

**REMEDiation IMPLEMENTATION PLAN**

**WARLEY ROAD, SCUNTHORPE**

**FOR**

**ONGO HOMES LIMITED**

**ISSUE 1**



**TO BE APPROVED BY THE LOCAL PLANNING AUTHORITY PRIOR TO WORKS BEING UNDERTAKEN**

**46663-002**

**13 May 2022**

**REMEDIATION IMPLEMENTATION PLAN**  
**WARLEY ROAD, SCUNTHORPE**  
**FOR**  
**ONGO HOMES LIMITED**  
**ISSUE 1**

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'Verification Requirements for Cover Systems'
- Appendix 3** Soil Assessment Values
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## **1.0 INTRODUCTION**

This Implementation Plan has been produced by Eastwood & Partners (Consulting Engineers) Ltd. on the instruction of BSB Architecture, on behalf of Ongo Homes Ltd., for a site located to the north of Warley Road in Scunthorpe, North Lincolnshire. The purpose of this document is to detail the procedures for the implementation and subsequent verification of remedial works to deal with contamination found within the ground at the site.

This is to ensure that upon completion of the residential development, the site can be shown to be suitable for its intended use and that it will not pose unacceptable risks to future receptors. This therefore covers the protective measures to be installed during the construction phases of the redevelopment for a residential end use.

This document is a working publication and may need to be updated, in agreement with the relevant regulatory bodies, at any stage during development dependent on what is encountered. This document is also subject to the approval of the regulatory parties; the Local Authority and your warranty provider. This version constitutes Issue 1. Please contact Eastwood & Partners if you are unsure of the current issue.

## **2.0 RATIONALE FOR REMEDIAL WORKS**

Eastwood & Partners have completed a site investigation. The following report is to be read in conjunction with this Implementation Plan: Geotechnical and Geo-environmental Site Investigation, Warley Road, Scunthorpe, Issue 2, reference 46663-001, dated 13 May 2022.

### ***The Site***

The approximately 0.16 hectare site is located north of Warley Road, in Scunthorpe, Lincolnshire. The site is roughly rectangular in shape and it is centred on grid reference 490480, 409260.

The site currently comprises a grassed area of amenity landscaping in the western half of the site, with the centre of the site used for parking, surfaced with macadam hardstanding; and the east of the site is an area surfaced with macadam gravel. Wooden fences, around 2 m high, separate the three areas. The site is generally level.

### ***Ground Conditions***

Topsoil was encountered in the west of the site, to depths of between 0.2 m and 0.3 m. Macadam hardstanding and gravel is present across the east of the site. Natural ground, comprising fine to medium sand was encountered to depths in excess of 2.8 m. Peat was also encountered at depths of between 2.7 m to 3.4 m, in the trial pits undertaken to the south of the site. Bedrock was not encountered. No groundwater was encountered.

The trial pits were very unstable during excavation in the natural sand.

### **Chemical Testing Assessment**

Two samples of topsoil, two samples of made ground, and one sample of natural ground were tested during the site investigation.

### ***Topsoil***

Two samples of topsoil were tested: TP01 and TP03 at 0.2 m.

One sample of topsoil, TP03 at 0.2 m, recorded an elevated concentration of copper (4,200 mg/kg) above the human health assessment value (2,400 mg/kg). Four additional sub samples were scheduled for copper analysis, none of the four sub samples recorded elevated contaminant concentrations above their respective human health or phytotoxicity assessment values; and the results were significantly lower than initial concentration.

The average copper concentration for the sample (856 mg/kg) is below the respective human health assessment value. The initial elevated copper result is therefore considered to be anomalous, possibly due to laboratory error.

No asbestos fibres were identified in any of the samples of topsoil analysed.

One of the topsoil samples, TP03, recorded an elevated concentration of zinc, above the phytotoxicity assessment value.

### ***Made Ground***

Two samples of made ground were tested: HP02 at 0.15 m and 0.5 m.

One sample of made ground, HP02 at 0.15 m, recorded elevated benzo(b)fluoranthene benzo(a)pyrene, dibenz(a,h)anthracene above the respective assessment values, with respect to human. The concentration of dibenz(a,h)anthracene was also elevated above the less conservative 6% SOM assessment value.

TPH concentrations were below the limit of detection.

No asbestos fibres were identified in either of the samples of made ground analysed.

### ***Natural Ground***

One sample of natural ground was tested: TP02 at 0.4 m.

The sample recorded an elevated concentration of copper (4,900 mg/kg) above the human health assessment value (2,400 mg/kg). Four additional sub samples were scheduled for copper analysis, none of the four sub samples recorded elevated contaminant concentrations above their respective human health or phytotoxicity assessment values; and the results were significantly lower than initial concentration.

The average copper concentration for the sample (985 mg/kg) is below the respective human health assessment value. The initial elevated copper result is therefore considered to be anomalous, possibly due to laboratory error.

The sample of natural ground recorded an elevated concentration of zinc, above the phytotoxicity assessment value.

One sample of potentially reworked natural ground was also tested to the south of the site. The sample did not record any elevated contaminants above their respective human health or phytotoxicity assessment values.

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## **Remedial Proposals**

Where made ground is to remain beneath private gardens or soft landscaped areas of the proposed development, the material will require a capping layer of inert material above it. The capping layer should be a minimum of 600 mm thickness, with an anti-dig layer. At least 150 mm of this capping thickness should comprise topsoil, to act as a growing medium for plants.

## **Construction Materials Assessment**

Based on the chemical test results, a design sulphate class of DS-2 and an ACEC class of AC-2 is considered appropriate for concrete in contact with the made ground.

No sulphate precautions are required for below ground concrete in contact with the reworked natural ground or natural ground.

It is considered that protective measures may be required for new drinking water supply pipes laid within the made ground. The test results will need to be submitted to the water supplier for review.

Basic radon protective measures are required in the ground floor construction.

### 3.0 REMEDIATION OBJECTIVES

The remedial objectives for this site are therefore:

1. To ensure that 600 mm of clean inert physically suitable material, including at least 150 mm of topsoil, is present within gardens and areas of soft landscaping where made ground remains;
2. The capping layer is to include an anti-dig layer (ADL);
3. To install basic radon protective measures\*;
4. To ensure that appropriate sulphate precautions and water supply pipes are installed\*;
5. Upon identification of any additional or unexpected contamination, a suitable strategy to determine any remedial action is to be in place; and
6. To reduce the risks to construction workers, they should be made aware of the presence of elevated levels of contaminants within the materials to be excavated and ensure that the requisite working practices are adhered to\*.

\*No further guidance with regards to this is considered necessary as part of this document.

#### **4.0 WORKING METHOD**

During the works, procedures to protect site neighbours, the environment and amenity, and to control dust, noise and odours should be put in place by the contractor, in addition to the required site health and safety procedures that apply. Control of surface runoff over areas of potentially contaminated ground should also be taken into consideration.

The procedures for implementation of the mitigation measures identified in Section 2, to ensure that the objectives detailed in Section 3 are met, are outlined in Sections 5 to 7. All remediation works are to be overseen by suitably experienced site staff. Periodic visits will be made by a suitably qualified independent consulting Engineer, to undertake the necessary verification works detailed.

## **5.0 CAPPING MATERIALS**

### **5.1 Sourcing of Capping Material**

The site won topsoil and natural ground are considered suitable for re-use in the development. However, if additional material is required, this will need to be imported.

Imported topsoil and subsoil should be from a source not expected to be contaminated and meet both physical and chemical criteria as detailed in the Sections 5.2 and 5.3. Testing will need to be carried out in accordance with the guidance given in the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG) document 'Verification Requirements for Cover Systems', a copy of which can be found in the Appendix.

Prior to importation, certification should be obtained from the supplier detailing the source site, its previous and current land use and relevant test results. A copy of this information should also be forwarded to the Engineer.

If no such information is available, the Engineer will need to visit the source site and collect samples which will be submitted for testing to determine the suitability of the material for use within the development. Material which does not hold the relevant certification should not be brought to site.

For imported materials, copies of the carrier's consignment notes should be retained with the documentation detailed in Section 5.4 and a copy forwarded to the Engineer. The soil should be stockpiled separately and away from areas designated for storing other materials or potential sources of contamination. Separate stockpiles should also be created for each different source. All stockpiles should be suitably quarantined and identified as such until deemed suitable for use.

The following soil handling procedures should also be adhered to:

- Topsoil and subsoil should not become mixed;
- Capping should not be laid during or immediately following heavy rain;
- Double handling of material should be avoided;
- Stockpiles of topsoil should be shaped to shed water;
- Topsoil stockpiles should be low and narrow to ensure that the core is within 1 m of the surface; and
- Over tracking by machinery used to place soils should be avoided.

Imported and site won stockpiles should not be mixed. Site won stockpiles considered as suitable for reuse in gardens and site won stockpiles considered to be impacted with contaminants must not be mixed.

## 5.2 Physical Requirements

Topsoil and subsoil should comprise clay or sand. Topsoil should have a maximum of 30% of fragments in excess of 2 mm, a maximum of 10% in excess of 20 mm and nothing greater than 50 mm. Subsoil should comprise clay or sand and should have a maximum of 65% of fragments in excess of 2 mm, a maximum of 60% in excess of 20 mm, a maximum of 40% in excess of 50 mm and only occasional pieces in excess of 100 mm.

Topsoil should be free of fragments of glass and wire or other potentially hazardous foreign material which could cause traumatic injury. Significant quantities of extraneous material such as brick and concrete should also not be present within the topsoil. Reasonable judgement should be taken with respect to their presence in subsoil. In addition, all materials should be free from propagules of aggressive weeds and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems.

## 5.3 Chemical Requirements

Testing should be carried out for the following general suite of contaminants:

Type of material	Frequency of testing	Testing schedule
Greenfield/ Manufactured Soils	Minimum 3 or 1 per 250 m <sup>3</sup> (whichever is greater)	Standard metals/metalloids PAHs (16 USEPA speciation) Asbestos
Brownfield Soils	Minimum 6 or 1 per 100 m <sup>3</sup> (whichever is greater)	Standard metals/metalloids PAHs (16 USEPA speciation) Asbestos TPH (CWG banded) Any additional analysis dependant on the history of the donor site.

The sampling is to be undertaken by a suitably qualified Geo-environmental Engineer and depending on the source or variability of imported material, the Engineer may, at their discretion, request additional testing to be undertaken.

A table of assessment values is included in Appendix 3.

If any of the assessment values are exceeded, the material shall be considered to be unsuitable unless further testing and risk assessment shows it to be satisfactory.

## 5.4 Documentation

Each stockpile of imported material should be given a clear reference number and designated sheet recording the following:

- Identification reference (e.g. Stockpile A, B, C etc.);
- Material type (e.g. Topsoil);
- Source site;
- The carrier's consignment note reference numbers;
- The approximate volume (or number of loads); and
- Which plots the material is to be used on and where (i.e. Plot number and landscaped area to the front or rear garden);

Each entry shall be signed and dated by the Site Manager or their assistant. A template is enclosed in the Appendix. These sheets should be available for inspection by the Engineer, Warranty Inspectors, Local Authority staff and others involved with this development. A copy should also be given to the Engineer when verification visits are made.

## **6.0 INSTALLATION AND VERIFICATION OF CAPPING**

### **6.1 Capping Installation**

Where made ground is to remain or be placed below gardens and landscaped areas, a minimum 600 mm thick capping including at least 150 mm of topsoil will be required. An anti-dig layer (ADL) needs to be present in the base of the capping in gardens and landscaped areas. The ADL can comprise 150 mm of crushed stone in the base of the capping, overlain by 450 mm of subsoil and topsoil; or a suitable proprietary product overlain by 600 mm of subsoil and topsoil.

The capping installation should be undertaken by site staff in the following steps:

1. Establish the finished ground levels over each garden or landscaped area and from this determine the required level of the underside of the ADL.
2. Where present ground levels are above the level of the underside of the ADL, re-grading of the ground is to be undertaken to accommodate the capping/ADL. This excavated material may be placed in areas where ground levels are to be raised, such as beneath hard-standing or used to raise levels beneath other capped areas (see 3 below). Failing this the material can be removed from site (see 4 below).
3. Where the present ground levels are below the underside of the ADL, the ground level may be made up to the underside of the capping layer using material from 2 (above) or imported material where no suitable fill exists.
4. All arisings should be regarded as contaminated until proven otherwise. If they cannot be used on site, they are to be removed to a licensed waste management facility. The waste is to be taken by a registered waste carrier in accordance with the Waste Management Duty of Care Code of Practice. Copies of all waste transfer notices are to be retained.
5. Check the level of the ground surface to ensure that it is at the correct level for the underside of the ADL
6. Install the ADL and subsoil, if required.
7. Install private services, where applicable. Where materials from above and below the capping are excavated these should be kept separate. Capping materials can be reused but the material below the cap should be placed as detailed in 3 or removed from site following the procedures set out in 4.
8. Place a minimum of 150 mm topsoil.

## 6.2 Verification of the Capping Installation

Upon completion of the capping, verification pits shall be dug by an independent Engineer in order to measure the thickness of topsoil and subsoil, where present. Verification pits will be dug at a rate of 1 pit per 3 plots.

Prior to placement of the capping materials, the formation layer shall be inspected by the Site Manager and photographed. Verification pits shall be dug by an independent Engineer in order to measure the thickness of the capping.

Each verification pit shall be photographed. The photograph will include reference of depth and location of the pit.

If the capping is deemed to be insufficient, the Site Manager will be informed and advised on how much more material is needed for the capping to be adequate. Verification of capping can only be carried out on areas where the capping has been completed. All gardens and landscaped areas which have had the capping layer completed will be photographed by the Engineer.

A verification report is to be produced by the Engineer, which includes:

- The documentation detailed in Section 5.4;
- The chemical test results for imported subsoil and topsoil;
- Confirmation of the capping thicknesses, including photographs of the verification pits with a scaled marker; and
- Confirmation of the physical suitability of the material.

The submission of verification reports is covered in Section 8.

## 7.0 AREAS OF UNEXPECTED CONTAMINATION

There is the potential for areas of unexpected contamination to be present as is the case with any 'brownfield' site. Any unusual, brightly coloured or significantly oily or odorous material should be considered in this category. Soils containing material suspected of containing asbestos or potentially combustible material should also be included.

If unexpected contamination is found the following procedures should be adhered to:

1. All site works at the position of the suspected contamination should stop, and visual and olfactory observations of the condition of the ground and the extent of contamination should be made. Notification shall be given to an independent consultant and the warranty provider and Local Authority not later than 24 hours after discovery. Should the contamination be likely to affect controlled waters the Environment Agency should also be informed.
2. During the presence of a suitably qualified engineer, investigation works shall commence to recover samples for testing and, using visual and olfactory observations of the condition of the ground, accurately delineate the area over which contaminated materials are present.
3. Should the consultant deem it appropriate, the affected material may be excavated and placed in a separate stockpile on a suitable impermeable surface. This should be suitably quarantined with no addition to or removal of the stockpile while chemical analysis is being undertaken. Alternatively, the material should remain in-situ until laboratory test results have been obtained.
4. The testing suite will be determined by the consultant on the basis of visual and olfactory observations.
5. Test results will be compared against current assessment criteria suitable for the future use of the area of the site affected.
6. If after testing the ground is found to be contaminated, the Local Authority and warranty provider shall be informed. After consultation with the Local Authority, and if necessary, the Environment Agency, materials should either be removed for disposal to a licensed waste management facility or remediated to agreed clean-up criteria. If the waste is removed, it should be taken by a registered waste carrier in accordance with the Waste Management Duty of Care Code of Practice. Copies of all waste transfer notices are to be retained.

A report will be prepared by the engineer and submitted to the Local Authority and where groundwater may potentially have been impacted, the Environment Agency.

## **8.0 COMPLETION DOCUMENTATION**

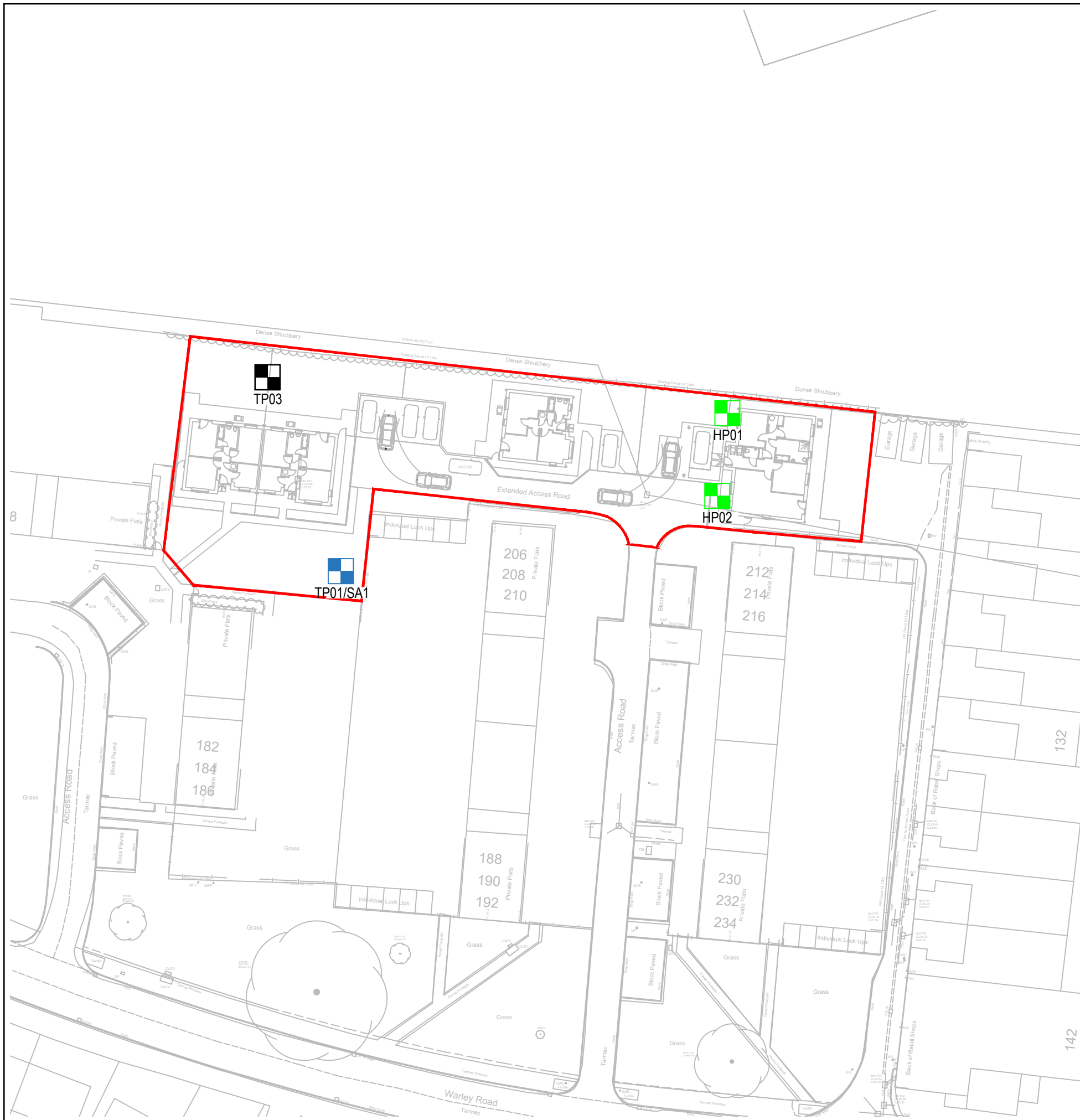
On completion of the verification works the appropriate verification documentation, detailing the works that have been completed in accordance with the agreed Implementation Plan, will be forwarded to the Local Authority and warranty provider. Should any remediation affecting controlled waters have been required and consequently undertaken, verification documentation will also need to be issued to the Environment Agency for their approval.

The verification report for the capping will include photographs of the capping materials within validation pits and of the garden and landscaped areas, as well as the pertinent chemical test results.

Necessary changes to the agreed Implementation Plan, arising during the course of the works, are to be agreed in writing with the Local Authority and warranty provider prior to being undertaken on site.





## **Appendix 1**

Exploratory Hole Location Plan – Drawing Number 46663/001B



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE.  
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

**KEY:**

-  Approximate location of trial pit excavated by Eastwood and Partners on 03.12.2021.
-  Approximate location of trial pit with soakaway installed excavated by Eastwood and Partners on 03.12.2021.
-  Approximate location of hand dug pit excavated by Eastwood and Partners on 20.04.2022.
-  Site Boundary

B	Site layout and hand pits added.	TC	DJ	10.05.22
A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

**ONGO HOMES LIMITED**

**WARLEY ROAD, SCUNTHORPE**

**EXPLORATORY HOLE LOCATION PLAN**

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SCALE WHEN PLOTTED AT A3 1:250			DRAWING STATUS <b>INFORMATION</b>	
DRAWN JRB	CHECKED CC	DATE 08.12.21	DRAWING NUMBER 46663/001	REV B

## **Appendix 2**

Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG) document 'Verification Requirements for Cover Systems'



# VERIFICATION REQUIREMENTS FOR COVER SYSTEMS

Technical Guidance for  
Developers,  
Landowners and  
Consultants



**Yorkshire and Lincolnshire  
Pollution Advisory Group**

Version 4.1 – June 2021

The purpose of this guidance is to promote consistency and good practice for development on land affected by contamination. The Local Authorities in Yorkshire, Lincolnshire, the North East of England, East Anglia, Greater Manchester and St Helens who have adopted this guidance are shown below:



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## Disclaimer

This guidance is intended to serve as an informative and helpful source of advice. YALPAG will review this guidance every three years, but readers must note that legislation, guidance and practical methods are inevitably subject to change and therefore should be aware of current UK policy and best practice. This note should be read in conjunction with prevailing legislation and guidance, as amended, whether mentioned here or not. Where legislation and documents are summarised this is for general advice and convenience, and must not be relied upon as a comprehensive or authoritative interpretation. Ultimately it is the responsibility of the person/company involved in the development or assessment of land to apply up-to-date working practices to determine the contamination status of a site and the remediation and verification requirements.

## Acknowledgments

YALPAG would like to thank North Lincolnshire Council, Leeds City Council, City of Bradford Metropolitan District Council, Barnsley Metropolitan Borough Council, Rotherham Metropolitan Borough Council, Wakefield Council, and Tameside Metropolitan Borough Council, for producing this guidance.

YALPAG would also like to acknowledge Liverpool City Council's Contaminated Land Team, Coopers Consulting Engineers for allowing us to use their guidance document and photographs and WSP Environmental Ltd for also donating photographs.

## Consultation

39 Local Authorities and 6 Environmental Consultants were consulted over a four week period in 2010 during the production of the initial guidance. At that time, consultation comments were considered by the review panel and a number of revisions were made to the guidance to reflect these comments.

49 Local Authorities and 25 Environmental Consultants were consulted in 2021, during the production of this version [4.1] of the guidance. Consultation comments were considered by the review panel and a number of revisions were made to the guidance to reflect these comments.

# Introduction

This guidance has been produced to help developers ensure that they can demonstrate that material brought onto a development site for gardens or areas of soft landscaping are suitable for use and do not present harm to people, the environment and/or property. It is intended to improve the quality of reports submitted to Local Authorities on this matter and to give contractors/consultants a point of reference to obtain approval for such work from their client. This guidance does not cover the geotechnical suitability of soils or materials, chemical suitability that does not affect human health e.g. sulphates, or importing soils contaminated with invasive (or injurious) plants.

The verification of cover systems should be an integral part of the remediation project and agreed between developers and regulators at an early stage in the project.

UK guidelines for remediation verification are set out within Land Contamination Risk Management<sup>1</sup> (LCRM) and the document on Verification of Remediation of Land Contamination<sup>2</sup>. This guidance note should be considered as supplementary advice in conjunction with these documents.

This guidance relates to the remediation of land contamination by using cover systems; however, the verification of the quality of imported material is equally important in other situations, such as raising levels for flood prevention or general landscaping works. This guidance could also be used in such instances.

## The Process of Verification

Implementation plans for remedial works should always be site specific. Where a cover system and potentially, excavation, is the main remedial method or a component of an overall site remediation, specific goals will need to be set that are linked directly to the risk management strategy for the site in question.

For cover and containment systems, verification will normally depend upon the provision of defensible measurements, observations and records. Critical factors to be considered are:

- What should be measured?
- When should they be measured?
- Where measurements need to be taken, what is the appropriate monitoring regime i.e. number and frequency of samples?
- Statistical constraints on sampling.

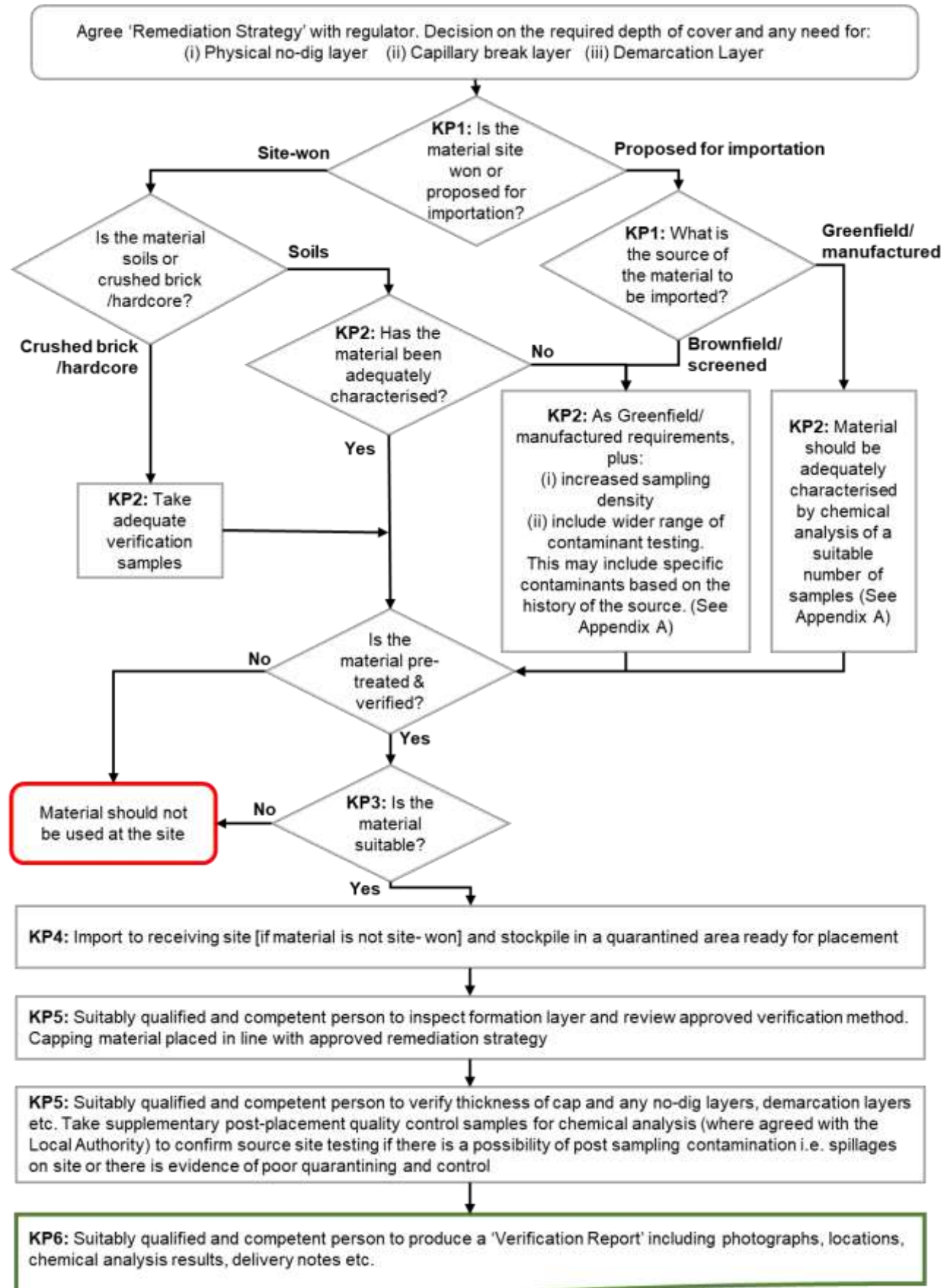
National Planning Policy Framework (NPPF) states that “planning policies and decisions should ensure that after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990”. The Verification Report is a key document to demonstrate compliance with NPPF, and the responsibility rests with the developer/applicant to submit the required Verification Report to complete the remediation and to discharge any planning conditions.

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<sup>1</sup> Land Contamination Risk Management, Environment Agency, Oct 2020

<sup>2</sup> Verification of Remediation of Land Contamination. Environment Agency, Feb 2010

# Overview Flowchart



# Key Points

## KP1: Source of Material

Material can be sourced from site won material i.e. crushed brick/hardcore or site-won soils from existing open or landscaped areas. In the interest of sustainability, Local Authorities promote the use of such site-won material providing that they are suitable for the intended end use of the site.

Alternatively, material can be sourced from other developments and commercial companies. Dependent on the source of the material it can be classified as either from a 'Greenfield/Manufactured' or 'Brownfield/Screened' source.

Broadly speaking material can be classified as follows:

**Greenfield** – Where documentary evidence is provided confirming that the source site has not been developed and that no past contaminative uses have occurred. Should evidence not be provided or approved by the Local Authority, please note that the source would be expected to be assessed as though it were a brownfield source.

**Manufactured** – from a commercial company who manufacture material by mixing or blending mineral soils (subsoil or sand) with an organic amendment (compost). If other soil component sources are used, documentary evidence should be provided confirming that the source site has not been developed and that no past contaminative uses have occurred. Should documentary evidence not be provided or approved by the Local Authority, please note that the source would be expected to be assessed as though it were a brownfield source.

**Brownfield** – material from a donor site that has previously been developed

**Screened** – material from a company who deal with skip/demolition waste which is screened for unsuitable material i.e. bricks, wood, plastic etc.

## KP2: Characterisation of Material

It is essential that material is suitable for its intended use. Documentary evidence of the source of the material should be provided to the Local Authority. This may include desk study or site investigation reports. A defensible method is required to ensure the verification proposals are site specific and that the level of sampling reflects the need to ensure that imported material are suitable for their intended use.

Due to the diminishing supply of suitable Greenfield topsoil sources it has been found that the chemical quality of Greenfield sources is less reliable in certain areas. As a result the recommended analytical rate for the intended use of the development may vary between Local Authorities [see **Appendix 1a**].

### When should this be done?

Sampling of material should be undertaken as early as possible i.e. prior to placement [for site won material] and prior to importation [for imported material]. This is to avoid the costly exercise of re-excavating unsuitable material and the possibility of cross contamination. Where the assessor has confidence that the material is of sufficient quality (i.e. tested by supplier, used previously) it is acceptable to test the material on site. Although, if it is deemed unsuitable it would have to be either removed off site or pre-treated at the cost and time of the developer. It is recommended that some verification samples are also taken once this material has been delivered to site to confirm suitability for use. Soils can become contaminated during transportation or when stockpiled on site.

## What about certificates from commercial suppliers?

Where the material is provided by a commercial company, certificates or other industry Quality Protocol compliance i.e. WRAP, DoWCoP, will normally be accepted. This is on the proviso that it: (i) relates to the actual material being imported to the site and the type and amount of analysis is in line with what is prescribed in Appendix 1a; and, (ii) the certificates are less than two months old.

It is recommended that some additional verification samples are taken once this material has been delivered to site. Soils can become contaminated during transportation or when stockpiled on site.

Extreme caution should be given to importing material that has been recycled from demolition or skip waste as they could easily be contaminated e.g. asbestos containing materials. Please refer to “questions you should be asking your supplier” in **Appendix 1b** and include the responses in your report.

## British Standard

Imported soils should be as specified in BS 3882:2015 for topsoil and BS8601:2013 for subsoil as ‘suitable for their intended purpose’. Both British Standards relate mostly to nutrient content of topsoil and phytotoxic contamination and they do not consider contaminants that pose a risk specifically to human health. Soils should be tested for contaminants that are considered to pose a risk to human health in addition to those specified in the relevant British Standards to ensure that they are suitable for their intended use.

## Initial screening

A visual / olfactory inspection of the material should be carried out by a suitably qualified and competent person to ensure that:

- It is a suitable growing medium;
- It is free from obvious contamination i.e. staining/free product etc.;
- It has not come from areas where Japanese Knotweed or other invasive or injurious plants, as specified by the Environment Agency, are suspected to have been growing;
- It is not odorous (could be considered a statutory nuisance);
- It is free from unsuitable material i.e. bricks, brick ties, timber and glass etc.); and,
- There are no visible signs of asbestos containing material (ACMs).

## Testing schedule & number of samples

Chemical testing will normally be required on any materials that are to be used as cover material, even where this includes first generation quarried material. This should be carried out by a suitably qualified and competent person.

**Appendix 1a** explains in detail the sampling and testing requirements for a typical residential development. These are only guidelines and it may be necessary to deviate away from them depending on local and site-specific factors. It is recommended that the developer discusses any deviation with the Local Authority.

The following criteria sets out the requirements for sampling and testing:

- **Virgin Quarried Material** sampling needs to be 1 or 2 samples depending on the type of stone utilised, to confirm the inert nature of the material. Testing to include standard metals/metalloids (should include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn).
- **Crushed Hardcore, Stone, Brick (excluding asphalt)** a minimum of 1 sample per 500m<sup>3</sup>. Testing to include standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, total TPH. Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).
- **Greenfield/ Manufactured Soils** a minimum of 3 samples or, dependent on source and receptor, between 1 per 50m<sup>3</sup> and 1 per 250m<sup>3</sup>. Testing to include standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, pH and soil organic matter (SOM) (or calculated from total organic carbon (TOC)).
- **Brownfield/ Screened Soils** a minimum of 6 samples or dependent on source and receptor, between 1 per 50m<sup>3</sup> and 1 per 100m<sup>3</sup>. Standard metals/ metalloids (as above), PAH (16 USEPA speciation), TPH (CWG banded), asbestos, pH and SOM (or calculated from TOC). Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).

The assessment criteria need to be UK based, e.g. LQM S4ULs, Defra C4SLs or other similarly derived GACs.

### **KP3: Suitability of Material**

Based on the characterisation of material above, the material should be either deemed suitable or unsuitable. Obviously unsuitable material should not be used (unless it is treated to reduce levels of contaminants below agreed target levels i.e. bioremediation – this would have to be agreed and included within the Remediation Strategy) and an alternative source of material should be sought by the developer. If the material is considered suitable it can be imported (if not site won) and stockpiled in a suitably quarantined area [refer to **KP4**].

### **KP4: Stockpiling & Quarantining of Material**

It is essential that the 'suitable' material is either placed in its intended area straight away i.e. soft/landscaped areas or stockpiled in a suitable quarantine area to prevent on-site contamination.

In the event that an assessor finds material has been stored in an unsuitable area, samples should be taken to confirm that no cross contamination has occurred (including a visual/olfactory check of the material). The material should then be suitably quarantined or placed at its intended location immediately.

## KP5: Verification of Required Depth

In line with the agreed Remediation Strategy, it is important to establish that the required depth has been achieved and is consistent across the site. There are two main ways to achieve this:

Depth testing in situ – small trial pit excavated to allow measurement of its depth by standardised tape measure or measuring staff.

Topographical surveys – accurate survey of the base and final formation layer height to establish the depth of cover.

### Specific Local Authority Policy

Please check with the local Contaminated Land Officer to establish:

- Which type of method for testing depth is accepted; and,
- The number of verification areas per property, plot, landscaped area or garden area (some Local Authorities recommend at least 2 per plot for residential developments).

**Important Note:** Where demarcation, physical no-dig and capillary break layers exist they should be verified for their thickness and presence during the time of their installation. Details of the demarcation layer should be agreed with the Contaminated Land Officer prior to placement. This will include the design, type and strength of the geotextile separator or visual warning membrane. The verification of depth and confirmation of such layers should be carried out by a suitably qualified and competent person.

## KP6: Reporting

The purpose of verification documentation is to provide transparent reasoning why the remediation was required, a methodology about how it was to be undertaken and proof that the specified works have been undertaken and to provide confirmation that the site is “suitable for its intended use”.

The document is utilised not only to satisfy conditions of planning permissions but also is to be kept on record by the Local Authority should queries be raised during the lifetime of the development and to confirm to future purchasers that the site is suitable for use.

National Planning Policy Framework (NPPF) states that “planning policies and decisions should ensure that after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990”. The Verification Report is a key document to demonstrate compliance with NPPF, and the responsibility rests with the developer/applicant to submit the required Verification Report to complete the remediation and to discharge any planning conditions.

It is also essential that other supporting documentation is included within a report carried out by a suitably qualified and competent person e.g. laboratory analysis results, delivery tickets for material, certificates for imported material (or if unavailable, documented evidence of the source of the Greenfield material), trial pit logs etc. A checklist has been included in **Appendix 2** to give an idea on what information should be recorded.

Additionally, any reporting should include details of any measures required to maintain the cover system integrity in the future e.g. successive construction phases (management plans) and longer term (restrictive covenants on title deeds).

### **Photographic evidence for validating the depth of cover**

The Local Authority ideally would recommend the following programme of photographs to be taken of the placement of inert cover:

- Photographs of any stockpiles and quarantine areas
- Proof that the depth of inert cover has been installed
- Proof of the quality of the material to be used as inert cover
- Proof there is a geotextile separator and visual warning membranes if used between the underlying material and suitable for use soils.
- Proof of the method of placement and different layers if appropriate
- Proof of the completed project
- Inclusion of background features which will aid locating the photograph
- Inclusion of site identification boards within the photos which show the date, position taken i.e. corner of plot 3 and the site name.
- Inclusion of photographs of site stockpiles and quarantine areas.

The presence of good quality photographs is essential to prove beyond doubt that the remediation has been done as specified both by method and position, and that the images have been taken from the specific area stated.

Refer to **Appendix 3** for examples of good photographic evidence.

## Appendix 1a – Sampling & Testing Matrix

Type	Number of Samples	Testing Schedule	Assessment Criteria
<p><b>Please note that these guidelines apply to a typical residential development, and relaxation of the guidelines or more stringent requirements may apply dependent on local and site specific factors. Therefore, <u>all parameters need to be agreed with the Local Authority.</u></b></p>			
Virgin Quarried Material	1 or 2 depending on the type of stone utilised, to confirm the inert nature of the material.	Standard metals/metalloids (should include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn)	The assessment criteria need to be UK based, e.g. LQM S4ULs, Defra C4SLs or other similarly derived GACs.
Crushed Hardcore, Stone, Brick (excluding asphalt)	Minimum 1 per 500m <sup>3</sup>	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, total TPH.  Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).	
Greenfield/ Manufactured Soils	Minimum 3  Dependent on source and receptor, between 1 per 50m <sup>3</sup> and 1 per 250m <sup>3</sup>	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, pH and soil organic matter (SOM) (or calculated from total organic carbon (TOC)).	
Brownfield/ Screened Soils	Minimum 6  Dependent on source and receptor, between 1 per 50m <sup>3</sup> and 1 per 100m <sup>3</sup>	Standard metals/ metalloids (as above), PAH (16 USEPA speciation), TPH (CWG banded), asbestos, pH and SOM (or calculated from TOC).  Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).	

## Appendix 1b – Questions to Ask Your Soil Supplier Relating to Soil Quality

- What is the source of the material (refer to KP1)? If the source is Greenfield, can they provide evidence of this?
- Will all of the material be coming from the same source?
- Are you satisfied that the material is a suitable growing medium for the proposed end use?
- Has the supplier used an appropriate sampling protocol to ensure a representative sample is analysed? What volume of soil is represented by the analysis and does it comply with Appendix 1a?
- Does the testing include analysis of contaminants identified in Appendix 1a?
- Does the laboratory conducting the analysis have UKAS and MCERTS accreditation for the tests they are carrying out?
- Does the material comply with relevant waste regulations?
- Can I have a copy of the whole analysts report and does it include an interpretive section?
- Will the provided certificate be dated within the last 2 months?

## Appendix 2 – Checklist for Verification Reports

**Example only. Not to be considered as typical minimum requirements. Additional information should be included for non-cover systems aspects of the remediation i.e. gas protection measures etc.**

<b>Site Details</b>	
Site Name / location	
Developer name	
Development use	
Plot No / description of landscaped area (inc plan of inspection areas)	
National Grid Reference	
Inspection visit date	
<b>Supporting Evidence</b>	
Description of remediation (as per agreed Remediation Method Statement including depths / thickness checks, topographical readings)	
Material tracking information (including way tickets etc.)	
Name of groundwork's remediation contractor	
Name of supervising environmental consultant	
Site Specific chemical analysis results	
Verification Photographs (inc. remarks)	
<b>Recommendations</b>	
Pass/fail	
If material fails, how will this be managed i.e. removed, treated	
Detail any further remedial works and/or inspection	
Signed off	

**Failure to provide any of the above information may prevent planning conditions from being discharged.**

## Appendix 3 – Examples of Good Quality Photographs



© Coopers  
Consulting  
Engineers

Photograph 1:  
Depth check of inert  
cover within area of  
public open space.  
Physical break layer  
and topsoil visible.



© WSP

Photograph 2:  
Depth check of inert  
cover with Site &  
Location Information  
Board.



© Coopers Consulting Engineers

Photograph 3:  
Depth check of inert cover within areas of front gardens.



© Coopers Consulting Engineers

Photograph 4:  
Depth check of inert cover within areas of front gardens.



© Coopers Consulting Engineers

Photograph 5:  
Depth check of inert cover within rear gardens. Taut string line spans across excavation.



© Coopers  
Consulting  
Engineers

Photograph 6:  
Depth check of inert  
cover within rear  
gardens. Taut string  
line spans across  
excavation.



© Coopers  
Consulting  
Engineers

Photograph 7:  
Shows the spatial  
location of the  
verification pit.



© **Coopers Consulting Engineers**

Photograph 8: Excavation within public open space and verification pit showing the presence of a remediation break layer at the base, a crushed sandstone inert fill overlain by topsoil.



© **Coopers Consulting Engineers**

Photograph 9: Inert crushed sandstone being delivered. The spatial area of the remediation can be observed from these photographs (old terrace housing).



© **Coopers Consulting Engineers**

Photograph 10: Inert crushed sandstone being delivered with visible remediation break layer. The spatial area of the remediation can be observed from these photographs (traffic lights).



© **Coopers Consulting Engineers**

Photograph 11:  
Shows the remediation of the rear garden, with a significant depth (1.0m) of inert cover. This photograph has been stitched to form a panoramic photograph and hence there is slight distortion



© **Coopers Consulting Engineers**

Photograph 12:  
Shows the remediation of the rear garden, with a significant depth (1.0m) of inert cover. Remediation break layer visible at the base of the excavation.

## **Appendix 3**


### Soil Assessment Values

Inorganic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)
Arsenic	37
Cadmium	11
Chromium (III)	910
Chromium (VI)	6
Lead	200
Mercury	1.2
Nickel	180
Selenium	250
Copper	2400
Zinc	3700

Organic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310

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Prepared	KB	Checked	CLC	Date	13.05.2022	Job No	46663
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 <b>Eastwood &amp; Partners</b> <small>CONSULTING ENGINEERS</small> <b>St Andrew's House</b> <b>23 Kingfield Road</b> <b>Sheffield</b> <b>S11 9AS</b> Tel: (0114) 255 4554 Fax: (0114) 255 4330	<b>WARLEY ROAD, SCUNTHORPE</b>  <b>ONGO HOMES LIMITED</b>  <b>ASSESSMENT CRITERIA – RESIDENTIAL WITH          HOMEGROWN PRODUCE</b>
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Contaminant	Phytotoxicity			
	pH 5.0 to 5.5	pH 5.5 to 6.0	pH 6.0 to 6.5	pH >7.0
Arsenic	50			
Cadmium	3			
Chromium	400			
Lead	300			
Mercury	1			
Nickel	50	60	75	110
Copper	80	100	135	200
Zinc	200	200	200	300


The assessment concentration for lead is the Category 4 Screening Level produced by Contaminated Land: Applications in Real Environments (CL:AIRE) and outlined in Appendix H of their report SP1010. The others have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, 'The LQM/CIEH S4ULs for Human Health Risk Assessment', Land Quality Press, Nottingham. The metals/metalloids are based on a sandy loam soil and 6% soil organic matter. The assessment values are not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. Instead, the modified mean value should be compared with the assessment concentration.

The assessment values for phytotoxicity are the levels at which plant growth is thought to be affected. They are taken from the maximum permissible and advisable concentrations in soil after application of soil sludge given in the 'The Code of Good Agricultural Practice for the Protection of Soil', MAFF, 1998.

The assessment of sulphate, water soluble sulphate, elemental sulphur and sulphide is to determine the aggressive nature of the ground with respect to concrete and consequently the results are compared with BRE Special Digest 1:2005 'Concrete in Aggressive Ground'.

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## **Appendix 4**

### Imported Material Documentation Form

## Imported Soil Documentation Form

<b>Stockpile Identification Reference</b>	
<b>Material Type</b>	
<b>Source Site</b>	
<b>Consignment Note Reference Numbers</b>	
<b>Volume of Stockpile (or number of loads)</b>	
<b>Plots Material to be used in</b>	

**Signed** \_\_\_\_\_

**Position** \_\_\_\_\_

**Date** \_\_\_\_\_