

20/MIL/039/JMS/BL/L2

10th December 2021

FAO Nichola Burns
Technical Manager
Miller Homes
Hawthorn House,
Woodlands Park,
Ashton Road,
Newton-le-Willows,
WA12 0HF

Northenden College- Additional Investigation Recommendations.

Dear Nichola,

Following on from Betts Geo report reference 20MIL039/GI we have been asked to produce a scope of additional investigation required for the above site. This is in order to satisfy Statutory requirements and as such should be agreed prior to undertaking additional SI

REC (spectris) have previously undertaken a desk study report for the site. This report is as follows;

- Desk Study Report for TMC Northenden Campus, Wythenshawe by REC on Behalf of The Manchester College. Report ref. 108393P1R0 dated October 2019.

e3p have also previously undertaken an intrusive investigation, as referenced below;

- Phase II Geoenvironmental Site Assessment for Northenden College by e3p, on behalf of Cushman and Wakefield / The Manchester College, Report ref.13-969-R1-1, dated July 2020.
- Ground Gas Addendum Report for Northenden College by E3P, on behalf of Cushman and Wakefield / The Manchester College, Report ref.13-969-R2-1, dated May 2021

Where necessary the above reports have been used throughout this report and referenced accordingly.

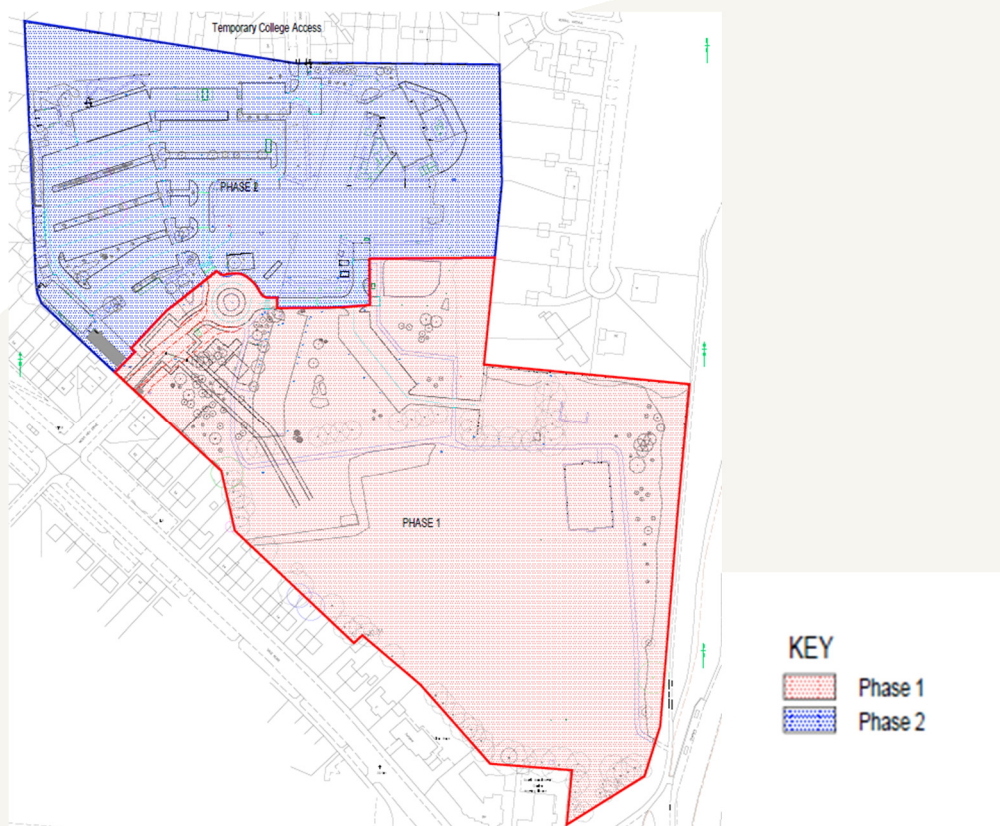
Whilst Betts Geo Environmental Ltd cannot be held liable for the third party, client furnished, results/data, it is suggested that it is reasonable to assume that the data provided in these reports have been undertaken with suitable care and due diligence by suitably experience consultants. As such the data is regarded as being of an appropriate standard to utilise within this report.

Miller Homes are splitting the site into two phases of development as per sketch below:



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1. Phase 1

1.1 Summary of investigation

The phase 1 area has been largely accessible pre demo and investigated with window samples and trial pits during investigations by both E3P and Betts Geo. As such additional investigation post demo is not required in this area however, given the nature of the site should ground conditions different to those previously encountered, or potential contamination be suspected, liaison with a Geoenvironmental Engineer will be required.

Following on the intrusive investigations undertaken the remaining risk to site end users in this area is low level contamination within made ground. As per the summary table below:

Location	Depth (mbgl)	Determinant	Observed concentration (mg/kg)	AtRisk Threshold (mg/kg)	2017 DEFRA C4SL Threshold (mg/kg)
<i>Betts Investigation</i>					
WS211	0.80	Asbestos (Chrysotile)	<0.001	<0.001	<0.001
B3	0.35				



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E3p Investigation					
WS107	0.55	Arsenic	68	32	37
WS118	0.30	Asbestos (Chrysotile)	0.002	<0.001	<0.001

Given the nature of made ground in various areas of phase 1, clean cover systems are required over the majority of the area. The proposed areas and full details are shown in Section 1.2 of this report.

1.2 Remediation Requirements Phase 1

Any soils intended for use as part of the growing medium (including site won material) will be tested at source or stockpiled on site until approved for use by the Supervising Engineer. Topsoil testing will be carried out at the frequencies below;

Intended End Use	Source / Origin of Material		
	Greenfield	Remediated	Brownfield / Unknown
Gardens	1:200m ³	1:100m ³	1:50m ³
Soft Landscaping	1:200m ³	1:150m ³	1:150m ³
Other	1:200m ³	1:200m ³	1:200m ³

Chemical analysis should be assessed using a desk study/details of historic use of the site where the imported soil originated. Chemical analysis is likely to include (but is not limited to); CLEA Metals (Arsenic, cadmium, chromium (Vi), lead, mercury, selenium, copper, nickel and zinc), pH values, Sulphate - soluble 2:1 extract, speciated polycyclic aromatic hydrocarbons (PAH), extractable petroleum hydrocarbons (EPH), TPH CWG, Asbestos screening and Organic matter.

This work may be undertaken as part of the contract for the preparatory & remedial works, in which case soils should be stockpiled in a location agreed with the Engineer. Alternatively, the Developer may choose to import soil at a later stage in the development. Should stockpiles require testing a minimum of 3 samples should be undertaken.

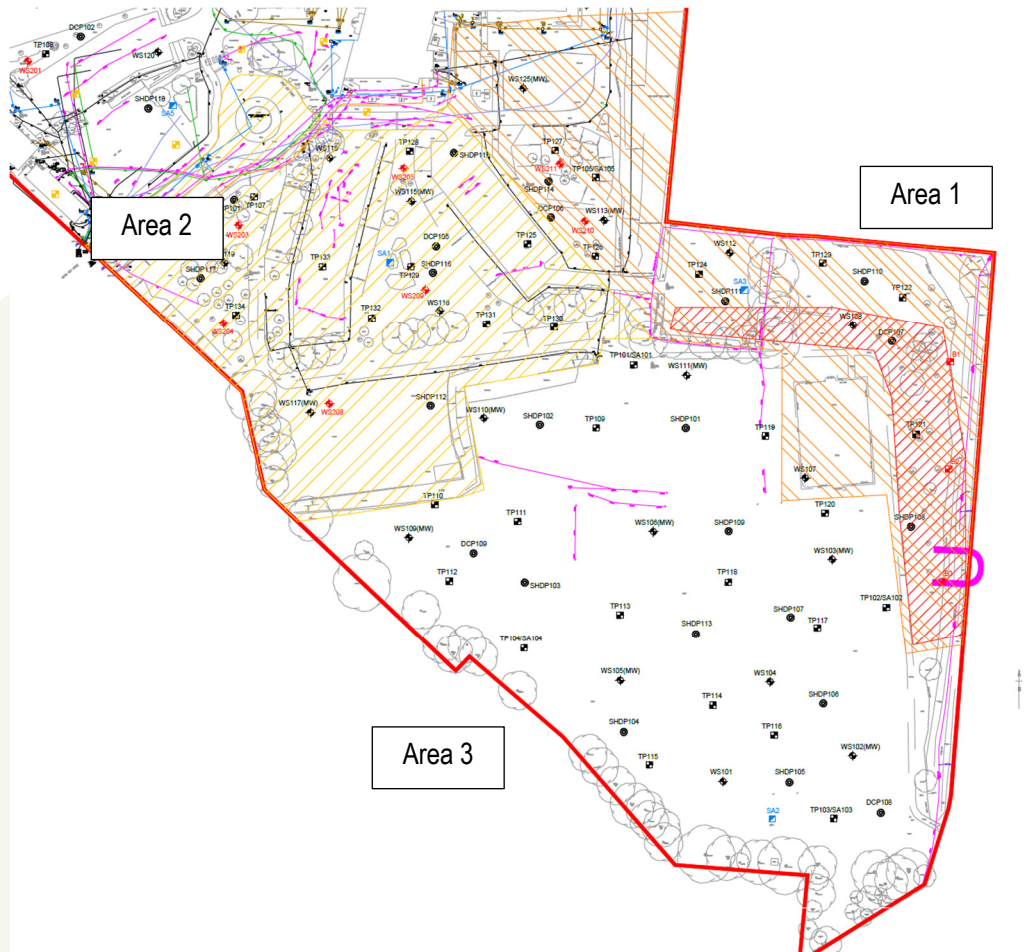
Within Soft Landscaping Areas

There are three distinct areas within Phase 1 which require different remediation options as follows:



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Area 1 (orange) affected by Asbestos- 600mm clean cover comprising with a geotextile membrane or 150mm 6f2 no dig layer is required in soft landscaping areas. This will comprise of minimum 150mm topsoil and 450mm subsoil with the membrane/no dig layer below.

Area 2 (yellow) made ground but no significant contamination encountered during SI- 600mm clean cover comprising soft landscaping areas. This will comprise of minimum 150mm topsoil and 450mm subsoil

Area 3 - No significant made ground or contamination was encountered over the remainder of the phase 1 area, therefore 300mm growing medium is proposed within soft landscaping areas in this locality.

Site won or imported soils will require testing as per the remediation requirements in Section 1.2. The areas requiring 600mm/300mm cover systems are broadly laid out as below. Should ground conditions in these areas be different than those anticipated, additional assessment will be required to confirm cover system requirements.



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The above is proposed to comply with NHBC Chapter 9 regulations regarding physical composition of cover (i.e. no coarse granular material within the first 300mm) and exceeds the minimum requirement of 100mm depth of topsoil – extract from Ch9 below:

*'9.2 - S5 Garden areas shall be free from obstructions beneath the surface old foundations, concrete bases and similar obstructions occurring within 300mm of the finished ground surface should be removed.
9.2 - S6 Garden areas shall be adequately prepared for cultivation construction rubbish and debris should be removed from garden and other areas around the home. Garden areas should be provided with topsoil to a thickness of not less than 100mm. The topsoil should not contain contaminants which are likely to present a hazard to users of the garden area.'*

1.3 Validation Requirements

The following information should be used to provide validate implementation of the remediation on the site. Given that this is primarily clean cover in garden areas, this is likely to be provided in letter format to confirm physical and chemical suitability of the soils imported or site won soils re-used

- Desk study undertaken to establish source (for imported soils)
- Source used to determine sampling frequency / chemical analysis scheduling as per the recommendations in the previous section.
- Engineer to attend source site/site and collect representative samples for assessment.
- Samples analysed and screened for end use suitability for residential with root uptake.
- Place soil in garden areas to the agreed cover thickness.
- Engineer to attend site and undertake photographic cover thickness validation via hand dug exposure pits on the basis of 1:3 gardens. Report to be produced and submitted to the local Authority for approval.

1.4 Contingency for Unknown

There is at this stage a potential risk of localised, unidentified contaminated Made Ground being present at the site.

Should any suspicious material be encountered during the remediation works, the area will be investigated further by a Betts Geo Environmental engineer and sampled as necessary. The Contaminated Land Officer at the Local Authority will also be notified if the material is deemed to represent a risk to environmental receptors or public health. Samples will be forwarded to a UKAS accredited laboratory for a suite of analytical testing deemed appropriate based upon a visual and olfactory appraisal of the material identified.

Once the results of any analysis are known, the required remedial action (if any) will be determined.



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2. Phase 2

Additional Investigation is required post demolition of the existing college and ancillary buildings. There are also significant services in this phase. Both hindered investigation in the area.

Potential fuel/chemical storage was noted in the vicinity of the art and design buildings to the west of Phase 2 which also require investigating when access/service diversion allows

Although areas were inaccessible during the initial E3P SI, it's concluded that unless significant changes in ground conditions are encountered post demolition, the ground gas investigation is sufficient in scope and duration to assess the site as a whole. As such ground gas protection measures are not required for the site (subject to regulatory sign off).

Betts Geo recommend a series of post demolition trial pits as per the attached drawing.

Chemical Analysis should be undertaken in order to assess potential significant risks and confirm remediation requirements in this area.

Chemical analysis is likely to include (but is not limited to); CLEA Metals (Arsenic, cadmium, chromium (Vi), lead, mercury, selenium, copper, nickel and zinc), pH values, Sulphate - soluble 2:1 extract, speciated polycyclic aromatic hydrocarbons (PAH), extractable petroleum hydrocarbons (EPH), TPH CWG, Asbestos screening and Organic matter. PCB testing should be undertaken and targeted to substation areas.

We trust this information is sufficient for your immediate requirements, if you have any queries please let me know,

Yours sincerely



Beverley Lewis

Director

BETTS GEO ENVIRONMENTAL



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PHASE 1 ONLY

PHASE 2

PHASE 1

DO NOT SCALE

NOTES

THIS SKETCH SHOWS THE ZONATION OF PROPOSED GARDEN CLEAN COVER SYSTEM FOR PHASE 1 ONLY OVERLAIN THE PROPOSED SITE LAYOUT.

KEY

- 600mm CLEAN COVER WITH EITHER 150mm HARD NO DIG LAYER OR GEOTEXTILE MEMBRANE
- 600mm CLEAN COVER

REMAINDER OF PHASE 1 REQUIRES 150mm CLEAN/DEBRIS FREE GROWING MEDIUM.

FURTHER ASSESSMENT IS REQUIRED TO CONFIRM COVER SYSTEM REQUIREMENTS FOR PHASE 2.

The details provided on this drawing are subject to comments by all the relevant approving authorities. Until such time as all comments have been received and incorporated onto the drawings, all the information provided and coatings, are used at Miller Homes risk and no liability will be accepted by RSK. Scheme based on Miller Homes site plan 2131/SL/01 Rev F.

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REV	DATE	BY	DESCRIPTION	CHK
DRAWING STATUS: DRAFT				
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 the place to be®				
PROJECT: NORTHENDEN				
TITLE: PROPOSED CLEAN COVER SYSTEM – PHASE 1				
DATE: 13/12/21		SCALE: @ SIZE: NTS	DRAWN: RD	CHECKED: BL
PROJECT No: 20MIL039		DRAWING No: CCSYS001 – Ph1		REV: –