Wentworth Laboratories,
Wentworth Road,
South Park Industrial Estate,
Scunthorpe.
North Lincolnshire.
Tel : **01724 842520**
Fax : 01724 842520

T. L. P. Ground Investigations Ltd.

17th August 2023.

Paul Barnsdale
12, Goxhill Avenue
Maple Way
Donington
South Holland
Lincolnshire

F.A.O. Mr. P. Barnsdale

Dear Sir,

REMEDIATION AND VALIDATION STRATEGY, RESIDENTIAL DEVELOPMENT, 12, GOXHILL AVENUE / MAPLE WAY, , DONINGTON.

CONTEXT AND PREVIOUS WORK

Contamination Remediation Strategy options for the above development were provided in the report, entitled - Post Demolition Intrusive Ground Investigation Report - Proposed Residential Development, Plot 7, Maple Way, Donington, South Holland, Lincolnshire.- *issued on 8th June 2023 by TLP Ground Investigations Ltd*).

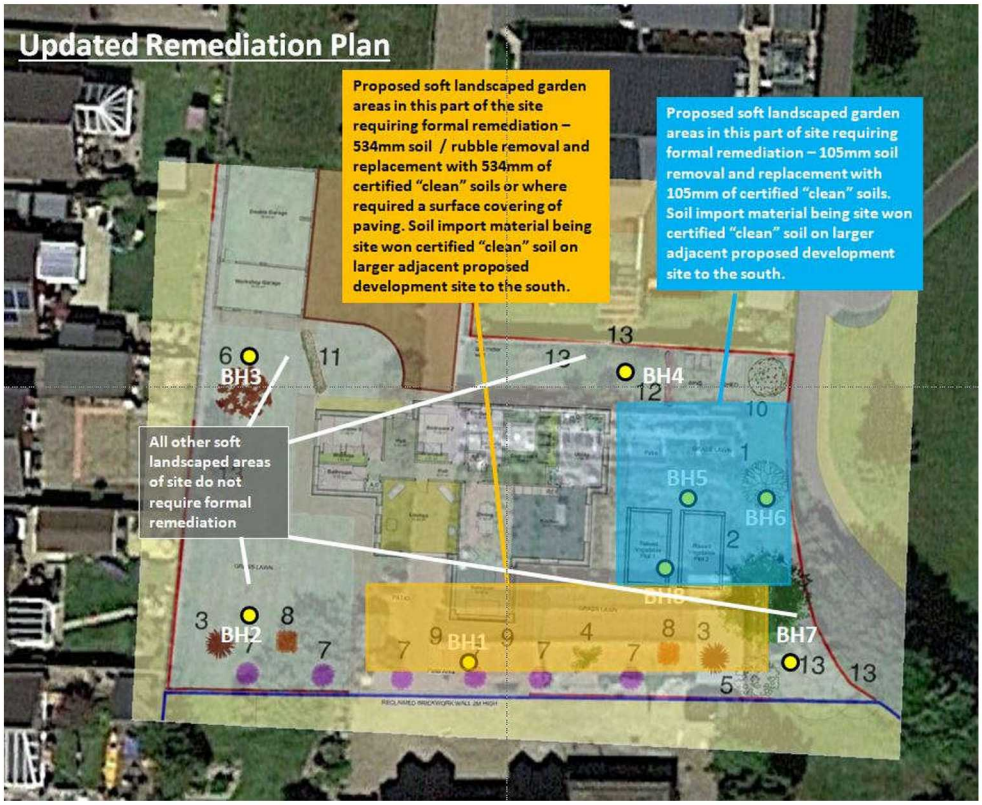
Link –

https://www.dropbox.com/s/cuh1wkv9lq1lnir/Plot%207%20Post%20Demo%20Contamination%20Investigation%20FULL.pdf?dl=0

The report outlined the necessary remediation requirements to render the proposed development site suitable for its intended residential end use. South Holland District Council has subsequently requested clarification of the actual remediation and validation strategies that will be adopted by the client in order to ensure that the remediation is formalised and is then undertaken to a satisfactory standard.

The aforementioned Post Demolition Intrusive Ground Investigation *(TLP Ground Investigations Ltd June 2023)* concluded that parts of the development site required remediation in the form of a simple cover system. The report recommended that the design of a simple cover system should take into consideration the methodology outlined in the BRE Publication 'Cover Systems for Land Regeneration' March 2004. The methodology assumes that intermixing of the cover system with the underlying material will occur over time and provides a means to determine a sufficient thickness of cover (given the nature and severity of the contamination) such that even with complete intermixing in the long-term, the concentrations of contaminants within the mixed zone remain within target guideline values.

The report also indicated that the concentrations of the identified contamination varied over the different parts of the site which historically have been subject to different uses. In order to economise on the extent of the remediation and bearing in mind environmental concerns associated with the disposal of contaminated materials and the acquisition of clean sub-soils, it was considered prudent to zone the site into three separate areas (See attached drawing showing demarked zones).



The TLP Post Demolition Intrusive Ground Investigation Report outlined that the preferred remediation option would involve the placing of simple cover systems over the areas of the site identified as requiring remediation.

The contamination tests performed on samples obtained from certain areas outside the 'footprint' of the former outbuildings (Blue Zone), recorded only 'slight' contamination of Lead. Using the procedures outlined in the BRE Publication 'Cover Systems For Land Regeneration' March 2004, it has been determined that the maximum thickness of cover required to mitigate the risk from **Lead** contamination **over the garden, landscaped and growing areas (Blue Zone)** should be approximately **105mm**. A 'clean' cover of this thickness will also serve to provide an effective media for healthy plant growth. The calculation assumes that the imported soils of the cover system contain similar low levels of contamination as those encountered in the adjacent southern development site, which was investigated as part of the initial Phase II Geo Environmental Assessment. Any surplus soil from the development site to the south could therefore be considered suitable for use in the cover system.

The contamination tests performed on the samples obtained from locations inside the 'footprint' of the former outbuildings (Orange Zone) encountered slightly more significant Lead contamination. Using the procedures outlined in the BRE Publication 'Cover Systems For Land Regeneration' March 2004, it has been determined that the maximum thickness of cover required to mitigate the risk from **Lead** contamination **over the garden, landscaped and growing areas (Orange Zone)** should be approximately **534mm**. A 'clean' cover of this thickness will also serve to provide an effective media for healthy plant growth. The calculation assumes that the imported soils of the cover system contain similar low levels of contamination as those encountered in the southern part of the site as this material is likely to be used as the cover system soil. **In order to ensure that contaminated soils will not be exposed at the surface should any of the proposed hard standing be removed and converted to soft landscaping by occupants at some time in the future, it has been decided that these areas will also be afforded a clean soil cover of suitable thickness prior to the placing of any hard-standing.**

The BRE publication does not specify materials, which should be used for a cover system other than it should be of 'good quality' and should incorporate a topsoil layer, ideally at least 150mm in thickness or 30% of the cover thickness, whichever is the greater. Reference should be made to Specification for Topsoil BS 3882 2007. Natural soil including sands and gravels and low plasticity clays or mixtures of various soils should be acceptable, provided it has been certified 'clean' at source and **has the**

appropriate documentation demonstrating it is relatively contamination free and suitable for use within a residential setting (see YALPAG - Verification Requirements for Cover Systems guidance). The provision of a layer of granular material within the cover system may also serve to act as a capillary break particularly if the underlying sub-soils are clayey. The existing ground should be suitably compacted prior to placement of the cover system (as set out in CIRIA SP 105). This will inhibit root penetration, infiltration, burrowing animals and instability but should not be compacted to such an extent that it will induce water logging.

Depending on the preferred method of placement (see cover system design above), the provision of a cover system may elevate the general site level and the implications of this should be considered in the light of the proposed development and also within the context of the existing residential setting of the site.

According to NHBC Guidance chapter 9.2, *'the top 300mm of any soil cover in garden and landscaped areas should be free from obstruction of which, at least, the top 100mm must be topsoil'.*

REMEDIATION STRATEGY

Overview

On consultation with the client, it has been decided that the majority of the external soil and patio areas will be set approximately 300mm higher than that of the surrounding and current existing level. It is still nevertheless the intention of the developer to excavate out the full thickness of any calculated cover system (as prescribed in the previous Post Demolition Report – i.e. 534mm in the orange zone and 105mm in the blue zone) and dispose of the arisings off-site and then replace with soil from the "clean" donor site to the south or from foundation arisings obtained from the "clean" areas of the study site to +300mm higher than current and surrounding ground level. It is the intention to backfill areas intended for patio's and external paving to be at least partially backfilled with crushed whole and broken 'clean' bricks with no mortar, soil or fines inclusion. The final say 100mm topping in proposed patio areas prior to the placement of paving slabs will be of typical limestone sub-base purchased from a local builder's merchant. Areas intended for landscaping will be backfilled excursively with clean soils from the donor site or site won material from areas outside the remediation area ensuring the top dressing soil is nutrient rich and is suitable as a growing media. Where the property boarders any adjacent sites any elevation in level will be retained by concrete gravel boards supported by concrete posts.

Aims

The main aims of the remediation strategy are as follows:-

- To provide a remediated site that is suitable for its proposed redevelopment i.e. residential housing with gardens, associated parking and localised soft landscaping.
- To ensure that Lead impacted topsoil and sub-soils encountered within the orange and blue areas are excavated and removed from site to appropriate depth and reinstated with a suitable soil cover.
- To satisfy the requirements of the regulatory authorities (i.e. the Local Planning Authority, Environment Agency and National House Builders Council).

Remedial Measures

Based on the findings of the Post Demolition Intrusive Ground Investigation Report, and upon receipt of an updated Landscaping Plan, the following remediation strategy has been updated for the site. The proposed scope of the works is summarised below:-

- In order to break the pollutant linkage posed by Lead impacted soils it is proposed to remove the majority of the source by means of excavation of

impacted soils to the calculated thickness of the cover system. Waste transfer tickets/duty of care notes will be retained to demonstrate that the contaminated soil waste has been exported to an appropriate waste receiving facility.

- A visual inspection and photographic evidence of the excavated areas of impacted soil (areas highlighted blue and orange on previous remediation plan) will be provided.

- The transfer and placement of 'clean' soil from areas of the site where contamination was not identified (site won foundation excavation arisings etc.) or topsoil / excavated soils imported from to the adjacent residential development to the south in order to achieve the desired development levels and depth of cover.

- Topsoil and Subsoil depth validation in the remediated areas. (i.e. site visit by TLP Ground Investigations and hand excavations in affected areas to demonstrate remediation has been undertaken as per agreed strategy)

Notes to Developer on Photographic evidence for validating the depth of cover

The developer should familiarise themselves with YALPAG Document "Verification Requirements for Cover Systems. Version 4.1 – June 2021" which South Holland District Council have adopted.

https://www.sholland.gov.uk/media/19804/210603-Final-YALPAG-Guidance-Verification-Cover-Version-4-1/pdf/210603_FINAL_YALPAG_Guidance_-_Verification_cover_version_4.1.docx_002.pdf?m=637751575786830000

In accordance with YALPAG guidance a schedule of photographs are to be taken depicting the removal of the contaminated materials and subsequent placement of inert cover as the remediation process progresses. This is likely to include the following:

- Photographs showing the depth of materials that have been excavated from the areas of proposed remediation showing local extant features for reference purposes.

- Photographs of any stockpiles and quarantine areas where contaminated soils are awaiting exportation from the site.

- Photographs showing transfer notes indicating that appropriate volumes of contaminated materials have been removed from the site to an appropriate receiving facility.

- Photographs showing the depth of inert cover (clean sub-soils/ topsoil or granular materials) being installed within the previous excavated areas.

- If any imported materials are to be sourced from a third party, evidence showing the quality of the materials to be used as inert cover will be presented. This will be in accordance with the recommendations outlined in YALPAG Verification Requirements for Cover Systems KP1 and KP2. If soils are to be recycled from areas of the proposed development, which have been found to be free from contamination or from the adjacent residential development site to the south, which was also found to be free from contamination, then the original certificates of analytical screening, transfer notes and photographs should be presented as proof of soil characterisation.

- Photographs of any separator membranes if used between the underlying subgrade and soils of the cover system.

- Photographs showing of the method of placement and different layers if appropriate.

- Photographs showing the completion of the remediation process.

Physical Validation

Upon completion of the placement of the topsoil and subsoil in the proposed landscaped areas, TLP Ground Investigations Ltd. recommends that a suitably qualified and experienced engineer visit the areas of soft standing and undertake the excavation of a number of hand dug inspection pits in each of the areas which have been remediated.

The works are to be carried out to the satisfaction of South Holland District Council and in accordance with *'Development on Land Affected by Contamination'V11.2 2020* and *"Verification Requirements for Cover Systems – Technical Guidance for Developers Landowners and Consultants" V4.1 2021.*

The engineer will record the thickness, depth and composition of both the topsoil and subsoil and would take validation photographs. In addition, samples of topsoil and subsoil will be obtained for validation testing if required.

The engineers should ensure that the requirements of the Remediation and Validation Strategy are complied with. On satisfactory completion of all of the remediation works, the engineer will provide a validation report. This report will comprise relevant site records and act as certification that the remedial preparation works have been carried out in accordance with the Strategy.

The validation report shall include the following:

- A description of the works undertaken.

- Validation photographs showing the remediation process and subsequent validation.

- Waste transfer notes and importation certificates if appropriate.

- Any relevant chemical validation test certificates.

- A statement that the works have been undertaken and completed to a satisfactory standard in accordance with the agreed Remediation and Validation Strategy.

We trust that this information is sufficient for your present requirements. Should you require any further assistance, please do not hesitate to contact us.

TLP Ground Investigations Ltd.