

Soil Remediation Strategy

Soil Validation Sampling & Testing

Soil Sampling

In accordance with the current requirements of the regulatory authorities, validation samples will be collected from all materials that are to be subject to movement and reuse, or for materials to be imported onto site to facilitate the proposed residential development.

Soil samples destined for chemical analysis will be collected at regular intervals in appropriate sampling containers. All samples will subsequently be stored in cooled boxes prior to submission to a UKAS / MCERTS accredited laboratory.

All samples will be collected using appropriate PPE and sampling equipment that will be cleaned at each sampling location.

Where material is found to contain concentrations of potential contaminants at levels in excess of the site-specific screening criteria the excavation will be extended, and further sampling undertaken.

The sampling frequency for materials to be managed under the Remediation Strategy is presented within *Table 1.1* and *Table 1.2*.

Table 4.1: Testing Frequency for Material Use on Site (Imported)

Material Use	Testing Frequency
Subsoil Greenfield Source (450mm garden cover)	1 Sample per 200m ³ (Minimum 3 samples)
Subsoil Brownfield Source (450mm garden cover)	1 Sample per 50m ³ (Minimum 3 samples)
Topsoil Greenfield Source (150mm garden cover)	1 Sample per 200m ³ (Minimum 3 samples)
Topsoil Brownfield Source (150mm garden cover)	1 Sample per 50m ³ (Minimum 3 samples)

Table 4.2: Testing Frequency for Material Use on Site (Site Generated)

Material Use	Testing Frequency
Site Generated 6F2	1 Sample Per 1000m ³ (Minimum 3 samples)
Site Won Made Ground General Backfill	1 Sample Per 250m ³ (Minimum 3 samples)
Site Won Natural Backfill	1 Sample Per 2000m ³ (Minimum 3 samples)
Site generated Sub-Soil (450mm garden cover)	1 Sample Per 250m ³ (Minimum 3 samples)
Site Generated Topsoil Cover (150mm garden cover)	1 Sample per 50m ³ (Minimum 3 samples)
Hotspot Validation Samples	1 Sample per 10m of linear excavation to base and sidewall.

Imported Soil Validation Testing

Imported material needs to be compliant with BS3882: 2015 Specification for Topsoil and BS8601: 2013 Specification for Subsoil and requirements for use.

The typical testing suite will comprise:

Arsenic, boron, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate, pH, USEPA PAH 16, asbestos (presence or absence) and organic matter.

Where the source is 'brownfield' or to site source unknown, the soil will additionally be tested for the following:

Speciated banded petroleum hydrocarbons (TPHCWG), benzene, toluene, ethylbenzene and xylene (BTEX), MTBE, cyanide suite, boron and phenol.

Site Generated Soil Validation Testing

The typical testing suite will comprise:

Arsenic, boron, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate, pH, USEPA PAH 16, asbestos (presence or absence) and organic matter, speciated banded petroleum hydrocarbons (TPHCWG), benzene, toluene, ethylbenzene and xylene (BTEX), MTBE, cyanide suite, boron and phenol.

Dependant on this additional sampling and assessment consideration will be given to its emplacement within garden areas.

Soil Validation Criteria

Generic Soil Assessment Criteria – Imported Top & Sub soils

The results of the topsoil and subsoil samples may be contrasted to contemporary UK soil assessment criteria.

With regards to the soil risk assessment for imported top and sub soils Sutcliffe will use the following hierarchy:

-  LQM Suitable 4 Use Levels (S4ULs).
-  ATRISK Soil Screening Values (SSVs) and DEFRA Generic Assessment Criteria (GACs).
-  DEFRA Category 4 Screening Levels (C4SLs) for Lead.

Based upon the above we will use the LQM S4ULs. These use similar assumptions and land uses to C4SLs. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions.

If contaminants are not present as S4ULs, then we propose to use ATRISK SSVs or CL:AIRE GACs. These follow the 'minimal' risk principle and more stringent exposure parameters and will be conservative. The only exception to this is for Lead where the C4SL is used.