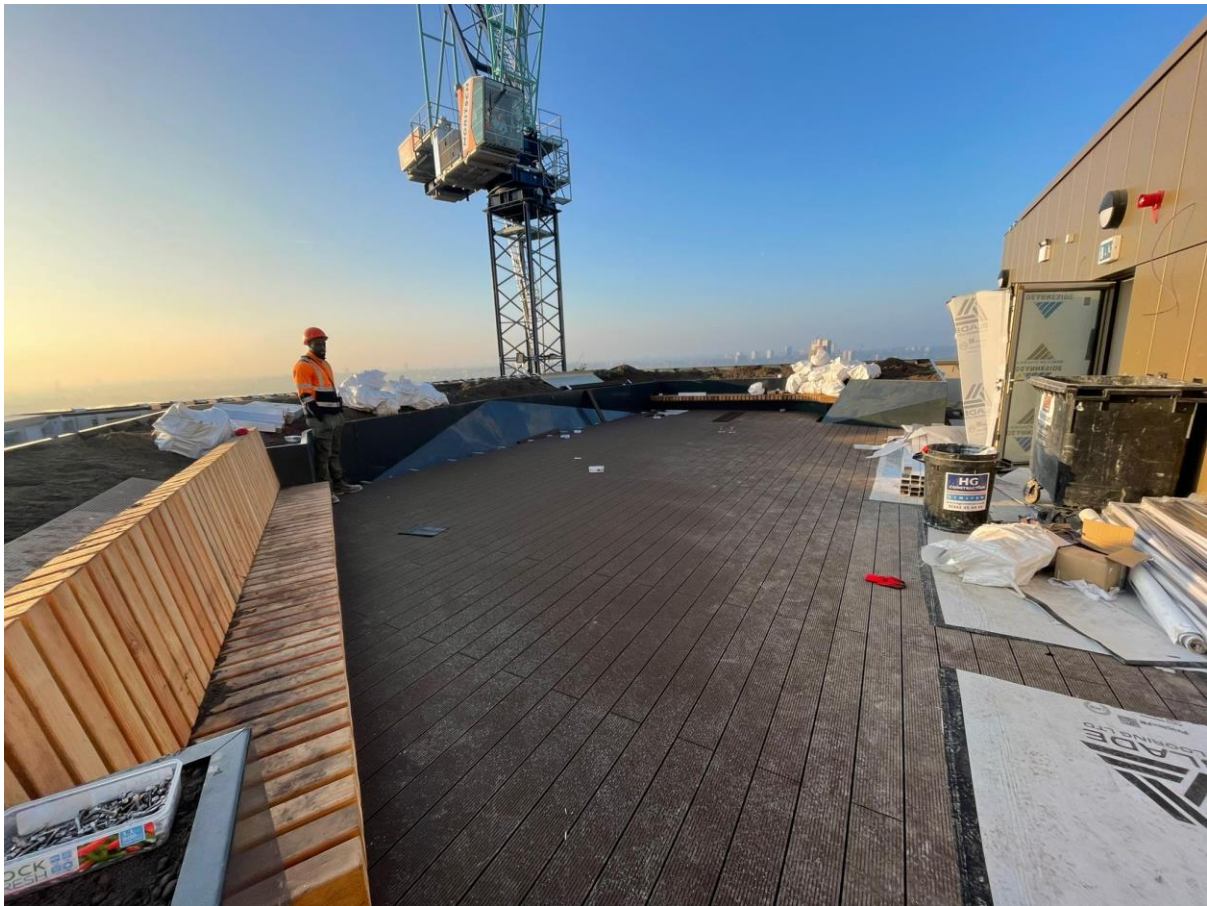
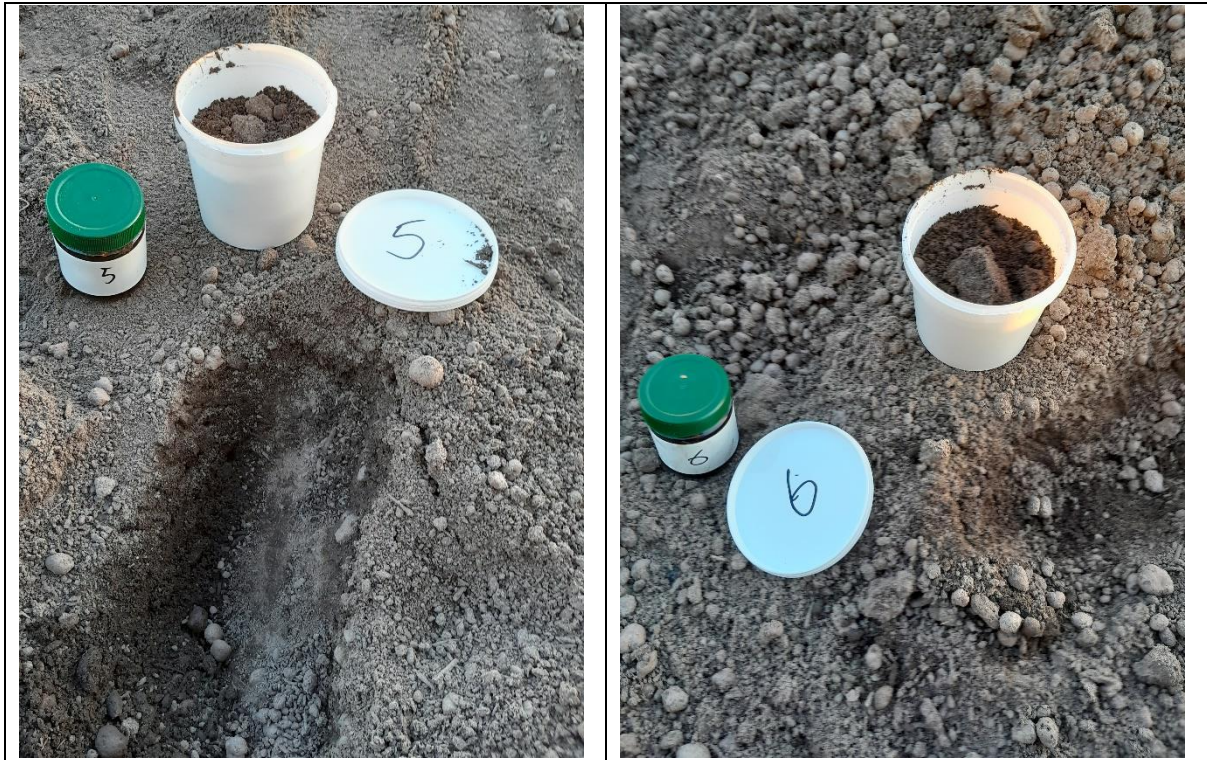
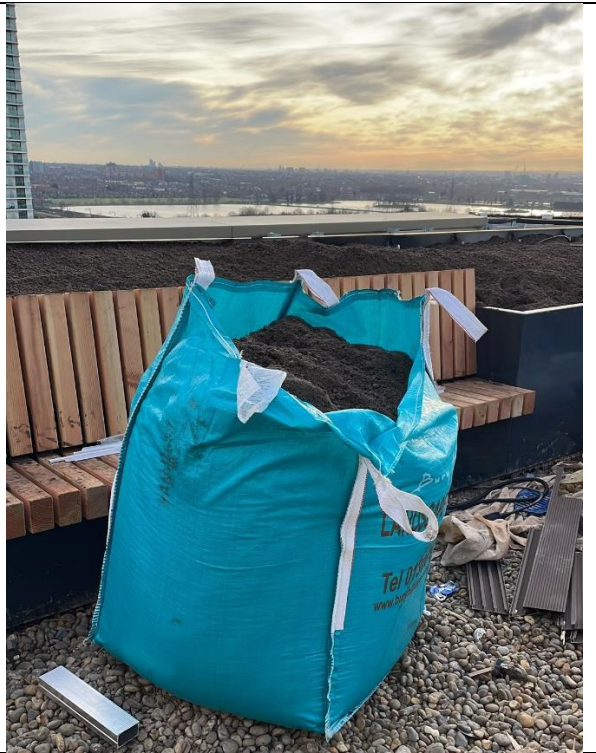


ATTACHMENT 5: IMPORTED TOPSOIL AND CAPPING LAYER VERIFICATION









Nick Tocher
Symbiotic Solutions Ltd
Unit A1
East Gores Farm
East Gores Road
Coggeshall
Essex
CO6 1RZ

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-01888

Site Reference: THNI
Project / Job Ref: 1320
Order No: None Supplied
Sample Receipt Date: 13/02/2023
Sample Scheduled Date: 13/02/2023
Report Issue Number: 1
Reporting Date: 22/02/2023

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate						
DETS Report No: 23-01888	Date Sampled	07/02/23	07/02/23	07/02/23	07/02/23	07/02/23
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THNI	TP / BH No	1320/101	1320/102	1320/103	1320/105	1320/106
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E5	E6
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 22/02/2023	DETS Sample No	634114	634115	634116	634117	634118

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.6	8.3	8.4	8.2	8.0
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	554	571	498	476	429
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.06	0.06	0.05	0.05	0.04
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Organic Matter (SOM)	%	< 0.1	MCERTS	2.3	3	3	2.9	3.6
TOC (Total Organic Carbon)	%	< 0.1	MCERTS	1.3	1.7	1.8	1.7	2.1
Arsenic (As)	mg/kg	< 2	MCERTS	12	15	13	15	14
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	9	10	9	10	9
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	6	8	7	8	7
Lead (Pb)	mg/kg	< 3	MCERTS	218	9	8	9	8
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	< 3	5	4	5	3
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Zinc (Zn)	mg/kg	< 3	MCERTS	16	19	16	18	16
Total Phenols (monohydric)	mg/kg	< 1	NONE	< 2	< 2	< 2	< 2	< 2
EPH (C10 - C40)	mg/kg	< 6	MCERTS	82	60	90	55	108

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-01888	Date Sampled	07/02/23	07/02/23	07/02/23	07/02/23	07/02/23
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THNI	TP / BH No	1320/101	1320/102	1320/103	1320/105	1320/106
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E5	E6
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 22/02/2023	DETS Sample No	634114	634115	634116	634117	634118

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6



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Tel : 01622 850410



Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 23-01888	Date Sampled	07/02/23	07/02/23	07/02/23	07/02/23	07/02/23
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THNI	TP / BH No	1320/101	1320/102	1320/103	1320/105	1320/106
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E5	E6
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 22/02/2023	DETS Sample No	634114	634115	634116	634117	634118

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	17	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 23-01888	Date Sampled	07/02/23	07/02/23	07/02/23	07/02/23	07/02/23
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THNI	TP / BH No	1320/101	1320/102	1320/103	1320/105	1320/106
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E5	E6
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 22/02/2023	DETS Sample No	634114	634115	634116	634117	634118

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 23-01888	
Symbiotic Solutions Ltd	
Site Reference: THNI	
Project / Job Ref: 1320	
Order No: None Supplied	
Reporting Date: 22/02/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
634114	1320/101	E1	None Supplied	10.4	Black sandy clay with stones and concrete
634115	1320/102	E2	None Supplied	8.2	Black sandy clay with stones
634116	1320/103	E3	None Supplied	11.1	Black sandy clay with stones
634117	1320/105	E5	None Supplied	6.9	Black sandy clay with stones and concrete
634118	1320/106	E6	None Supplied	8	Black sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{u/s}



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Maidstone
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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-01888

Symbiotic Solutions Ltd

Site Reference: THNI

Project / Job Ref: 1320

Order No: None Supplied

Reporting Date: 22/02/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

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TN12 6QN

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Fax: 01892 835079
Email: admin@stewardtransport.com

Order No: 64243

Date: _____

Call off No: _____

Job No: _____

Customer/Merchant:-

Delivery Address:-

BURY HILL LANDSCAPES
LOWER Broadbridge Farm
HORSHAM
RH12 3LR

ARF LANDSCAPES
TOTEHAM HOLE
M17 9JZ
07713296253

DRIVERS ARE INSTRUCTED TO DELIVER TO KERBSIDE ONLY. ANY DEVIATION FROM THIS RULE IS AT THE CUSTOMERS ENTIRE RESPONSIBILITY AND IN THE EVENT OF A COLLISION OR DAMAGE NO CLAIM WILL BE ACCEPTED BY THE COMPANY

Quantity	Description
12 BLK BAGS	LW INTENSIZE PLANTING SOIL u/c K

Collected From: HORSHAM

Driver: GADGET

Vehicle: GUNTOYRW

Works Ticket No:

SIGN HERE FOR TIME

SIGN HERE FOR GOODS

PRINT

TIME ON SITE

PRINT

SIGN

TIME OFF SITE

SIGN

Green-Tech Limited
Rabbit Hill Business Park
Great North Road, Arkendale
Knaresborough, HG5 0FF.

www.green-tech.co.uk

Tel: 01423 332100 Fax: 01423 332101

Our Standard Terms & Conditions Apply

Inv. Address A & F Landscapes Ltd
2 High Road
Little Downham
Cambridgeshire
CB6 2TB

Del Address: Ship To
A & F Landscapes Ltd
HG Construction
Tottenham Hale
London
N17 9JZ

Tel: 01353 698833
Mobile: 07713 266 253

Account No: A&FL01

Order Date: 17.01.2023
Due Date: 20.01.2023 On
Order No.: 370675
Cust Order Ref.: Tottenham Hale
Shipping Type:
Consignment No.:
Shipping Service: 424463/reddog

17.01.2023

11:20

PL No.	Item	Description	ATP	Qty to Pick	Qty Picked	Ship Type	Packed By
1	190GT4551	Rabbit Hill GT4 Intensive Roof Garden Substrate (1.7m³ bulk bags) SALES USE	-184	10	10		SR
2	190GT4569	GT4 Rabbit Hill Roof Garden Subsoil (1.4m³ bags)	-34	11	11		SR
3	SHIPFL	Full Load Shipping - Artic flatbed without offload	9,875	1			
4							

Site contact Alan Snowball 07713 266253
8am to 4pm It needs to be approached from the north along
Monument Way to line up properly
for the onloading bay. It is an 18 storey building with a tower
crane that has HG Construction on

Signature for Receipt of Goods and agreeance
to T&C's.
Print Name underneath

Date: 19/1/23

Subsoil on rear of trailer
Intensive on front

Any Goods consisting of pesticides and chemicals are sold on the basis that they will be used by competent and users within the guidelines of the FEPA (Food and Environment Protection Act) 1985. Any such Goods are sold on the understanding that they are used strictly within the latest Approved Recommendations for such products. The Buyer acknowledges that when using pesticides and chemicals that they are qualified to do so and that they will ensure that any person that comes into contact with such Goods are suitably qualified and Green-Tech accepts no responsibility for any losses, damages or injuries incurred as a result of any such misuse.

Pick List

RED DOG AREC PART BED 424463

Pre load 19th

Delivered 20th Jan

ATTACHMENT 6: ENABLING WORKS PHASE VALIDATION REPORT

TECHNICAL NOTE

North Island, Tottenham Hale – Validation Report: Enabling, Piling and Attenuation Tank Works

Issue Record			
Project No.	1320		
Document Ref.	1320_TN_210607_ValRpt		
Issue Date	24/03/2021		
Client	HG Construction Limited		
Author	P. Taylor		03/06/2021
Reviewed By	Nick Tocher		07/06/2021

1 Introduction

Symbiotic Solutions Limited (SSL) have been commissioned by HG Construction Limited (the Client) to prepare a remediation validation report for the works undertaken by SSL and the Client at the development site at North Island, Tottenham Hale, London N17 9LR (The Site). The works have comprised the enabling works and installation of the piling mat, piling works and installation of the attenuation tank.

The site is permitted for redevelopment under planning consent HGY/2018/2223 issued by the London Borough of Haringey. The development will comprise demolition and removal of the existing site structures and construction of a 19-storey building to provide 136 no. residential units and 3 no. retail units on the ground floor. The site location and proposed development layout is presented in Appendix 1.

This validation report is required to address (in part) Condition A25 of the above consent (Contaminated Land – Part 2, relating to verification of remediation).

The site has previously been subject to geoenvironmental site investigation and risk assessments and remediation requirements have been determined. These are set out in the following Burro Happold report which has previously been submitted and accepted (planning ref. HGY/2020/3175) in support of discharge of Conditions A24 (Contaminated Land) and A19 (Monitoring) of HGY/2018/2223.

Burro Happold report, *Tottenham Hale Centre Development – North Island, Geoenvironmental Investigation Report*, ref. 0044753-BHE-XX-XX-RP-Y-0001, dated 1st December 2020 (R.1).

2 Summary of Site Investigation and Remediation Strategy

The Burro Happold (BH) report (R.1) determined that (as summarise in Section 13.1 of the BH report):

No gross visual or olfactory evidence of contamination was encountered during the intrusive works. Elevated concentrations of some heavy metals (arsenic, beryllium and lead) and some PAHs exceeded the residential without plant uptake thresholds in the Made Ground. No concentrations of any contaminants analysed in soil exceeded the commercial or Acute thresholds. Asbestos containing materials (ACM) was identified as relatively bound and low friability fragments (tiles) within the Made Ground. Of the 17 Made Ground samples screened for asbestos, one included a positive detection of asbestos and was subsequently quantified at the

limit of detection (0.001% chrysotile). Approximately 30% of samples included concentrations of copper and zinc exceeding phytotoxic threshold.

Concentrations in groundwater of some metals (cadmium, copper, nickel and zinc) were reported above their respective EQS. A similar groundwater regime was also recorded on the Ashley Road West Plot to the northeast and Ashley Road East Plot further to the northeast, suggesting these slightly elevated concentrations are present within the local area rather than localised on the Plot. Hydrocarbons in groundwater reported at concentrations less than laboratory limits of detection. The results do not report elevated lead or arsenic concentrations in groundwater; therefore, substantial leaching of metals into groundwater from the Made Ground is unlikely to be occurring at the Plot.

The ground gas regime was determined as CS1; therefore, ground gas protection measures are not required.

The relevant recommended mitigation measures (Remediation Strategy) comprised:

- Risks to future users and planting in soft landscaped areas from contact with soils should be mitigated by installation of a geotextile liner and a minimum of 600mm of suitable (for chemical and horticultural purposes) imported soil.
- Suitable material to be imported for use within soft landscaped areas and tree pits. The import criteria were set out in Appendix H of the BH report and are included as Attachment 2 of this report.
- Risks to water supply pipework to be mitigated by using appropriate barrier pipe as agreed with the local network provider and with Building Control.
- Made Ground materials removed from the Plot to be managed in accordance with waste legislation.
- Unexpected or otherwise exceptional contamination (including potential ACM fragments) encountered during development works to be managed through operation of a watching brief and discovery strategy.

3 Summary of Works Undertaken

The development layout plans are included in Appendix 1.

The works undertaken to date by SSL and the Client relevant to the remediation strategy comprise:

- Enabling works including removal of obstructions and reducing site levels prior to installation of the piling platform.
- Installation of piling platform: import of suitable crush materials and installation of the piling mat.
- Piling and removal of pile arisings.
- Installation of the attenuation tank.
- Removal of waste soils.

3.1 Enabling Works and Piling Mat

The site was probed to 2.5mbgl and all obstructions removed, and the soils replaced to formation level. There was a net reduction in site levels prior to building the piling mat up to the required levels. Surplus soils were disposed of off-site.

Prior to works in the respective areas 3 (no.) potentially hazardous waste hotspots identified by the Burro Hapold site investigation report / waste classification analysis were removed to segregated stockpiles

prior to disposal off-site as hazardous waste. The hazardous hotspots were removed at (See Attachment 1 for the site investigation location layout):

- 2020-BH01A – lead concentrations at potentially hazardous levels (at 0.7mbgl)
- TT02 lead concentrations at potentially hazardous levels (at 0.4mbgl)
- TT03 lead and zinc concentrations at potentially hazardous levels (at 0.4mbgl)

The piling mat was installed using imported crush materials in 2 (no.) layers to a minimum 550mm thickness to the required levels.

Over the course of the site works 108 loads (around 900 m³) of imported crush were imported (Summary of import records included in Appendix 6). All materials were products produced under WRAP protocols at permitted facilities. 5 (no.) validation samples were taken and submitted for laboratory analysis to confirm the quality of the imported materials. The laboratory report is included in Attachment 3. The results are discussed in Section 4.2.

3.2 Piling and Removal of Arisings

The piling works were undertaken by Central Piling Limited for the Client. The piling layout is included in Appendix 4.

SSL attended the piling operation to remove and segregate arising for disposal and for loading lorries with stockpiled waste soil for off-site disposal.

3.3 Installation of Attenuation Tank

The attenuation tank layout is included in Appendix 5. The excavation and removal of waste soils was undertaken by SSL. The installation of the attenuation tank was then undertaken by the groundworker for the Client.

3.4 Removal of Waste Soils

Waste soil arisings were segregated on the basis of (1) potential hazardous materials from hotspots, (2) general made ground arisings and (3) natural soils from deeper pile arisings.

Classification was in accordance with WM3 and on the basis of the Burro Happold site investigation information and waste classification information (R.1) and site observations.

Overall the following materials were removed from site:

- 3 (no.) loads of hazardous waste
- 57 (no.) loads of non-hazardous waste (general made ground materials)
- 194 (no.) loads of inert waste (natural soil arisings from piling)
- 68 (no.) loads of concrete
- 7 (no.) loads of mixed construction waste or plastic waste

A summary of the waste transfer records is included in Attachment 6 and full records are available on request.

4 Validation Actions / Results

4.1 Watching Brief

No evidence of unexpected or otherwise exceptional or otherwise potentially significant contamination was identified by SSL or the Client during the course of the works undertaken.

4.2 Imported Crush

Over the course of the site works 108 loads (around 900 m³) of imported crush were imported for the piling mat and other fill. All imported crush materials were products produced under WRAP protocols at permitted facilities.

5 (no.) validation samples (ref. 1320/001 – 1320/005) of the imported crush materials were taken and submitted for laboratory analysis to confirm the quality of the imported materials. The laboratory report is included in Attachment 3.

The potential contaminant levels identified were generally low and generally met the Burro Happold (BH) criteria for imported soils (Attachment 2) with the exception of:

- Low asbestos fibre levels (detected but at <0.001%) were identified in 2 (no.) samples – 1320/001 and 1320/002. Asbestos was not detected in any other sample.
- Benzo(a)pyrene and Benzo(b)fluoranthene were slightly above the BH criteria in 1 (no.) sample (1320/003). It is noted however that this criteria is based on residential soils (i.e. gardens); if compared to equivalent residential public open space screening levels the PAH levels would pass.
- All other potential contaminants pass the BH criteria and were observed to be generally low or below detection limits.

It is noted that the BH criteria are for capping layer soils exposed at the surface in the final development and as such are very conservative for the screening of crush materials. Where crush materials remain present in the permanent works in the final layout they would be below hardstanding or building footprint. If present in areas of soft standing in the final layout these materials would not be physically suitable and would require excavation to at least 0.6m below finished levels and replacement with physically suitable soils that pass the BH criteria.

It is noted that where contaminants have been detected at levels above the BH criterion they are consistent with or below those detected in the site soils during the site investigations. The crush is therefore not degrading the site.

With regard to potential controlled waters risks it is also noted that no determinands were present at levels that are likely to present a risk to controlled waters – particularly as will be largely present under building footprint and hard standing which will act to reduce or negate any infiltration through these materials. In areas of soft standing the crush materials are likely to be largely removed to facilitate the provision of the 0.6m clean soil capping layer required.

4.3 Waste Records

In summary the following waste soils were removed from the site:

Overall, the following materials were removed from site:

- 3 (no.) loads of hazardous waste
- 57 (no.) loads of non-hazardous waste (general made ground materials)
- 194 (no.) loads of inert waste (natural soil arisings from piling)

- 68 (no.) loads of concrete
- 7 (no.) loads of mixed construction waste or plastic waste

A summary of the waste transfer records is included in Attachment 6 and full records are available on request.

4.4 Outstanding Remediation Actions

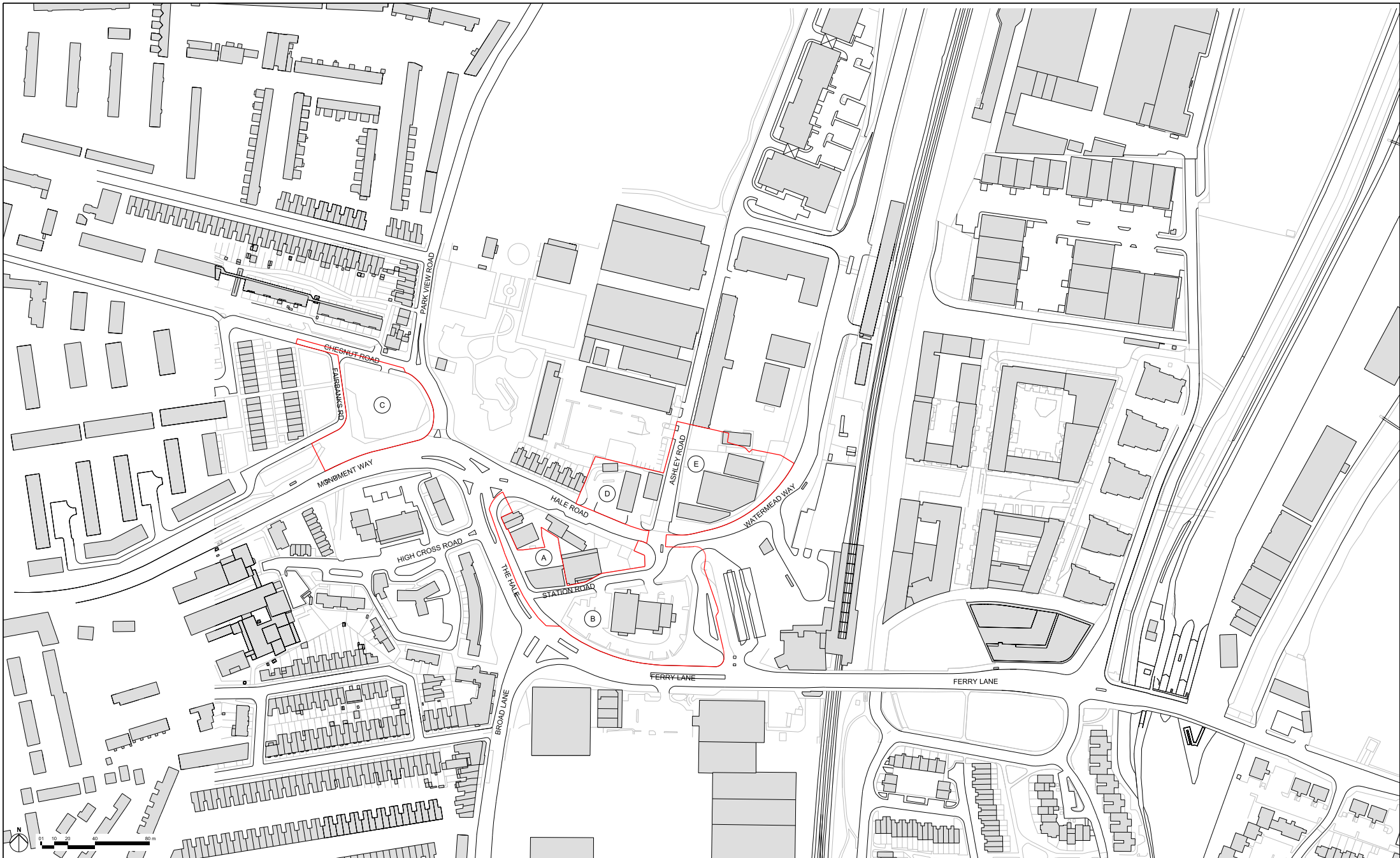
At the time of reporting the following remediation actions are yet to be undertaken / completed; these will need to be completed and validated and a validation report produced when the actions are complete.

- Installation of capping layer soils in areas of soft standing – including import of suitable soils.
- Installation of water pipe to the service supplier's specification.
- Ongoing watching brief for unexpected contamination.

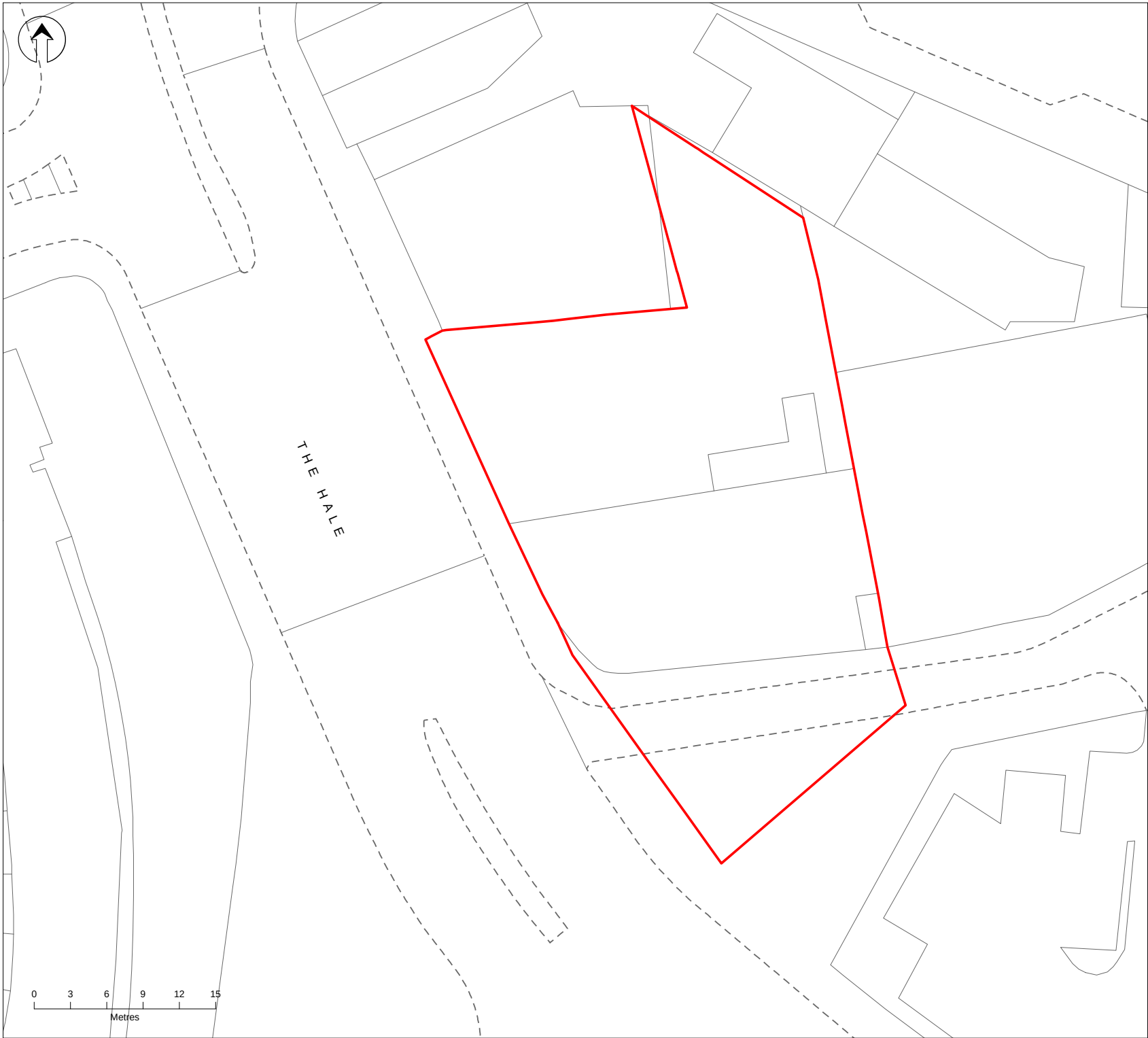
5 References

- R.1. Burro Happold report, Tottenham Hale Centre Development – North Island, Geoenvironmental Investigation Report, ref. 0044753-BHE-XX-XX-RP-Y-001, dated December 2020.

ATTACHMENT 1: SITE LOCATION AND LAYOUT DRAWINGS



KEY	REV DATE	ARCHITECTS		NOTE		
Application Site Boundary	P00 July '18 ISSUED FOR INFORMATION	Ashley Road East	ALISON BROOKS ARCHITECTS Unit 016, Highgate Studios 53-57 Highgate Road London N15 1TL info@alisonbrooksarchitects.com +44 (0)207 267 9777	Ashley Road West Webbourn		Pollard Thomas Edwards Disperser Wharf 38 Graham Street London N1 6JX T +44 (0) 20 7336 7777
A North Island						
B Ferry Island						
C Webbourn						
D Ashley Road West						
E Ashley Road East						
		Ferry Island North Island	ALLFORD HALL MONAGHAN MORRIS Monkshead, 5-23 Old Street London EC1A 1BE T +44 (0) 20 7251 5261 F +44 (0) 20 7251 5123 www.allfords.co.uk	Ferry Square Pavilion	RUFFARCHITECTS 205 Wandsworth Street London W1R 8J1 T +44 (0) 20 3614 8992 info@ruffarchitects.co.uk	



KEY:

 North Island Plot Boundary

COPYRIGHT:

© Crown copyright and database rights 2020 Ordnance Survey 100058778.

PROJECT:

TOTTENHAM HALE

DRAWING TITLE:

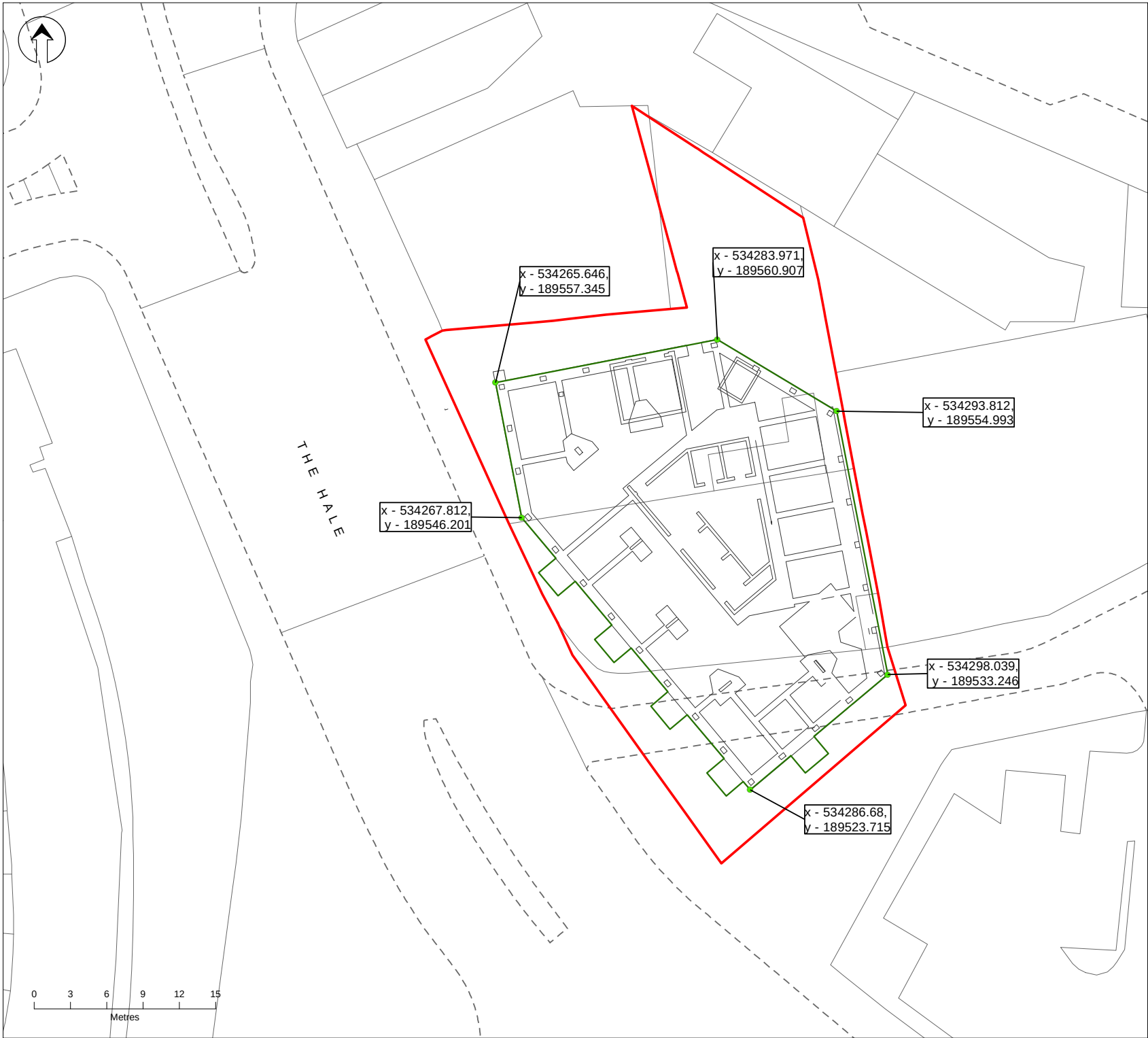
North Island Plot Boundary Plan

SCALE AT A3:	STATUS:	DATE:
1:300	FINAL	28/07/2020
DRAWN BY:	CHECKED BY:	APPROVED BY:
AH	LAW	MS

ARGENT | **RELATED**

4 Stable Street, London, N1C 4AB
T: +44 (0) 20 3664 0200

DRAWING NUMBER:	REV:
TOT-LETH-LOWN-86-A-P01	P01



KEY:

North Island Plot Boundary

Above Ground Building Setting-Out

Below Ground Building Setting-Out

COPYRIGHT:
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PROJECT:
TOTTENHAM HALE

DRAWING TITLE:
North Island: Building Setting Out Plan

SCALE AT A3: 1:300	STATUS: FINAL	DATE: 29/07/2020
DRAWN BY: AH	CHECKED BY: LAW	APPROVED BY: MS

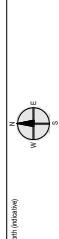
 ARGENT

 RELATED

4 Stable Street, London, N1C 4AB
T: +44 (0) 20 3664 0200

DRAWING NUMBER: TOT-PRDE-SITE-19-A-P01	REV: P01
---	-------------

Released: C:\01_Planets\TOT\Project_Colour\Site_Information\TOT-PRDE-SITE-19-A-P01.mxd
P01 Date: 29/07/2020



- NOTES**
1. Coordinates and levels quoted refer to Ordnance Survey (OS) National Grid.
 2. Bare drawing provided by Volker, with drawing title 'North Island bore hole positions and WGS trenches 210202'.
 3. The drawing should not be scaled, only use annotated dimensions.
 4. All levels are in mOD (metres above Ordnance Datum).
 5. Trial Trenches locations surveyed by Volker. Borehole locations surveyed by Concept.

[illegible]

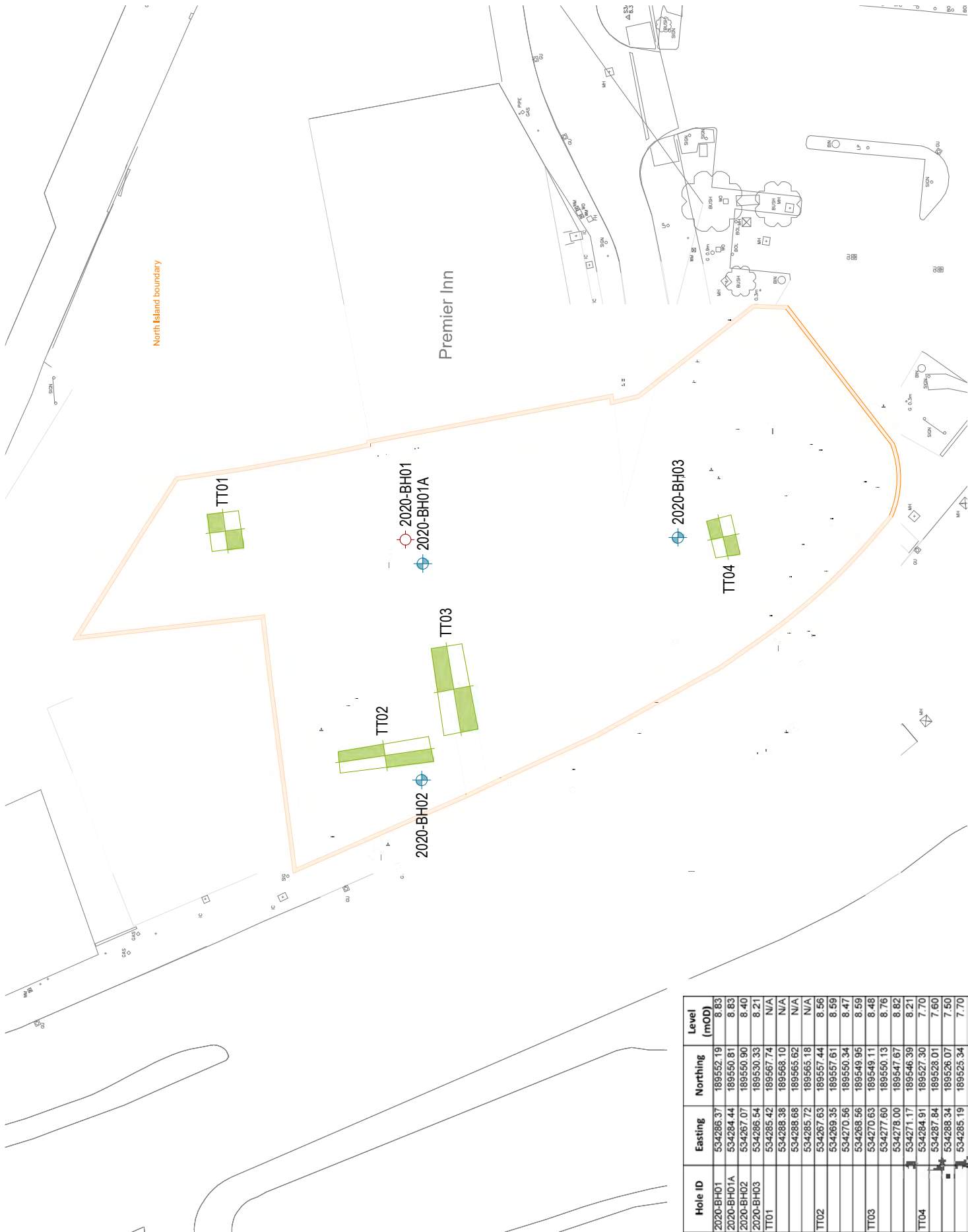
Gardiner and Theobald LLP

Tottenham Hale -
North Island

North Island, 33 The Hale,
Tottenham Hale, London, N17 9JZ

Exploratory Hole Location Plan

Project no	20/3466	Drawing no	01	Revision	00
Scale	NTS	Sheet size	A3		
Date	October 2020	Status	Issue		
Reviewed by	C	Drawn by	AC	Checked by	OS
				Printed by	AB



ATTACHMENT 2: BURO HAPPOLD IMPORT CRITERIA FOR CAPPING LAYER SOILS

Appendix H Suggested Imported Material Criteria

1 Imported Material Criteria

1.1 General

All material that is imported into the Plot, including geotechnical fill, topsoil and subsoil for landscaping, is required to meet the parameters set out in this specification.

1.2 Landscaping Soil Specification

1.2.1 Existing Plot topsoil

It is not anticipated that any topsoil/subsoil that is presently on the Plot will be retained within soft landscaping areas or tree pits due to its chemical and physical composition.

If any material is to be retained and reused, it should be stripped and stored in stockpiles which are separate from other stockpiled soils. Topsoil must not be stockpiled for longer than two years, after two years the stockpile is to be excavated, reconditioned and formed into a new stockpile.

The existing Plot topsoil has not been characterised to date and will therefore require characterisation as outlined below.

1.2.2 Topsoil and Subsoil Specification

All topsoil and subsoil to be used as part of the landscaping areas must comply with the physical, biological and chemical parameters set out in the following sections.

All topsoil must comply with British Standard 3882:2015 (Ref 3) as a multipurpose soil (as set out in Table 1 of that Standard). The soil should be a clay loam as defined in BS3882:2015. The soil is to have a defined granular or blocky structure and be free from non-soil material i.e. brick, other building materials, wastes, hydrocarbons, plant matter, roots and rhizomes of perennial weeds and any other foreign matter or material or substance that would render the topsoil unsuitable for use. The physical parameters of the material must comply with those set out in Table 1 below.

Table 1 Physical Parameters

Determinand	Unit	Sub soil Value	Topsoil Value
Clay (less than 0.002mm)	%	5 - 40	5 – 27
Silt (0.002 - 0.06mm)	%	5 - 60	5 -45
Sand (0.06 - 2.00mm)	%	20 – 65	50 - 90
Max. Stone Content (2 - 50mm)	% by weight	<50	<35
Max. Stone Size in any dimension	mm	75	30

3.2 Soil Quality Parameters

Topsoil must contain sufficient nutrients that it allows plant growth as detailed in Table 2.

Table 2 Soil Quality Parameters (suitability as a growing medium related)

Determinand	Unit	Concentration
pH value	pH units	5.0 - 8.0
Electrical Conductivity (1:2.5 extract)	μS/cm	100 to 1500
Organic Matter	%	4.0 – 15.0
Total Nitrogen	%	>0.2
Extractable Phosphorus	mg/l	>26
Extractable Potassium	mg/l	>240
Extractable Magnesium	mg/l	>50

1.3 Chemical (contamination related) Parameters

Table 3 below details the chemical compounds that require testing for each sample and also details the maximum permissible average concentration of those compounds (i.e. the US⁹⁵ average value for an imported material batch must not exceed these values for the material to be accepted). A batch is considered to be a material that has the same origin (i.e. is made up of the same material and/or is from the same source location).

In the first instance the values have been derived from the LQM Suitable for Use Levels (S4UL) (Ref 1) or the phytotoxic values (Ref 3) and with lead C4SL values have been used (Ref 2).

Table 3 - Chemical (contamination related) Parameters

Determinand	Concentration (mg/kg)	Determinand	Concentration (mg/kg)
Arsenic	40 ¹	Cadmium	85 ¹
Chromium (total)	910 ¹	Lead	310 ²
Mercury	56 ¹	Selenium	430 ¹
Boron	11000 ¹	Copper	200 ³
Nickel	60 ¹	Zinc	300 ³
Naphthalene	2.3 ¹	Benzo[a]anthracene	11 ¹
Acenaphthylene	2900 ¹	Chrysene	30 ¹
Acenaphthene	3000 ¹	Benzo[b]fluoranthene	3.9 ¹
Fluorene	2800 ¹	Benzo[k]fluoranthene	110 ¹
Phenanthrene	1300 ¹	Benzo[a]pyrene	3.2 ¹
Anthracene	31000 ¹	Indeno[123-cd]pyrene	45 ¹
Fluoranthene	1500 ¹	Dibenzo[ah]anthracene	0.31 ¹
Pyrene	3700 ¹	Benzo[ghi]perylene	360 ¹
TPH aliphatic >C5-C6	42 ¹	TPH aromatic >C5-C7	370 ¹
TPH aliphatic >C6-C8	100 ¹	TPH aromatic >C7-C8	860 ¹
TPH aliphatic >C8-C10	27 ¹	TPH aromatic >C8-C10	47 ¹
TPH aliphatic >C10-C12	130 ¹	TPH aromatic >C10-C12	250 ¹
TPH aliphatic >C12-C16	1100 ¹	TPH aromatic >C12-C16	1800 ¹

TPH aliphatic >C16-C35	65000 ¹	TPH aromatic >C16-C21	1900 ¹
Free cyanide	760 ¹	TPH aromatic >C21-C35	1900 ¹
Benzene	0.38	Toluene	869 ¹
Ethylbenzene	83 ¹	Xylene	79 ¹
		Asbestos	No detectable fibres

¹ Value derived from LQM Suitable for Use Levels (Ref 1)

² Value derived from Category 4 Screening Levels (Ref. 2)

³ Value derived from British Standard BS3882:2007 (Ref 3)

1.4 Testing regimes

1.4.1 Material recovered from the Plot

Topsoil material recovered from the Plot and stockpiled will be subject to representative sampling of the stockpile and testing. A minimum of three tests per stockpile will be taken after which one test per 250m³ will be taken. Topsoil that does not meet specification will be rejected and will not be used on the Plot.

1.4.2 Material imported from off-site sources

Topsoil material imported from off-site will be tested either at the source site or in-situ once the topsoil has been placed. Testing will be at a frequency of one sample per 250m³ or a minimum of 5 samples across the Plot (whichever is the greater).

If testing shows that some areas of topsoil fail the criteria the contractor will be required to source material from a different site or, if already placed, excavate and remove these areas and replace them with fresh imported topsoil with further sampling of the fresh imported material. Failure of the criteria will be determined by the engineer. Topsoil that does not meet specification will be rejected and will not be used on the Plot.

1.4.3 Validation of materials

In addition to the laboratory sampling as detailed above, a suitable depth of material (450mm) will be verified by the excavation of topsoil/subsoil following placement, prior to planting. A photographic record of depth with scale indicator (tape measure) will be provided along with a plan of locations.

Appendix References

1. LQM/CIEH. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.
2. Department for Environment, Food and Rural Affairs. SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document. March 2014
3. British Standards Institution. BS3882:2015. Specification for topsoil and requirements for use. 2015

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UK

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Email: francesca.gould@burohappold.com

ATTACHMENT 3: LABORATORY REPORTS



Nick Tocher
Symbiotic Solutions Ltd
Unit A1
East Gores Farm
East Gores Road
Coggeshall
Essex
CO6 1RZ

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 21-06246

Site Reference: THNI

Project / Job Ref: 1320

Order No: None Supplied

Sample Receipt Date: 14/05/2021

Sample Scheduled Date: 14/05/2021

Report Issue Number: 1

Reporting Date: 20/05/2021

Authorised by:

A handwritten signature in black ink, appearing to read "Dave Ashworth".

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 21-06246	Date Sampled	10/05/21	10/05/21	10/05/21	10/05/21	10/05/21
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THN1	TP / BH No	1320/001	1320/002	1320/003	1320/004	1320/005
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E4	E5
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 20/05/2021	DETS Sample No	543398	543399	543400	543401	543402

Determinand	Unit	RL	Accreditation	(n)	(n)	(n)	(n)	(n)
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Detected	Detected	Not Detected	Not Detected	Not Detected
Sample Matrix ^(S)	Material Type	N/a	NONE	Chrysotile present as fibre bundle	Chrysotile present as fibre bundles			
Asbestos Type ^(S)	PLM Result	N/a	ISO17025	Chrysotile	Chrysotile			
Asbestos Quantification ^(S)	%	< 0.001	ISO17025	< 0.001	< 0.001			
pH	pH Units	N/a	ISO17025	10.1	10.1	9.8	10.7	10.0
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Total Sulphate as SO ₄	mg/kg	< 200	ISO17025	13820	15240	13930	13740	12910
Total Sulphate as SO ₄	%	< 0.02	ISO17025	1.38	1.52	1.39	1.37	1.29
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Organic Matter (SOM)	%	< 0.1	ISO17025	0.8	0.9	< 0.1	1.1	0.8
TOC (Total Organic Carbon)	%	< 0.1	ISO17025	0.5	0.5	< 0.1	0.6	0.4
Arsenic (As)	mg/kg	< 2	ISO17025	12	13	13	13	12
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	NONE	0.3	0.3	0.3	0.3	0.3
Chromium (Cr)	mg/kg	< 2	ISO17025	20	21	22	19	20
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	ISO17025	60	90	82	81	83
Lead (Pb)	mg/kg	< 3	ISO17025	138	190	195	193	149
Mercury (Hg)	mg/kg	< 1	ISO17025	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	ISO17025	15	17	17	15	16
Selenium (Se)	mg/kg	< 2	ISO17025	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	ISO17025	281	525	266	324	304
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
EPH (C10 - C40)	mg/kg	< 6	ISO17025	226	439	297	311	414

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 21-06246	Date Sampled	10/05/21	10/05/21	10/05/21	10/05/21	10/05/21
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THNI	TP / BH No	1320/001	1320/002	1320/003	1320/004	1320/005
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E4	E5
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 20/05/2021	DETS Sample No	543398	543399	543400	543401	543402

Determinand	Unit	RL	Accreditation	(n)	(n)	(n)	(n)	(n)
Naphthalene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	ISO17025	< 0.1	0.22	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	ISO17025	< 0.1	0.23	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	ISO17025	0.33	10.30	0.31	0.37	0.36
Anthracene	mg/kg	< 0.1	ISO17025	< 0.1	2.87	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	ISO17025	0.61	16.20	0.70	0.72	1.01
Pyrene	mg/kg	< 0.1	ISO17025	0.59	12.80	0.69	0.70	1.06
Benzo(a)anthracene	mg/kg	< 0.1	ISO17025	0.36	5.63	0.45	0.47	0.91
Chrysene	mg/kg	< 0.1	ISO17025	0.36	3.93	0.40	0.39	0.74
Benzo(b)fluoranthene	mg/kg	< 0.1	ISO17025	0.56	4.80	0.90	0.86	1.95
Benzo(k)fluoranthene	mg/kg	< 0.1	ISO17025	0.22	1.83	0.29	0.30	0.62
Benzo(a)pyrene	mg/kg	< 0.1	ISO17025	0.39	4.02	0.65	0.60	1.40
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	ISO17025	0.20	1.16	0.21	0.23	0.55
Dibenz(a,h)anthracene	mg/kg	< 0.1	ISO17025	< 0.1	0.16	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	ISO17025	0.19	0.86	0.16	0.19	0.45
Total EPA-16 PAHs	mg/kg	< 1.6	ISO17025	3.8	65	4.8	4.8	9

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 21-06246	Date Sampled	10/05/21	10/05/21	10/05/21	10/05/21	10/05/21
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THN1	TP / BH No	1320/001	1320/002	1320/003	1320/004	1320/005
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E4	E5
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 20/05/2021	DETS Sample No	543398	543399	543400	543401	543402

Determinand	Unit	RL	Accreditation	(n)	(n)	(n)	(n)	(n)
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	ISO17025	< 3	< 3	3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	ISO17025	< 3	7	6	4	10
Aliphatic >C21 - C34	mg/kg	< 10	ISO17025	44	73	55	90	112
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	44	80	64	95	122
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	ISO17025	< 2	5	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	ISO17025	< 3	83	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	ISO17025	< 10	54	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	142	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	44	222	64	95	122

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 21-06246	Date Sampled	10/05/21	10/05/21	10/05/21	10/05/21	10/05/21
Symbiotic Solutions Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: THNI	TP / BH No	1320/001	1320/002	1320/003	1320/004	1320/005
Project / Job Ref: 1320	Additional Refs	E1	E2	E3	E4	E5
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 20/05/2021	DETS Sample No	543398	543399	543400	543401	543402

Determinand	Unit	RL	Accreditation	(n)	(n)	(n)	(n)	(n)
Benzene	ug/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	ISO17025	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5

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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 21-06246	
Symbiotic Solutions Ltd	
Site Reference: THNI	
Project / Job Ref: 1320	
Order No: None Supplied	
Reporting Date: 20/05/2021	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
543398	1320/001	E1	None Supplied	8.6	Brown sandy gravel with stones and brick
543399	1320/002	E2	None Supplied	10.6	Brown sandy gravel with stones and concrete
543400	1320/003	E3	None Supplied	8.9	Brown sandy gravel with stones and concrete
543401	1320/004	E4	None Supplied	9.8	Brown sandy gravel with stones and concrete
543402	1320/005	E5	None Supplied	8.6	Brown sandy gravel with stones and concrete

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 21-06246

Symbiotic Solutions Ltd

Site Reference: THN1

Project / Job Ref: 1320

Order No: None Supplied

Reporting Date: 20/05/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

ATTACHMENT 4: PILING LAYOUT DRAWINGS