



West Park Place LLP

West Park Place
Haymarket
Edinburgh
EH11 2DP

Phase III Remediation Statement

12917/5002-2 (rev A)
April 2014

**Professional, Innovative,
Practical Solutions**

Revision Record

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1. Introduction

- 1.1. Met Engineers were commissioned by West Park Place LLP to conduct an appraisal of the land contamination issues at West Park Place, Haymarket, Edinburgh, EH11 2DP (Grid Reference: 323920, 673010) and to determine any ground remediation measures which may be necessary, based on the findings of two site investigations conducted by Met Engineers in January 2012 and February 2014.
- 1.2. The following statement will outline the remedial proposals for the site based around the findings and proposals of Met Engineers Phase II Geo-Environmental Assessment (rev B) dated February 2014.
- 1.3. The objective of the proposed remediation is to improve the quality of materials found at the surface of the site in order to remove a pollution linkage between contaminants encountered near the surface of the site during the investigation and the proposed end user of the site.
- 1.4. The following document should be read in conjunction with Met Engineers Phase II Geo-Environmental Assessment.

2. Summary of Investigative Works

- 2.1. The site is located approximately 1.5 km southwest of Edinburgh city centre and is 0.23 Hectares in area. The site is an approximate L-shaped site, bounded on the southwest by West Park Place, to the southeast by the backs of properties on Dalry Road, and on the other boundaries by adjacent properties. There is a substantial difference in level on the North boundary, with the adjacent site being much lower. Consequently, there is a large retaining wall running along this boundary. The buildings formerly occupying the site have recently been demolished with the exception of a small building fronting directly onto West Park Place which is to be retained.
- 2.2. The initial site investigation was carried out between 9th and 11th January 2012 consisted of 14No. Boreholes progressed to depths of between 0.7 and 5.5m. Ground conditions are as described below:-
 - MADE GROUND – Dark Brown Sand including fragments of Brick, Sandstone, Ash & Clinker.
 - Stiff Dark Brown Sandy Gravelly CLAY with gravels of mixed lithology.
- 2.3. The supplementary site investigation was carried out between 4th and 5th February 2014 and comprised of 10No. Trail Pits. The pits were excavated to depths of between 2.5 to 4.5m Ground conditions were found to be much the same as the initial borehole investigation.
- 2.4. Groundwater was encountered in a number of the boreholes. Water seepage was recorded in BH2, BH3, BH4 and BH5 at depths between 2.6 and 3.0m. BH6 was wet at 3.6, so too was BH7 at 3.6m and 4.0m depth. No significant flow was recorded.
- 2.5. The site is to be classified under the CLEA model as Residential. CLEA guidelines and recommendations given in LQM, “Generic Assessment Criteria for Human Health, Risk Assessment (2nd Edition)” have been applied to establish a risk based CLEA model to assess the likely contamination issues and to comment on potential constraints for the development of the site.
- 2.6. Soils samples were removed from 8No. of the boreholes for laboratory contamination analysis to determine concentrations of Metals, Poly-Aromatic Hydrocarbons and Total Petroleum Hydrocarbons. Leachate was recovered from 2No. boreholes and submitted to the same tests. The results reveal concentrations of Lead, Copper and Zinc, various constituents of PAH and various types of TPH above the Generic Acceptance Criteria for the proposed land use of Residential.

- 2.7. Groundwater and gas monitoring equipment was installed in 4No. Boreholes and a total of 3No. rounds of gas monitoring were completed. The maximum gas screening value (gsv) noted throughout the monitoring is 0.0 for Methane and 0.0012 for Carbon Dioxide. In addition Maximum observed concentration of Methane and Carbon Dioxide are 0.0 and 0.4 (%v/v) respectively. No special protection measures are therefore considered necessary.
- 2.8. Based on the findings of the investigation summarised above, Met Engineers Phase II Geo-Environmental Assessment (rev B) concludes that a potential pollution linkage exists between contaminants contained within surface materials and the Future Users of the site including Construction Workers, Future Inhabitants, Flora and Fauna. Therefore remedial measures are proposed in the form of removal of made ground to suit the development in conjunction with placement of an imported inert capping layer consisting of 600mm of Topsoil and of Sub-soil to be placed in all soft landscaped areas.

3. Remediation Proposals

3.1. The recommendations for remediation are as follows:-

- Due to the proposed level of the buildings for the site it is likely that the majority of made ground will be removed as part of the bulk earthworks. In areas where this is not the case, the removal of made ground material should be enacted in order to allow placement of the required capping layers within soft landscaped area.
- The area around the underground tank is deemed to be a potential contamination hotspot. It is understood that the tank has been removed from site however visual and or laboratory proof of its absence and lack of contamination potential are not forth coming. It is also understood that made ground consisting of broken rubble has been placed in this area to allow access of plant to the rest of the site. Therefore a validity trial pit should be dug in the area of the tank to confirm its absence. Samples should be taken from undisturbed ground below the area and tested for poly aromatic hydrocarbons and total petroleum hydrocarbons to confirm the lack of any contaminant source.
- The area around BH01 has been identified as a hotspot for Poly Aromatic Hydrocarbon contamination. It is understood that since the borehole investigation occurred all made ground in this area has been removed as part of the site enabling works. Validity sampling should be undertaken in this area to confirm that the contamination source has been removed. Samples should be tested for poly aromatic hydrocarbons and total petroleum hydrocarbons to confirm the lack of any contaminant source.
- In areas of proposed soft landscaping a new growing medium comprising of 300mm inert topsoil and 300mm inert subsoil is to be placed towards the completion of the development scheme
- The new growing medium in the landscaped areas will be verified with 8No. hand dug trial holes to check the depth of the topsoil capping layer.
- A proposed remediation plan for the site can be found in Appendix A.

3.2. A photographic record of all ground works should be taken and retained on site for inclusion within the Verification Statement

- 3.3. The ground works are to be monitored by suitably qualified personnel and any abnormal materials encountered during the course of the works are to be assessed by means of visual and olfactory evidence.
- 3.4. Where ground conditions encountered during the course of the ground works give cause for concern, the following procedures should be observed:
- Any areas which are suspected to contain contaminants which have not been identified as part of the remediation should be identified and zoned off. The extent of the potential contamination can then be determined by a suitably qualified person and samples taken for laboratory assessment.
 - Photographic evidence should be obtained of the material along with an accurate location made upon the site plan.
 - Where deemed necessary an amended remediation statement may be presented to the Local Authority prior to commencing further works.
- 3.5. Soils imported to the site for use in filling and landscaping should be suitable for the intended use, clean and free of deleterious material.
- 3.6. Imported and re-used topsoil should be tested at source to confirm their suitability using the following ratios:
- Greenfield Source – 1 sample per 200 cubic metres (Min 3 samples) per source – **{Evidence of a Greenfield source will be required}**
 - Brownfield - 1 sample per 50 cubic metres (Min 3 samples) per source

The soils will be screened for Metals, PAH & TPH. The assessment criteria used can be found below.

Contaminate	Generic Acceptance Criteria (mg/Kg)	Source
Testing for Greenfield & Brownfield Sources		
Asbestos	NAD	
Arsenic	32	CLEA
Cadmium	3	LQM
Chromium VI	4.3	LQM
Chromium III	3000	LQM
Copper	2330	LQM
Lead	230	CLEA
Mercury	11	CLEA
Nickel	130	CLEA
Selenium	350	CLEA

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Zinc	3750	LQM
Cyanide	34	CLEA
Phenol	210	LQM
Acenaphthene	210	LQM
Acenaphthylene	170	LQM
Anthracene	2300	LQM
Benzo(a)anthracene	3.1	LQM
Benzo(a)pyrene	0.83	LQM
Benzo(b)fluoranthene	5.6	LQM
Benzo(ghi)perylene	44	LQM
Benzo(k)fluoranthene	8.5	LQM
Chrysene	6.0	LQM
Dibenz(ah)anthracene	0.76	LQM
Fluoranthene	260	LQM
Fluorene	160	LQM
Indeno(123-cd)pyrene	3.2	LQM
Naphthalene	1.5	LQM
Phenathrene	92	LQM
Pyrene	560	LQM

Testing for Brownfield Sources Only		
Ali >C5-C6	30	LQM
Ali >C6-C8	73	LQM
Ali >C8-C10	19	LQM
Ali >C10-C12	93	LQM
Ali >C12-C16	740	LQM
Ali >C16-C21	45000	LQM
Ali >C21-C35	45000	LQM
Aro >C5-C7	65	LQM
Aro >C7-C8	120	LQM
Aro >C8-C9	27	LQM
Aro >C9-C10	69	LQM
Aro >C10-C12	140	LQM
Aro >C12-C16	250	LQM
Aro >C16-C21	890	LQM
Aro >C21-C35	890	LQM
BTEX - Benzene	65	LQM
BTEX - Toluene	120	LQM
BTEX - Ethyl Benzene	350	SGV
BTEX - m & p Xylene	230	SGV
BTEX - o Xylene	250	SGV

4. Consents, Agreements & Licenses

Generally the materials to be removed from the site are considered to be non-hazardous, comprising of general made ground material. The following consents, agreements and licenses will be necessary.

- 4.1. All disposals of materials off site must be appropriately approved in terms of Planning Permission and Waste Management Licensing. Available and appropriate waste disposal facilities must be identified prior to removal. Licensed waste transfer contractors should be used at all times. Details of all contractors together with their license documentation should be retained on site for inclusion within the Verification Statement.
- 4.2. The disposal operation must comply with all Waste Regulation, Planning, Environmental and Occupational Health and Water Quality Protection requirements as specified in the Planning or Licensing Conditions.
- 4.3. The disposal facility must be of a design which is wholly acceptable to the Regulatory Authorities.
- 4.4. Records of the disposal of materials should be maintained and carefully monitored to ensure that the long term security of the waste material and the performance of any control measures are strictly adhered to. The disposal must be adequately documented to aid control measures. Waste transfer notes are to be retained on site for inclusion within the Verification Statement.
- 4.5. A Site Specific Health and Safety Plan should be developed for the site, indicating areas of works and ensuring that all construction workers are inducted before commencing on site. This procedure should be monitored and maintained during the course of the remediation.
- 4.6. Adequate precautions should be made to control dust and noise. If sprays are used to control dust, surface water run off should be controlled and a discharge consent obtained if effluents are to be discharged to sewers.
- 4.7. Where disposal of contaminated material not covered by the above description is found to be necessary due to uncovering abnormal material, the following action should be taken.
 - a. On identification of material considered to be contaminated with reference to the sites proposed used, the Planning Authority should be informed and permission for a variation to this Remediation Statement sought.

- b.** The consents, agreements and licenses defined above should then be revised in line with the agreed variation.

- 4.8. On completion of the ground works, a summary of the works is to be compiled, containing all relevant documentation, which will form the basis of the Validation Statement. This will include the following:
 - a.** Photographic Record of the Ground Works
 - b.** Waste Transfer Tickets from licensed contractors for materials removed from site
 - c.** License details of waste transfer contractors
 - d.** Imported soils contamination test results confirming compliance with the requirements defined within this document
 - e.** Imported soils transfer tickets.
 - f.** Completion Trial Holes Logs including a photographic record

5. Summary of Remediation

The remediation proposed for the site will consist of the following:

- 5.1. General site wide strip and removal of made ground material where required to facilitate the construction works and allow placement of the required capping layers within soft landscaped area.
- 5.2. Landscaped areas are to be left 600mm short of proposed levels to allow for a new soil growing medium.
- 5.3. On completion of the 600mm growing medium placement, 8No. hand dug pits are to be completed to confirm the depth of the imported topsoil.
- 5.4. Area around underground tank to be investigated by way of trial pit to confirm its absence. Soil samples to be taken from ground below and tested for PAH and TPH to confirm lack of contamination source.
- 5.5. Soil samples to be taken from around area of BH01 and tested for PAH and TPH to confirm the lack of any contamination source.
- 5.6. A plan indicating the above remediation proposals described above can be found in Appendix A of this document.
- 5.7. Where during the course of the ground works, materials are uncovered which it is suspected may contain contaminants, the procedures outlined in sections 3 & 4 should be adhered to.
- 5.8. An accurate record must be kept on site at all times, recording the loads taken off site to the disposal facility.
- 5.9. The site should be checked and assessed by suitably qualified person following the remediation. All relevant documentation can then be assessed to ensure compliance with the remediation proposal.
- 5.10. On completion of the ground works, a Validation Statement is to be prepared and submitted to the Local Authority for approval

Appendix I

Remediation Proposal General Arrangement Plan





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1. Do not scale dimensions from this drawing in either paper or electronic format.

2. To be read in conjunction with all relevant Engineer's, Architect's and Other drawings and specifications.

3. All building products to be used in strict accordance with the manufacturer's recommendations.

4. Any discrepancies are to be reported to the Engineer immediately.

5. Main Contractor to provide a detailed method statement for all works prior to commencement on site.

KEY

 Proposed position of 8No. Hand Dug Trial Pits to 600mm

 Proposed areas of soft landscaping requiring a minimum of 600mm capping layer

Rev	Date	Drawn	Description	Chkd



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Client

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Project

West Park Place
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Title

Remediation Proposal
General Arrangement Plan

Drawn	SJBF	Checked	RJS	Scale
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Approval

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