

Molyneux Architects

181 Union Street

London

SE1 0LN

Our Ref: P17-005 L01

Your Ref:

Date: 29th November 2022

St John the Baptist, Great Cambridge Road, London N17 8LR – Remediation Validation

F.A.O. Mr Roger Molyneux,

Further to the Ground Investigation (P17-005gi) for the site and subsequent comments received by yourself from the London Borough of Haringey Council's Contaminated Land Officer in October 2022 a strategy has been designed and carried out to assess the suitability of the implemented site remediation works.

Previous Works

A Ground Investigation was carried out for the site in March 2017 reference P17-005, this comprised borehole and trial pits and sampling to allow a generic human health contamination risk assessment. This assessment indicated elevated PAH indicative compounds and phytotoxic levels of heavy metals on the south and west of the site, within shallow Made Ground strata in TP1 (metals), TP3 (PAH) and TP5 (metals). The areas impacted with PAH indicative compounds and phytotoxic levels of heavy metals were all under areas of building footprint in the proposed development.

Given this, the only active pollutant pathways considered were from direct contact in open areas of the site if the impacted Made Ground extended beyond the footprint of the proposed development. The soil impacted with PAHs did not indicate significantly elevated associated lighter TPH fractions or volatile contaminants so were considered likely to be due to cross contamination of macadam surfacing above the TP3 location and therefore, no pollutant pathways in areas covered in permanent hardstanding were considered complete.

Following the ground investigation works the site was indicated to have been cleared as part of the development enabling and ground works, such as the installation of a piling matt and oversight reduction, and the levels reduced by c. 750mm to 1500mm across the site.

Milton Keynes: The Log Cabin, Manor Farm, Whaddon Road, Newton Longville, Milton Keynes, MK17 0AU

Swindon/Oxford: 21 Tyrell Close, Stanford in the Vale, Oxon, SN7 8EY

T: 44 (0) 1908 764032

M: 44 (0) 7377 422528

E: matt@paddockgeoengineering.co.uk

W: www.paddockgeoengineering.co.uk

These works should have reduced the levels across the site to natural soils effectively removing the identified impacted Made Ground. However, no lines of evidence for this were available for validation purposes.

Additional Contamination Risk Assessment

As the site levels and surface soils have changed significantly since those at the time of the ground investigation with no suitable records made available of the changes, it was decided to carry out further simple intrusive assessment works in open and garden areas of the almost completed development to ensure that these are suitable for the proposed use and validate the Topsoil placement.

The open and garden areas had been built up to finished level and turfed at the time of the additional intrusive assessment site visit on 4th November 2022. During the site visit 4 no. hand excavated trial pits were formed to assess the soil make up in the open garden areas and to recover samples for laboratory analysis from the Topsoil and Sub-soil. The locations of the trial pits were chosen at random in accessible areas by the PGE Site Engineer and are detailed on the enclosed Additional GI Trial Pit Location Plan.

The details of the soils encountered are summarised below:

Encountered Strata – Trial Pit Strata	Exploratory Hole and Basal Depth (m bgl)			
	VP1	VP2	VP3	VP4
TOPSOIL Dark grey and dark brown slightly gravelly clayey loamy/organic SAND	0.45	0.35	0.35	0.35
Made Ground (Reworked Natural) Firm brown grey sandy CLAY	0.60	-	-	-
Firm brown grey sandy CLAY with brick and limestone fragments	-	0.50	0.50	0.60
Total Depth (m bgl)	0.60	0.50	0.50	0.60

The soil samples were sent to I2 Limited (MCerts 4041) for analysis. The suite of analysis included:

- Metals and Inorganic compounds on all 6no. samples
- Polyaromatic Hydrocarbons (PAH) USEPA Priority 16 Compounds
- Total Petroleum Hydrocarbons (TPH) Screen (EC10-EC40)
- Asbestos screen

A series of photos of the open gardens and trial pits are enclosed with this letter

The results of the analysis of the samples recovered from the trial pits were compared individually with the PGE In-House GACs for a stringent residential with plant uptake land use.

Some exceedances were noted within the deeper sub-soils within trial pit VP1 for PAH indicative compounds and VP3 for lead.

All determinands were below their respective GACs for the Topsoil samples. Further to this the Topsoil placed appeared to be suitable physically as Topsoil, however, no classification testing such as BS3882 was available.

A copy of the laboratory analysis is enclosed and the exceedances are summarised below.

Determinand	Assessment Criteria (mgkg ⁻¹)	Trial Pit and Depth (m bgl) (strata)	Maximum Reported Concentration (mgkg ⁻¹)	95 th Percentile Upper Confidence Limit (mgkg ⁻¹) (with exceedances removed)
Benzo[a]pyrene	2.7	VP1 0.50m	3.5	N/A
Dibenzo(a,h) anthracene	0.28	VP1 0.50m	0.58	N/A
Lead	190	VP3 0.50m	230	N/A

Given the identified elevated PAH indicative compounds and lead within the sub-soils above a depth of 0.60m below ground level (bgl), some further assessment is deemed necessary to ensure the site suitability of these soils in the open areas of the development.

Cover System

The proven clean placed Topsoil is between 0.35m and 0.45m depth across the site and the source of the soil is indicated to be the same across the site, although no details of the source have been made available at this time.

To assess the suitability of the identified and sampled soils in open garden areas, the garden areas clean topsoil cover has been considered as a remediation cover system.

In the trial pit VP2 and VP4 the open areas are considered suitable for the end use as no elevated priority contaminant concentrations were identified in the Topsoil or sub-soils above a depth of 0.60m bgl.

For the trial pits VP1 and VP3 the BRE's Cover systems for land regeneration (BRE, 2004) has been employed to assess if a suitable depth of clean imported Topsoil (cover thickness) has been placed above the identified impacted sub-soils. The cover system calculation sheets are enclosed. For the assessment the impacted sub-soil impacting elevated priority contaminants concentration has been employed along with the mean concentration of the impacting elevated priority contaminants from the Topsoil samples analysed.

This assessment indicates a calculated maximum cover thickness of 419mm for the VP1 area and 207mm for the VP3 area.

In these areas we have a cover system Topsoil depth of 450mm for VP1 and 350mm for VP3. Therefore, these areas are also considered suitable for the proposed residential with plant uptake land use scenario.

Notwithstanding the above assessment, if any unexpected or previously unidentified contamination is discovered during the site development works, a suitably qualified and experienced person should be contacted so any further assessment required can be carried out.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'S. Fisk'.

Stephen Fisk BSc (Hons) FGS
Senior Geo-Environmental Engineer

A handwritten signature in blue ink, appearing to read 'M. Paddock'.

Matt Paddock MSc FGS
Director

Encs:

GI Borehole and Trial Pit Plan

Proposed Plan

Additional GI Trial Pit Logs

Additional GI Trial Pit Location Plan

Siteworks Photos

Laboratory Analysis Results

PGE In-House GACs

Cover System Spreadsheet – VP1 and VP3

General Notes

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

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

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

The report has been prepared following the guidelines and principles established in the British Standards, BS 10175:2011, entitled 'Investigation of Potentially Contaminated Sites – Code of Practice' and the DEFRA/EA Contaminated Land Reports CLR7 and CLR8. It necessarily relies on the co-operation of other organisations and the free availability of information and total access. No responsibility can, therefore, be accepted for conditions arising from information that was not available to the investigating team as a result of information being withheld or access being denied.

This report may suggest an opinion on a possible configuration of strata or conditions between exploratory points and below the maximum depth of investigation. However, this is for guidance only and no liability can be accepted for its accuracy.



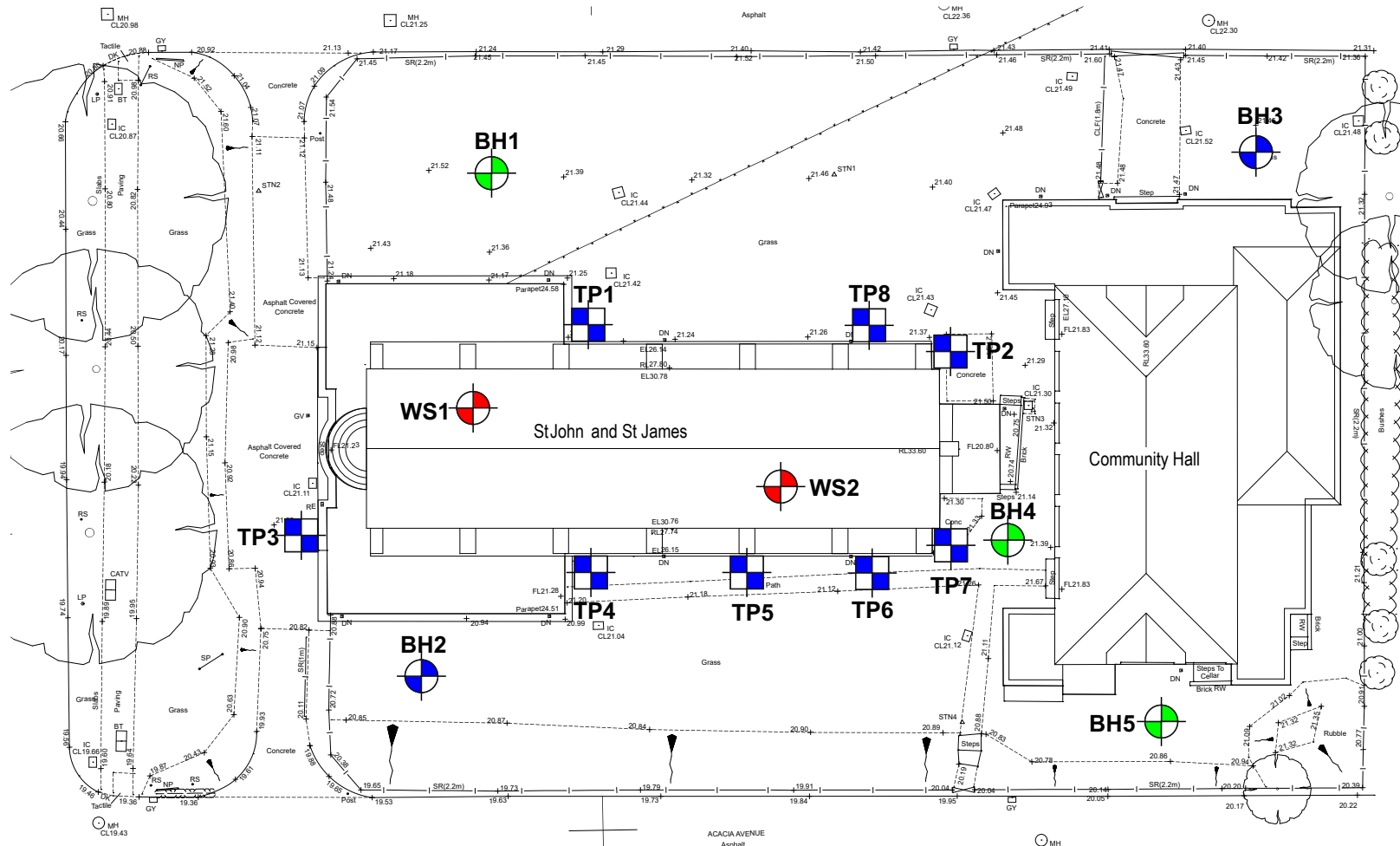
GI Borehole and Trial Pit Plan

Borehole and Trail Pit Plan

**St John the Baptist Church
and Hall, Tottenham,
N17 8LR**

Christian Action Housing

March 2017



**Window Sampler
Borehole Location**



**Cable Percussion
Borehole Location**



**Cable Percussion
Borehole Location
with Well**



**Foundation Trial
Pit Location**

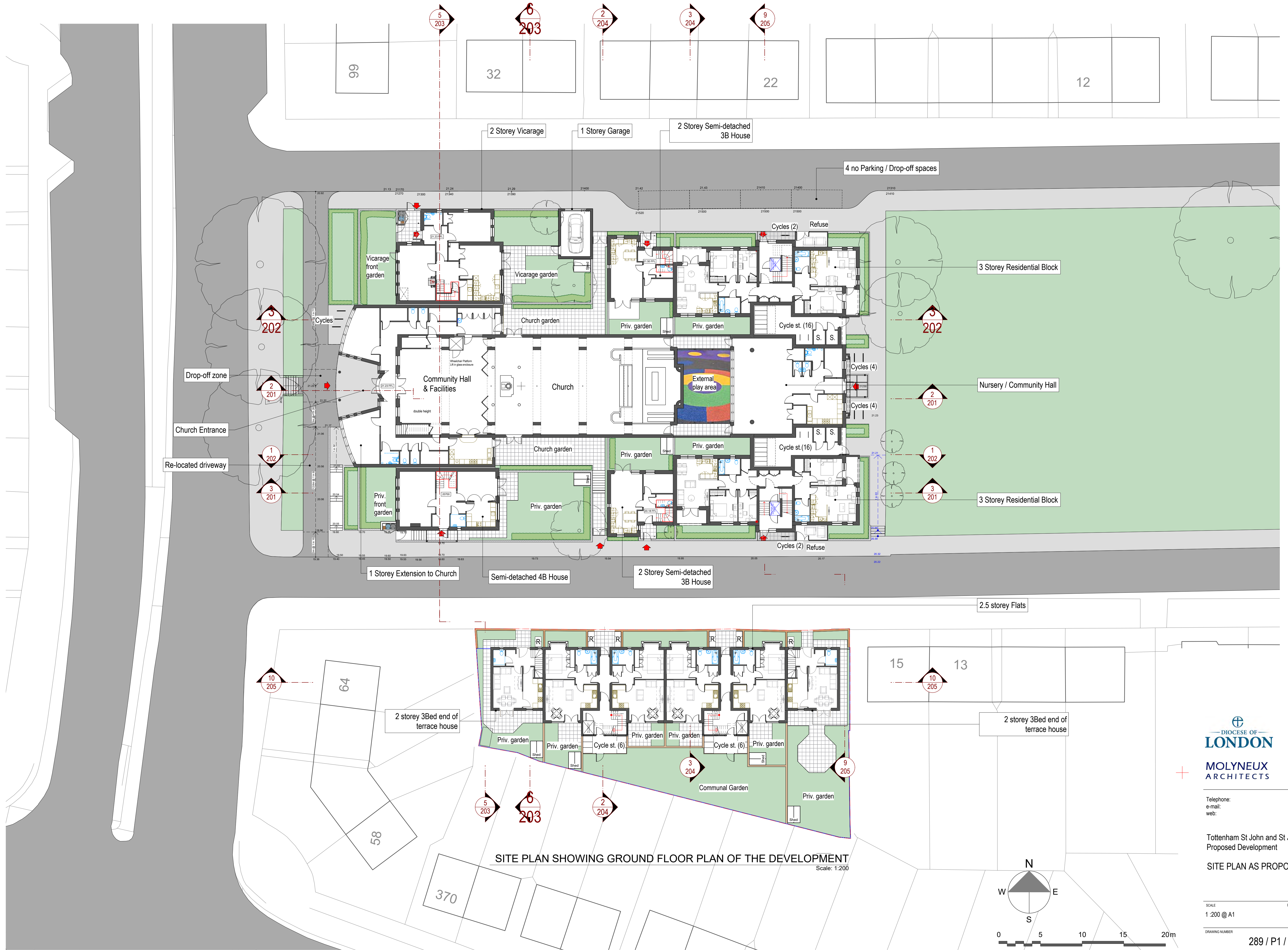
North



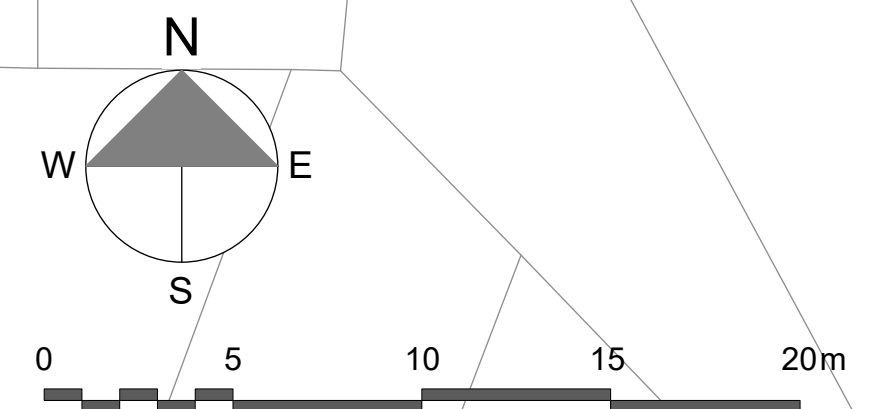
Not to scale.
All positions are approximate
Plan based on Molyneux Architects
Survey Plan 289/P1/01 02/12/16



Proposed Plan



SITE PLAN SHOWING GROUND FLOOR PLAN OF THE DEVELOPMENT
Scale: 1:200



— DIOCESE OF —
LONDON

**MOLYNEUX
ARCHITECTS**



**RYAN
BUNCE & CO**

Telephone:
e-mail:
web:

0207 021 0411
rm@molyarch.co.uk
www.molyarch.co.uk

Tottenham St John and St James
Proposed Development

SITE PLAN AS PROPOSED

SCALE
1:200 @ A1

DATE
12.16

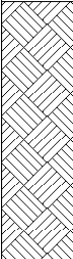
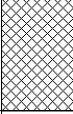
DRAWING NUMBER
289 / P1 / 05

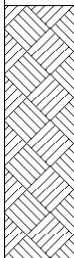
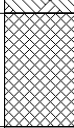
Date Printed: 1 Dec 2016
File Name: 289_P2_Tottenham St Johnm MASTERPLAN v2017.vwx

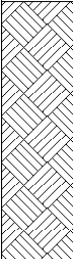
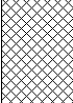


Additional GI Trial Pit Logs

PADDOCK GEO ENGINEERING						Site St John the Baptist, Great Cambridge Road, London N17 8LR		Trial Pit Number VP1			
Excavation Method Trial Pit		Dimensions 0.3mx0.30m		Ground Level (mOD)		Client Molyneux Architects		Job Number P17-005			
		Location		Dates 04/11/2022		Engineer MIP		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water			
0.30	C				(0.45)	Grass over, dark grey and dark brown slightly gravelly clayey loamy/organic SAND (TOPSOIL)					
0.50	C				0.45 (0.15)	Firm brown grey sandy CLAY (MADE GROUND - REWORKED LONDON CLAY FORMATION)					
					0.60	Complete at 0.60m					
						Remarks Backfilled with arisings and turf replaced					
						Scale (approx) 1:10		Logged By SF		Figure No. P17-005.VP1	

						Site St John the Baptist, Great Cambridge Road, London N17 8LR		Trial Pit Number VP2	
Excavation Method Trial Pit		Dimensions 0.3mx0.30m		Ground Level (mOD)		Client Molyneux Architects		Job Number P17-005	
		Location		Dates 04/11/2022		Engineer MIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	C				(0.35)	Grass over, dark grey and dark brown slightly gravelly clayey loamy/organic SAND (TOPSOIL)			
0.40	C				0.35 (0.15)	Firm brown grey sandy CLAY (MADE GROUND - REWORKED LONDON CLAY FORMATION)			
					0.50	Complete at 0.50m			
						Remarks Backfilled with arisings and turf replaced			
						Scale (approx) 1:10		Logged By SF	

PADDOCK GEO ENGINEERING						Site St John the Baptist, Great Cambridge Road, London N17 8LR		Trial Pit Number VP3	
Excavation Method Trial Pit		Dimensions 0.3mx0.30m		Ground Level (mOD)		Client Molyneux Architects		Job Number P17-005	
		Location		Dates 04/11/2022		Engineer MIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	C				(0.35)	Grass over, dark grey and dark brown slightly gravelly clayey loamy/organic SAND (TOPSOIL)			
					0.35 (0.15)	Firm brown grey sandy CLAY (MADE GROUND - REWORKED LONDON CLAY FORMATION)			
0.50	C				0.50	Complete at 0.50m			
						Remarks Backfilled with arisings and turf replaced			
						Scale (approx) 1:10	Logged By SF	Figure No. P17-005.VP3	

						Site St John the Baptist, Great Cambridge Road, London N17 8LR		Trial Pit Number VP4	
Excavation Method Trial Pit		Dimensions 0.3mx0.30m		Ground Level (mOD)		Client Molyneux Architects		Job Number P17-005	
		Location		Dates 04/11/2022		Engineer MIP		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.10	C				(0.35)	Grass over, dark grey and dark brown slightly gravelly clayey loamy/organic SAND (TOPSOIL)			
					0.35	Firm brown grey sandy CLAY (MADE GROUND - REWORKED LONDON CLAY FORMATION)			
0.50	C		Water strike(1) at 0.50m.		0.50	Complete at 0.50m		V1	
						Remarks Backfilled with arisings and turf replaced			
						Scale (approx) 1:10		Logged By SF	



Additional GI Trial Pit Location Plan

Additional GI Trial Pit Plan

**St John the Baptist Church
and Hall, Tottenham,
N17 8LR**

Molyneux Architects

November 2022



**Hand Excavated
Trial Pit Location**

North

**Not to scale.
All positions are approximate
Plan based on Molyneux Architects
Plan**



Siteworks Photos



VP1 Garden area



VP1 Garden area



VP1 Garden area



VP4 Garden area



VP3 Garden area



VP3 Garden area



VP1



VP1



VP1



VP1



VP2



VP2



VP3



VP3



VP4



VP4



Laboratory Analysis Results

**Matt Paddock**

Paddock Geo Engineering
The Log Cabin
Manor Farm
Whaddon Road
Newton Longville
Milton Keynes
MK17 0AU

t: 01908 271366

e: labs@paddockgeoengineering.co.uk

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

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 22-95380

Project / Site name:	St Johns the Baptist Tottenham	Samples received on:	08/11/2022
Your job number:	P17 005	Samples instructed on/ Analysis started on:	08/11/2022
Your order number:	P17 005 G02	Analysis completed by:	26/11/2022
Report Issue Number:	1	Report issued on:	28/11/2022
Samples Analysed:	4 soil samples		

Signed:

Anna Goc
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 22-95380

Project / Site name: St Johns the Baptist Tottenham

Your Order No: P17 005 G02

Lab Sample Number				2492181	2492182	2492183	2492184
Sample Reference				VP1	VP2	VP3	VP4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.40	0.50	0.50
Date Sampled				04/11/2022	04/11/2022	04/11/2022	04/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	27	24	27	22
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.4	8.3	10.2
Total Sulphate as SO ₄	mg/kg	50	MCERTS	4200	2500	4900	2600
Loss on Ignition @ 450°C	%	0.2	MCERTS	4.8	5.3	5.5	3.6

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.31	0.15	0.19	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	0.36	0.09	0.15	< 0.05
Acenaphthene	mg/kg	0.05	NONE	0.13	0.13	0.1	< 0.05
Fluorene	mg/kg	0.05	NONE	0.18	0.12	0.11	< 0.05
Phenanthrene	mg/kg	0.05	NONE	1.8	1.3	1.4	< 0.05
Anthracene	mg/kg	0.05	NONE	0.69	0.3	0.48	< 0.05
Fluoranthene	mg/kg	0.05	NONE	7.7	3	4.5	0.55
Pyrene	mg/kg	0.05	NONE	7.2	2.7	4.3	0.51
Benzo(a)anthracene	mg/kg	0.05	NONE	3.3	1.7	2.5	0.24
Chrysene	mg/kg	0.05	NONE	2.9	1.4	2.3	0.29
Benzo(b)fluoranthene	mg/kg	0.05	NONE	4.2	1.8	2.6	0.27
Benzo(k)fluoranthene	mg/kg	0.05	NONE	1.3	1	2	0.23
Benzo(a)pyrene	mg/kg	0.05	NONE	3.5	1.7	2.6	0.22
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	2.1	1	1.4	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.58	0.2	0.27	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	2.2	1	1.7	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	38.2	17.7	26.6	2.31
-----------------------------	-------	-----	------	------	------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	15	17	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.2	1.2	1
Boron (water soluble)	mg/kg	0.2	MCERTS	3	2.8	6.6	2.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37	35	37	34
Copper (aqua regia extractable)	mg/kg	1	MCERTS	49	58	55	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	160	120	230	33
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	0.4	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	29	30	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	60	65	61	60
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	140	180	180

Petroleum Hydrocarbons

TPH C10 - C40 _{EH,CU,10_TOTAL}	mg/kg	10	NONE	230	120	140	< 10
---	-------	----	------	-----	-----	-----	------

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

Analytical Report Number : 22-95380

Project / Site name: St Johns the Baptist Tottenham

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2492181	VP1	None Supplied	0.5	Brown clay with vegetation.
2492182	VP2	None Supplied	0.4	Brown clay and sand with vegetation.
2492183	VP3	None Supplied	0.5	Brown clay and sand with vegetation.
2492184	VP4	None Supplied	0.5	Brown clay and sand with vegetation.

Analytical Report Number : 22-95380

Project / Site name: St Johns the Baptist Tottenham

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

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

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 22-95380

Project / Site name: St Johns the Baptist Tottenham

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
----------------------	-------------------------------	-----------------------------	---------------	--------------------	----------------------

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Matt Paddock

Paddock Geo Engineering
The Log Cabin
Manor Farm
Whaddon Road
Newton Longville
Milton Keynes
MK17 0AU

t: 01908 271366

e: labs@paddockgeoengineering.co.uk

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

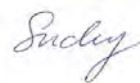
t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 22-95383

Project / Site name:	St Johns the Baptist, Tottenham	Samples received on:	08/11/2022
Your job number:	P17-005	Samples instructed on/ Analysis started on:	08/11/2022
Your order number:	P17-005 G01	Analysis completed by:	22/11/2022
Report Issue Number:	1	Report issued on:	22/11/2022
Samples Analysed:	4 soil samples		



Signed:

Elżbieta Suchy
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 22-95383
 Project / Site name: St Johns the Baptist, Tottenham
 Your Order No: P17-005 G01

Lab Sample Number				2492189	2492190	2492191	2492192
Sample Reference				VP1	VP2	VP3	VP4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.20	0.20	0.10
Date Sampled				04/11/2022	04/11/2022	04/11/2022	04/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	29	29	25
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.1	8.2	8
Total Sulphate as SO ₄	mg/kg	50	MCERTS	970	780	720	820
Loss on Ignition @ 450oC	%	0.2	MCERTS	9.5	8.7	7.9	8.3

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.35	0.09	0.06	0.05
Acenaphthylene	mg/kg	0.05	NONE	0.05	0.09	0.08	0.09
Acenaphthene	mg/kg	0.05	NONE	0.51	< 0.05	< 0.05	0.08
Fluorene	mg/kg	0.05	NONE	0.32	0.09	< 0.05	0.09
Phenanthrene	mg/kg	0.05	NONE	3.8	1.1	0.44	0.95
Anthracene	mg/kg	0.05	NONE	0.87	0.29	0.14	0.27
Fluoranthene	mg/kg	0.05	NONE	4.7	2.4	1.8	2.6
Pyrene	mg/kg	0.05	NONE	4	2	1.7	2.4
Benzo(a)anthracene	mg/kg	0.05	NONE	1.8	1.1	1.1	1.4
Chrysene	mg/kg	0.05	NONE	1.8	0.99	1.1	1.2
Benzo(b)fluoranthene	mg/kg	0.05	NONE	1.3	1.1	0.97	1.5
Benzo(k)fluoranthene	mg/kg	0.05	NONE	1.4	0.66	1	0.83
Benzo(a)pyrene	mg/kg	0.05	NONE	1.6	1	1.3	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.79	0.57	0.61	0.82
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.21	0.11	0.13	0.17
Benzo(ghi)perylene	mg/kg	0.05	NONE	1.1	0.73	0.83	0.94

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	24.6	12.3	11.2	14.8
-----------------------------	-------	-----	------	------	------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.7	11	11	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.5	0.64	0.66	0.68
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	3.3	1.1	3.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.5	0.5	0.5
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	18	18	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	55	50	50	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	100	110	160	85
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	15	14	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	30	30	31
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	150	140	110

Petroleum Hydrocarbons

TPH C10 - C40 EH_CU_ID_TOTAL	mg/kg	10	NONE	130	100	64	26
---------------------------------	-------	----	------	-----	-----	----	----

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

Analytical Report Number : 22-95383

Project / Site name: St Johns the Baptist, Tottenham

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2492189	VP1	None Supplied	0.3	Brown sandy loam with vegetation and gravel
2492190	VP2	None Supplied	0.2	Brown sandy loam with vegetation and gravel
2492191	VP3	None Supplied	0.2	Brown clay and gravel with vegetation.
2492192	VP4	None Supplied	0.1	Brown clay and gravel with vegetation.

Analytical Report Number : 22-95383
Project / Site name: St Johns the Baptist, Tottenham

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

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

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

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

Analytical Report Number : 22-95383
Project / Site name: St Johns the Baptist, Tottenham

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
----------------------	-------------------------------	-----------------------------	---------------	--------------------	----------------------

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



PGE In-House GACs

GENERIC HUMAN HEALTH SCREENING TOTAL SOIL CONCENTRATION ASSESSMENT CRITERIA (GAC)

DETERMINAND		RESIDENTIAL (mg/kg)		COMMERCIAL (mg/kg)
Chemical	GAC Sources and units	With Home Grown produce	Without Home Grown produce	
Asbestos Screen & ID*	-	Detected	Detected	Detected
Cyanide - Total	SNIFFER	53.25	53.25	53.25
Cyanide - Free	SNIFFER	53.25	53.25	53.25
Loss on Ignition @ 450°C	-	-	-	-
Sulphate (as SO ₄) - Total	BRE****	2400	2400	2400
Sulphide	ICRCL	2500	2500	2500
Sulphur - Total	ICRCL	2500	2500	2500
Phenol (Total Monohydric)	CLEA	420	420	3200
pH	ICRCL	<5,>12	<5,>12	-
Metals and Metalloids (CLEA Metals)				
Arsenic	LQM S4UL	37	40	640
Beryllium	LQM S4UL	1.7	1.7	12
Cadmium	LQM S4UL	11	85	190
Chromium III	LQM S4UL	910	910	8600
Lead	DEFRA C4SL	190	310	2300
Mercury (Total)	LQM S4UL (Inorganic)	40	56	1100
Selenium	LQM S4UL	250	430	12000
Copper (phytotoxicity)	LQM S4UL	2400 (111)	7100	68000
Nickel	LQM S4UL	180	180	980
Zinc (phytotoxicity)	LQM S4UL	3700 (330)	40000	730000
Vanadium	LQM S4UL	410	1200	9000
Boron - Water Soluble	LQM S4UL	290	11000	240000
Total Petroleum Hydrocarbons**				
TPH (EC6-EC10) - PRO	LQM S4UL (2.5% SOM)	65	100	4800
TPH (EC10-EC21) - DRO	LQM S4UL (2.5% SOM)	300	600	23000
TPH (EC21-EC40) - Min. Oil	LQM S4UL (2.5% SOM)	1500	1900	28000
Total TPH (EC10-EC40)	LQM S4UL (2.5% SOM)	600	900	23000
Polycyclic Aromatic Hydrocarbons***				
Naphthalene	LQM S4UL (2.5% SOM)	5.6	5.6	460
Flourene	LQM S4UL (2.5% SOM)	400	3800	68000
Benzo[a]pyrene	LQM S4UL (2.5% SOM)	2.7	3.2	35
Dibenzo[a,h]anthracene	LQM S4UL (2.5% SOM)	0.28	0.32	3.6

Notes

The Generic Assessment Criteria (GAC) are based on CLEA Soil Guidance Values published values and CIEH/LQM S4CLs where available or ICRCL, DoE, BRE and HSE levels where necessary.
Where gaps remain GACs were calculated using the latest CLEA spreadsheet using DEFRA C4SL toxicology and physiochemical parameters from DEFRA SP1010.

* Guidance level set at any fibre identification.

** TPH 3 band is employed as a screening tool to instigate detailed speciated analysis to the TPHCWG methodology. Based on mean of fractions included

*** Testing based on USEPA Priority 16 compounds. GACs for four compounds and total PAH with published GACs only, used as a screening tool.

**** BRE SD1 - DS-1 Concrete Sulphate Design Class limit. Sulphate is not considered to pose a significant risk to human health under normal circumstances.



Cover System Spreadsheet – VP1 and VP3

Calculations based on mixed zone (M)	600	mm
--------------------------------------	-----	----

VP1

[illegible]

Summary		
	Target Guideline Value 1	Target Guideline Value 2
Number of contaminants	18	18
Number of contaminants with no thickness calculation	16	18
Breakdown - Number for which no TV specified	16	18
Breakdown - Number for which no soil specified	16	16
Breakdown - Number for which no cover specified	16	16
Breakdown - Number for which cover > TV	0	0
Number of contaminants with thickness calculation	2	0
Breakdown - Number for which no cover required	0	0
Breakdown - Number for which cover required	2	0
Overall thickness of cover required	419	0

[illegible]

Summary		
	Target Guideline Value 1	Target Guideline Value 2
Number of contaminants	18	18
Number of contaminants with no thickness calculation	17	18
Breakdown - Number for which no TV specified	17	18
Breakdown - Number for which no soil specified	17	17
Breakdown - Number for which no cover specified	17	17
Breakdown - Number for which cover > TV	0	0
Number of contaminants with thickness calculation	1	0
Breakdown - Number for which no cover required	0	0
Breakdown - Number for which cover required	1	0
Overall thickness of cover required	207	0