 Water:Soil

U - UNDISTURBED SAMPLE
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C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l		pH
WS1	D2	0.50	36	23	13	17												SOIL CLASSIFICATION = CI 38% retained on 425µm sieve
	D4	1.00	39	22	17	21												SOIL CLASSIFICATION = CI 39% retained on 425µm sieve
	D6	1.50	58	21	37	19												SOIL CLASSIFICATION = CH 16% retained on 425µm sieve
	D8	3.30	30	24	6	12												SOIL CLASSIFICATION = CL 56% retained on 425µm sieve
	D11	4.80	102	45	57	65												SOIL CLASSIFICATION = ME 9% retained on 425µm sieve

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l		pH
MS2	D2	0.40	29	18	11	8.9												SOIL CLASSIFICATION = CL 66% retained on 425µm sieve
	D4	1.00	74	29	45	34												SOIL CLASSIFICATION = CV 2% retained on 425µm sieve
	D6	1.50	71	26	45	34												SOIL CLASSIFICATION = CV 13% retained at 425µm sieve
	D8	2.00	69	27	42	33												SOIL CLASSIFICATION = CH 1% retained on 425µm sieve

Aqueous Extract 2:1 Water:Soil

- U - UNDISTURBED SAMPLE
- D - DISTURBED SAMPLE
- B - BULK SAMPLE
- W - WATER SAMPLE
- C.U. - CONSOLIDATED UNDRAINED
- C.D. - CONSOLIDATED DRAINED
- Q. - IMMEDIATE UNDRAINED
- Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l		pH
WS3	D2	0.50	37	23	14	15												SOIL CLASSIFICATION = CI 49% retained on 425µm sieve
	D6	1.50	54	29	25	27												SOIL CLASSIFICATION = CH/MH 50% retained on 425µm sieve

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
G. - IMMEDIATE UNDRAINED
G.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l		pH
WS3A	D2	0.50	38	24	14	16												SOIL CLASSIFICATION = CI 42% retained on 425µm sieve
	D4	1.00	68	27	41	33												SOIL CLASSIFICATION = CH 1% retained on 425µm sieve

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l	pH	
WS4	D1	0.05																Organic Content = 7.3%
	D2	0.25	32	19	13	13												SOIL CLASSIFICATION = CL 47% retained on 425µm sieve
	U1	1.20 - 2.00				18												Unsuitable for triaxial testing
	D5	1.30	73	30	43	32												SOIL CLASSIFICATION = CV 0% retained on 425µm sieve
	U2	2.00 - 3.00				20												Unsuitable for triaxial testing
	D9	2.95	28	20	8	24												SOIL CLASSIFICATION = CL 57% retained on 425µm sieve
	U3	3.00 - 4.00				18												Unsuitable for triaxial testing
	D11	3.95	93	48	45	58												SOIL CLASSIFICATION = ME 19% retained on 425µm sieve Organic Content = 14%
	D13	5.50	81	36	45	58												SOIL CLASSIFICATION = CV/MV 17% retained on 425µm sieve

Aqueous Extract 2:1 Water:Soil

U - UNDISTURBED SAMPLE
 D - DISTURBED SAMPLE
 B - BULK SAMPLE
 W - WATER SAMPLE
 C.U. - CONSOLIDATED UNDRAINED
 C.D. - CONSOLIDATED DRAINED
 Q. - IMMEDIATE UNDRAINED
 Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression				Sulphates (SO ₄)			Remarks		
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Aqueous Extract mg/l		Water mg/l	pH
WS5	D5	1.60	44	27	17	26												SOIL CLASSIFICATION = MI 32% retained on 425µm sieve
	D9	3.60	82	40	42	51												SOIL CLASSIFICATION = MV 1% retained on 425µm sieve
	D11	4.30	30	23	7	18												SOIL CLASSIFICATION = ML 48% retained on 425µm sieve
	D12	4.80	33	22	11	19												SOIL CLASSIFICATION = CL 63% retained on 425µm sieve
	D13	5.30																Organic Content = 5.1%

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOMER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total Dry Wt. %	Soil Aqueous Extract mg/l	Water mg/l		pH
WS6	D1	0.10	30	21	9	12												SOIL CLASSIFICATION = CL 28% retained on 425µm sieve
	D5	1.45	76	31	45	34												SOIL CLASSIFICATION = CV 2% retained on 425µm sieve
	U2	2.00 - 3.00				22												Unsuitable for triaxial testing
	U4	4.00 - 5.00				78	1.48	0.83			Q	27	80	13	0			Organic Content = 4.6%
	D13	4.80																
	U5	5.00 - 6.00				65	1.76	1.07			Q	40	100	20	0			SOIL CLASSIFICATION = ME 0% retained on 425µm sieve
	D14	5.30	91	42	49	68												

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

14757

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total Dry Wt. %	Aqueous Extract mg/l	Water mg/l		pH
MS7	B1	0.10 - 0.40	33	21	12	15												SOIL CLASSIFICATION = CL 32% retained on 425µm sieve
	B2	0.80 - 1.20	38	25	13	22												SOIL CLASSIFICATION = CI/MI 50% retained on 425µm sieve
	D10	2.25	41	31	10	20												SOIL CLASSIFICATION = MI 62% retained on 425µm sieve
	D14	3.25	97	45	52	62												SOIL CLASSIFICATION = ME 3% retained on 425µm sieve
	D17	4.00	95	40	55	63												SOIL CLASSIFICATION = CE/ME 0% retained on 425µm sieve
	D18	4.25																Organic content = 9.2%
	D21	5.00	66	32	34	48												SOIL CLASSIFICATION = CH/MH 1% retained on 425µm sieve
	D25	6.00	84	28	56	37												SOIL CLASSIFICATION = CV 23% retained on 425µm sieve

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

14.757

GROUND ENGINEERING

L I M I T E D

Tel: 01733-566666
www.groundengineering.co.uk

LABORATORY TEST RESULTS

CONTRACT NHM, VICTORIA TOWER GARDENS, LONDON SW1

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)			Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l		pH
WS8	D3	0.90	73	28	45	31												SOIL CLASSIFICATION = CV 0% retained on 425µm sieve

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

14757



8180

Newark Road Peterborough
t: 01733 566566
e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/1/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 18.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

Laboratory Reference: PL6722-1/1
Client Reference: B2

Pre-treatment for organic material: No

Sample Description: Dark brown black slightly gravelly silty SAND. Gravel consists of sub-angular to sub-rounded pottery bone ash flint and coal.

Material Specification: Not Required

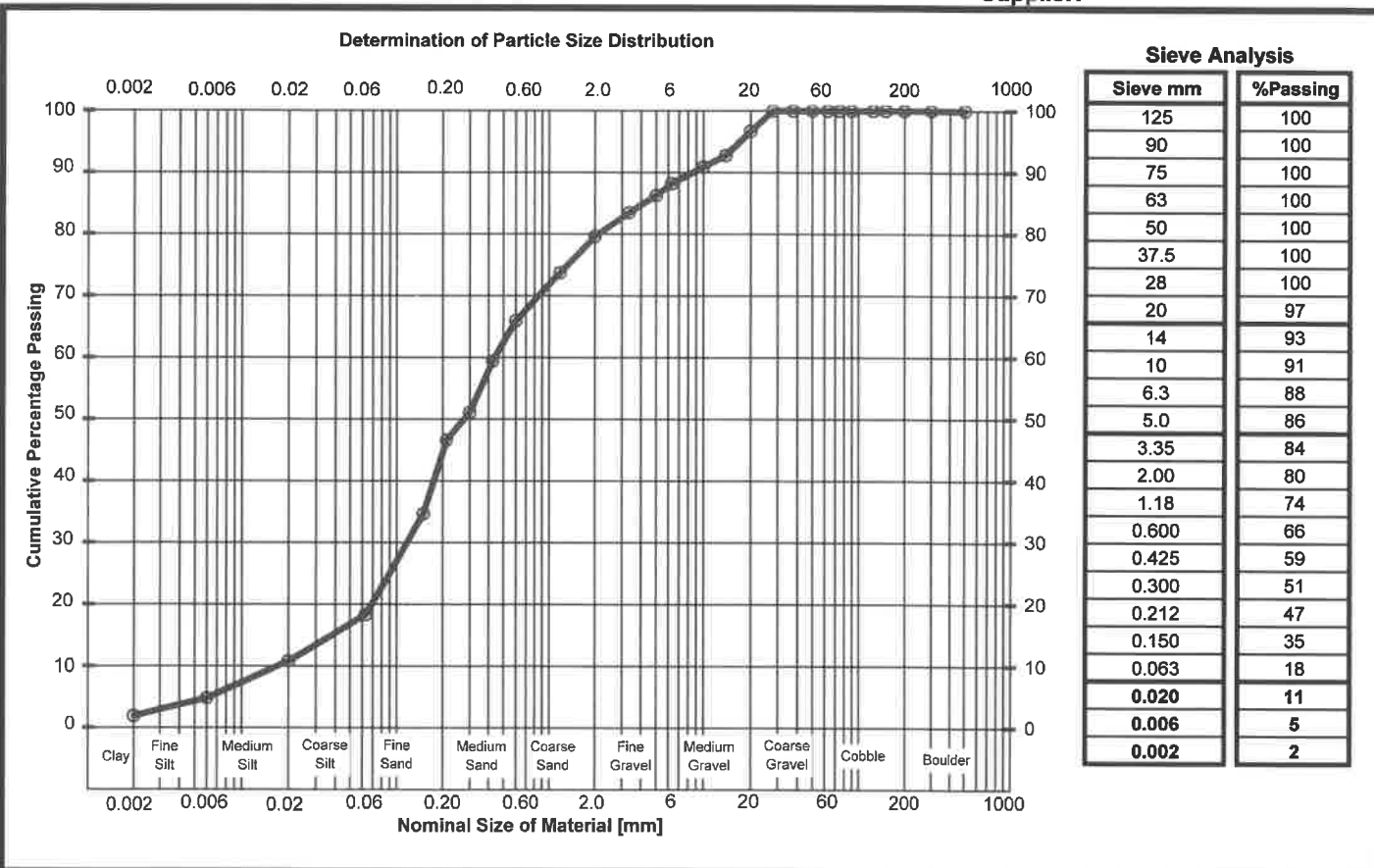
Depth Top: 0.70m

Location: BH1

Depth Base: 1.20m

Source:

Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

for and on behalf of Ground Engineering Ltd

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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

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Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6723-1/1/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

Laboratory Reference: PL6723-1/1
Client Reference: B3

Pre-treatment for organic material: No

Sample Description: Brown dark brown orange-brown clayey silty SAND and GRAVEL. Gravel consists of angular to sub-rounded concrete brick flint mortar pottery and slate.

Material Specification: Not Required

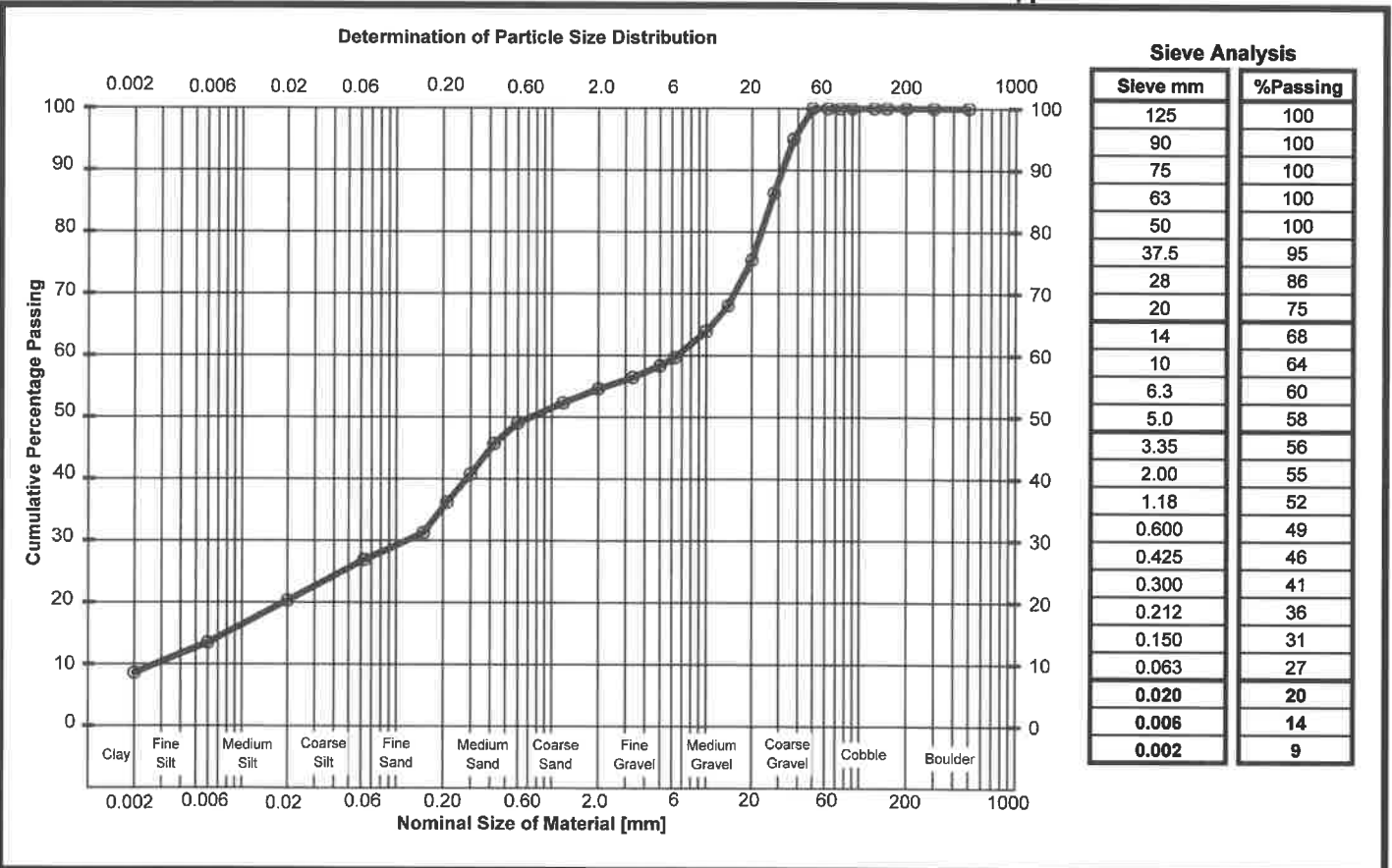
Depth Top: 1.20m

Location: BH1

Depth Base: 1.50m

Source:

Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 11.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 51

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Certificate Number: PL6723-1/2/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

Laboratory Reference: PL6723-1/2
Client Reference: B6

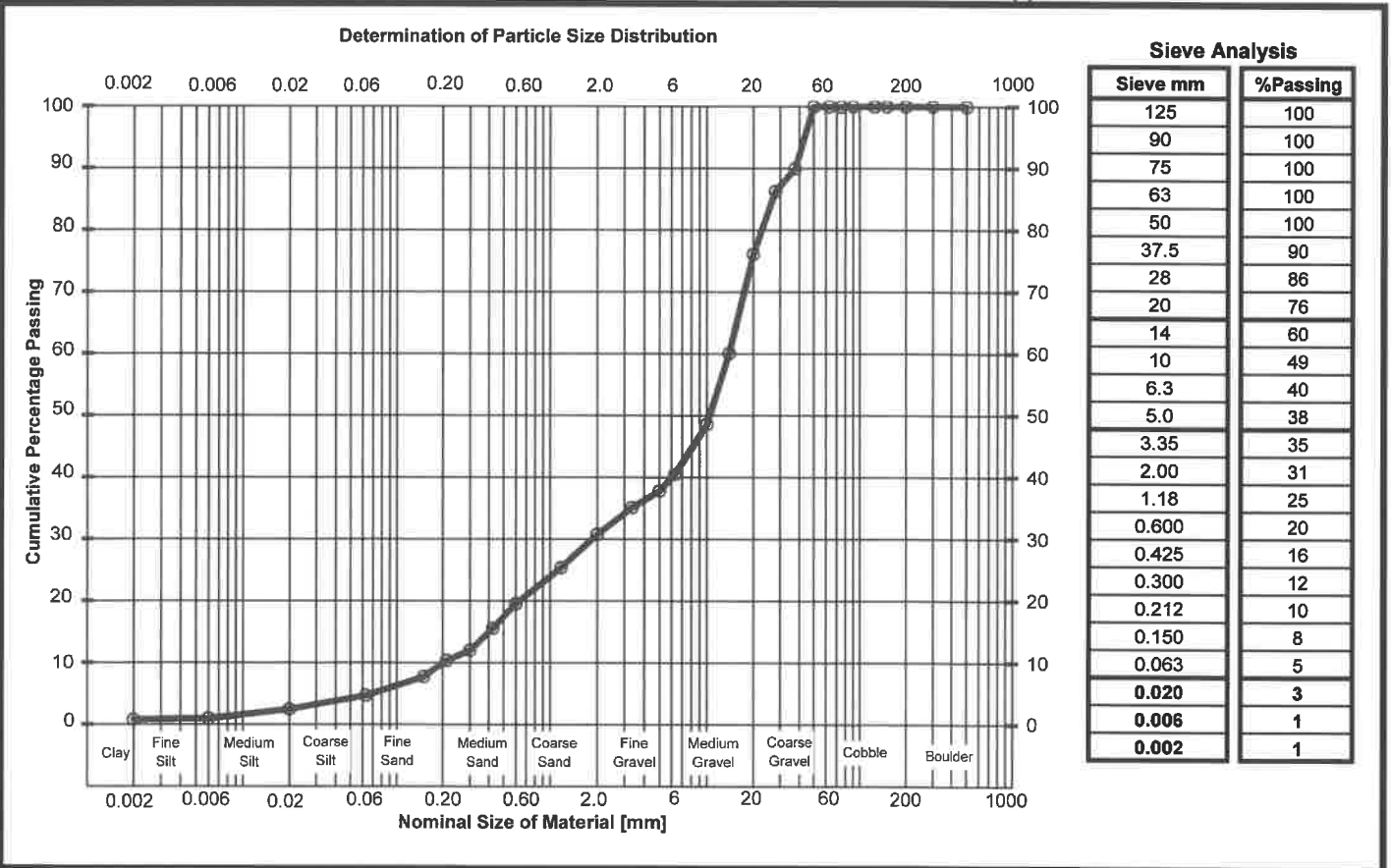
Pre-treatment for organic material: No

Sample Description: Brown silty sandy GRAVEL. Gravel consists of sub-angular to rounded concrete brick flint coke and coal.

Material Specification: Not Required
Location: BH1

Depth Top: 2.70m
Depth Base: 3.20m
Supplier:

Source:



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Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 11.06.2019 Page 1 of 1
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Client Address: Newark Road
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PE1 5UA

Certificate Number: PL6723-1/3/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

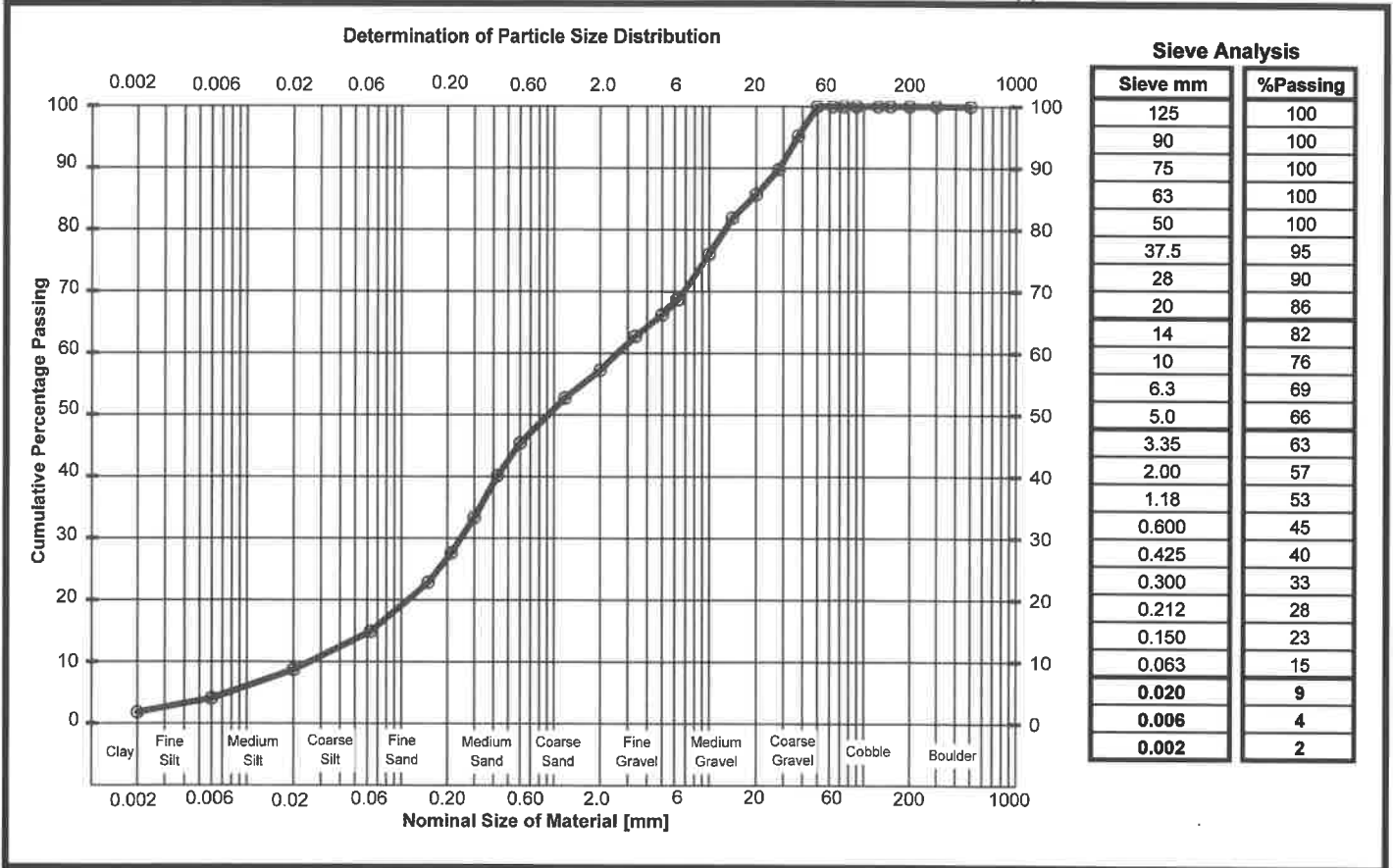
Laboratory Reference: PL6723-1/3
Client Reference: B8

Pre-treatment for organic material: No

Sample Description: Dark brown red-brown slightly clayey silty SAND and GRAVEL. Gravel consists of angular to sub-rounded brick coke flint and shells.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 4.00m
Depth Base: 5.00m
Supplier:



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Approved Signatory: M. Hartnup - Laboratory Manager

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Form Number: GELab/C/709-2 Version 51

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t: 01733 566566
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Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/2/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 18.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

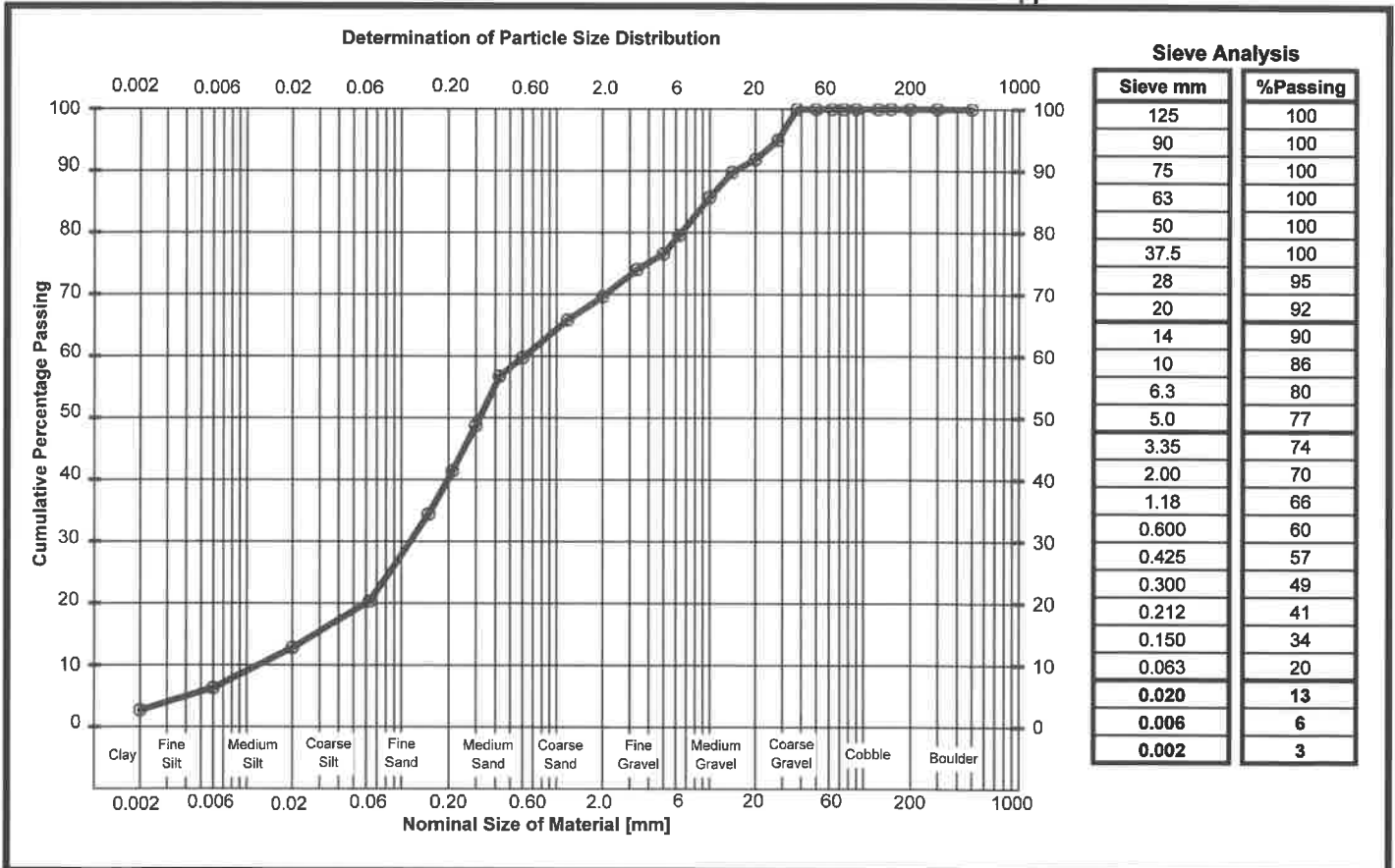
Laboratory Reference: PL6722-1/2
Client Reference: B9

Pre-treatment for organic material: No

Sample Description: Dark brown black slightly clayey silty gravelly SAND. Gravel consists of sub-angular to sub-rounded brick pottery bone ash and shells.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 5.00m
Depth Base: 5.70m
Supplier:



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Approved Signatory: M. Hartnup - Laboratory Manager

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Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

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Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/4/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 20.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

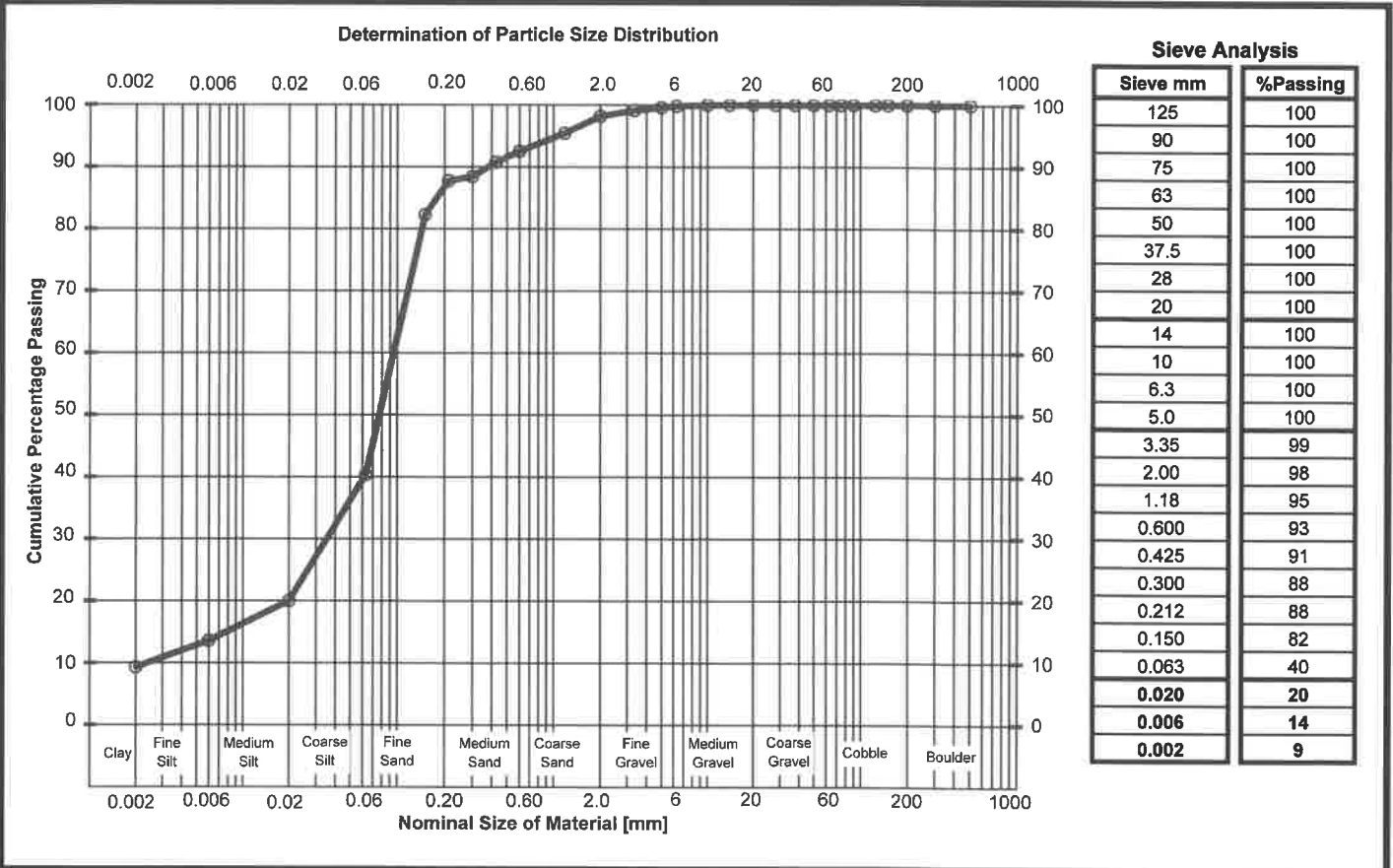
Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS Laboratory Reference: PL6722-1/4 Pre-treatment for organic material: No
Client Reference: B11

Sample Description: Grey black clayey SILT/SAND with shell fragments.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 6.00m
Depth Base: 6.50m
Supplier:



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Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
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TEST CERTIFICATE

Determination of Particle Size Distribution

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Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6723-1/4/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

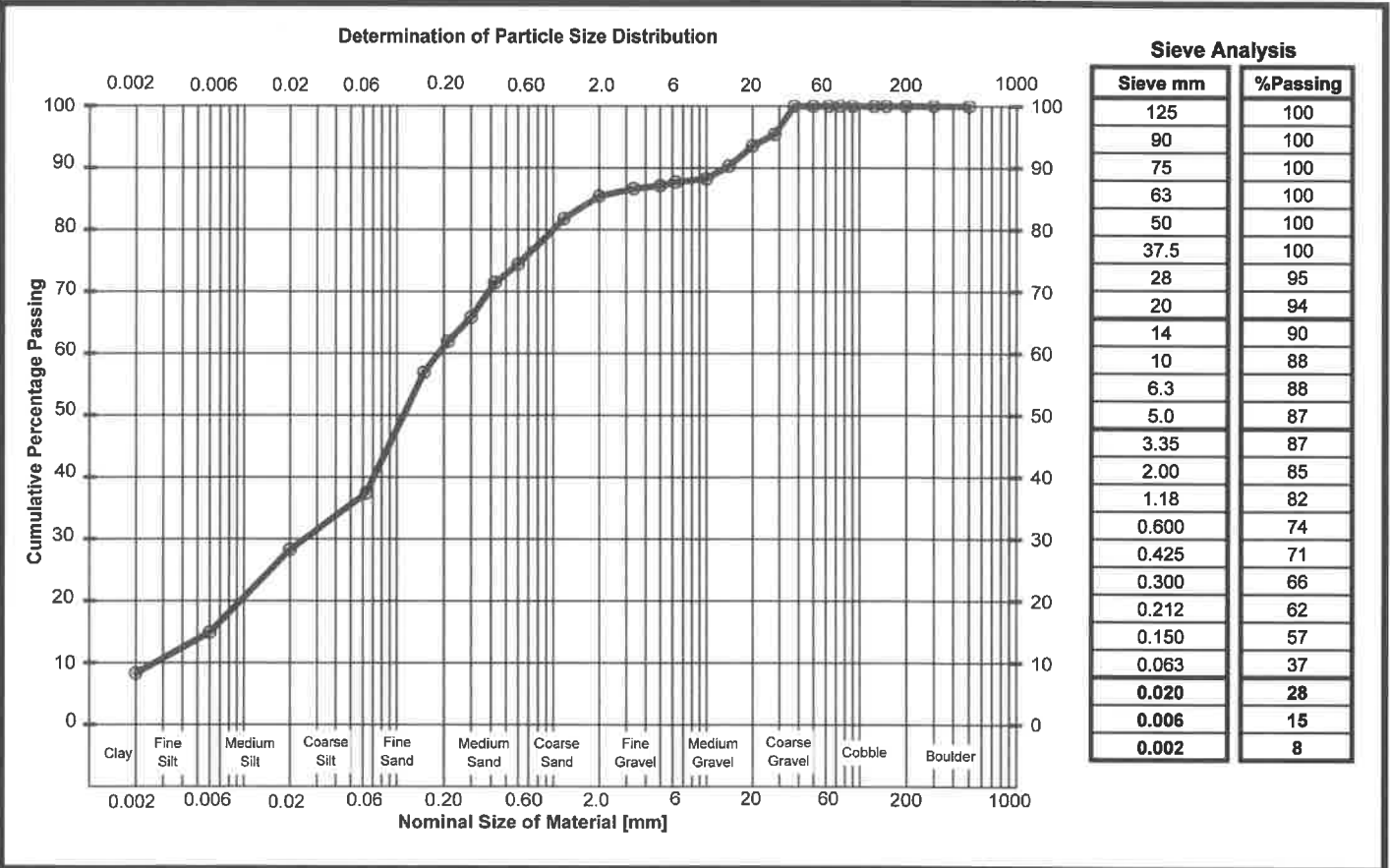
Laboratory Reference: PL6723-1/4
Client Reference: B12

Pre-treatment for organic material: No

Sample Description: Grey dark grey dark brown clayey gravelly SILT/SAND. Gravel consists of sub-angular flint and shells.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 6.50m
Depth Base: 7.00m
Supplier:



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Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 11.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/6/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 18.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

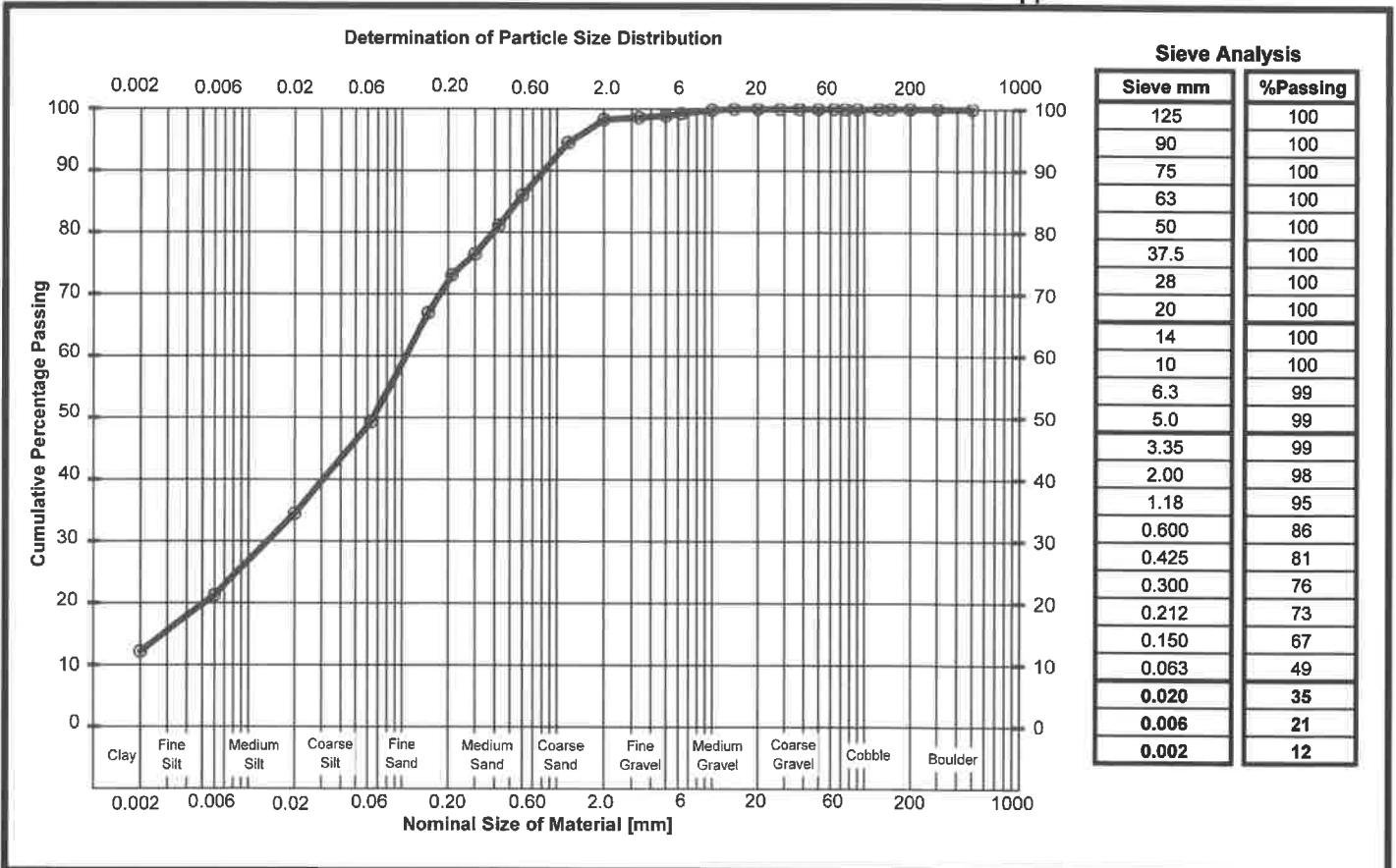
Laboratory Reference: PL6722-1/6
Client Reference: B13

Pre-treatment for organic material: No

Sample Description: Grey brown clayey SILT/SAND with rare fine to medium angular flint.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 7.30m
Depth Base: 7.80m
Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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Newark Road Peterborough
t: 01733 566566
e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/9/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 20.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS Laboratory Reference: PL6722-1/9 Pre-treatment for organic material: No
Client Reference: B15

Sample Description: Saturated slightly clayey silty SAND and GRAVEL with shell fragments. Gravel consists of fine to medium angular to sub-rounded flint.

Material Specification: Not Required

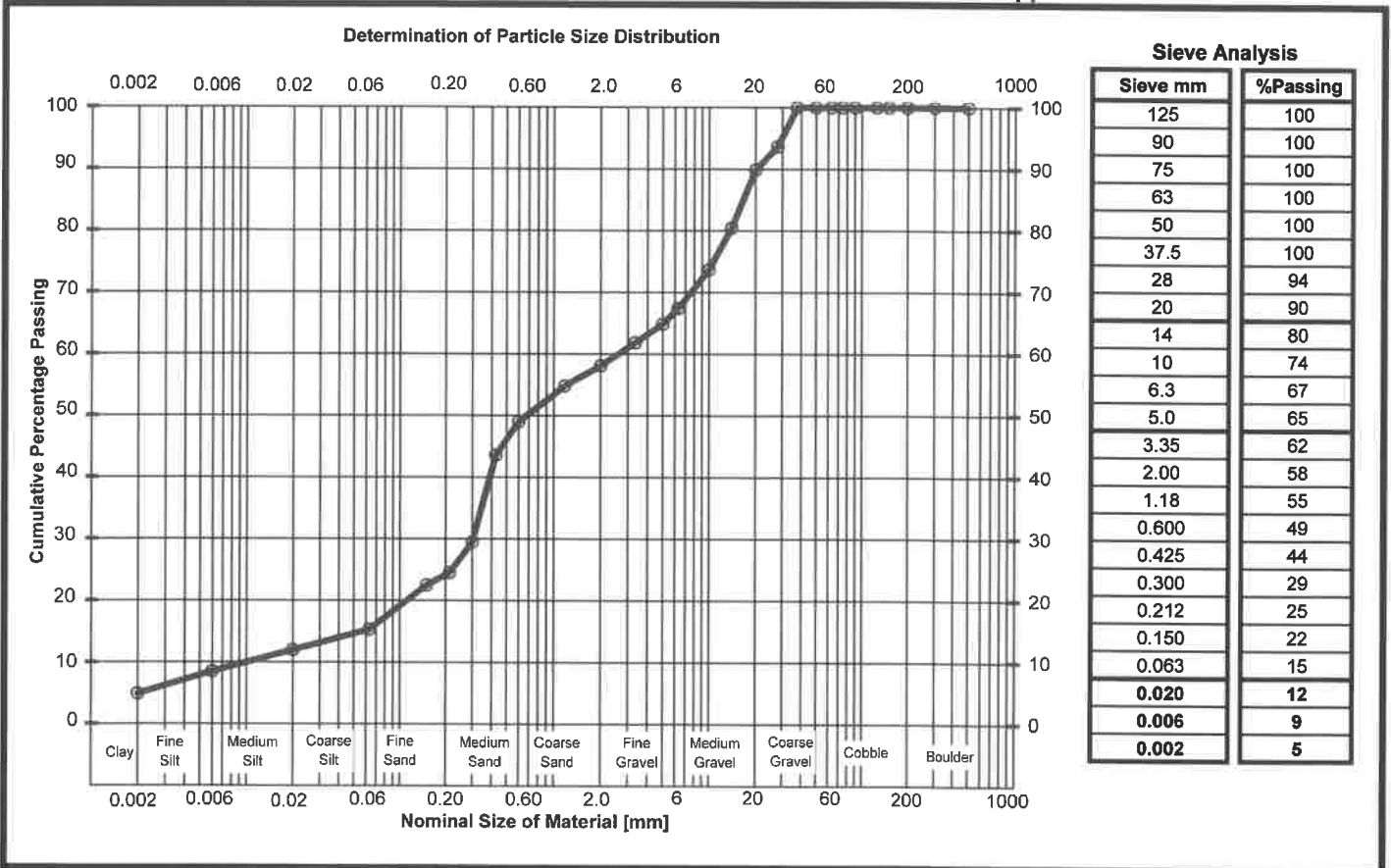
Depth Top: 8.70m

Location: BH1

Depth Base: 9.00m

Source:

Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed: *[Signature]*

for and on behalf of Ground Engineering Ltd

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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t: 01733 566566
e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6723-1/5/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

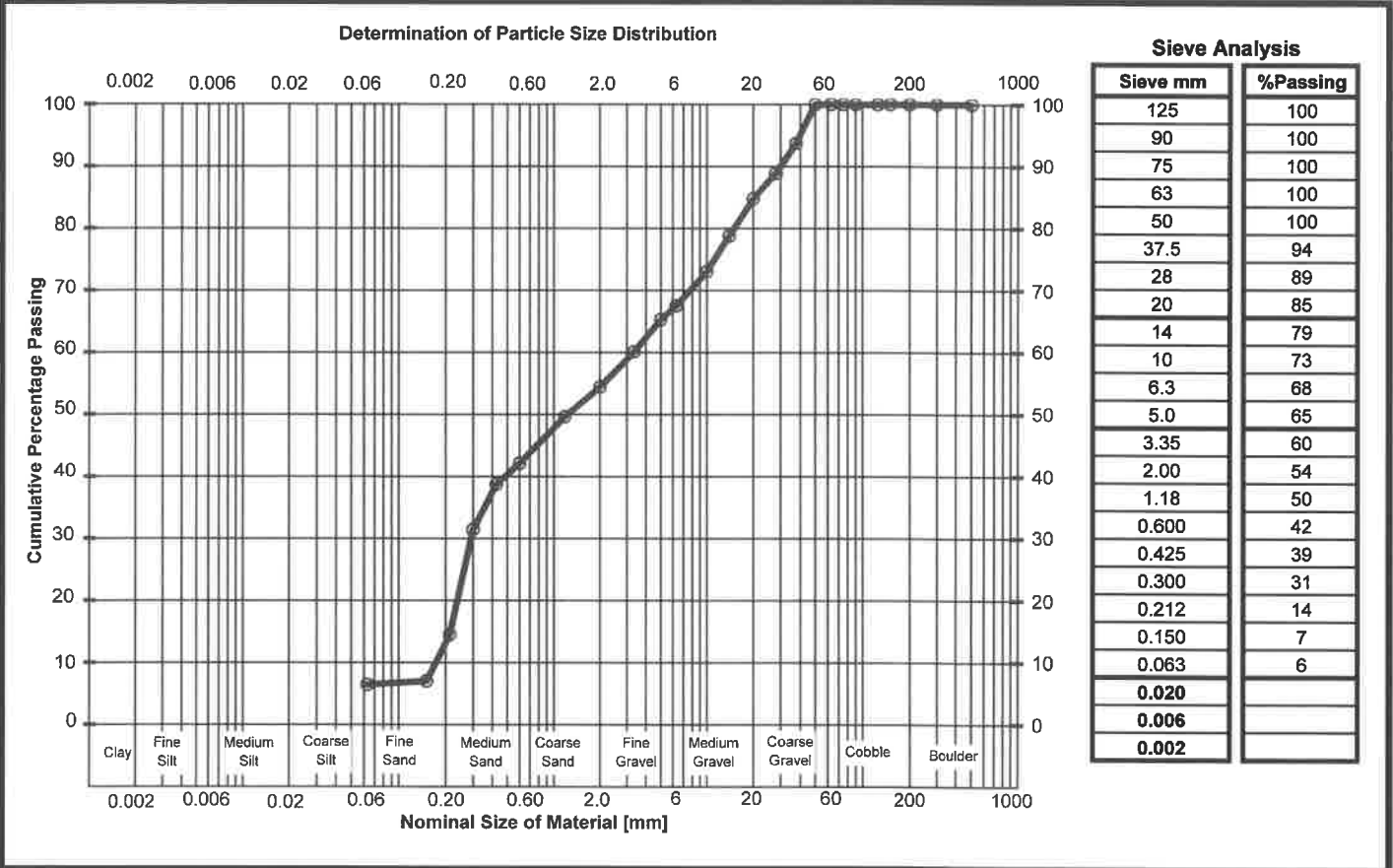
Laboratory Reference: PL6723-1/5
Client Reference: B18

Pre-treatment for organic material: N/A

Sample Description: Brown slightly clayey slightly silty SAND and GRAVEL. Gravel consists of sub-angular to rounded flint and quartzite.

Material Specification: Not Required
Location: BH1
Source:

Depth Top: 11.50m
Depth Base: 11.70m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 11.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 51



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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6723-1/6/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

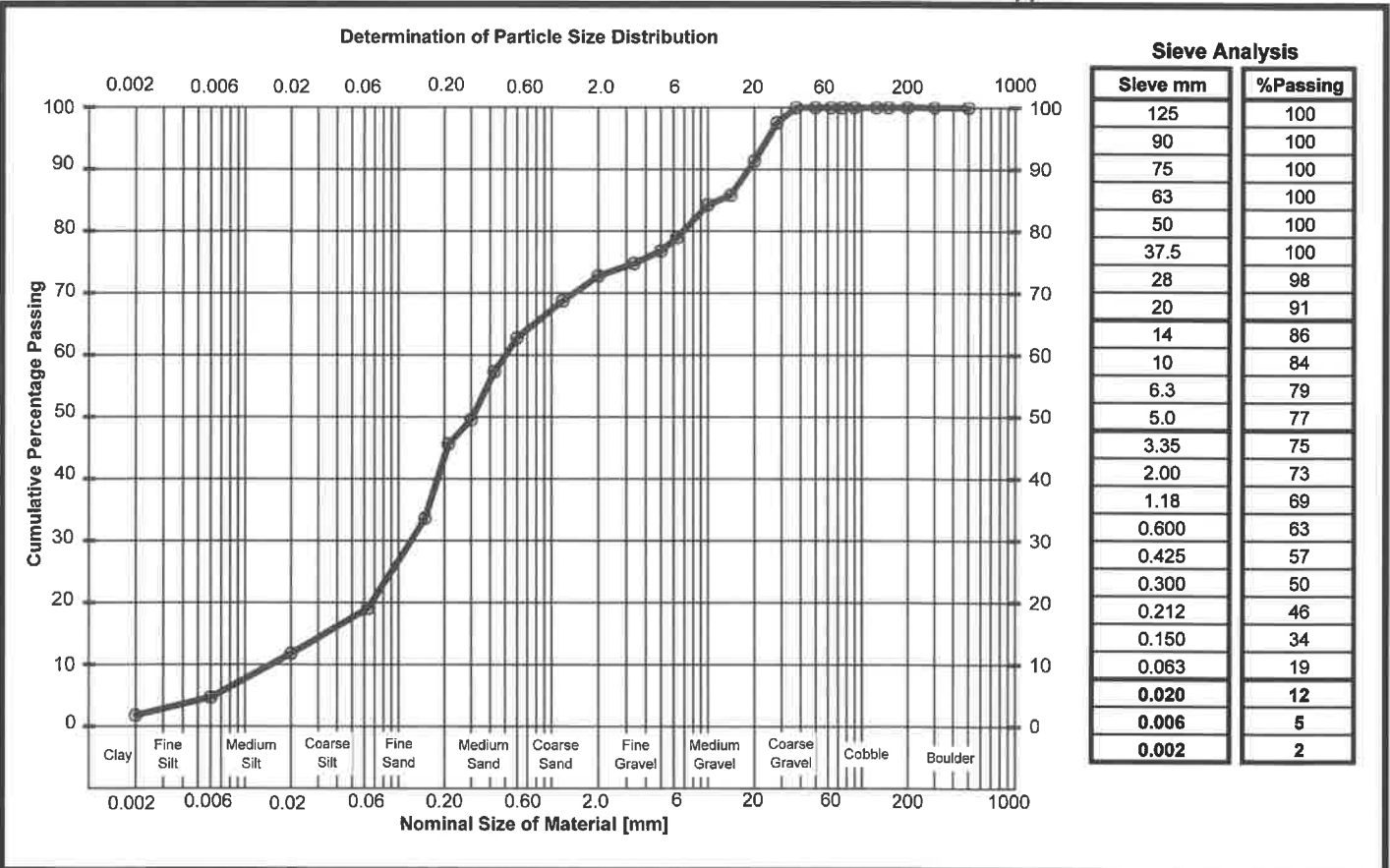
Laboratory Reference: PL6723-1/6
Client Reference: B1

Pre-treatment for organic material: No

Sample Description: Dark brown clayey silty gravelly SAND. Gravel consists of sub-angular to sub-rounded flint brick pottery shells and metal fragments.

Material Specification: Not Required
Location: BH2
Source:

Depth Top: 0.00m
Depth Base: 0.50m
Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 11.06.2019 Page 1 of 1
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Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/23/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 20.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

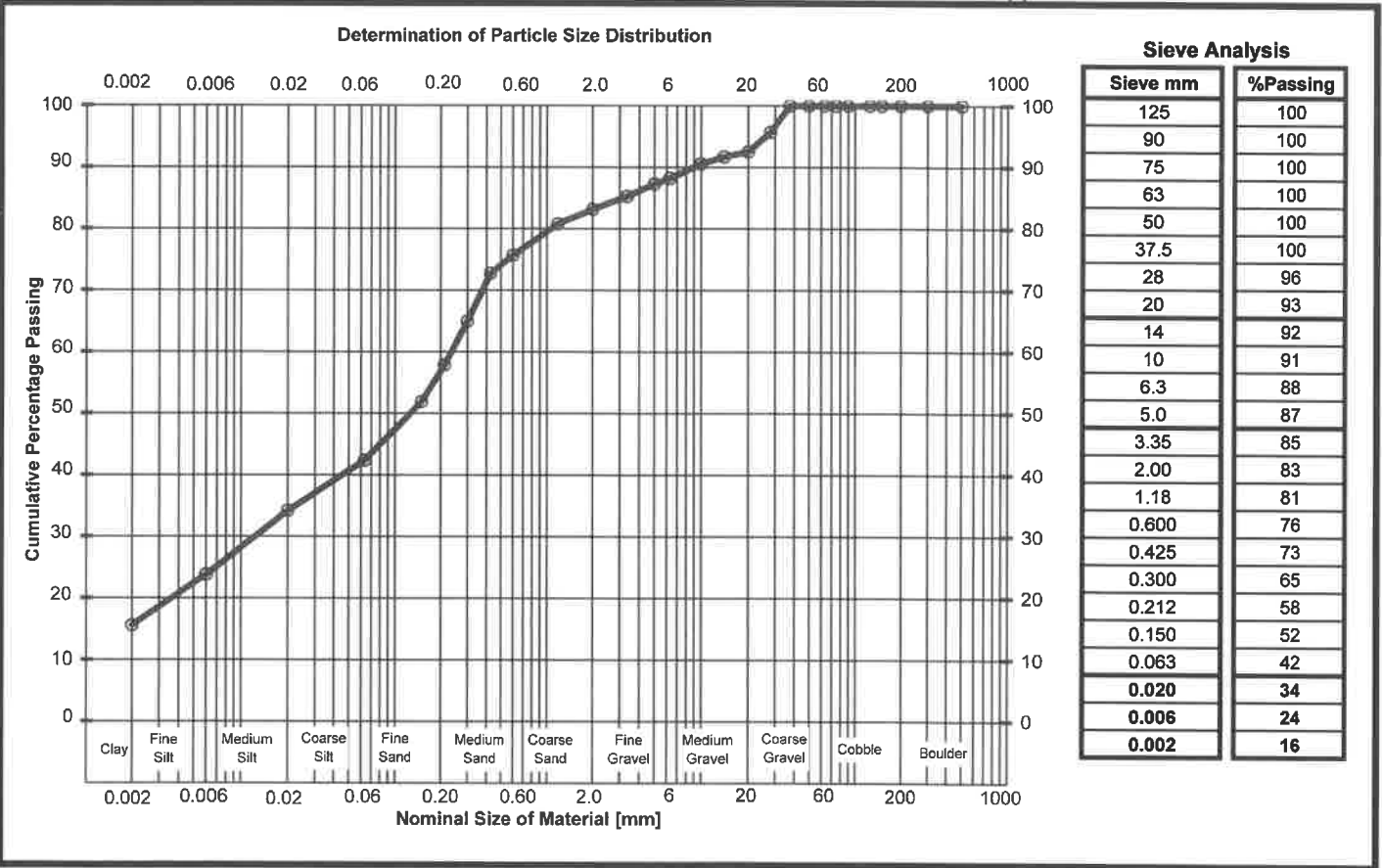
Laboratory Reference: PL6722-1/23
Client Reference: B5

Pre-treatment for organic material: No

Sample Description: Brown slightly gravelly silty SAND with clay lumps. Gravel consists of angular brick chalk and flint.

Material Specification: Not Required
Location: BH2
Source:

Depth Top: 1.50m
Depth Base: 2.00m
Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 26.06.2019 Page 1 of 1
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PE1 5UA

Certificate Number: PL6723-1/7/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

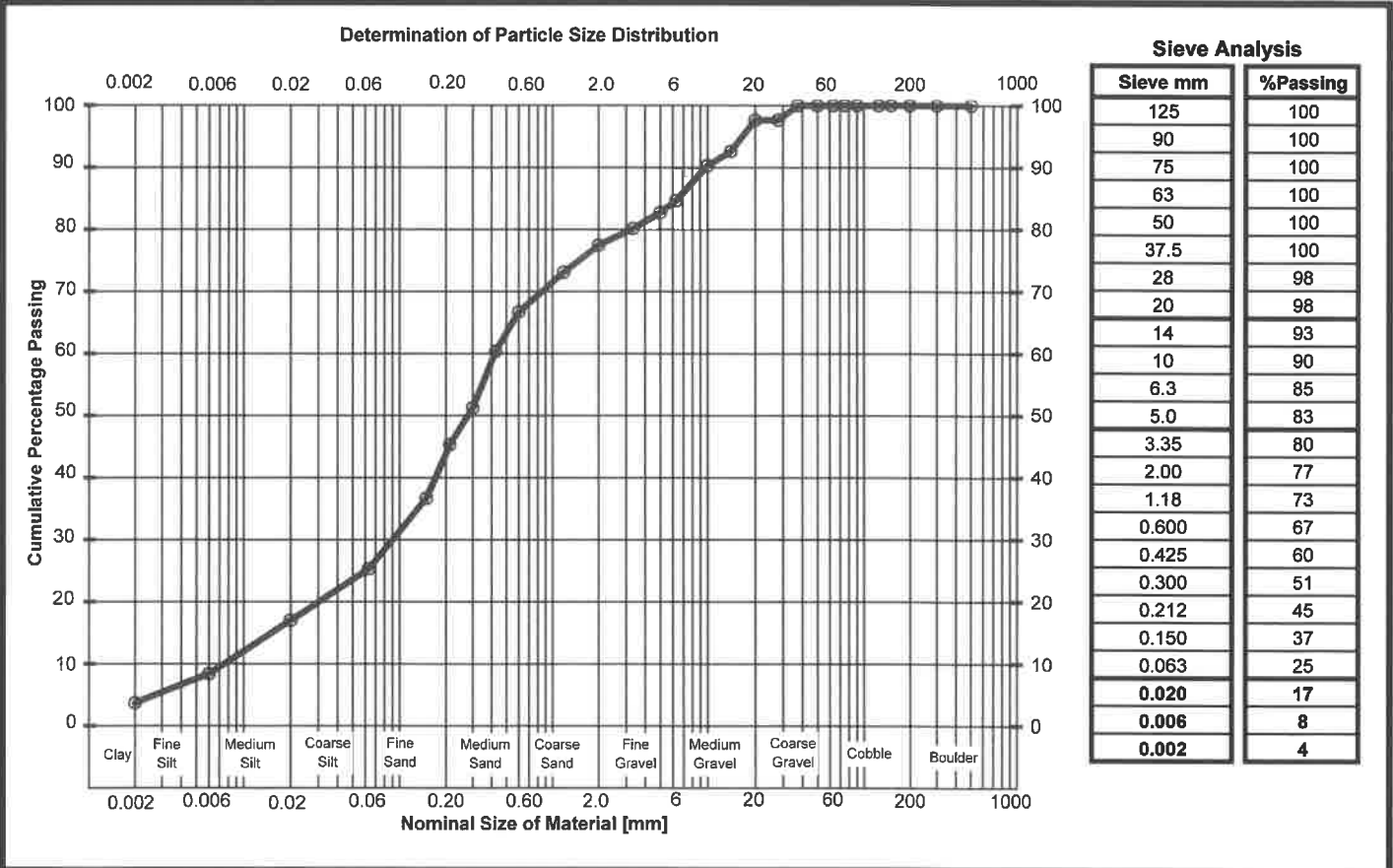
Laboratory Reference: PL6723-1/7
Client Reference: B9

Pre-treatment for organic material: No

Sample Description: Dark brown black slightly clayey gravelly SILT/SAND with abundant soft clay lumps. Gravel consists of sub-angular to sub-rounded brick bone ash flint shells and coke.

Material Specification: Not Required
Location: BH2
Source:

Depth Top: 3.50m
Depth Base: 4.00m
Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 11.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 51

for and on behalf of Ground Engineering Ltd

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Registration Number: 6929574
Reg Office: Ground Engineering Ltd
Newark Rd, Peterborough PE1 5UA



8180

Newark Road Peterborough
t: 01733 566566
e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/24/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 18.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS Laboratory Reference: PL6722-1/24 Pre-treatment for organic material: No
Client Reference: B11

Sample Description: Brown grey silty clayey SAND with rare fine to medium angular brick flint and shells.

Material Specification: Not Required

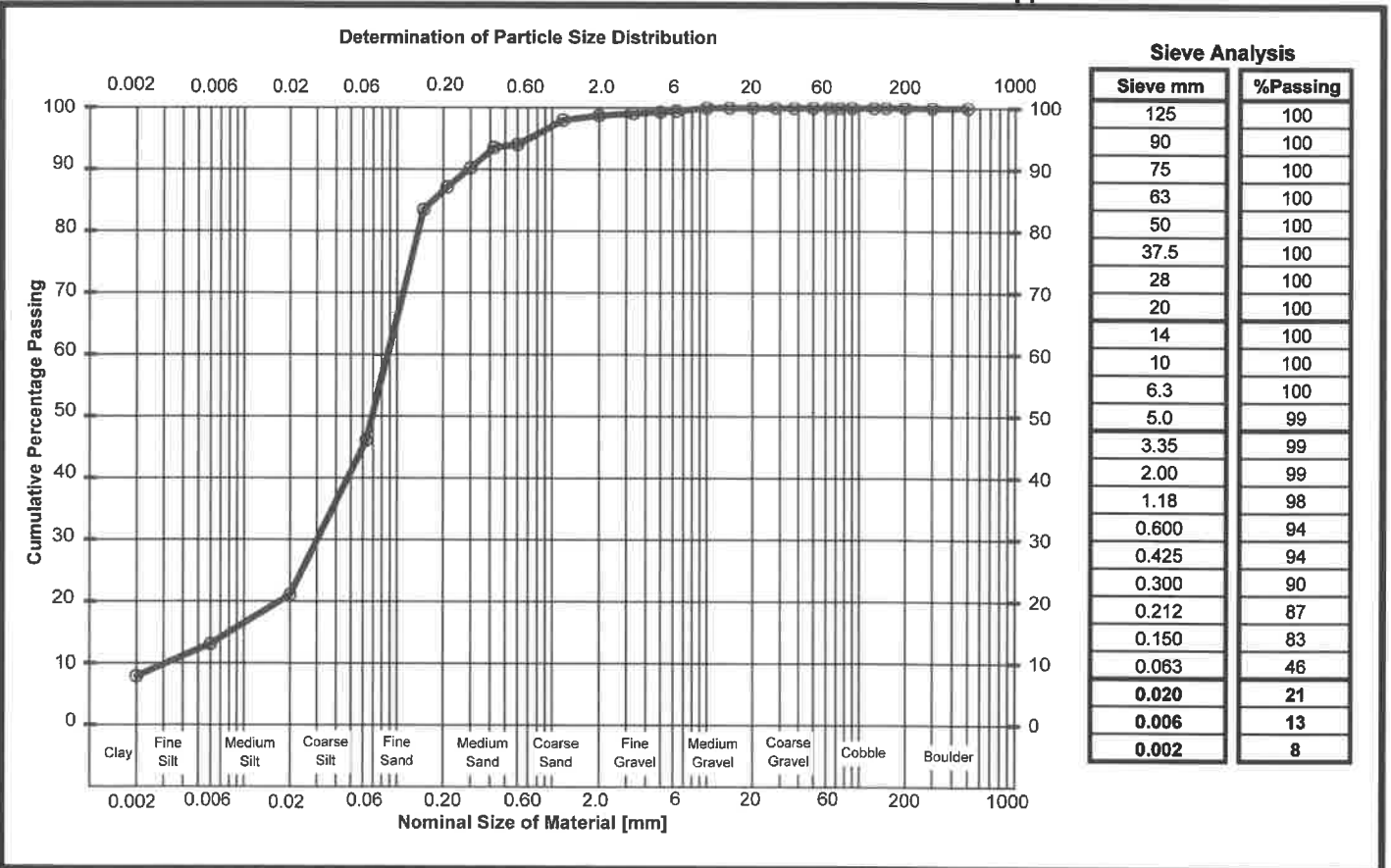
Depth Top: 4.30m

Location: BH2

Depth Base: 5.00m

Source:

Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6723-1/8/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

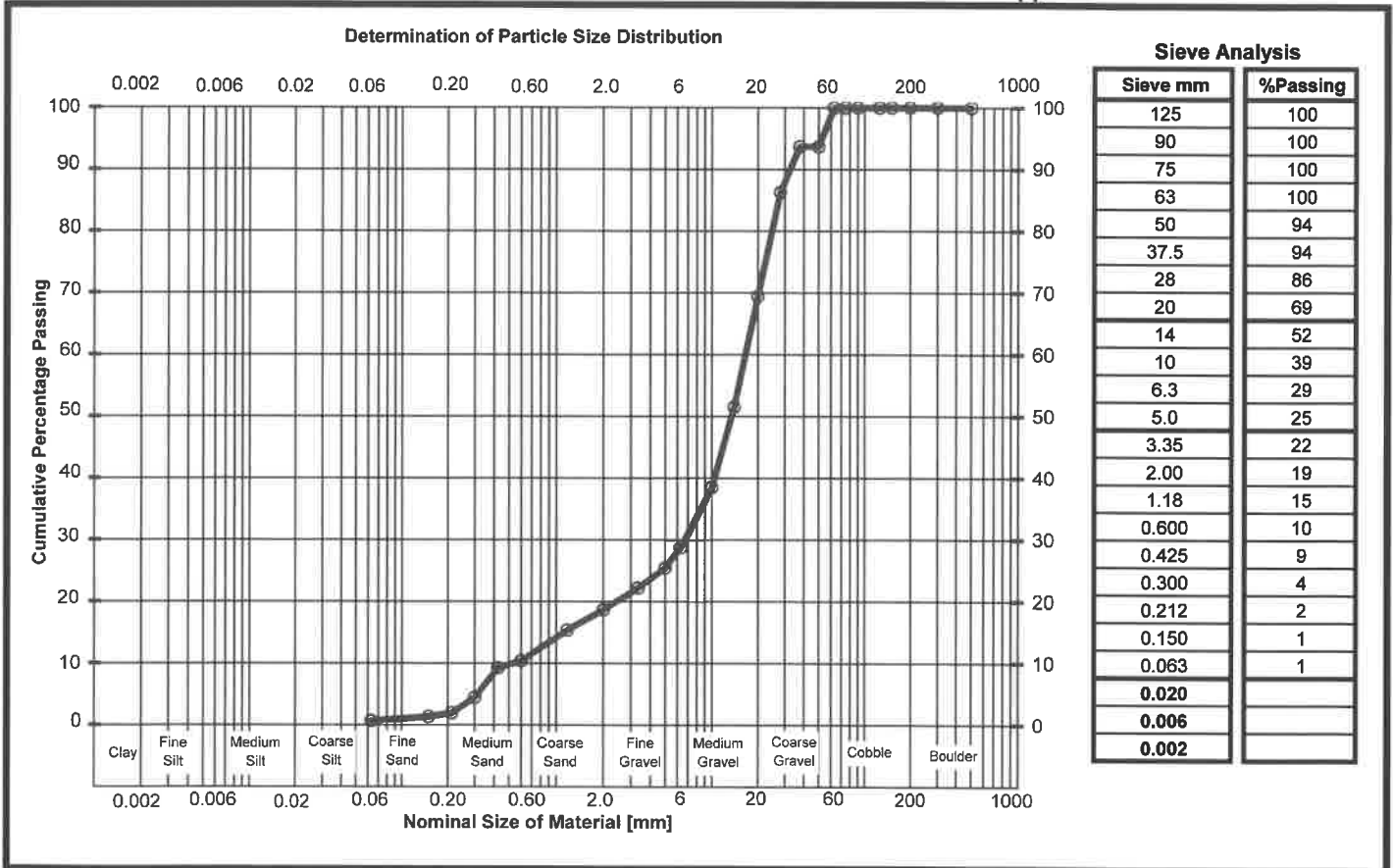
Laboratory Reference: PL6723-1/8
Client Reference: B16

Pre-treatment for organic material: N/A

Sample Description: Brown slightly silty very sandy GRAVEL. Gravel consists of sub-angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH2
Source:

Depth Top: 8.20m
Depth Base: 8.70m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 11.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 51

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6723-1/9/710-2
Client Reference: C14757
Lab Job Number: PL6723-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 06.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

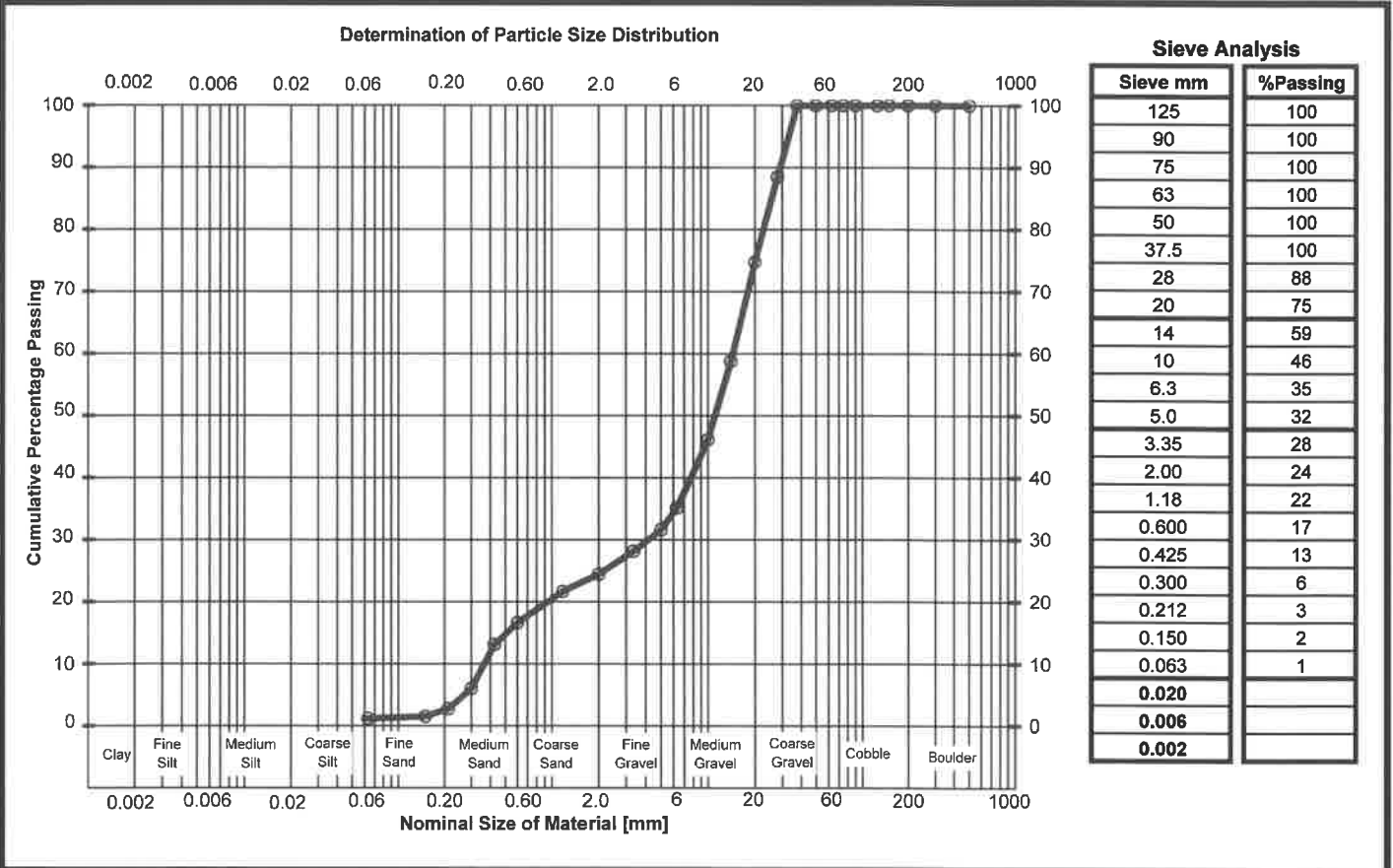
Laboratory Reference: PL6723-1/9
Client Reference: B17

Pre-treatment for organic material: N/A

Sample Description: Brown slightly silty very sandy GRAVEL. Gravel consists of sub-angular to rounded flint quartzite and chalk.

Material Specification: Not Required
Location: BH2
Source:

Depth Top: 9.00m
Depth Base: 9.50m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 11.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 51

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/29/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 19.06.2019

Contact: Steve Fleming
Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

TEST RESULTS

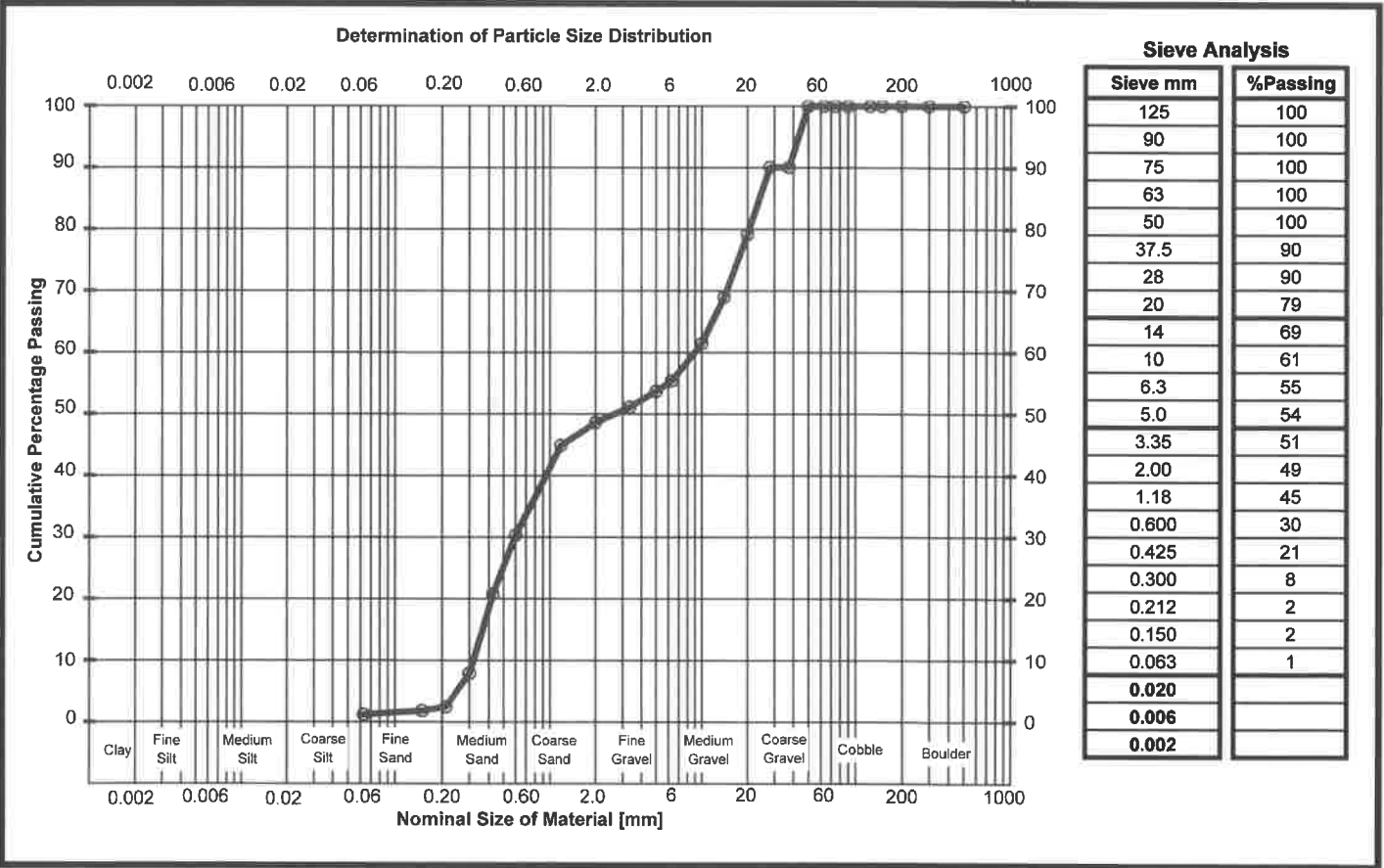
Laboratory Reference: PL6722-1/29
Client Reference: B18

Pre-treatment for organic material: N/A

Sample Description: Brown slightly silty SAND and GRAVEL. Gravel consists of sub-angular to rounded flint and quartzite.

Material Specification: Not Required
Location: BH2
Source:

Depth Top: 10.20m
Depth Base: 10.50m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/51/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 18.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

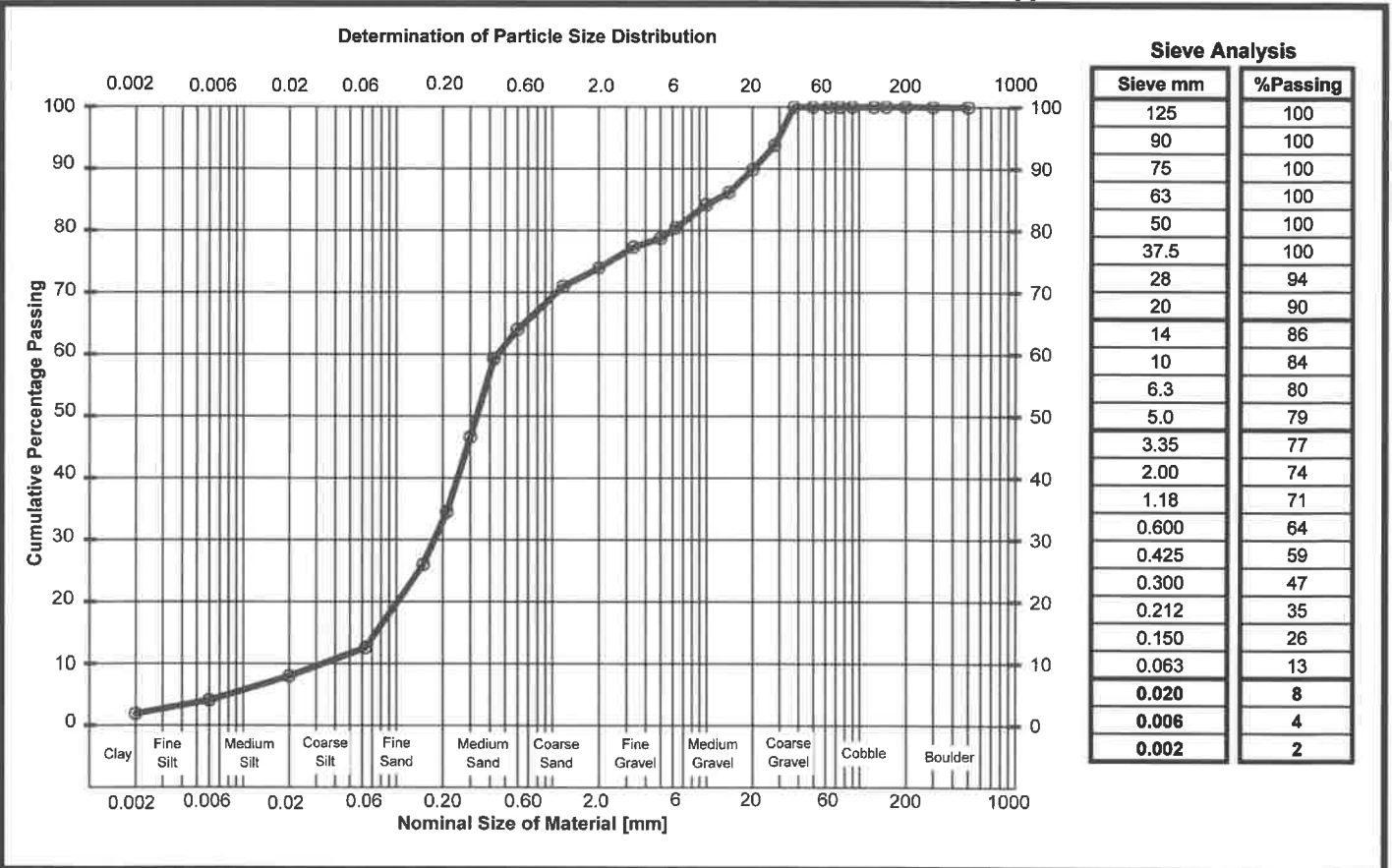
Laboratory Reference: PL6722-1/51
Client Reference: B2

Pre-treatment for organic material: No

Sample Description: Brown slightly silty gravelly SAND. Gravel consists of fine to medium angular to sub-rounded brick mortar and flint.

Material Specification: Not Required
Location: BH3
Source:

Depth Top: 0.40m
Depth Base: 0.80m
Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 26.06.2019 Page 1 of 1
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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/53/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 19.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

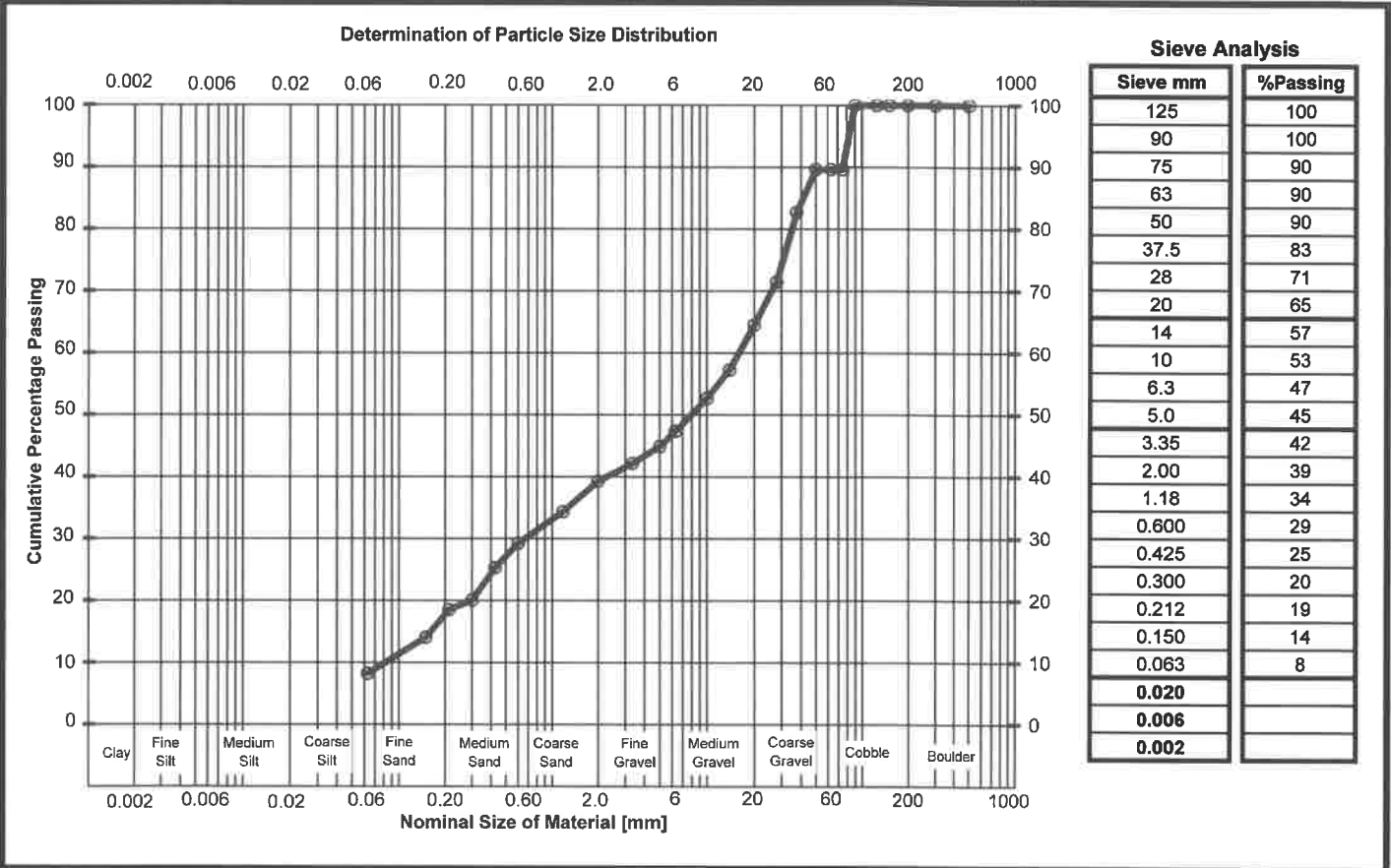
Laboratory Reference: PL6722-1/53
Client Reference: B6

Pre-treatment for organic material: N/A

Sample Description: Brown silty gravelly SAND. Gravel consists of fine to medium angular to rounded brick mortar and flint.

Material Specification: Not Required
Location: BH4
Source:

Depth Top: 2.00m
Depth Base: 2.50m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/54/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 11.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

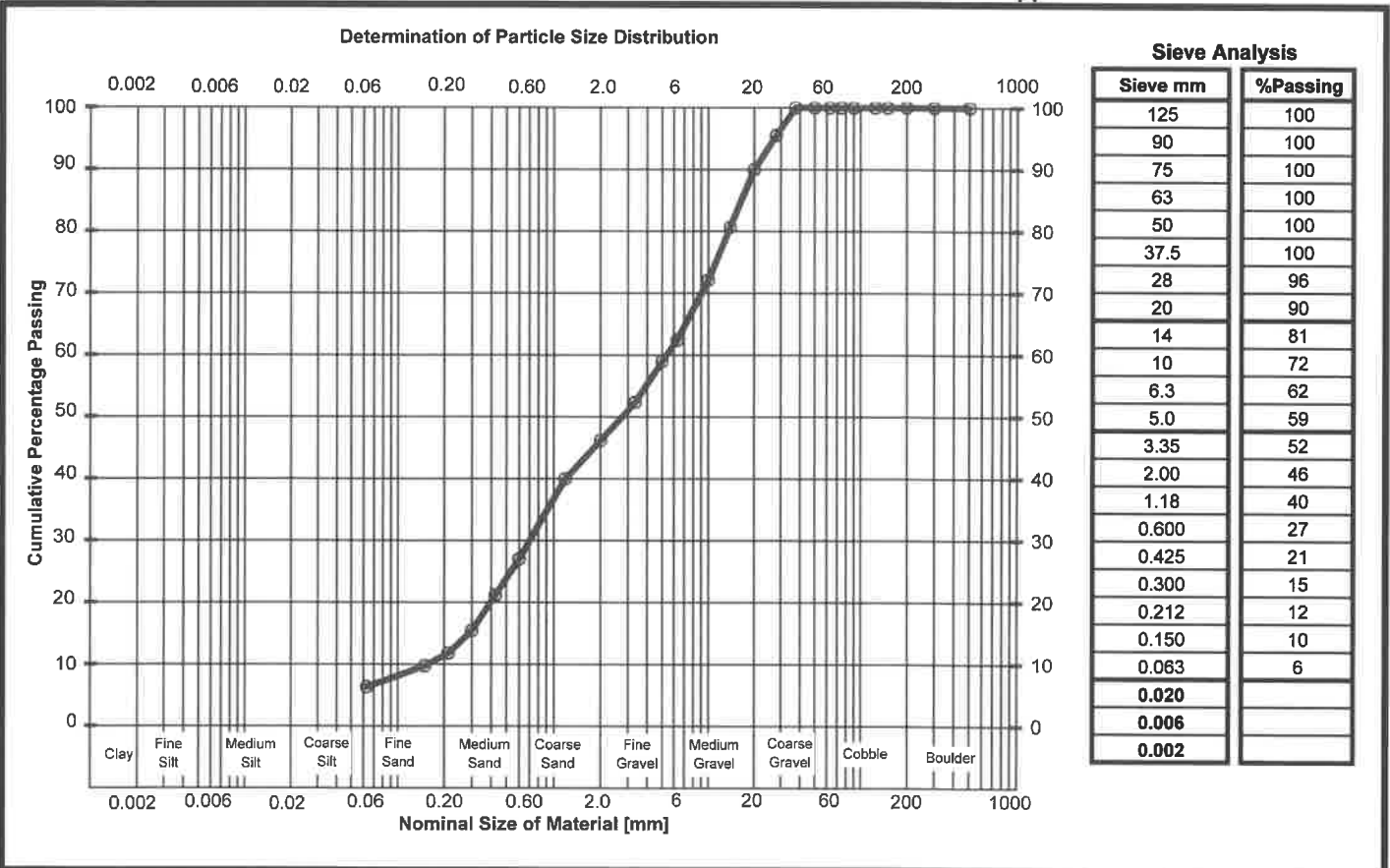
Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS Laboratory Reference: PL6722-1/54 Pre-treatment for organic material: N/A
Client Reference: B9

Sample Description: Brown slightly clayey SAND and GRAVEL with sandy clay lumps. Gravel consists of fine to medium angular to rounded flint and brick.

Material Specification: Not Required
Location: BH4
Source:

Depth Top: 4.00m
Depth Base: 4.50m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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e: admin@groundengineering.co.uk

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Determination of Particle Size Distribution

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Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/56/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 11.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

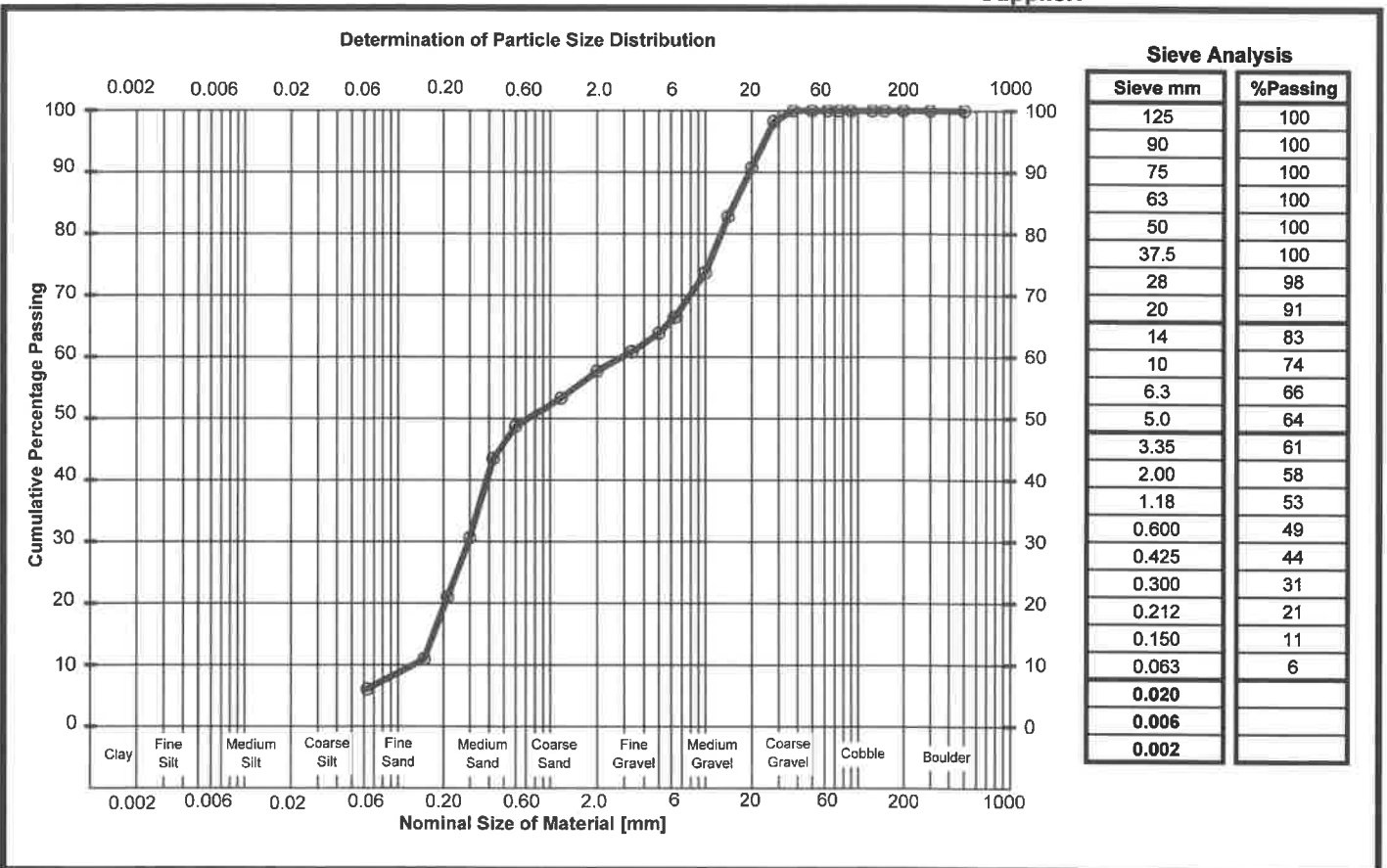
Laboratory Reference: PL6722-1/56
Client Reference: B12

Pre-treatment for organic material: N/A

Sample Description: Brown gravelly SAND. Gravel consists of fine to medium angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH4

Depth Top: 5.70m
Depth Base: 6.20m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

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Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/57/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 19.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

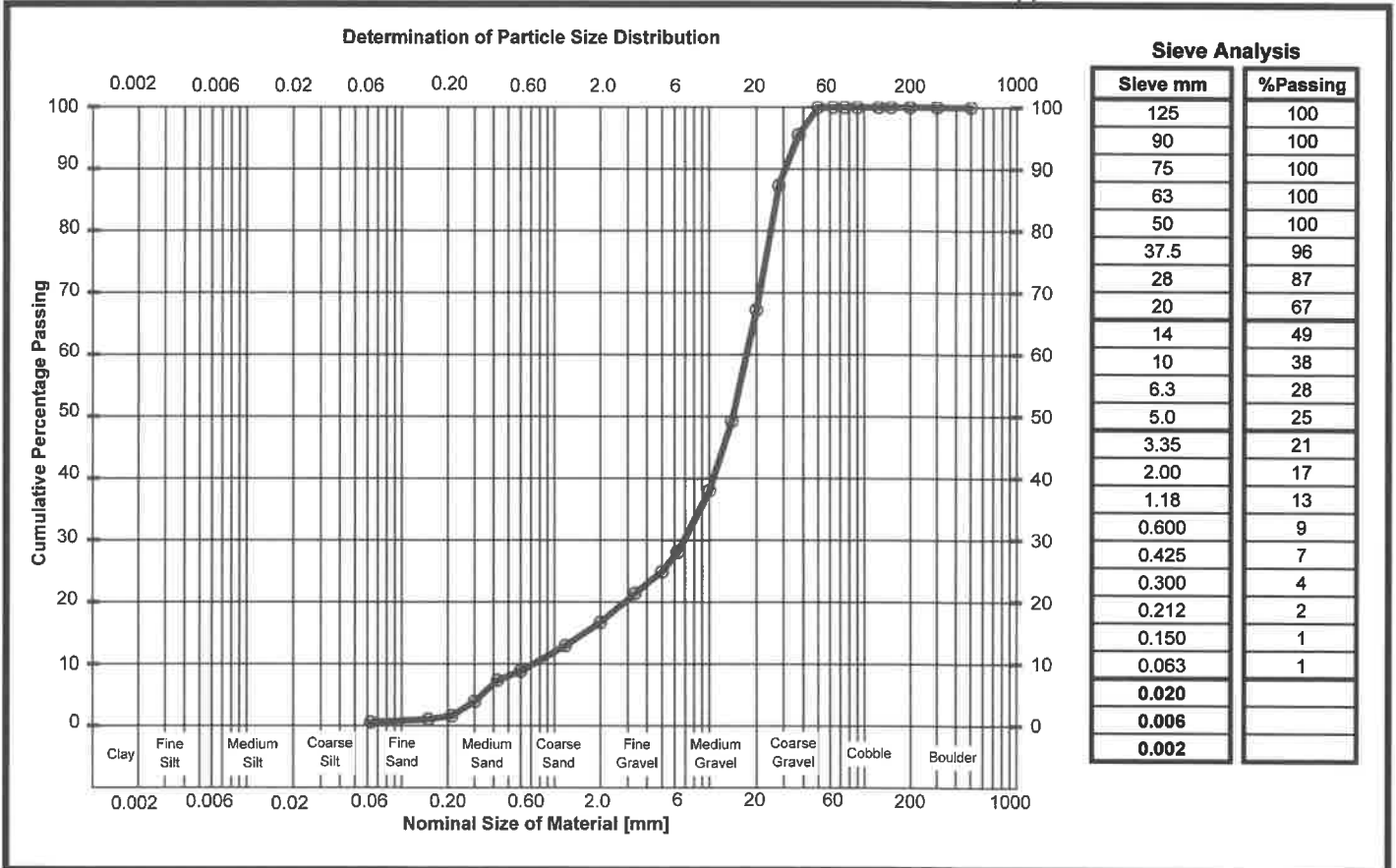
Laboratory Reference: PL6722-1/57
Client Reference: B13

Pre-treatment for organic material: N/A

Sample Description: Brown sandy GRAVEL. Gravel consists of angular to sub-rounded flint.

Material Specification: Not Required
Location: BH4
Source:

Depth Top: 7.00m
Depth Base: 7.50m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2 & 9.4
Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/86/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 11.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

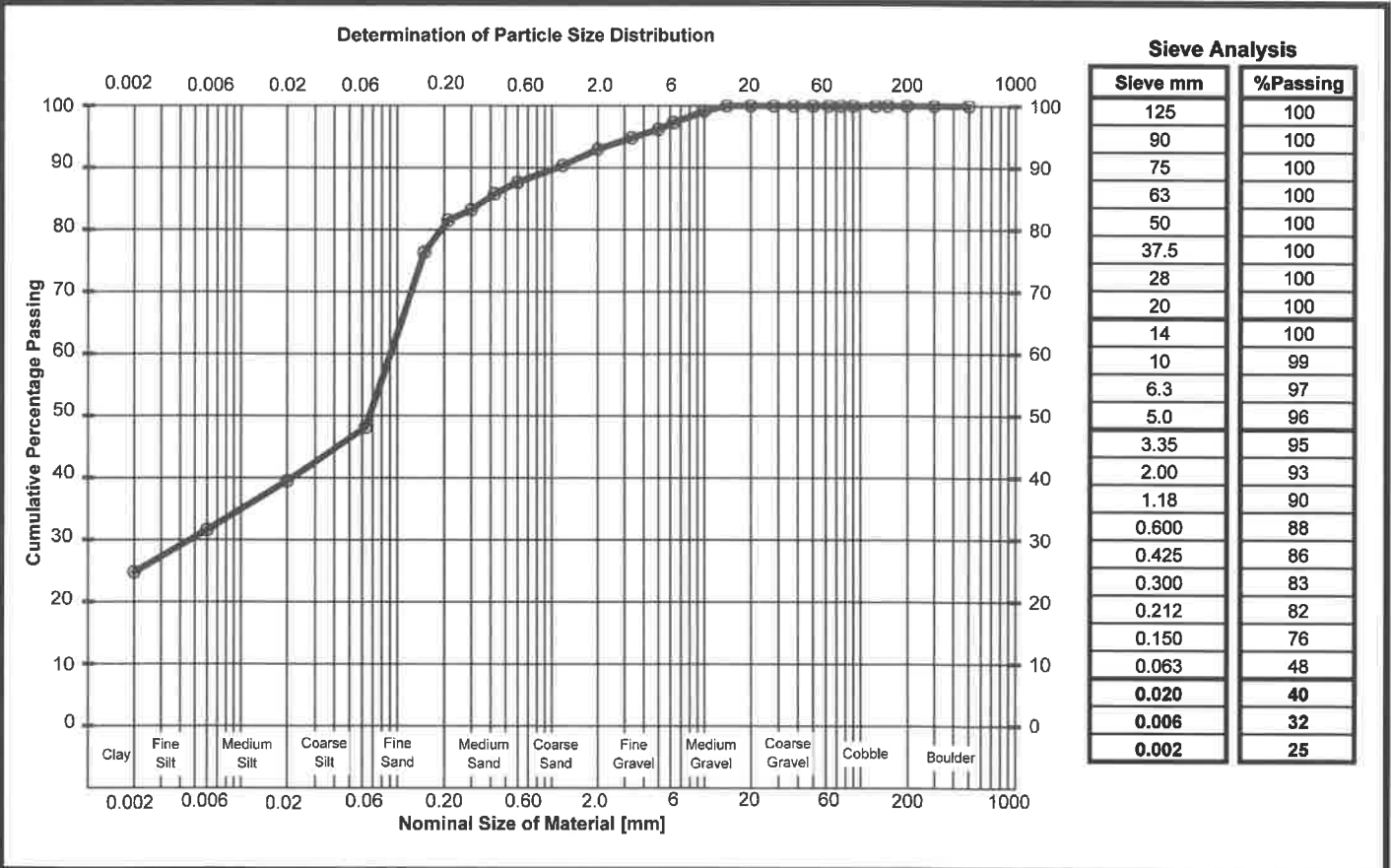
Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS Laboratory Reference: PL6722-1/86 Pre-treatment for organic material: No
Client Reference: B34

Sample Description: Saturated soft grey slightly gravelly sandy SILT/CLAY.

Material Specification: Not Required
Location: BH4
Source:

Depth Top: 42.60m
Depth Base: 42.70m
Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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Determination of Particle Size Distribution

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Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/90/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 11.06.2019

Contact: Steve Fleming

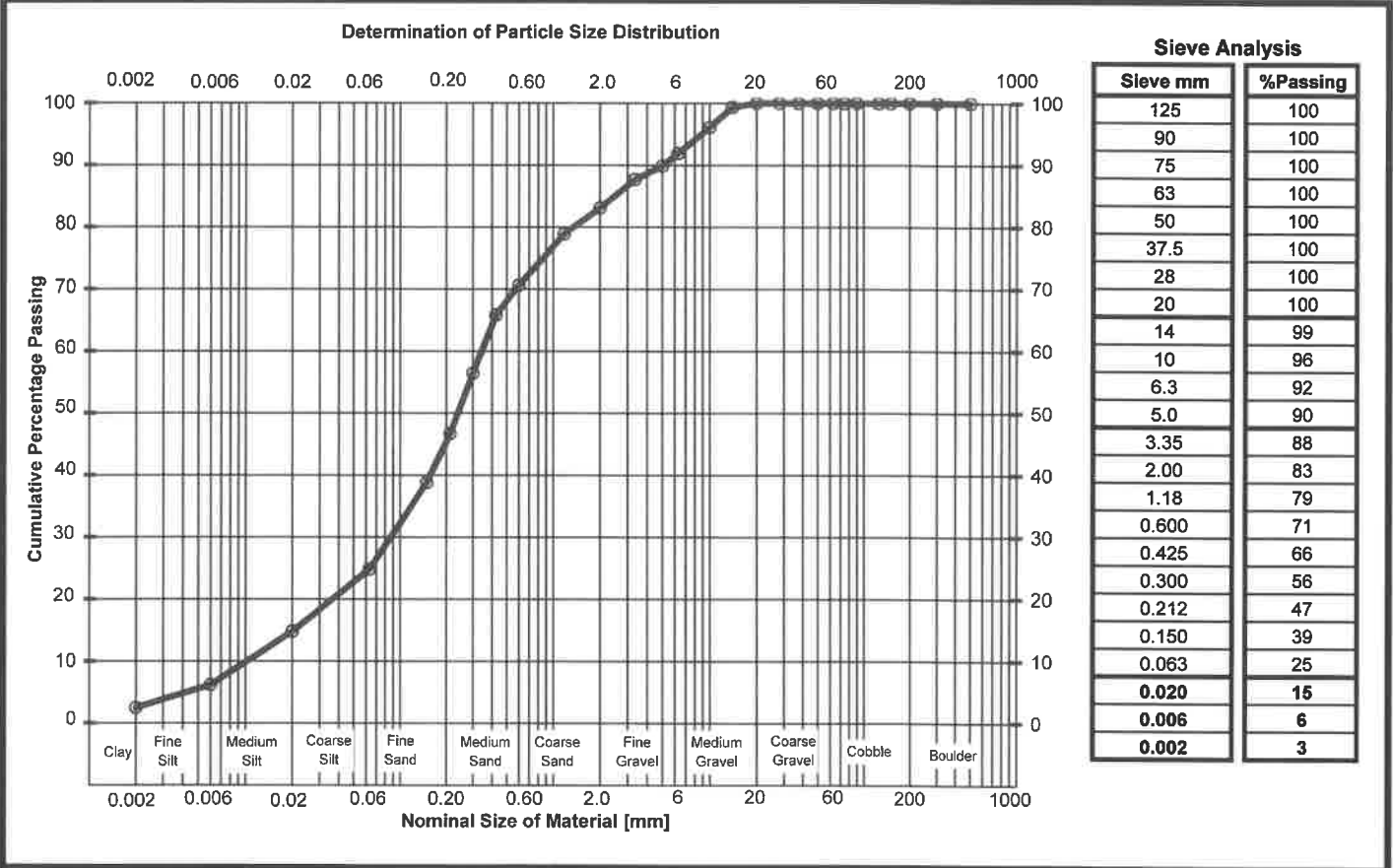
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS Laboratory Reference: PL6722-1/90 Pre-treatment for organic material: No
Client Reference: B8

Sample Description: Brown slightly gravelly silty clayey SAND. Gravel consists of fine to medium angular shell fragments brick limestone and flint.

Material Specification: Not Required Depth Top: 3.00m
Location: BH5 Depth Base: 4.00m
Source: Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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Sieved Grading and Sedimentation by Pipette

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/91/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 18.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

Laboratory Reference: PL6722-1/91
Client Reference: B12

Pre-treatment for organic material: No

Sample Description: Grey black slightly clayey slightly gravelly SILT/SAND. Gravel consists of fine to medium angular to sub-rounded shell fragments brick and quartzite.

Material Specification: Not Required

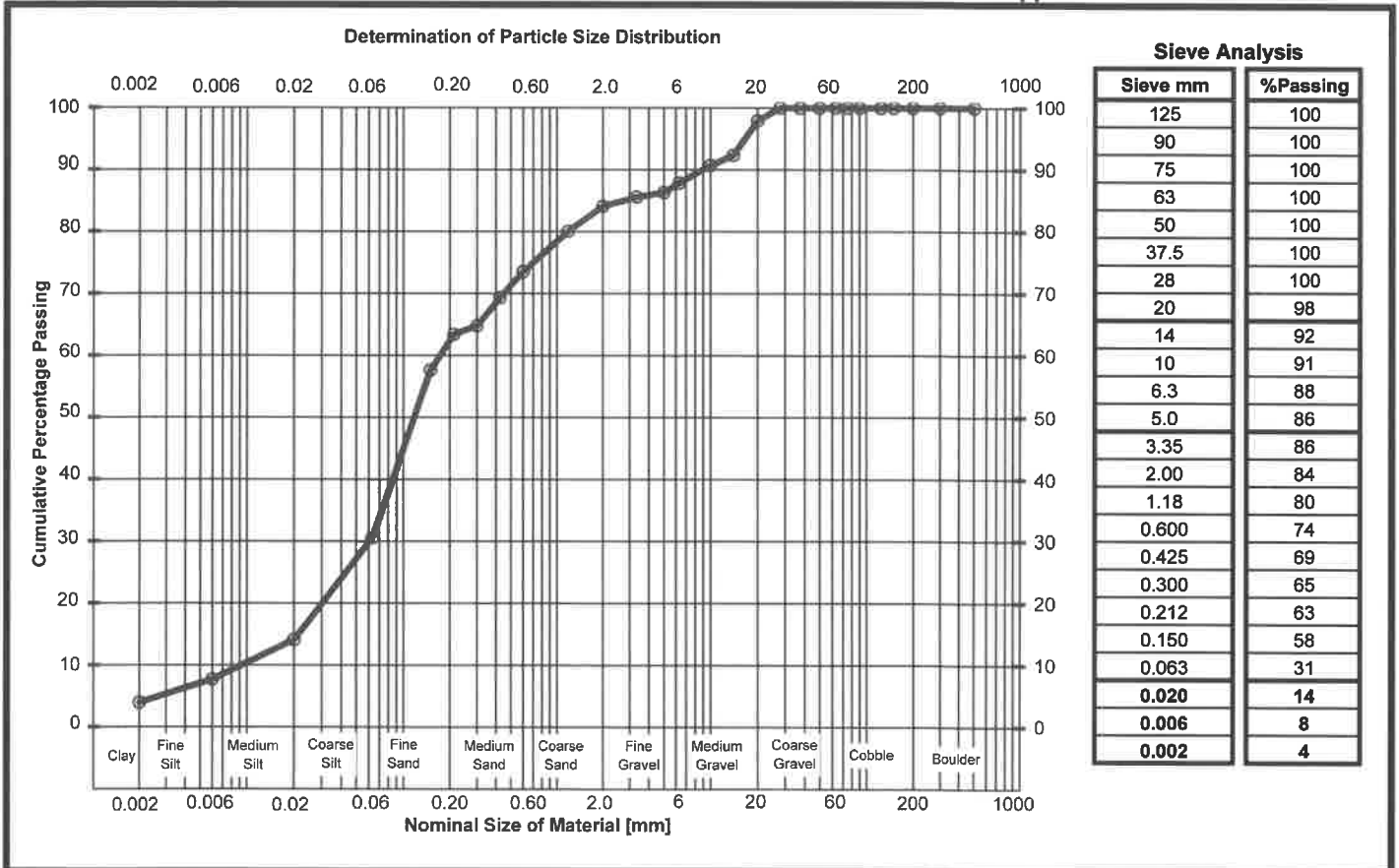
Depth Top: 5.00m

Location: BH5

Depth Base: 5.50m

Source:

Supplier:



Comments: Data relevant to material below 63 microns is outside the current scope of UKAS accreditation

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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TEST CERTIFICATE

Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/94/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 19.06.2019
Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Contact: Steve Fleming

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

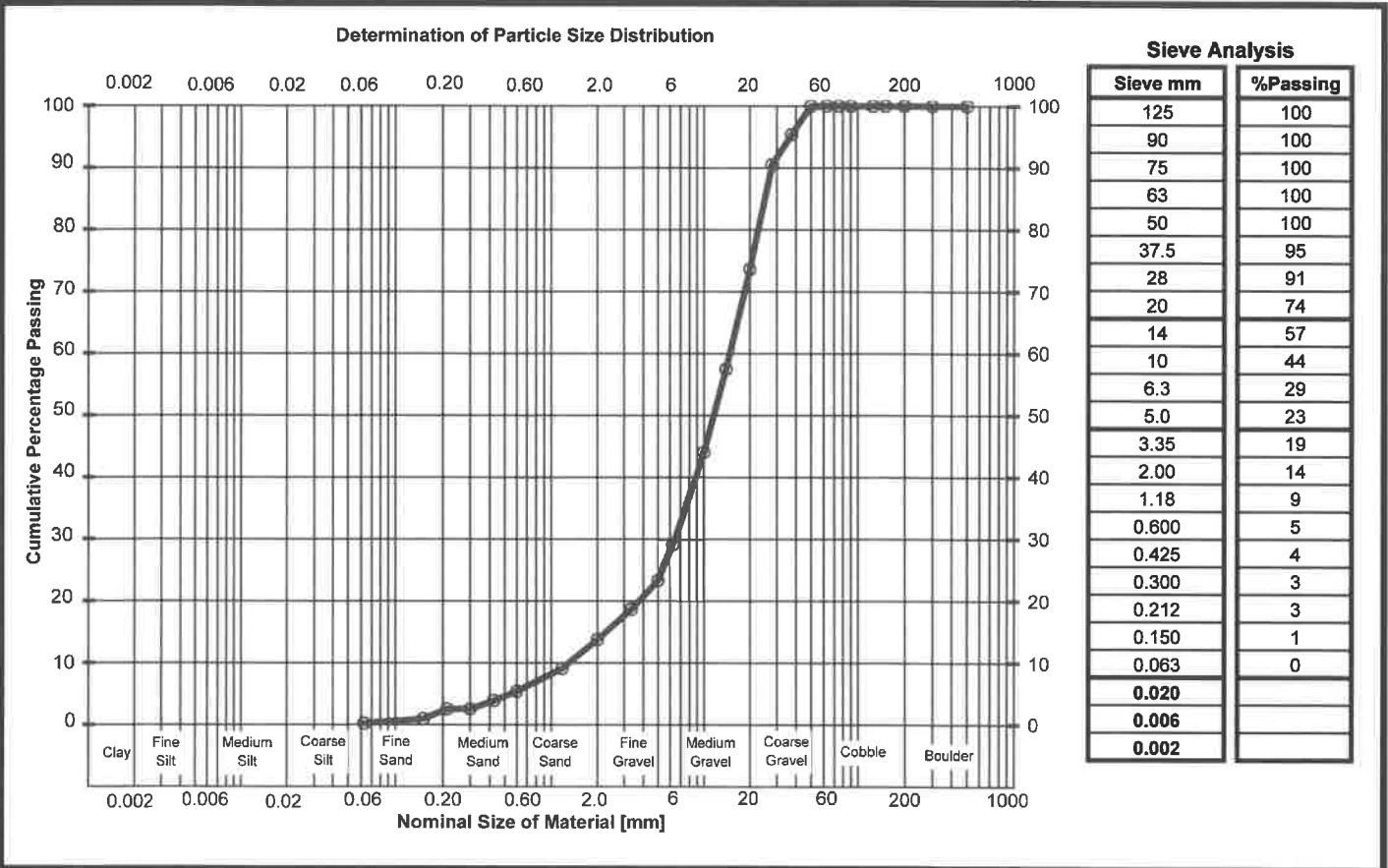
Laboratory Reference: PL6722-1/94
Client Reference: B16

Pre-treatment for organic material: N/A

Sample Description: Brown sandy GRAVEL. Gravel consists of angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH5
Source:

Depth Top: 9.50m
Depth Base: 10.00m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

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Determination of Particle Size Distribution

Tested in Accordance with BS 1377-2: 1990: Clause 9.2
Sieved Grading

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
PE1 5UA

Certificate Number: PL6722-1/95/710-2
Client Reference: C14757
Lab Job Number: PL6722-1
Date Sampled: Unknown
Date Received: 30.05.2019
Date Tested: 20.06.2019

Contact: Steve Fleming

Certificate of Sampling: N/A
Sampling Certificate No.: N/A
Sampled By: Client

Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

TEST RESULTS

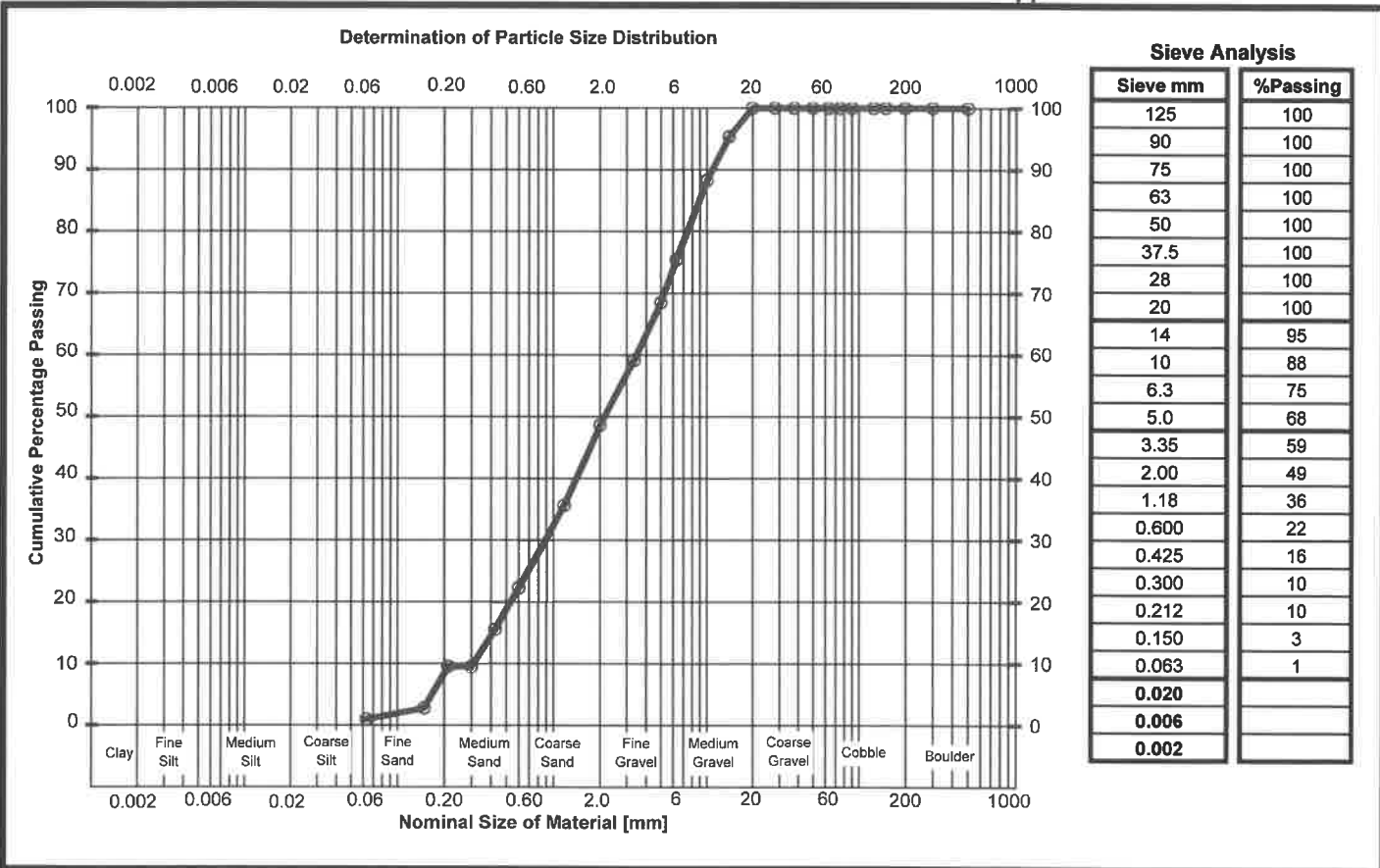
Laboratory Reference: PL6722-1/95
Client Reference: B18

Pre-treatment for organic material: N/A

Sample Description: Brown SAND and GRAVEL. Gravel consists of angular to sub-rounded flint and quartzite.

Material Specification: Not Required
Location: BH5

Depth Top: 10.80m
Depth Base: 11.30m
Supplier:



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 26.06.2019 Page 1 of 1
Form Number: GELab/C/709-2 Version 52

for and on behalf of Ground Engineering Ltd

TEST CERTIFICATE**One-Dimensional Consolidation****Properties**

(Tested in accordance with BS1377 : Part 5 1990)

Newark Road Peterborough

t:01733 566566

e: admin@groundengineering.co.uk

Client: Ground Engineering Ltd
 Client Address: Newark Road
 Peterborough
 Cambridgeshire
 Postcode: PE1 5UA
 Contact: Steve Fleming
 Site Name: NHM
 Site Address: Victoria Tower Gardens, London SW1

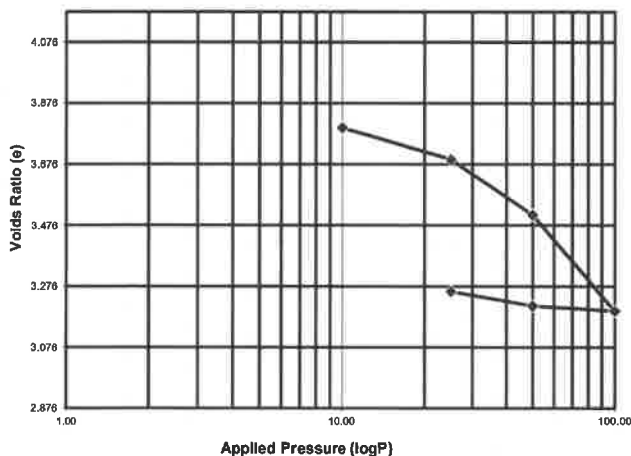
Certificate Number: PL6722-1-8/731
 Client Reference Number: C14757
 Date Sampled: Unknown
 Date Received: 31.05.2019
 Date Tested: 11.06.2019
 Sampling Certificate No: N/A
 Certificate of Sampling: N/A
 Sampled By: Client

Test Details

Location: BH1
 Sample Ref: U1
 Sample Description: Dark brown black plastic amorphous PEAT.
 Particle Density (Mg/m³): 1.7 Assumed
 Mean Lab Temp. (°C): 22
 Variations from Standard: None
 Lab Reference: PL6722-1-8
 Depth: 8.10 m

Specimen Details

	INITIAL	FINAL
Height (mm):	18.95	16.83
Bulk Density (Mg/m ³):	1.15	1.26
Moisture Content (%):	223	217
Dry Density (Mg/m ³):	0.35	0.40
Voids Ratio:	3.796	3.260
Degree of Saturation (%):	100.0	100.0
Diameter (mm):	75.03	N/A
Swelling Pressure (kPa):	10	N/A
Method of time fitting used:	Square Root Time	

Voids Ratio against logarithm of Applied Pressure

Applied Pressure (kPa)	Coefficient of Compressibility m_v (m ² /MN)	Coefficient of Consolidation c_v (m ² /year)
10	1.44	0.01
25	1.55	0.01
50	1.39	0.01
100	0.08	--
50	0.45	---
25		

Comments:

Approved [x] M.Hartnup - Laboratory Manager
 Signatory: [] L.Petch - Team Leader

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 26/06/2019

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Registered in England Wales
 Reg Number 6929574
 Reg Office: Ground Engineering Ltd
 Newark Rd
 Peterborough PE1 5UA

Form No: GELab/C/731 Issue 1

TEST CERTIFICATE**One-Dimensional Consolidation
Properties**

(Tested in accordance with BS1377 : Part 5 1990)

Client: Ground Engineering Ltd
 Client Address: Newark Road
 Peterborough
 Cambridgeshire
 Postcode: PE1 5UA
 Contact: Steve Fleming
 Site Name: NHM
 Site Address: Victoria Tower Gardens, London SW1

Newark Road Peterborough
 t:01733 566566
 e: admin@groundengineering.co.uk

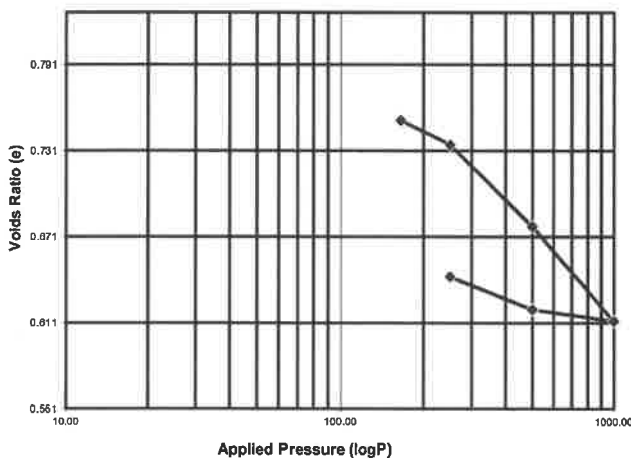
Certificate Number: PL6722-1-12/731
 Client Reference Number: C14757
 Date Sampled: Unknown
 Date Received: 31.05.2019
 Date Tested: 11.06.2019
 Sampling Certificate No: N/A
 Certificate of Sampling: N/A
 Sampled By: Client

Test Details

Location: BH1
 Sample Ref: B19
 Sample Description: Stiff brown CLAY.
 Particle Density (Mg/m³): 2.7 Assumed
 Mean Lab Temp. (°C): 22
 Variations from Standard: None
 Lab Reference: PL6722-1-12
 Depth: 11.70 m

Specimen Details

	INITIAL	FINAL
Height (mm):	18.52	17.37
Bulk Density (Mg/m ³):	2.00	2.10
Moisture Content (%):	30	28
Dry Density (Mg/m ³):	1.54	1.64
Voids Ratio:	0.752	0.643
Degree of Saturation (%):	100.0	100.0
Diameter (mm):	50.00	N/A
Swelling Pressure (kPa):	165	N/A
Method of time fitting used:	Log Time	N/A

Voids Ratio against logarithm of Applied Pressure

Applied Pressure (kPa)	Coefficient of Compressibility m_v (m ² /MN)	Coefficient of Consolidation c_v (m ² /year)
165		
250	0.12	0.74
500	0.13	0.50
1000	0.08	0.39
500	0.01	--
250	0.06	---

Comments:

Approved [x] M.Hartnup - Laboratory Manager
 Signatory: [] L.Petch - Team Leader

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 26/06/2019

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 Reg Number 6929574
 Reg Office: Ground Engineering Ltd
 Newark Rd
 Peterborough PE1 5UA

TEST CERTIFICATE

One-Dimensional Consolidation

Properties

(Tested in accordance with BS1377 : Part 5 1990)

Client: Ground Engineering Ltd
 Client Address: Newark Road
 Peterborough
 Cambridgeshire
 Postcode: PE1 5UA
 Contact: Steve Fleming
 Site Name: NHM
 Site Address: Victoria Tower Gardens, London SW1

Newark Road Peterborough
 t:01733 566566
 e: admin@groundengineering.co.uk
 Certificate Number: PL6722-1-25/731
 Client Reference Number: C14757
 Date Sampled: Unknown
 Date Received: 31.05.2019
 Date Tested: 11.06.2019
 Sampling Certificate No: N/A
 Certificate of Sampling: N/A
 Sampled By: Client

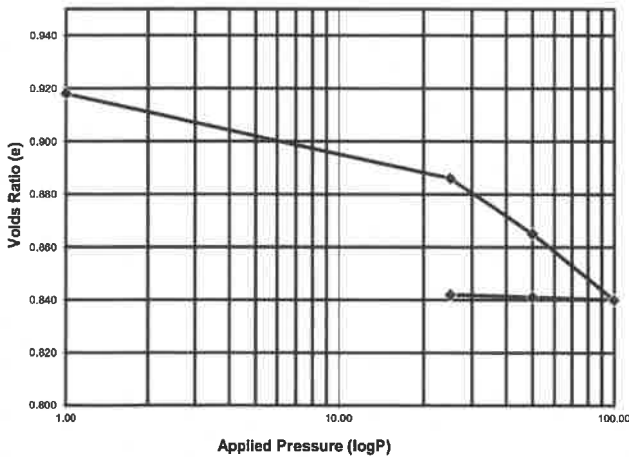
Test Details

Location: BH2
 Sample Ref: U1
 Sample Description: Soft dark grey brown very sandy CLAY.
 Particle Density (Mg/m³): 2.65 Assumed
 Mean Lab Temp. (°C): 22
 Variations from Standard: None
 Lab Reference: PL6722-1-25
 Depth: 5.00 m

Specimen Details

	INITIAL	FINAL
Height (mm):	18.67	17.93
Bulk Density (Mg/m ³):	1.87	1.88
Moisture Content (%):	35	31
Dry Density (Mg/m ³):	1.38	1.44
Voids Ratio:	0.918	0.842
Degree of Saturation (%):	100.0	96.4
Diameter (mm):	74.98	N/A
Swelling Pressure (kPa):	1	N/A
Method of time fitting used:	Square Root Time	

Voids Ratio against logarithm of Applied Pressure



Applied Pressure (kPa)	Coefficient of Compressibility m _v (m ² /MN)	Coefficient of Consolidation c _v (m ² /year)
1		
25	0.71	0.18
50	0.44	0.02
100	0.27	0.02
50	0.01	--
25	0.02	---

Comments:

Approved [x] M.Hartnup - Laboratory Manager
 Signatory: [] L.Petch - Team Leader

Signed: *MHA*

for and on behalf of Ground Engineering Ltd

Date Reported: 26/06/2019

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 Peterborough PE1 5UA

TEST CERTIFICATE
One-Dimensional Consolidation
Properties

Newark Road Peterborough
t:01733 566566
e: admin@groundengineering.co.uk

(Tested in accordance with BS1377 : Part 5 1990)

Client: Ground Engineering Ltd
Client Address: Newark Road
Peterborough
Cambridgeshire
Postcode: PE1 5UA
Contact: Steve Fleming
Site Name: NHM
Site Address: Victoria Tower Gardens, London SW1

Certificate Number: PL6722-1-31/731
Client Reference Number: C14757
Date Sampled: Unknown
Date Received: 31.05.2019
Date Tested: 11.06.2019
Sampling Certificate No: N/A
Certificate of Sampling: N/A
Sampled By: Client

Test Details

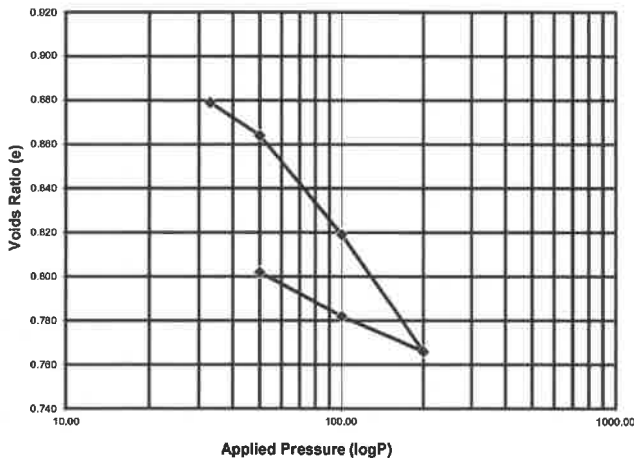
Location: BH2
Sample Ref: U2
Sample Description: Stiff fissured dark brown CLAY with some clayey sandy pockets.

Particle Density (Mg/m³): 2.7 Assumed
Mean Lab Temp. (°C): 22
Variations from Standard: None
Lab Reference: PL6722-1-31
Depth: 11.40 m

Specimen Details

	INITIAL	FINAL
Height (mm):	18.94	18.17
Bulk Density (Mg/m ³):	1.90	1.98
Moisture Content (%):	32	32
Dry Density (Mg/m ³):	1.44	1.50
Voids Ratio:	0.879	0.803
Degree of Saturation (%):	99.3	100.0
Diameter (mm):	74.96	N/A
Swelling Pressure (kPa):	33	N/A
Method of time fitting used:	Log Time	N/A

Voids Ratio against logarithm of Applied Pressure



Applied Pressure (kPa)	Coefficient of Compressibility m _v (m ² /MN)	Coefficient of Consolidation c _v (m ² /year)
33		
50	0.47	0.36
100	0.48	0.68
200	0.29	0.73
100	0.09	--
50	0.23	---

Comments:

Approved [x] M.Hartnup - Laboratory Manager
Signatory: [] L.Petch - Team Leader

Signed: *MHA*

for and on behalf of Ground Engineering Ltd

Date Reported: 26/06/2019

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Reg Number 6929574
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Newark Rd
Peterborough PE1 5UA

APPENDIX 4 – CHEMICAL LABORATORY TEST RESULTS

TOTAL SOIL, WAC & LEACHATE ANALYSES



Final Report

Report No.: 19-17187-1

Initial Date of Issue: 29-May-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 21-May-2019

Order No.: C14757 **Date Instructed:** 21-May-2019

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 28-May-2019

Date Approved: 29-May-2019

Approved By:


Details: Martin Dyer, Laboratory Manager

Client: Ground Engineering Limited		Chemtest Job No.: 19-17187			
Quotation No.:		Chemtest Sample ID.: 830022			
		Client Sample ID.: B10			
		Sample Location: BH1			
		Sample Type: SOIL			
		Top Depth (m): 5.70			
		Bottom Depth (m): 6.00			
		Date Sampled: 13-May-2019			
Determinand	Accred.	SOP	Type	Units	LOD
Ammonium	U	1220	10:1	mg/l	0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0
Copper (Dissolved)	U	1450	10:1	µg/l	1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aromatic TPH >C35-C44	N	1675	10:1	µg/l	0.10
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	50.00
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	5.0
Naphthalene	U	1700	10:1	µg/l	10
Acenaphthylene	U	1700	10:1	µg/l	0.10
Acenaphthene	U	1700	10:1	µg/l	0.10
Fluorene	U	1700	10:1	µg/l	0.10
Phenanthrene	U	1700	10:1	µg/l	0.10
Anthracene	U	1700	10:1	µg/l	0.10
Fluoranthene	U	1700	10:1	µg/l	0.10



The right chemistry to deliver results
 Project: C14757 NHM, Victoria Tower Gardens, London SW1

Results - Leachate

Client: Ground Engineering Limited		Chemtest Job No.: 19-17187			
Quotation No.:	Chemtest Sample ID.: 830022	Client Sample ID.:	B10		
	Sample Location:	BH1			
	Sample Type:	SOIL			
	Top Depth (m):	5.70			
	Bottom Depth (m):	6.00			
	Date Sampled:	13-May-2019			
Determinand	Accred.	SOP	Type	Units	LOD
Pyrene	U	1700	10:1	µg/l	0.10
Benzo[a]anthracene	U	1700	10:1	µg/l	0.10
Chrysene	N	1700	10:1	µg/l	0.10
Benzo[b]fluoranthene	U	1700	10:1	µg/l	0.10
Benzo[k]fluoranthene	U	1700	10:1	µg/l	0.10
Benzo[a]pyrene	U	1700	10:1	µg/l	0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	10:1	µg/l	0.10
Dibenz(a,h)Anthracene	U	1700	10:1	µg/l	0.10
Benzo[g,h,i]perylene	U	1700	10:1	µg/l	0.10
Total Of 16 PAH's	N	1700	10:1	µg/l	2.0
Benzene	U	1760	10:1	µg/l	1.0
Toluene	U	1760	10:1	µg/l	1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0
o-Xylene	U	1760	10:1	µg/l	1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0
Total Phenols	U	1920	10:1	mg/l	0.030

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited	Chemtest Job No.:		19-17187		19-17187		19-17187	
	Chemtest Sample ID.:	Client Sample ID.:	830022	B10	830023	B14	830024	B15
Quotation No.:	Sample Location:		BH1		BH1		BH1	
	Sample Type:		SOIL		SOIL		SOIL	
	Top Depth (m):		5.70		7.90		8.70	
	Bottom Depth (m):		6.00		8.10		9.00	
	Date Sampled:		13-May-2019		13-May-2019		13-May-2019	
	Asbestos Lab:		LIVERPOOL		LIVERPOOL		LIVERPOOL	
Determinand	Accred.	SOP	Units	LOD				
pH	U	2010		N/A	7.9	7.7	7.4	8.2
Moisture	N	2030	%	0.020	30	31	55	22
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.7	1.8	2.7	1.0
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.27	0.30	0.52	0.11
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2450	mg/kg	1.0	15	23	37	21
Cadmium	U	2450	mg/kg	0.10	< 0.10	0.12	0.17	0.12
Chromium	U	2450	mg/kg	1.0	20	22	20	44
Copper	U	2450	mg/kg	0.50	20	15	16	28
Mercury	U	2450	mg/kg	0.10	0.29	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	18	23	23	50
Lead	U	2450	mg/kg	0.50	47	25	19	16
Selenium	U	2450	mg/kg	0.20	0.89	1.5	3.2	0.91
Zinc	U	2450	mg/kg	0.50	46	45	41	95
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	3.1	3.5	5.3	0.67
Acenaphthene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz[a,h]Anthracene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.10	< 0.10

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited		Chemtest Job No.:		19-17187		19-17187		19-17187		19-17187	
Quotation No.:		Chemtest Sample ID.:		830022		830023		830024		830025	
		Client Sample ID.:		B10		B14		B15		B19	
		Sample Location:		BH1		BH1		BH1		BH1	
		Sample Type:		SOIL		SOIL		SOIL		SOIL	
		Top Depth (m):		5.70		7.90		8.70		11.70	
		Bottom Depth (m):		6.00		8.10		9.00		12.00	
		Date Sampled:		13-May-2019		13-May-2019		13-May-2019		14-May-2019	
		Asbestos Lab:		LIVERPOOL		LIVERPOOL		LIVERPOOL		LIVERPOOL	
Determinand	Accred.	SOP	Units	LOD	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Fluoranthene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Fluorene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Naphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Pyrene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	
ACM Type	U	2192		N/A	-	-	-	-	-	-	
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	
Cyanide (Complex)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Determind	Accred.	SOP	Units	LOD	Chemtest Job No.:		19-17187		19-17187		19-17187								
					Chemtest Sample ID.:	Client Sample ID.:	Sample Location:	Sample Type:	Top Depth (m):	Bottom Depth (m):	Date Sampled:	Asbestos Lab:	19-17187	19-17187	19-17187				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	8.00	11.70	12.00
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Total Of 9 PAH's	U	2700	mg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Chloromethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Bromomethane	U	2760	µg/kg	20	< 20	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Chloroethane	U	2760	µg/kg	2.0	< 2.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Trichloromethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Benzene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Dibromomethane	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Toluene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Dibromochloromethane	U	2760	µg/kg	10	< 10	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	830022	B10	BH1	SOIL	5.70	7.90	830023	B14	BH1	SOIL	8.70	9.00	11.70	12.00

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Chemtest Job No.:		19-17187	830023	19-17187	830024	19-17187
	Chemtest Sample ID.:	Client Sample ID.:					
	B10	BH1	SOIL	7.90	8.10	9.00	11.70
	Sample Location:		BH1	BH1	BH1	BH1	BH1
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		5.70	7.90	8.10	9.00	11.70
	Bottom Depth (m):		6.00	8.10	9.00	12.00	12.00
	Date Sampled:		13-May-2019	13-May-2019	13-May-2019	14-May-2019	14-May-2019
	Asbestos Lab:		LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD			
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0		
Tribromomethane	U	2760	µg/kg	1.0	< 1.0		
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0		
Bromobenzene	U	2760	µg/kg	1.0	< 1.0		
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50		
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0		
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0		
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50		
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0		
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0		
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0		
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0		
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50		
Phenol	U	2790	mg/kg	0.50	< 0.50		
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50		
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50		
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50		
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50		
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50		
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50		
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50		
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50		

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-17187		19-17187		19-17187	
	Chemtest Sample ID.:		Client Sample ID.:		830022		830023		830024	
	Sample Location:		B10		BH1		BH1		B15	
	Sample Type:		SOIL		SOIL		SOIL		SOIL	
	Top Depth (m):		5.70		7.90		8.70		11.70	
	Bottom Depth (m):		6.00		8.10		9.00		12.00	
	Date Sampled:		13-May-2019		13-May-2019		13-May-2019		14-May-2019	
	Asbestos Lab:		LIVERPOOL		LIVERPOOL		LIVERPOOL		LIVERPOOL	
Determinand	Accred.	SOP	Units	LOD						
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50					
Isophorone	U	2790	mg/kg	0.50	< 0.50					
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50					
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50					
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50					
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50					
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50					
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50					
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50					
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50					
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50					
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50					
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50					
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50					
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50					
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50					
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50					
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50					
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50					
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50					
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50					
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50					
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50					
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50					
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50					
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50					
Azobenzene	U	2790	mg/kg	0.50	< 0.50					
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50					
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50					
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50					
Carbazole	U	2790	mg/kg	0.50	< 0.50					
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50					
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50					
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50					
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50					

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-17187		Sample Ref: 830023		Sample ID: B14		Sample Location: BH1		Top Depth(m): 7.90		Bottom Depth(m): 8.10		Sampling Date: 13-May-2019	
Determinand	SOP	Accred.	Units	Inert Waste Landfill		Stable, Non-reactive hazardous waste in non-hazardous Landfill		Hazardous Waste Landfill		Landfill Waste Acceptance Criteria			
Total Organic Carbon	2625	U	%	2.0	3	5	6						
Loss On Ignition	2610	U	%	10	--	--	10						
Total BTEX	2760	U	mg/kg	<0.010	6	--	--						
Total PCBs (7 Congeners)	2815	U	mg/kg	<0.10	1	--	--						
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	<10	500	--	--						
Total (Of 17) PAH's	2700	N	mg/kg	<2.0	100	--	--						
pH	2010	U		7.7	--	>6	--						
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate						
Eluate Analysis				10:1 Eluate	10:1 Eluate		Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg						
Arsenic	1450	U	mg/l	0.0039	<0.050	2	25						
Barium	1450	U	mg/l	0.021	<0.50	100	300						
Cadmium	1450	U	mg/l	<0.00010	<0.010	0.04	5						
Chromium	1450	U	mg/l	<0.0010	<0.050	0.5	70						
Copper	1450	U	mg/l	<0.0010	<0.050	2	100						
Mercury	1450	U	mg/l	<0.00050	<0.0050	0.01	2						
Molybdenum	1450	U	mg/l	0.0051	0.051	0.5	30						
Nickel	1450	U	mg/l	<0.0010	<0.050	0.4	40						
Lead	1450	U	mg/l	<0.0010	<0.010	0.5	50						
Antimony	1450	U	mg/l	<0.0010	<0.010	0.06	5						
Selenium	1450	U	mg/l	0.0010	0.010	0.1	7						
Zinc	1450	U	mg/l	0.0016	<0.50	4	200						
Chloride	1220	U	mg/l	11	110	800	25000						
Fluoride	1220	U	mg/l	0.087	<1.0	10	500						
Sulphate	1220	U	mg/l	59	590	1000	50000						
Total Dissolved Solids	1020	N	mg/l	230	2200	4000	100000						
Phenol Index	1920	U	mg/l	<0.030	<0.30	1	--						
Dissolved Organic Carbon	1610	U	mg/l	13	130	500	1000						

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	31

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-17187

Sample Ref: 830024

Sample ID: B15

Sample Location: BH1

Top Depth(m): 8.70

Bottom Depth(m): 9.00

Sampling Date: 13-May-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3.1	5	6
Loss On Ignition	2610	U	%	9.2	--	10
Total BTEX	2760	U	mg/kg	< 0.010	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0	--	--
pH	2010	U		7.4	> 6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.019	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg	
Arsenic	1450	U	mg/l	0.10	0.5	25
Barium	1450	U	mg/kg	< 0.50	20	300
Cadmium	1450	U	< 0.00010	< 0.010	0.04	5
Chromium	1450	U	< 0.0010	< 0.050	0.5	70
Copper	1450	U	< 0.0010	< 0.050	2	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	2
Molybdenum	1450	U	0.0034	< 0.050	0.5	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	40
Lead	1450	U	< 0.0010	< 0.010	0.5	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	7
Zinc	1450	U	0.0049	< 0.50	4	200
Chloride	1220	U	16	160	800	25000
Fluoride	1220	U	0.14	1.4	10	500
Sulphate	1220	U	63	630	1000	50000
Total Dissolved Solids	1020	N	250	2400	4000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	--
Dissolved Organic Carbon	1610	U	11	110	500	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	55

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-17187

Chemtest Sample ID: 830025

Sample Ref: B19

Sample ID: BH1

Sample Location: 11.70

Top Depth(m): 12.00

Bottom Depth(m): 14-May-2019

Sampling Date: SOP

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	0.39	5	6
Loss On Ignition	2610	U	%	4.2	--	10
Total BTEX	2760	U	mg/kg	< 0.010	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0	--	--
pH	2010	U		8.2	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.033	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg	
Arsenic	1450	U	mg/l	< 0.0010	0.5	25
Barium	1450	U	mg/kg	0.0075	20	300
Cadmium	1450	U	mg/kg	< 0.00010	0.04	5
Chromium	1450	U	mg/kg	< 0.0010	0.5	70
Copper	1450	U	mg/kg	< 0.0010	2	100
Mercury	1450	U	mg/kg	< 0.00050	0.01	2
Molybdenum	1450	U	mg/kg	< 0.0010	0.5	30
Nickel	1450	U	mg/kg	< 0.0010	0.4	40
Lead	1450	U	mg/kg	< 0.0010	0.5	50
Antimony	1450	U	mg/kg	< 0.0010	0.06	5
Selenium	1450	U	mg/kg	0.0022	0.1	7
Zinc	1450	U	mg/kg	< 0.0010	4	200
Chloride	1220	U	mg/kg	100	800	25000
Fluoride	1220	U	mg/kg	0.12	10	500
Sulphate	1220	U	mg/kg	22	1000	50000
Total Dissolved Solids	1020	N	mg/kg	98	4000	100000
Phenol Index	1920	U	mg/kg	< 0.030	1	--
Dissolved Organic Carbon	1610	U	mg/kg	7.2	500	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	22

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5-C6, >C6-C8, >C8- C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35- C44 Aromatics: >C5-C7, >C7-C8, >C8- C10, >C10-C12, >C12-C16, >C16- C21, >C21- C35, >C35- C44	Pentane extraction / GCxGC FID detection
1680	Fatty Acids	Fatty Acids	GCMS detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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.
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.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.

SOP	Title	Parameters included	Method summary
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

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



Amended Report

Report No.: 19-15685-2

Initial Date of Issue: 16-May-2019 **Date of Re-Issue:** 24-May-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London, SW1

Quotation No.: **Date Received:** 10-May-2019

Order No.: C14757 **Date Instructed:** 10-May-2019

No. of Samples: 5

Turnaround (Wkdays): 9 **Results Due:** 22-May-2019

Date Approved: 24-May-2019

Approved By:


Details: Martin Dyer, Laboratory Manager

Client: Ground Engineering Limited		Chemtest Job No.: 19-15685			
Quotation No.:		Chemtest Sample ID.: 823013			
		Client Sample ID.: ES3			
		Sample Location: BH2			
		Sample Type: SOIL			
		Top Depth (m): 0.70			
		Date Sampled: 07-May-2019			
Determinand	Accred.	SOP	Type	Units	LOD
Ammonium	U	1220	10:1	mg/l	0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0
Copper (Dissolved)	U	1450	10:1	µg/l	1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10
Naphthalene	U	1700	10:1	µg/l	0.10
Acenaphthylene	U	1700	10:1	µg/l	0.10
Acenaphthene	U	1700	10:1	µg/l	0.10
Fluorene	U	1700	10:1	µg/l	0.10
Phenanthrene	U	1700	10:1	µg/l	0.10
Anthracene	U	1700	10:1	µg/l	0.10
Fluoranthene	U	1700	10:1	µg/l	0.10
Pyrene	U	1700	10:1	µg/l	1.4
Benzo[a]anthracene	U	1700	10:1	µg/l	1.8
	U	1700	10:1	µg/l	0.10

Client: Ground Engineering Limited		Chemtest Job No.: 19-15685			
Quotation No.:		Chemtest Sample ID.: 823013			
		Client Sample ID.: ES3			
		Sample Location: BH2			
		Sample Type: SOIL			
		Top Depth (m): 0.70			
		Date Sampled: 07-May-2019			
Determinand	Accred.	SOP	Type	Units	LOD
Chrysene	N	1700	10:1	µg/l	0.10 < 0.10
Benzo[b]fluoranthene	U	1700	10:1	µg/l	0.10 < 0.10
Benzo[k]fluoranthene	U	1700	10:1	µg/l	0.10 < 0.10
Benzo[a]pyrene	U	1700	10:1	µg/l	0.10 < 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	10:1	µg/l	0.10 < 0.10
Dibenz(a,h)Anthracene	U	1700	10:1	µg/l	0.10 < 0.10
Benzo[g,h,i]perylene	U	1700	10:1	µg/l	0.10 < 0.10
Total Of 16 PAH's	N	1700	10:1	µg/l	2.0 3.2
Benzene	U	1760	10:1	µg/l	1.0 < 1.0
Toluene	U	1760	10:1	µg/l	1.0 < 1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0 < 1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0 < 1.0
o-Xylene	U	1760	10:1	µg/l	1.0 < 1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0 < 1.0
Total Phenols	U	1920	10:1	mg/l	0.030 < 0.030

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Determiand	Accred.	SOP	Units	LOD	Chemtest Job No.:		Chemtest Sample ID.:		Client Sample ID.:		Sample Location:		Sample Type:		Top Depth (m):		Date Sampled:		Asbestos Lab:				
					19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685	19-15685
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	63	823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	190	823017	D6	TP4	SOIL	2.00	07-May-2019	DURHAM
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	823013	823015	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	D12	BH2	SOIL	4.70	07-May-2019	DURHAM
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	64	823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 5.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	83	823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	17	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Total Of 9 PAH's	U	2700	mg/kg	1.0	4.7	823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Dichlorodifluoromethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Chloromethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Vinyl Chloride	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Bromomethane	U	2760	µg/kg	2.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 2.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Chloroethane	U	2760	µg/kg	2.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 2.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Trichlorofluoromethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,1-Dichloroethene	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,1-Dichloroethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Bromochloromethane	U	2760	µg/kg	5.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 5.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Trichloromethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,1,1-Trichloroethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Tetrachloromethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,1-Dichloropropene	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Benzene	U	2760	µg/kg	1.0	< 1.0	823013	823015	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,2-Dichloroethane	U	2760	µg/kg	2.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 2.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Trichloroethene	N	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,2-Dichloropropane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Dibromomethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Bromodichloromethane	U	2760	µg/kg	5.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 5.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
cis-1,3-Dichloropropene	N	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Toluene	U	2760	µg/kg	1.0	< 1.0	823013	823015	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Trans-1,3-Dichloropropene	N	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,1,2-Trichloroethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Tetrachloroethene	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,3-Dichloropropane	U	2760	µg/kg	2.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 2.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Dibromochloromethane	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,2-Dibromoethane	U	2760	µg/kg	5.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 5.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Chlorobenzene	U	2760	µg/kg	1.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0		823013	823014	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 2.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	823013	823015	ES7	BH2	SOIL	4.70	07-May-2019	DURHAM	07-May-2019	DURHAM	< 1.0	823017	BH2	SOIL	4.70	07-May-2019	DURHAM	

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Quotation No.:	Chemtest Job No.:		19-15685	823014	19-15685	823015	19-15685
	Chemtest Sample ID.:	Client Sample ID.:					
	ES3	BH2	ES3	BH2	ES7	BH2	D6
	Sample Location:		BH2	BH2	BH2	BH2	TP4
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		0.70	2.80	2.80	4.70	2.00
	Date Sampled:		07-May-2019	07-May-2019	07-May-2019	07-May-2019	07-May-2019
	Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD	19-15685	19-15685	19-15685
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50	< 50
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Quotation No.:	Chemtest Job No.:		19-15685	823014	19-15685	823015	19-15685	823017
	Chemtest Sample ID.:	Client Sample ID.:						
	823013	ES3	ES7	BH2	BH2	D12	D6	
		SOIL	SOIL	SOIL	SOIL	BH2	TP4	
	0.70		2.80	4.70				
	07-May-2019	DURHAM	07-May-2019	DURHAM	07-May-2019	DURHAM	07-May-2019	
Determinand	Accred.	SOP	Units	LOD				
Isophorone	U	2790	mg/kg	0.50	< 0.50			< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50
2,4-Dimethylphenol	U	2790	mg/kg	0.50	< 0.50			< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50			< 0.50
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50			< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50			< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50			< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50			< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50			< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50			< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50			< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50			< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50			< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50			< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50			< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50			< 0.50
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50			< 0.50
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50			< 0.50
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50			< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50			< 0.50
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50			< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50			< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50
Azobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50			< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50
Carbazole	U	2790	mg/kg	0.50	< 0.50			< 0.50
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50			< 0.50
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50			< 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50			< 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50			< 0.50

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Chemtest Job No: 19-15685

Sample ID: D12

Sample Ref: 823015

Sample Location: BH2

Top Depth(m): 4.70

Bottom Depth(m):

Sampling Date: 07-May-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis				Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	10:1 Eluate mg/l	0.5	2	25
Barium	1450	U	< 0.0010	< 0.50	100	300
Cadmium	1450	U	< 0.0010	< 0.10	0.04	5
Chromium	1450	U	< 0.0010	< 0.050	0.5	70
Copper	1450	U	< 0.0010	< 0.050	2	100
Mercury	1450	U	< 0.00050	< 0.01	0.01	2
Molybdenum	1450	U	0.0047	< 0.050	0.5	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	40
Lead	1450	U	< 0.0010	< 0.010	0.5	50
Antimony	1450	U	0.0012	0.012	0.06	5
Selenium	1450	U	0.0020	0.020	0.1	7
Zinc	1450	U	0.010	< 0.50	4	200
Chloride	1220	U	5.6	56	800	25000
Fluoride	1220	U	0.10	1.0	10	500
Sulphate	1220	U	230	2300	1000	50000
Total Dissolved Solids	1020	N	420	4200	4000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	--
Dissolved Organic Carbon	1610	U	16	160	500	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	29

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Chemtest Job No: 19-15685

Chemtest Sample ID: 823016

Sample Ref: B31

Sample ID: BH4

Sample Location: 41.90

Top Depth(m): 42.00

Bottom Depth(m): 03-May-2019

Sampling Date:

Determinand	SOP	Accred.	Units		10:1 Eluate mg/l	10:1 Eluate mg/kg	Landfill Waste Acceptance Criteria			
			%	%			Inert Waste Landfill	Stable, Non- reactive hazardous waste in non- hazardous Landfill	Hazardous Waste Landfill	
Total Organic Carbon	2625	U			0.45		3	5	6	
Loss On Ignition	2610	U			3.3		--	--	10	
Total BTEX	2760	U			< 0.010		6	--	--	
Total PCBs (7 Congeners)	2815	U			< 0.10		1	--	--	
TPH Total WAC (Mineral Oil)	2670	U			< 10		500	--	--	
Total (Of 17) PAH's	2700	N			< 2.0		100	--	--	
pH	2010	U			8.4		--	>6	--	
Acid Neutralisation Capacity	2015	N			0.040		--	To evaluate	To evaluate	
Eluate Analysis							Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1450	U			0.0021	< 0.050	0.5	2	25	
Barium	1450	U			0.0060	< 0.50	20	100	300	
Cadmium	1450	U			< 0.00010	< 0.010	0.04	1	5	
Chromium	1450	U			< 0.0010	< 0.050	0.5	10	70	
Copper	1450	U			< 0.0010	< 0.050	2	50	100	
Mercury	1450	U			< 0.00050	< 0.0050	0.01	0.2	2	
Molybdenum	1450	U			0.0048	< 0.050	0.5	10	30	
Nickel	1450	U			< 0.0010	< 0.050	0.4	10	40	
Lead	1450	U			< 0.0010	< 0.010	0.5	10	50	
Antimony	1450	U			0.0014	0.014	0.06	0.7	5	
Selenium	1450	U			0.046	0.46	0.1	0.5	7	
Zinc	1450	U			0.0055	< 0.50	4	50	200	
Chloride	1220	U			30	300	800	15000	25000	
Fluoride	1220	U			0.40	4.0	10	150	500	
Sulphate	1220	U			86	860	1000	20000	50000	
Total Dissolved Solids	1020	N			200	2000	4000	60000	100000	
Phenol Index	1920	U			< 0.030	< 0.30	1	--	--	
Dissolved Organic Carbon	1610	U			18	180	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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.
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.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

SOP	Title	Parameters included	Method summary
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols>Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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



Amended Report

Report No.: 19-15152-2

Initial Date of Issue: 13-May-2019 **Date of Re-Issue:** 22-Jul-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London, SW1

Quotation No.: **Date Received:** 03-May-2019

Order No.: C14757 **Date Instructed:** 07-May-2019

No. of Samples: 3

Turnaround (Wkdays): 5 **Results Due:** 13-May-2019

Date Approved: 22-Jul-2019

Approved By:

Details: Martin Dyer, Laboratory Manager
Robert Monk, Technical Manager

Client: Ground Engineering Limited		Chemtest Job No.: 19-15152			
Quotation No.:		Chemtest Sample ID.: 820822			
		Client Sample ID.: ES10			
		Sample Location: BH4			
		Sample Type: SOIL			
		Top Depth (m): 4.20			
		Date Sampled: 30-Apr-2019			
Determinand	Accred.	SOP	Type	Units	LOD
Ammonium	U	1220	10:1	mg/l	0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080
Cobalt (Dissolved)	U	1450	10:1	µg/l	1.0
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0
Copper (Dissolved)	U	1450	10:1	µg/l	1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10
Naphthalene	U	1700	10:1	µg/l	0.10
Acenaphthylene	U	1700	10:1	µg/l	0.10
Acenaphthene	U	1700	10:1	µg/l	0.10
Fluorene	U	1700	10:1	µg/l	0.10
Phenanthrene	U	1700	10:1	µg/l	0.10
Anthracene	U	1700	10:1	µg/l	0.10
Fluoranthene	U	1700	10:1	µg/l	0.10
Pyrene	U	1700	10:1	µg/l	0.10



The right chemistry to deliver results
Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Results - Leachate

Client: Ground Engineering Limited		Chemtest Job No.: 19-15152			
Quotation No.:		Chemtest Sample ID.:	820822		
		Client Sample ID.:	ES10		
		Sample Location:	BH4		
		Sample Type:	SOIL		
		Top Depth (m):	4.20		
		Date Sampled:	30-Apr-2019		
Determinand	Accred.	SOP	Type	Units	LOD
Benzo[a]anthracene	U	1700	10:1	µg/l	< 0.10
Chrysene	N	1700	10:1	µg/l	< 0.10
Benzo[b]fluoranthene	U	1700	10:1	µg/l	< 0.10
Benzo[k]fluoranthene	U	1700	10:1	µg/l	< 0.10
Benzo[a]pyrene	U	1700	10:1	µg/l	< 0.10
Indeno[1,2,3-c,d]Pyrene	U	1700	10:1	µg/l	< 0.10
Dibenz[a,h]Anthracene	U	1700	10:1	µg/l	< 0.10
Benzo[g,h,i]perylene	U	1700	10:1	µg/l	< 0.10
Total Of 16 PAH's	N	1700	10:1	µg/l	< 2.0
Benzene	U	1760	10:1	µg/l	< 1.0
Toluene	U	1760	10:1	µg/l	< 1.0
Ethylbenzene	U	1760	10:1	µg/l	< 1.0
m & p-Xylene	U	1760	10:1	µg/l	< 1.0
o-Xylene	U	1760	10:1	µg/l	< 1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	< 1.0
Total Phenols	U	1920	10:1	mg/l	< 0.030

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Quotation No.:	Chemtest Job No.:		19-15152	19-15152	19-15152
	Chemtest Sample ID.:	Client Sample ID.:			
	820820	820821	ES2	ES7	ES10
			BH4	BH4	BH4
			SOIL	SOIL	SOIL
			0.40	2.30	4.20
			30-Apr-2019	30-Apr-2019	30-Apr-2019
			LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD	
pH	U	2010		N/A	8.8
Moisture	N	2030	%	0.020	14
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.3
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.25
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2450	mg/kg	1.0	24
Cadmium	U	2450	mg/kg	0.10	< 0.10
Chromium	U	2450	mg/kg	1.0	21
Copper	U	2450	mg/kg	0.50	52
Mercury	U	2450	mg/kg	0.10	0.91
Nickel	U	2450	mg/kg	0.50	22
Lead	U	2450	mg/kg	0.50	370
Selenium	U	2450	mg/kg	0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	56
Chromium (Hexavalent)	N	2490	mg/kg	0.50	0.77
Organic Matter	U	2625	%	0.40	2.8
Acenaphthene	U	2790	mg/kg	0.50	< 0.50
Acenaphthylene	U	2790	mg/kg	0.50	< 0.10
Acenaphthylene	U	2790	mg/kg	0.10	< 0.10
Anthracene	U	2790	mg/kg	0.50	< 0.50
Anthracene	U	2790	mg/kg	0.10	1.8
Benzo[a]anthracene	U	2790	mg/kg	0.50	0.67
Benzo[a]anthracene	U	2790	mg/kg	0.10	3.0
Benzo[a]pyrene	U	2790	mg/kg	0.50	< 0.50
Benzo[a]pyrene	U	2790	mg/kg	0.10	2.4
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	0.64
Benzo[b]fluoranthene	U	2790	mg/kg	0.10	2.3
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	< 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.10	1.5
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	< 0.50
Benzo[k]fluoranthene	U	2790	mg/kg	0.10	1.4
Chrysene	U	2790	mg/kg	0.50	0.61
Chrysene	U	2790	mg/kg	0.10	2.9
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	< 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.10	0.76

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Quotation No.:	Chemtest Job No.:		19-15152	19-15152	19-15152
	Chemtest Sample ID.:	Client Sample ID.:			
	820820	ES2	820820	ES7	820822
		BH4	BH4	BH4	ES10
		SOIL	SOIL	SOIL	BH4
		0.40	0.40	2.30	4.20
		30-Apr-2019	30-Apr-2019	30-Apr-2019	30-Apr-2019
		LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD	
Fluoranthene	U	2790	mg/kg	0.50	
Fluoranthene	U	2700	mg/kg	0.10	1.2
Fluorene	U	2790	mg/kg	0.50	5.6
Fluorene	U	2700	mg/kg	0.10	< 0.50
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.50
Naphthalene	U	2790	mg/kg	0.50	1.4
Naphthalene	U	2700	mg/kg	0.10	< 0.50
Phenanthrene	U	2790	mg/kg	0.50	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	1.1
Pyrene	U	2790	mg/kg	0.50	5.8
Pyrene	U	2700	mg/kg	0.10	0.93
Total Of 16 PAH's	U	2700	mg/kg	2.0	5.1
Total Phenols	U	2920	mg/kg	0.30	34
ACM Type	U	2192	%	N/A	< 2.0
Asbestos Identification	U	2192	%	0.001	< 0.30
ACM Detection Stage	U	2192		N/A	-
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	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	4400
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	710
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	270
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 1.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	5400
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	45
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	160
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	21
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	77
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	300
					5700
					170

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Client: Ground Engineering Limited		Chemtest Job No.: 19-15152		19-15152		19-15152	
Quotation No.:		Chemtest Sample ID.: 820820		820821		820822	
		Client Sample ID.: ES2		ES7		ES10	
		Sample Location: BH4		BH4		BH4	
		Sample Type: SOIL		SOIL		SOIL	
		Top Depth (m): 0.40		2.30		4.20	
		Date Sampled: 30-Apr-2019		30-Apr-2019		30-Apr-2019	
		Asbestos Lab: LIVERPOOL		LIVERPOOL		LIVERPOOL	
Determinand	Accred.	SOP	Units	LOD			
Total Of 9 PAH's	U	2700	mg/kg	1.0	40	25	< 1.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0			< 1.0
Chloromethane	U	2760	µg/kg	1.0			< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0			2.3
Bromomethane	U	2760	µg/kg	2.0			< 2.0
Chloroethane	U	2760	µg/kg	2.0			< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0			< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0			< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0			< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0			< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0			< 1.0
Bromochloromethane	U	2760	µg/kg	5.0			< 5.0
Trichloromethane	U	2760	µg/kg	1.0			< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0			< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0			< 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0			< 1.0
Benzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0			< 2.0
Trichloroethene	N	2760	µg/kg	1.0			< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0			< 1.0
Dibromomethane	U	2760	µg/kg	1.0			< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0			< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10			< 10
Toluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10			< 10
1,1,2-Trichloroethane	U	2760	µg/kg	1.0			< 1.0
Tetrachloroethene	U	2760	µg/kg	1.0			< 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0			< 2.0
Dibromochloromethane	U	2760	µg/kg	10			< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0			< 5.0
Chlorobenzene	U	2760	µg/kg	1.0			< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0			< 2.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Styrene	U	2760	µg/kg	1.0			< 1.0
Tribromomethane	U	2760	µg/kg	1.0			< 1.0

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Quotation No.:	Chemtest Job No.:		19-15152	19-15152	19-15152
	Chemtest Sample ID.:	Client Sample ID.:			
	820820	ES2	820820	ES7	820822
		BH4	BH4	BH4	BH4
		SOIL	SOIL	SOIL	SOIL
	0.40		2.30		4.20
			30-Apr-2019	30-Apr-2019	30-Apr-2019
		LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD	
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	1.4
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50
Isophorone	U	2790	mg/kg	0.50	< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Quotation No.:	Chemtest Job No.:		19-15152	19-15152	19-15152
	Chemtest Sample ID.:	Client Sample ID.:			
	820820	820821	ES2	ES7	820822
			BH4	BH4	BH4
			SOIL	SOIL	SOIL
	Top Depth (m):	2.30	0.40	2.30	4.20
	Date Sampled:	30-Apr-2019	30-Apr-2019	30-Apr-2019	30-Apr-2019
	Asbestos Lab:	LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD	
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50
Azobenzene	U	2790	mg/kg	0.50	< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50
Carbazole	U	2790	mg/kg	0.50	< 0.50
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London, SW1

Chemtest Job No: 19-15152

Chemtest Sample ID: 820821

Sample Ref: ES7

Sample Location: BH4

Top Depth(m): 2.30

Bottom Depth(m):

Sampling Date: 30-Apr-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	mg/l	0.5	2	25
Barium	1450	U	0.0035	20	100	300
Cadmium	1450	U	0.0035	< 0.50	1	5
Cadmium	1450	U	< 0.0010	0.04	10	70
Chromium	1450	U	< 0.0010	0.5	10	100
Copper	1450	U	0.0068	2	50	100
Mercury	1450	U	< 0.00050	0.01	0.2	2
Molybdenum	1450	U	0.0029	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	40
Nickel	1450	U	< 0.0010	< 0.050	10	50
Lead	1450	U	< 0.0010	0.06	0.7	5
Antimony	1450	U	< 0.0010	0.1	0.5	7
Selenium	1450	U	< 0.0010	4	50	200
Zinc	1450	U	< 0.0010	800	15000	25000
Chloride	1220	U	7.9	10	150	500
Fluoride	1220	U	0.16	1000	20000	50000
Sulphate	1220	U	35	4000	60000	100000
Total Dissolved Solids	1020	N	160	1	--	--
Phenol Index	1920	U	< 0.030	500	800	1000
Dissolved Organic Carbon	1610	U	12			

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	14

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5-C6, >C6-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44 Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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.
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.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

SOP	Title	Parameters included	Method summary
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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



2183

Amended Report

Report No.: 19-16631-4

Initial Date of Issue: 23-May-2019 **Date of Re-Issue:** 22-Jul-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 16-May-2019



Order No.: C14757 **Date Instructed:** 16-May-2019

No. of Samples: 14

Turnaround (Wkdays): 47 **Results Due:** 22-Jul-2019

Date Approved: 22-Jul-2019

Approved By:

Details: Martin Dyer, Laboratory Manager
Robert Monk, Technical Manager

Client: Ground Engineering Limited		Chemtest Job No.: 19-16631		19-16631	
Quotation No.:		Chemtest Sample ID.: 827594		827598	
		Client Sample ID.: D10/ES10		D2/ES2	
		Sample Location: WS4		WS6	
		Sample Type: SOIL		SOIL	
		Top Depth (m): 3.50		0.50	
		Date Sampled: 09-May-2019		09-May-2019	
Determinand	Accred.	SOP	Type	Units	LOD
Ammonium	U	1220	10:1	mg/l	0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0
Copper (Dissolved)	U	1450	10:1	µg/l	1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aromatic TPH >C35-C44	N	1680	10:1	µg/l	50.00
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10
Naphthalene	U	1700	10:1	µg/l	0.10
Acenaphthylene	U	1700	10:1	µg/l	0.10
Acenaphthene	U	1700	10:1	µg/l	0.10
Fluorene	U	1700	10:1	µg/l	0.10
Phenanthrene	U	1700	10:1	µg/l	0.10
Anthracene	U	1700	10:1	µg/l	0.10
Fluoranthene	U	1700	10:1	µg/l	0.10
Pyrene	U	1700	10:1	µg/l	0.10

Client: Ground Engineering Limited		Chemtest Job No.:		19-16631	
Quotation No.:		Chemtest Sample ID.:		827594	
		Client Sample ID.:		D10/ES10	
		Sample Location:		WS4	
		Sample Type:		SOIL	
		Top Depth (m):		3.50	
		Date Sampled:		09-May-2019	
		Date Sampled:		09-May-2019	
Determinand	Accred.	SOP	Type	Units	LOD
Benzo[a]anthracene	U	1700	10:1	µg/l	0.10
Chrysene	N	1700	10:1	µg/l	0.10
Benzo[b]fluoranthene	U	1700	10:1	µg/l	0.10
Benzo[k]fluoranthene	U	1700	10:1	µg/l	0.10
Benzo[a]pyrene	U	1700	10:1	µg/l	0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	10:1	µg/l	0.10
Dibenz(a,h)Anthracene	U	1700	10:1	µg/l	0.10
Benzo[g,h,i]perylene	U	1700	10:1	µg/l	0.10
Total Of 16 PAH's	N	1700	10:1	µg/l	2.0
Benzene	U	1760	10:1	µg/l	1.0
Toluene	U	1760	10:1	µg/l	1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0
o-Xylene	U	1760	10:1	µg/l	1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0
Total Phenols	U	1920	10:1	mg/l	0.030

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Chemtest Job No.:		Chemtest Sample ID.:		19-16631		19-16631		19-16631		19-16631		19-16631		19-16631	
	Client Sample ID.:	Sample Location:	Sample Type:	Top Depth (m):	Bottom Depth (m):	Date Sampled:	Asbestos Lab:	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631
Determinand	Accred.	SOP	Units	LOD	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631
Chlorobenzene	U	2760	µg/kg	1.0	827590	B16	BH2	SOIL	8.20	8.70	07-May-2019	DURHAM	10-May-2019	DURHAM	10-May-2019	DURHAM
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	827591	D2/ES2	BH3	SOIL	0.60		10-May-2019	DURHAM	10-May-2019	DURHAM	10-May-2019	DURHAM
Ethylbenzene	U	2760	µg/kg	1.0	827592	D5/ES5	BH3	SOIL	1.90		10-May-2019	DURHAM	10-May-2019	DURHAM	10-May-2019	DURHAM
m & p-Xylene	U	2760	µg/kg	1.0	827593	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
o-Xylene	U	2760	µg/kg	1.0	827594	D10/ES10	WS4	SOIL	3.50		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Styrene	U	2760	µg/kg	1.0	827595	D1/ES1	WS5	SOIL	0.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Tribromomethane	U	2760	µg/kg	1.0	827596	D10/ES10	WS4	SOIL	3.50		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Isopropylbenzene	U	2760	µg/kg	1.0	827597	D13/ES13	WS5	SOIL	3.85		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Bromobenzene	U	2760	µg/kg	1.0	827598	D10/ES10	WS4	SOIL	3.50		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2,3-Trichloropropane	N	2760	µg/kg	50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
N-Propylbenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
2-Chlorotoluene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
4-Chlorotoluene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Tert-Butylbenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Sec-Butylbenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
4-Isopropyltoluene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
N-Butylbenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Hexachlorobutadiene	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Phenol	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
2-Chlorophenol	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
2-Methylphenol	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	827599	D7/ES7	WS4	SOIL	2.20		09-May-2019	DURHAM	09-May-2019	DURHAM	09-May-2019	DURHAM

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-16631		19-16631		19-16631		19-16631		19-16631		19-16631				
	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	827590	B16	827591	D2/ES2	827592	D5/ES5	827593	D7/ES7	827594	D10/ES10	827595	D1/ES1	827596	D10/ES10	
Sample Location:		Sample Type:		Top Depth (m):		Bottom Depth (m):		Date Sampled:		Asbestos Lab:		Date Sampled:		Asbestos Lab:		Date Sampled:		Asbestos Lab:	
Determinand	Accred.	SOP	Units	LOD															
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Isophorone	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Azobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Carbazole	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited	Chemtest Job No.: 19-16631	Chemtest Sample ID.: 827590	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631
Quotation No.:	Client Sample ID.: B16	D2/ES2	827591	827592	D7/ES7	D10/ES10	D1/ES1	D10/ES10	D10/ES10	D10/ES10	D13/ES13
	Sample Location: BH2	BH3	SOIL	BH3	WS4	WS4	WS5	WS4	WS5	WS5	WS5
	Sample Type: SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m): 8.20	0.60	0.60	1.90	2.20	3.50	0.20	3.50	3.85	3.85	5.30
	Bottom Depth (m): 8.70										
	Date Sampled: 07-May-2019	10-May-2019	10-May-2019	10-May-2019	09-May-2019	09-May-2019	09-May-2019	09-May-2019	09-May-2019	09-May-2019	09-May-2019
	Asbestos Lab: DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD							
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-16631		19-16631		19-16631		19-16631		19-16631	
	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	827598	D2/ES2	827599	D7/ES7	827600	D11/ES11	827601	D13/ES13	827602	D1/ES1
Sample Location:		Sample Type:		Date Sampled:		Asbestos Lab:		Date Sampled:		Date Sampled:		Date Sampled:		
Top Depth (m):		Bottom Depth (m):		09-May-2019		DURHAM		09-May-2019		09-May-2019		10-May-2019		
0.50		0.50		DURHAM		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	Accred.	SOP	Units	LOD										
Chlorobenzene	U	2760	µg/kg	1.0										
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0										
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited	Chemtest Job No.:	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631	19-16631
Quotation No.:	Chemtest Sample ID.:	827598	827599	827600	827601	827602	827603		
	Client Sample ID.:	D2/ES2	D7/ES7	D11/ES11	D13/ES13	D1/ES1	D3/ES3		
	Sample Location:	WS6	WS6	WS6	WS6	WS8	WS8		
	Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
	Top Depth (m):	0.50	1.95	3.90	4.80	0.20	0.90		
	Bottom Depth (m):								
	Date Sampled:	09-May-2019	09-May-2019	09-May-2019	09-May-2019	10-May-2019	10-May-2019		
	Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM		
Determinand	Accred.	SOP	Units	LOD					
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50					
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50					

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16631

Chemtest Sample ID: 827590

Sample Ref:

Sample ID: B16

Sample Location: BH2

Top Depth(m): 8.20

Bottom Depth(m): 8.70

Sampling Date: 07-May-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	< 0.20	5	6
Loss On Ignition	2610	U	%	0.86	--	10
Total BTEX	2760	U	mg/kg	< 0.010	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	35	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0	--	--
pH	2010	U		8.3	> 6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.012	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg	
Arsenic	1450	U	mg/l	< 0.0010	0.5	25
Barium	1450	U	mg/l	0.0019	20	300
Cadmium	1450	U	mg/l	< 0.0010	0.04	5
Chromium	1450	U	mg/l	< 0.0010	0.5	70
Copper	1450	U	mg/l	< 0.0010	2	100
Mercury	1450	U	mg/l	< 0.00050	0.01	2
Molybdenum	1450	U	mg/l	0.0026	0.5	30
Nickel	1450	U	mg/l	< 0.0010	0.4	40
Lead	1450	U	mg/l	< 0.0010	0.5	50
Antimony	1450	U	mg/l	< 0.0010	0.06	5
Selenium	1450	U	mg/l	< 0.0010	0.1	7
Zinc	1450	U	mg/l	< 0.0010	0.5	200
Chloride	1220	U	mg/l	2.9	4	25000
Fluoride	1220	U	mg/l	< 0.050	800	500
Sulphate	1220	U	mg/l	16	10	50000
Total Dissolved Solids	1020	N	mg/l	49	4000	100000
Phenol Index	1920	U	mg/l	< 0.030	1	--
Dissolved Organic Carbon	1610	U	mg/l	4.4	500	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	4.8

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16631

Chemtest Sample ID: 827594

Sample Ref: D10/ES10

Sample Location: WS4

Top Depth(m): 3.50

Bottom Depth(m): 09-May-2019

Sampling Date:

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	mg/kg	0.5	2	25
Barium	1450	U	mg/kg	<0.050	<0.50	300
Cadmium	1450	U	mg/kg	<0.010	0.04	5
Chromium	1450	U	mg/kg	<0.050	0.5	70
Copper	1450	U	mg/kg	<0.050	2	100
Mercury	1450	U	mg/l	<0.0050	0.01	2
Molybdenum	1450	U	mg/kg	0.067	0.5	30
Nickel	1450	U	mg/kg	<0.050	0.4	40
Lead	1450	U	mg/kg	<0.010	0.5	50
Antimony	1450	U	mg/kg	<0.010	0.06	5
Selenium	1450	U	mg/kg	0.023	0.1	7
Zinc	1450	U	mg/kg	<0.50	4	200
Chloride	1220	U	mg/kg	<1.0	800	25000
Fluoride	1220	U	mg/kg	<0.050	10	500
Sulphate	1220	U	mg/kg	5500	20000	50000
Total Dissolved Solids	1020	N	mg/kg	7100	4000	100000
Phenol Index	1920	U	mg/kg	<0.30	1	--
Dissolved Organic Carbon	1610	U	mg/kg	<50	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	16

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16631

Chemtest Sample ID: 827597

Sample Ref: D13/ES13

Sample Location: WS5

Top Depth(m): 5.30

Bottom Depth(m): 09-May-2019

Sampling Date:

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	mg/l	0.5	2	25
Barium	1450	U	0.0012	<0.050	20	300
Cadmium	1450	U	0.0046	<0.50	100	5
Chromium	1450	U	<0.00010	<0.010	0.04	70
Copper	1450	U	<0.0010	<0.050	0.5	100
Mercury	1450	U	<0.0010	<0.050	2	2
Molybdenum	1450	U	<0.00050	<0.0050	0.01	30
Nickel	1450	U	0.0065	0.065	0.5	40
Lead	1450	U	<0.0010	<0.050	0.4	50
Antimony	1450	U	<0.0010	<0.010	0.5	5
Selenium	1450	U	<0.0010	<0.010	0.06	7
Zinc	1450	U	<0.0010	<0.010	0.1	200
Chloride	1220	U	<0.0010	<0.50	4	25000
Fluoride	1220	U	10	100	800	500
Sulphate	1220	U	0.062	<1.0	10	50000
Total Dissolved Solids	1020	N	31	310	1000	100000
Phenol Index	1920	U	180	1700	4000	--
Dissolved Organic Carbon	1610	U	<0.030	<0.30	1	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	31

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16631

Chemtest Sample ID: 827600

Sample Ref: D11/ES11

Sample Location: WS6

Top Depth(m): 3.90

Bottom Depth(m): 09-May-2019

Sampling Date:

Determinand	SOP	Accred.	Units		Landfill Waste Acceptance Criteria			
			%	mg/kg	Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Total Organic Carbon	2625	U	%		26	3	5	6
Loss On Ignition	2610	U	%		29	-	-	10
Total BTEX	2760	U	mg/kg		< 0.010	6	-	-
Total PCBs (7 Congeners)	2815	U	mg/kg		< 0.10	1	-	-
TPH Total WAC (Mineral Oil)	2670	U	mg/kg		220	500	-	-
Total (Of 17) PAH's	2700	N	mg/kg		< 2.0	100	-	-
pH	2010	U			7.7	-	> 6	-
Acid Neutralisation Capacity	2015	N	mol/kg		0.029	-	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1450	U	mg/l	mg/kg	0.5	2	2	25
Barium	1450	U	0.0036	< 0.050	20	100	100	300
Cadmium	1450	U	0.0029	< 0.010	0.04	1	1	5
Chromium	1450	U	< 0.00010	< 0.050	0.5	10	10	70
Copper	1450	U	< 0.0010	< 0.050	2	50	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	0.2	2
Molybdenum	1450	U	0.0086	0.086	0.5	10	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	0.5	7
Zinc	1450	U	0.0014	< 0.50	4	50	50	200
Chloride	1220	U	3.3	33	800	15000	15000	25000
Fluoride	1220	U	0.16	1.6	10	150	150	500
Sulphate	1220	U	5.1	51	1000	20000	20000	50000
Total Dissolved Solids	1020	N	65	630	4000	60000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-	-
Dissolved Organic Carbon	1610	U	9.4	94	500	800	800	1000

Solid Information

Dry mass of test portion/kg	0.090
Moisture (%)	40

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5-C6, >C6-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44 Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Pentane extraction / GCxGC FID detection
1680	Fatty Acids	Fatty Acids	GCMS detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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.
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.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.

SOP	Title	Parameters included	Method summary
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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.: 19-16949-1

Initial Date of Issue: 24-May-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 20-May-2019

Order No.: C14757 **Date Instructed:** 20-May-2019

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 24-May-2019

Date Approved: 24-May-2019

Approved By:



Details: Martin Dyer, Laboratory Manager



Bulk Identification Certificate

Client: Ground Engineering Limited

Site Address:

Date Sampled: 14-May-2019

Date Received: 20-May-2019

Your Ref.:

Project:

Job Number:

No Samples:

Date Reported:

C14757 NHM, Victoria Tower

Gardens, London SW1

19-16949

24-May-2019

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
829049	ASB1		WS3A	0.30		2185	U	COVENTRY	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).

The results relate only to items tested as supplied by the client.

Comments and interpretations are beyond the scope of UKAS accreditation.

Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Client: Ground Engineering Limited		Chemtest Job No.: 19-16949		19-16949	
Quotation No.:		Chemtest Sample ID.: 829045		829047	
		Client Sample ID.: D5		D10	
		Sample Location: WS1		WS1	
		Sample Type: SOIL		SOIL	
		Top Depth (m): 1.25		4.30	
		Date Sampled: 14-May-2019		14-May-2019	
Determinand	Accred.	SOP	Type	Units	LOD
Ammonium	U	1220	10:1	mg/l	0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080
Chromium (Dissolved)	U	1450	10:1	µg/l	1.0
Copper (Dissolved)	U	1450	10:1	µg/l	1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10
Aromatic TPH >C35-C44	N	1680	10:1	µg/l	50.00
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10
Naphthalene	U	1700	10:1	µg/l	0.10
Acenaphthylene	U	1700	10:1	µg/l	0.10
Acenaphthene	U	1700	10:1	µg/l	0.10
Fluorene	U	1700	10:1	µg/l	0.10
Phenanthrene	U	1700	10:1	µg/l	0.10
Anthracene	U	1700	10:1	µg/l	0.10
Fluoranthene	U	1700	10:1	µg/l	0.10
Pyrene	U	1700	10:1	µg/l	0.10

Client: Ground Engineering Limited		Chemtest Job No.: 19-16949		19-16949	
Quotation No.:		Chemtest Sample ID.: 829045		829047	
		Client Sample ID.: D5		D10	
		Sample Location: WS1		WS1	
		Sample Type: SOIL		SOIL	
		Top Depth (m): 1.25		4.30	
		Date Sampled: 14-May-2019		14-May-2019	
Determinand	Accred.	SOP	Type	Units	LOD
Benzofluranthracene	U	1700	10:1	µg/l	0.10
Chrysene	N	1700	10:1	µg/l	0.10
Benzofluoranthene	U	1700	10:1	µg/l	0.10
Benzokifluoranthene	U	1700	10:1	µg/l	0.10
Benzofluoranthene	U	1700	10:1	µg/l	0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	10:1	µg/l	0.10
Dibenz(a,h)Anthracene	U	1700	10:1	µg/l	0.10
Benzofluoranthene	U	1700	10:1	µg/l	0.10
Total Of 16 PAH's	N	1700	10:1	µg/l	2.0
Benzene	U	1760	10:1	µg/l	1.0
Toluene	U	1760	10:1	µg/l	1.0
Ethylbenzene	U	1760	10:1	µg/l	1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0
o-Xylene	U	1760	10:1	µg/l	1.0
Methyl Tert-Butyl Ether	N	1760	10:1	µg/l	1.0
Total Phenols	U	1920	10:1	mg/l	0.030

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Determinand	Accred.	SOP	Units	LOD	Chemtest Job No.:		19-16949		19-16949		19-16949															
					Chemtest Sample ID.:	Client Sample ID.:	Sample Location:	Sample Type:	Top Depth (m):	Date Sampled:	Asbestos Lab:	Chemtest Sample ID.:	Client Sample ID.:	Sample Location:	Sample Type:	Top Depth (m):	Date Sampled:	Asbestos Lab:								
pH	U	2010		N/A	7.9	WS1	SOIL	1.25	14-May-2019	COVENTRY	7.7	WS1	SOIL	3.70	14-May-2019	COVENTRY	8.0	WS1	SOIL	4.30	14-May-2019	COVENTRY	8.4	WS3A	SOIL	0.50
Moisture	N	2030	%	0.020	22	WS1	SOIL	0.43	14-May-2019	COVENTRY	15	WS1	SOIL	0.61	14-May-2019	COVENTRY	8.8	WS2	SOIL	0.95	14-May-2019	COVENTRY	13	WS2	SOIL	1.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.43	WS1	SOIL	0.34	14-May-2019	COVENTRY	1.8	WS1	SOIL	0.61	14-May-2019	COVENTRY	1.7	WS2	SOIL	0.95	14-May-2019	COVENTRY	1.2	WS2	SOIL	1.1
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.34	WS1	SOIL	0.34	14-May-2019	COVENTRY	0.72	WS1	SOIL	0.61	14-May-2019	COVENTRY	0.95	WS2	SOIL	0.95	14-May-2019	COVENTRY	1.1	WS2	SOIL	1.1
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	WS1	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS2	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS2	SOIL	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	WS1	SOIL	< 0.50	14-May-2019	COVENTRY	0.60	WS1	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS2	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS2	SOIL	< 0.50
Arsenic	U	2450	mg/kg	1.0	34	WS1	SOIL	1.0	14-May-2019	COVENTRY	39	WS1	SOIL	3.2	14-May-2019	COVENTRY	49	WS2	SOIL	4.7	14-May-2019	COVENTRY	46	WS2	SOIL	4.7
Cadmium	U	2450	mg/kg	0.10	0.15	WS1	SOIL	0.15	14-May-2019	COVENTRY	0.13	WS1	SOIL	0.15	14-May-2019	COVENTRY	0.23	WS2	SOIL	0.23	14-May-2019	COVENTRY	0.25	WS2	SOIL	0.25
Chromium	U	2450	mg/kg	1.0	52	WS1	SOIL	52	14-May-2019	COVENTRY	29	WS1	SOIL	22	14-May-2019	COVENTRY	25	WS2	SOIL	25	14-May-2019	COVENTRY	27	WS2	SOIL	27
Copper	U	2450	mg/kg	0.50	59	WS1	SOIL	59	14-May-2019	COVENTRY	1000	WS1	SOIL	170	14-May-2019	COVENTRY	160	WS2	SOIL	160	14-May-2019	COVENTRY	54	WS2	SOIL	54
Mercury	U	2450	mg/kg	0.10	1.4	WS1	SOIL	1.4	14-May-2019	COVENTRY	1.3	WS1	SOIL	3.2	14-May-2019	COVENTRY	3.5	WS2	SOIL	3.5	14-May-2019	COVENTRY	2.9	WS2	SOIL	2.9
Nickel	U	2450	mg/kg	0.50	66	WS1	SOIL	66	14-May-2019	COVENTRY	49	WS1	SOIL	46	14-May-2019	COVENTRY	46	WS2	SOIL	46	14-May-2019	COVENTRY	29	WS2	SOIL	29
Lead	U	2450	mg/kg	0.50	57	WS1	SOIL	57	14-May-2019	COVENTRY	360	WS1	SOIL	290	14-May-2019	COVENTRY	290	WS2	SOIL	290	14-May-2019	COVENTRY	380	WS2	SOIL	380
Selenium	U	2450	mg/kg	0.20	< 0.20	WS1	SOIL	< 0.20	14-May-2019	COVENTRY	< 0.20	WS1	SOIL	< 0.20	14-May-2019	COVENTRY	< 0.20	WS2	SOIL	< 0.20	14-May-2019	COVENTRY	< 0.20	WS2	SOIL	< 0.20
Zinc	U	2450	mg/kg	0.50	130	WS1	SOIL	130	14-May-2019	COVENTRY	170	WS1	SOIL	110	14-May-2019	COVENTRY	130	WS2	SOIL	130	14-May-2019	COVENTRY	140	WS2	SOIL	140
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	WS1	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS2	SOIL	< 0.50	14-May-2019	COVENTRY	< 0.50	WS2	SOIL	< 0.50
Organic Matter	U	2625	%	0.40	1.9	WS1	SOIL	1.9	14-May-2019	COVENTRY	14	WS1	SOIL	24	14-May-2019	COVENTRY	22	WS2	SOIL	22	14-May-2019	COVENTRY	4.7	WS2	SOIL	4.7
Acenaphthene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.49	WS2	SOIL	0.49
Acenaphthylene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.97	WS2	SOIL	0.97
Anthracene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	2.3	WS2	SOIL	2.3
Benzo[a]anthracene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	6.5	WS2	SOIL	6.5
Benzo[a]anthracene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	5.9	WS2	SOIL	5.9
Benzo[a]pyrene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	7.7	WS2	SOIL	7.7
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	4.0	WS2	SOIL	4.0
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	3.2	WS2	SOIL	3.2
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	5.8	WS2	SOIL	5.8
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.72	WS2	SOIL	0.72
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.72	WS2	SOIL	0.72
Chrysene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.72	WS2	SOIL	0.72
Dibenz[a,h]Anthracene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.72	WS2	SOIL	0.72
Dibenz[a,h]Anthracene	U	2790	mg/kg	0.50	< 0.10	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.50	WS1	SOIL	< 0.10	14-May-2019	COVENTRY	< 0.10	WS2	SOIL	< 0.10	14-May-2019	COVENTRY	0.72	WS2	SOIL	0.72

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Client: Ground Engineering Limited		Chemtest Job No.:		19-16949		19-16949		19-16949		19-16949		
Quotation No.:		Chemtest Sample ID.:		829045		829046		829047		829048		
		Client Sample ID.:		D5		D9		D10		D2		
		Sample Location:		WS1		WS1		WS1		WS2		
		Sample Type:		SOIL		SOIL		SOIL		SOIL		
		Top Depth (m):		1.25		3.70		4.30		0.70		
		Date Sampled:		14-May-2019		14-May-2019		14-May-2019		14-May-2019		
		Asbestos Lab:		COVENTRY		COVENTRY		COVENTRY		COVENTRY		
Determinand	Accred.	SOP	Units	LOD	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	
Fluoranthene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50		13	
Fluoranthene	U	2700	mg/kg	0.10	< 0.10		< 0.10		< 0.10		3.9	
Fluorene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50		0.56	
Fluorene	U	2700	mg/kg	0.10	< 0.10		< 0.10		< 0.10		0.56	
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50		4.0	
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10		< 0.10		< 0.10		4.0	
Naphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50		0.52	
Naphthalene	U	2700	mg/kg	0.10	< 0.10		< 0.10		< 0.10		0.52	
Phenanthrene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50		5.6	
Phenanthrene	U	2700	mg/kg	0.10	< 0.10		< 0.10		< 0.10		5.6	
Pyrene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50		13	
Pyrene	U	2700	mg/kg	0.10	< 0.10		< 0.10		< 0.10		13	
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0		< 2.0		< 2.0		74	
Total Phenols	U	2920	mg/kg	0.30	< 0.30		< 0.30		< 0.30		< 0.30	
ACM Type	U	2192	%	N/A	-		-		-		-	
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	
ACM Detection Stage	U	2192		N/A	-		-		-		-	
Cyanide (Complex)	U	2300	mg/kg	0.50	< 0.50		0.60		< 0.50		< 0.50	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		55	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		< 5.0		< 5.0		55	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		6.2	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		100	
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		540	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		< 1.0		< 1.0		< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		< 5.0		< 5.0		640	

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Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-16949		19-16949		19-16949		19-16949		
	Chemtest Sample ID.:		Client Sample ID.:		829045		829046		829047		829048		
Sample Location:		Sample Type:		D5		D9		D10		D2		D2	
Top Depth (m):		Sample Type:		WS1		WS1		WS1		WS2		WS3A	
Date Sampled:		Sample Type:		SOIL		SOIL		SOIL		SOIL		SOIL	
Asbestos Lab:		Top Depth (m):		1.25		3.70		4.30		0.70		0.50	
Date Sampled:		Date Sampled:		14-May-2019		14-May-2019		14-May-2019		14-May-2019		14-May-2019	
Asbestos Lab:		Date Sampled:		COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY	
Determinand	Accred.	SOP	Units	LOD									
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	760	150	
Total Of 9 PAH's	U	2700	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12	51	
Dichlorodifluoromethane	U	2760	µg/kg	1.0									
Chloromethane	U	2760	µg/kg	1.0									
Vinyl Chloride	U	2760	µg/kg	1.0									
Bromomethane	U	2760	µg/kg	20									
Chloroethane	U	2760	µg/kg	2.0									
Trichlorofluoromethane	U	2760	µg/kg	1.0									
1,1-Dichloroethene	U	2760	µg/kg	1.0									
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0									
1,1-Dichloroethane	U	2760	µg/kg	1.0									
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0									
Bromochloromethane	U	2760	µg/kg	5.0									
Trichloromethane	U	2760	µg/kg	1.0									
1,1,1-Trichloroethane	U	2760	µg/kg	1.0									
Tetrachloromethane	U	2760	µg/kg	1.0									
1,1-Dichloropropene	U	2760	µg/kg	1.0									
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	U	2760	µg/kg	2.0									
Trichloroethene	N	2760	µg/kg	1.0									
1,2-Dichloropropane	U	2760	µg/kg	1.0									
Dibromomethane	U	2760	µg/kg	1.0									
Bromodichloromethane	U	2760	µg/kg	5.0									
cis-1,3-Dichloropropene	N	2760	µg/kg	10									
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10									
1,1,2-Trichloroethane	U	2760	µg/kg	10									
Tetrachloroethene	U	2760	µg/kg	1.0									
1,3-Dichloropropane	U	2760	µg/kg	2.0									
Dibromochloromethane	U	2760	µg/kg	10									
1,2-Dibromoethane	U	2760	µg/kg	5.0									
Chlorobenzene	U	2760	µg/kg	1.0									
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0									
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Styrene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

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Client: Ground Engineering Limited		Chemtest Job No.: 19-16949		19-16949		19-16949		19-16949		19-16949	
Quotation No.:		Chemtest Sample ID.:		829046		829047		829048		829050	
		Client Sample ID.:		D9		D10		D2		D2	
		Sample Location:		WS1		WS1		WS2		WS3A	
		Sample Type:		SOIL		SOIL		SOIL		SOIL	
		Top Depth (m):		1.25		3.70		0.70		0.50	
		Date Sampled:		14-May-2019		14-May-2019		14-May-2019		14-May-2019	
		Asbestos Lab:		COVENTRY		COVENTRY		COVENTRY		COVENTRY	
Determinand	Accred.	SOP	Units	LOD							
Tribromomethane	U	2760	µg/kg	1.0			< 1.0				
Isopropylbenzene	U	2760	µg/kg	1.0			< 1.0				
Bromobenzene	U	2760	µg/kg	1.0			< 1.0				
1,2,3-Trichloropropane	N	2760	µg/kg	50			< 50				
N-Propylbenzene	U	2760	µg/kg	1.0			< 1.0				
2-Chlorotoluene	U	2760	µg/kg	1.0			< 1.0				
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0			< 1.0				
4-Chlorotoluene	U	2760	µg/kg	1.0			< 1.0				
Tert-Butylbenzene	U	2760	µg/kg	1.0			< 1.0				
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0			< 1.0				
Sec-Butylbenzene	U	2760	µg/kg	1.0			< 1.0				
1,3-Dichlorobenzene	U	2760	µg/kg	1.0			< 1.0				
4-Isopropyltoluene	U	2760	µg/kg	1.0			< 1.0				
1,4-Dichlorobenzene	U	2760	µg/kg	1.0			< 1.0				
N-Butylbenzene	U	2760	µg/kg	1.0			< 1.0				
1,2-Dichlorobenzene	U	2760	µg/kg	1.0			< 1.0				
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50			< 50				
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0			< 1.0				
Hexachlorobutadiene	U	2760	µg/kg	1.0			< 1.0				
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0			< 2.0				
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0			< 1.0				< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50			< 0.50				< 1.0
Phenol	U	2790	mg/kg	0.50			< 0.50				
2-Chlorophenol	U	2790	mg/kg	0.50			< 0.50				
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50			< 0.50				
1,3-Dichlorobenzene	U	2790	mg/kg	0.50			< 0.50				
1,4-Dichlorobenzene	N	2790	mg/kg	0.50			< 0.50				
1,2-Dichlorobenzene	U	2790	mg/kg	0.50			< 0.50				
2-Methylphenol	U	2790	mg/kg	0.50			< 0.50				
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50			< 0.50				
Hexachloroethane	N	2790	mg/kg	0.50			< 0.50				
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50			< 0.50				
4-Methylphenol	U	2790	mg/kg	0.50			< 0.50				
Nitrobenzene	U	2790	mg/kg	0.50			< 0.50				
Isophorone	U	2790	mg/kg	0.50			< 0.50				
2-Nitrophenol	N	2790	mg/kg	0.50			< 0.50				
2,4-Dimethylphenol	N	2790	mg/kg	0.50			< 0.50				

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Quotation No.:	Chemtest Job No.:		19-16949	829045	19-16949	829046	19-16949	829047	19-16949	829048	19-16949
	Chemtest Sample ID.:	Client Sample ID.:									
			D5	WS1	D9	WS1	D10	WS1	D2	WS2	D2
			Sample Location:	SOIL	Sample Location:	SOIL	Sample Location:	SOIL	Sample Location:	SOIL	Sample Location:
			Top Depth (m):	1.25	Top Depth (m):	3.70	Top Depth (m):	4.30	Top Depth (m):	0.70	Top Depth (m):
			Date Sampled:	14-May-2019	Date Sampled:	14-May-2019	Date Sampled:	14-May-2019	Date Sampled:	14-May-2019	Date Sampled:
			Asbestos Lab:	COVENTRY	Asbestos Lab:	COVENTRY	Asbestos Lab:	COVENTRY	Asbestos Lab:	COVENTRY	Asbestos Lab:
Determinand	Accred.	SOP	Units	LOD							
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50						
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50						
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50						
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50						
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50						
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50						
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50						
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50						
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50						
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50						
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50						
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50						
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50						
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50						
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50						
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50						
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50						
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50						
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50						
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50						
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50						
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50						
Azobenzene	U	2790	mg/kg	0.50	< 0.50						
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50						
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50						
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50						
Carbazole	U	2790	mg/kg	0.50	< 0.50						
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50						
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50						
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50						
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50						

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16949

Chemtest Sample ID: 829045

Sample Ref: D5

Sample Location: WS1

Top Depth(m): 1.25

Bottom Depth(m): 14-May-2019

Sampling Date: 14-May-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	mg/l	0.5	2	25
Barium	1450	U	0.0011	<0.050	20	300
Cadmium	1450	U	0.0088	<0.010	1	5
Chromium	1450	U	<0.00010	0.04	10	70
Copper	1450	U	0.0044	<0.050	0.5	10
Mercury	1450	U	<0.0010	<0.050	2	100
Molybdenum	1450	U	<0.00050	0.01	0.2	2
Nickel	1450	U	0.0045	<0.050	0.5	30
Lead	1450	U	0.0026	<0.050	10	40
Antimony	1450	U	<0.0010	<0.010	0.5	50
Selenium	1450	U	<0.0010	<0.010	0.06	5
Zinc	1450	U	0.0018	0.018	0.1	7
Chloride	1450	U	0.0014	<0.50	4	200
Fluoride	1220	U	17	170	800	25000
Sulphate	1220	U	0.12	1.2	10	500
Total Dissolved Solids	1020	U	130	1300	1000	50000
Phenol Index	1920	N	270	2700	4000	100000
Dissolved Organic Carbon	1610	U	<0.030	<0.30	1	--
		U	7.3	73	500	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	22

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5-C6, >C6-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44 Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Pentane extraction / GCxGC FID detection
1680	Fatty Acids	Fatty Acids	GCMS detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2185	Asbestos	Asbestos	Polarised light microscopy
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.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.

SOP	Title	Parameters included	Method summary
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols>Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

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.: 19-16790-1

Initial Date of Issue: 24-May-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 17-May-2019

Order No.: C14757 **Date Instructed:** 17-May-2019

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 23-May-2019

Date Approved: 24-May-2019

Approved By:



Details: Martin Dyer, Laboratory Manager

Client: Ground Engineering Limited		Chemtest Job No.: 19-16790		19-16790		
Quotation No.:		Chemtest Sample ID.: 828260		828262		
		Client Sample ID.: U2		D10		
		Sample Location: WS3		WS7		
		Sample Type: SOIL		SOIL		
		Top Depth (m): 2.00		2.25		
		Bottom Depth (m): 2.40				
		Date Sampled: 13-May-2019		13-May-2019		
Determinand	Accred.	SOP	Type	Units	LOD	
Ammonium	U	1220	10:1	mg/l	0.050	0.45
Boron (Dissolved)	U	1450	10:1	µg/l	20	160
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Aliphatic TPH >C5-C6	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	10:1	µg/l	0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	10:1	µg/l	0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	10:1	µg/l	5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	10:1	µg/l	0.10	< 0.10
Aromatic TPH >C35-C44	N	1680	10:1	µg/l	50.00	< 50
Total Aromatic Hydrocarbons	N	1675	10:1	µg/l	5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	10:1	µg/l	10	< 10
Naphthalene	U	1700	10:1	µg/l	0.10	150
Acenaphthylene	U	1700	10:1	µg/l	0.10	4.5
Acenaphthene	U	1700	10:1	µg/l	0.10	3.8
Fluorene	U	1700	10:1	µg/l	0.10	2.8
Phenanthrene	U	1700	10:1	µg/l	0.10	3.2
Anthracene	U	1700	10:1	µg/l	0.10	0.71
Fluoranthene	U	1700	10:1	µg/l	0.10	< 0.10
Pyrene	U	1700	10:1	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1700	10:1	µg/l	0.10	< 0.10
Chrysene	N	1700	10:1	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1700	10:1	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1700	10:1	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1700	10:1	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	10:1	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	10:1	µg/l	0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	10:1	µg/l	0.10	< 0.10

Project: C14757 NHM_Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-16790		19-16790		19-16790		19-16790		19-16790		
	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	828259	D3	828260	U2	828261	D7	828262	D10	828263	B19	
Sample Location:		Sample Type:		19-16790		19-16790		19-16790		19-16790		19-16790		19-16790	
Top Depth (m):		SOIL		WS3		WS3		WS3		WS7		WS7		BS2	
Bottom Depth (m):		SOIL		0.75		2.00		2.40		1.65		2.25		10.50	
Date Sampled:		13-May-2019		13-May-2019		13-May-2019		13-May-2019		13-May-2019		13-May-2019		08-May-2019	
Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		DURHAM		DURHAM		DURHAM	
Determinand	Accred.	SOP	Units	LOD											
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[C] 5.6	170	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[C] 22	200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Total Of 9 PAH's	U	2700	mg/kg	1.0	9.6	470	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dichlorodifluoromethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	U	2760	µg/kg	20	[C] < 20		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	
Chloroethane	U	2760	µg/kg	2.0	[C] < 2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Trichlorofluoromethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromochloromethane	U	2760	µg/kg	5.0	[C] < 5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Trichloromethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloromethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	U	2760	µg/kg	2.0	[C] < 2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Trichloroethene	N	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloropropane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	U	2760	µg/kg	5.0	[C] < 5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10	[C] < 10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Toluene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	[C] < 10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
1,1,2-Trichloroethane	U	2760	µg/kg	10	[C] < 10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Tetrachloroethene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0	[C] < 2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Dibromochloromethane	U	2760	µg/kg	10	[C] < 10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
1,2-Dibromoethane	U	2760	µg/kg	5.0	[C] < 5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Chlorobenzene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	[C] < 2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Ethylbenzene	U	2760	µg/kg	1.0	[C] < 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-16790		19-16790		19-16790		19-16790		19-16790	
	Chemtest Sample ID.:		Client Sample ID.:		828259		828260		828261		828262		828263	
Sample Location:		WS3		D3		U2		D7		D10		B19		
Sample Type:		SOIL		WS3		WS3		WS7		WS7		BH2		
Top Depth (m):		0.75		0.75		2.00		1.65		2.25		10.50		
Bottom Depth (m):						2.40								
Date Sampled:		13-May-2019		13-May-2019		13-May-2019		13-May-2019		13-May-2019		08-May-2019		
Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	Accred.	SOP	Units	LOD										
					U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Tribromomethane	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	[C] < 50	< 50	[C] < 50	< 50	[C] < 50	< 50	[C] < 50	< 50	[C] < 50	< 50
N-Propylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	[C] < 50	< 50	[C] < 50	< 50	[C] < 50	< 50	[C] < 50	< 50	[C] < 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	[C] < 2.0	< 2.0	[C] < 2.0	< 2.0	[C] < 2.0	< 2.0	[C] < 2.0	< 2.0	[C] < 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0	[C] < 1.0	< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
Phenol	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50	[C] < 0.50	< 0.50

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-16790		19-16790		19-16790		19-16790		19-16790		
	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	828260	828261	828262	828263	828264	828265	828266	828267	828268	828269	
Sample Location:		Sample Type:		Top Depth (m):		Bottom Depth (m):		Date Sampled:		Asbestos Lab:		Asbestos Lab:		Asbestos Lab:	
WS3		SOIL		0.75		2.40		13-May-2019		DURHAM		DURHAM		DURHAM	
WS3		SOIL		1.65				13-May-2019		DURHAM		DURHAM		DURHAM	
WS7		SOIL		2.25				13-May-2019		DURHAM		DURHAM		DURHAM	
WS7		SOIL		10.50				08-May-2019		DURHAM		DURHAM		DURHAM	
WS3A		SOIL		0.75				14-May-2019		DURHAM		DURHAM		DURHAM	
Determinand	Accred.	SOP	Units	LOD	19-16790	19-16790	19-16790	19-16790	19-16790	19-16790	19-16790	19-16790	19-16790	19-16790	
Nitrobenzene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Isophorone	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2-Nitrophenol	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2,4-Dimethylphenol	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2,4-Dichlorophenol	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
4-Chloroaniline	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Hexachlorobutadiene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2-Methylnaphthalene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
4-Nitrophenol	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2-Chloronaphthalene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2-Nitroaniline	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Dimethylphthalate	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
3-Nitroaniline	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Dibenzofuran	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Diethyl Phthalate	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
4-Nitroaniline	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Azobenzene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Hexachlorobenzene	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Pentachlorophenol	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Carbazole	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16790

Chemtest Sample ID: 828260

Sample Ref: U2

Sample Location: WS3

Top Depth(m): 2.00

Bottom Depth(m): 2.40

Sampling Date: 13-May-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate	Limit values for compliance using BS EN 12457 at L/S 10 l/kg	Limit values for compliance leaching test	
Arsenic	1450	U	mg/l	0.5	2	25
Barium	1450	U	mg/l	20	100	300
Cadmium	1450	U	< 0.00010	0.04	1	5
Chromium	1450	U	0.0029	0.5	10	70
Copper	1450	U	0.0049	2	50	100
Mercury	1450	U	< 0.00050	0.01	0.2	2
Molybdenum	1450	U	0.0079	0.5	10	30
Nickel	1450	U	< 0.0010	0.4	10	40
Lead	1450	U	< 0.0010	0.5	10	50
Antimony	1450	U	< 0.0010	0.06	0.7	5
Selenium	1450	U	0.0057	0.1	0.5	7
Zinc	1450	U	0.0059	4	50	200
Chloride	1220	U	22	800	15000	25000
Fluoride	1220	U	0.15	10	150	500
Sulphate	1220	U	270	1000	20000	50000
Total Dissolved Solids	1020	N	530	4000	60000	100000
Phenol Index	1920	U	< 0.030	1	--	--
Dissolved Organic Carbon	1610	U	14	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Chemtest Job No:	19-16790					
Chemtest Sample ID:	828262					
Sample Ref:						
Sample ID:	D10					
Sample Location:	WS7					
Top Depth(m):	2.25					
Bottom Depth(m):						
Sampling Date:	13-May-2019					
Total Organic Carbon	2625	U	%	5.0	5	6
Loss On Ignition	2610	U	%	1.3	--	10
Total BTEX	2760	U	mg/kg	< 0.10	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	< 10	500	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0	100	--
pH	2010	U		7.7	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.021	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate mg/l	10:1 Eluate mg/kg	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg	
Arsenic	1450	U	0.0011	< 0.050	0.5	25
Barium	1450	U	0.024	< 0.50	20	100
Cadmium	1450	U	< 0.00010	< 0.010	0.04	1
Chromium	1450	U	< 0.0010	< 0.050	0.5	10
Copper	1450	U	0.0094	0.094	2	50
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2
Molybdenum	1450	U	0.0038	< 0.050	0.5	10
Nickel	1450	U	0.0029	< 0.050	0.4	10
Lead	1450	U	< 0.0010	< 0.010	0.5	10
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7
Selenium	1450	U	0.0016	0.016	0.1	0.5
Zinc	1450	U	0.0072	< 0.50	4	50
Chloride	1220	U	27	270	800	15000
Fluoride	1220	U	0.18	1.8	10	150
Sulphate	1220	U	280	2800	1000	20000
Total Dissolved Solids	1020	N	590	5700	4000	60000
Phenol Index	1920	U	< 0.030	< 0.30	1	--
Dissolved Organic Carbon	1610	U	30	300	500	800

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	39

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Chemtest Job No: 19-16790

Chemtest Sample ID: 828263

Sample Ref: B19

Sample ID: BH2

Sample Location: 10.50

Top Depth(m):

Bottom Depth(m):

Sampling Date: 08-May-2019

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria Limits		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon	2625	U	%	3	5	6
Loss On Ignition	2610	U	%	--	--	10
Total BTEX	2760	U	mg/kg	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	500	--	--
Total (Of 17) PAHs	2700	N	mg/kg	100	--	--
pH	2010	U		--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	--	To evaluate	To evaluate
Eluate Analysis			10:1 Eluate mg/l	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1450	U	< 0.0010	0.5	2	25
Barium	1450	U	0.0073	20	100	300
Cadmium	1450	U	< 0.00010	0.04	1	5
Chromium	1450	U	< 0.0010	0.5	10	70
Copper	1450	U	< 0.0010	2	50	100
Mercury	1450	U	< 0.00050	0.01	0.2	2
Molybdenum	1450	U	< 0.0010	0.5	10	30
Nickel	1450	U	< 0.0010	0.4	10	40
Lead	1450	U	< 0.0010	0.5	10	50
Antimony	1450	U	< 0.0010	0.06	0.7	5
Selenium	1450	U	0.0022	0.1	0.5	7
Zinc	1450	U	0.0027	4	50	200
Chloride	1220	U	5.5	800	15000	25000
Fluoride	1220	U	0.095	10	150	500
Sulphate	1220	U	36	1000	20000	50000
Total Dissolved Solids	1020	N	98	4000	60000	100000
Phenol Index	1920	U	< 0.030	1	--	--
Dissolved Organic Carbon	1610	U	8.8	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	21

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
828259		D3	WS3	13-May-2019	C	Plastic Bag

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1680	Fatty Acids	Fatty Acids	GCMS detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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.
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.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.

SOP	Title	Parameters included	Method summary
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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.: 19-16273-1

Initial Date of Issue: 20-May-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London, SW1

Quotation No.: **Date Received:** 14-May-2019

Order No.: C14757 **Date Instructed:** 14-May-2019

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 20-May-2019

Date Approved: 20-May-2019

Approved By:


Details: Martin Dyer, Laboratory Manager



Bulk Identification Certificate

Client: Ground Engineering Limited

Site Address:

Date Sampled: 02-May-2019

Date Received: 14-May-2019

Your Ref.:

Project: C14757 NHM, Victoria Tower
Gardens, London, SW1

Job Number: 19-16273

No Samples:

Date Reported: 20-May-2019

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
825889	ASB1		DP8	0.20		2185	U	COVENTRY	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).

The results relate only to items tested as supplied by the client.

Comments and interpretations are beyond the scope of UKAS accreditation.

Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)



Bulk Identification Certificate

Client: Ground Engineering Limited

Site Address:

Date Sampled: 07-May-2019

Date Received: 14-May-2019

Your Ref.:

Project:

Job Number:

No Samples:

Date Reported:

C14757 NHM, Victoria Tower

Gardens, London, SW1

19-16273

20-May-2019

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
825888	ASB1		TP4	0.80		2185	U	COVENTRY	Paper	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).

The results relate only to items tested as supplied by the client.

Comments and interpretations are beyond the scope of UKAS accreditation.

Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Test Methods

SOP	Title	Parameters included	Method summary
2185	Asbestos	Asbestos	Polarised light microscopy
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry

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.: 19-16944-1

Initial Date of Issue: 24-May-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 20-May-2019

Order No.: C14757 **Date Instructed:** 20-May-2019

No. of Samples: 1

Turnaround (Wkdays): 5 **Results Due:** 24-May-2019

Date Approved: 24-May-2019

Approved By:


Details: Martin Dyer, Laboratory Manager

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited		Chemtest Job No.: 19-16944	
Quotation No.:		Chemtest Sample ID.: 829016	
		Client Sample ID.: D20	
		Sample Location: WS7	
		Sample Type: SOIL	
		Top Depth (m): 4.75	
		Date Sampled: 13-May-2019	
		Asbestos Lab: LIVERPOOL	
Determinand	Accred.	SOP	LOD
pH	U	2010	N/A
Moisture	N	2030	%
Boron (Hot Water Soluble)	U	2120	mg/kg
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l
Cyanide (Free)	U	2300	mg/kg
Cyanide (Total)	U	2300	mg/kg
Arsenic	U	2450	mg/kg
Cadmium	U	2450	mg/kg
Chromium	U	2450	mg/kg
Copper	U	2450	mg/kg
Mercury	U	2450	mg/kg
Nickel	U	2450	mg/kg
Lead	U	2450	mg/kg
Selenium	U	2450	mg/kg
Zinc	U	2450	mg/kg
Chromium (Hexavalent)	N	2490	mg/kg
Organic Matter	U	2625	%
Acenaphthene	U	2700	mg/kg
Acenaphthylene	U	2700	mg/kg
Anthracene	U	2700	mg/kg
Benzo[a]anthracene	U	2700	mg/kg
Benzo[a]pyrene	U	2700	mg/kg
Benzo[b]fluoranthene	U	2700	mg/kg
Benzo[g,h,i]perylene	U	2700	mg/kg
Benzo[k]fluoranthene	U	2700	mg/kg
Chrysene	U	2700	mg/kg
Dibenz[a,h]Anthracene	U	2700	mg/kg
Fluoranthene	U	2700	mg/kg
Fluorene	U	2700	mg/kg
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg
Naphthalene	U	2700	mg/kg
Phenanthrene	U	2700	mg/kg
Pyrene	U	2700	mg/kg
Total Of 16 PAH's	U	2920	mg/kg
Total Phenols	U	2192	mg/kg
ACM Type	U		N/A

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited		Chemtest Job No.: 19-16944			
Quotation No.:		Chemtest Sample ID.:	829016		
		Client Sample ID.:	D20		
		Sample Location:	WS7		
		Sample Type:	SOIL		
		Top Depth (m):	4.75		
		Date Sampled:	13-May-2019		
		Asbestos Lab:	LIVERPOOL		
Determinand	Accred.	SOP	Units	LOD	No Asbestos Detected
Asbestos Identification	U	2192	%	0.001	-
ACM Detection Stage	U	2192		N/A	
Cyanide (Complex)	U	2300	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	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	U	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	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	U	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
Total Of 9 PAH's	U	2700	mg/kg	1.0	< 1.0
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
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; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com

APPENDIX 5 – CHEMICAL LABORATORY TEST RESULTS

GROUNDWATER ANALYSES



Final Report

Report No.: 19-18673-1

Initial Date of Issue: 11-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London 5EI

Quotation No.: **Date Received:** 04-Jun-2019

Order No.: C14757 **Date Instructed:** 04-Jun-2019

No. of Samples: 8

Turnaround (Wkdays): 5 **Results Due:** 10-Jun-2019

Date Approved: 11-Jun-2019

Approved By:


Details: Martin Dyer, Laboratory Manager

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1170	Redox Potential	Redox Potential	Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	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	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

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- U/S Unsuitable Sample
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- > "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.: 19-18944-1

Initial Date of Issue: 13-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 06-Jun-2019

Order No.: C14757 **Date Instructed:** 06-Jun-2019

No. of Samples: 8

Turnaround (Wkdays): 5 **Results Due:** 12-Jun-2019

Date Approved: 13-Jun-2019

Approved By:



Details: Robert Monk, Technical Manager

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-18944		19-18944		19-18944		19-18944		19-18944		19-18944	
	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:	Chemtest Sample ID.:	Sample Location:
	BH1	BH1	BH2	BH2	BH4	BH5D	WS1	WS5	WS6							
	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER							
	6.87	6.43	6.28	6.27	6.42	5.65	3.49	3.18								
	04-Jun-2019	04-Jun-2019	04-Jun-2019	04-Jun-2019	04-Jun-2019	04-Jun-2019	04-Jun-2019	04-Jun-2019	04-Jun-2019							
	Top Depth (m):															
	Date Sampled:															
	Units	LOD														
Determinand	Accred.	SOP	Units	LOD												
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,3-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5-C6, >C6-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44 Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

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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
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- D - Broken Container
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Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com

APPENDIX 6 – CHEMICAL LABORATORY TEST RESULTS

SULPHATE/pH ANALYSES



2183

Final Report

Report No.: 19-18267-1

Initial Date of Issue: 05-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 15

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 05-Jun-2019

Approved By:



Details: Robert Monk, Technical Manager

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

Key

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- M MCERTS and UKAS accredited
- N Unaccredited
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- I/S Insufficient Sample
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- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

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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

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- D - Broken Container
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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

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customerservices@chemtest.com



Final Report

Report No.: 19-18288-1

Initial Date of Issue: 06-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 15

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 06-Jun-2019

Approved By:



Details: Martin Dyer, Laboratory Manager

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Quotation No.:	Client: Ground Engineering Limited		Chemtest Job No.:		19-18288		19-18288		19-18288		19-18288		19-18288		19-18288	
	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:	Chemtest Sample ID.:	Client Sample ID.:
	B6	B6	B6	B6	B8	B8	B11	B11	B15	B15	D14	D14	D15	D15	D15	D15
	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2
	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	2.00	2.00	2.00	2.00	3.00	3.00	4.30	4.30	7.00	7.00	24.40	24.40	25.00	25.00	25.00	25.00
	2.50	2.50	2.50	2.50	3.50	3.50	5.00	5.00	7.50	7.50						
	0.50	0.50	0.50	0.50	0.75	0.75										
	0.75	0.75	0.75	0.75												
	8.4	8.4	8.4	8.4	7.8	7.8	7.9	7.9	8.4	8.4	8.3	8.3	8.3	8.3	8.3	8.3
	7.4	7.4	7.4	7.4	17	17	31	31	7.0	7.0	18	18	18	18	18	18
	0.056	0.056	0.056	0.056	0.16	0.16	0.66	0.66	0.23	0.23	0.041	0.041	0.092	0.092	0.092	0.092
	< 0.010	< 0.010	< 0.010	< 0.010	0.011	0.011	0.026	0.026	< 0.010	< 0.010	0.010	0.010	0.028	0.028	0.028	0.028
	0.010	0.010	0.010	0.010							0.32	0.32	0.37	0.37	0.37	0.37
	0.010	0.010	0.010	0.010	0.013	0.013	0.028	0.028	< 0.010	< 0.010	0.017	0.017	0.023	0.023	0.023	0.023
	0.010	0.010	0.010	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	1.0	1.0	1.0	1.0												

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited	Chemtest Job No.:	19-18288		
Quotation No.:	Chemtest Sample ID.:	834878		
	Client Sample ID.:	W1		
	Sample Location:	BH2		
	Sample Type:	WATER		
	Top Depth (m):	9.00		
	Date Sampled:	07-May-2019		
Determinand	Accred.	SOP	Units	LOD
pH	U	1010		N/A
Sulphate	U	1220	mg/l	1.0
Chloride	U	1220	mg/l	1.0
Nitrate as N	U	1220	mg/l	0.50
Magnesium	U	1415	mg/l	0.50

Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
834878		W1	BH2	07-May-2019	B	Plastic Tub 500g

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

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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.: 19-18272-1

Initial Date of Issue: 05-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 3

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 05-Jun-2019

Approved By:



Details: Robert Monk, Technical Manager

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited		Chemtest Job No.: 19-18272		19-18272		19-18272	
Quotation No.:		Chemtest Sample ID.: 834797		834798		834799	
		Client Sample ID.: B2		B4		B7	
		Sample Location: BH3		BH3		BH3	
		Sample Type: SOIL		SOIL		SOIL	
		Top Depth (m): 0.40		1.20		2.10	
		Bottom Depth (m): 0.80		1.50		2.60	
		Date Sampled: 10-May-2019		10-May-2019		10-May-2019	
Determinand	Accred.	SOP	Units	LOD			
pH	U	2010		N/A	8.4	8.4	8.6
Moisture	N	2030	%	0.020	12	13	9.8
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.027	0.021	0.078

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES

Report Information

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- > "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.: 19-18277-1

Initial Date of Issue: 10-Jun-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 14

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 10-Jun-2019

Approved By:


Details: Martin Dyer, Laboratory Manager



Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
834836		B2	BH4		A	Plastic Tub 500g
834837		B5	BH4		A	Plastic Tub 500g
834838		B10	BH4		A	Plastic Tub 500g
834839		B11	BH4		A	Plastic Tub 500g
834840		B12	BH4		A	Plastic Tub 500g
834841		B16	BH4		A	Plastic Tub 500g
834842		D4	BH4		A	Plastic Tub 500g
834843		D10	BH4		A	Plastic Tub 500g
834844		D17	BH4		A	Plastic Tub 500g
834845		D25	BH4		A	Plastic Tub 500g
834846		D27	BH4		A	Plastic Tub 500g
834847		D28	BH4		A	Plastic Tub 500g
834848		D29	BH4		A	Plastic Tub 500g
834849		D31	BH4		A	Plastic Tub 500g

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

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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.: 19-18269-1

Initial Date of Issue: 05-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 5

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 05-Jun-2019

Approved By:



Details: Robert Monk, Technical Manager

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited	Chemtest Job No.:	19-18269	19-18269	19-18269	19-18269	19-18269	19-18269
Quotation No.:	Chemtest Sample ID.:	834791	834791	834791	834791	834791	834791
	Client Sample ID.:	B4	B7	B10	B12	D1	
	Sample Location:	BH5	BH5	BH5	BH5	BH5	BH5
	Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):	1.20	2.50	3.80	5.00	11.25	
	Bottom Depth (m):	1.50	3.00	4.10	5.50		
Determinand	Accred.	SOP	Units	LOD			
pH	U	2010		N/A	[A] 8.5	[A] 8.2	[A] 8.5
Moisture	N	2030	%	0.020	12	25	28
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.18	0.83	0.30

Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
834789		B4	BH5		A	Plastic Tub 500g
834790		B7	BH5		A	Plastic Tub 500g
834791		B10	BH5		A	Plastic Tub 500g
834792		B12	BH5		A	Plastic Tub 500g
834793		D1	BH5		A	Plastic Tub 500g

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES

Report Information

Key

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- 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



2183

Final Report

Report No.: 19-18279-1

Initial Date of Issue: 06-Jun-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 06-Jun-2019

Approved By:



Details: Robert Monk, Technical Manager

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited		Chemtest Job No.:	19-18279	19-18279	19-18279	19-18279
Quotation No.:		Chemtest Sample ID.:	834851	834852	834853	834854
		Client Sample ID.:	B10	B13	B14	B15
		Sample Location:	BH1	BH5	BH5	BH5
		Sample Type:	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):	5.70	6.00	7.20	8.00
		Bottom Depth (m):	6.00	6.50	7.60	8.50
		Date Sampled:	13-May-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019
Determinand	Accred.	SOP	Units	LOD		
pH	U	2010		N/A		
Moisture	N	2030	%	[B] 8.3	[B] 8.5	[B] 8.7
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	26	7.0	3.5
				0.19	0.13	0.045

Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
834852		B13	BH5	29-Apr-2019	B	Plastic Tub 500g
834853		B14	BH5	29-Apr-2019	B	Plastic Tub 500g
834854		B15	BH5	29-Apr-2019	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES

Report Information

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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.: 19-16607-1

Initial Date of Issue: 22-May-2019

Client Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 16-May-2019

Order No.: C14757 **Date Instructed:** 16-May-2019

No. of Samples: 3

Turnaround (Wkdays): 5 **Results Due:** 22-May-2019

Date Approved: 22-May-2019

Approved By:



Details: Martin Dyer, Laboratory Manager

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

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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.: 19-18284-1

Initial Date of Issue: 06-Jun-2019

Client: Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Steve Fleming

Project: C14757 NHM, Victoria Tower Gardens,
London SW1

Quotation No.: **Date Received:** 30-May-2019

Order No.: C14757 **Date Instructed:** 30-May-2019

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 05-Jun-2019

Date Approved: 06-Jun-2019

Approved By:



Details: Martin Dyer, Laboratory Manager

Project: C14757 NHM, Victoria Tower Gardens, London SW1

Client: Ground Engineering Limited		Chemtest Job No.: 19-18284		19-18284		19-18284		19-18284	
Quotation No.:		Chemtest Sample ID.: 834861		834862		834863		834864	
		Client Sample ID.: D12		D14		D1		D12	
		Sample Location: WS4		WS4		WS5		WS6	
		Sample Type: SOIL		SOIL		SOIL		SOIL	
		Top Depth (m): 5.20		5.80		0.20		4.30	
		Date Sampled: 09-May-2019		09-May-2019		10-May-2019		09-May-2019	
Determinand	Accred.	SOP	Units	LOD					
pH (2.5:1)	N	2010		N/A	8.3	8.1	11.2	9.3	
Moisture	N	2030	%	0.020	26	38	9.3	40	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.032	0.26	0.74	0.36	
Magnesium (Water Soluble)	N	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	
Chloride (Water Soluble)	U	2220	g/l	0.010	0.010	0.015	0.025	0.029	
Nitrate (Water Soluble)	N	2220	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com

APPENDIX 7

WASTE TRANSFER NOTES



Gowing & Pursey
100 Twyford Abbey Road
Park Royal
NW10 7XE

Telephone No: 0208 963 4070
Fax No: 0208 963 4078
VAT Reg: 510 3722 94
Landfill Tax Reg No: 510 3722 94

TicketNo: 1161578
Date: 09/05/2019
Time: 09:26
Outlet: Twyford Abbey Road In
Site Licence: EAWML400803

Customer Acc No: G9999
Customer Acc Name: GOWING AND PURSEY - INTERNAL ACC
Site Name: THE HIRE NETWORK / SKIP UK - MILLBANK
Site Address: C/O GROUND ENGINEERING LTD,
VICTORIA TOWER GARDENS
ENTRANCE OFF DEAN STANLEY STREET
MILLBANK
Postcode: SW1P 3JU
Sic Code: 00.00
Customer Order No: X63235/H63235

Vehicle Reg: WN66LRE
Haulier: GOWING AND PURSEY
Waste Carrier Reg: CBDU103062

**Consignment
Note No:** 1161269

Product Code: GENERAL
Description: GENERAL
Unit of Sale: Tonnes

EWC Code: 170904
Description: Mixed construction &
demolition waste

Weights

Tare: 10600.00
Tally No:
Gross: 13260.00
Tally No:
Net: 2660.00
Quantity: 2.660

I confirm that I have fulfilled my duty to apply
the waste hierarchy as required by regulation
12 of the Waste (England and Wales)
Regulations 2011.

Driver's Name

CLAUDIU COROGIANU

Weighbridge Operator

AnnA



Gowing & Pursey
100 Twyford Abbey Road
Park Royal
NW10 7XE

Telephone No: 0208 963 4070
Fax No: 0208 963 4078
VAT Reg: 510 3722 94
Landfill Tax Reg No: 510 3722 94

TicketNo: 1163680
Date: 21/05/2019
Time: 09:11
Outlet: Twyford Abbey Road In
Site Licence: EAWML400803

Customer Acc No: G9999
Customer Acc Name: GOWING AND PURSEY - INTERNAL ACC
Site Name: THE HIRE NETWORK / SKIP UK - MILLBANK
Site Address: C/O GROUND ENGINEERING LTD,
VICTORIA TOWER GARDENS
ENTRANCE OFF DEAN STANLEY STREET
MILLBANK
Postcode: SW1P 3JU
Sic Code: 00.00
Customer Order No: X63235/H63235

Vehicle Reg: GP17PUR
Haulier: GOWING AND PURSEY
Waste Carrier Reg: CBDU103062

**Consignment
Note No:** 1163226

Product Code: GENERAL
Description: GENERAL
Unit of Sale: Tonnes

EWC Code: 170904
Description: Mixed construction &
demolition waste

Weights

Tare: 10200.00

Tally No:

Gross: 12720.00

Tally No:

Net: 2520.00

Quantity: 2.520

I confirm that I have fulfilled my duty to apply
the waste hierarchy as required by regulation
12 of the Waste (England and Wales)
Regulations 2011.

Driver's Name

MATEUSZ TOMCZYK

Weighbridge Operator

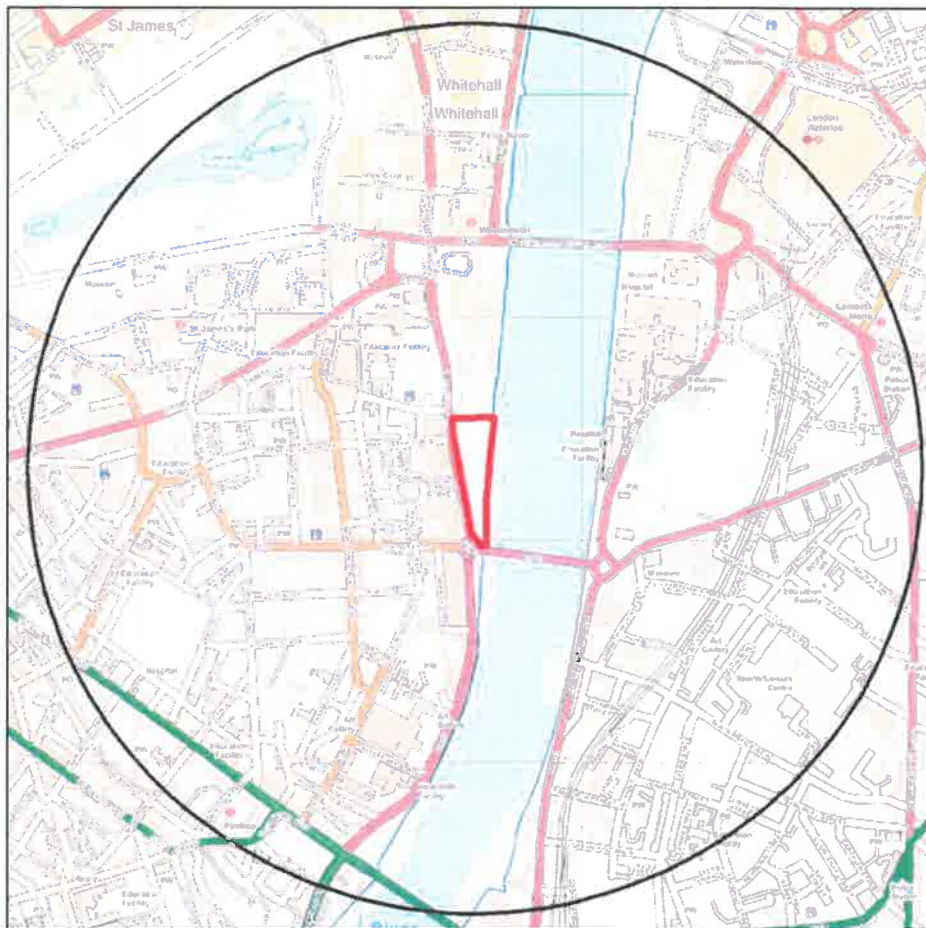
AnnA

APPENDIX 8

PRELIMINARY UNEXPLODED ORDNANCE (UXO) THREAT ASSESSMENT

PRELIMINARY UNEXPLODED ORDNANCE (UXO) THREAT ASSESSMENT

Meeting the requirements of CIRIA C681 'Unexploded Ordnance (UXO) – A guide for the Construction Industry' Risk Management Framework



PROJECT NUMBER	P7546	ORIGINATOR	J. Webber
VERSION NUMBER	1.0	REVIEWED BY	S. Barratt (13 th August 2019)
CLIENT	Ground Engineering	RELEASED BY	R. Griffiths (14 th August 2019)
SITE	Victoria Tower Gardens, London SW1P 3JU		
RECOMMENDATION	This Site requires a Detailed UXO Threat and Risk Assessment		



STUDY SITE

The Study Site is described as "Victoria Tower Gardens, London SW1P 3JU", and it is centred on National Grid Reference 530257, 179160.

THREAT POTENTIAL AND RECOMMENDATIONS

The potential for a UXO hazard to occur, and more specifically, the potential for unexploded WWI and WWII ordnance to exist at this site is assessed as being **LIKELY** (*Figure 2*).

In accordance with *CIRIA C681* Chapter 5 on managing UXO risks, *6 Alpha* recommends that the next stage in the risk management framework is:

DETAILED UXO THREAT & RISK ASSESSMENT



We would be pleased to provide this service, please contact *6 Alpha Associates* for further details.

REPORT SUMMARY

During WWII, the Study Site was situated within *Westminster Metropolitan Borough*, which recorded 122 High Explosive (HE) bomb strikes per 100 hectares; a very high level of bombing.

Luftwaffe aerial reconnaissance photography associated with the Site identified five command posts (located 140m west, 315m north-west, 390m north-west, 820m north and 910m north) as primary bombing targets.

Air Raid Precaution (ARP) records identified two HE bomb strikes on-site. In addition, six HE bomb strikes were identified within 40m of the Site boundary; the closest being 2m south-west. Furthermore, three Unexploded Bombs (UXBs) were recorded 30m west, 130m north-west and 220m north of the Site boundary.

London County Council (LCC) bomb damage mapping did not identify any areas of bomb damage on-site, however, given that the Site was largely undeveloped during WWII, areas of bomb damage were unlikely to have been displayed. Nonetheless, "serious damage; doubtful if repairable" was identified 25m north-west and "general blast damage; minor in nature" was identified 60m north-west of the Site boundary.

Given that bomb strikes were recorded on-site during WWII; it would suggest that further action is warranted to address the potential for UXO encounter.

USING THIS REPORT

This Preliminary Assessment is designed to inform environmental and construction professionals of the potential threat of military related explosives and/or ordnance on, or in, the vicinity of the Study Site.

This assessment is designed to be employed as a site-screening tool to meet with the requirement of Phase One of the *CIRIA UXO Risk Management Framework*; there are two broad prospective outcomes; either the threat level requires a detailed threat & risk assessment; or no further action is required. In the former instance we can provide a report within 10 working days (or more quickly upon application).

Two figures accompany the report, the *Second World War* (WWII) High Explosive (HE) Bomb Density and the final Probability of UXO Encounter. The purpose of this approach is to demonstrate that whilst bomb density statistics give an indication for WWII bombing, they should not be relied upon exclusively to generate a holistic assessment.

For further information, please contact *6 Alpha*:

Website: <http://www.6alpha.com>

Telephone: +44 (0)2033 713 900

Email: enquiry@6alpha.com

DATA FINDINGS

Threat Source (within 1,000m)		Identified	Detail Comments
	Airfields/Military Facilities	✓	<i>Horse Guards (850m north-north-west), Wellington Barracks (885m west-north-west) and DCSA St. Vincent (915m north).</i>
	Ordnance Manufacture/Storage	✓	<i>Whitehall Old War Office (895m north).</i>
	WWII Decoy Bombing Sites	✗	None recorded within 1,000m.
	WWII Defensive Features	✓	Pillbox (on-site and eight within 830m; closest being 305m west).
	WWII <i>Luftwaffe</i> Designated Bombing Targets	✓	<i>Luftwaffe</i> aerial photography identified five command posts as primary bombing targets within 910m; closest being 140m west.
	WWII Bomb Strikes Within Site Boundary	✓	ARP records identified two HE bomb strikes on-site.
	WWII Bomb Strikes Near Site Boundary	✓	ARP records identified six HE bomb strikes located 2m south-west, 10m north, 30m south-west, 30m north, 35m north and 40m west.
	WWII Bomb Damage	✓	LCC bomb damage mapping identified "serious damage; doubtful if repairable" 25m north-west of the Site boundary.
	Abandoned Bomb Register	✗	The official abandoned bomb list did not identify any abandoned bombs located on-site or within 1,000m of the Site boundary.
	Potential Threat Sources	✓	The most probable UXO threat is posed by WWII <i>German</i> HE bombs, whilst IBs and <i>British</i> AAA projectiles pose a residual threat.
	WWII Bombing Density Per 100 Hectares	✓	The Site was located within <i>Westminster Metropolitan Borough</i> , which recorded 122 HE bomb strikes per 100 hectares.

IMPORTANT NOTES

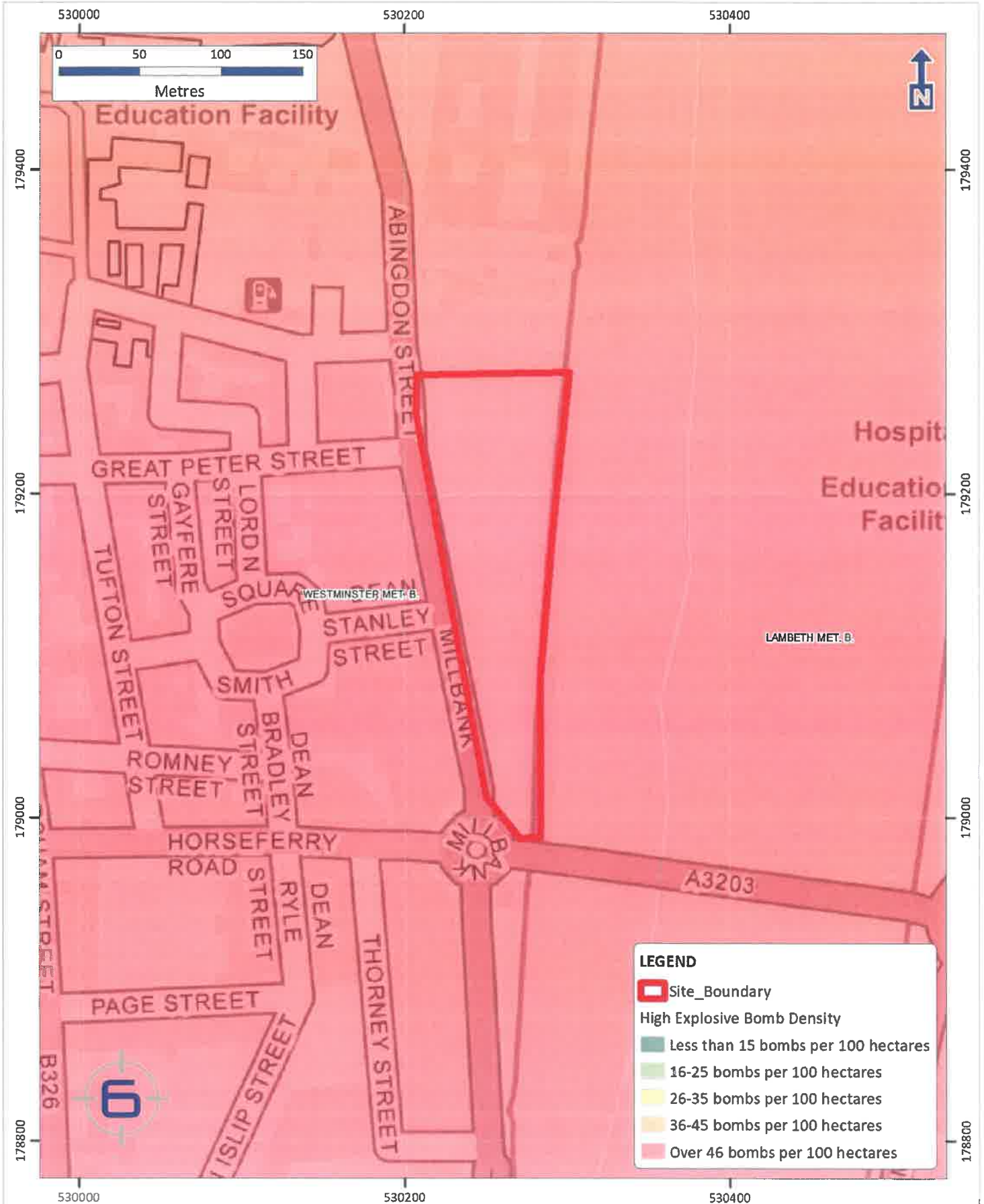
1. The term 'Preliminary UXO Threat Assessment' has been used to describe this report, to fall in line with the *CIRIA* C681 guidelines. Whilst the term 'Risk' can be justifiably used at this stage, the reader should note that the 'Consequence' function of 'Risk' is not considered. Should it be required, this would be addressed in the 'Detailed UXO Threat & Risk Assessment' (Stages 2 and 3).
2. This report is accurate and up to date at the time of writing.
3. The assessment levels have been generated from historical data and third party sources. Where possible *6 Alpha* have sought to verify the accuracy of such data, but cannot be held accountable for inherent errors that may be in third party data sets (e.g. *National Archives* or library sources).
4. *6 Alpha* have exercised all reasonable care, skill and due diligence in producing this service.
5. Whilst every effort has been used to identify all potential UXO/explosive threats, there were a number of private facilities, which may not have released privately recorded information concerning UXO/explosive threats into the public domain. It is therefore possible that some of the aforementioned sites may not be included within the database.

VICTORIA TOWER GARDENS, LONDON SW1P 3JU

WWII High Explosive Bomb Density



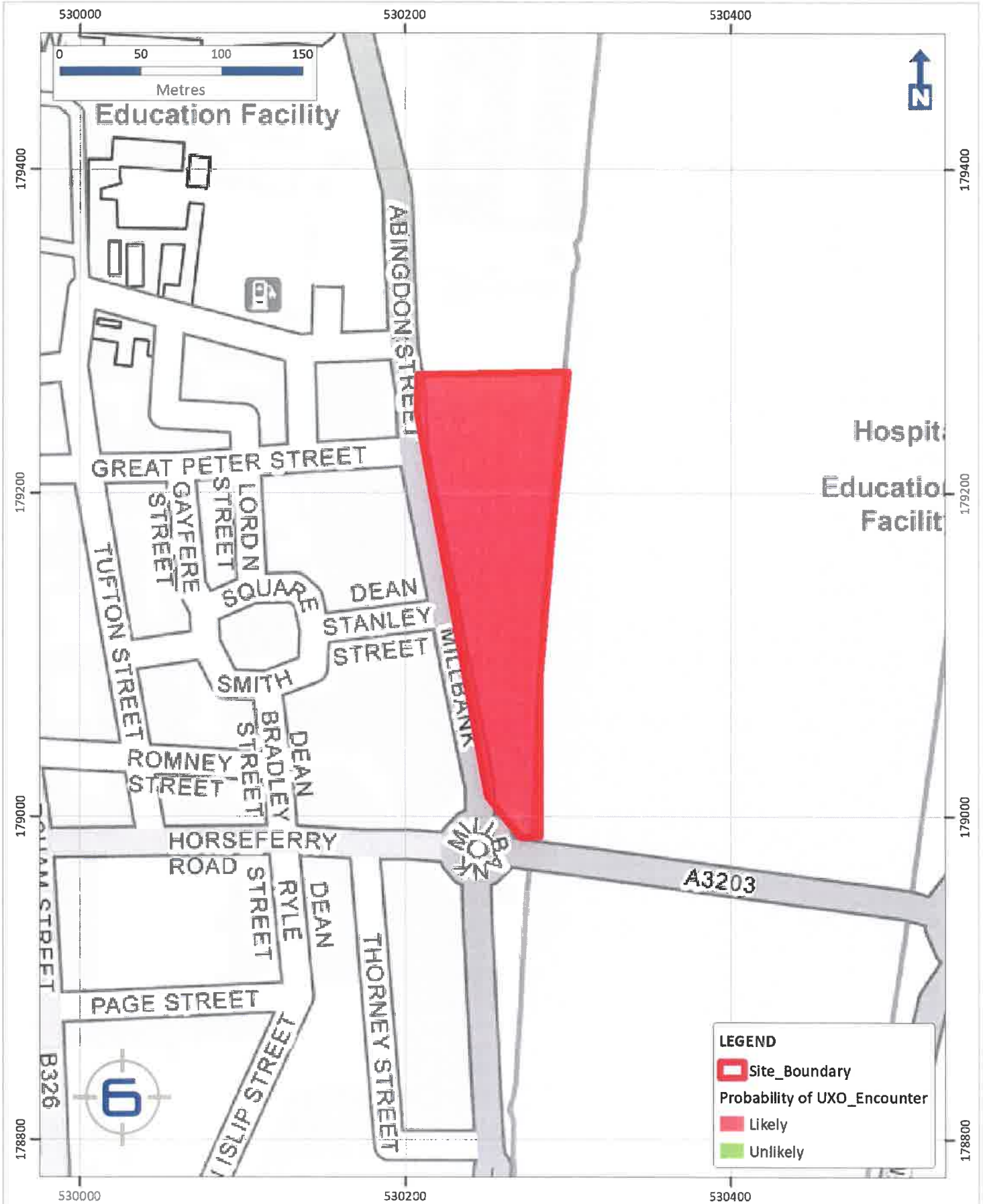
BRITISH NATIONAL GRID



PROJECT NO. P7546	FIGURE 1	DRAWN CC	CHECKED SB	DATE 12 August 2019	Contains Ordnance Survey data © Crown copyright and database right 2017	Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha.	
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Probability of UXO Encounter

BRITISH NATIONAL GRID



LEGEND

- Site_Boundary
- Probability of UXO_Encounter
- Likely
- Unlikely

PROJECT NO. P7546	FIGURE 2	DRAWN CC	CHECKED SB	DATE 12 August 2019	Contains Ordnance Survey data © Crown copyright and database right: 2017	Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha.	
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