

GRM Development Solutions Ltd Laurus House First Avenue Centrum 100 Burton upon Trent Staffordshire DE14 2WH

 Tel:
 01283 551 249

 Web:
 www.grm-uk.com

 Our Ref:
 P7711

 Date:
 27<sup>th</sup> January 2017

Taurus Construction Midlands Ltd Dunan Heath Road Uttoxeter DE14 7LU

# For the attention of Mr. P Udall

Dear Paul,

# Re: Chapel Street, Forsbrook: Additional Asbestos Investigation.

Further to your recent instructions GRM attended the above site on 13<sup>th</sup> January 2017 to establish the extent of confirmed asbestos contamination within the made ground on site. This letter report should be read in conjunction with GRM Letter Report - Ref GRM/P7711, dated December 2016.

The initial investigation on the  $21^{st}$  November 2016 recorded the presence of Asbestos Containing Materials (ACMs) in TP01 at 0.1 - 0.3m begl in the form of chrysotile (loose insulation); at this depth it is considered that asbestos poses a potential low risk to end-users, however an unacceptable risk to site workers. It was recommended that further works are carried out to better quantify the risks posed to human health and the extent of contamination. The exploratory hole location plan and chemical analysis results are enclosed for reference.

## Additional Investigation Works

In order to delineate the area of asbestos impacted made ground four hand-dug pits were excavated at a 1m radius from TP01 to a maximum depth of 0.3m begl. The made ground materials were recorded to be similar to previous findings.

Samples were taken at depths between 0.1 - 0.3m begl, corresponding to the depth where asbestos was previously identified (Samples A, B, C and D) and were screened for the presence of asbestos.

A Location Plan for the delineation sampling locations has been enclosed.

## **Results**

The delineation test results recorded the presence of ACMs in the form of chrysotile from Sample A, located 1m towards the north west of TP01. No asbestos was found to be present within the remaining samples.

Therefore, it is considered that the hotspot of contamination extends towards the northwest and remedial works are required to remove the risk to site workers and end-users.

## **Remediation Recommendations**

Based upon the delineation works, the extent of the impacted soil has been estimated to be approximately is 4m by 6m and to a depth of 0.3m; an excavation plan has been enclosed for reference.

The impacted soil is not suitable for reuse at shallow depth onsite, and therefore can be either:

A. The impacted soil can be temporarily stockpiled onsite in a lined designated area of the site prior to offsite removal to a suitable facility. It should be noted that when stockpiled the material will require covering to prevent dust generation and potential for cross-contamination.



B. The impacted soil could be placed within the rear garden of the proposed bungalows at a depth greater than 1m below finished ground levels. The depth of placement should be sufficient that the likelihood of exposure is very low to end users and the potential pathway is severed.

Should any additional material suspected of being significantly contaminated be encountered during the redevelopment of the site, GRM can be contacted to undertake additional investigation if necessary. The local Environmental Health Officer should be contacted and informed of any additional remedial work required.

## **Validation**

Following the hotspot removal, validation will be required in the form of sampling the sides of the resultant void to ensure no contaminated soils remain. A sample should be taken from each side of the excavation. The samples will be screened for the presence of asbestos to confirm that the impacted soil is removed.

Should the presence of asbestos remain, the hotspot will need to be increased in size; if the pit exceeds 10m in length or width, the number of samples obtained and tested will need to be increased accordingly.

We trust this is suitable for your current requirements, should you require any further information or need clarification of any of the points raised please do not hesitate to contact us.

Yours sincerely, for GRM Development Solutions Ltd

George Salloway Geo-Environmental Scientist

Charlotte Taylor Senior Environmental Scientist

Enclosed: Exploratory Hole Location Plan Chemical Analysis Results Delineation Sampling Plan Delineation Asbestos Screen Results Excavation Area Plan











#### **GRM Development Solutions**

Laurus House First Avenue Centrum 100 Burton on Trent Staffs DE14 2WH

Analytical Test Report:	L16/2705/GRM/001 - Amendment A
-------------------------	--------------------------------

Your Project Reference:	Chapel Street, Forsbrook	Samples Received on:	23.11.2016
Your Order Number:	P7711	Testing Instruction Received:	23.11.2016
Report Issue Number:	2	Sample Tested:	23.11 to 16.12.2016
Samples Analysed:	8 Soils	Report issued:	16.12.2016

Signed

James Gane Commercial Manager Nicholls Colton Analytical

Notes:					
General					
Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.					
Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion	which is held for 6 months unless otherwise requested.				
Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven d	ried at <30°C.				
Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with B	51377, Part 2, 1990, Clause 3.2				
Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers	to the percentage of stones retained on a 10mm BS test sieve.				
With the exception of Sulphate, which is crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.					
Samples were supplied by customer, results are representative of the material provided					
Asbestos					
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation					
Deviating Samples					
Samples were received in suitable containers	Yes				
A date and time of sampling was provided	Yes				
Sample holding times were exceeded prior to analysis of determinants	No				
Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.					
Accreditation Key					
UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited					
Date of Issue 17.11.16					
Owned by Emily Blissett - Customer Services Supervisor					
Authorised by James Gane - Commercial Manager					

G:\Nicholls Colton Analytical\Commercial\Current Reports\2016\L16\GRM - GRM\L16-2705-GRM P7711\[L16-2705-GRM 001a.xlsx]GRM Suite





### L16/2705/GRM/001 - Amendment A

# Project Reference - Chapel Street, Forsbrook

## Analytical Test Results - GRM Brownfield Suite

NCA Reference			16-38689	16-38690	16-38691	16-38692	16-38693	16-38694
Client Sample Reference			TP01	TP02	TP03	TP04	TP05	TP01
Client Sample Location			TP01	TP02	TP03	TP04	TP05	TP01
Depth (m)			0.1-0.2	0.2-0.3	0.1-0.2	0.2-0.3	0.1-0.2	1.0-1.1
Date of Sampling			21.11.2016	21.11.2016	21.11.2016	21.11.2016	21.11.2016	21.11.2016
Time of Sampling			10:30	09:30	11:00	11:30	10:00	Not provided
Sample Matrix			Clay	Clay	Clay	Slag	Clay	Clay
Determinant	Units	Accreditation						
Arsenic	(mg/kg)	MCERTS		< 10	10.8	14.5	18.9	-
Cadmium	(mg/kg)	MCERTS		1.2	1.6	3.0	2.3	-
Chromium (Total)	(mg/kg)	UKAS		25.5	19.0	54.3	28.3	-
Copper	(mg/kg)	MCERTS		8.5	75.4	230	54.6	-
Lead	(mg/kg)	MCERTS	Not possible*	29.7	102	27.8	197	-
Mercury	(mg/kg)	UKAS		< 2.5	< 2.5	< 2.5	< 2.5	-
Nickel	(mg/kg)	MCERTS		23.5	26.8	175	36.2	-
Selenium	(mg/kg)	u		< 8	< 8	< 8	< 8	-
Zinc	(mg/kg)	MCERTS		148	236	72.8	308	-
Total Phenols	(mg/kg)	MCERTS	< 10	< 1	< 1	< 1	< 10	-
Cyanide (Total)	(mg/kg)	MCERTS	< 10	< 1	< 1	< 1	< 10	-
Chromium (Hexavalent)	(mg/kg)	u	< 10	< 1	< 1	< 1	< 10	-
рН	pH Units	MCERTS	8.0	8.0	7.0	7.6	7.1	7.2
SOM	(%)	UKAS	11.4	2.1	6.7	35.1	11.8	-
Sulphate	(mg/l)	u	250	71	<10	950	80	33
Acenaphthene	(mg/kg)	MCERTS	<0.2	<0.02	<0.02	<0.02	<0.02	-
Acenaphthylene	(mg/kg)	UKAS	<0.2	<0.02	<0.02	<0.02	0.05	-
Anthracene	(mg/kg)	UKAS	0.49	<0.02	0.04	<0.02	0.06	-
Benzo (a) anthracene	(mg/kg)	MCERTS	1.07	<0.02	0.10	<0.02	0.26	-
Benzo (a) pyrene	(mg/kg)	MCERTS	1.63	<0.02	0.09	<0.02	0.28	-
Benzo (b) fluoranthene	(mg/kg)	MCERTS	1.82	<0.02	0.17	<0.02	0.41	-
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	1.23	<0.02	0.09	<0.02	0.20	-
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.69	<0.02	0.06	<0.02	0.16	-
Chrysene	(mg/kg)	MCERTS	1.44	<0.02	0.16	<0.02	0.40	-
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.36	<0.02	<0.02	<0.02	0.04	-
Fluoranthene	(mg/kg)	MCERTS	2.47	<0.02	0.21	0.03	0.70	-
Fluorene	(mg/kg)	MCERTS	<0.2	<0.02	<0.02	<0.02	<0.02	-
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	1.21	<0.02	0.08	<0.02	0.20	-
Naphthalene	(mg/kg)	MCERTS	<0.2	<0.02	0.06	<0.02	<0.02	-
Phenanthrene	(mg/kg)	MCERTS	0.93	<0.02	0.11	<0.02	0.16	-
Pyrene	(mg/kg)	MCERTS	2.24	<0.02	0.20	<0.02	0.62	-
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	16.6	<0.32	1.47	0.37	3.67	-
Asbestos	-	UKAS	Chrysotile	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	-
Quantification Screen	-	u	Chrysotile	-	-	-	-	-
ACM Type Detected	-	u	Loose Insulation	-	-	-	-	-
Total Asbestos in Sample	(%)	u	0.113	-	-	-	-	-

\*Testing not possible due to sample containing Chrysotile





### L16/2705/GRM/001 - Amendment A

## Project Reference - Chapel Street, Forsbrook

## Analytical Test Results - GRM Brownfield Suite

NCA Reference			16-38695	16-38696
Client Sample Reference			TP02	TP04
Client Sample Location			TP02	TP04
Depth (m)			1.4-1.5	2.0-2.1
Date of Sampling			21.11.2016	21.11.2016
Time of Sampling			Not provided	Not provided
Sample Matrix			Clay	Clay
Determinant	Units	Accreditation		
Arsenic	(mg/kg)	MCERTS	-	-
Cadmium	(mg/kg)	MCERTS	-	-
Chromium (Total)	(mg/kg)	UKAS	-	-
Copper	(mg/kg)	MCERTS	-	-
Lead	(mg/kg)	MCERTS	-	-
Mercury	(mg/kg)	UKAS	-	-
Nickel	(mø/kø)	MCERTS	-	-
Selenium	(mg/kg)	U. U.	-	-
Zinc	(mg/kg)	MCERTS	-	-
<b>L</b>	\···6/ \6/	MCENTS	-	-
Total Phenols	(mg/kg)	MCERTS	-	-
Cyanide (Total)	(mg/kg)	MCERTS	-	-
Chromium (Hexavalent)	(mg/kg)	u	-	-
рН	pH Units	MCERTS	7.4	7.5
SOM	(%)	UKAS	-	-
Sulphate	(mg/l)	u	<10	17
Acenaphthene	(mg/kg)	MCERTS	-	-
Acenaphthylene	(mg/kg)	UKAS	-	-
Anthracene	(mg/kg)	UKAS	-	-
Benzo (a) anthracene	(mg/kg)	MCERTS	-	-
Benzo (a) pyrene	(mg/kg)	MCERTS	-	-
Benzo (b) fluoranthene	(mg/kg)	MCERTS	-	-
Benzo (g, h, i) pervlene	(mg/kg)	MCERTS	-	-
Benzo (k) fluoranthene	(mg/kg)	MCERTS	_	-
Chrysene	(ma/ka)	MCERTS	-	_
Dibenzo (a h) anthracono	(mg/kg)	MCEDTS	-	-
	(mg/kg)	MCERTS	-	-
Fluorancie	(mg/kg)	IVICER IS	-	-
	(mg/kg)	IVICERTS	-	-
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	-	-
Naphthalene	(mg/kg)	MCERTS	-	-
Phenanthrene	(mg/kg)	MCERTS	-	-
Pyrene	(mg/kg)	MCERTS	-	-
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	-	-
Asbestos	-	UKAS	-	-
Quantification Screen	-	u	-	-
ACM Type Detected		u	-	-
Total Asbestos in Sample	(%)	u	-	-
rotar Asbestos in Sample	(79)	u	-	-





## L16/2705/GRM/001 - Amendment A

## Project Reference - Chapel Street, Forsbrook

## Sample Descriptions

NCA Reference	Client Sample Reference	Sample Depth (m)	Description	Moisture Content (%)	Stone Content (%)
16-38689	TP01	0.1-0.2	Dark brown silty slightly sandy gravelly clay with tile fragments.	32	37
16-38690	TP02	0.2-0.3	Brown slightly silty slightly sandy clay with root fragments.	25	0
16-38691	TP03	0.1-0.2	Dark brown silty slightly sandy gravelly clay with root fragments.	28	11
16-38692	TP04	0.2-0.3	Brown slag.	16	0
16-38693	TP05	0.1-0.2	Dark brown slightly silty slightly sandy slightly gravelly clay with organic matter.	87	0

NCA Reference	Client Sample Reference	Sample Depth (m)	Description	% Passing 2mm BS test sieve
16-38694	TP01	1.0-1.1	Brown/grey slightly gravelly slightly silty clay.	70
16-38695	TP02	1.4-1.5	Brown/grey slightly gravelly slightly silty clay.	96
16-38696	TP04	2.0-2.1	Brown slightly gravelly slightly silty clay.	93





## L16/2705/GRM/001 - Amendment A

Project Reference - Chapel Street, Forsbrook

## Analysis Methodologies

N	Aatrix	Determinant	Sample condition for analysis	Test Method used
	Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
	Soil	РАН	As Received	In house method statement - MS - CL - PAH (As received)
	Soil	Phenols	As Received	In house method statement - MS - CL - Phenols by Skalar
	Soil	Chromium (hexavalent)	As Received	In house method statement - MS - CL - Hexavalent Chromium by Skalar
	Soil	Cyanide	As Received	In house method statement - MS - CL - Cyanide by Skalar
	Soil	рН	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
	Soil	SOM	Air Dried	In house method statement - MS - CL - TOC Eltra
	Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
	Soil	Asbestos	As Received	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
	Soil	Asbestos Quantification	-	Subcontract Analysis







Nicholls Colton Group 7 - 11 Harding Street Leicester LE1 4DH

#### **GRM Development Solutions**

Laurus House First Avenue Centrum 100 Burton Upon Trent Staffs DE14 2WH

	Analytical Test Report:	L17/0080/GRM/001	
Your Project Reference:	Chapel Street, Forsbrook	Samples Received on:	13.01.2017
Your Order Number:	P7711	Testing Instruction Received:	13.01.2017
Report Issue Number:	1	Sample Tested:	13 to 24.01.2017
Samples Analysed:	4 Soils	Report issued:	24.01.2017

Signed

James Gane Commercial Manager Nicholls Colton Group

#### Notes:

### General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Samples were supplied by customer, results are representative of the material provided

#### Asbestos

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

#### Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

Date of Issue 05.01.2017

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

G:\LE1 Production\Commercial\Current Reports\2017\L17\GRM - GRM Development Solutions\L17-0080-GRM P7711\[L17-0080-GRM 001.xlsx]Cover Sheet





#### Nicholls Colton Group 7 - 11 Harding Street Leicester LE1 4DH

## L17/0080/GRM/001

## Project Reference - Chapel Street, Forsbrook

## Analytical Test Results

NC Reference			17-836	17-837	17-838	17-839
Client Sample Reference			Sample A	Sample B	Sample C	Sample D
Client Sample Location			Sample A	Sample B	Sample C	Sample D
Depth (m)			0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3
Date of Sampling			13.01.2017	13.01.2017	13.01.2017	13.01.2017
Time of Sampling			Not provided	Not provided	Not provided	Not provided
Sample Matrix			Soil	Soil	Soil	Soil
Determinant	Units	Accreditation				
Asbestos	-	UKAS	Chrysotile	No asbestos detected	No asbestos detected	No asbestos detected





#### Nicholls Colton Group 7 - 11 Harding Street Leicester LE1 4DH

## L17/0080/GRM/001

## Project Reference - Chapel Street, Forsbrook

## Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Asbestos	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling. analysis and clearance procedures"

