



Contaminated Land Remediation and Verification Plan for proposed residential development at Land Off Chapel Street, Manchester, M19 3QB.

Prepared for

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October 2024



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Introduction

This report provides a summary of the findings from previous investigations on land off Chapel Street, Manchester and to provide a strategy for remediation and verification of the site to ensure it is safe and suitable for use and does not present any significant risk of significant harm to identified receptors.

The Site:

Site Address: 7-9 Chapel Street, Manchester, M19 3QB.

Grid reference: 387486; 394216

An aerial photograph of the site is included in Figure 1.

Site use:

The site was previously an industrial site consisting of metal engineering works. The buildings have now been demolished and the site cleared. The Proposed development consists of the erection of eight two storey dwellings with gardens.



Previous Investigations

Phase I and Initial Phase II findings

The site was first developed between 1849-1892 with a Mission Room in the centre of the site. By 1905-11 the site had been redeveloped with a smithy to the western section. By 1956 the site is an engineering works, later redeveloped between 1968-1981. Off site a reservoir was identified ~100m to the south of the site from 1893 until 1956 when the carpet mill was redeveloped into a saw mill and later a church. A house estate was erected on the northern section opposite the site in 2018. A large electricity sub-station was located to the south 40m away on Elbow Street from 1907.

The initial phase II investigation consisted of a series of trial holes across the site. These identified elevated levels of contaminations in five areas as indicated in the report and the plan in figure 2.

The Phase II additional Intrusive Investigation

A site visit was conducted on the 8th June 2024 to undertake an intrusive investigation. The site had been cleared at the time of the visit with previous buildings demolished. A sampling program of 18 sample locations, identified in Figure 2, spread across the site at approximately 10m centres were undertaken. Some of these were located adjacent to the previously sampled locations. Both rounds of sampling are shown on the plan in Figure 3.

The samples were sent to Chemtech environmental a UKAS and MCERTs laboratory and each analysed for heavy metals, Total Petroleum Hydrocarbons (TPH) and Polyaromatic Hydrocarbons (PAH), and Asbestos.

The demolition of the buildings on site had also seen the removal of the concrete hardstanding across the site.

Elevated levels of Arsenic were identified from the second round of monitoring in TP4a and TP11a, and in the first round at TP5a and 8a. TP4 & 5 were in similar locations to the southeast of the site.

In addition, elevated lead levels were encountered across the centre of the site (front to back) In TP5, 7-12 15 & 16 during the second investigation which mirrored the first round with the exception of the northwest corner where elevated lead was found in the first round.



Elevated Total Petroleum Hydrocarbons (TPH) were identified in TP6 during the first round and TP11, 13 & 15 in the second.

Elevated Polyaromatic Hydrocarbons levels were identified in TP1B, 3A, 5A and 6A (i.e. surface levels) during the first phase of investigation. During the second-round elevated levels were encountered in TP 4, 8-13, 16 & 18. These correspond to the first round plus some additional areas. Predominantly the central strip of the site to form the roadway and the western corners.

Further Investigations

Since the above results were obtained further made ground has been removed from site, particularly across the centre of the site covering the above TP 5, 7-12, 15-16 locations. Confirmation of site levels and foundation designs have been made.

On the 2nd September 2024 a further site visit was made, the aim to verify removal of additional contaminated material in the centre of the site. A total of eight samples were taken from across the side walls and base of the excavation. These were sent to Chemtech Environmental Limited laboratories for analysis. The samples were tested for the heavy metals, Polyaromatic hydrocarbons, total petroleum hydrocarbons and asbestos.

Anecdotally the made ground had been removed down to clean clay.

The full sampling results are presented in Appendix 1, the sampling locations in Figure 4. The results have been compared against the LQM/CIEH S4UL's for a residential without homegrown produce scenario & the C4SL value for Lead. Soil organic matter varied across the site from 2.4-5.5%.

Details of each trial pits, including photographs are shown in Appendix 2.

Material comprised of clay with gravel.

The results of the samples identified no asbestos fibres, no elevated levels of heavy metals, no elevated levels of total Petroleum Hydrocarbons.

No elevated levels of Polyaromatic hydrocarbons were identified with the exception of the very front entrance to the site (300mm from the boundary) under the proposed entrance road. when compared against the residential with home grown produce criterion.



No odour was identified at the time of the visit. (previously odours had been identified in this area of hydrocarbon and an amount of tar impregnated wooden timbers was removed as part of the excavation of the area).

Ground gas

The preliminary desk study report identified infilled ground in the vicinity of the site from historically filled reservoirs, the last infilled in the 1950's, 70yrs previously. The report concluded that it was unlikely ground gas would still be produced after such an elapse of time and the risk from ground gas affecting the site was low. Additional research identified a recent planning application for a mill/engineering site to the south and on/adjacent to the former reservoir, redeveloped in the early 1950's. (Planning application 113618/FO/2016 & CDN/17/0092). Gas monitoring undertaken at this site identified no ground gas, no elevated levels of methane or carbon dioxide and a site characteristic gas situation of CS1 / Green was determined.



Proposed Remediation

Ground Gas

Research into nearby development sites has identified no ground gas emissions, however the original phase I report did recommend precautionary ground gas protection measures. In addition, the further work undertaken in September resulted in the removal of some hydrocarbon contamination identified on site.

However, the precautionary inclusion of gas protection measures is still considered appropriate.

Excavations to remove contaminated soil from below the building footprints was undertaken in September and the clean clay was identified below the made ground across the site. The excavated areas were backfilled with clean imported hardcore.

Since the last report foundation designs have been changed and the dwelling will now be built with a beam and block floor. A minimum 200mm cavity will be left below the floor and sufficient air bricks will be provided to an equivalent 2000mm²/m. With a Visqueen Ultimate HC BLOK membrane installed over the beam and block floor, insulation and screen above.

The above design specification has been considered in respect to BS8485:2015 and for the proposed development, type A private dwelling the design provides a gas protection score of 4.5 suitable for a CS3 level of protection.

Element	Details	Gas Protection Score
Structural Barrier	Beam & Block	0.0
Passive sub-floor dispersal layer	>200mm clear void	2.5
Gas resistant membrane	Visqueen Ultimate HC Blok, installed by specialist company	2.0
Total		4.5 (CS3)

The membrane is to be installed by Octopus Waterproofing, a specialist independent company, who will install and arrange for verification of the system. Minimal service penetrations will be included within the floor but where these do occur appropriate top-hat seals will be included. The membrane will be installed in accordance with the



manufacturer's specifications including overlapping and sealing of the membrane sheets and lapping the membrane across the external cavity.

On-site contamination

The previous investigation identified slightly elevated levels of contamination within the ground around the proposed garden areas. As detailed within the reports.

It is proposed that a clean cover system be installed within the garden amenity areas of the site to break any residual pathway between contamination and human receptors. This will be provided using a minimum of 600mm of clean imported material into the rear garden areas for each property, 450mm to the front and any other soft landscaping areas. The clean material will be placed over a geotextile "no dig barrier" to prevent movement of particles and to warn of potential contamination below.

Material for cover systems shall be purchased from a reputable supplier with test certification to demonstrate it is contamination free, these should be provided at a ratio of 1 sample to every 50m³ of material if the origin of the material is brown field or unknown and 1 sample every 100m³ if the source is green field. Subject to the source and date of any testing consideration will also be given to sampling of material once on site to confirm the lack of any contamination.

In addition, any service trenches are to be backfilled with clean imported material and not the excavated material. Mains water pipework will be installed using a MDPE barrier pipe to prevent any potential ingress of any contamination into the water supply.

Impact on the Water-table

No ground water has been identified during any of the works on site to date, while the weather has been relatively wet over the course of the year. Works on site have removed the majority of contamination from the site and a solid clean clay layer has been identified below the made ground across the site.

The impact on the water-table is therefore considered to be minimal.

Verification of Measures

The following verification actions will be undertaken as part of the development.

Gas Membrane:

To be installed by a specialist company and full verification of the installed membrane to be undertaken with a separate report produced confirming the membrane has been installed as per the manufacturer's instructions, with all repairs undertaken to a suitable standard.

Installation of Services:

Photographs of all trench back filling to be taken with appropriate paperwork for incoming aggregate.

Clean Cover:

The clean cover system will be verified in two ways. Firstly, the material will be tested in accordance to the above sampling ration depending on the amount of material imported and the source of the material.

Once confirmed as contamination free the material will be placed over the geotextile no dig layer to a depth of 450/600mm as detailed above. Evidence of the geotextile layer being installed will be obtained.

Martin Environmental Solutions will then undertake random checks within the garden/landscaping area to confirm the depth of the cover layer above the textile barrier.

Figure 1 – Aerial Photograph



Figure 2 – Foundation design

