Document: Remediation Verification Report

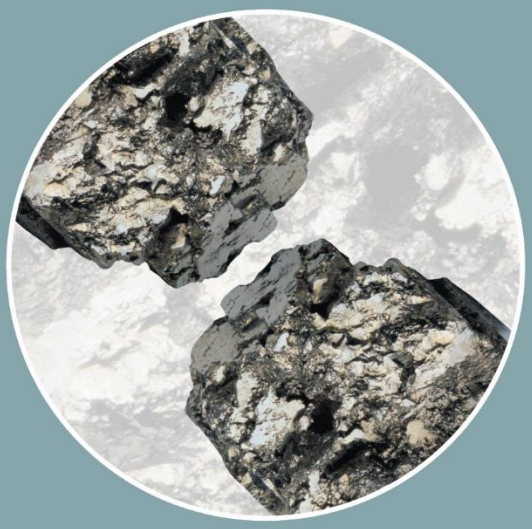
Project: Needham Market Quarry

Reference No.: GN17820_RV7

Date: April 2019

Prepared for: Hopkins Homes Limited

harrisongeotechnical
ENGINEERING



A division of Harrison Group Environmental Limited

HARRISON GROUP ENVIRONMENTAL LIMITED

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REPORT STATUS:

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

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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 Contaminated Land Report 11 'Model procedures for the management of contaminated land' (Department for Environment, Food and Rural Affairs and the Environment Agency, 2004). 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 170 and 223. 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.

Further 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.
- 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).

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 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 (ST01) created during earthworks was considered suitable for reuse in gardens, chemical analysis of this material confirmed its 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. Where observed, it was recommended that this material is removed from topsoil planned for use in gardens and areas of public open space.

A remediation method statement (RMS) report 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 report. 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 170 and 223.

An Engineer from HGE visited site on the 15th of March and 9th of April to undertake confirmatory hand dug trial pits within the garden areas of plots 170 and 223 following confirmation that the cover system had been placed. The following sections of this report outline the remediation completed for plots 170 and 223.

3.1 Cover System Material

The material used for the back and front gardens of plots 170 and 223 comprised site won subsoil and topsoil (from previously verified stockpile ST01 as mentioned in section 2.2 of this report). A total of six hand excavated pits were undertaken on the 09/04/19 across the back and front gardens of plot 170 (HDTP170-01 to HDTP170-06). One machine excavated trial pit was undertaken within the back garden of plot 223 on the 09/10/18 (prior to placement of topsoil), four hand excavated pits were undertaken on the 15/03/19 within the back garden of plot 223 (HDTP223-01 to HDTP223-04) and two hand excavated pits were undertaken on the 09/04/19 within the front garden of plot 223 (HDTP223-05 to HDTP223-06). The fieldwork locations are shown

on drawing GN17820-DR502l and GN17820-DR502m included within the appendix. These were undertaken to confirm the thickness of the soil cover system materials as well as to note the physical descriptions of the materials 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. The full depth of 600mm was noted in the majority of the hand dug trial pits undertaken within plots 170 and 223. However, several of the positions were not able to be advanced to the full 600mm due to the density of the natural ground encountered. Due to the fact that natural ground was encountered in these positions the cover system was considered satisfactory.

3.1.1 Site Won Subsoil

The material was generally described as either;

- Structureless Chalk composed of cream sandy very silty gravel. Gravel is extremely weak to weak subangular to subrounded fine to coarse white chalk with occasional orange staining and occasional subangular to rounded medium flint (Grade Dc). Chalk very hard with increasing depth.
- Made ground (reworked natural glacial material); yellowish white very sandy very gravelly clay with pockets of structureless chalk. Gravel is angular to subrounded fine to coarse chalk, flint and brick with occasional flint cobbles
- Made ground (reworked chalk); grey sandy gravelly silt. Gravel is subangular to rounded fine to coarse flint, chalk, wood and brick.
- Made ground (granular fill); multi-coloured gravel of angular to subrounded fine to medium flint.

The darker organic/ashy material was not encountered within the garden areas of these plots and therefore the material encountered is considered satisfactory for use as subsoil.

3.1.2 Site Won Topsoil

Topsoil from stockpile ST01 (created during earthworks) was previously considered suitable for reuse in gardens and chemical analysis of this material has confirmed its suitability. The results of the chemical analysis were appended to report GN17820_SI_Soilrev1 dated November 2017. 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 ST01 was described as brown silty gravelly sand, with clay pockets and gravel including flint and chalk. Rare steel wire, brick and porcelain was also observed in this recycled stockpile of topsoil, which was recommended to be removed when placed. A total of seven samples were submitted to a laboratory in September 2017 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 site criteria adopted at the time.

The material was described (during the verification works) as brown slightly gravelly slightly clayey fine to medium sand. Gravel is subangular to subrounded fine to coarse flint with occasional brick fragments, therefore limited anthropogenic material was encountered (brick fragments). This recent description matches the previous description and therefore has been confirmed as the same material.

This material was used for the surface material (ground level up to 550mm depth) within the front and back gardens of plots 170 and 223. The minimum thickness of 150mm of topsoil was encountered in all of the trial pits during the verification exercise.

4 CONCLUSION

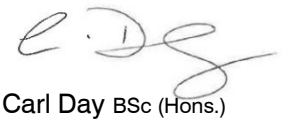
Harrison Group Environmental Limited considers that a suitable cover system of suitable thickness, comprising chemically and physically suitable material, has been implemented. We are satisfied that there will be no significant risk to human health from residual contamination in plots 170 and 223 at the development known as Needham Market Quarry.

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

Plots 161-163, 218-222 and 234-238 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

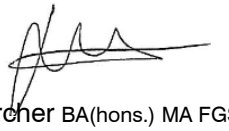
area is remediated. These include plots 1-136, 164-169, 184-193, 197-211, 239-266 and soft landscaping areas in these development phases.

Report by:



Carl Day BSc (Hons.)
Senior Geoenvironmental Engineer

Checked and approved by:



Jon Archer BA(hons.) MA FGS FRGS
Associate Director

APPENDICES – Supporting Documentation

Photographic Evidence:	Photo sheet 1
Chemical Analysis Reports:	17-59423-1
Machine Excavated Trial Pit Logs	TP223-01
Hand Dug Trial Pit Logs	HDTP170-01 to HDTP170-06
	HDTP223-01 to HDTP223-06
Drawings:	GN17820-DR402
	GN17820-DR502l
	GN17820-DR502m

GN17820 – Needham Market Quarry.
Verification Report 7 - Photo Sheet 1.

Photographs 1 - 2, taken on the 9th April 2019, showing the depth and nature of subsoil and topsoil within the front garden of plot 170 (HDTP170-05) and the arisings from the excavation.

Photograph 3 - 4, taken on the 15th March 2019, showing the depth and nature of subsoil and topsoil within the back garden of plot 223 (HDTP223-02) and the arisings from the excavation.

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Analytical Report Number : 17-59423

Project / Site name:	Needham Market Quarry	**Samples received on:**	06/09/2017
Your job number:	GN17820	**Samples instructed on:**	06/09/2017
Your order number:	GN17820-30122-JA	**Analysis completed by:**	12/09/2017
Report Issue Number:	1	**Report issued on:**	12/09/2017
Samples Analysed:	7 soil samples		

Signed:

Dr Irma Doyle
Senior Account 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

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

Analytical Report Number: 17-59423

Project / Site name: Needham Market Quarry
Your Order No: GN17820-30122-JA

Lab Sample Number				811164	811165	811166	811167	811168
Sample Reference				ST01	ST01	ST01	ST01	ST01
Sample Number				ES1	ES2	ES3	ES4	ES6
Depth (m)				0.00-0.20	0.00-0.20	0.00-0.20	0.00-0.20	0.00-0.20
Date Sampled				04/09/2017	04/09/2017	04/09/2017	04/09/2017	04/09/2017
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	25	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.0	6.2	4.6	6.1	5.4
Total mass of sample received	kg	0.001	NONE	1.8	1.7	1.6	1.6	1.7
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	7.9	8.1	8.5	7.5	7.8
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	0.7	0.5	0.6	0.7
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

Analytical Report Number: 17-59423

Project / Site name: Needham Market Quarry
Your Order No: GN17820-30122-JA

Lab Sample Number				811164	811165	811166	811167	811168
Sample Reference				ST01	ST01	ST01	ST01	ST01
Sample Number				ES1	ES2	ES3	ES4	ES6
Depth (m)				0.00-0.20	0.00-0.20	0.00-0.20	0.00-0.20	0.00-0.20
Date Sampled				04/09/2017	04/09/2017	04/09/2017	04/09/2017	04/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.2	9.0	13	6.3	7.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.7	0.5	0.5	0.8
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	8.7	9.1	9.2	11	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.7	10	7.4	9.7	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	17	13	15	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	10	9.8	11	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	41	41	32	38	43
Monoaromatics								
Benzene	ug/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	< 10	< 10	< 10

Analytical Report Number: 17-59423

Project / Site name: Needham Market Quarry
Your Order No: GN17820-30122-JA

Lab Sample Number				811169	811170			
Sample Reference				ST01	ST01			
Sample Number				ES8	ES10			
Depth (m)				0.00-0.20	0.00-0.20			
Date Sampled				04/09/2017	04/09/2017			
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	%	N/A	NONE	5.4	6.5			
Total mass of sample received	kg	0.001	NONE	1.7	1.6			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.2			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	0.7			
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	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			

Analytical Report Number: 17-59423

Project / Site name: Needham Market Quarry
Your Order No: GN17820-30122-JA

Lab Sample Number				811169	811170			
Sample Reference				ST01	ST01			
Sample Number				ES8	ES10			
Depth (m)				0.00-0.20	0.00-0.20			
Date Sampled				04/09/2017	04/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	8.2			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.0			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	8.7			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	11			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	19			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	10			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	45	37			
Monoaromatics								
Benzene	ug/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	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
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	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

Analytical Report Number : 17-59423

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 *
811164	ST01	ES1	0.00-0.20	Light brown sandy loam with gravel and vegetation.
811165	ST01	ES2	0.00-0.20	Light brown sandy loam with vegetation.
811166	ST01	ES3	0.00-0.20	Light brown sandy loam with stones and vegetation.
811167	ST01	ES4	0.00-0.20	Light brown sandy loam with gravel and vegetation.
811168	ST01	ES6	0.00-0.20	Light brown sandy loam with gravel.
811169	ST01	ES8	0.00-0.20	Light brown sandy loam with gravel and vegetation.
811170	ST01	ES10	0.00-0.20	Light brown sandy loam with gravel and vegetation.

Analytical Report Number : 17-59423

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	L073B-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	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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Trial Pit Record

HDTP223-01

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609470.07	N: 254208.70
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 15/03/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly clayey fine to medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint with occasional brick fragments.							
		0.30					
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) *Between 0.30m and 0.40m: Chalk is very hard.*		0.40					
Trial pit terminated at 0.40m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.40m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP223-02

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609477.36	N: 254213.44
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 15/03/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly clayey fine to medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint with occasional brick fragments.		0.25					
MADE GROUND. Grey sandy gravelly SILT. Gravel is sub-angular to rounded fine to coarse flint, chalk, wood and brick. (Reworked chalk)		0.60					
Trial pit terminated at 0.60m.							

Weather:	Dry and Sunny
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP223-03

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609476.66	N: 254201.14
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 15/03/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly clayey fine to medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint with occasional brick fragments.		0.20					
Between 0.15m and 0.30m: Chalk is very hard.		0.30					
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 0.30m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.30m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP223-04

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609481.84	N: 254207.83
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 15/03/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
TOPSOIL. Brown slightly gravelly slightly clayey fine to medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint with occasional brick fragments.		0.20					
MADE GROUND. Grey sandy gravelly SILT. Gravel is sub-angular to rounded fine to coarse flint, chalk, wood and brick. (Reworked chalk)		0.40					
Between 0.20m and 0.40m: Chalk is very hard.							
Trial pit terminated at 0.40m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.40m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP223-05

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609464.25	N: 254191.25
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

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 medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.		0.35					
MADE GROUND. Yellowish brown very gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse chalk, flint, concrete and brick.		0.50					
MADE GROUND. Multicoloured GRAVEL of angular to sub-rounded fine to medium flint.		0.60					
Trial pit terminated at 0.60m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP223-06

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609472.17	N: 254188.36
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

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 medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint and brick.		0.25					
MADE GROUND. Structureless CHALK composed of cream sandy very silty GRAVEL with occasional pockets of yellowish brown clay. Gravel is extremely weak to weak white sub-angular to sub-rounded fine to coarse chalk with occasional flint and concrete.		0.60					
Trial pit terminated at 0.60m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP170-01

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609429.64	N: 254179.39
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

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 medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint and brick with rare clinker.							
		0.55					
Structureless CHALK composed of cream sandy very silty GRAVEL. Gravel is extremely weak to weak sub-angular to sub-rounded fine to coarse white chalk with occasional orange staining and occasional sub-angular to rounded medium flint. (Grade Dc)		0.60					
Trial pit terminated at 0.60m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP170-02

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609424.20	N: 254185.77
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

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 medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint and brick.							
		0.30					
MADE GROUND. Yellowish white very sandy very gravelly CLAY with pockets of structureless chalk. Gravel is angular to sub-rounded fine to coarse chalk, flint and brick with occasional flint cobbles.		0.60					
Trial pit terminated at 0.60m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP170-03

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609421.84	N: 254178.61
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

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 medium SAND. Gravel is angular to sub-rounded fine to coarse flint and brick.							
		0.25					
MADE GROUND. Structureless CHALK composed of cream sandy very silty GRAVEL with occasional pockets of yellowish brown clay and dark brown sand. Gravel is extremely weak white sub-angular to sub-rounded fine to coarse chalk with occasional rinded flint and brick.							
		0.60					
Trial pit terminated at 0.60m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP170-04

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609417.03	N: 254182.20
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

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 medium SAND. Gravel is angular to sub-rounded fine to coarse flint and brick.		0.25					
Structureless CHALK composed of cream sandy gravelly SILT. Gravel is extremely weak to weak sub-angular to sub-rounded fine to coarse white chalk. (Grade Dm)		0.30					
Trial pit terminated at 0.30m: Due to dense ground conditions.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.30m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP170-05

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609409.04	N: 254170.89
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
Grass over TOPSOIL. Dark brown slightly gravelly silty fine to medium SAND with occasional pockets of orangish brown sand. Gravel is angular to sub-rounded fine to coarse flint.							
		0.30					
MADE GROUND. Structureless CHALK composed of cream sandy very silty GRAVEL with occasional pockets of yellowish brown gravelly clay. Gravel is extremely weak to very weak white sub-angular to sub-rounded fine to coarse chalk with occasional flint and concrete.							
		0.60					
Trial pit terminated at 0.60m.							

Weather:	Dry and Sunny
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.60m arisings.
2. Approximate coordinates.

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Trial Pit Record

HDTP170-06

Sheet 1 of 1

Project ID: **GN17820**	Client: Hopkins Homes Limited	E: 609406.32	N: 254176.03
Location: Needham Market Quarry	Consultant:		
	Plant used: Hand Dug	Date: 09/04/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
				Type	Depth	Results / Remarks	
Grass over TOPSOIL. Dark brown slightly gravelly silty fine to medium SAND. Gravel is sub-angular to sub-rounded fine to coarse flint.		0.25					
MADE GROUND. Structureless CHALK composed of cream sandy very silty GRAVEL with occasional pockets of yellowish brown gravelly clay. Gravel is extremely weak to very weak white sub-angular to sub-rounded fine to coarse chalk with occasional flint and concrete.		0.60					
Trial pit terminated at 0.60m.							

Weather: Dry and Sunny

Pit Stability: Stable

Shoring Used:

Pit Dimensions: L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

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
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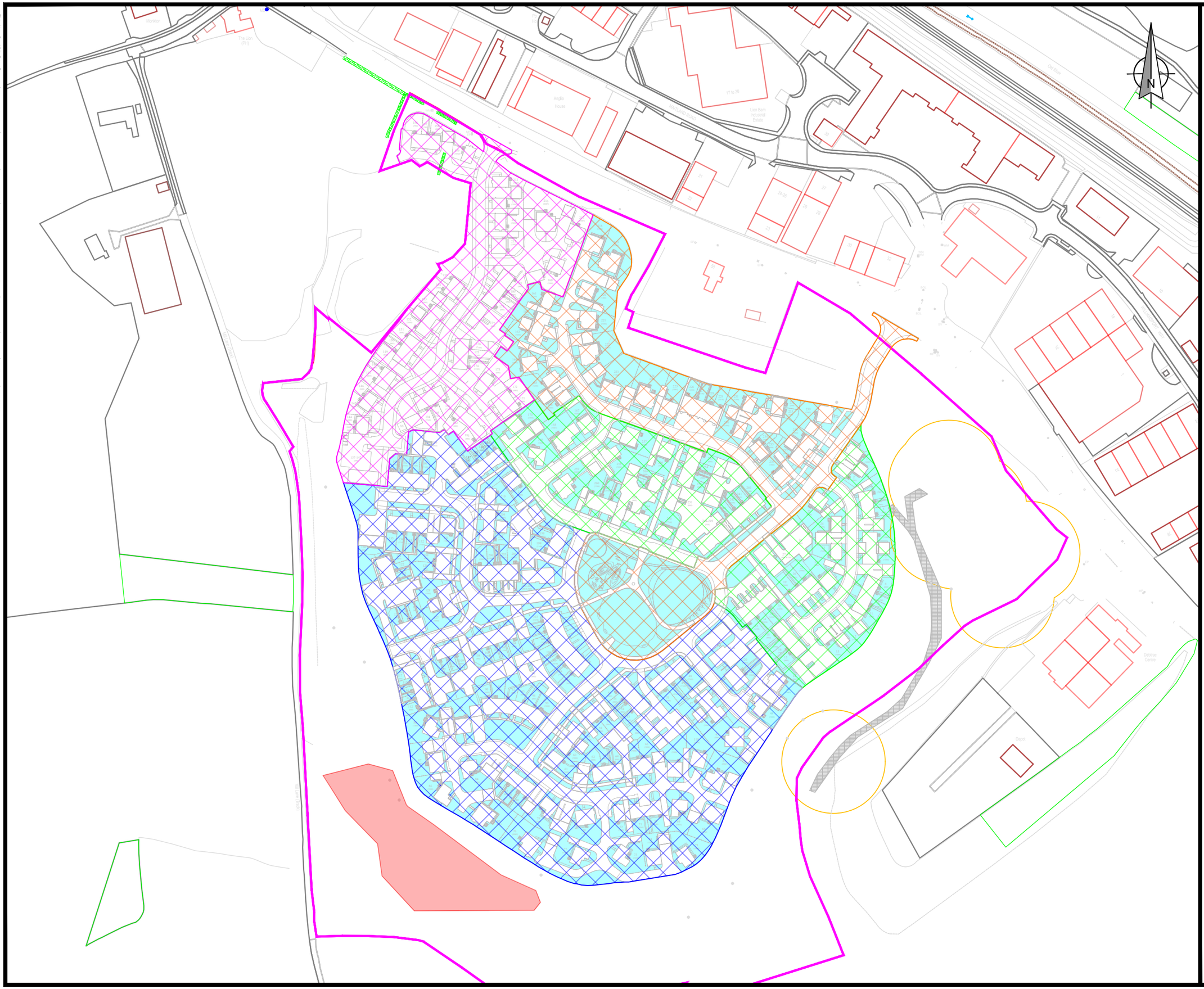
AGS

Logged by: RK | Checked by: CD | **Fm-Hn-R-3069-Rev E**

FM-Hn-D-101 Rev B N:\Norwich\Projects\Jobs 17000s\Jobs 17800\GN17820 Needham Market Quarry\Remediation\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 : 609411 Northings : 254247

Revision history

Rev	Date	Revision Data

harrisongroup ENVIRONMENTAL

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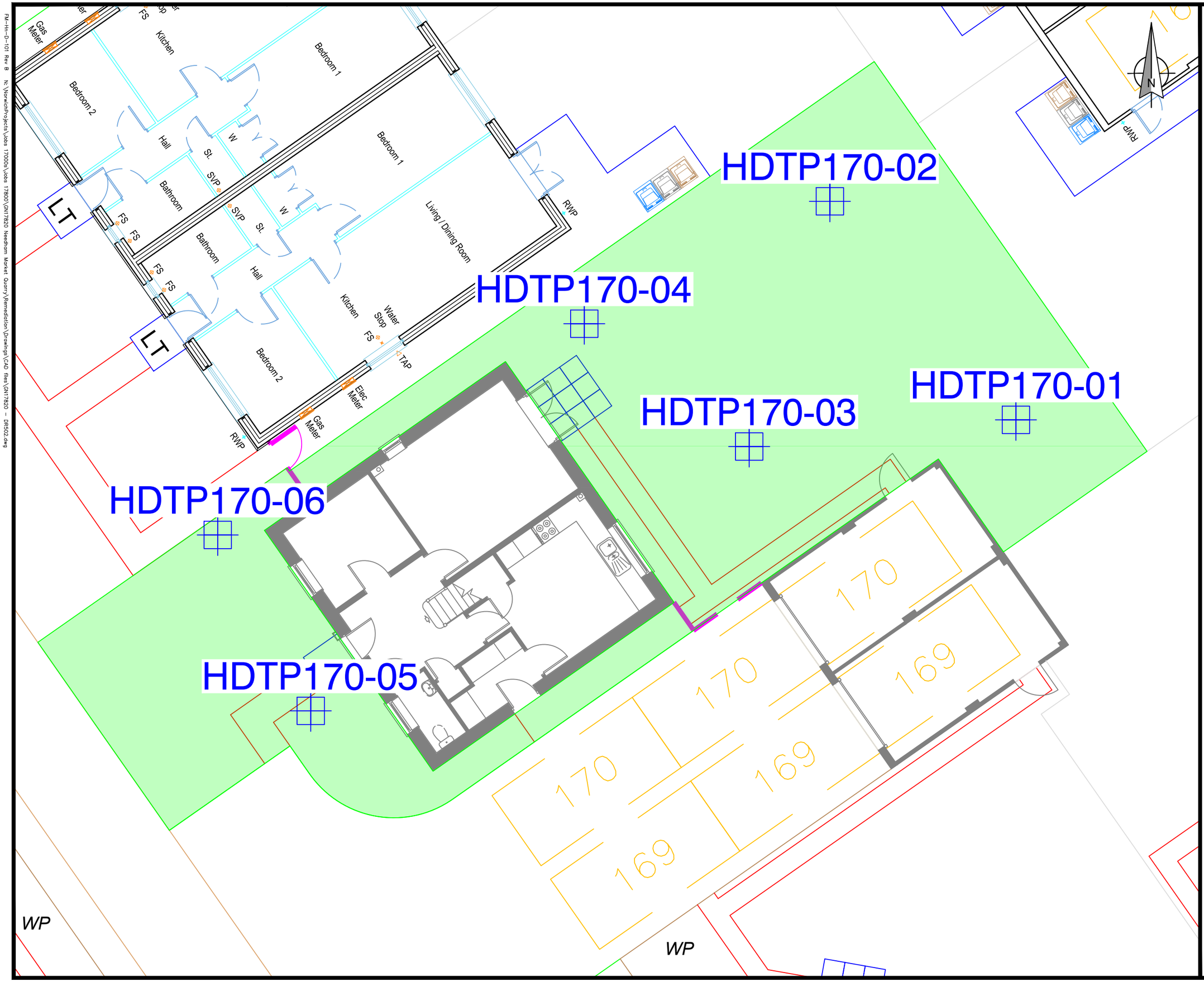
Certificate Number 5933
ISO 9001, ISO 14001



Key :

HDTP170-01 — Hand Dug Trial Pit

Acceptable Cover System

Notes :

Client : Hopkins Homes Limited

Project : Needham Market Quarry

Job No : GN17820 Date : April 2019

Drawing Title : Fieldwork Location Plan - Plot 170

Drawing No : GN17820 - DR502I

Scale : 1:100 @ A3

Drawn by : RW Checked by : CD

Eastings : 609420 Northings : 254240

Revision history

Rev	Date	Revision Data

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Certificate Number 5933
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FM–Hn–D–101 Rev B N:\Norwich\Projects\Jobs 17000s\Jobs 17800\GN17820 Needham Market Quarry\Remediation\Drawings\CAD files\GN17820 – DR502.dwg

FM-Hn-D-101 Rev B N:\Norwich\Projects\Jobs 17000s\Jobs 17800\GN17820 Needham Market Quarry\Remediation\Drawings\CAD files\GN17820 - DR502.dwg

HDTP223-02

HDTP223-01

HDTP223-04

HDTP223-03

HDTP223-05

HDTP223-06

Family Room

RWP

223

224

BCP

WP

Road

Kitchen

Dining

Family Room

Utility

Cpd

WC

Study

Hall

Living Room

Water Stop

FS

SVP

TAP

Elec Meter

Gas Meter

LTo

CP

N

Key :

HDTP223-01 Hand Dug Trial Pit

Acceptable Cover System

Cover System to be Confirmed

Notes :

Client : Hopkins Homes Limited

Project : Needham Market Quarry

Job No : GN17820 Date : April 2019

Drawing Title : Fieldwork Location Plan - Plot 223

Drawing No : GN17820 - DR502m

Scale : 1:100 @ A3

Drawn by : RW Checked by : CD

Eastings : 609420 Northings : 254240

Revision history

Rev	Date	Revision Data

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