

Fallowfield Campus

03847AB

Remediation Strategy

Kennedy Redford

15/08/2025

Document prepared on behalf of Coffey Geotechnics Limited



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Appendix A: Acceptability Criteria for Capping Soils

1.0 Introduction

1.1 General

Coffey Geotechnics Ltd (Coffey) has been instructed by Kennedy Redford (KR) to provide geotechnical services to assist Graham Construction Ltd (Graham) to deliver a Design-Build-Finance-Operate (DBFO) project for a student housing redevelopment at the University of Manchester (UoM) Fallowfield Campus, including production of a Remediation Strategy (this document).

The redevelopment of the site includes several new buildings of varying height and arrangement as shown in Figure 1-1 below.



Figure 1-1: Proposed building layout (Sheppard Robinson, 2025)

1.2 Previous Investigation and Reporting

Coffey prepared the following Geoenvironmental and Geotechnical Interpretative Reports, for the same overall site (noting different site boundaries), undertaken under a different contract:

- Project Oak, Stage 2a Geoenvironmental and Geotechnical Interpretative Report (Ref. Coffey, 2015a)
- Project Oak, Stage 2b Geoenvironmental and Geotechnical Interpretative Report (Ref. Coffey, 2015b)

UoM has confirmed that Graham can place reliance upon these two documents. Coffey has also prepared the following Geotechnical Interpretative Report for the current site:

- Fallowfield Campus, Geotechnical Interpretative Report (Ref. Coffey, 2025).

The following documents were used as sources of information to prepare the Geotechnical Interpretative Report:

- Fallowfield Campus Factual Report (Ref. Tetra Tech, 2025)
- Fallowfield Campus Phase 1 Desk Study Report (Ref. Buro Happold, 2023)
- Sitewide Pile Cut Off Level Plan (Ref. KR, 2024a).
- Typical Block 13/14 Foundation Option Layout Cast in Place Option (Ref. KR, 2024b).
- Main Hub Foundation General Arrangement (Ref. KR, 2024c).
- Preliminary Additional GI (Ref. KR, 2024d).

1.3 Objectives

Based on the available information, the geo-environmental remediation requirements for redevelopment of the site are detailed in this document (Remediation Strategy).

The objectives of this Strategy are to:

- Present a strategy for the safe, economic and sustainable geo-environmental risk mitigation of the site for the intended end use as a residential flat development with associated public open space (carparks and landscaping).

- Set out the requirements for validation data needed to demonstrate the requirements of this Strategy are met, for presentation in the post-construction Validation Report.

2.0 Site Setting

2.1 Site Location and Description

The site is located within the Fallowfield Residential Campus, off Moseley Road in Fallowfield, Manchester (M14 6HD). The National Grid Reference of the site is 385790E, 394180N (National Grid Reference of the Limes Building). The location of the site is shown on Figure 2-1.

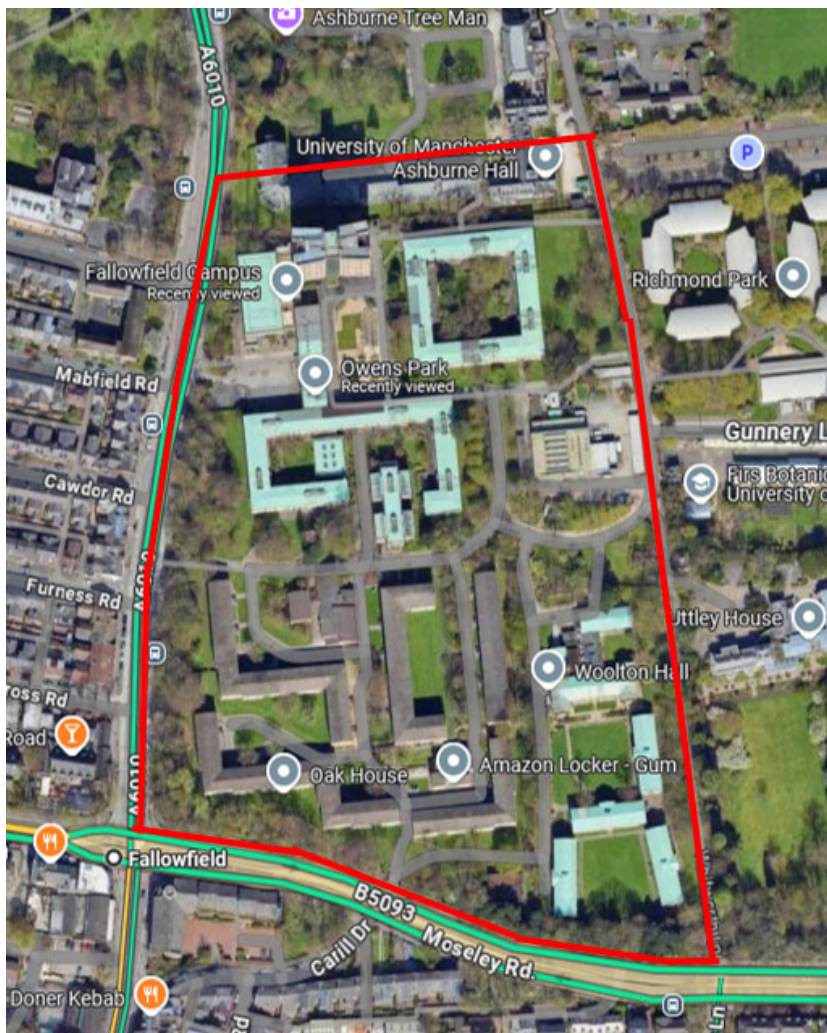


Figure 2-1: Site Location with red line showing the approximate site boundary
(Google Maps, 2025)

The site has a total area of approximately 8 ha. The Site is characterised as an urban setting, and the topography is relatively flat with ground level sloping slightly from north to south, with the north of the site at an elevation of 44m AOD and Moseley Road at the south at about 39m AOD.

The west of the site is bounded by the A6010 (Wilmslow Road) with residential properties beyond, the south of the site is bounded by the B5093 (Moseley Road), and the north and east of the site are bounded by further UoM buildings and significant green space including playing fields, rows of mature trees and parkland.

The existing site is used for student accommodation and other university-related land use and at the time of the additional ground investigation was split into two distinct areas: the north-west of the site enclosed by PP. O'Connor as a demolition site; and the rest of the site an active student accommodation area.

2.2 Planning Application

The Planning Application Number for the scheme is 138126/OO/2023. The Decision Notice (Ref. MCC, 2024) was published in January 2024 and includes a number of conditions.

Planning Condition 20a states:

“Before the development within each phase commences, with the exception of demolition and site clearance, a report (the Preliminary Risk Assessment) to identify and evaluate all potential sources and impacts of any ground contamination, groundwater contamination and/or ground gas relevant to the site shall be submitted to and approved in writing by the City Council as local planning authority. The Preliminary Risk Assessment shall conform to City Council's current guidance document (Planning Guidance in Relation to Ground Contamination).

“In the event of the Preliminary Risk Assessment identifying risks which in the written opinion of the Local Planning Authority require further investigation, the development shall not commence until a scheme for the investigation of the site and the identification of remediation measures (the Site Investigation Proposal) has been submitted to and approved in writing by the City Council as local planning authority.

“The measures for investigating the site identified in the Site Investigation Proposal shall be carried out before development commences and a report prepared outlining 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.”

A Geo-environmental Risk Assessment is included in the Geotechnical Interpretative Report (Ref. Coffey, 2025).

This Remediation Strategy outlines the measures required to address the risks identified.

2.3 Findings of Previous Work

The site has been recorded as open fields in the mid-nineteenth century and shown as developed since 1890s, with various uses. A number of unnamed buildings are recorded across the site in 1890s, serviced by roads, and a tramway is recorded from north to south in the western portion of the site. From mid 1950s the tramway is no longer recorded, and the site is recorded as Owen Park from 1970s.

Since then, the development is shown to have expanded with more buildings added up to the present University of Manchester Fallowfield Campus.

The site history is outlined in more detail in Refs. Coffey (2015a & 2015b) as well as in Ref. Buro Happold (2023).

The ground conditions encountered at the site comprised Made Ground and glacial clay superficial deposits, underlain by weathered sandstone and sandstone. The rock is highly weathered and described as weak to extremely weak with closely spaced discontinuities.

Groundwater levels in standpipes installed across the site were recorded between 2.7m and 2.8m below ground level (bgl) in the Made Ground / Glacial Till indicating that groundwater is perched locally at shallow depths at the site within the Made Ground, overlying the more impermeable strata of the Glacial Till. Higher groundwater levels were measured during the 2015 investigation including water seepage during drilling at 0.5 m depth. Therefore, it is considered that the perched groundwater level may rise to of 0.5m bgl.

The Sandstone (Chester Pebble Bed Formation) is a Principal Aquifer and is anticipated to be water-bearing. In the deeper installations with response zones in the Sandstone, groundwater levels were measured during monitoring at between 4.8m and 15.18m bgl.

Chemical analysis has been carried out on soil and water samples obtained during the 2015 and 2025 site investigation works and post fieldwork groundwater monitoring. The

data have been compared against Generic Assessment Criteria (GAC) derived for a residential land use scenario to provide a conservative initial assessment of the data to establish what determinands exceed their respective GAC. Full details are provided in the Geotechnical Interpretative Report (Ref. Coffey, 2025).

The range of contaminants identified from the test results included elevated metals (arsenic, lead, mercury), TPHs and PAHs in samples of Made Ground. The arsenic and mercury values are considered slight exceedances. It is considered likely that fragments of asphalt / tarmac are present within the Made Ground which have caused the TPH and PAH exceedances.

No hydrocarbons or inorganic/metals were detected in samples of natural ground.

A ground gas assessment undertaken in 2015 indicated that the individual hazardous gas flow rate for the current site area is Category CS 1 and not require gas protection measures according to BS 8485:2015; therefore, no further assessment is necessary. There has been subsequent revision to the code (BS 8485:2015+A1:2019) but this conclusion for a Category CS1 site remains valid.

During the 2025 investigation, possible asbestos was identified at the location of BH105A where the borehole was terminated due to the presence of asbestos. During the 2015 investigation, 8 samples within the current site boundary were tested and these did not contain asbestos. However, two trial pits (TP04/1B at 0.35m depth and TP06/1B at 0.6m depth) contained fragments identified as possible asbestos during the fieldworks.

Japanese Knotweed was identified on the site in 2015.

The Phase 1 Desk Study (Ref. Buro Happold, 2023) has categorised the site as at moderate risk for unexploded ordnance (UXO). A Preliminary UXO Risk Assessment undertaken by 6 Alpha Associates Ltd as part of the 2015 ground investigation concludes that the UXO probability assessment has a rating of 3, indicating a medium possibility of a UXO encounter. The Preliminary UXO Risk Assessment was reported in a geo-environmental desk study report undertaken by RSK (Ref. RSK, 2015).

3.0 Remediation Requirements

3.1 Introduction

The risk assessment process has identified potential geo-environmental risks to human health from contamination at shallow depths within the Made Ground (Ref. Coffey 2025).

These risks are characterised as:

- HIGH/MODERATE with respect to risk from asbestos.
- LOW in relation to ground gas and soil contamination with exceedances of arsenic, lead, mercury, TPH and PAH.

The presence of Japanese Knotweed on the site was noted in 2015. This should be reviewed, and if found to be present during the proposed works should be treated and removed from site in accordance with statutory / Environment Agency guidelines (e.g. [How to stop Japanese knotweed from spreading – GOV.UK](#), accessed 12/08/2025).

These result in the need for geo-environmental remedial activities and risk mitigation.

The remediation requirements in this section are intended to render the site suitable for the intended end use.

3.2 Scope

In broad terms, the scope of geo-environmental remedial actions required are summarised as:

- The risk of chronic exposure to asbestos is to be managed by the adoption of good general working practices (during all groundworks) together with guidance and direction from a suitably qualified and experienced asbestos specialist.
- A contingency, during the redevelopment groundworks, for encountering ground that is locally impacted with contaminants such as further asbestos-containing materials (ACM), hydrocarbons or similar; this will involve communications between the Principal Contractor and Coffey, site visits at appropriate times (e.g. during site clearance, and if/when suspect ground conditions are encountered), and may necessitate further sampling and laboratory testing, with additional assessment and provision of recommendations.
- Investigation and delineation of potential asbestos impacted ground at BH105A.

- Sorting, segregation and possibly additional testing of site-won soil materials, particularly if such are to be re-used in the redevelopment (e.g. as uncontaminated capping soils in new/modified landscaped areas).
- Ensuring that the upper 600mm of soils in such landscaped/soft-standing parts of the site are uncontaminated, in particular, are devoid of asbestos and PAH.
- Japanese Knotweed identification, removal and treatment.

3.3 Provision of an Asbestos Specialist

As described previously, traces of asbestos have been found in Made Ground at shallow depth.

Site clearance is anticipated to include localised de-vegetation, topsoil strip and removal of existing surface hardstandings if present; this will need to be undertaken prior to commencing the main construction works. An asbestos specialist or suitable asbestos trained construction staff should be provided for the project, particularly prior to and during the site clearance. This is required in order to ensure that all risks relating to asbestos at the site are mitigated and that the work is undertaken in accordance with current guidance and legislation. The Principal Contractor is expected to develop a Safe System of Work (SSoW) comprising a comprehensive risk assessment and method statement (RA/MS) within the context of their Construction Phase Plan (CPP) to manage this operation safely.

3.4 Remediation of Asbestos-Impacted Ground

Areas of proposed landscaping where asbestos has been encountered, and any additional asbestos encountered during preparation and groundworks, will need to be remediated. It is likely that additional asbestos may be encountered on site due to past land use.

In particular, the potentially asbestos-impacted ground at and around BH105A where asbestos was suspected during the 2025 ground investigation will need to be remediated for the redevelopment. This will involve further sampling and testing of near-surface Made Ground around the location to delineate the area affected, then placing a marker layer (such as geotextile) over the area delineated as affected by asbestos ('delineated area', for brevity) and covering the marker with new hardstandings or a similar capping layer such as 600mm of uncontaminated fill.

The required delineation work can be undertaken at a very early stage in the redevelopment process, immediately following the site clearance. The Principal Contractor is required to arrange the following near-surface soil sampling and testing to be undertaken at a series of locations by an asbestos specialist or other suitably trained person with appropriate safety PPE and a SSoW, as summarised below:

- Soil sampling is to be undertaken initially at 4no. sampling locations on a regular grid pattern at a radius of 5.0m from the location.
- Each sampling point will be taken to (the shallower of) the base of the Made Ground or a depth of 1.0m bgl; soils shall be described and recorded. Any suspected asbestos containing material should be sampled, otherwise representative soil samples taken from each (Made Ground) horizon, with a minimum one sample per sampling point. All sampling point locations will be clearly set out on site and surveyed for location using suitable (e.g. GPS) equipment.
- Each sample will be tested for the presence (and, if necessary, type and concentration) of asbestos by a suitably accredited laboratory. All sample locations would be subject to asbestos screening and only those that were positive for asbestos fibres would require quantification.
- If asbestos is detected in any of the soil samples from the initial 5m radius sampling locations, further sampling shall be arranged by the Principal Contractor in consultation with a geo-environmental specialist – anticipated to be sampling a further 8no. sampling locations on a regular grid pattern at a radius of 10m from BH105A and tested for asbestos. Essentially the process should comprise one ‘circle’ of four sample locations at about 5m distance from the central location and a second circle of 8 sample locations at 10m distance from the central location and more if required, as shown in Figure 3-1. Further consultation may then be appropriate. There would only be nominal logging of these holes, primarily treating them as sample locations, but all would be CAT scanned before digging.
- Following effective delineation of the asbestos-affected ground, the delineated area should be marked by placing a marker layer such as geotextile, underlying a suitable capping layer such as new hardstandings or 600mm of uncontaminated fill, provided that:

- The extent of the ground affected by asbestos is limited to the areas where new hardstandings / 600mm of uncontaminated fill can be placed. For example, if the ground affected by asbestos is proved to be extended across to areas of soft landscaping, placement of the marker and hardstandings / uncontaminated fill may not be feasible in that specific soft landscaping area. In this case, the asbestos-impacted soils should be excavated out (to a maximum depth of 600mm below finished levels), segregated and removed to landfill. Such works will need to be carried out under the supervision and direction of an Asbestos Specialist or other suitably asbestos trained person with appropriate safety PPE and a SSoW as described in Section 3.3.
- If the proposed formation levels are below the soil zone where asbestos is encountered (i.e. below the base of the Made Ground) then the material to be removed (including the asbestos impacted ground) may simply be excavated and disposed of to an appropriate landfill.

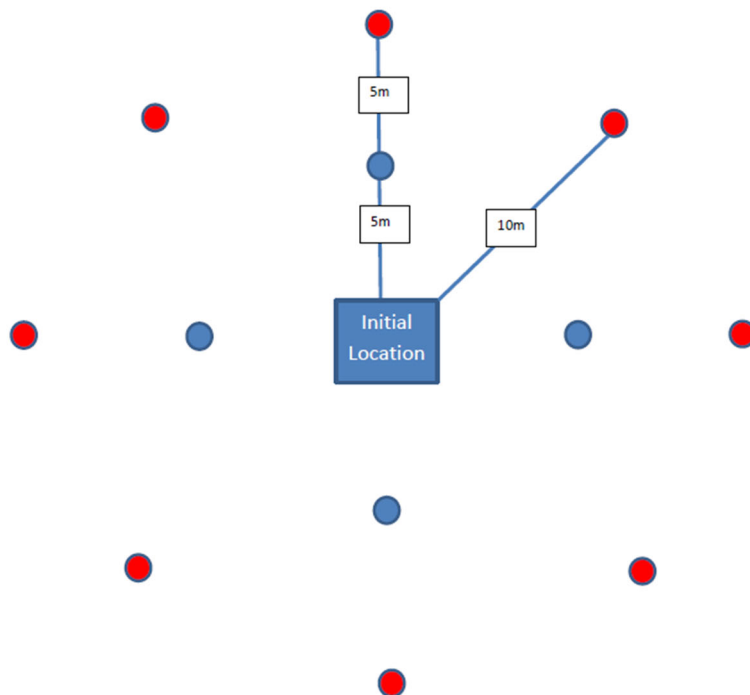


Figure 3-1: Asbestos / Contamination Delineation – proposed additional sampling locations.

If asbestos-impacted soils are found to extend to depths of greater than 600mm, left in situ and capped, future ground intrusive works (if required) should be prohibited within the affected area unless special protective measures are applied.

If additional asbestos is encountered on site, the location should be recorded in discussion with a geo-environmental specialist and the procedures above adopted to delineate the extent of the contamination.

Records, including sample as-surveyed locations / depths, description and test results, should be maintained by the Principal Contactor for inclusion in the Validation Report, which will be an important reference for stakeholders including those responsible for future site management and for the CDM Principal Designer. It is anticipated that the Validation Report and any significant findings including residual risks will be referenced in the Health & Safety File for the development.

3.5 Remediation of localised metals and PAH

3.1.1 Identified areas of localised metals and PAH

The ground investigations, exceedances of PAH were recorded in the following exploratory holes, see Ref. Coffey (2025) for full details: TP01/1B, TP03/1B, TP04/1B, TP05/1B, BH03/1B, BH20/2, WS05/2.

The Principal Contractor should ensure that a review is undertaken before any intrusive works of the known locations of PAH exceedances (as per Ref Coffey, 2025) correlated to the proposed position of hardstanding and soft landscaping / residential flats as the basis of informing a suitable and sufficient assessment of risks to construction workers and future site users; this review and assessment of risk will need to be updated if the positions of hardstanding and soft landscaping / residential flats change.

3.1.2 Areas of planned hardstanding

Where exceedances of PAH were encountered in areas of planned hardstanding, it is considered that capping the area with hardstanding will act as a sufficient barrier to any contaminant pathway for future site users. The risk to construction workers should be managed by adopting appropriate precautions within the context of a SSoW such as provision of appropriate training/guidance, PPE and welfare facilities during the works.

If additional gross contamination is encountered, the procedures presented in Section 3.6 of this strategy should be adopted.

3.1.3 Areas of proposed soft landscaping and residential flats

Where exceedances of PAH were encountered in areas of planned soft landscaping or residential flats, areas will need to be subject to moderate additional investigation and remediation, in a similar manner to that for asbestos in Section 3.4. This will involve further sampling and testing of near-surface Made Ground around the locations identified to delineate the area affected, surveying then placing a marker layer (such as geotextile) over the area delineated as affected by exceedances ('delineated area', for brevity) and covering the marker with new hardstandings or a similar capping layer such as 600mm of uncontaminated fill.

The required delineation work can be undertaken at a very early stage in the redevelopment process, immediately following the site clearance. Near-surface soil sampling is to be undertaken at a series of locations, as summarised below:

- Soil sampling is to be undertaken by the Principal Contractor initially at 4no. sampling locations on a regular grid pattern at a radius of 5.0m from the locations listed above.
- Each sampling point will be taken to (the shallower of) the base of the Made Ground or a depth of 1.0m bgl; soils shall be described and recorded, and representative soil samples taken from each (Made Ground) horizon, with a minimum one sample per sampling point. All sampling point locations will be clearly set out on site and surveyed for location using suitable (e.g. GPS) equipment.
- Each sample will be tested by the Principal Contractor for the presence (and if necessary, concentration) of PAH, TPH and metals suite by a suitably accredited laboratory. The suite is to include arsenic, cadmium, chromium (all compounds), copper, lead, mercury, nickel, selenium, zinc), pH, SOM, total TPH, total PAH and asbestos.
- If exceedances are detected in any of the soil samples from the initial 5m radius sampling locations further sampling shall be arranged by the Principal Contractor in consultation with a geo-environmental specialist – anticipated to be sampling a further 8 no. sampling locations on a regular grid pattern at a radius of 10m from the starting point - and tested for PAH, TPH and metals suite (as listed above) by a

suitably accredited laboratory. Essentially the process should comprise one circle of four sample locations at about 5m distance from the central location and a second circle of 8 sample locations at 10m distance from the central location (Figure 3-1), and more if required. Further consultation may then be appropriate. There would only be nominal logging of these holes, primarily treating them as sample locations, but all would be CAT scanned before digging.

- Following effective delineation of the affected ground, the delineated area should be marked by placing a marker layer such as geotextile, underlying a suitable capping layer such as new hardstandings or 600mm of uncontaminated fill, provided that:
 - The extent of the ground affected is limited to the areas where new hardstandings / 600mm of uncontaminated fill can be placed. For example, if the ground affected by exceedances is proved to be extended across to areas of soft landscaping, placement of the marker and hardstandings / uncontaminated fill may not be feasible in that specific soft landscaping area. In this case, the contaminated soils should be excavated out (to a maximum depth of 600mm below finished levels), segregated and removed to landfill.
 - If the proposed formation levels are below the soil zone where contamination is encountered (i.e. below the base of the Made Ground) then then the material to be removed (including the contamination impacted ground) may simply be excavated and disposed of to an appropriate landfill.

If additional contamination is encountered on site, the location should be recorded in discussion with a geo-environmental specialist as presented in Section 3.6 below.

Records, including sample as-surveyed locations / depths, description, and test results, should be maintained by the Principal Contactor for inclusion in the Validation Report, which will be an important reference for stakeholders including those responsible for future site management and for the CDM Principal Designer. It is anticipated that the Validation Report will be referenced in the Health & Safety File for the development.

3.6 Other Potential Ground Contamination Sources

As indicated previously, it is possible that localised ground that is impacted with contaminants may exist elsewhere at the site and may be encountered during the site redevelopment. Accordingly, the remediation strategy needs to include contingency

measures for dealing with such. The contingency measures are described in the following paragraphs.

On completion of the site clearance, to include breaking out of all residual hardstanding, de-vegetation and removal of topsoil, the exposed formation is to be inspected and recorded by a competent person of the Principal Contractor's site staff.

If during this inspection, or at any other time during the ground works' activities, ground is exposed that is suspected to be impacted with contaminants (such as asbestos, hydrocarbons, or similar) the suspect ground is to be sampled and tested by the Principal Contactor, and the test results are to be subjected to further consideration and assessment. A suitably qualified geo-environmental engineer should be contacted with regard to further assessment of the contamination.

In the event that such work confirms the presence of further contaminated ground conditions that could pose a risk to receptors (human health, controlled waters, buildings and/or the environment) the impacted area is to be delineated, and appropriate measures agreed and implemented. Such measures could comprise or include: excavation to a suitable depth, segregation and off-site removal to landfill, or possibly covering with an uncontaminated cover system (similar to the process described in Section 3.4). If such ground contamination relates to asbestos-impacted soils, the work would need to be undertaken in accordance with the requirements of an asbestos specialist.

3.7 Reuse of Site-Won Materials

The proposed development will include areas of soft landscaping. Cover soils (including topsoil) to be used in these areas should be uncontaminated and of sufficient thickness. Topsoil will need to comply with the Specification as set out in the employer's requirements for the development.

Subject to confirmation by validation testing by the Principal Contactor, it is anticipated that site-won soils may be suitably uncontaminated for re-use as soil fill in the redevelopment. All such soils that are to be considered for re-use should be segregated and stockpiled in areas which can be accessed and inspected conveniently. The soil stockpiles should be checked by the Principal Contactor to determine if they are suitable for such re-use and (in the case of cover soils) are free from material such as broken glass, sharps, tree roots, entrained contaminants, etc. Such stockpiled soil materials will also require testing with an

appropriate frequency (as defined in Section 4.1 and 4.3 of this Remediation Strategy) by the Principal Contactor; this testing should include geotechnical testing to confirm suitability (particularly if to be reused as structural or engineered fill) and chemical testing to confirm them to be suitably uncontaminated (in accordance with the acceptance criteria presented in Appendix A).

With regard to landscaped areas the following requirements should also be met:

- A minimum thickness of 150mm of uncontaminated topsoil is required to promote and sustain plant growth within any general landscaped (grassed) area.
- A minimum thickness of 450mm topsoil is required to promote plant growth within any proposed planted areas (greater thickness if any deeper rooting species are proposed).
- Validation will need to include sampling, testing and measurement in validation pits to confirm adequate cover thicknesses on a 30m grid. Sampling, testing and measurement to be undertaken by the contractor and photographic records provided to the geo-environmental engineer for validation. The geo-environmental engineer is to be on site during the excavation and photography of pits for validation.

3.8 Imported Soil Materials

For all imported soils, appropriate chain of custody records should be obtained and provided by the Principal Contactor for inclusion in the Validation Report.

3.9 Japanese Knotweed

The presence of Japanese Knotweed should be reviewed, and if present should be treated and removed from site in accordance with statutory / Environment Agency guidelines (refer Section 3.1). A suitably qualified contractor, should be consulted to assess and remediate the potential Japanese Knotweed over the full site area.

4.0 Validation Requirements

4.1 Frequency of Validation Testing of Contaminated Soils

The validation programme has been developed in general accordance with the latest government guidance (Ref. LCRM, 2025). The testing frequency proposed here is based on such guidance, together with Coffey's professional judgement and experience. Test requirements are given in Section 4.3 below.

In relation to the validation of site-won or imported soil materials for use in the proposed areas of soft landscaping, the requirements for on-site testing by the Contactor are as follows:

- A testing frequency of 1no. sample per 100m³ of material from an approved Greenfield source. The source of the imported soil should be clearly identified and there must be a minimum of 4no. samples tested from each separate source.
- Ideally, imported soil materials should be sampled and tested either before they are brought to site or when stockpiled on arrival. This will effectively eliminate the need to sample and test soils after placement. Site inspection will subsequently be able to be limited to confirmation of adequate cover thickness via hand-excavated validation pits as described below.

4.2 Independent Validation of the Landscaping Cover System Thickness

Confirmatory inspections are to be undertaken by an independent geo-environmental engineer. Records, including photographic evidence, are to be retained for review, as required.

The number of validation pits required will be based on a grid system. A 30m grid across the areas of new/modified landscaping will be adopted (or 1no. per 900m² or 4no. tests, whichever is the greater). Sampling, testing and measurement to be undertaken by the contractor and photographic records provided to the geo-environmental engineer for validation. The geo-environmental engineer to be on site during the excavation and photography of pits for validation.

4.3 Validation Laboratory Testing and Assessment

It is proposed that the validation laboratory testing for imported or site-won soil materials to be used in the redevelopment should include for the following standard suite of tests:

- Metal suite (arsenic, cadmium, chromium (all compounds), copper, lead, mercury, nickel, selenium, zinc), pH, SOM, total TPH, total PAH and asbestos.

Appropriate Acceptability Criteria are then to be used for comparison to confirm that the sampled soil materials meet the chemical requirements. Proposed Acceptability Criteria for (imported) capping soils are presented in Appendix A. Given the nature of the redevelopment, the relevant acceptability criteria are those relevant to the 'Residential without home grown produce' scenario.

The Contactor to arrange a minimum of 4No. samples to independent sampled and collected for the landscape areas.

4.4 Validation Reporting

Upon completion of the remediation works described in this document, a Validation Report is to be prepared to include details of the works undertaken, presenting factual data and records.

The required list of records, to be kept by the Contractor and sent to Coffey for validation, include:

- Validation laboratory test results, including the location of where and at what depth samples were taken.
- Validation pit photographs and logs, including the location of each pit.
- Soil import and export records, including location of sources and the volumes imported/exported.
- Certificates and import records of any geosynthetics used in the remedial works.
- Coffey's site visit records, and other photographic evidence including photographs of gas protection measures.

The Validation Report is to assess conformity and demonstrate compliance of the implemented remedial measures with the requirements set out in this strategy. The Validation Report should then be submitted to the Planning Local Authority for their review and approval / comments.

5.0 Conclusions

In conclusion:

1. The Fallowfield Campus site is to be redeveloped as residential flats with associated car parking and landscaping (see Figure 1-1). This report comprises the Remediation Strategy to address the findings of the geo-environmental Risk Assessment included in the Geotechnical Interpretative Report (Coffey, 2025).
2. The site has been used by the University of Manchester since 1970s.
3. This remediation strategy is to be implemented to mitigate geo-environmental risks for the whole site area in relation to the intended end use (defined as “Residential without home grown produce”). Geo-environmental risks include:
 - a. Slightly elevated levels of arsenic, lead, mercury in existing Made Ground (LOW risk).
 - b. Elevated levels of TPH and PAH in existing Made Ground (LOW risk).
 - c. Asbestos in Made Ground (HIGH / MODERATE risk).
4. The scope of the remedial actions required by this strategy is summarised as:
 - a. Investigate and delineate asbestos impacted ground at BH105A
 - b. Investigate and delineate ground impacted by PAH, TPH and metals.
 - c. Ensuring that the upper 600mm of soils in such landscaped/soft-standing parts of the site are uncontaminated, in particular, are devoid of asbestos and PAH.
5. A contingency during the redevelopment ground works for encountering ground that is locally impacted with contaminants such as further asbestos-containing material, hydrocarbons, or similar. This will involve communication between the Contractor and Coffey, site visits when required – during site clearance and if/when suspected contaminated material is encountered. This may also require further sampling and testing, with additional assessment and provision of recommendations. The Principal Contractor is expected to develop a comprehensive risk assessment and method statement (RA/MS) to manage this operation safely.
6. The effective implementation of the above remedial actions are to be independently documented (i.e. by Coffey) and presented in a Validation Report for the remediated development. The Validation Report will include details of the works undertaken,

factual data and records such as laboratory test results, site visit records and photographic evidence.

7. The list of records Coffey will require from the Contractor include:

- Validation laboratory test results, including the location of where and at what depth samples were taken.
- Validation pit photographs and logs, including the location of each pit.
- Soil import and export records.
- Certificates and import records of any geosynthetics used in the remedial works (e.g. gas protection membrane).

6.0 References

- **Buro Happold (2023)**, Fallowfield Campus Redevelopment Project, Ground Conditions Phase 1 Desk Study Report, Rev. 2.
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- **Coffey (2015a)**, Geoenvironmental and Geotechnical Interpretative Report, Stage 2a, Project Oak, Fallowfield, Manchester, Rev. 2, 4 September 2015, Ref. 02428AA_R_002B_MJW-GIR- Stage 2a Rev 2.
- **Coffey (2015b)**, Geoenvironmental and Geotechnical Interpretative Report, Stage 2b, Project Oak, Fallowfield, Manchester, Rev. 2, 4 September 2015, Ref. 02428AA_R_003B_MJW-GIR- Stage 2b.
- **Coffey (2025)**, Geotechnical Interpretative Report, Fallowfield Campus, Ref. UMRF-COF-XX-XX-RP-Y-00003 (Coffey Ref: 03847AB_R_002C_RP-GIR).
- **LCRM (2025)**, Land contamination risk management LCRM: Stage 3 remediation and verification, updated 12 June 2025: Land contamination risk management LCRM: Stage 3 remediation and verification, accessed 13/08/2025
- **KR (2024a)**, Kennedy Redford, Sitewide Pile Cut Off Level Plan, Ref. 231018-KRD-EX-XX-DR-S-2101.
- **KR (2024a)**, Kennedy Redford, Typical Block 13/14 Foundation Option Layout Cast in Place Option.
- **KR (2024c)**, Kennedy Redford, Main Hub Foundation General Arrangement Ref. 231018-KRD-MH-BF-DR-S-1700.
- **KR (2024d)**, Preliminary Additional GI, Ref. 231018-KRD-XX-XX-SK-C-0100 - EXISTING OVERLAY.
- **MCC (2024)**, Manchester City Council, Planning Permission Decision Notice for Application Number 138126/OO/2023, 19 January 2024.

- RSK (2015), Geoenvironmental Stage 1, Project Oak, Fallowfield, Project No. 321991-R1-01.
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Appendix A: Acceptability Criteria for Capping Soils

Acceptability criteria for capping soils (Residential Without Home Grown Produce)

Determinand	Criteria (mg/kg)	Source of criteria
Metals and inorganics		
Arsenic	32	SGVs (2009)
Cadmium	10	SGVs (2009)
Chromium III	910	S4UL (Residential Without Home Grown Produce)
Chromium VI	6	S4UL (Residential Without Home Grown Produce)
Copper	100	BS 3882:2015
Lead	450	S4UL (Residential Without Home Grown Produce)
Mercury - Elemental	1.2	S4UL (Residential Without Home Grown Produce)
Nickel	60	BS 3882:2015
Selenium	250	S4UL (Residential Without Home Grown Produce)
Zinc	200	BS 3882:2015
pH	5.5 – 8.5	BS 3882:2015
Water soluble sulphate	500	BRE SD-1:2005
Asbestos	None	Presence of detectable asbestos means soil is not suitable for reuse as capping material.
Organics (For most conservative SOM% = 1)		
Total PAH	3.2	S4UL (Residential Without Home Grown Produce) <i>(based on value for benzo[a]pyrene)</i>
TPH (C6 – C40)	1000	Hazardous waste acceptance criteria
BTEX	0.38	S4UL (Residential Without Home Grown Produce) <i>(based on value for benzene)</i>
Total Phenol	440	S4UL (Residential Without Home Grown Produce)
References		
SGVs (2009): derived by the Environment Agency using the CLEA 1.04 software. Published 2009 to the present and available at https://www.gov.uk/government/publications/land-contamination-soil-guideline-values-sgvs		
S4UL (2015): GAC values derived by the LQM/CIEH using the CLEA 1.06 software (published 2015 in The LQM/CIEH S4ULs for Human Health Risk Assessment). Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3338. All rights reserved.		
C4SL: Category 4 Screening Levels (2014) derived by DEFRA to aid in determining whether land is suitable for use. Levels quoted are for Public Open Space (Scenario 2 – park type open space) use.		

BS 3882:2015 "Specification for topsoil and requirements for reuse" – criteria for multipurpose topsoils.
The limit of 1000mg/kg for TPH is obtained from the definition of hazardous waste
For PAH, TPH and BTEX – This criteria is a minimum one (for the speciated component shown) if this minimum limit is exceeded, speciated tests to be undertaken to assess specific compounds against specific GAC limits.
BRE SD-1:2005 Concrete in aggressive ground