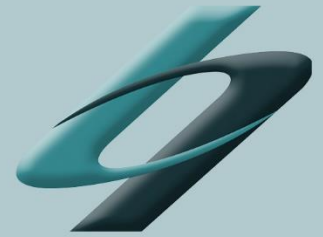
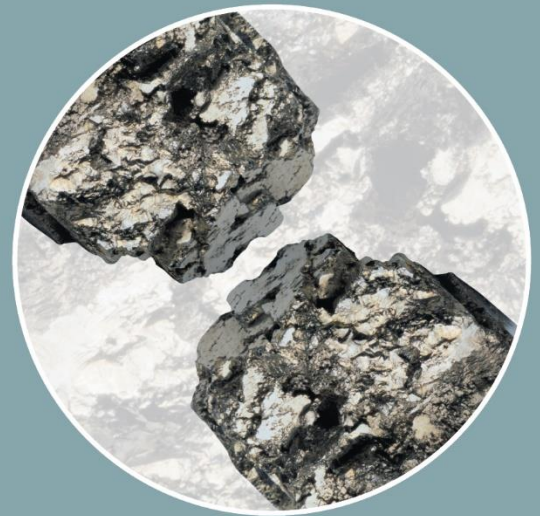


Document: Remediation Verification Report
Project: Needham Markey Quarry
Reference No.: GN17820_RV21
Date: January 2021
Prepared for: Hopkins Homes Limited



harrisongeotechnical
ENGINEERING



HARRISON GROUP ENVIRONMENTAL LIMITED

Document: Remediation Verification Report

Project: Needham Market Quarry

Reference No.: GN17820_RV21

Date: January 2021

Prepared For: Hopkins Homes Limited

REPORT STATUS:

Revision	Comments	Prepared By	Approved By	Issued By	Audited By
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		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE

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FOREWORD

General Conditions Relating To a Verification Report

This investigation has been devised to generally comply with the relevant principles and requirements of B.S.10175:2011+A2:2017 'Investigation of potentially contaminated sites - Code of practice', science report SC050021/SR3 'Updated Technical Background to the CLEA Model' (Environment Agency, 2008), and DEFRA/Environment Agency (EA), 2019 'land contamination: risk management'. The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.

The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.

Boring and sampling procedures are undertaken in accordance with B.S.5930:2015 +A1:2020 'Code of Practice for Ground Investigations'. Likewise, in-situ and laboratory testing complies with B.S.1377:1990 'Methods of Tests for Soils for Civil Engineering Purposes' and B.S.22475:2011, unless stated otherwise in the text. Chemical testing has been undertaken by a UKAS accredited laboratory.

Some items of the investigation have been provided by third parties and whilst Harrison Group have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.

This report is produced in accordance with the scope of Harrison Group's appointment and is subject to the terms of appointment. Harrison Group accepts no liability for any use of this document other than by its client and only for the purposes, for which it was designed and produced. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

VERIFICATION REPORT
FOR REMEDIAL ACTIVITY
AT
NEEDHAM MARKET QUARRY

1 TERMS OF REFERENCE & INTRODUCTION

The work covered by this document was undertaken on behalf of Hopkins Homes Ltd, in accordance with an emailed instruction to proceed from Hopkins Homes Ltd dated 3th October 2018.

The work described in this report represents validation and verification of remediation comprising a suitable soil cover system (600mm of combined subsoil and topsoil, with a minimum thickness of topsoil to be 150mm) to the back and front gardens of plots 3-7. A remediation method statement (RMS) for the site was compiled and provided for the client to submit to the regulatory authorities in December 2017. The RMS (reference GN17820_RMS1) detailed the method of remediation to be undertaken, based on the ground investigations and assessment previously completed. We believe that the RMS was issued to Mid Suffolk District Council and the NHBC for their review and comment on the planned remediation.

The plots which require validation of the suitability of the soils in gardens and soft landscaping can be identified in drawing GN17820_DR402 (appended to this VR), which highlights the development phasing plan (phases 1A, 1B, 2 and 3). Specifically, plots which require confirmation of the suitability of the near-surface soils, and the need for a soil cover, includes plot numbers 1-136, 161-170, 184-193, 197-211, 218-266 and soft landscaping areas in these development phases.

Subsequent remediation verification reports are in production for additional affected plots/areas, as each area is remediated.

2 BACKGROUND INFORMATION

2.1 Verification Report Structure

This document has been set out as follows:

- A brief background of the site, the findings of previous investigations and nature of the remediation planned.
- A description of the activities undertaken.
- Details of soil sampling undertaken to date.
- Concluding with an assessment of the suitability for reuse.

Appended to this document is supporting evidence as follows:

- Photographs taken during the verification of the suitability of the cover system material.
- Chemical analysis of the material used within the cover system (topsoil and subsoil).

2.2 Site Setting, History and Investigation

Harrison Group Environmental Limited (HGE) provided ground investigation for Hopkins Homes (HH) under the direction of Coffey Geotechnics Limited (CG) as part of their interpretative report on contamination and geotechnical aspects of the former chalk quarry, which was completed to provide HH with information for their development prior to acquiring the site. Reference should be made to CG report (reference 02095AA_R_003A-InterpReport v6, dated 23rd May 2014). Part of CG recommendations were for ground improvement in parts of the site, where deep fill material was placed as part of quarrying activity, and for two zones to require ground gas protection measures.

HGE were contacted by HH in 2017 to assess the ground gas regime during and after earthworks, and to assess the exposure of made ground soils by their earthworks contractor (Breheny Civil Engineering) when they removed approximately 2m thickness of surcharge toward the conclusion of ground improvement. We were also asked to consider the suitability of topsoil and subsoil stockpiled by Breheny Civil Engineering (BCE) as part of earthworks for reuse within the development.

The HGE report on the ground gas regime (reference GN17820_SI_GGrev1, dated November 2017) should be referred to for the details. In summary, the concentrations of ground gases were not found to significantly differ during or after earthworks. The two zones requiring protection measures to CS2 in accordance with BS8485 were refined to specifically include plots 109-111, 116 and 121-126 in zone 1 and plots 1, 230, 234-239, 240-249, 251-256, 265 and 266 in zone 2. Drawing GN17820_DR104 (appended to the RMS document) identifies the two zones referred to and the plots affected.

HGE reported on the suitability of identified soil for use within the residential development (GN17820_SI_Soilrev1, also dated November 2017) and should be referred to for details. Based on the available ground investigation information the quarry backfill material was generally found to comprise reworked glacial drift and structureless chalk but was also noted to include some organic soils with low levels of PAH compounds in some soil samples analysed. It was considered likely that where the darker organic/ashy material was encountered it may potentially be unsuitable to remain where exposed in the near surface of domestic gardens. These areas approximately correspond to development phases 1B and 2, but may extend to areas within phase 3. It was recommended that where unsuitable material is exposed or is present within the near surface of domestic gardens and soft landscaping areas, that a suitable soil cover system is implemented. In order to determine the affected gardens and soft landscaping areas, it was proposed that HGE undertake shallow trial pit excavations.

A stockpile of topsoil (S02) was imported from Hopkins Homes' Bramford site during the summer of 2018. The topsoil was considered physically suitable for reuse in gardens with chemical analysis of this material confirming its chemical suitability. There was a minimal amount of anthropogenic content to the stockpiled topsoil, which was inert and does not present a significant risk to end users, but may be physically undesirable. It was recommended that this undesirable content is removed from topsoil planned for use in gardens and areas of public open space, where observed during moving and placing the topsoil.

A remediation method statement (RMS) for the site was compiled following completion of the site investigation works and submitted to the regulatory authorities in December 2017 (reference GN17820_RMS1). The method for ensuring soil suitability is detailed in sections 4, 5 and 6 of the RMS. Section 3 within the RMS document details the need for gas protection measures. HH have confirmed that gas protection measures are being installed where required and verification of these works is being undertaken by others.

The plots which require validation of the suitability of the soils in gardens and soft landscaping can be identified in drawing GN17820_DR402 (appended to this VR), which highlights the development phasing plan (phases 1A, 1B, 2 and 3). Specifically, plots which require investigation before the suitability of the near-surface soils (and the need for a soil cover) can be confirmed includes plot numbers 1-136, 161-170, 184-193, 197-211, 218-266 and soft landscaping areas in these development phases.

3 SOIL REMEDIATION

As described above, the verification process was to comprise confirmation that there is sufficient thickness of suitable cover soil within the garden areas of plots 1-136, 161-170, 184-193, 197-211, 218-266 and soft landscaping areas in these development phases, as indicated on drawing GN17820_DR402 within the appendix. The work described in this report represents validation and verification of remediation comprising a suitable soil cover system (subsoil and topsoil) to the back and front gardens of plots 3-7.

An engineer from HGE visited site on 14/12/20 to undertake hand dug trial pits within the front and rear gardens of plots 3-7 to confirm that suitable topsoil and subsoil was present in the gardens.

During this visit material described as a black gravelly sand was encountered within HDTP6-03 and HDTP7-03. Due to its appearance chemical testing was performed on two samples. The results of the chemical testing identified elevated concentrations of a number of polycyclic aromatic hydrocarbons (PAH) such that it was not considered chemically suitable to remain within the cover systems for these gardens. After discussions with the site manager, it was concluded that this material was used as a subbase below the nearby paved footpaths and contained asphalt chippings which is thought to be the source of the elevated PAHs. An

engineer returned to site on the 05/01/21 and the 07/01/21 to observe groundworkers removing this material and replacing with additional topsoil from stockpile S02. Prior to backfilling, samples of the base and sides of the shallow excavation were obtained for chemical testing to ensure no cross contamination had occurred/all chemically unsuitable material had been removed. Photographs of this exercise are included within the appendix.

During the visits, a number of observations were made:

- A substantial amount of brick and concrete gravel was present within HDTP7-04, this was removed prior to backfilling
- A pipe was encountered at 0.55m within the side wall of HDTP6-01.
- HDTP04-01 and HDTP05-01 were terminated at 0.45m, due to the likely presence of a service beneath this depth.

The following sections of this report outline the remediation completed for plots 3-7.

3.1 Cover System Material

The material used for the cover system included site won subsoil and imported topsoil (from previously verified stockpile S02 as mentioned in section 2.2 of this report).

The fieldwork locations are shown on drawing GN17820-DR502ab included within the appendix. The trial pits were undertaken to record the thickness and physical descriptions of the materials present and to confirm material suitability.

3.1.1 Site Won Subsoil

The material was generally described as a combination of:

- Soft to firm brown slightly gravelly sandy clay with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.
- Brown or yellowish brown slightly gravelly slightly silty fine to medium sand. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk with brick and concrete in places.
- Yellowish white sandy gravelly silt. Gravel is sub-angular to sub-rounded fine to medium flint, chalk, and brick.
- Yellowish brown slightly gravelly sandy silt. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk with brick in places.

The materials mentioned above are considered satisfactory for use as subsoil from visual inspection. The dark material identified elsewhere on site that contained low levels of contaminants was not encountered in plots 3-7.

3.1.2 Imported Topsoil

Topsoil from stockpile S02 (imported from Hopkins Homes' Bramford Site) was previously considered suitable for reuse in gardens and chemical analysis of this material has confirmed its chemical suitability. The results of the chemical analysis are appended to this report. The material was previously deemed physically suitable for use as a topsoil, as the soil appeared to be an appropriate consistency for use in garden areas. The material within S02 was described as dark brown slightly gravelly slightly silty sand with fine to medium subangular to subrounded flint. A total of ten samples were submitted to a laboratory in May 2019 for testing of a general suite of contaminants and an asbestos screen. No asbestos was detected, and the levels of all other contaminants were below the screening criteria adopted at the time.

During the verification works, the material was described as dark brown slightly gravelly slightly silty fine to coarse sand. Gravel is sub-angular to subrounded fine to coarse flint with rare brick in places. This recent description is generally consistent with the previous description, allowing for some variability, and therefore has been confirmed as the same material.

This material was used for the topsoil (ground level up to 450mm depth) within all pits excavated in plots 3-7. The minimum thickness of 150mm of topsoil was encountered in all of the trial pits during the verification exercise.

3.1.3 Chemical Testing

Material described as a black gravelly sand was encountered within HDTP6-03 and HDTP7-03. Due to the dark colouration, this shallow material was deemed as potentially contaminative, and as such delineation of this material was undertaken within plot 7 by completing additional hand dug trial pits HDTP7-05, HDTP7-06, and HDTP7-07. The material was not encountered within these nearby positions and was shown to be of limited extent during excavations to remove it. Within the rear garden of plot 6, the same material was less extensive and was only encountered immediately adjacent to the paved footpath. This material was excavated and removed from the garden.

Two samples of the material were submitted to a UKAS/MCERTS accredited laboratory for a general suite of analytes (Heavy metals (As, B, Cd, Cr (total & VI), Cu, Ni, Pb, Hg, Se, Zn, V, Be), pH, TOC, TPH CWG, PAH USEPA 16, phenols (total), asbestos screen (with ID where found).

The results were screened were compared to GAC. Land Quality Management Limited and the Chartered Institute for Environmental Health published 'Suitable 4 Use Levels' (S4UL) as GAC for a range of substances, for a range of generic land uses. DEFRA published category four screening levels (C4SL) for six contaminants in March 2014 to assist practitioners in assessing land contamination under part IIA of the environmental protection act 1990. These have also been identified as suitable for use within the planning system, although it should be noted that they assume a higher level of acceptable risk than S4UL and earlier published GAC.

The end use for the plots in question is residential, this is covered by the 'residential with home-grown produce' generic land uses for which S4ULs are available.

For each land use category, a single value is provided for metals, with three values specified for organic contaminants based on the proportion of soil organic matter (%SOM) or the total organic carbon (%TOC) content of the soil. The GAC (S4UL and C4SL) for the moderate classification of SOM (2.5%) has been used for the assessment due to the TOC results gathered from chemical laboratory testing.

Records of the soil chemical testing have been appended to this report, and are summarised in Table 3.1.3a below.

Determinant	Maximum recorded concentration (mg/kg)	LQM/CIEH S4UL 2014 and C4SL* for residential with home-grown produce (mg/kg)	Samples Exceeding (Fieldwork ID_Sample ID_Depth)
Asbestos	Not Detected	-	No
Arsenic	6.5	37	No
Beryllium	0.89	1.7	No
Boron	4.2	290	No
Cadmium	1	11	No
Chromium	75	910	No
Chromium - Hexavalent	< 4	6 / 21	No
Copper	12	2400	No
Lead	19	200	No
Mercury	< 0.3	1.2	No
Nickel	13	130	No
Selenium	3.5	250	No
Vanadium	130	410	No
Zinc	65	3700	No
Acenaphthene	1.1	510	No
Acenaphthylene	< 0.05	420	No
Anthracene	2.4	5400	No
Benzo(a)anthracene	18	11	HDTP6-02_ES1_0.3-0.5m,
Benzo(a)pyrene	12	2.7 / 5	HDTP6-02_ES1_0.3-0.5m, HDTP7-03_ES1_0.2-0.25m
Benzo(b)fluoranthene	17	3.3	HDTP6-02_ES1_0.3-0.5m, HDTP7-03_ES1_0.2-0.25m
Benzo(ghi)perylene	8.5	340	No

Determinant	Maximum recorded concentration (mg/kg)	LQM/CIEH S4UL 2014 and C4SL* for residential with home-grown produce (mg/kg)	Samples Exceeding (Fieldwork ID_Sample ID_Depth)
Benzo(k)fluoranthene	5.8	93	No
Chrysene	14	22	No
Di-benzo(a,h)anthracene	2.7	0.28	HDT6-02_ES1_0.3-0.5m, HDT6-03_ES1_0.2-0.25m
Fluoranthene	31	560	No
Fluorene	1.1	400	No
Indeno(1,2,3-cd)pyrene	7.4	26	No
Naphthalene	< 0.05	5.6	No
Phenanthrene	11	220	No
Pyrene	36	1200	No
Aliphatic >C5 - C6	< 0.001	78	No
Aliphatic >C6 - C8	< 0.001	230	No
Aliphatic >C8 - C10	< 0.001	65	No
Aliphatic >C10 - C12	< 1	330	No
Aliphatic >C12 - C16	< 2	2400	No
Aliphatic >C16 - C21	16	92000	No
Aliphatic >C21 - C35	310	92000	No
Aromatic >C5 - C7	< 0.001	140	No
Aromatic >C7 - C8	< 0.001	290	No
Aromatic >C8 - C10	< 0.001	83	No
Aromatic >C10 - C12	< 1	180	No
Aromatic >C12 - C16	< 2	330	No
Aromatic >C16 - C21	97	540	No
Aromatic >C21 - C35	590	1500	No
Benzene	< 0.001	0.17/0.87	No
Ethylbenzene	< 0.001	110	No
o-Xylene	< 0.001	140	No
p & m-Xylene	< 0.001	130	No
Toluene	< 0.001	290	No

Table 3.1.3a: Contamination Test Result Summary for Dark Subbase Material.

When the results of the laboratory analysis are compared against available S4UL screening levels, slightly elevated concentrations of benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene have been identified (within both samples). Due to these exceedances, the shallow black material was deemed to pose a significant risk to human health and as such it was necessary for the material to be removed.

Following removal of this material, further verification was undertaken, which included collecting samples of the topsoil from the base and sides of the excavation, which were then submitted for laboratory analysis of PAH compounds. This was to assess whether any cross contamination of PAH compounds had occurred and to confirm that all chemically unsuitable material had been removed. The results of this testing is presented in table 3.1.3b.

Determinant	Maximum recorded concentration (mg/kg)	LQM/CIEH S4UL 2014 and C4SL* for residential with home-grown produce (mg/kg)	Samples Exceeding (Fieldwork ID_Sample ID_Depth)
Acenaphthene	<0.05	510	No
Acenaphthylene	< 0.05	420	No
Anthracene	0.37	5400	No
Benzo(a)anthracene	2.1	11	No
Benzo(a)pyrene	1.7	2.7 / 5	No
Benzo(b)fluoranthene	1.9	3.3	No
Benzo(ghi)perylene	0.96	340	No
Benzo(k)fluoranthene	0.95	93	No
Chrysene	1.8	22	No
Di-benzo(a,h)anthracene	<0.05	0.28	No
Fluoranthene	4.9	560	No
Fluorene	<0.05	400	No
Indeno(1,2,3-cd)pyrene	0.87	26	No
Naphthalene	< 0.05	5.6	No
Phenanthrene	1.9	220	No
Pyrene	4.0	1200	No

Table 3.1.3b: Contamination Test Result Summary for Topsoil at Base and Sides of Excavation.

The majority of the samples tested did not return any PAH concentrations above the limit of detection. One sample recorded low concentrations of a number of PAHs however these are all below with the adopted screening values. The removal of the black subbase material has sufficiently reduced risk to future site users and no further action is required.

4 CONCLUSIONS

Harrison Group Environmental Limited considers that a suitable cover system of suitable thickness, comprising chemically and physically suitable material, has been implemented. We are satisfied that there will be no significant risk to human health from residual contamination in plots 3-7 at the development known as Needham Market Quarry.

This report should be submitted to the regulators in order to conclude the remediation process.

Plots 25-26, 161-170, 218-239, 250-266 have previously been validated. The requirement for remediation in other plots is currently being assessed and the remediation undertaken as appropriate. Further remediation verification reports are in production for additional affected plots/areas on the whole development, as each area is built and remediated. These include plots 1, 2, 8-24, 27-136, 184-193 and 197-211 and soft landscaping areas in these development phases.

Report by:



Daniel Moody BSc (Hons.) MSc FGS
Graduate Geotechnical Engineer

Checked and approved by:

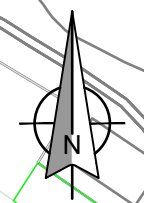
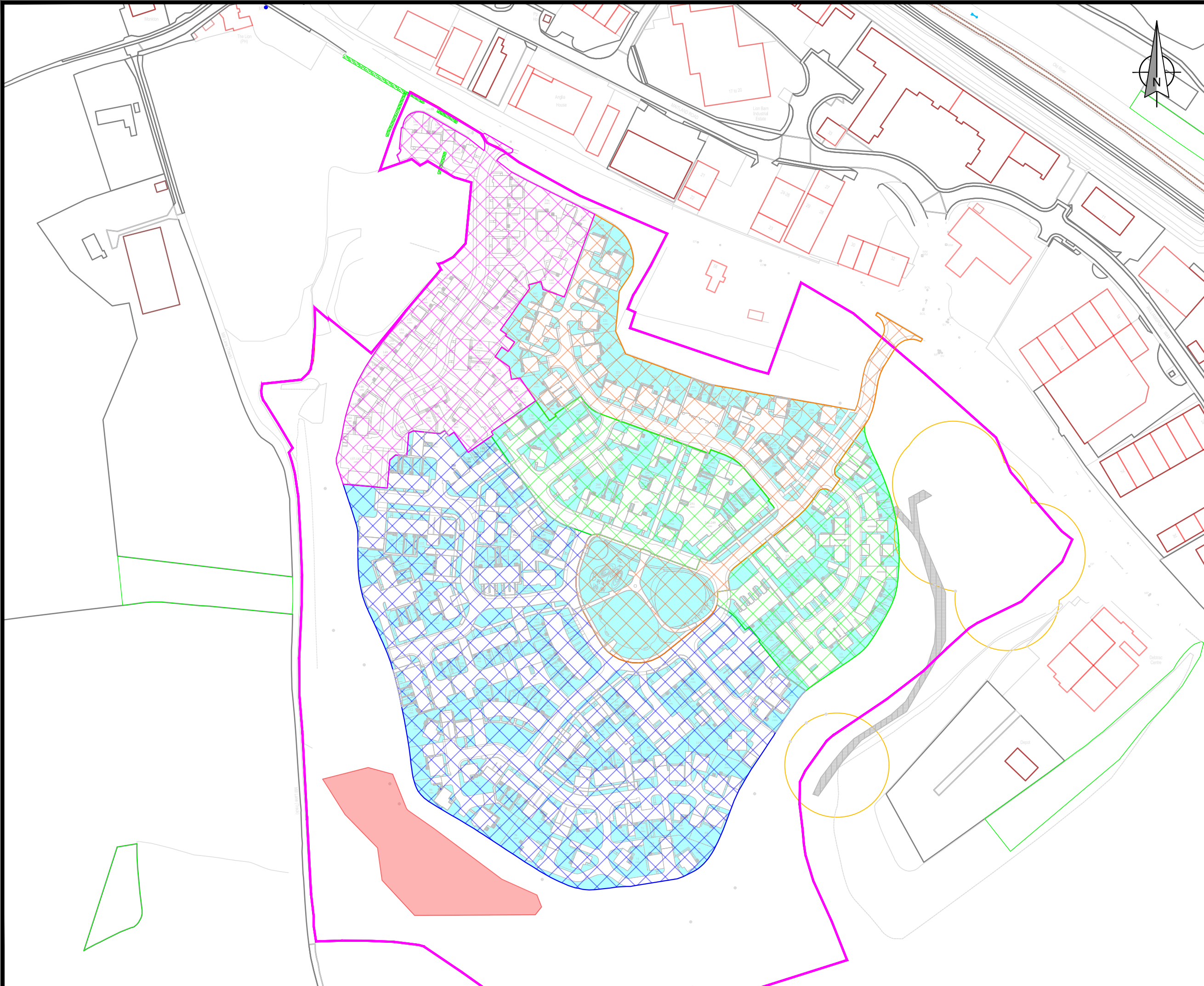


Mark Rivett BSc (Hons.) FGS
Senior Geoenvironmental Engineer

APPENDICES – Supporting Documentation


Drawings:	GN17820-DR402
	GN17820-DR502ab
Hand Dug Trial Pit Logs	HDTP03-01 to HDTP03-04
	HDTP04-01 to HDTP04-03
	HDTP05-01 to HDTP05-04
	HDTP06-01 to HDTP06-03
	HDTP07-01 to HDTP07-07
Chemical Analysis Reports:	19-41738-1
	20-47845-1
	21-52456-1
Photo Sheet:	GN17820_RV21 Photo Sheet 1

PL-HI-D-101 Rev B N:\work\p\projects\jobs 17000s\jobs 17800\GN17820 Needham Market Quarry\Renovation\Drawings\CAD files\GN17820 - DR402.dwg



- Key :**
- Site Boundary
 - Area of Phase 1A
 - Area of Phase 1B
 - Area of Phase 2
 - Area of Phase 3
 - Areas of Soft Landscaping
 - Area of Potential Backfill

Notes:

 HOPKINS HOMES		
Client : Hopkins Homes Limited		
Project : Needham Market Quarry		
Job No : GN17820	Date : December 2017	
Drawing Title : Development Layout with Phases and Plots Requiring Suitable Soil Verifying		
Drawing No : GN17820 - DR402		
Scale : 1:2000 @ A3		
Drawn by : RW	Checked by : JA	
Eastings : 009411	Northings : 254247	
Revision history		
Rev	Date	Revision Data



Norwich: 01603 613111 London: 020 7537 9233
 Cambridge: 01223 781585 Laboratory: 01603 416333

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 0026

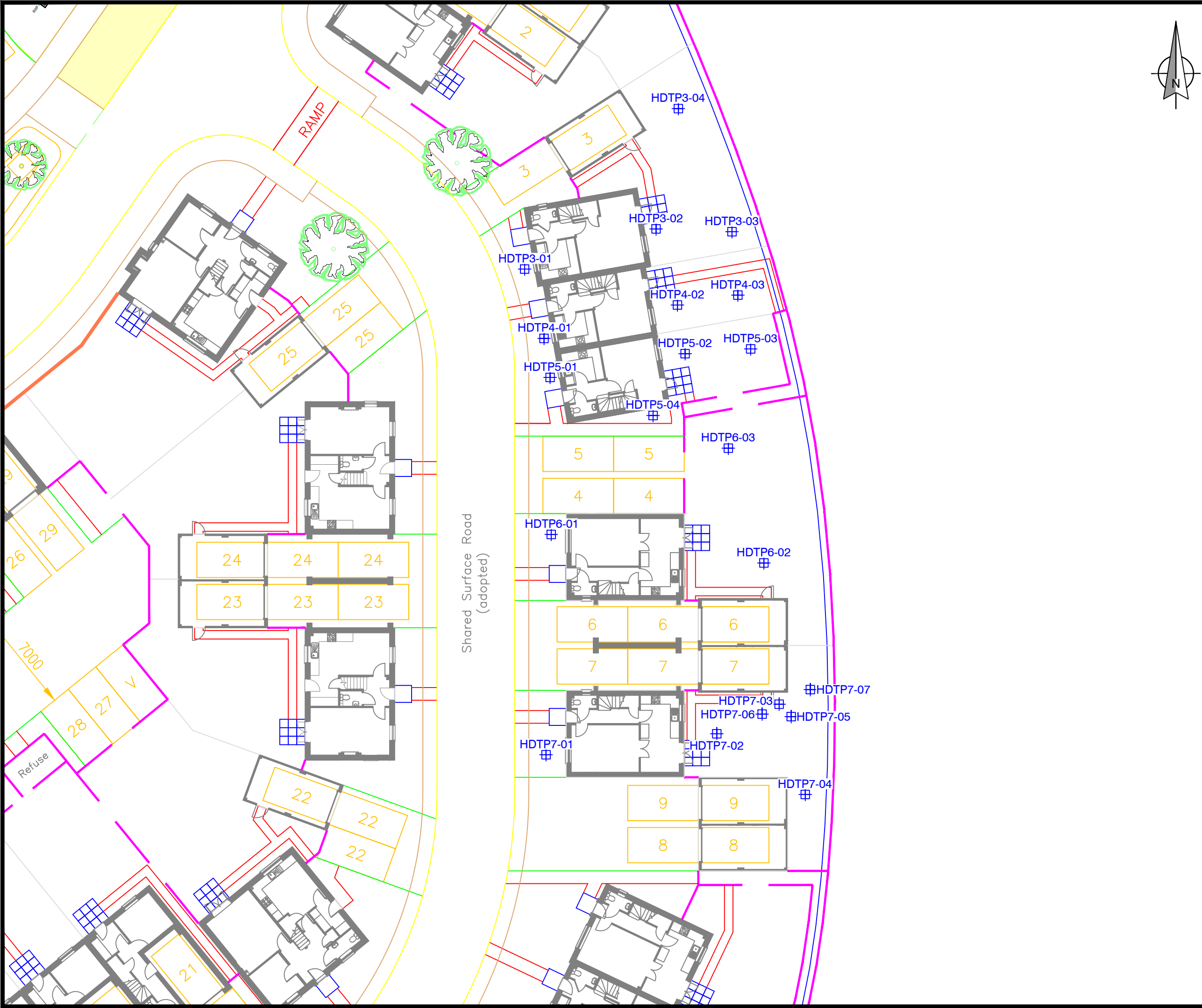

 UKAS
 TESTING
 4031

Certificate Number 5933
ISO 9001, ISO 14001

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PL-HI-D-101 Rev B N:\work\p\projects\jobs 17000s\jobs 17800\GN17820 Needham Market Quarry Remediation Drawings\CAD files\GN17820 - DR502.dwg



Key :
 Hand Dug Trial Pit

Notes :

HOPKINS HOMES

Client : Hopkins Homes Ltd
 Project : Needham Market Quarry
 Job No : GN17820 Date : December 2020
 Drawing Title : Fieldwork Location Plan - Plots 3 - 7
 Drawing No : GN17820 - DR502ab
 Scale : 1:200 @ A3
 Drawn by : RW Checked by : MR
 Eastings : 009580 Northings : 254120

Revision history

Rev	Date	Revision Data

harrisongroup ENVIRONMENTAL

Norwich: 01603 613111 London: 020 7537 9233
 Cambridge: 01223 781585 Laboratory: 01603 416333
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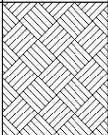

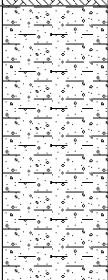

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Project ID: GN17820	Client: Hopkins Homes Limited	E: 609613.36	N: 254131.68
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.		0.20					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

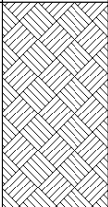


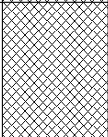
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609622.66	N: 254134.52
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated		Date: 14/12/2020

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Yellowish brown slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.35					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m		Remarks 1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com		Logged by: DM Checked by: CD Fm-Hn-R-3069-Rev E

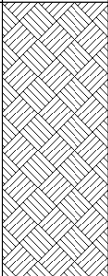

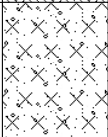

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609628.04	N: 254134.32
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
MADE GROUND. Yellowish white sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to coarse flint, chalk and brick.		0.30					
MADE GROUND. Yellowish brown slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk with rare brick.		0.40					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com		1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.			
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

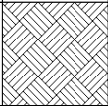

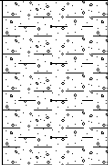



Project ID: GN17820	Client: Hopkins Homes Limited	E: 609624.24	N: 254143.03
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Yellowish brown slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.40					
Trial pit terminated at 0.60m.		0.60					

Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

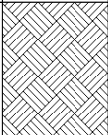

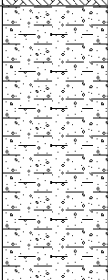

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609614.73	N: 254126.77
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.		0.15					
MADE GROUND. Multicoloured sub-angular to sub-rounded fine to medium GRAVEL of flint. <i>At 0.45m: Possible service present.</i> Trial pit terminated at 0.45m: Possible service present		0.40 0.45					

Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered
Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com			1. Backfill: GL to 0.45m arisings. 2. Approximate coordinates.		
	Logged by: DM	Checked by: CD		Fm-Hn-R-3069-Rev E	

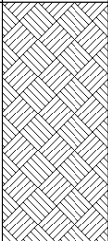

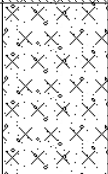
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609624.18	N: 254129.13
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.		0.20					
Trial pit terminated at 0.60m.		0.60					

Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
	Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E		

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609628.45	N: 254129.84
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

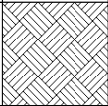

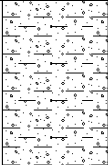



Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Yellowish brown slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.35					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m		Remarks			
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com		1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.			
		Logged by: DM		Checked by: CD	

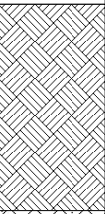





Project ID: GN17820	Client: Hopkins Homes Limited	E: 609615.16	N: 254124.01
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.		0.15					
MADE GROUND. Multicoloured sub-angular to sub-rounded fine to medium GRAVEL of flint. <i>At 0.45m: Possible service present.</i> Trial pit terminated at 0.45m: Possible service present		0.40 0.45					

Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered
Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com			1. Backfill: GL to 0.45m arisings. 2. Approximate coordinates.		
	Logged by: DM	Checked by: CD		Fm-Hn-R-3069-Rev E	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609624.72	N: 254125.69
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Yellowish brown slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.30					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

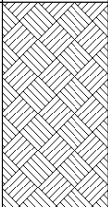

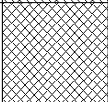
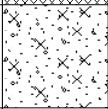
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609629.36	N: 254126.03
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Yellowish brown slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.30					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com		Remarks 1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.
Logged by: DM		Checked by: CD
		Fm-Hn-R-3069-Rev E

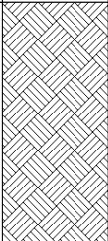

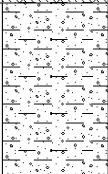
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609622.45	N: 254121.31
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
MADE GROUND. Yellowish white sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to coarse flint, chalk and brick.		0.30					
Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.		0.45					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609615.24	N: 254112.89
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.		0.35					
At 0.55m: Pipe exposed in side wall of pit.							
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609630.30	N: 254110.87
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
<p>TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.</p> <p><i>Between 0.30m to 0.60m: Pocket of orangish sand present.</i></p> <p>MADE GROUND. Yellowish brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint, chalk and brick.</p>		0.35		ES1	0.30 - 0.50		
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m		Remarks 1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.			
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com					
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

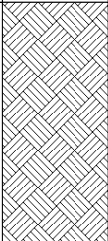

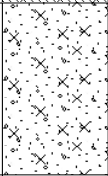
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609627.78	N: 254119.00
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
<p>TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.</p> <p><i>Between 0.30m to 0.50m: Pocket of black gravelly fine to coarse sand present in side wall. Gravel is angular to sub-rounded fine to medium flint.</i></p> <p>MADE GROUND. Yellowish white sandy gravelly SILT. Gravel is angular to sub-rounded fine to coarse flint, chalk and brick.</p>	[Pattern]	0.35		ES1	0.30 - 0.50		[Pattern]
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
<p>Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com</p> 	<p>1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.</p>				
	Logged by: DM	Checked by: CD			Fm-Hn-R-3069-Rev E

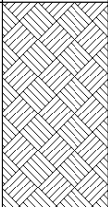

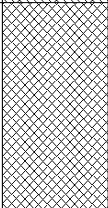

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609614.87	N: 254097.30
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Yellowish brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.35					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

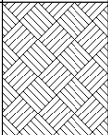

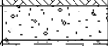
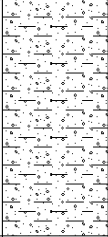
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609626.96	N: 254098.79
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
MADE GROUND. Soft to firm brown slightly gravelly sandy CLAY. Gravel is sub-angular to sub-rounded fine to medium flint and chalk with rare brick.		0.30					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

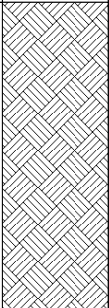

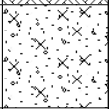
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609631.38	N: 254100.88
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Black gravelly fine to coarse SAND. Gravel is angular to sub-rounded fine to medium flint.		0.20		ES1	0.20 - 0.25		
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk.		0.25					
Trial pit terminated at 0.60m.		0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

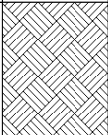

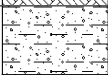
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609633.23	N: 254094.49
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint and brick.							
Yellowish brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk. <i>At 0.50m: Gravel of angular coarse brick and concrete present.</i> Trial pit terminated at 0.60m.		0.45 0.60					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.60m arisings. 2. Approximate coordinates.				
		Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	


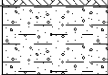
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609632.23	N: 254100.00
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk. Trial pit terminated at 0.30m.		0.20 0.30					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.30m arisings. 2. Approximate coordinates.				
	Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E		

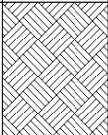

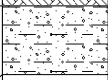


Project ID: GN17820	Client: Hopkins Homes Limited	E: 609630.17	N: 254100.18
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Excavated	Date: 14/12/2020	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk. Trial pit terminated at 0.30m.		0.20 0.30					


Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks			
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.30m arisings. 2. Approximate coordinates.			
	Logged by: DM	Checked by: CD	Fm-Hn-R-3069-Rev E	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609633.58 N: 254101.91
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Excavated	Date: 14/12/2020

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.							
Soft to firm brown slightly gravelly sandy CLAY with occasional pockets of gravelly slightly silty sand. Gravel is sub-angular to sub-rounded fine to medium flint and chalk. Trial pit terminated at 0.30m.		0.20 0.30					
							

Weather: Dry and cloudy	Water Strike				
Pit Stability: Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:					No groundwater encountered

Pit Dimensions: L: 0.35m x W: 0.35m	Remarks				
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com	1. Backfill: GL to 0.30m arisings. 2. Approximate coordinates.				
	Logged by: DM	Checked by: CD		Fm-Hn-R-3069-Rev E	



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Analytical Report Number : 19-41738

Project / Site name:	Needham Market Quarry	Samples received on:	17/05/2019
Your job number:	GN17820	Samples instructed on:	17/05/2019
Your order number:	GN17820-33605-JC	Analysis completed by:	24/05/2019
Report Issue Number:	1	Report issued on:	24/05/2019
Samples Analysed:	10 soil samples		

Signed: 

Zina Abdul Razzak
Senior Quality 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

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

Analytical Report Number: 19-41738

Project / Site name: Needham Market Quarry

Your Order No: GN17820-33605-JC

Lab Sample Number	1224213	1224214	1224215	1224216	1224217			
Sample Reference	SO2-01	SO2-02	SO2-03	SO2-04	SO2-05			
Sample Number	1	1	1	1	1			
Depth (m)	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50			
Date Sampled	15/05/2019	15/05/2019	15/05/2019	15/05/2019	15/05/2019			
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	25	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.8	7.6	8.8	8.7	9.4
Total mass of sample received	kg	0.001	NONE	0.47	0.50	0.48	0.49	0.49

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

pH - Automated	pH Units	N/A	MCERTS	8.1	8.1	9.0	7.9	7.8
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.8	0.8	0.8	0.8	0.8

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.64	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.87	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.83	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.46	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.26	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.26	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.19	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.18	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	3.69	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.2	10	14	7.2	6.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.3	1.0	1.2	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	11	8.7	12	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	16	18	13	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	25	25	25	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	11	11	11	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.2
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	39	55	37	38

Analytical Report Number: 19-41738

Project / Site name: Needham Market Quarry

Your Order No: GN17820-33605-JC

Lab Sample Number	1224213	1224214	1224215	1224216	1224217
Sample Reference	SO2-01	SO2-02	SO2-03	SO2-04	SO2-05
Sample Number	1	1	1	1	1
Depth (m)	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50
Date Sampled	15/05/2019	15/05/2019	15/05/2019	15/05/2019	15/05/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Compound	Units	Limit of detection	Accreditation Status	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

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

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	15	14	13	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	19	18	19	< 10	< 10

Analytical Report Number: 19-41738

Project / Site name: Needham Market Quarry

Your Order No: GN17820-33605-JC

Lab Sample Number	1224218	1224219	1224220	1224221	1224222
Sample Reference	SO2-06	SO2-07	SO2-08	SO2-09	SO2-10
Sample Number	1	1	1	1	1
Depth (m)	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50
Date Sampled	15/05/2019	15/05/2019	15/05/2019	15/05/2019	15/05/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.9	9.0
Total mass of sample received	kg	0.001	NONE	0.51	0.51

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

pH - Automated	pH Units	N/A	MCERTS	7.7	7.8	8.0	7.5	7.8
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.9	0.7	0.7	0.9	0.8

Speciated PAHs

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

Total PAH

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

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.5	11	12	9.1	8.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	1.1	1.1	0.9	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	14	9.2	11	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	14	15	11	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	23	22	24	23
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.6	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	11	11	10	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	35	31	35	37



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Environmental Science

Analytical Report Number: 19-41738

Project / Site name: Needham Market Quarry

Your Order No: GN17820-33605-JC

Lab Sample Number				1224218	1224219	1224220	1224221	1224222
Sample Reference				SO2-06	SO2-07	SO2-08	SO2-09	SO2-10
Sample Number				1	1	1	1	1
Depth (m)				0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50	0.00-0.50
Date Sampled				15/05/2019	15/05/2019	15/05/2019	15/05/2019	15/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Monoaromatics & Oxygenates				
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

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

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	12	< 10	< 10

Analytical Report Number : 19-41738

Project / Site name: Needham Market Quarry

* 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 *
1224213	SO2-01	1	0.00-0.50	Brown loam and sand with vegetation and gravel.
1224214	SO2-02	1	0.00-0.50	Brown loam and sand with gravel and stones.
1224215	SO2-03	1	0.00-0.50	Brown loam and sand with gravel.
1224216	SO2-04	1	0.00-0.50	Brown loam and sand with vegetation and gravel.
1224217	SO2-05	1	0.00-0.50	Brown loam and sand with vegetation and gravel.
1224218	SO2-06	1	0.00-0.50	Brown loam and sand with vegetation and gravel.
1224219	SO2-07	1	0.00-0.50	Brown loam and sand with vegetation and gravel.
1224220	SO2-08	1	0.00-0.50	Brown loam and sand with gravel.
1224221	SO2-09	1	0.00-0.50	Brown loam and sand with vegetation and gravel.
1224222	SO2-10	1	0.00-0.50	Brown loam and sand with gravel.



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Environmental Science

Analytical Report Number : 19-41738

Project / Site name: Needham Market Quarry

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L009-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

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

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

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



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Analytical Report Number : 20-47845

Project / Site name:	Needham Market Quarry	Samples received on:	16/12/2020
Your job number:	GN17820	Samples instructed on/ Analysis started on:	16/12/2020
Your order number:	GN17820-36407-DM	Analysis completed by:	22/12/2020
Report Issue Number:	1	Report issued on:	29/01/2021
Samples Analysed:	2 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 20-47845
 Project / Site name: Needham Market Quarry
 Your Order No: GN17820-36407-DM

Lab Sample Number				1720340	1720341
Sample Reference				HDP07-03	HDP06-02
Sample Number				1	1
Depth (m)				0.20-0.25	0.30-0.50
Date Sampled				14/12/2020	14/12/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.9	9.5
Total mass of sample received	kg	0.001	NONE	0.5	0.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.6	9.7
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.9	2.3

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	1.1
Fluorene	mg/kg	0.05	MCERTS	< 0.05	1.1
Phenanthrene	mg/kg	0.05	MCERTS	3.1	11
Anthracene	mg/kg	0.05	MCERTS	1.0	2.4
Fluoranthene	mg/kg	0.05	MCERTS	15	31
Pyrene	mg/kg	0.05	MCERTS	19	36
Benzo(a)anthracene	mg/kg	0.05	MCERTS	11	18
Chrysene	mg/kg	0.05	MCERTS	8.7	14
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	12	17
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.8	5.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	7.7	12
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.9	7.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.9	2.7
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	6.1	8.5

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	93.5	168

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.5	6.1
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.84	0.89
Boron (water soluble)	mg/kg	0.2	MCERTS	3.1	4.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	1.0
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	50	75
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	3.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	110	130
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	56	65

Analytical Report Number: 20-47845
 Project / Site name: Needham Market Quarry
 Your Order No: GN17820-36407-DM

Lab Sample Number				1720340	1720341
Sample Reference				HDT07-03	HDT06-02
Sample Number				1	1
Depth (m)				0.20-0.25	0.30-0.50
Date Sampled				14/12/2020	14/12/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	9.5	16
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	200	310
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	210	320

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	76	97
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	590	550
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	660	650

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



Analytical Report Number : 20-47845

Project / Site name: Needham Market Quarry

* 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 *
1720340	HDTP07-03	1	0.20-0.25	Brown clay and sand with gravel.
1720341	HDTP06-02	1	0.30-0.50	Brown clay and sand with gravel.

Analytical Report Number : 20-47845

Project / Site name: Needham Market Quarry

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

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

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

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



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Analytical Report Number : 21-52456

Project / Site name:	Needham Marked Quarry	Samples received on:	11/01/2021
Your job number:	GN17820	Samples instructed on/ Analysis started on:	22/01/2021
Your order number:	GN17820-36407-DM	Analysis completed by:	27/01/2021
Report Issue Number:	1	Report issued on:	27/01/2021
Samples Analysed:	5 soil samples		

Signed: *Karolina Marek*

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

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

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

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

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

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

Analytical Report Number: 21-52456
 Project / Site name: Needham Marked Quarry
 Your Order No: GN17820-36407-DM

Lab Sample Number				1745127	1745128	1745129	1745130	1745131
Sample Reference				HDP07-08	HDP07-08	HDP07-08	HDP07-08	HDP07-08
Sample Number				1	2	3	4	5
Depth (m)				0.05	0.10	0.05	0.25	0.25
Date Sampled				07/01/2021	07/01/2021	07/01/2021	07/01/2021	07/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	13	12	9.5	9.1
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

Total Organic Carbon (TOC)	%	0.1	MCERTS					
				0.7	0.7	0.7	0.2	0.6

Speciated PAHs

Compound	mg/kg	0.05	MCERTS					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.9
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.37
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	4.9
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	4.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	2.1
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.8
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.9
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.95
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.87
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.96

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS					
				< 0.80	< 0.80	< 0.80	< 0.80	21.5

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



Analytical Report Number : 21-52456

Project / Site name: Needham Marked Quarry

* 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 *
1745127	HDTP07-08	1	0.05	Brown clay and sand with gravel.
1745128	HDTP07-08	2	0.1	Brown clay and sand with gravel and vegetation.
1745129	HDTP07-08	3	0.05	Brown clay and sand with gravel.
1745130	HDTP07-08	4	0.25	Brown clay and loam with gravel.
1745131	HDTP07-08	5	0.25	Brown clay and loam with gravel.

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

GN17820 – Needham Market Quarry
Verification Report 21 - Photo Sheet 1



Photographs 1 - 4, taken on the 14th December 2020 showing the nature of the subsoil and topsoil within the cover systems for plots 3-7.



Photographs 5-6, taken on the 14th December 2020 showing the black material found, and the attempt to delineate the material within plot 7. The material in question was not present in the three surrounding exploratory locations.



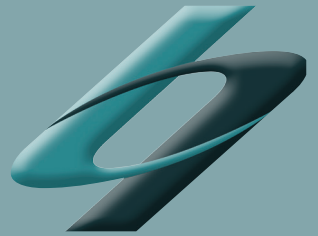
Photograph 7, taken on the 5th January 2021 showing the black material extending away from the paved footpath in plot 7.



Photograph 8, taken on the 7th January 2021 showing the excavation of the black material encountered in plot 7.



Photograph 9, taken on the 7th January 2021 showing the black material found as a subbase underlying the paved footpath in plot 7. A concrete apron was observed extending at approximately 45° from the footpath which generally capped the subbase material.



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