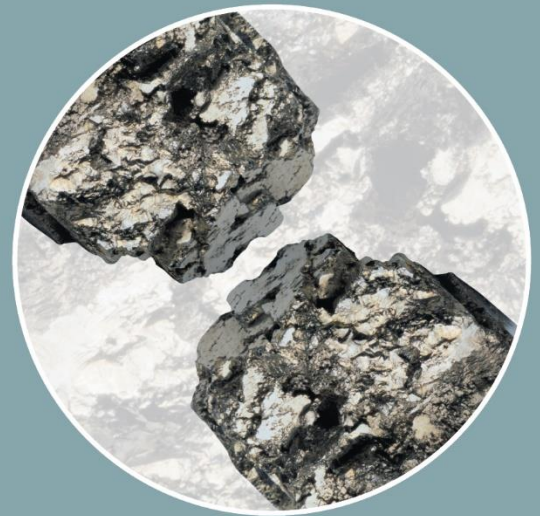


Document: Remediation Verification Report
Project: Needham Market Quarry
Reference No.: GN17820_RV16
Date: December 2019
Prepared for: Hopkins Homes Limited



harrisongeotechnical **ENGINEERING**



HARRISON GROUP ENVIRONMENTAL LIMITED

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REPORT STATUS:

Revision	Comments	Prepared By	Approved By	Issued By	Audited By
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This sheet is to be kept in Report file.

Auditors to insert their comments on the table, to annotate the report itself or provide comments on a separate sheet. (Please state which)

For final reports a hard copy of the signed off form will be kept on the appropriate QA file.

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Remediation Plans and Drawings

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 'Code of Practice for Site 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 for the benefit of the client alone. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

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 251, 256, 260, 261, 262, 265 and 266. 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 (Brehehy 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 Brehehy 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 report on the suitability of identified soil for use within the residential development (GN17820_SI_Soilrev1, also dated November 2017) 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 material 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 (which includes plot 239) 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.

During development, groundworkers (Anderson Group) encountered a hotspot of asbestos contamination while excavating a soakaway in the vicinity of plots 262, 264 and 265. Remediation comprised source removal with all excavated material being taken for offsite disposal as hazardous waste. Following installation of the soakaway crate, the excavation was backfilled with site won material. Validation samples were taken from machine excavated trial pits from the gardens of the surrounding plots to confirm the absence of potential asbestos containing materials. The trial pit logs from this stage of remediation validation are appended to this report (TP262, TP264 and TP265). The remediation of this hotspot and subsequent verification has been documented in a previous remediation verification report (GN17820_RV11 dated July 2019).

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 251, 256, 260, 261, 262, 265 and 266.

An engineer from HGE visited site on 03/12/19 to undertake hand dug trial pits within the rear gardens of plots 260, 261 and 262 to confirm that suitable topsoil and subsoil was present in the gardens. Samples were taken from plot 262 as this is adjacent to the previously identified and remediated asbestos hotspot.

A second visit was completed on the 10/12/19 to validate the front gardens of plots 260, 261 and 262 and both the front and rear gardens for plots 256, 265 and 266. Samples were taken from the hand dug trial pits in the rear garden of plot 265 as this also borders the previous asbestos hotspot. At the time of this site visit, the front garden of plot 256 had not been completed however the subsoil was observed and considered to be suitable based on visual observations. The client provided photographs of the completed garden which can be used in conjunction with previous photos taken during the site visit to confirm that a sufficient depth of topsoil has been used for the cover system.

Plot 251 comprised a flat with no garden areas however there was a small strip of soft landscaping between plot 251 and the access road to the west which was considered to be an area of public open space.

The following sections of this report outline the remediation completed for plots 256, 260, 261, 262, 265 and 266.

3.1 Cover System Material

The material used for the front and back gardens of plots 256, 260, 261, 262, 265 and 266 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-DR502w included within the appendix. These were undertaken to record the thickness and physical descriptions of the materials present and to confirm their suitability.

Photo sheet 1 included in the appendix records the validation process, including the records of the thicknesses of the cover system.

3.1.1 Site Won Subsoil

The material encountered was variable but was generally described as a combination of;

- Made Ground - Brownish orange slightly gravelly slightly silty sand with pockets of grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.
- Made Ground (reworked chalk) - Grey/white mottled cream slightly sandy slightly gravelly/gravelly SILT. Gravel is fine to coarse sub-angular to sub-rounded chalk, flint with rare concrete and brick.
- Made Ground - Light greyish brown/light brown slightly gravelly silty fine to coarse sand. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.
- Made Ground - Greyish brown slightly sandy gravelly silt. Gravel is sub-angular to sub-rounded fine to medium flint, brick and chalk.
- Pea shingle and coarse flint gravel used as a marker layer above presumed services.

The materials encountered were considered satisfactory for use as subsoil from visual inspection. Where cobbles of anthropogenic material were encountered these were removed from the cover system. Samples were taken of the different made ground horizons from trial pits in the rear gardens of plots 262 and 265.

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 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.

The material was described (during the verification works) as dark brown slightly gravelly slightly silty fine to coarse sand. Gravel is subangular to subrounded fine to medium flint and rare brick fragments. This recent description is 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 300mm depth) within the all pits excavated in plots 256, 260, 261, 262, 265 and 266. The minimum thickness of 150mm of topsoil was encountered in all of the trial pits during the verification exercise.

3.2 Soil Sampling and Analysis

During a site visit on the 16/04/19, six soil samples taken from trial pits in the rear gardens of plots 262, 264 and 265 were submitted for chemical testing as part of the validation of the asbestos hotspot remediation. These samples were scheduled an asbestos screen to confirm that these soils were suitable to remain as part of the soil cover system. The results of this chemical analysis are appended to this report (19-37897-1).

During the site visits on the 3/12/19 and 10/12/19, seven soil samples from the subsoil in the rear gardens of plots 262 and 265 were also scheduled for an asbestos screen to provide further confidence that these soils are suitable for use. The results of this testing has also been appended to this report (19-76073-1 and 19-77580-1).

All of the chemical testing did not identify any asbestos fibres within the soil samples and therefore the subsoil materials are considered suitable for use.

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 251, 256, 260, 261, 262, 265 and 266 at the development known as Needham Market Quarry.

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

Plots 161-169, 170, 218-239 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 1-136, 184-193, 197-211, 240-250, 252-255, 263, 264 and soft landscaping areas in these development phases.

Report by:



Mark Rivett BSc (Hons.) FGS
Senior Geoenvironmental Engineer

Checked and approved by:



Carl Day BSc (hons.)
Senior Geoenvironmental Engineer

APPENDICES – Supporting Documentation

Photographic Evidence:	Photo sheet 1
Chemical Analysis Reports:	19-41738-1
	19-37897-1
	19-76073-1
	19-77580-1
Hand Dug Trial Pit Logs	HDTP256-01 to HDTP256-04
	HDTP260-01 to HDTP260-03
	HDTP261-01 to HDTP261-03
	HDTP262-01 to HDTP262-03
	HDTP265-01 to HDTP265-03
	HDTP266-01 to HDTP266-02
Machine Excavated Trial Pit Logs	TP262, TP264 and TP265
Drawings:	GN17820-DR402
	GN17820-DR502w

**GN17820 – Needham Market Quarry
Verification Report 16 - Photo Sheet 1**



Photographs 1 - 2, taken on the 10th December 2019, showing the depth and nature of subsoil and topsoil within the rear garden area of plot 256 (HDTP256-02 and HDTP256-04).



Photographs 2 - 4, taken on the 10th December 2019, showing the area of the front garden prior to placement of the topsoil.



Photograph 5, taken on the 19th December 2019 by the client, showing completed cover system in the front garden of plot 256.



Photographs 6 and 7, taken on the 3rd and 10th December 2019, showing the depth and nature of subsoil and topsoil within the garden areas of plots 260, 261 and 262 (HOTP260-01 and HOTP261-03).



Photographs 8 and 9, taken on the 10th December 2019 showing where pea shingle and coarse gravel were encountered within hand dug trial pits (HDT262-03 and HDT266-01) and presumed to indicate the presence of services.



Photographs 10 and 11, taken on the 10th December 2019, showing the depth and nature of subsoil and topsoil within the garden areas of plots 265 and 266 (HDT265-03 and HDT266-02).



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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

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

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

Analytical Report Number: 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

Compound	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
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

Element	mg/kg	1	MCERTS	5.2	10	14	7.2	6.5
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

Parameter	Units	Limit of detection	Accreditation Status	1224213	1224214	1224215	1224216	1224217
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

Parameter	Units	Limit of detection	Accreditation Status	1224213	1224214	1224215	1224216	1224217
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

Parameter	Units	Limit of detection	Accreditation Status	1224213	1224214	1224215	1224216	1224217
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	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.9	9.0	8.5	9.4
Total mass of sample received	kg	0.001	NONE	0.51	0.51	0.50	0.58

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

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

	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
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

Heavy Metals / Metalloids

	mg/kg	1	MCERTS	7.5	11	12	9.1	8.7
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
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	< 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 : 19-37897

Project / Site name:	Needham Market Quarry	Samples received on:	18/04/2019
Your job number:	GN17820	Samples instructed on:	18/04/2019
Your order number:	GN17820-33433-CD	Analysis completed by:	26/04/2019
Report Issue Number:	1	Report issued on:	26/04/2019
Samples Analysed:	1 bulk sample - 6 soil samples		

Signed: 

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 19-37897
Project / Site name: Needham Market Quarry
Your Order No: GN17820-33433-CD

Lab Sample Number				1203413	1203414	1203415	1203416	1203417
Sample Reference				TP262	TP262	TP264	TP264	TP265
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				0.50	1.00	0.50	1.50	0.00-0.70
Date Sampled				16/04/2019	16/04/2019	16/04/2019	16/04/2019	16/04/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Asbestos in Soil	Type	N/A	ISO 17025	Not-detected



Analytical Report Number: 19-37897
Project / Site name: Needham Market Quarry
Your Order No: GN17820-33433-CD

Lab Sample Number				1203418				
Sample Reference				TP265				
Sample Number				ES6				
Depth (m)				0.70-1.10				
Date Sampled				16/04/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				



Analytical Report Number: 19-37897

Project / Site name: Needham Market Quarry

Lab Sample Number				1203419				
Sample Reference				Asbestos Fragment				
Sample Number				B7				
Depth (m)				0.00				
Date Sampled				16/04/2019				
Time Taken				None Supplied				
Analytical Parameter (Bulk Analysis)	Units	Limit of detection	Accreditation Status					
Asbestos Identification Name	Type	N/A	ISO 17025	Chrysotile- Hard/Cement Type Material				



Analytical Report Number : 19-37897

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 Bulks	Asbestos Identification in bulk material with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	W	ISO 17025
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

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 : 19-76073

Project / Site name:	Needham Market Quarry	Samples received on:	06/12/2019
Your job number:	GN17820	Samples instructed on:	06/12/2019
Your order number:	GN17820-MR	Analysis completed by:	11/12/2019
Report Issue Number:	1	Report issued on:	11/12/2019
Samples Analysed:	4 soil samples		

Signed: *K. Lewicka*

Katarzyna Lewicka
Head of Reporting Section

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.

Iss No 19-76073-1 Needham Market Quarry GN17820

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The results included within the report are representative of the samples submitted for analysis.

Page 1 of 4



Analytical Report Number: 19-76073

Project / Site name: Needham Market Quarry

Your Order No: GN17820-MR

Lab Sample Number	1384149	1384150	1384151	1384152	
Sample Reference	TP262-01	TP262-02	TP262-02	TP258-05	
Sample Number	ES1	ES1	ES2	ES1	
Depth (m)	0.25-0.60	0.20-0.35	0.35-0.60	0.35	
Date Sampled	03/12/2019	03/12/2019	03/12/2019	03/12/2019	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	-	< 0.1
Moisture Content	%	N/A	NONE	-	8.1
Total mass of sample received	kg	0.001	NONE	-	0.48

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

Speciated PAHs

Compound	Units	Limit of detection	Accreditation Status				
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	0.80
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	0.57
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	0.20
Fluorene	mg/kg	0.05	MCERTS	-	-	-	1.0
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	7.1
Anthracene	mg/kg	0.05	MCERTS	-	-	-	0.39
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	5.3
Pyrene	mg/kg	0.05	MCERTS	-	-	-	3.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	1.3
Chrysene	mg/kg	0.05	MCERTS	-	-	-	1.8
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	1.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	0.74
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	0.64
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	0.66

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	27.2



Analytical Report Number : 19-76073

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 *
1384149	TP262-01	ES1	0.25-0.60	-
1384150	TP262-02	ES1	0.20-0.35	-
1384151	TP262-02	ES2	0.35-0.60	-
1384152	TP258-05	ES1	0.35	Brown sand with gravel.



Analytical Report Number : 19-76073

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
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In-house method based on BS1377 Part 2, 1990, Classification tests	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

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 : 19-77580

Project / Site name:	Needham Market Quarry	Samples received on:	16/12/2019
Your job number:	GN17820	Samples instructed on:	16/12/2019
Your order number:	GN17820-MR	Analysis completed by:	18/12/2019
Report Issue Number:	1	Report issued on:	18/12/2019
Samples Analysed:	4 soil samples		

Signed: _____

Rachel Bradley

Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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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.

Iss No 19-77580-1 Needham Market Quarry GN17820

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The results included within the report are representative of the samples submitted for analysis.

Page 1 of 3



Analytical Report Number: 19-77580

Project / Site name: Needham Market Quarry

Your Order No: GN17820-MR

Lab Sample Number				1392748	1392749	1392750	1392751	
Sample Reference				TP265-01	TP265-01	TP265-02	TP265-02	
Sample Number				1	2	1	2	
Depth (m)				0.15-0.40	0.40-0.60	0.40-0.35	0.35-0.60	
Date Sampled				10/12/2019	10/12/2019	10/12/2019	10/12/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Asbestos in Soil				Type	N/A	ISO 17025	Not-detected	Not-detected
							Not-detected	Not-detected



Analytical Report Number : 19-77580

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

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.

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609498.88 N: 254147.67
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.20					
MADE GROUND. Reworked CHALK recovered as grey slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium chalk and flint.		0.55 0.60					
Trial pit terminated at 0.60m.							

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: 0.30m x W: 0.30m	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


Project ID: GN17820	Client: Hopkins Homes Limited	E: 609494.08 N: 254149.24
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.		0.20					
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.60					
Trial pit terminated at 0.60m.							

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: 0.30m x W: 0.30m	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

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609497.66 N: 254154.58
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.20					
MADE GROUND. Reworked CHALK recovered as grey slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium chalk and flint.		0.30					
<i>At 0.55m: Brick cobble present.</i>							
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: 0.30m x W: 0.30m	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					
	Logged by: DM	Checked by: MR		Fm-Hn-R-3069-Rev E	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609505.36	N: 254154.44
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 10/12/2019	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.		0.30					
MADE GROUND. Reworked CHALK recovered as grey slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium chalk and flint.		0.60					
Trial pit terminated at 0.60m.							

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: 0.30m x W: 0.30m	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.				

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609459.80	N: 254138.16
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 03/12/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Greyish brown slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium flint, brick and chalk. <i>At 0.50m: Concrete cobble present.</i>		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: 0.30m x W: 0.30m 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: MR
		Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609462.03	N: 254144.30
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 03/12/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Greyish brown slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium flint, brick 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: 0.30m x W: 0.30m		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: MR Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609453.72	N: 254125.99
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 10/12/2019	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Light greyish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint.		0.25					
MADE GROUND. Pea shingle.		0.45					
Trial pit terminated at 0.55m: Presumed service encountered		0.55					

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: 0.30m x W: 0.30m 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 0.55m arisings. 2. Approximate coordinates.
Logged by: DM		Checked by: MR
		Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609465.00	N: 254136.61
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 03/12/2019	


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

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: 0.30m x W: 0.30m	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					
	Logged by: DM			Checked by: MR	

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609467.36	N: 254143.30
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 03/12/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint.		0.20					
MADE GROUND. Orangish brown gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.		0.35					
MADE GROUND. Light greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is sub-angular to sub-rounded fine to medium flint, brick and chalk.		0.60					
Trial pit terminated at 0.60m.							


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: 0.30m x W: 0.30m		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: MR Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609459.01	N: 254124.01
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 10/12/2019	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Light greyish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse chalk and flint.		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: 0.30m x W: 0.30m		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: MR Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609471.57 N: 254133.28
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 03/12/2019


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Reworked CHALK recovered as white mottled cream slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium chalk, flint and brick.		0.25		ES1	0.25 - 0.60		
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: 0.30m x W: 0.30m	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: MR		Fm-Hn-R-3069-Rev E

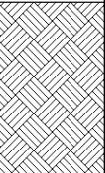

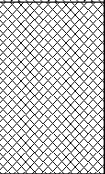

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609473.29 N: 254139.06
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 03/12/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Dark brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Orangish brown gravelly slightly silty fine to coarse SAND with pockets of silty clay. Gravel is sub-angular to sub-rounded fine to coarse flint.		0.20		ES1	0.20 - 0.35		
MADE GROUND. Greyish brown slightly silty sandy angular to sub-rounded fine to coarse GRAVEL of flint, brick, chalk, concrete and metal.		0.35		ES2	0.35 - 0.60		
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: 0.30m x W: 0.30m		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: MR Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609464.40	N: 254121.99
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 10/12/2019	


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Light yellowish grey slightly gravelly sandy SILT. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.25					
MADE GROUND. Pea shingle.		0.50					
Trial pit terminated at 0.55m: Presumed service encountered		0.55					

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: 0.30m x W: 0.30m	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 0.55m arisings. 2. Approximate coordinates.		
		Logged by: DM	Checked by: MR	Fm-Hn-R-3069-Rev E


Project ID: GN17820	Client: Hopkins Homes Limited	E: 609486.48	N: 254140.31
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 10/12/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.15		ES1	0.15 - 0.40		
MADE GROUND. Reworked CHALK recovered as grey slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium chalk and flint.		0.40		ES2	0.40 - 0.60		
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: 0.30m x W: 0.30m	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


Project ID: GN17820	Client: Hopkins Homes Limited	E: 609490.36 N: 254142.58
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.		0.15		ES1	0.10 - 0.35		
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.35		ES2	0.35 - 0.60		
MADE GROUND. Reworked CHALK recovered as grey slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to medium chalk and flint.		0.60					
Trial pit terminated at 0.60m.							

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: 0.30m x W: 0.30m	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					
	Logged by: DM	Checked by: MR	Fm-Hn-R-3069-Rev E		

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609499.68 N: 254138.88
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Light brown slightly gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint and 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: 0.30m x W: 0.30m	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

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609491.53 N: 254146.46
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.							
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.15					
MADE GROUND. Multicoloured sub-angular coarse GRAVEL of flint.		0.35					
Trial pit terminated at 0.45m: Presumed service encountered		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

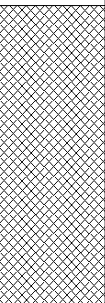

Pit Dimensions: L: 0.30m x W: 0.30m		Remarks 1. Backfill: GL to 0.45m arisings. 2. Approximate coordinates.
Norwich Office: 01603 613111 London Office: 020 7537 9233 Cambridge Office: 01223 781585 Colchester Office: 01206 986675 Testing Services: 01603 416333 E-mail: info@harrisingroupuk.com Website: www.harrisingroupuk.com		Logged by: DM Checked by: MR Fm-Hn-R-3069-Rev E

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609487.73 N: 254148.15
Location: Needham Market Quarry	Consultant:	
	Plant used: Hand Dug	Date: 10/12/2019


Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium flint.		0.15					
MADE GROUND. Brownish orange slightly gravelly slightly silty fine to coarse SAND with occasional pockets of soft grey clay. Gravel is sub-angular to sub-rounded fine to coarse flint and chalk.		0.60					
Trial pit terminated at 0.60m.							

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: 0.30m x W: 0.30m	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

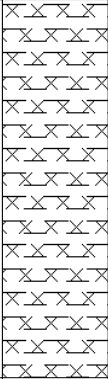

Project ID: GN17820	Client: Hopkins Homes Limited	E: 609471.84	N: 254136.17
Location: Needham Market Quarry	Consultant:		
	Plant used: 13 Tonne Tracked Excavator	Date: 16/04/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
MADE GROUND. Greyish white slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to coarse flint, chalk and brick. Slight organic odour present. (Reworked chalk)		1.20		ES1	0.50		
Trial pit terminated at 1.20m.							


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

Pit Dimensions: L: 2.00m x W: 0.60m	Remarks 1. Backfill: GL to 1.20m 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: CD	Checked by: CD	Fm-Hn-R-3069-Rev E

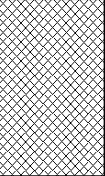

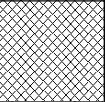

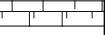
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609490.27	N: 254126.85
Location: Needham Market Quarry	Consultant:		
	Plant used: 13 Tonne Tracked Excavator	Date: 16/04/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
Light brown sandy gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse flint. At 0.50m: <i>Flint cobble present.</i>				ES1	0.50		
Trial pit terminated at 1.50m.		1.50		ES2	1.50		


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

Pit Dimensions: L: 2.00m x W: 0.60m	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 1.50m arisings. 2. Approximate coordinates.				
	Logged by: CD	Checked by: CD	Fm-Hn-R-3069-Rev E		

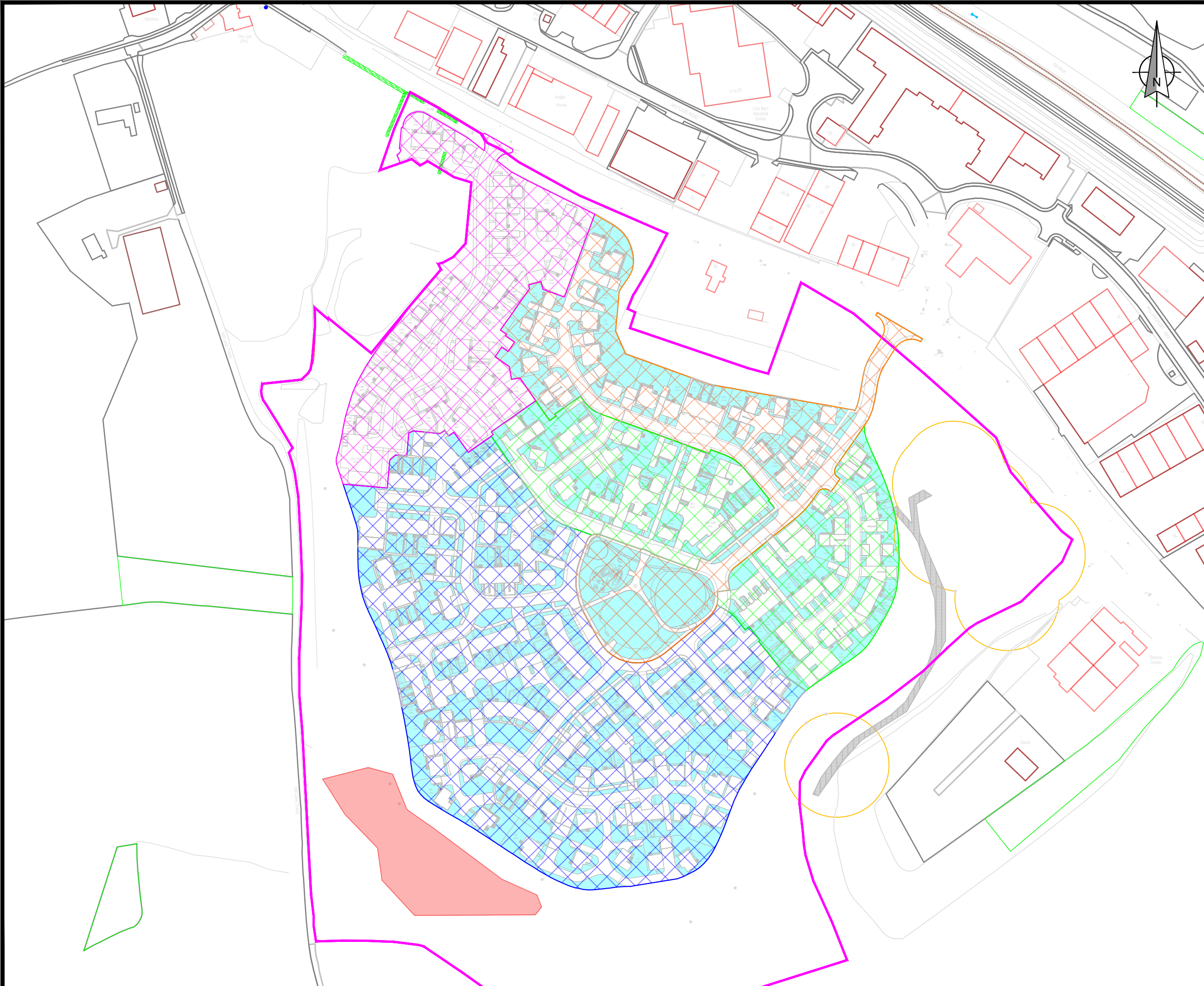
Project ID: GN17820	Client: Hopkins Homes Limited	E: 609487.96	N: 254141.26
Location: Needham Market Quarry	Consultant:		
	Plant used: 13 Tonne Tracked Excavator	Date: 16/04/2019	








Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
MADE GROUND. Orangish yellowish brown very gravelly silty fine to coarse SAND with low cobble content. Gravel is sub-angular to sub-rounded fine to coarse brick, concrete and ceramics. Cobbles are brick and concrete.				ES1	0.00 - 0.70		
MADE GROUND. Black gravelly slightly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse brick, flint, concrete and ceramic.		0.70		ES2	0.70 - 1.10		
Structureless CHALK composed of off white and cream slightly sandy gravelly SILT. Gravel is weak low density chalk with rare sub-angular to sub-rounded fine to coarse flint. (Grade Dm) Trial pit terminated at 1.20m.		1.10 1.20					

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


Pit Dimensions: L: 2.00m x W: 0.60m	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 1.20m arisings. 2. Approximate coordinates.				
	Logged by: CD	Checked by: CD	Fm-Hn-R-3069-Rev E		

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


harrisongroup ENVIRONMENTAL

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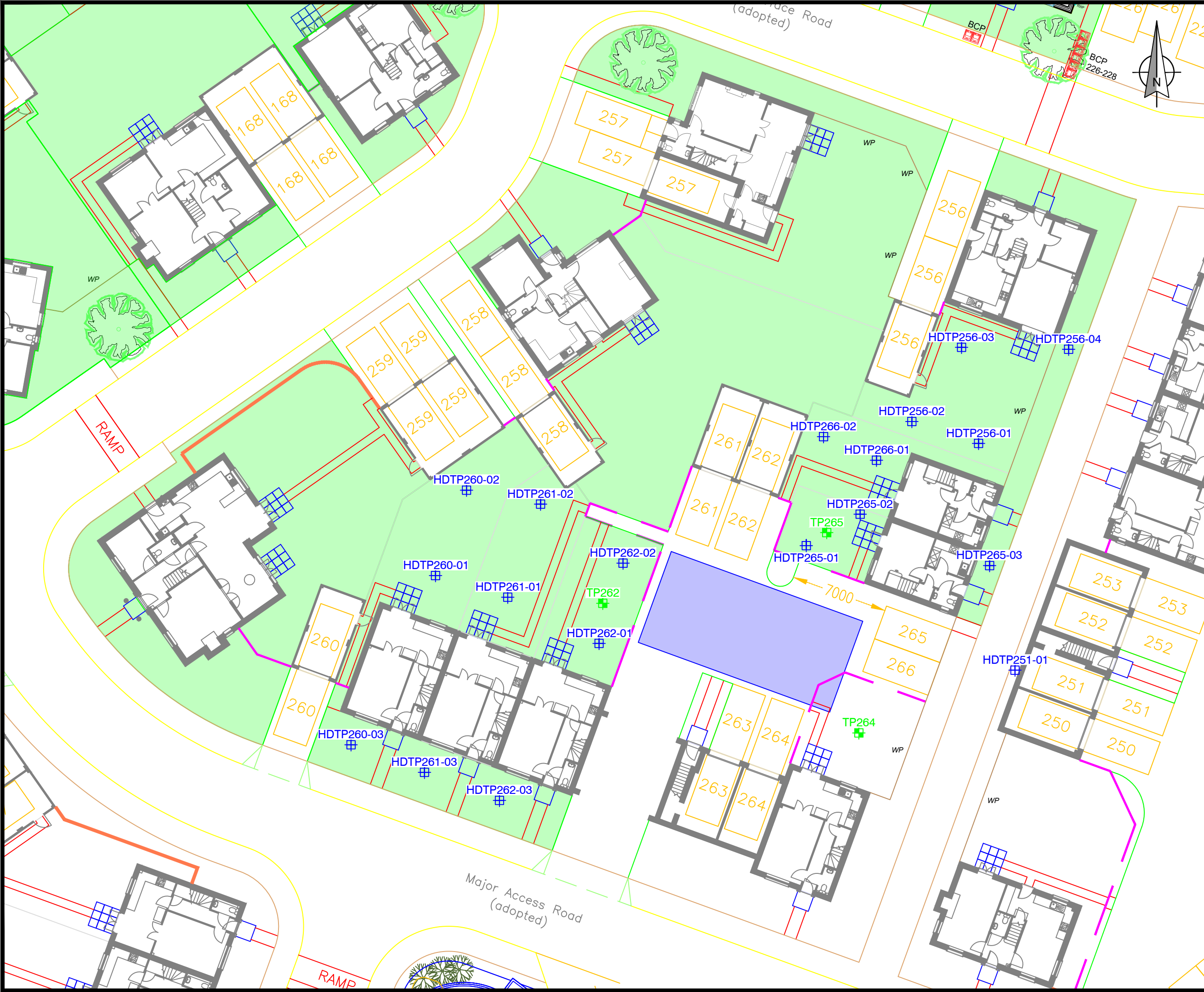

UKAS
TESTING
4031

Certificate Number 5933
ISO 9001, ISO 14001

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PL-HI-D-101 Rev B N:\work\projects\jobs 17000\jobs 17820\GN17820 Needham Market Quarry Remediation Drawings\CAD files\GN17820 - DR502.dwg



Key :

- HOTP256-01 Hand Dug Trial Pit
- TP262 Machine Excavated Trial Pit - April 2019
- Excavation 102
- Acceptable Cover System

Notes :

HOPKINS HOMES

Client : Hopkins Homes Ltd
 Project : Needham Market Quarry
 Job No : GN17820 Date : December 2019
 Drawing Title : Fieldwork Location Plan - Plots 251, 256, 260-262 & 265-266
 Drawing No : GN17820 - DR502w
 Scale : 1:250 @ A3
 Drawn by : RW Checked by : MR
 Eastings : 609475 Northings : 254145

Revision history

Rev	Date	Revision Data

harrisongroup ENVIRONMENTAL

Norwich: 01603 613111 London: 020 7537 9233
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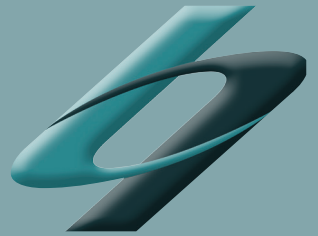
UKAS MANAGEMENT SYSTEMS
 0026

UKAS TESTING
 4031

Certificate Number 5933
 ISO 9001, ISO 14001

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