

OUR REF: A0667/15 1st October 2015 YOUR REF:

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Mr. Phil Sarbutts SWF Consulting Unit 4 Millbank House Riverside Business Park Wilmslow Cheshire SK9 1BJ

By Email (phil.sarbutts@swf.uk.com)

Dear Phil,

Site Remediation Strategy Rice Lane, Liverpool

It is understood that planning permission is being sought for the new ALDI store development and a neighbouring proposed residential development.

At the request of SWF Consulting we have prepared an Outline Remediation Tel: 01458 250163 Strategy for the development of the site.

This strategy report, for the ALDI development area, should be read in conjunction with our site investigation report dated December 2014, together with a Phase 1 Desk Study report dated November 2014.

Site Location

The site is located off Rice Lane in a mixed residential and commercial area of Walton, Liverpool, approximately 4.7km north of Liverpool city centre. The approximate National Grid Reference for the centre of the site is Easting: 335950, Northing: 395470, at postcode L9 1LS.

The site is currently unoccupied, with grass and rough vegetation covering the majority of the site. Former access roads are present in the central and southeast sectors with trees adjacent to these former roads.

The site is accessed off Rice Lane to the east.

Walton Hospital is located immediately to the southwest of the site. A railway is present approximately 130m northwest, trending northeast – southwest and Walton Park Cemetery is located approximately 140m northwest of the site.

A location plan is shown overleaf as Figure 1.

CONSULTING ENGINEERS

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Figure 1 Site Location Plan



At the time of the site investigation the site was vacant with grass and rough vegetation across the site. Trees were present on the eastern boundary and adjacent to former access roads in the central and southeast sectors, including willow.

The site was generally flat but with the ground level approximately 1m - 2m above the level of surrounding roads.

Development Plan

The development plan (Figure 2, overleaf) consists of the construction of a new retail store and associated car parking.

Ground Conditions

Eight boreholes were drilled by use of a windowless sampling drilling rig across the site. At several locations relict foundations and obstructions were encountered which required adjustment of borehole locations. In order to provide sufficient site coverage boreholes were carefully located within areas that were previously landscaped when the site was a hospital.

This was achieved by reference to Google Earth imagery whilst on site.

WS8 was drilled in a car-park that was at the time used by contractors working on an adjacent site.

Prior to the drilling of the boreholes all available service records, provided by the client, were checked with precautionary hand-dug pits excavated to a depth of 1.2m. A CAT-SCAN was used to check for electricity cables and shallow drains.

All locations were surveyed by use of a handheld GPS to a horizontal accuracy of less than 3m, with the resultant locations shown on a sampling location plan (Figure 3 overleaf).



Figure 2 Development Layout Plan



The boreholes revealed a thin mantle of made ground and topsoil underlain by competent sands and clays.

In-situ standard penetration testing was conducted at 1m centres down each borehole profile to assist in assessment of soil strength and relative density.



Figure 3 Sampling Location Plan



Relict slabs and foundations were encountered at several site investigation points corresponding to the footprint of former hospital buildings.

Contamination Assessment

The site investigation by Earth Environmental & Geotechnical Ltd proved an absence of soil and groundwater contamination on the site for the proposed commercial retail store development.

Groundwater was not intercepted within the boreholes and trial pits and given the absence of any nearby controlled waters no assessment was considered necessary.

A pending site investigation is planned to further characterise soil materials that are intended to be removed offsite as part of the construction of the new store.

Ground Gas Assessment

The monitoring of ground gases was not considered necessary due to the environmental setting of the site and the absence of nearby infilled areas or landfill sites.

Made ground was proved across the site underlain by competent relatively impermeable glacial clay.

Research published by CLAIRE, Reference Research Bulletin (RB) 17, November 2012 entitled 'A Pragmatic Approach to Ground Gas Risk Assessment' provides risk practitioners with a useful framework for the investigation and assessment of low risk gassing sites using information and data that allows the gas generation potential of a source to be estimated. Within the framework there are certain limiting factors, i.e;

• Have any credible sources and pathways for landfill gas migration from a landfill been identified?

- Does the thickness of Made Ground exceed maximum 5m?
- Does the average thickness of Made Ground exceed 3m average?

The limiting factors do not prohibit the approach outlined in RB 17 from being adopted as the sole method of assessing gas risks at the Rice Lane site, i.e:

- The site is not suspected to be a former landfill;
- The maximum thickness of Made Ground does not exceed 5m.

Research published in RB 17 in relation to the gas generation potential of a source and this relationship with a materials Total Organic Content (TOC), provides a useful tool to supplement potentially other lines of evidence when considering gas risks.

Earth Environmental & Geotechnical ensured that soil samples were recovered as part of intrusive works. In total 6 No. individual TOC results were obtained from Made Ground as part of the soil chemical test analysis.

The results of the TOC analysis on the 6 No. samples of Made Ground indicate a geomean of 0.83%, less than the maximum limiting TOC of 1% for made ground, where it is (on average) less than 3m thick.



Consistent with the research presented in RB 17, this equates to a site conforming with Characteristic Situation (CS) 1 of the Modified Wilson and Card classification (CIRIA Report C665, Assessing Risks Posed by Hazardous Ground Gases to Buildings, 2007).

The results of the TOC analysis indicate that the site is likely to conform to a CS1 designation in accordance with Modified Wilson and Card. This classification of the site is considered reasonable based on the descriptions of the made ground.

As such no ground gas mitigation measures are required.

Site Levels

The site investigation has confirmed that shallow strip or pad foundations would be appropriate for any new structures. The foundation solution assumes that ground levels would not change significantly from those existing at the time. Final site levels will be dictated by the client and their Engineer.

Final site levels will be issued by the Engineer via an External Works Drawing which would show proposed finished floor levels, finished roads levels and gradients.

Proposed Enabling Works

Outlined below are some of the main task and activities associated with the enabling works.

Site Organisation

Site works will be supervised throughout by a suitably qualified Engineer, who will report to a Project Manager. Supervision may be part-time for certain activities, but will be full-time during the removal of any unrecorded contaminated soil/fill and any placement of fill to an engineering specification.

Welfare Facilities/Security

Initial mobilisation works will include the establishment of appropriate office and welfare facilities. Such facilities may include but are not restricted to; office accommodation, canteen facilities, washroom/drying room, toilets, wheel wash, car parking, stores and security unit.

The site should be secured by Heras fencing to prevent unauthorised access onto the site during the enabling works.

Health & Safety

All site personnel will undergo a site-specific health and safety induction prior to commencement of work on site.

The Engineer will be informed prior to any proposed entry of a confined space or deep excavation. Entry will be restricted to suitably qualified and equipped personnel.

Works will be carried out with regard to current statutory requirements and guidance by the Health & Safety Executive "Protection of workers and the general public during the redevelopment of contaminated land". Protective clothing, footwear and gloves will be required with hand washing and boot-washing facilities made available. Smoking will be limited to designated areas.



Site Clearance

Any trees currently under a preservation order should be identified and agreed with relevant authorities prior to the commencement of the works. All trees subject to a Tree Preservation Order should be clearly identified and protected by chestnut paling with fluorescent tape.

The site should then be cleared of all residual debris, fly tipped materials, any vegetation, shrubs, bushes and unprotected trees as instructed by the Client.

Excavation of Subsurface Obstructions

The contractor shall break out all hardstanding (predominantly comprising concrete floor slabs) across the site, as identified during site investigation, in order to remove potential obstructions to new foundations and infrastructure. Suitable reclaimed material from the demolition/site clearance operation shall be crushed to an appropriate specification and, if required, processed for re-use as part of any general site raise.

The crushing of this material should be supervised and monitored by an appropriately qualified person, with selected samples periodically obtained and tested to confirm its suitability. Any material that is deemed to be unsuitable for crushing and re-use should be removed from the site to a suitably licensed landfill site.

Suitable materials derived from the excavation process should be stored on site at a convenient location, prior to crushing.

Placement of Clean Growing Medium

This work may be undertaken as part of the contract for the enabling works, in which case imported soils should be stockpiled in a location agreed with the Engineer.

A 300mm thickness of imported clean soil should be placed in landscaped areas in order to provide a clean growing medium in these areas. This cover layer should comprise 150mm of topsoil and 150mm of subsoil.

Any soil intended for use in landscaped areas should be tested at source or stockpiled on site until approved for use by the Engineer. Testing will be carried out at a rate of 1 test per 250m³ and the results compared to a series of imported soil threshold concentrations, as proposed in Appendix A to this document.

We trust that this Remediation Strategy is satisfactory and we look forward to hearing from you in due course.

Please do not hesitate to contact me should there be any further queries.

Yours Sincerely,

A Czaswecki



APPENDIX A

IMPORTED SOIL THRESHOLDS



Asbestos	%	<0.001	
Arsenic	mg/kg	37	Category 4 Screening level based on 6% SOM
Boron	mg/kg	290	CIEH S4UL based on 6% SOM
Beryllium	mg/kg	1.7	CIEH S4UL based on 6% SOM
Cadmium	mg/kg	26	Category 4 Screening level based on 6% SOM
Chromium (III)	mg/kg	910	CIEH S4UL based on 6% SOM
Chromium (IV)	mg/kg	21	Category 4 Screening level based on 6% SOM
Lead	mg/kg	200	Category 4 Screening level based on 6% SOM
Mercury (Inorganic)	mg/kg	40	CIEH S4UL based on 6% SOM
Selenium	mg/kg	250	CIEH S4UL based on 6% SOM
Nickel	mg/kg	130	CIEH S4UL based on 6% SOM
Copper	mg/kg	2400	CIEH S4UL based on 6% SOM
Toluene	mg/kg	130	CIEH S4UL based on 1% SOM
Benzene	mg/kg	0.087	CIEH S4UL based on 1% SOM.
Ethylbenzene	mg/kg	47	CIEH S4UL based on 1% SOM
Xylene	mg/kg	56	CIEH S4UL based on 1% SOM
Trichlorethene (TCE)	mg/kg	0.016	CIEH S4UL based on 1% SOM
Tetrachloroethene (PCE)	mg/kg	0.18	CIEH S4UL based on 1% SOM
Zinc	mg/kg	3700	CIEH S4UL based on 6% SOM
Cyanide - Free	mg/kg	41	Based on acute risk to 0-6yr old child, HPA
Phenols	mg/kg	280	CIEH S4UL based on 1% SOM
PCB	mg/kg	1.4	CLEA 1.06 modelling with 1% SOM
Benzo(a)pyrene	mg/kg	5.0	Category 4 Screening level based on 6% SOM
Dibenzo(a,h)Anthracene	mg/kg	0.24	CIEH S4UL based on 1% SOM
Fluorene	mg/kg	170	CIEH S4UL based on 1% SOM
Naphthalene	mg/kg	2.3	CIEH S4UL based on 1% SOM



Vanadium	mg/kg	410	CIEH S4UL based on 6% SOM
TPH Ali C5-C6	mg/kg	42	CIEH S4UL based on 1% SOM
TPH Ali C6-C8	mg/kg	100	CIEH S4UL based on 1% SOM
TPH Ali C8-C10	mg/kg	27	CIEH S4UL based on 1% SOM
TPH Ali C10-C12	mg/kg	130	CIEH S4UL based on 1% SOM
TPH Ali C12-C16	mg/kg	1100	CIEH S4UL based on 1% SOM
TPH Ali C16-C35	mg/kg	65000	CIEH S4UL based on 1% SOM
TPH Ali C35-C44	mg/kg	65000	CIEH S4UL based on 1% SOM
TPH Aro C5-C7	mg/kg	370	CIEH S4UL based on 1% SOM
TPH Aro C7-C8	mg/kg	860	CIEH S4UL based on 1% SOM
TPH Aro C8-C10	mg/kg	47	CIEH S4UL based on 1% SOM
TPH Aro C10-C12	mg/kg	250	CIEH S4UL based on 1% SOM
TPH Aro C12-C16	mg/kg	1800	CIEH S4UL based on 1% SOM
TPH Aro C16-C21	mg/kg	1900	CIEH S4UL based on 1% SOM
TPH Aro C21-C35	mg/kg	1900	CIEH S4UL based on 1% SOM
TPH Aro C35-C44	mg/kg	1900	CIEH S4UL based on 1% SOM