
REMEDIATION METHOD STATEMENT

Royal Heights
57 Queen's Road
Reading
RG1 4BN

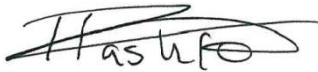
for Reading Heights Ltd

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1.0 INTRODUCTION

Consideration is being given to the redevelopment of this site through the conversion of the existing office building into residential units, which will include the addition of two extra storeys and a ten-storey extension on the eastern half of the car park. Some landscaped areas are to be incorporated into the scheme including a mixture of communal amenity space and private gardens, which will comprise raised planters and hedges.

A desk study and ground investigation has previously been carried out by GEA (Report Ref J18003, dated 9 March 2018). The previous investigation found concentrations of lead and benzo(a)pyrene that were elevated relative to guidelines for a residential end use with plant uptake.

This report sets out a formalised Remedial Method Statement and should be read in conjunction with the previous report.

1.1 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigations carried out. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; no liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

2.0 THE SITE

The site is located about 900 m to the southeast of Reading railway station and fronts onto Queen's Road to the south. It is bounded to the east by Watlington Street, located at a higher level and supported by a retaining wall, to the north by Grantley Heights, a six-storey apartment block, and to the west by Queen's Wharf, a seven-storey apartment block.

The site is irregular in shape and measures roughly 40 m north-south by 50 m east-west. It is essentially on a level plot and is currently occupied by Clarendon House, which fronts onto Queen's Road to the south. Clarendon House is a four-storey building with partial basement, formerly used as offices and currently vacant apart from live-in security personnel. A tarmac car park is present to the north of the office building, with an area of soft landscaping in the southeastern corner, planted with bushes. The car park can be accessed via Kennet Side.

2.1 Site History

The desk study indicated that the site was developed by terraced housing prior to 1879. A print works was present in the central western part of the site from some time between 1931 and 1957. The site was redeveloped by 1989 with the existing office building and car park.

Off-site there have been saw mills, a timber yard, gas works, factories, breweries, wharves, works and warehouses, which have all been redeveloped. A tank of unknown contents has been located from 1991 until the present day within the grounds of Queen's Wharf.

3.0 GROUND MODEL

The desk study indicated a low risk of contamination at the site. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows,

- ❑ beneath a nominal thickness of made ground, Superficial Deposits overlie the Seaford Chalk Formation, proved to the maximum depth investigated of 30.00 m;
- ❑ the made ground extends to depths of between 0.80 m and 2.60 m; the greatest thickness being in the east of the site;
- ❑ Superficial Deposits, consisting of soft brown clayey silt with occasional flint and chalk gravel, were found to extend to depths of between 1.75 m and 4.40 m;
- ❑ the underlying chalk was highly weathered to a depth of about 6 m;
- ❑ groundwater was encountered during drilling at a depth of approximately 4.00 m from within the chalk, rising to 2.00 m;
- ❑ subsequent groundwater monitoring has measured water to be standing in the standpipes at a depth of about 2.00 m; and
- ❑ contamination testing has measured elevated lead and benzo(a)pyrene above the screening values for a residential end use with plant uptake.

4.0 RISK ASSESSMENT

The table below sets out the risk pathways that could potentially be present following the redevelopment of the site, which will result in a residential end use with plant uptake. This Conceptual Model is based upon the findings of the ground model developed in the light of the investigation findings and highlights areas where remedial work should be considered.

Source	Receptor	Pathway	Comment
Lead and benzo(a)pyrene contamination	End users	Direct contact	At the concentrations measured, these hydrocarbons are unlikely to pose a risk to human health.
	Ground workers and future site workers	Accidental ingestion of soil and inhalation and ingestion of soil derived dust	Skin contact with the soil should be minimized through the use of PPE and washing facilities will be provided.
	Buried services	Direct contact	Buried services may need to be protected from direct contact with potentially contaminated soil. Contamination will be isolated from buried services through the use of oversized, clean backfilled trenches or through the use of barrier pipe.

Remedial measures in the form of imported clean soil will be required where any areas of soft landscaping are proposed, to protect end users and future maintenance workers from lead and benzo(a)pyrene contamination. Site workers and buried services will also need to be protected.

5.0 REMEDIAL OBJECTIVES

Based on the above risk assessment the following remedial objectives have been established for this development;

- ❑ to protect end users and provide a suitable growing medium for plant growth;
- ❑ protect ground workers who will be exposed to the soil; and
- ❑ provide buried water pipes with protection to minimise the potential for permeation or degradation by contaminants and to minimise the potential exposure of future maintenance personnel.

6.0 REMEDIAL RECOMMENDATIONS

The site investigation and above risk assessment have identified potential risks to end users of the site and as such remedial measures will be implemented to ensure the safe development of the site. To address the remedial objectives the remedial measures will include;

- ❑ installation of clean imported soil in landscaped areas; and
- ❑ installation of barrier pipe to protect water pipes.

The details of these remedial measures are set out below:

6.1 Soft Landscaped Areas

Where depths of made ground in excess of 0.60 m are present, a 0.60 m thick capping layer comprising a layer of topsoil and subsoil with a geotextile at the base will be installed over the made ground. The capping layer will prevent direct contact with the potentially contaminated soils below the site.

If the made ground is less than 0.60 m thick, for example if only 0.30 m of made ground is present and natural uncontaminated soils are encountered at a depth of 0.30 m, only the thickness of made ground will need to be removed and replaced with a clean capping layer and a geotextile will not be required. It will not be necessary to excavate natural uncontaminated soil to a depth of 0.60 m. The final thickness of clean cover may then depend on ensuring successful plant growth.

Clean imported soil will also need to be placed in raised planters. Unless the soil within the raised planter is in direct contact with made ground, a geotextile barrier will not be necessary.

6.2 Site Workers

Site workers will be made aware of the potential for contamination in the soils and a programme of working will be identified to protect workers handling any soil. The method of site working will be in accordance with guidelines set out by HSE and CIRIA. Washing facilities will be provided and site workers will be encouraged to wash prior to eating and to use appropriate PPE when on site to minimise skin contact with the soil.

6.3 Services

Consideration may need to be given to the protection of buried plastic services if they are to be laid within the made ground. Details of the proposed protection measures for buried plastic services will in any case need to be approved by the EHO and the relevant service authority prior to the adoption of any scheme.

It is recommended that barrier pipe is used to protect new buried services. It will be installed within oversized trenches backfilled within clean material. This will protect water supply pipes from degradation and the permeation of organic compounds and protect future utility workers from any potential contaminants.

7.0 VALIDATION OF REMEDIAL MEASURES

7.1 Landscaped Areas

Prior to the importation of any clean topsoil for use within landscaped areas, certification will be provided and approved by GEA. The suitability of the material will be assessed against the GEA Screening Values, which are based on C4SL or LQM/CIEH S4UL for a residential end use, a copy of which is enclosed. Photographs of the installation will be taken by the contractor along with records of the levels before and after installation, and these will be included in the validation report. In addition to the photographic evidence and the ground level records, confirmation of the correct installation of the clean cover layer will be validated by a series of trial holes and / or hand auger boreholes undertaken by GEA. In support of the visual examination, further samples of the material will be taken by GEA for laboratory testing and assessment against the adopted screening values for a commercial end use.

Confirmatory soil samples will be taken at a rate of one sample per 50m³ of certified material and a minimum of three samples per source.

7.2 Site Workers

Site work will be carried out in accordance with guidelines set out by HSE and CIRIA and all appropriate PPE will be worn.

7.3 Unknown Contamination

Where any odorous, discoloured, or suspicious material is identified during construction, work in that area will cease until GEA return to site to investigate, assess the risk posed by the material. Unless testing confirms the material to pose an acceptable level of risk, all such materials will be excavated and disposed of off-site.

7.4 Services

The technical specification along with photographs of the installation taken by the contractor will be included in the validation report.

7.5 Completion Report

On completion of the remedial works, a report will be prepared documenting the satisfactory compliance with the remediation proposals and of any duty of care under the waste management legislation, together with an assessment of the suitability of the soils remaining beneath the site in respect of the proposed residential development. The report will include written and photographic records of the site inspections carried out, together with the results of the validation analyses and will present an assessment of the condition of the remediated site with respect to the end use. The report will also include waste transfer documents for all exported and imported material.