

**FORMER NORTHENDEN COLLEGE,
WYTHENSHAW, MANCHESTER**

REMEDIATION STRATEGY

For: Urban Regen Ltd. & Miller Homes

March 2023

R3186-R01-v1 Final

DOCUMENT CONTROL SHEET

Report Title: Former Northenden College
Remediation Strategy

Client: Urban Regen Ltd. & Miller Homes

Report Reference Number: R3186-R01-v1

Issue Final

Version: 1

Report Date: March 2023

Signed for Smith Grant LLP

	Name	Position	Signature	Date
Author	D Wayland BSc MSc AssocMCIWM MCIWEM C.WEM	Partner		13.03.23
Reviewer	M K Jones BSc Msc AMIEEnvSc	Consultant		13.03.23

Document Revision Record:

Version	Report Status	Date	Details of Revision
v1	Draft	09.03.23	Issue to client for comment
v1	Final	13.03.23	Minor amendments / report finalised

This report has been prepared by Smith Grant LLP for the sole and exclusive use of Urban Regen Ltd. & Miller Homes. All reasonable skill, care and diligence has been exercised within the terms of the contract with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report may be relied upon or transferred to any other parties only with the express written authorisation of Smith Grant LLP, such consent not to be unreasonably withheld or delayed. If any Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty or care of skill. Smith Grant LLP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines, and responses by the statutory and regulatory authorities.

FORMER NORTHENDEN COLLEGE, WYTHENSHAW

REMEDIATION STRATEGY

CONTENTS

1. Introduction
2. Information Sources
3. Site Characterisation, Risk Assessment and Remediation Objectives
4. Options Appraisal
5. Implementation Plan
6. Verification Plan
7. Conclusions & Recommendations

DRAWINGS

R3186-D01 Remediation Boundary
R3186-D02 Site Investigation Entries
R3008b-D03 Areas of Dedicated Ground Inspection

PHP/S106/01 Phasing Plan

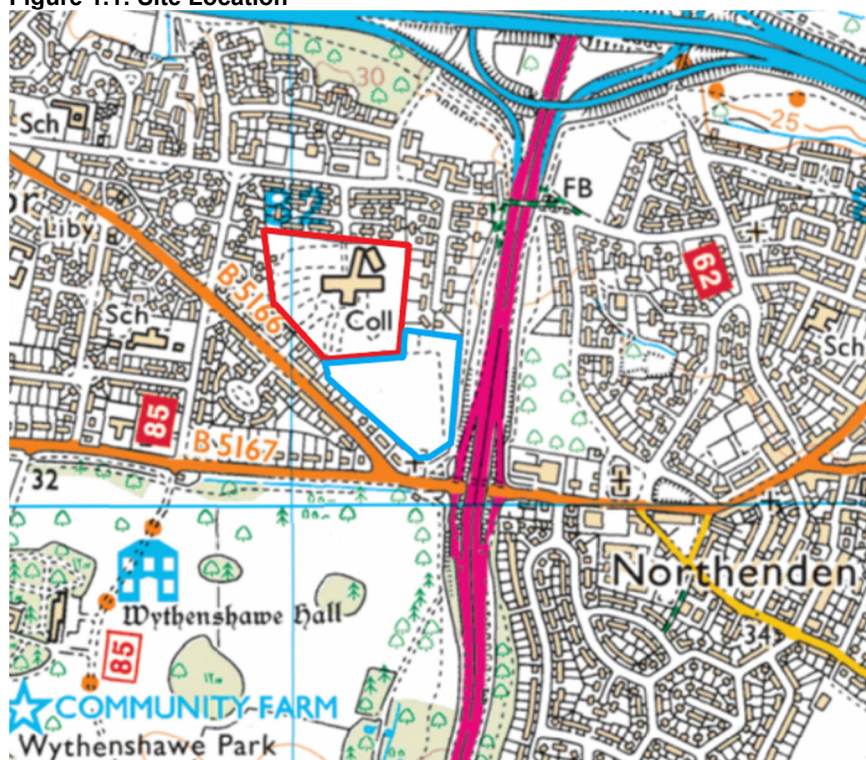
1. Introduction

- 1.1. Planning Consent (ref. 131147/FO/2021) has been granted for the demolition and redevelopment of the former Northenden College Arden Centre, located off Sale Road, Manchester for up to 224 dwellings with associated access, landscaping, parking and other works.
- 1.2. Condition 4 of the consent relates to contaminated land and is reproduced below in Section 1.8. To allow development to take place as soon as possible, the site has been split into 2 phases. Phase 1 is in the south and was largely occupied by playing fields and Phase 2 in the north where the existing college buildings are located.
- 1.3. To allow development works to commence within Phase 1, supporting information was submitted under an application to discharge condition 4a (ref. CDN/21/0979). This was duly approved, and it was stated that *“Phase 2 of the site will need additional soil contamination investigation once the demolition process has been completed”*.
- 1.4. Miller Homes (MH) are currently redeveloping Phase 1 and have appointed Urban Regen Ltd. (URL) to carry out demolition and preparatory earthworks within Phase 2 to prepare the site for re-development. It is understood that demolition works are due to commence shortly and will be carried out in accordance with the Site Construction Environmental Management and Demolition Plan. Once demolition works have been completed, preparatory earthworks to prepare Phase 2 for redevelopment will commence. URL have duly instructed Smith Grant LLP (SGP) to prepare a Remediation Strategy for Phase 2 to partially satisfy Condition 4.
- 1.5. For the avoidance of doubt, this Remediation Strategy only relates to Phase 2, herein referred to as The Site.
- 1.6. The Site currently consists of the former college buildings, areas of car parking, landscaping, infrastructure and playing fields.

Table 1.1: Site details

Address	Former Northenden College, Moss Hey Drive, Wythenshawe, Manchester, M23 ODD
National Grid Reference	382097, 390374
Local Authority	Manchester City Council
Site Area	Phase 2 ~28,366m ²
Current Site Use	Derelict site – former Northenden College Arden Centre
Proposed Use	Residential development with associated infrastructure
Planning Consent	131147/FO/2021

Figure 1.1: Site Location



Reproduced with the permission of the Ordnance Survey @Crown Copyright Licence No. 100005799

*Red Boundary = Phase 2 – Approx (Former Northenden College)**

*Blue Boundary = Phase 1 – Approx Development underway (former playing fields)**

**See Phasing Plan ref. PHP/S106/01 for detailed phasing boundaries*

1.7. Planning Condition 4 relates to contaminated land and is worded as follows:

Table 1.2. Contaminated Land Condition

4 (a)	Post demolition and/or prior to development commencing, additional site investigation should be undertaken, and a report prepared outline what measures, if any, are required to remediate the land (the Site Investigation Report and/or Remediation Strategy) which shall be submitted to and approved in writing by the City Council as Local Planning Authority.
4 (b)	When the development within each phase commences, the development shall be carried out in accordance with the previously agreed Remediation Strategy and a Completion / Verification Report shall be submitted to and approved in writing by the City Council as Local Planning Authority. In the event that ground contamination, groundwater contamination and/or ground gas, not previously identified, are found to be present on the site at any time before the development in each phase is occupied, then development shall cease and/or the development shall not be occupied until, a report outlining what measures, if any are required to remediate the land (the Revised Remediation Strategy) is submitted to and approved in writing by the City Council as Local Planning Authority and the development shall be carried out in accordance with the Revised Remediation Strategy, which shall take precedence over any Remediation Strategy or earlier Revised Remediation Strategy.

- 1.8. The assessment and methodology in the production of this Remediation Strategy follows the framework described in the EA / DEFRA Contaminated land Report 11: 'Model Procedures for the Management of Land Contamination' 2004 as amended by 'Land Contamination: Risk Management (LCRM)', comprising an options appraisal to evaluate and identify feasible remediation options, specification of appropriate techniques, and an implementation programme and verification plan.

2. Information Sources

2.1. Previous reports

2.1.1. The Site has been subject to several phases of investigation and assessment. Initially a Phase 1 Desk Study (ref. 10893p1r0) was produced by REC in October 2019, a copy of this report has not been obtained, however a summary of the findings is presented in the subsequent site investigation reports. A Phase II Geo-Environmental Site Assessment (ref. 13-969-R1-1) was undertaken by e3p in July 2020 and accompanying Ground Gas Addendum Report (ref. 13-969-R2-1) in May 2021. It is understood that these reports were produced on behalf of Manchester College to support the sale of the site and to partially satisfy any relevant planning conditions.

2.1.2. A supplementary Ground Investigation Report (ref. 20MIL039/GI) was undertaken by Betts Geo on behalf of Miller Homes to provide additional information on ground conditions as part of due diligence procedures prior to the purchase of the site and to provide additional information to support any relevant planning conditions.

2.1.3. A summary of the reviewed reporting in relation to the Site is presented below in Table 1.3.

Table 1.3: Information Sources

Report	Factual Information
E3p, July 2020 (ref. 13-969-R1-1)	Summary review of REC Phase I Environmental Report (ref. 108393p1r0) produced in October 2019 [report has not been made available to SGP for review]. Includes summary of site history, geology, hydrogeology, hydrology and preliminary conceptual site model which concluded low to moderate risk to human health, negligible risk from off-site sources and a low risk to groundwater.
Phase II Geo-Environmental Site Assessment – Northenden College	Intrusive investigation undertaken by e3p included: Ph2 - 5x trial-pits (TP106, TP108, TP135-137) - 10x window sampler boreholes (WS120-124, WS126-129) with 7 installed with gas/groundwater monitoring standpipes - 8x dynamic probes / super-heavy dynamic probes <u>Total no entries = 23</u> The report obtained does not include the laboratory test results and no reference is made to the number of samples collected as part of the investigation. The chemical analysis test suite undertaken, however, included heavy metals, sulphide, cyanide, phenols, PAHs, VOCs and SVOCs, asbestos and fractionated hydrocarbons. Concentrations were compared to generic assessment criteria (S4ULs) based on a residential land use. A summary table (Table 5.1) reports to locations of exceedances, non are reported within Phase 2. Groundwater samples were collected from selected installed boreholes and soil leachates; however, it is uncertain how many samples were collected. Groundwater chemical analysis was completed for heavy metals, PAHs, hydrocarbons and VOCs.

Report	Factual Information
	Concentrations were compared to Environmental Quality Standards (EQS) 3 rounds of ground gas monitoring in boreholes WS121, WS123, WS124, WS127, WS128 and WS129.
E3p, May 2021 (ref. 13-969-R2-1) Ground Gas Addendum Report – Northenden College	Completion of ground gas monitoring programme resulting in a maximum of 9 monitoring rounds per installed borehole and update of ground gas risk assessment. The report concludes that the whole site is classed as CIRIA CS1 (very low risk) meaning that gas protection measures are no required.
Betts Geo, January 2021 (ref. 20MIL039/GI) Ground Investigation Report	Desk-based review of the site and its setting including site and surrounding area history, hydrogeology, hydrology, geology, sensitive land use, industrial data, coal mining, radon. A review of the previous e3p findings is also presented including a review of the chemical exceedances reported. Commentary is provided on the e3p soil and groundwater risk assessment, concluding that additional soil sampling is required (reference made to e3p collecting only 9 samples) and that no further testing/assessment of groundwater is required. Intrusive investigation undertaken by Betts Geo included: - 4x window sampler boreholes - 2x soakaway test pits <u>Total no entries = 6</u> Representative soil samples were collected and submitted for chemical analysis including heavy metals, asbestos and hydrocarbons (TPH). Samples were compared to derived and generic assessment criteria. The laboratory dataset is not available for review, however a summary table (section 10.2.2) refers to the locations of sample exceedances, none are reported within Phase 2.

2.2. Investigation Coverage

2.2.1. The total of the 29 (combined investigation) entries across the site is roughly equivalent to an average of 1 entry per 978m² or an approximate 30m grid spacing across all areas. Some areas of the Site are limited in entry coverage due to the existing buildings (northeast and west) and areas of dense vegetation in the northwest where access during the investigation was constrained. Good coverage is provided within the remainder of the site which is occupied by hardstanding (car parks) and areas of soft landscaping.

2.2.2. The site investigations completed are considered to cumulatively provide an assessment of ground conditions at the site, appropriate to its development history (fields then school (1935-1936) before redevelopment to the existing college buildings (2010)) and anticipated ground conditions. Whilst there are some limited gaps within the overall investigation coverage, these have been addressed through recommendations for post-demolition investigation and it is considered that the existing information to date is sufficient to develop an appropriate and robust Remediation Strategy.

2.3. Use of Information in Strategy Development

2.3.1. The Site Characterisation and Risk Assessment outcomes from the available information sources (e3p and Betts Geo Site Investigation reports) are briefly summarised and used to define appropriate and proportionate Remediation Objectives to allow safe redevelopment for its intended use, remove risks of unacceptable pollution and manage residual risks where these exist. An assessment of viable, and then feasible, Remediation Options is provided, the preferred approaches selected and a decision of the techniques to be adopted is arrived at before Implementation and Verification Plans are provided.

3. Site Characterisation, Risk Assessment & Remediation Objectives

3.1. Historical Development and Potentially Contaminative Land Use

3.1.1. A summary review of the historical development of the site and wider surrounding area of the Site made within the REC Phase I report (which has not been provided to SGP) is presented within the Betts Geo report. A brief historical summary is presented below:

Table 3.1. Historical Summary of the Site from Betts Geo reporting

Date	Historical Information
1874	Site occupied by a series of fields and surrounded by fields
1935	Site remains undeveloped and is occupied by fields and playing fields. A track is present in the centre extending north to south off Holyhey Drive to the north. This provides access to a school which now occupies land to the immediate south (phase 1). A school and playing field have been constructed to the immediate south. It appears to consist of courtyards surrounded by buildings and a playing field. Significant residential development has taken place within the wider surrounding area to the north, south and west.
1956	The school (Yew Tree School) to the south has expanded with 3 buildings now present in the southwest of the site. Two relate to the existing rectangular structures along the western boundary whilst the third is a "H-shaped" building opposite these structures. A tennis court is also mapped
1977	Further buildings associated with the school have been constructed in the west of the site with a tennis court also shown
2010	Yew Tree School and most of its associated structures have been demolished and replaced with the existing college building, areas of car parking / infrastructure and landscaping. It is understood that the only buildings to remain associated with the original school are those located along the western boundary.
2022	Anecdotal information suggests the Site closed following relocation of facilities into the City Centre

3.1.2. No significant contaminative uses of the site or surrounding area have been identified with the Site being occupied by several buildings in the west associated with the original school located to the south before the Site was developed for the existing college.

3.1.3. It is possible that the original school may have been served by an oil-fired boiler at some point, however this is considered most likely to have been located off-site to the immediate south. Buildings associated with the original school may have contained asbestos containing materials (ACM), two of these remain and one has been demolished. It is understood that demolition works took place in 2010, a period in which an appropriate asbestos survey and strip prior to demolition should have taken place. The remaining buildings in the west are due to be demolished as part of current works and will be subject to an appropriate survey prior to demolition.

3.1.4. There is no evidence of any fuel stores etc. although it is assumed that the existing college buildings may have been served by a boiler house although given the age of construction, will most likely have been a modern gas-fired boiler.

3.2. Present Land Condition

3.2.1. Descriptions are based on observations made within the reviewed reports and examination of more recent mapping and aerial photographs.

Table 3.3: Land Condition Summary

Site Description	The Site currently comprises derelict buildings associated with the former Northenden College, areas of car parking surfaced with hardstanding, areas of soft landscaping and an area of dense vegetation (trees) in the north. It is understood that the Site closed in 2022 and has remained derelict since.
Access	The site is accessed off Moss Hey Drive to the west. A secondary access (via foot) is located off Holyhell Drive in the north.
Boundaries/Adjoining Land Uses	North: boundary extends onto existing residential housing East: boundary extends onto existing residential housing South: Miller Homes residential re-development (Phase 1) West: boundary extends onto existing residential housing
Services / Wayleaves	No utility information has been obtained as part of this reporting. It is reported by Betts (following review of the REC reporting) that there are 2 substations present on the whole site. Their location is unclear and it is uncertain whether any of these are / were located within Phase 2. The e3p reporting makes reference to a full ground penetrating radar (GPR) survey being undertaken which identified drainage, electricity, Virgin Media and gas. It is reported that the majority of services enter the site through the main gate off Moss Hey Drive (west) or via the entrance to the north off Hollyhey Drive.
Surfaces / Vegetation / Structures	Buildings associated with the modern college buildings are present in the northeast of the site. Two rectangular buildings are present in the west, possibly associated with the original school which occupied part of the site. Areas of hardstanding associated with widespread car parking are present in the west, north and south with reporting referring to a tarmacadam surfacing. Soft landscaping (verges) are present in the east around the areas of car parking whilst larger areas of public open space are present in the south. An area of dense vegetation (trees) is present in the north / northeast.

3.3. Geology

3.3.1. BGS mapping maps the Site as being underlain by superficial Glaciofluvial drift deposits (sand and gravel) underlain by bedrock of Tarporley Siltstone Formation (siltstone, mudstone and sandstone).

3.3.2. A summary of the ground conditions in relation to Phase 2 following a review of the available site investigation logs is presented below.

Made Ground

3.3.3. Made ground was largely consistent within entries and was reported at all locations except WS126 where it was absent. Made ground consisted of the following two types:

- Made Ground (I) consisted of a gravelly sand with coarse to fine angular to subangular brick and concrete. Inclusions of ash were reported within WS201 (1.1-1.3m bgl) beneath a buried concrete slab at 0.9-1.1m. This was the most common type of made ground reported within most entries and extended to a maximum confirmed depth of 1.3m (WS201).
- The second type of made ground (II) was generally much shallower consisting of a sandy gravel MOT, presumably associated with placed sub-base materials to form areas of existing hardstanding. This was encountered within entries: WS120 (0.1-0.25m bgl), WS121 (0.15-0.4m bgl), WS123 (0.1-0.6m bgl), WS127 (0.1-0.2m bgl), WS128 (0.1-0.3m bgl) and WS129 (0.0-0.3m bgl).

3.3.4. The full depth of made ground was not confirmed in WS202 (>0.8m bgl), WS122 (>0.95m bgl).

3.3.5. Two types of surface hardstanding cover above made ground deposits was recorded as asphalt (WS206, WS207, WS120, WS121, WS123, WS124) and concrete (WS127, WS128). The thickness of hardstanding with all entries was recorded as 0.1m.

Topsoil

3.3.6. Topsoil was recorded within TP135 (0.0-0.5m bgl), WS122 (0.0-0.15m bgl) and WS126 (0.0-0.3m bgl) consisting of a black brown slightly gravelly medium sand with rootlets and inclusions of plastic and brick. Topsoil within TP135 and WS126 was present above natural strata whilst that within WS122 overlain made ground.

Natural Strata

3.3.7. Natural strata were reported within all entries where the full depth of made ground was confirmed with superficial deposits consisting of granular (sand) and cohesive (sandy clay) strata. Granular soils were encountered at shallower depths ranging from 0.2m (TP137 and WS127) to 1.3m (WS201).

3.3.8. Natural cohesive strata of a stiff sandy clay was reported below the granular deposits at: 2.5m (WS206), 3.6m (WS120), 2.7m (WS121), 2.8m (WS123), 2.60m (WS124), 2.6m (WS126), 2.4m (WS127), 2.2m (WS128) and 2.8m (WS129). This stratum was confirmed to a maximum depth of 5.45m in WS121, WS123-WSWS128.

3.4. Hydrogeology and Hydrology

3.4.1. The superficial deposits (Glaciofluvial Deposits) are classified as supporting a Secondary A and a Secondary Undifferentiated aquifer, the bedrock also supports a Secondary A aquifer. The Site

does not lie within a Groundwater Source Protection Zone and there are no non-licensed water abstractions within 1km of the Site.

3.4.2. Groundwater was encountered during the intrusive investigation works within WS206, WS120, WS123 and WS124 at 2m bgl. It was recorded within e3p logs that where water strikes occurred, the granular strata was saturated down to the interface of the underlying cohesive soils. This suggests perched water within the natural granular soils although not all entries recorded perched groundwater within these deposits.

3.4.3. Given that groundwater was not consistently encountered within the underlying granular soils across the Site it was just localised areas of perched groundwater. The perched groundwater (where encountered) is situated above the underlying cohesive natural clays which will significantly limit groundwater movement into the deeper bedrock aquifer.

3.4.4. Site drainage will be predominantly via surface water run-off into the existing surface water drainage system for the site. Limited drainage via infiltration within areas absent from hardstanding will also occur.

3.4.5. The nearest surface watercourse has been recorded as an inland river located approximately 205m southwest, a distance where any impacted from the site is considered unlikely.

3.5. Soil Contamination

3.5.1. No visual or olfactory contamination indicators encountered during the site investigations were encountered according to records produced by e3p and Betts Geo other than the reported presence of ash within WS201.

3.5.2. A comprehensive testing suite appropriate to the site characterisation has been completed on the site soils which included testing for asbestos, heavy metals, PAHs, fractionated hydrocarbons, cyanide and phenol. The e3p report contains a summary table of the range of concentrations for each determinant and compares these to generic assessment criteria (GACs) for a residential land use. Due to the absence of the laboratory test certificates within the reviewed reporting it has not been possible to differentiate between samples collected from Phase 1 and Phase 2, however the authors do detail locations and concentrations where exceedances were reported as part of their assessment. This table has been reproduced below and compared to the LQM Suitable for Use Levels (S4ULs) and DEFRA Category 4 Screening Levels (C4SLs) for a residential land use with plant uptake.

Table 3.4 Summary table of e3p soil data (whole site)

Contaminant	Samples	Maximum Concentration (mg/kg unless stated) & Location	Residential Use	
			Screening criteria (mg/kg unless stated)	No. Exceedances
pH			-	-
Total Cyanide	19	<1	-	-
asbestos fibre	12	0.002% (WS118)	<0.001%	Exceedance in Ph1 NOT Ph2
arsenic	19	68 (WS107)	37 (S4UL)	Exceedance in Ph1 NOT Ph2
cadmium	19	1	11 (S4UL)	None
Hexavalent chromium	19	<4	6 (S4UL)	None
copper	19	56	2400 (S4UL)	None
lead	19	150	200 (C4SL)	None
mercury	19	1	170 (S4UL)	None
nickel	19	35	180 (S4UL)	None
selenium	19	2	250 (S4UL)	None
zinc	19	250	3700 (S4UL)	None
naphthalene	18	2	2.3 (S4UL)	None
acenaphthylene	18	<0.05	170 (S4UL)	None
acenaphthene	18	0.76	210 (S4UL)	None
fluorene	18	0.47	170 (S4UL)	None
phenanthrene	18	4.6	95(S4UL)	None
anthracene	18	0.96	2400 (S4UL)	None
fluoranthene	18	5.4	280 (S4UL)	None
pyrene	18	5.5	620 (S4UL)	None
benzo(a)anthracene	18	2.9	7.2 (S4UL)	None
chrysene	18	2.7	15 (S4UL)	None
benzo(b)fluoranthene	18	2.5	2.6(S4UL)	None
benzo(k)fluoranthene	18	1.4	77(S4UL)	None
benzo(a)pyrene	18	2.2	2.2 (S4UL)	None
indeno(123cd)pyrene	18	1.1	27 (S4UL)	None
dibenzo(ah)anthracene	18	0.32 (WS111) 0.29 (WS118) 0.35 (TP110) 0.28 (TP128) 0.31 (TP129)	0.24(S4UL)	Exceedance in Ph1 NOT Ph2
benzo(ghi)perylene	18	1.3	320 (S4UL)	None
TPH (C5-C6)	9	<1	42 (S4UL) – aliphatic*	None
TPH (C6-C8)	9	<0.1	100 (S4UL) - aliphatic*	None
TPH (C8-C10)	9	<0.1	27 (S4UL) - aliphatic*	None
TPH (C10-C12)	9	4.1	74 (S4UL) - aromatic*	None
TPH (C12-C16)	9	5.8	140 (S4UL) - aromatic*	None
TPH (C16-C21)	9	30	260 (S4UL) - aromatic*	None
TPH (C21-C35)	9	57	1100 (S4UL) - aromatic*	None

Notes to table:

S4UL: Suitable For Use Levels published by Chartered Institute of Environmental Health and Land Quality Management Ltd, residential with plant uptake scenario (1% SOM); copyright Land Quality Management Ltd reproduced with permission publication number S4UL3102. All rights reserved.

C4SL: Category 4 Screening Levels published by CL:AIRE (C4SLs); 'residential without home grown produce land use' (at 1% SOM)

*Where TPH has been scheduled the lower GAC for the aliphatic / aromatic split has been adopted

3.5.3. E3p reported exceedances for the PAH dibenzo(ah)anthracene within multiple entries, a single exceedance of arsenic and an incidence of asbestos at 0.002%. However, all locations were located outside the Phase 2 area.

3.5.4. The Betts Geo report did not include a summary table of the laboratory data as part of their investigation but did tabulate locations of reported exceedances. Again, these were limited to the PAH (benzo(a)pyrene) within WS205 and incidences of asbestos fibres (<0.001%) within WS211 and B3. All these locations are outside the Ph2 area.

3.5.5. No exceedances were reported within the Site (Phase 2); however, it is acknowledged that the exceedances were reported within the made ground and that these were located to the immediate south of Phase 2 within the area of the former school which occupied the site. Given the uncertainty of the number of samples which have been collected within Phase 2 and the reported consistency in made ground across the site, it is considered reasonable and appropriate to consider that exceedances of PAHs and trace / low-level incidences of asbestos fibres may be present within the made ground beneath the Site.

3.6. Groundwater Contamination

3.6.1. Groundwater samples were collected as part of the e3p investigation and submitted for heavy metal, PAH, hydrocarbon and SVOC/VOC analysis, however it is unclear as to which boreholes were sampled. The summary table suggests that 3 soil leachate samples were analysed and 4 groundwater samples. Whilst there is some uncertainty as to sample locations, this is not considered to be a deficiency in the assessment or a limitation to be considered within this Remediation Strategy as no significant sources of groundwater contamination have been identified within the preliminary conceptual site model and this is largely agreed within the subsequent Betts Geo Reporting.

3.6.2. E3p reported that there were no exceedances of the EQS values for any of the determinants but noted that there were some SVOCs reported above analytical detection limits within WS117 and WS123. WS123 is located within Phase 2 and reported the presence of diethyl-phthalate (0.92 ug/l) and dibutyl-phthalate (0.81 ug/l). Betts provided further assessment on the presence of these compounds and concluded that no further testing is required and that the report [e3p] is correct stating a low risk to groundwater.

3.6.3. No descriptions of any impacted groundwater (odours, floating product etc.) were reported.

3.7. Ground Gas Contamination

Ground Gas

3.7.1. The preliminary conceptual site model produced by e3p identified that the presence of made ground deposits could give rise to ground gas and potentially infilled areas in the north could serve as

potential sources of ground gas. Deep deposits of made ground were not encountered within Phase 2 and no previous reference to potentially infilled areas in the north (assumed to be located within Phase 2) have been identified within the reviewed information.

3.7.2. Initially 4 rounds of monitoring were completed, however this was extended to 9 rounds within the e3p Ground Gas Addendum (ref. 13-969-R2-1) The report tabulates the monitoring data for the site, a summary table of the monitored wells within Phase 2 with maximum recorded concentrations is reproduced below:

Table 3.6 Summary of maximum methane, carbon dioxide and flows recorded

Borehole	No Rounds	Max CO ₂ (%)	Max Methane (%)	Min Oxygen (%)	Max Flow (l/hr)
WS121	9	0.8	0.1	18.5	1.98
WS123	9	2.4	0.1	12	7.41
WS124	9	3.3	0.1	12	8.40
WS127	9	2.2	0.1	18	2.57
WS128	9	5.4	0.1	9.2	1.4
WS129	9	3.7	0.1	14.8	1.74

3.7.3. Concentrations of methane were consistently low (0.1% v/v) which is assumed to relate to the gas analysers detection limits. Carbon dioxide was also generally low, however the 5% threshold in which basic protection measure would be required were reported within WS128.

3.7.4. Positive ground gas flows were recorded during the monitoring period within all wells, however e3p further assessed these and attributed them to be a result of groundwater fluctuations “piston-effect” as opposed to gas generation.

3.7.5. The ground gas risk assessment classified boreholes WS121, WS127 and WS129 as CIRIA CS1 / NHBC green and WS123, WS124 and WS128 as CIRIA CS2 / NHBC Amber-1. Further assessment was undertaken on the results which concluded that given the absence of any gas generation sources and that the 5% threshold for carbon dioxide was only marginally exceeded over 2 of the 9 monitoring rounds, that there is no credible source of carbon dioxide and that the Site should be classified as CS1 – no gas protection measures required.

3.7.6. Betts Geo appraised the e3p assessment and completed a final ground gas summary, concluding that the risk from ground gas is negligible and the whole site should be classed as CIRIA CS1 (very low risk) / NHBC Green meaning that no specialist ground gas protection measures are required.

Radon

3.7.7. Betts Geo confirm that the site is located within a low-risk radon area where 1% of homes are estimated to be above the action level, therefore radon protection measures are not required.

3.7.8. Following the recent (December 2022) re-publication of radon maps. SGP has reviewed the mapping coverage for the Site¹ and confirms that the site is still classed within an area where 1% of homes are above the action level.

3.8. Risk Assessment

3.8.1. The potential contamination sources identified during the investigations which could impose constraints on the proposed redevelopment of the site for residential uses are:

- Widespread made ground with limited inclusions of ash. No exceedances reported within Phase 2 but acknowledged that low-level / trace asbestos fibres and elevated PAHs and arsenic have been reported within the made ground to the immediate south of the site and can be reasonably anticipated to be present within Phase 2.
- Asbestos release during demolition of western buildings (associated with original school) and disturbance of made ground soils which has reported the presence of low level / trace fibres within made ground soils to the immediate south of Phase 2.

3.8.2. Concentrations of contaminants were compared to current assessment criteria derived for the protection of human health and initial screening levels were adopted from published generic assessment criteria for a residential land use. No exceedances were reported within Phase 2, however there is some uncertainty as to the number of samples collected from Phase 2 due to the absence of laboratory test certificates within the reviewed reporting. Given that low level / trace asbestos fibres and elevated PAHs and to a lesser extent arsenic have been reported within the made ground soils to the immediate south, it is prudent to assume the chemistry of made ground soils within Phase 2 is similar.

3.8.3. No contamination hotspots have been identified to date, but it is acknowledged and recommended within the Betts Geo reporting that post-demolition site investigation is undertaken to confirm the ground conditions beneath the building footprint and wooded area in the north. It is considered unlikely that there will be a significant difference in the depth and chemistry of made ground in these locations, particularly given the undeveloped history of this part of the site until the construction of the modern college building. Any such additional investigation works could be completed concurrently during site preparatory works.

3.8.4. A total of 9 rounds of gas monitoring have been undertaken which satisfies the suggested frequency of monitoring for a highly sensitive land use (residential) with a low generation potential². Whilst slightly elevated carbon dioxide has been reported within Phase 2, further assessment by both e3p and Betts Geo concluded that the Site is classed as CIRIA CS1 / NHBC Green meaning that gas protection measure is appropriate.

¹ <https://www.ukradon.org/information/ukmaps>

² Ground Gas Handbook (2009)

3.8.5. An assessment of the ground conditions to determine their potential to impact concrete has been carried out by both e3p and Betts Geo, whom both recommended a classification of Design Sulphate DS-1 and Aggressive Chemical Environments for Concrete of AC-1s.

3.8.6. It is unlikely that special measures for water supply pipes will be required based on the soil contamination identified to date, although this assumes no unexpected contamination sources are identified during the preparatory construction works.

3.9. Conceptual Site Model

3.9.1. The conceptual site model is summarised below:

Table 3.4: Summary of Pollutant Linkages under development and residential use

receptors	pathways	contaminant sources
Human health (future residents) (transient risks to construction workers addressed under HSWA 1974 / COSSH)	Consumption of contaminated vegetables	Widespread made ground. No exceedances reported to date, however low-level / trace asbestos fibres, arsenic and multiple PAH exceedances have been reported within the made ground to the immediate south. It is assumed that similar exceedances may be present within the Phase 2 made ground soils. Potential for ACM to be present within westernmost buildings which may have been constructed during the original school.
	Soil and dust ingestion	
	Inhalation of dust	
	Dermal uptake	
Built development (and by extension future residents)	Contact with aggressive soil or groundwater	Recommendation for concrete classification has been made; no special precautions for plastic pipes or other polymers are required based on current information.
	Ingress of hazardous ground gas into poorly ventilated spaces and build up to harmful or flammable concentrations	Concentrations of methane were consistently low / negligible. Slightly elevated carbon dioxide reported within WS128, however further appraisal of the results concluded given the absence of significant ground gas sources and requirement to proof-dig / turnover made ground soils that the Site is classed as CIRIA CS1 / NHBC Green meaning that gas protection measures are not required.
Controlled waters	Migration via permeable stratum. Sensitive groundwater receptors absent and protected by low permeability superficial deposits	Potential for viable pollution sources is minimal and migration to receptor unlikely given the distance to surface watercourse and protection afforded by the significant depths of cohesive soils beneath the site.

3.10. Remediation Objectives

3.10.1. The key remediation objectives are to:

- break significant or potentially significant future pollutant linkages resulting from the change of land use.
- remove / remediate significant pollution sources if identified during the works that pose a risk to man and / or the environment.
- respond appropriately to contingencies, in particular the discovery of currently uncharacterised contamination.
- recover materials with the potential for re-use within the development (specifically soils which may be reused in gardens, fill materials required to achieve planned development levels, and aggregates for use in construction).
- manage all emissions to air and water to protect local-residents, surface waters, groundwater and the atmosphere during the remediation works.
- allow appropriate additional protection measures to be implemented during construction (if required).

3.10.2. The potential risks identified will be managed to break any potential pollution linkages and allow development of the site for its intended residential use without harm to human health, property, and the environment. Each of the potential contaminant linkages identified in the site conceptual model and risk assessment will be addressed for the Remediation Strategy to be considered appropriate for the site and to allow construction to commence.

3.10.3. During the remediation works, various contaminated materials may be exposed and mitigation to prevent exposure of site workers, local residents and site visits to harmful or nuisance substances including dust or asbestos fibre is a requirement of the Remediation Strategy. Similarly, the works must not cause pollution of water by discharge of silt or other materials to surface waters.

3.10.4. The risk assessment carried out does not indicate any requirement for remediation of contamination to protect controlled waters; risks to surface and groundwater appear to be minimal based on the available evidence.

3.10.5. The potential for exposure of concrete to aggressive ground conditions and water supply pipes to damaging substances is considered to be low but may be subject to further assessment during or following the remediation works.

3.10.6. Enabling works will also be required to physically prepare the site for the proposed development. This will entail demolition of existing structures, stripping topsoil and vegetation, removing wastes, obstructions and otherwise deleterious materials (if encountered), modifying ground levels and provision of supporting structures and suitable founding surfaces for infrastructure.

3.10.7. No contamination hotspots which require further investigation / remediation have been identified to date and given the history of the site it is considered unlikely that such hotspots may exist,

however a detailed watching brief should be maintained by site operatives and workers should remain vigilant for visual or olfactory evidence of contamination.

3.10.8. Betts Geo recommended that post-demolition investigation is undertaken and that this forms a requirement under Condition 4a of the Consent. It is understood that this is required to confirm that ground conditions beneath the existing building footprints are consistent with those reported within the wider Phase 2 site. It is also acknowledged that Betts Geo recommended entries in the north as this area was previously constrained by vegetation. Given the history of the site and relatively modern construction of the college buildings, it is considered appropriate that inspection of ground conditions within these locations can be completed concurrently with the preparatory works as they will require the proof-dig / turnover of made ground soils to remove any obstructions. Dedicated attendance by the appointed consultant during turnover works within these areas to record and confirm the ground conditions is considered an appropriate approach.

3.11. Remediation Criteria

Soils

3.11.1. Remediation Criteria are site specific objectives that have been determined through quantitative or qualitative risk assessment. The Risk Assessment completed by e3p and Betts Geo has relied on the use of Generic Assessment Criteria (GACs) for residential land use to compare against concentrations of common industrial and urban contaminants. This is considered a reasonable and proportionate means of assessing the limited risks posed by ground contamination on the site.

3.11.2. The criteria selected are protective of human health when applied to shallow soils in a model residential garden, with sensitive (child) receptors and high exposure frequencies and durations assumed for a conservative approach. While exceedances of the GACs may indicate a significant risk, it is also acceptable to undertake further testing, statistical analysis of the results and / or more detailed risk assessment in this eventuality. Specifically, other available GACs for the different land uses planned within the overall development could be applied (e.g., POS_{resi}). If failures for residential criteria occur, then the impacted materials could be utilised in less sensitive areas such as Public Open Space (POS).

3.11.3. The criteria are not designed to be protective of controlled waters, however given the absence of potential or identified pollution sources and groundwater impacts, this is not considered a deficiency. If very substantial exceedances or otherwise high concentrations are encountered during subsequent assessments, then other criteria may have to be added but this is not required based on the available information.

3.11.4. The criteria will be applied to shallow soils, defined as those which will be in the upper 600mm of garden surfaces following completion of the development, with a shallower depth of 300mm suitable for the managed POS areas and other landscaping where penetration below the surface layers is

less likely and can be controlled. They can be applied to other deeper soils but are unnecessarily conservative for these and would only be used as a screening criterion for this purpose.

3.11.5. Where criteria are not published and cannot be readily derived (for asbestos for example) an arbitrary level which is representative of what would be considered a clean soil is used. Typically, this is the limit of detection that can be achieved through quantification of the amount of asbestos in the soil by commercially available laboratory techniques, typically 0.001% by mass. If higher concentrations are encountered then further assessment would be required to determine likely risks, however concentrations above what are widely recognised as “trace” are not normally tolerated in residential soils and so this will be adopted for the residential areas of the development. Higher concentrations in other areas / or at greater depths may be acceptable (i.e., below the soil cover system or within low sensitivity areas such as POS), depending on whether future exposure during construction or maintenance can be reasonably anticipated. The criteria of 0.001% will be adopted for any validation of residual made ground following the removal of ACM, exceedances of this will prompt further risk assessment utilising the CL:AIRE JIWG Decision Support and Receptor Ranking Assessment, however concentrations of 0.01% would prompt further removal.

3.11.6. The Remediation criteria for the site are summarised in the tables below:

Table 3.5 Shallow (Garden) Soils Compliance Criteria

Contaminant	Residential Use Screening criteria (mg/kg unless stated)
Asbestos	<0.001% by mass (LOD)
Arsenic	37 LQM/CIEH S4UL
Cadmium	11 LQM/CIEH S4UL
Chromium (total)	910 LQM/CIEH S4UL
Hexavalent Chromium	6 LQM/CIEH S4UL
Copper	2,400 LQM/CIEH S4UL
Lead	200 (C4SL)
Mercury	40 LQM/CIEH S4UL
Nickel	180 LQM/CIEH S4UL
Zinc	3,700 LQM/CIEH S4UL
Naphthalene	2.3 LQM/CIEH S4UL
Acenaphthylene	170 LQM/CIEH S4UL
Acenaphthene	210 LQM/CIEH S4UL
Fluorene	170 LQM/CIEH S4UL
Phenanthrene	95 LQM/CIEH S4UL
Fluoranthene	2400 LQM/CIEH S4UL
Anthracene	280 LQM/CIEH S4UL
Pyrene	620 LQM/CIEH S4UL
Benzo(a)anthracene	7.2 LQM/CIEH S4UL
Chrysene	15 LQM/CIEH S4UL
Benzo(b)fluoranthene	2.6 LQM/CIEH S4UL
Benzo(k)fluoranthene	77 LQM/CIEH S4UL
Benzo(a)pyrene	2.2 LQM/CIEH S4UL
Indeno(123cd)pyrene	27 LQM/CIEH S4UL
Dibenzo(ah)anthracene	0.24 LQM/CIEH S4UL

Contaminant	Residential Use Screening criteria (mg/kg unless stated)
Benzo(ghi)perylene	320 LQM/CIEH S4UL
Aliphatic C5-C6	42 LQM / CIEH S4UL
Aliphatic C6-C8	100 LQM / CIEH S4UL
Aliphatic C8-C10	27LQM / CIEH S4UL
Aliphatic C10-C12	130LQM / CIEH S4UL
Aliphatic C12-C16	1100 LQM / CIEH S4UL
Aliphatic C16-C21	65,000 LQM / CIEH S4UL
Aliphatic C21-C35	65,000 LQM / CIEH S4UL
Aromatic C5-C6	70 LQM / CIEH S4UL
Aromatic C6-C8	130 LQM / CIEH S4UL
Aromatic C8-C10	34 LQM / CIEH S4UL
Aromatic C10-C12	74 LQM / CIEH S4UL
Aromatic C12-C16	140 LQM / CIEH S4UL
Aromatic C16-C21	260 LQM / CIEH S4UL
Aromatic C21-C35	1100 LQM / CIEH S4UL
Benzene	0.08 LQM / CIEH S4UL
Toluene	130 LQM / CIEH S4UL
Ethyl-benzene	47 LQM / CIEH S4UL
m/p-xylene	56 LQM / CIEH S4UL
o-xylene	60 LQM / CIEH S4UL

S4UL: Generic assessment criteria published by Chartered Institute of Environmental Health and Land Quality Management Ltd S4UL, residential land use scenario; COPYRIGHT Land Quality Management Limited reproduced with permission; publication number UL3102. All Rights Reserved

C4SL: Category 4 Screening Levels published by CL: AIRE 'residential land use with plant uptake'

3.11.7. Significant exceedances of these criteria will only indicate that the material is unsuitable for inclusion at shallow depth in gardens. Criteria from the same sources are available for POS_{resi} and these will be applied to shallow soils in POS / landscaped areas, or soils which can be moved to these less sensitive areas.

4. Options Appraisal

4.1. Options Appraisal Objectives

4.1.1. The objectives of the Options Appraisal are to determine the most appropriate means of meeting the above Remediation Objectives and Criteria, taking into account project and site-specific considerations including:

- Physical site constraints (boundaries, groundwater levels, available space);
- Costs;
- Programme (Duration);
- Sustainability (use of resources);
- Environmental Impact (pollution, nuisance);
- Health and Safety requirements;
- Geotechnical Requirements & Development Design;
- Regulatory controls - Permitting and Waste.

4.1.2. Physical site clearance, demolition and earthworks will be carried out in accordance with the applicable Method Statements and specifications and are not considered further. However, the chosen remedial techniques must not impede the works to physically prepare the site or unduly compromise the stability of the ground in respect of the design of foundations, pavements, and infrastructure.

4.1.3. One of the main constraints in selecting an appropriate remediation technique can be programme duration. Lengthy post-remediation monitoring to demonstrate the adequacy of the remediation techniques to achieve the objectives is undesirable. Also, given an approximate earthworks balance (no net surplus or deficiency in fill materials), it is important that the volume of any excavated materials that cannot be returned to the earthwork's operation is minimised, and that, as far as possible, excavated materials can ultimately be retained subject to their contamination status and geotechnical suitability.

4.1.4. Several potential methods could be considered to meet the site remediation objectives and criteria; however, these will vary in their impacts and requirements as well as their effectiveness. The objective of the Options Appraisal is to assess what remedial techniques might be effective, then to balance the advantages and disadvantages of each and arrive at the most appropriate method or combination.

4.2. Viable Technical Approaches

4.2.1. The identified pollutant linkage that requires addressing as the primary objective of the task is limited to the potential for elevated arsenic, PAHs and low-level / trace asbestos fibres in made ground soils. These materials have not been identified within the made ground of the Site, however

their presence has been recorded within the made ground to the immediate south within Phase 1. New receptors will be introduced following development (ground workers / residents) and there is therefore a viable pollutant source, sensitive receptor and linkages between these at the site. Remediation measures could be targeted to any of these three elements to reduce risk to acceptable levels.

4.2.2. Modification of receptor behaviour would not normally be considered for a new development. For example, the planned dwellings have private gardens and areas of adjoining open space for reasons of amenity and marketing. As the properties may be sold freehold with permitted development rights, it is considered that the preferred approach should protect the future residents from unacceptable exposure during whatever activities can be reasonably envisaged over the design life of the development.

4.2.3. Based on the above considerations, managing the sources and / or exposure pathways is confirmed as the most appropriate means of managing risks to the future residents in the long-term. Source reduction may be appropriate for some specific circumstances, for example asbestos containing materials or hydrocarbon impacted soils if these are identified, and can be achieved through a number of means, the simplest is to remove the contamination from the site to be dealt with elsewhere. Other methods generally utilise chemical or biological processes which destroy the contaminants or achieve a reduction in the amount of effective contaminant mass through removal of mobile phase contaminants or fixing these within the soil matrix.

4.2.4. However, for the most part, as impacted soils do not appear to present a pollution risk and the types and concentrations of contaminants anticipated are of low mobility in the environment, retaining the impacted materials on site and severing the exposure linkage by ensuring isolation from contact with the future residents would appear to provide a sure and robust means of reducing risks.

4.3. Feasible Remediation Options & Feasibility Screening

4.3.1. Based on existing information gained from the intrusive investigations and risk assessment, a variety of techniques could be applied to manage the potential or confirmed sources. The general classifications of technique which could be considered viable in the context of the development and the requirement to manage the identified pollution linkage under consideration are listed below:

- Isolation of the materials through reduction of infiltration or in-ground barriers to achieve *Engineered Encapsulation*;
- *Excavation and Disposal* of contaminated soils off-site;
- *Excavation and Ex-Situ Treatment* by physical, chemical, or biological means to reduce concentrations and replacement once Remediation Criteria are achieved;
- Application of similar chemical, biological or physical process to the contaminant mass while still in the ground – *In-Situ Treatment* – to reduce concentrations sufficiently to achieve Remediation Criteria;

- Use of chemical / physical treatments to reduce the mobilisation of the contaminants from the impacted material matrix by *Solidification and Stabilisation* – may be achieved in-situ or ex-situ.

4.3.2. Several different techniques could be used for the above methods giving a wide range of options. These are explored further below with the costs / benefits and advantages / disadvantages of each and a separate assessment of the possibility of combinations of options. Each of the various classes of remediation that could be applied to the potential or confirmed sources have relative advantages and disadvantages, some of which allow early exclusion from the feasibility assessment.

Table 4.1: Feasibility Screening Assessment

Method Class	Advantages / Merits	Disadvantages / Limitations	Feasible?
Isolation / Encapsulation	Avoids generation of wastes and large-scale earthworks / vehicle movements / import materials. Short term programme constructing engineered barriers.	May require additional earthworks to achieve isolation by moving materials to less sensitive areas. Requirement to source clean cover materials. Requirement to maintain barriers or design so would not be compromised during site operations.	Yes
Excavation and disposal	Fast and can be achieved using traditional plant to shallow water table and verified simply with on-site monitoring equipment (PID) and comparison of residual soil concentrations to Remediation Criteria. Allows physical preparation of site through removal of structures to be completed at the same time.	Excessive cost if large volumes or hazardous waste classification. Large number of lorry movements and use of resources (landfill space and replacement fill). Possible release of emissions and associated health / nuisance odour risks during disturbance.	Yes
Excavation and Ex-Situ Treatment: Destructive Techniques	All advantages of excavation and disposal (above) without generation of excessive wastes. Wide range of techniques applicable. Only applicable to hydrocarbon impacted soils if present (non-encountered to date).	Inorganic (arsenic / asbestos) and recalcitrant organic contaminants (PAHs) less amenable to biodegradation. Different techniques have different costs and timescales: faster techniques generally more expensive. Possible emissions and associated health / nuisance odour risks during disturbance.	Yes / No (Contaminant dependent)
In-Situ Treatment	Avoids generation of wastes, and large-scale earthworks. Wide range of techniques applicable.	Significant uncertainty in terms of programme length and cost. Long-term monitoring programme to demonstrate no rebound effect conflicts with programme constraints. Currently the distribution of	No

Method Class	Advantages / Merits	Disadvantages / Limitations	Feasible?
		contamination is uncertain and further investigation required to fix design parameters.	
Stabilisation / Solidification	All advantages of <i>Excavation and Disposal</i> without generation of excessive wastes. Fast: materials can be processed in short timescales and binder curing completed to allow fast recovery of fill. Cost effective depending on amount and type of binders used. Can produce geotechnically suitable fill materials which are of lowered permeability, giving treated materials intrinsic properties with some of the advantages of encapsulation.	Uncertainty with respect to leaching properties of contaminants under consideration; may require special binders/ additives increasing costs. Limited track record in UK context. Possible release of emissions and associated health / nuisance odour risks during disturbance. Requirement of treatment trials to demonstrate remedial targets can be achieved.	No

4.3.3. Based on the anticipated requirement to regrade the site, recovery of materials for reuse within the construction and the absence of identified or potential hotspot areas, the techniques which involve excavation or isolation of the soil materials involve the least divergence from the overall, established general remediation earthworks requirements for the site. This infers a large advantage as it removes the requirement to undertake a significant programme of further site investigation and lengthy trials with the delineation and verification being performed contemporaneously with the preparatory earthworks.

4.3.4. The other advantages of these techniques are that the excavation (if required) can be completed rapidly with traditional plant and the contaminant removal verified quickly and with a high degree of certainty by competent practitioners, standard monitoring equipment and laboratory techniques. The comparison of soil concentrations to Remediation Criteria provides a simple and fast means of verifying removal. Once the material is delineated and has been adequately characterised, a decision can then be made as to whether removal from the site / disposal, on-site treatment, or straightforward isolation from gardens below a site cover system is the most appropriate option.

4.3.5. Removal from the site could be feasible, however it is the least desirable option in terms of cost and general sustainability. However, to provide surety and balance considering the inherent uncertainty in the various methods of treatment which could be applied, this should be maintained as a contingency.

4.3.6. It is therefore considered that made ground which may contain elevated concentrations of metals (arsenic), PAHs and low-level / trace asbestos can be retained on site, either below areas of permanent hardstanding (buildings, roads, driveways etc.) or beneath a soil system within private

gardens and POS areas to reduce exposure to future occupants from unacceptable soil concentrations.

4.3.7. Recovered soils during preparatory works may include natural subsoil and made ground topsoil which will be subject to chemical testing to assess their suitability for use within the development. Soils will be compared to the criteria outlined in Table 3.5 to assess their potential for reuse as part of the soil cover system. Exceedances may preclude this (subject to further assessment) but may allow reuse within less sensitive areas such as areas of Public Open Space.

4.3.8. A dedicated post-demolition investigation is not proposed due to the requirement for preparatory works to include the proof dig / turnover of made ground down to natural strata to remove relict sub-surface structures. It is therefore proposed that attendance during turnover works to permit inspection of ground conditions combined with some supplementary trial-pits within the area of the former building footprints and wooded area in the northwest will be completed. Inspection of ground conditions within these locations will be completed on a nominal 30m grid spacing. A record of the ground conditions will be maintained with a detailed photographic record and included within the earthworks completion report.

4.3.9. If in the event that unexpected contamination is encountered (e.g., fuels exhibiting odours or the presence of staining) this will be removed and validated under the provisions of this Strategy.

4.3.10. If significant amounts of asbestos containing materials are encountered such as ACM debris, then these should be removed as far as is reasonably practicable. Residual impacted soils can be isolated on site, but the locations and depth will require further consideration to avoid exposure of future construction and maintenance workers during the construction and operational phases of the development. If lagging or similar ACM (licenced works) is encountered these will be subject to controlled removal by specialist contractors with reassurance air monitoring. Removal of ACM as part of any licenced works will be subject to off-site disposal to a suitable waste accepting facility.

4.4. Decision

4.4.1. Most materials can be left in-situ following proof-digs / turnover of the full depth of made ground to meet the earthworks requirements with mitigation through application of a clean cover system by the developer within all areas absent from permanent hardstanding.

5. Implementation Plan

5.1. Preferred Approach

- 5.1.1. Based on the above assessment it is envisaged that demolition works will commence first, followed by vegetation clearance and a topsoil strip will be carried out prior to the commencement of the earthworks. Stripped topsoil should be formed into stockpiles for testing to demonstrate compliance. If the recovered topsoil is not classified as being suitable for reuse in private gardens it may still be acceptable for use in Public Open Space or landscaping.
- 5.1.2. Excavations to recover materials for use in construction would form the next logical step, with removal of road surfacing and slabs / relict foundations and any below ground structures for processing to generate aggregate for reuse within the development. Any aggregate generated from recovered hardstanding or imported recycled aggregate would be subject to testing to confirm suitability for use. During these elements of the works there is a low to moderate risk that ACM materials may be present. A specialist sub-contractor should be appointed to attend site at relatively short notice if suspected ACM is encountered.
- 5.1.3. No contamination hotspots or potential hotspot areas requiring further investigation have been identified, however weekly attendance by an appointed independent consultant will be required to confirm the ground conditions during preparatory works and carrying out testing of recovered materials.
- 5.1.4. No fuel stores or similar have been identified on site and given the use as a college or unlikely to have been present, however in such an eventuality that fuel or hydrocarbon impacted soils are encountered, these will be subject to screening with a PID and visual / olfactory observation. Any suspected materials will be removed and tested. The test suite will be dependent on-site observations but is anticipated to be limited to TPHCWG + BTEX with comparison to the criteria outlined in Table 3.5. The base and sides of any excavation following the removal of impacted soil will be sampled at a frequency of 1 sampler per 5m sidewall and 1 per 25m³ base with a minimum of 5 samples to verify the efficiency of the remedial works.
- 5.1.5. Inspection of soils within the footprint of existing buildings and wooded areas in the northwest (as shown on Drawing D03) will be undertaken to confirm ground conditions as these areas were previously constrained during the initial site investigation. This will be completed through a combination of inspection during turnover works supplemented by trial-pits. Inspection of the ground in these areas will be completed on a nominal 30m grid spacing. If suspected contamination is encountered within these locations, samples will be collected of the suspected material to characterise the potentially contaminated soils. There is no requirement to sample the general soils within these areas otherwise.
- 5.1.6. A watching brief should be maintained by operatives and supervisors in case any currently uncharacterised areas need addition to the prescribed list where inspections and remediation

excavations are recommended. Areas where heterogeneous fills, soils emitting odours, high proportions of wastes, staining, sheens, drums, tanks or other containers, or suspended ACM are observed will trigger an inspection by a specialist in land contamination, sampling, analysis and assessment.

5.1.7. The preferred option for managing soil contamination within the site therefore involves elements of all previously described techniques. This will entail:

- Recovery, segregation and testing of site-won soils to determine the potential for reuse within the development
- Dedicated inspections during turnover / supplementary trial-pits within footprint of former buildings and wooded area in the northwest on approximate 30m grid
- Weekly attendance by appointed consultant to observe ground condition across rest of the site / sample recovered materials
- Turnover of made ground to facilitate inspection of ground conditions and removal of sub-surface obstructions
- Regrading of the site to appropriate formation levels (-600mm garden areas and -300mm POS / landscaping).
- Placement of 600mm clean imported soil cover system and basal geotextile within all rear gardens

5.2. General Approach: Preparatory Remediation Earthworks

5.2.1. The general approach to the site preparatory / remediation works is described below:

Site security and supervision	The site will be securely fenced throughout the works and appropriate security provided; a full-time site manager representing the Principal Contractor will attend site during the works and welfare facilities for staff / visitors will be provided.
Access	Access will be formed off Moss Hey Drive
Further investigations	• Dedicated inspection to observe ground conditions within footprint of existing buildings and wooded area in northwest either through observation of turnover or supplementary trial-pits. • General inspections of ground conditions during site turnover and regrading works
Ecological clearance	SGP are not aware of a detailed ecological survey having taken place. A separate method statement will be required for the management of any invasive or protected species.
Vegetation strip	The vegetation strip will entail removal of tall plants, grass, and turf to a nominal 50mm depth. Stripped vegetation will be stockpiled for reuse or disposal by the developer.

Demolition/Obstructions Breaking out paved surfaces, foundations, and sub-structures	Demolitions works will be undertaken and completed prior to the commencement of preparatory earthworks. This will include breaking out and removal of concrete slabs, tarmac roads, relict foundations, and other sub-structures which could provide obstructions to development or result in ground stability risks should be removed.
Site turnover / earthworks	All areas of made ground will be subject to a proof-dig / turnover down to natural strata to facilitate the removal of any relict sub-surface structures and allow the inspection of site soils. Vigilance by site operatives will be maintained due to the low but not negligible potential for ACM to be present. This is generally anticipated to be limited to the southern part of the site where buildings associated with the original school were located. Any ACM encountered will be subject to removal by a specialist contractor who will provide verification reporting for each area of ACM removal. Stripped surfaces are to be inspected and suitable inert materials are to be replaced in-situ and subject to an appropriate degree of compaction for the foundation and infrastructure design.
Handling / treatment of wastes	There is a low but not negligible possibility that ACM will be present although this is anticipated to be limited to the southern extent of the site where the former school buildings were located. Appropriate disposal of ACM to a suitable waste facility will be required with retention of all waste transfer and consignment notes to demonstrate appropriate disposal of such hazardous materials. Other than potential ACM, wastes generated from the site are unlikely to be classed as hazardous but will require classification. The developer has a duty of care to ensure the correct classification and appropriate disposal of all wastes generated. If recovery of waste materials and arisings is intended, this must be carried out under the provisions of a registered Materials Management Plan (MMP) prepared and reviewed in accordance with "The Definition of Waste: Development Industry Code of Practice" or alternative permitting requirements.
Completion	On completion of the preparatory remediation works the site will be re-graded to design formation levels with gardens trimmed to -650mm / POS -300mm to allow the developer to place the prescribed clean soil cover system.

5.3. Dedicated Investigation / Attendance

5.3.1. Observation of ground conditions within area of former buildings and wooded area in the northwest, to be completed by either observations during turnover or dedicated trial-pits. Inspections to be completed on a 30m grid across these areas as shown in Drawing D03 to confirm ground conditions. Full time attendance during works in these areas is not required.

5.3.2. Weekly site visits by the appointed consultant will be required to inspect ground conditions during the breaking out of hardstanding, removal of sub-surface structures and turnover of made ground

soils across the rest of the site. A detailed watching brief supplemented by a photographic record will be maintained. Any previously unexpected contamination or suspect materials will be subject to sampling and analysis.

5.3.3. If ACM is identified and removed, the residual soils will be subject to sampling with composite samples collected at 5m lengths across the areas of the removal works. Samples will be submitted for asbestos identification and initially compared to the criteria of 0.001% (Table 3.5). Exceedances of this would prompt further risk assessment including the risks to future workers. If residual concentrations exceed 0.01% then further remediation will be required.

5.3.4. The site management and supervision should be carried out by a competent individual at all stages of construction including excavations and earthworks who should be aware of the provisions of the Remediation Strategy. Site operatives must be briefed on the potential for unexpected ground conditions. If suspect materials are encountered, then an appropriately qualified Environmental Consultant should be notified immediately, and soil sampling carried out to determine the significance of the soil contamination and whether the materials should be treated as a hotspot and excavated for disposal / treatment off-site at a permitted facility. Similarly, site operatives should be briefed on the potential presence of ACM and remain vigilant during the works. If suspect material is encountered, works should cease in the area until a specialist sub-contractor can attend site.

5.3.5. Other specific measures to remediate potential sources such as segregation and ex-situ treatment will be implemented only if required to improve the characteristics of the site fills to allow retention. Such treatments are anticipated to be limited to the bioremediation of any fuel / oil impacted soils (if encountered) if sufficient volumes are found to justify such an approach, or stabilisation to improve the geotechnical properties of waterlogged fills.

5.3.6. Based on the available information, risks from any impacted soils and fill material can be adequately managed by adoption of the recommended soil cover system where made ground is present. Due to the recorded presence of asbestos fibre within the made ground within the wider site and the limited but not negligible potential for further ACM to be present which will be subject to specialist removal if encountered, a basal geotextile is also required to provide a “no break layer” at the interface between made ground soils and the placed soil cover system.

5.4. Materials Management

5.4.1. Assuming an earthworks balance can be achieved and that development levels necessitate significant regrading, including the recovery of soils or other materials which would otherwise be wastes, the proposed preparatory works require a Materials Management Plan (MMP) as set out under the Definition of Waste: The Development Industry Code of Practice (CoP) for use on the site of origin. If export of soils from, or onto the site, is proposed, then an MMP for direct transfer for the receiving site will also be required.

5.4.2. Careful recovery and segregation of recovered topsoil will be required during the site works. Topsoil recovered from the landscaped areas should be carefully removed to ensure collection of any underlying made ground is not recovered. Topsoil will then be stockpiled within a designated stockpile area pending verification testing to establish suitability for reuse. Stockpiles of materials intended for re-use should be battered to prevent saturation. A similar process will be undertaken if natural subsoils are recovered for potential use by the developer as cover system subsoils.

5.4.3. In the event that surplus arisings requiring removal from the site comprising made ground are generated, or materials other than natural soils or recovered aggregate need to be removed, then these will be waste materials requiring disposal at a suitably permitted facility and transfer documentation should be retained. Similarly, waste transfer notes for other materials removed from the site should be retained. Clean, uncontaminated soils could be transferred offsite under an MMP for the receiving site.

5.5. Unexpected Contamination

5.5.1. There is a low but not negligible chance that previously uncharacterised materials or contamination sources (i.e., buried wastes / tanks etc.) will be identified during the works, however in this eventuality, a decision must be made as to whether these can be dealt with using the techniques selected to manage the contamination characterised to date. Due to the widespread spacing of site investigation entries across the site, any previously unexpected contamination is anticipated to be highly localised. Materials must be inspected by an appropriately qualified and experienced person and, if appropriate, samples collected and analysed. The Local Authority will be immediately informed in writing following any such discovery.

5.5.2. The main potential of unexpected contamination is associated with the presence of ACM within made ground soils. Such materials are likely to be limited to the southern part of the Site where the former school buildings were once located. Removal of ACMs, if encountered, will be undertaken by a specialist sub-contractor in accordance with their Method Statements.

5.5.3. It is anticipated that materials associated with immobile (low volatility / solubility) contaminants such as ash, clinker, tarmac, or soils with low residual concentrations of asbestos would be retained but excluded from garden areas and relocated either at depth or in less sensitive parts of the development. If other contaminants such as discrete deposits of ACM, volatile or liquid hydrocarbons, drums, tanks or pipes, or significant amounts of organic wastes or otherwise deleterious materials are identified then these will be excavated and removed from the site for treatment or disposal.

5.6. Construction materials

5.6.1. It is not considered likely that protected water mains will be required, however United Utilities (UU) guidelines require production of a pipeline risk assessment. Requirements for concrete specification (DS1-AC1s) are as specified within the e3p and Betts Geo ground investigation report subject to any further testing which may be completed.

5.7. Construction Stage Mitigation Measures

5.7.1. The majority of the site will require the application of a basal geotextile and 600mm soil cover system within garden areas (reduced to 300mm within POS areas) due to the widespread presence of made ground which may contain elevated metals (arsenic), PAHs, and low-level / trace asbestos fibres.

5.7.2. The standing recommendation for the provision of gas protection measures in accordance with CIRIA CS1 / NHBC Green classification within all plots and buildings is considered appropriate. The requirement to turnover / proof-dig the full depth of made ground across the site will provide further confidence of this classification.

5.8. Health and Safety Roles / Responsibilities

5.8.1. The Principal Contractor under the Construction Design and Management Regulations 2015 (CDM2015) will be responsible for managing health and safety during the remediation / preparation works and for producing any risk assessments and method statements required.

5.8.2. SGP's responsibilities as 'Designer' under CDM 2015 are to eliminate, reduce or control foreseeable risks that may arise during construction, maintenance or use, and to provide information to other members of the project team to assist them in fulfilling their duties. The recommendations in this report should be considered by the 'Client' and/or 'Principal Designer', and Principal Contractor, and included in the Health and Safety File for the site.

5.8.3. Protection of site workers, local residents and visitors during the remediation works can be achieved by the adoption of appropriate health and safety practices, environmental management and site security. All site workers will be given a comprehensive health and safety induction and will be required to use appropriate personal protective equipment.

5.9. Environmental Management Issues

5.9.1. The scope of remediation works is unlikely to have a significant impact upon nearby housing and the environment provided that due care is taken to control dust, odour, noise, and vibration, and to prevent surface runoff onto roads and into drains. Noise emissions will be managed through the observation of approved working hours and the use of appropriate plant.

5.9.2. Appropriate dust suppression measures will be deployed for crushing plant and earthworks during dry periods, particularly during the turnover of made ground within the southern part of the Site where there is a low but not negligible risk that low-level / trace asbestos fibres may be present within the made ground. Dust will be routinely monitored visually and if unacceptable emissions beyond the site boundaries are noted then the element of the works contributing to this will be halted until appropriate mitigation (damping down, road sweeper, etc) can be deployed.

5.9.3. The control of dust, or more accurately, prevention of conditions which might give rise to dust emissions is particularly important given the relatively high frequency of incidences of asbestos

reported within the made ground on the site. The Control of Asbestos Regulations 2012 (CAR 2012) specifies a Control Limit for workers' exposure to asbestos fibres in air of 0.1 fibres/cm³ (commonly expressed as 0.1 fibres/ml). This is not regarded as a safe level of exposure but indicates the statutory requirement to notify the HSE, limit exposure, deploy personal protective equipment, and carry out medical surveillance. The HSE advises a clearance and reassurance level giving a transient indication of site cleanliness for fibres in air following asbestos removal works of <0.01 fibres/cm³. CAR also requires the prevention of the spread of asbestos and states that employers have a specific duty of care to prevent exposure to asbestos fibres, or where this is not reasonably practicable, to reduce any exposure to as low as is reasonably practicable.

5.9.4. Uncontaminated or marginally contaminated water may be discharged to foul sewers in agreement with the utility provider. Regular inspections of the drains which cross the site must be undertaken to allow appropriate mitigation measures to be deployed in the event that silt runoff or other pollutants enter the drainage system as a result of the works.

5.9.5. Plant fuel and lubricant storage will take place using suitable containers, bunds, and secured filling points. An oil spill kit and adsorbent materials to manage any accidental release of liquid pollutants will be provided. Suitable sealed skips and containers will be used for the temporary storage of small quantities of asbestos or other hazardous wastes, if encountered.

5.10. Programme and Phasing

5.10.1. It is understood that demolition works will initially commence and once completed preparatory earthworks will be undertaken across the Site with works completed as part of a single phase. A single earthworks completion report will be produced.

5.10.2. To allow full discharge of Condition 4 in relation to the Site, a separate construction-stage verification report will be required in due course with confirmation of the application of the prescribed 600mm soil cover system and basal geotextile within plots.

5.10.3. A verification report for the site MMP will be required which cannot be produced until all materials have been placed in their intended locations.

6. Verification Plan

6.1. General Site Inspections

- 6.1.1. The remediation earthworks should be carried out under the supervision of an appropriately qualified and experienced site manager. If unexpected ground conditions and potential indicators of significant ground contamination are encountered, then works in that area should cease until specialist advice can be sought.
- 6.1.2. Weekly inspections for the duration of the preparatory works including the breakout and turnover of areas of made ground are to be undertaken by an independent consultant to assess whether currently uncharacterised contamination or pollution sources exist on the site.
- 6.1.3. Observation of ground conditions within the areas shown in Drawing D03 will be required on a nominal 30m grid. This will be achieved through either inspection during turnover works or through supplementary trial-pits or a combination of both. Full-time attendance for the duration of works within these areas is not considered necessary, however sufficient inspection of ground across these areas will be required.
- 6.1.4. During construction, a full-time site manager will be required to supervise the implementation of the remaining mitigation measures and arrange verification testing and inspections by an independent environmental consultant, as required.

6.2. Material Verification Testing

- 6.2.1. It is not envisaged that there will be a requirement to remove soils, however provisions are made within this Strategy for dealing with any unexpected contamination (e.g. hydrocarbon impacted soils or suspected ACM). In any such instances where impacted soils are removed, testing of the base and sides of these excavations will be undertaken to verify the efficiency of removal works and if necessary, allow further removal and/or risk assessment to be undertaken.
- 6.2.2. Testing of removed materials will depend on the reason for their quarantine and whether they are to be replaced within the development or are intended for disposal. If disposal is the preferred option, then simple waste characterisation testing is required to comply with the provisions of WM3.
- 6.2.3. Suspected ACM will undergo sampling and bulk asbestos identification. The surrounding soil matrix will undergo asbestos identification analysis and full quantification to provide information for assessing the type of work being undertaken in respect of CAR 2012 and determine where and how the material can be safely retained or whether disposal is required.
- 6.2.4. Retained soils following the removal of ACMs, if encountered, will be subject to composite sampling with 1 sample per 5m length of the remediation excavations. Samples will be submitted for asbestos identification and, if necessary, quantification if a positive incidence is reported. The threshold of 0.001% will be adopted as an initial screening criterion with exceedances of this prompting further

risk assessment; however, the proposed soil cover system will mitigate against risk to future site occupants and so the assessment will address the risk of exposure to future site workers. If a soil concentration of 0.01% is reported, then further removal of soils will be undertaken, and the validation process will be repeated.

6.2.5. If any recovered sub-base aggregate or removed oversized obstructions from areas of made ground are intended to be crushed and recovered these should be stockpiled separately. The feedstock should then be inspected by an appropriately trained operative and an asbestos screen on the final product at an appropriate frequency will be required. Depending on the volume generated, a sampling rate of 1 sample per 250m³ or 1kg bulk sample per 250m³ should be implemented. Widely accepted threshold values are currently unavailable for asbestos in soils or reclaimed materials but incidences over the common quantification threshold of 0.001% will require further assessment to determine the suitability of the processed materials for retention within the development.

6.2.6. Soils (subsoil and/or topsoil) recovered during the works or imported to the site and intended for use within gardens clean cover systems and / or areas of POS will also be sampled to verify their suitability for use. Given the site history and contamination status is well characterised, a screening frequency of 1 sample per 100m³ (minimum 3 samples) is proposed for site-won soils to assess the potential for reuse within the development. Soil concentrations will be compared to Remediation Criteria based on a residential land use as detailed in Table 3.5.

6.2.7. It is not considered likely that imported fill materials will be necessary, however imported soils for use within the soil cover system are likely to be required. Imported soils for cover system use will be subject to the testing suite (with comparison to the screening criteria) outlined in Table 3.5. The frequency of testing will be dependent on the source of the soil, as follows:

- Confirmed Greenfield Source: 1 sample per 250m³ (minimum 3 samples per single source)
- Characterised Brownfield Source: 1 sample per 100m³ (minimum 3 samples per single source)
- Unknown source: 1 sample per 50m³ (minimum 3 samples per single source)

6.3. Remediation / Preparatory Earthworks Completion Reporting

6.3.1. A report detailing the works carried out and the results of the validation / verification testing will be prepared by an Independent Consultant and submitted to the Local Authority for approval upon completion of the relevant phase of works. The report will include a full description of the works carried out, findings of all validation and verification testing, any photographic records, details of wastes removed, and any fills imported. The report will also confirm the construction-stage recommendations with respect to soil cover systems, specifically whether these are still considered appropriate and confirmation of the extent of these requirements across the development.

6.4. Developer-Stage Mitigation Validation (Soil Cover System)

- 6.4.1. Verification testing of all soils placed in the garden / POS cover system (subsoil and topsoil) will be subject to chemical testing to ensure suitability for use. Sampling should be undertaken by an independent consultant. Sampling frequencies will be dependent on the provenance and should be completed as per those outlined in Section 6.2.7. Samples will be compared to the criteria outlined in Table 3.5 to confirm suitability for use.
- 6.4.2. Prior to the placement of the 600mm garden / 300mm POS clean cover system, a high-warning geotextile is to be placed on formation soils.
- 6.4.3. Once high-warning geotextile and clean cover soils have been placed, depth validation will be undertaken in the rear gardens with 1 entry per 3 plots with a photographic record maintained to confirm the depth of soil cover and confirmation that the geotextile has been installed.
- 6.4.4. Depth testing will also be required with POS areas with 1 entry per 25m² spacing with a minimum of 3 entries per POS space.
- 6.4.5. Upon completion, the consultant will produce a verification certificate detailing the presence of the geotextile, depth of soil cover with accompanying photos, conformation of the source of the cover soils and corresponding laboratory test results for the placed soils.

7. Conclusions and Recommendations

7.1. Conclusions

- 7.1.1. The Site is generally of low to moderate risk from significant land contamination, having been developed from Greenfield land to part of a former school where the Site was occupied by three buildings (two of which remain) and playing fields before the more recent redevelopment of the existing college. Made ground has been reported across the Site, consisting of a gravelly sand with inclusions of brick and an MOT sub-base. Depths of made ground were generally limited where fully proven to a maximum depth of 1.3m bgl. No visual or olfactory contamination indicators were reported other than inclusions of ash within a single entry. The ground conditions have been largely confirmed across the Site except for a wooded area in the northwest and beneath the existing building footprints, however significantly different ground conditions or made ground composition are not expected. It is concluded that a specific post-demolition investigation is not required as the inspection of ground conditions within these areas can be carried out concurrently during the preparatory works which will include the turnover of the full depth of made ground to remove sub-surface obstructions.
- 7.1.2. No potential contamination hotspots have been identified to date with no areas of fuel storage etc. having been identified. Chemical testing of site-soils has not reported any exceedances of typical urban contaminants when compared to generic assessment criteria. Exceedances have been reported within the made ground to the immediate south with exceedances of arsenic, PAHs and trace to low-level incidences of asbestos fibres. It has been assumed that similar exceedances are likely to be present within the Site's made ground and so provisions to mitigate against potential exposure to these contaminants by future site occupants has been made.
- 7.1.3. A comprehensive ground gas monitoring programme has been undertaken with 9 rounds of monitoring in 6 boreholes. No potential ground gas sources have been identified other than the presence of made ground which has been confirmed to be of limited depth with no notable degradable matter present. Minor elevated carbon dioxide was reported within a single borehole; however, this was not consistently reported. Further assessment was undertaken through reappraisal of the dataset, and it was concluded that the Site is classified as CIRIA CS1 / NHBC Green (no gas protection measures required).
- 7.1.4. Given the generally widespread cover of made ground across the Site and potential for elevated contaminant concentration above residential land use criteria, the garden areas will be trimmed to -600mm to allow placement of a clean soil cover system with a basal geotextile; a reduced 300mm cover system with geotextile will be required within POS areas of the development.
- 7.1.5. Inspections, remedial actions and testing will therefore be limited to certain specific areas and materials. These can be readily incorporated into the more extensive preparatory and enabling

works to be carried out on the site in advance of construction. Final confirmation on construction stage mitigation measures should be made within the Earthwork's Completion reporting.

7.1.6. SGP considers that most parts of the site have been adequately investigated for the purpose of devising a Remediation Strategy suitable to prepare the site for residential development and the likely key development constraints and requirements for remediation are understood. However, some inspections / investigations are proposed to be incorporated within the preparatory earthworks programme to give additional confidence in this.

7.2. Recommendations

7.2.1. Dedicated inspection of the ground conditions during preparatory turnover works will be required within the wooded area in the northwest and beneath the existing building footprints as shown in Drawing D03 to confirm the ground conditions. These can be achieved through general observations during turnover works or supplementary trial-pits, confirmation of ground conditions in these areas will be completed on a nominal 30m grid.

7.2.2. No potential contamination hotspots have been identified, however weekly site inspections by an independent consult during the preparatory earthworks including the breaking out and recovery of materials for recycling to aggregate, turnover of the made ground, and trimming of site levels is required to maintain a detailed watching brief and photographic record.

7.2.3. All recovered topsoil, subsoil, imported fill (if required) and site-generated or imported recycled aggregates should be tested and compared to their respective assessment criteria outlined herein to determine the suitability for reuse on site.

7.2.4. A 600mm soil cover system with basal geotextile is required within all garden areas with a reduced 300mm soil cover and geotextile within POS areas. Independent testing of all soil cover system soils will be undertaken prior to placement with independent validation to confirm the placement of the geotextile and appropriate soil cover system at a frequency of 1 per 3 plots.

7.2.5. The proposed management and remediation, and implementation and reporting of the verification / validation testing regime will demonstrate that the proposed remedial works have been carried out in accordance with the Strategy and the site made suitable for the proposed development.

7.2.6. With the adoption of the above normal practices for Brownfield development, and on the information available to it, SGP considers that the site can be safely and economically redeveloped, and the existing environmental liabilities managed.

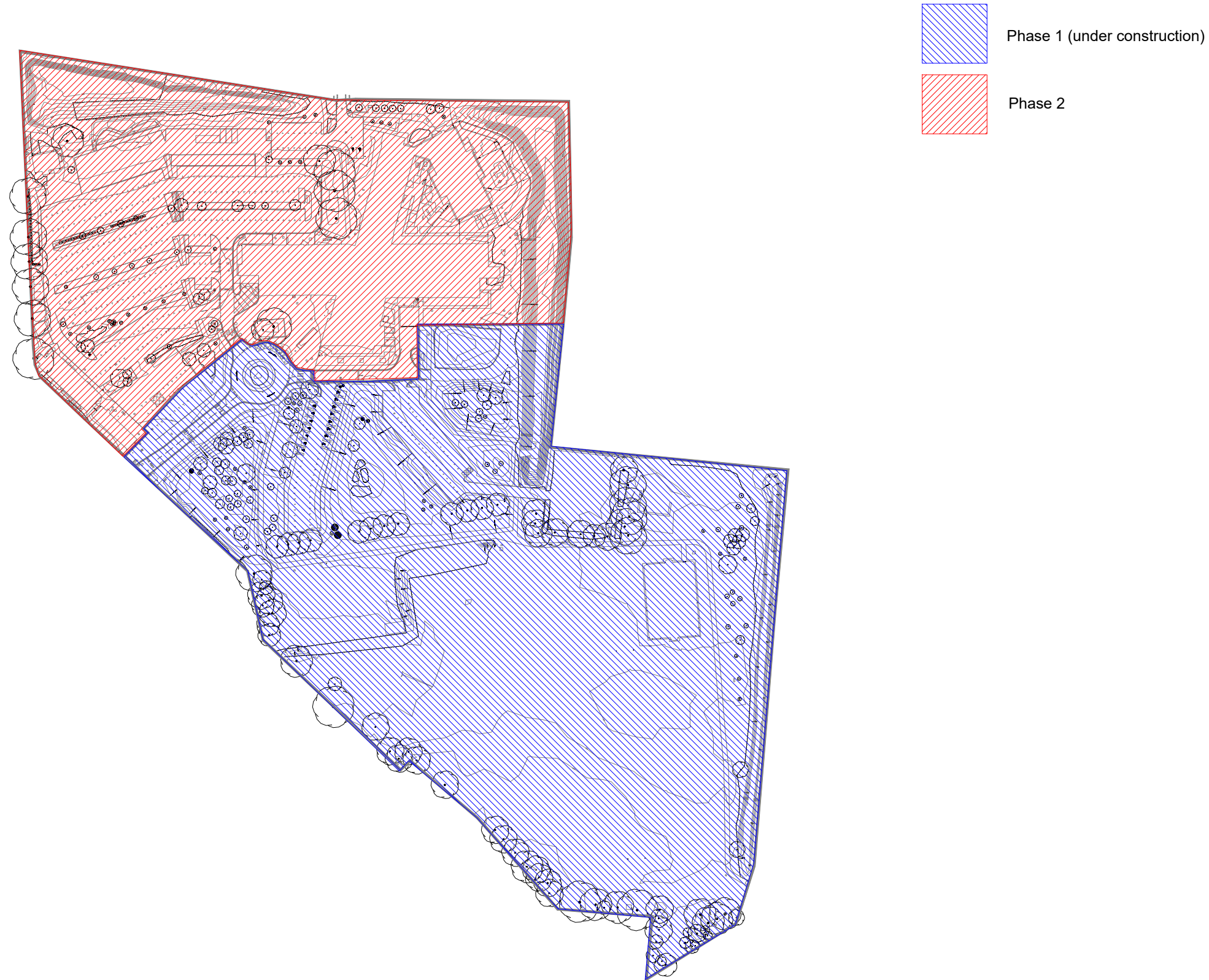
7.3. Limitations

7.3.1. This report has been prepared by SGP for the sole and exclusive use of Urban Regen Ltd and Miller Homes. All reasonable skill, care and diligence has been exercised within the budget available, and in accordance with the technical requirements of the brief. Notwithstanding the

efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context.

- 7.3.2. The factual information and recommendations for foundations measures has been largely informed by information prepared by third parties and provided to SGP. The recommendations contained within this report have been made in good faith, based on the totality of the information provided to SGP, however SGP accepts no responsibility or liability for errors or omissions caused by information which has been withheld, or where errors or omissions within previous reporting have led to false or unreliable conclusions by others relating to the contamination status of the site
- 7.3.3. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines, and responses by the statutory and regulatory authorities.

DRAWINGS

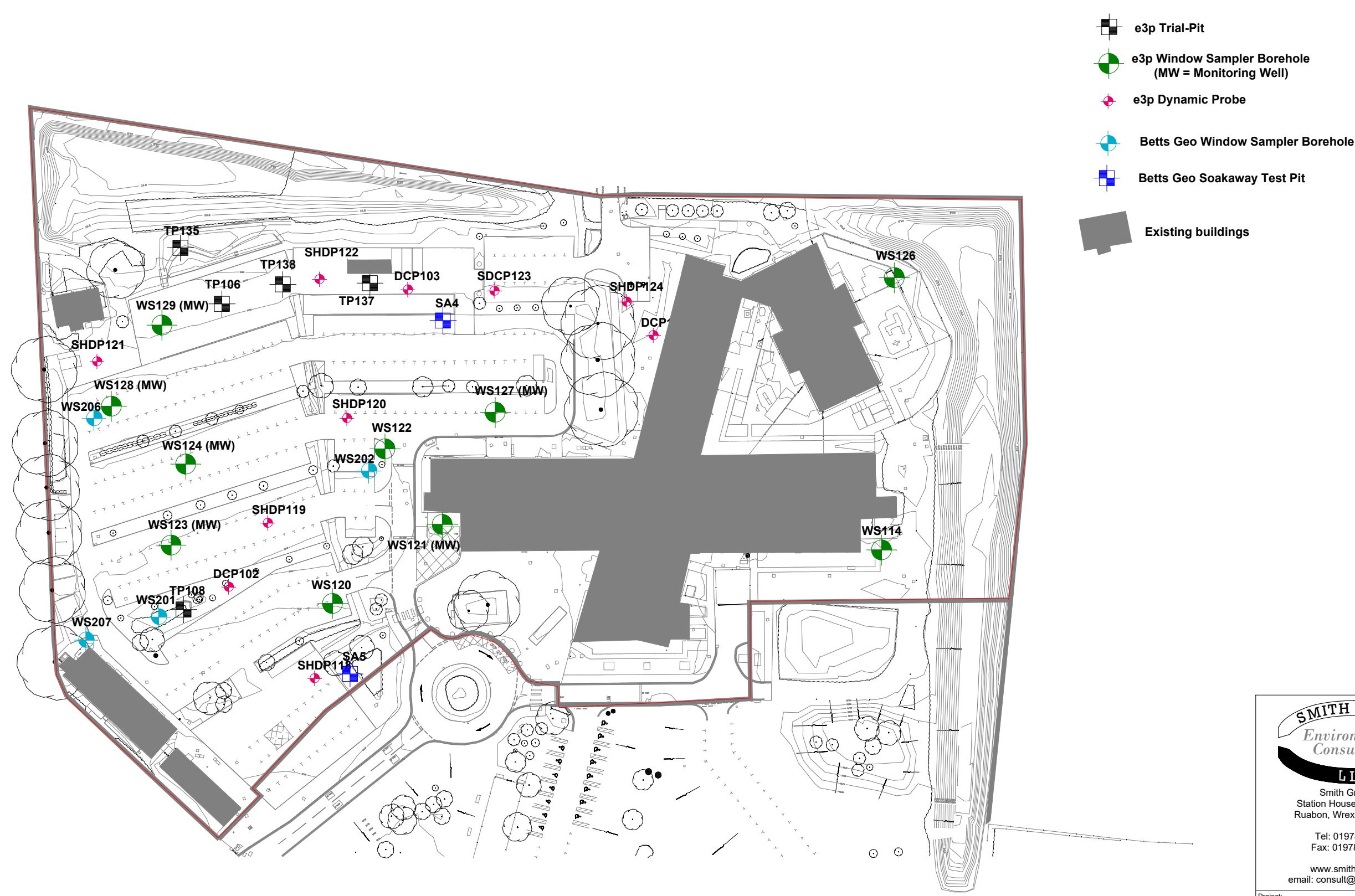


Smith Grant LLP
Station House, Station Road
Ruabon, Wrexham LL14 6DL
Tel: 01978 822367
Fax: 01978 8247182
www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project:
Former Northenden College,
Wythenshawe

Drawing:
Phasing Plan

Drawn:	DW	Checked:	MJ
Date:	06.03.23	Scale:	1:2,000 @ A3
Job No:	R3186	Drg No:	D01



SMITH GRANT

Environmental
Consultancy

LLP

Smith Grant LLP

Station House, Station Road

Ruabon, Wrexham LL14 6DL

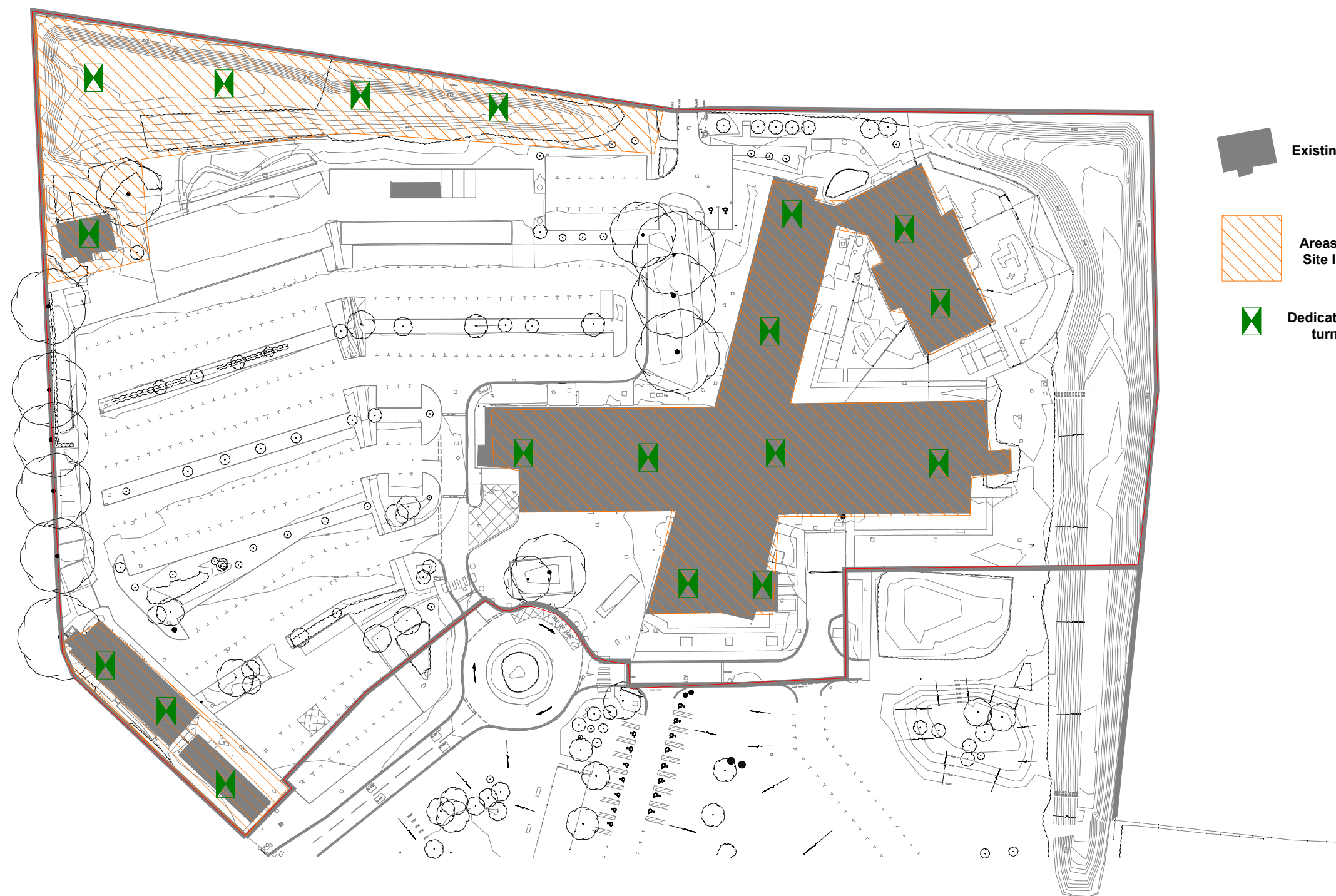
Tel: 01978 822367

Fax: 01978 8247182

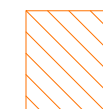
www.smithgrant.co.uk

email: consult@smithgrant.co.uk

Project:	
Former Northenden College, Wythenshawe	
Drawing:	
Historical Site Investigation Entry Location Plan	
Drawn:	Checked:
DW	MJ
Date:	Scale:
06.03.23	1:1,000 @ A3
Job No:	Drg No:
R3186	D02



Existing buildings



Areas absent from previous
Site Investigation coverage



Dedicated Ground Inspection during
turnover or trial-pit (30m grid)



Smith Grant LLP
Station House, Station Road
Ruabon, Wrexham LL14 6DL

Tel: 01978 822367
Fax: 01978 8247182

www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project:
Former Northenden College, Wythenshawe

Drawing:
Areas of Dedicated Ground Inspection

Drawn: DW	Checked: MJ
--------------	----------------

Date: 06.03.23	Scale: 1:1,000 @ A3
-------------------	------------------------

Job No: R3186	Drg No: D03
------------------	----------------