

4 Clean Cover Specification

4.1 Exclusions

- 4.1.1 It is understood that permeable hardstanding is to be used in the construction of new pavement for the access road and car parking area to the north of the dwelling, and concrete floor slabs for the garage and dwelling itself, which will effectively break the source/receptor pathway for human health at these locations. Where present, the provision of hardstanding areas will sever the pathway to end-users of the site, and no action is considered necessary.
- 4.1.2 A clean cover soil system is only required in soft landscaping areas within the northern half of the site, as indicated in the figure above.
- 4.1.3 To protect trees and their roots, no clean cover is required beneath the canopy of any existing mature trees which are to be retained. Made Ground and any associated contamination is likely to be lower at these locations and on consideration of averaging exposure across the whole garden area, such an exclusion is unlikely to pose a significant increase of risk to human health.

4.2 Clean Cover Design

- 4.2.1 All soils should be chemically and physically suitable for use, in terms of the risks to human health.
- 4.2.2 Soils may be site-won or imported from an off-site source.
- 4.2.3 For this development, soft landscaping areas comprise lawns and localised planted areas in a private garden. The required thickness of the cover system can be classified as follows:
- **Clean Cover Requirement:** Minimum 600mm of cover, comprising:
 - o Topsoil, between 150mm and 300mm thick
 - o Subsoil, making up the remainder of the 600mm cover.

4.3 Clean Cover Verification

4.3.1 Material import

- 4.3.1.1 Soils are likely required to be imported as part of the scheme. It is recommended to confirm the origin of materials and to request available chemical testing results from suppliers prior to delivery, in order to provide confidence of suitability.
- 4.3.1.2 The source and volume of all imported soils must be clearly documented, with records provided for inclusion in the Verification Report. As a minimum, records should be sufficient to evidence the material source, supplier, delivery dates and overall volume of imported soil brought onto site.

4.3.2 Material placement

- 4.3.2.1 A series of site photographs from the contractors are required to evidence the laying of the clean cover soils.
- 4.3.2.2 The contractor must clearly document any areas where the full 600mm of clean cover has not been provided, for instance immediately surrounding mature on-site trees.
- 4.3.2.3 Upon completion, Soiltechnics must undertake a series of verification pits to document, photograph and confirm the thickness of the cover system. Based on the size of the garden areas and previous contamination assessment, a minimum of 5 pits should be undertaken, with consideration given to sampling in each different area of landscaping.

4.3.3 Suitability

- 4.3.3.1 Regardless of source, all cover materials must be sampled on site. Where possible, it is recommended to undertake chemical analysis on stockpiled soils to ensure suitability is demonstrated prior to placement.
- 4.3.3.2 To assess the chemical verification testing, concentrations must fall within widely recognised and published soil guideline values for a residential end use with plant uptake. Asbestos, if present, should be quantified and be found at concentrations of less than 0.001% and in no more than 1 in 4 samples.
- 4.3.3.3 In addition, a visual inspection of the soils must confirm the absence of injurious artefacts (such as sharps), and over-sized materials (such as cobbles and boulders).
- 4.3.3.4 Sampling and testing should be undertaken by a geo-environmental consultancy, and comprise the following:

Area	Material Type	Thickness	Chemical Verification Testing	Visual Verification
Remedial Clean Cover Area (≥ 600 mm cover)	Topsoil	150 mm to 300 mm	<i>Testing frequency:</i> Min. of 1 sample / 100m ³ .	≥5 inspection pits within soft landscaping areas. Pits must confirm that capping is ≥600mm in the garden areas .
	Subsoil	≥ 300 mm	Min. of 3 samples per material type. <i>Testing scope:</i> Metals, speciated PAHs, banded TPH, asbestos screening	

Table 4-1: Verification Plan Summary

5 Verification Report

5.1 General Requirements

- 5.1.1 The verification requirements discussed above should be compiled into a Verification Report, which is to be produced on completion of the remedial works.
- 5.1.2 As part of the Verification Report, any imported materials should be clearly documented, including source certificates, delivery notes, and site plans. The results and frequency of verification testing undertaken should also be documented, along with confirmation of the materials suitability for use.
- 5.1.3 Records of the on-site inspections must be included within the Verification Report, and include a hole location plan, logs of the excavation and photographic record as a minimum.

5.2 Client / Contractor Requirements

- 5.2.1 Supporting information will be required from the client and their subcontractors. This includes the following:
- Appropriate site plans confirming location of remediated areas.
 - Photographic evidence of the clean cover system installation.
 - Signed delivery tickets, or an alternative reference system to track any imported loads, including a statement on the type and volume of materials imported.
 - All waste transfer documentation, including a statement on the type and volume of materials taken off-site, and all chemical analysis undertaken to determine compliance with landfill waste acceptance criteria.
 - Details on any unexpected ground conditions encountered and contingency arrangements that had to be implemented.

5.3 Report Requirements

- 5.3.1 The Validation Report will include the following, where appropriate:
- A summary of remedial requirements.
 - Lines of evidence to demonstrate compliant and effective material management, including confirmation of source, volumes and suitability of all site-won and imported materials, delivery notes, waste transfer and consignment notes and chemical testing records.
 - A concise summary of material types, sources and volumes used.
 - Details demonstrating the chemical verification of the capping materials.
 - Details demonstrating the visual verification of the cover system thickness.
 - Details of any unexpected or unencountered materials encountered, along with further investigative and remedial action undertaken.
 - Statements confirming if the remedial objectives have been met, and if the site is suitable for its proposed use.

6 Further Works and Recommendations

6.1 Waste disposal

- 6.1.1 All Made Ground soils destined for off-site disposal will require further analysis to characterise the material, to determine the most appropriate, sustainable, and cost-effective disposal route.
- 6.1.2 All waste/materials transfer documentation must be kept and compiled by the contractor for inclusion into the Verification Report, along with chemical test results confirming acceptability at the disposal destination.

6.2 Cross Contamination

- 6.2.1.1 Every effort should be put into place to prevent cross contamination of soils excavated in the north, from being placed, stored, or re-used in the uncontaminated southern half of the site.

6.3 Unexpected contamination

- 6.3.1 Should any previously unencountered and unexpected contamination be encountered, works in the area should be made safe and temporarily halted. Soiltechnics should then be informed so they can assess the situation and determine an appropriate methodology for continuing.
- 6.3.2 If the works are considered to deviate from the agreed Remediation Strategy, the Local Authority must be informed at the earliest opportunity.

6.4 On-site Verification

- 6.4.1 At least one site visit will be required by a competent geo-environmental consultant to undertake verification works, comprising:
- i. Sampling and inspection of clean cover materials to confirm material suitability. Ideally undertaken on stockpiled soils prior to placement.
 - ii. Excavation of hand-dug inspection pits across soft landscaping and garden areas to confirm cover system construction.

6.5 Verification Report

- 6.5.1 Upon satisfactory completion of the site inspection and chemical verification testing, the consultant must produce a Verification to demonstrate the effective remediation of the site.