

Phase 3: Remediation Statement

Location: **Upper Batley High School**
Batley Field Hill, Batley, West Yorkshire WF17 0BJ

For: MPH Building Systems Ltd

Report No. C2842/22/E/4322

Report date: April 2023

1. Introduction

Further to the site-specific risk assessment provided within the geo-environmental report (C2842/22/E/4322, August 2022), it is understood that a remediation strategy is now required for the site. This report provides the strategy for that remediation.

From the geo-environmental investigation, it was considered that the made ground present at the site was contaminated by some PAHs with respect to the intended end use. As the made ground will be exposed and moved during the groundworks phase, this contamination may represent a risk to operatives during the construction of the development. Ultimately though, this contamination shall either be removed or buried as part of the construction phase, thus breaking the pathway between end user and source, thereby representing a low risk to the end users.

The phase 1 and phase 2 reports highlighted that the site was within a radon affected area, as between 3% and 5% of dwellings were above the action level. However, the most recent radon maps¹ indicate that between 5% and 10% of dwellings are above the action level. Nonetheless, this increase in radon level does not change the requirements in terms of radon protection, and basic protection measures will still prove adequate.

2. Remediation Strategy

2.1 Remediation Objectives

Based on the site specific risk assessment provided in the geo-environmental report and gas monitoring letter, the object of remediation at the site is as follows:

- To protect the site operatives during the construction process from the ingestion of soil or dust, dermal contact with the soil and inhalation of dust.
- To protect neighbours from the ingestion of soil or dust, dermal contact with the soil and inhalation of dust.
- To protect plastic services from being penetrated by, or degrading due to the presence of contamination in the soil or groundwater.
- To protect buried concrete from being affected by aggressive ground conditions.
- To protect end users from the accumulation of radon.

¹ Sources: UK Radon Map [online resource from <https://www.ukradon.org/radonmaps/>]

2.2 Development Requirements.

The school is to be further developed by the construction of new administrative block. No soft landscaping is proposed. Therefore, screening criteria for a 'residential without plant uptake development' is deemed appropriate for the proposed end use.

3. Scope

In order to fulfill the objectives defined above the following remedial strategy will be utilised. A pragmatic approach will be undertaken, with observational techniques being employed at each stage of the work.

3.1 Groundworks

During the ground-works phase of the development, protection to the site operatives is required. The risk to site operatives is considered under the Health and Safety at Work Act 1974, together with regulations made under the act, which includes the Control of Substances Hazardous to Health (COSHH) regulations. Therefore the risks to site personnel will be considered under the Construction Design and Management (CDM) regulations at the planning stage and be included in the contractor's Health and Safety Plan and site specific Method Statements. These documents shall include the following main elements.

- Site operatives at all levels shall be made aware of the hazards of working with contaminated soils.
- Personal hygiene facilities, including washing and messing, will be provided and site operatives will be encouraged to use them.
- Where work is undertaken in dry weather the site will be dampened down to avoid dust. In addition, dust masks will be provided to all site operatives for use in dry weather.
- Where vehicles are transferring soil to the landfill site they will be covered to prevent contamination of the surrounding area by dust.
- Any stockpiles of contaminated soil on site will be sheeted over to prevent excessive amounts of airborne dust.
- Where work is undertaken in wet weather, vehicle and wheel washing facilities will be provided to ensure that the vehicles leaving the site do not transfer contamination to surrounding areas.

On completion of the ground-works a careful site inspection of the sub-grade will take place. Should visual or olfactory evidence of contamination be revealed, then suitably qualified specialists will be consulted. Further testing and updates to the site-specific ground model, risk assessment, and remediation strategy will be undertaken where necessary.

3.2 Construction

During the construction phase of the contract the following items are required to protect the end user from the potential contaminants revealed at this site.

- Beneath buildings, pavements and hard-standings clean inert granular sub-base shall be employed.
- New plastic services will be constructed in a surround of clean inert material and a risk assessment will be carried as instructed by the statutory water authority for the area. Where necessary testing as recommended in the United Kingdom Water Industry Research (UKWIR) website under Report Ref. No. 10/WM/03/21 - 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' will be carried out.
- Any redundant services revealed at this site will be de-commissioned and piped services sealed. Any existing services that are to be employed in the new development will be carefully inspected to ensure that they are serviceable and will not allow the ingress of contamination.
- Buried concrete placed at the site will conform to the guidance given in BRE Special Digest SD1 in accordance with a design sulphate class of DS-1.

3.3 Radon Protection Measures

In order to provide protection to end-users from the accumulation of radon gas within the proposed structure, the following shall be considered:

The gas barrier shall be:

- Sufficiently durable and strong to remain serviceable for the anticipated life of the building, to withstand in-service stresses and installation process.
- Capable, after installation, of providing a complete barrier to the entry of the relevant gas.
- Verified in accordance with CIRIA C735: 2014: *Good practice on the testing and verification of protection systems of buildings against hazardous ground gasses.*
- Chemically resistant to degradation by other contamination that might be present.

In addition:

- The installation of the membrane shall be carried out only by suitable personnel.
- The installation shall be in strict accordance with manufacturer specifications and recommendations, which shall also be included as part of the remediation statement.
- The membrane system employed will not be an ensemble (i.e. a system comprising a mixture of products from different manufacturers will not be employed).
- Membranes shall be supplied to site on a single wound roll, creased product will not be accepted or employed.
- Whilst membranes are exposed, signage will be provided to indicate the access to the installation area is prohibited unless authorised. Footwear will be checked prior to accessing the membrane surface to ensure no sharp objects are apparent, such as stones caught in treads. The use of sharp objects or hot-works around the exposed membrane will be strictly prohibited unless the risk of damaging the membrane has been full assessed and mitigated.
- Non-conformance of manufacturer recommendations shall be discussed and agreed as acceptable, in writing, with a suitably qualified person from the manufacturer.

4. Verification Report

In view of the limited contamination risks at the site, and given that soils are unlikely to be imported on to site as part of the development, it is not deemed necessary for a phase 4 verification report to be produced. Nonetheless, it is recommended that building control or a similar specialist are contacted to conduct a site visit and validate the installation of radon protection measures.

Should development plans change, then additional testing and reporting may become necessary.

We trust that this information is of interest. Rogers Geotechnical Services Ltd would be happy to offer advice with respect to the above and assist where necessary.

For Rogers Geotechnical Services Ltd,

Yours Faithfully

Rob Palmer MSc FGS ACIEH
Senior Geo-environmental Engineer