
**LIDSEY ROAD, WOODGATE
WEST SUSSEX**

SOIL RESOURCE PLAN

Prepared on behalf of:

BDW SOUTHAMPTON

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1. INTRODUCTION

1.1 Background

- 1.1.1 The project is a residential development which comprises the construction of a number of residential units with associated infrastructure, soft landscaping areas and residential back gardens.
- 1.1.2 The site currently comprises 2 No. agricultural fields. At the time of the initial Soil Resource Survey, the topsoil and subsoil were in-situ and undisturbed.
- 1.1.3 It is the intention to re-use the site soils for the residential back gardens and soft landscape areas of the development.

1.2 Reference Material

- 1.2.1 The following information should be reviewed in conjunction with this *Soil Resource Plan*.
 - Tim O'Hare Associates – Soil Resource Survey Report: *Lidsey Road, Woodgate* (dated 27/05/2025, referenced TOHA/25/2014/EG).
 - Green Landscape Studio Limited- Lidsey Road, Woodgate Phase 2- Landscape General Arrangement- Rev B– Drawing No. GLS_020_170_P2_1300- Date:25.10.2024;

1.3 Report Purpose and Limitations

- 1.3.1 The purpose of the *Soil Resource Plan* is to set out the correct procedures for topsoil recovery (stripping and storage), resspreading and amelioration as well as treatments for the subsoil to ensure that a suitable soil profile is produced to help enable healthy root growth and successful plant establishment.
- 1.3.2 Matters relating to geotechnical and geo-environmental issues are outside the scope of this document.
- 1.3.3 All earthworks activities which involve intensive soil handling, such as topsoil stripping, soil storage and reinstatement should be carried out in accordance with guidance contained within this Soil Management Plan. This includes works undertaken as part of archaeological surveys, services installation and other similar earthworks operations.

2. SITE SOIL RESOURCES

2.1 Site Topsoils

- 2.1.1 The Soil Resource Survey identified the topsoil to be reasonably consistent in composition across the site.
- 2.1.2 The topsoil was found to have the following characteristics:
- Slightly acid;
 - Non-saline;
 - Non-calcareous;
 - *Silty clay loam* texture (moisture retentive);
 - Well developed soil structure;
 - Low stone content, including occasional stones up to 50mm in size;
 - Sufficient reserves of organic matter and most major plant nutrients;
 - Deficiencies in extractable potassium.
- 2.1.3 At present the topsoil has an adequate soil structure and, as such, this should be maintained for future landscape works.
- 2.1.4 Based on written instruction via a email from Kieran McGuire (BDW Southampton) Ltd – 11th July 2025), we understand that there is provision for 50mm imported topsoil for all residential back gardens. Given the problematic nature of the soils, (see Soil Resource Survey report section 5.2 *Soil Suitability for Re-use*) the gardens are likely to perform badly (waterlogging and turf failure), particularly the gardens constructed during the winter and wet periods of the year.

2.2 Site Subsoil

- 2.2.1 The site subsoil has a *clay loam* to *sandy silt loam* soil texture. Soils of these types are characterised as moisture retentive and any damage to the structure of this soil (e.g. by compaction) will further reduce its drainage and aeration potential.
- 2.2.2 Following earthworks and construction activities, the subsoil will require suitable preparation as part of the construction of new landscape areas, including residential back gardens.

3.0 LANDSCAPE CONSTRUCTION

3.1 Development and Landscape Proposals

- 3.1.1 The current proposal for this site includes the construction of a new residential development, with associated residential back gardens and soft landscape areas.
- 3.1.2 To facilitate the development's proposals, the topsoil will be stripped and stored in temporary stockpiles before re-use for landscape construction.
- 3.1.3 The supplied Green Landscape Studio Ltd '*Landscape General Arrangement*' drawing indicates that the soft landscape scheme is likely to include the following:
- Residential back gardens;
 - Tree planting;
 - Ornamental planting mix;
 - Native Shrub;
 - Ornamental shrub planting;
 - Ornamental hedge;
 - Native hedgerow;
 - Marginal / Aquatic planting;
 - Tussocky grassland;
 - Species rich long neutral grassland;
 - Lawn;
 - Mown species rich grassland;
 - Wildflower meadow;
 - Wetland wildflower meadow;
 - SuDS features;
 - Existing Vegetation.
- 3.1.4 These potential landscape types will require a number of soil conditions (varying in terms of drainage characteristics and fertility status) in order to meet the demands of the plants and plant communities.

3.2 Soil Suitability

- 3.2.1 It would be sensible for the selected planting types and species to be suited to *moisture retentive soil* (subject to seasonal waterlogging); the site soils are not suited to species that prefer or demand light-free draining planting conditions, including backfilling tree pits.
- 3.2.2 The topsoil was slightly acid in reaction and the subsoil was slightly alkaline in reaction. As such, selected species should have a wide pH tolerance.
- 3.2.3 Extractable potassium deficiencies were identified within the topsoil and, as such, they should be addressed where necessary by either a suitable green compost application.
- 3.2.4 In relation to species-rich wildflower grassland, tussocky grassland, mown species rich grassland, wildflower meadow, wetland wildflower meadow and marginal / aquatic planting, the overall fertility status of the topsoil (based on its phosphorus content) would be considered to be high. As such,

this topsoil is not suitable to re-use for species-rich habitats and marginal planting. If this topsoil is used for this purpose, it would be unlikely to achieve high levels of floral diversity. It should also be borne in mind that the topsoil will have a significant existing seed bank which would require suitable management particularly during the establishment period in order to encourage the required species/sward development and prevent colonisation by aggressive species such as ryegrass, nettle and dock.

3.3 Summary of Soil Suitability

3.3.1 The horticultural suitability of the site topsoil and subsoil for the proposed landscape types is summarised below. The below is provided on the basis that the soils have adequate soil structures and selected species have a wide pH tolerance and are tolerant of heavy, moisture retentive soils. All large stones should be removed and the nutrient deficiencies addressed where necessary.

Planting Environment	Topsoil	Subsoil
Residential Back Gardens	See Section 5.3	See Section 5.3
Extra Heavy Standard and Semi-Mature Trees	X	X
Standard and Heavy Standard Trees	✓	✓
Ornamental Planting mix	O	O
Native Shrub planting	✓	✓
Ornamental Shrub planting	O	O
Ornamental Hedge	O	O
Native Hedgerow	✓	✓
Marginal/Aquatic planting	X	✓
Tussocky grassland	X	✓
Species rich long neutral grassland	X	✓
Wildflower meadow and Wetland Wildflower Meadow	X	✓
Lawn (low footfall)	✓	✓
Lawn (high footfall)	X	X
SUDS features	*	*

- ✓ = Soil suited to this landscape type.
- O = Soil may be suitable for this landscape type provided soils are in their optimum condition and hardy, robust species are selected.
- X = Soil not suited to this landscape type.
- * = Dependent on SuDs intended use i.e attenuate rainwater - See Soil Resource Survey- Section 5.5 (TOHA/25/2014/1/EG)

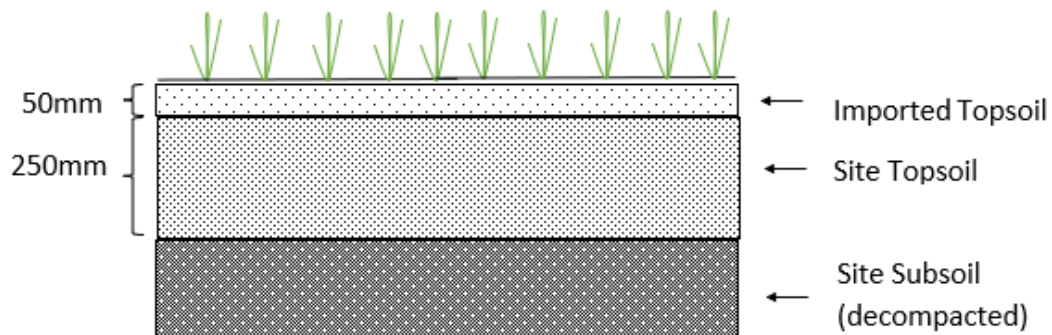
3.4 Drainage Considerations

- 3.4.1 The site soils are dominated by silt sized particles. As such, they will display significant structural degradation by settlement and self-compaction following disturbance, resulting in poor drainage and aeration. These effects are difficult to improve in the short term.
- 3.4.2 Given the soil's vulnerability to damage during handling, it will be essential that the damage caused is minimised by observing *best practice* in terms of soil management. In particular, close attention should be paid to Clause 4.2 *General Soil Handling* and the soils should only be handled when they are reasonably dry and friable in consistency (crumbly). If these soils are handled when they are moist/wet and plastic, the damage caused is likely to render the soil unsuitable for re-use without further reconditioning.
- 3.4.3 In view of these conditions, the site soils would only be suited to plants which are tolerant of moisture retentive soils; they are not suited to more demanding planting environments (e.g. residential back gardens or tree pits) or demanding species which prefer free draining soils. Demanding planting types, such as semi-mature trees, will require improvements to their planting conditions (tree pits) to improve drainage, to prevent tree pits from acting as sumps and to reduce the risk of prolonged waterlogging / stagnation within the rooting zone. Alternative sources of topsoil and subsoil should be considered for such uses.
- 3.4.4 There may be some options to mitigate the poor physical properties of these soils for soft landscape areas, including:
- 3.4.5 Installation of land drainage. Consideration should be given to installing drainage at key locations (base of slopes, residential back gardens – slot drains near the patio) and specifically for vulnerable planting types. The type, design and depth of the drainage should be suitable to the proposed application. Such drainage would require a suitable outfall / discharge point.
- 3.4.6 Localised mounding for tree and shrub planting. The topsoil may be mounded locally for tree pits and shrub beds. This effectively 'lifts' the plants and reduces the risk of harm from waterlogging and improves aeration within the rooting zone.

3.5 Residential Back Gardens

- 3.5.1 As per Clause 2.1.4, we understand there is provision for 50mm of suitable imported topsoil to be placed over 250mm of site topsoil, As shown in *Figure 1*.
- 3.5.2 Consideration should be given to the installation of positive drainage where necessary.
- 3.5.3 **It is essential that the site topsoil has an adequate soil structure following stripping and storage and that this is maintained after placement.**

Figure 1: Soil Build up for Residential Back Gardens



4. SOIL MANAGEMENT PRACTICES

4.1 Outline Requirements

- 4.1.1 This section highlights the sequential treatments for the re-use of the existing soils, including the recovery, storage and re-use of the existing topsoil resource. These practices are based on the DEFRA *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (2009).

4.2 General Soil Handling

- 4.2.1 It is important to avoid soil physical degradation during all phases of soil handling (e.g. stripping, storage, respreading and amelioration). Soil handling operations should ideally be carried out when the soil is reasonably dry and non-plastic (friable) in consistency.
- 4.2.2 The soils (topsoil and subsoil) should not be unnecessarily compacted by trampling or trafficking by site machinery.
- 4.2.3 If, during the course of the earthworks, the soil is structurally damaged, it should be suitably cultivated to relieve the compaction and restore the structure prior to any planting, seeding or turfing.

4.3 Pre-treatment of Existing Vegetation

- 4.3.1 It is good practice to minimise the quantity of vegetation entering the storage stockpiles in order to minimise the formation of anaerobic conditions during storage. As such, in advance of soil stripping, the topsoil should be cleared of surface vegetation by a method suited to the vegetation type present.
- 4.3.2 All grass should be close mown (< 100mm) and the cuttings collected where necessary for removal to a suitable green-waste recycling facility.
- 4.3.3 Trees/hedgerows should be pre-treated before soil stripping, in three stages:
1. Each tree/hedgerow should be felled/cut and removed from site, including all branches/brash.
 2. Stumps and associated large roots (> 20mm diameter) should be lifted using a suitable excavator fitted with a hydraulic grab.
 3. All woody materials (tree trunks, stumps, branches and brash, etc.), including wood chippings, should be removed from site to a suitable green-waste material processing facility for recycling.
- 4.3.4 To minimise anaerobism during storage and preserve the quality of the topsoil as a growing medium, coarse woody materials should not be incorporated with the soils during stripping. This includes any chippings left on the surface after clearance of trees/hedgerows.

4.4 Topsoil Stripping

- 4.4.1 The loose tip method, using dump trucks and hydraulic excavators, should be used to strip, transport and stockpile the topsoil.
- 4.4.2 The loose-tipping method involves the use of a tracked hydraulic excavator, fitted with a flat edged grading bucket to strip the topsoil and load it into a dump truck.
- 4.4.3 The dump truck, running along a pre-designated route, then transports the topsoil to the desired stockpile location.
- 4.4.4 This operation should be monitored to ensure that the topsoil is recovered without the inclusion of other soils (subsoil) or wastes. Cross contamination with other soil could significantly degrade the quality of the topsoil.
- 4.4.5 Any stones, waste or non-topsoil materials (>50mm) should be removed from areas to be stripped prior to topsoil stripping.
- 4.4.6 Stripping should ideally be carried out whilst the soil is reasonably dry and friable. However, if due to construction programme constraints, topsoil stripping needs to be carried out whilst the topsoil is wet, an alternative method for topsoil stockpiling will be used (*Figure 4*).

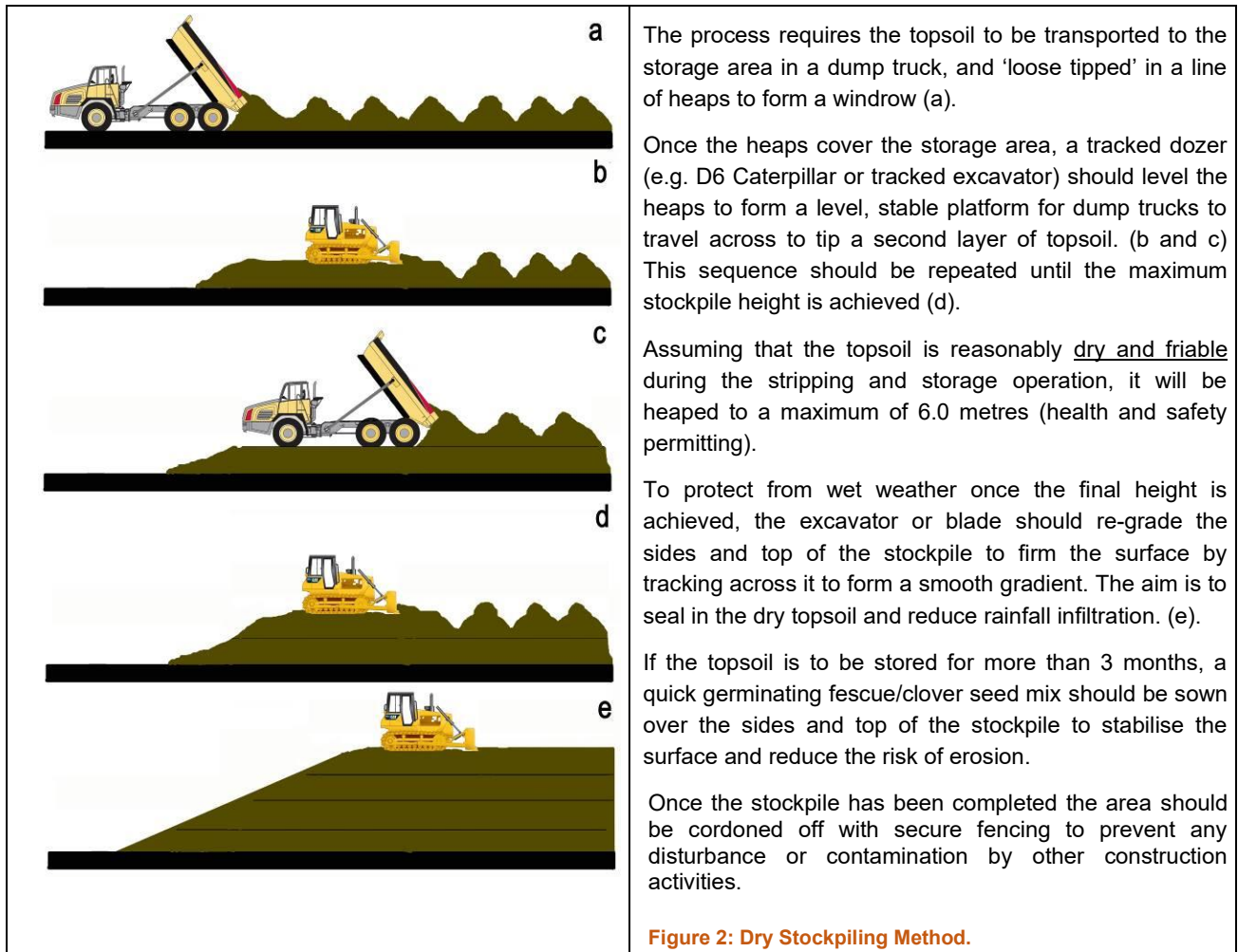
4.5 Depth of Topsoil Strip

- 4.5.1 The depth of strip should be set at 320mm. This will enable the majority of the topsoil to be recovered without the inclusion of significant quantities of subsoil.
- 4.5.2 When using an excavator to strip the topsoil, the colour differences between the topsoil and subsoil can be seen by the machine operator carrying out the soil strip so that some discretion can be made.

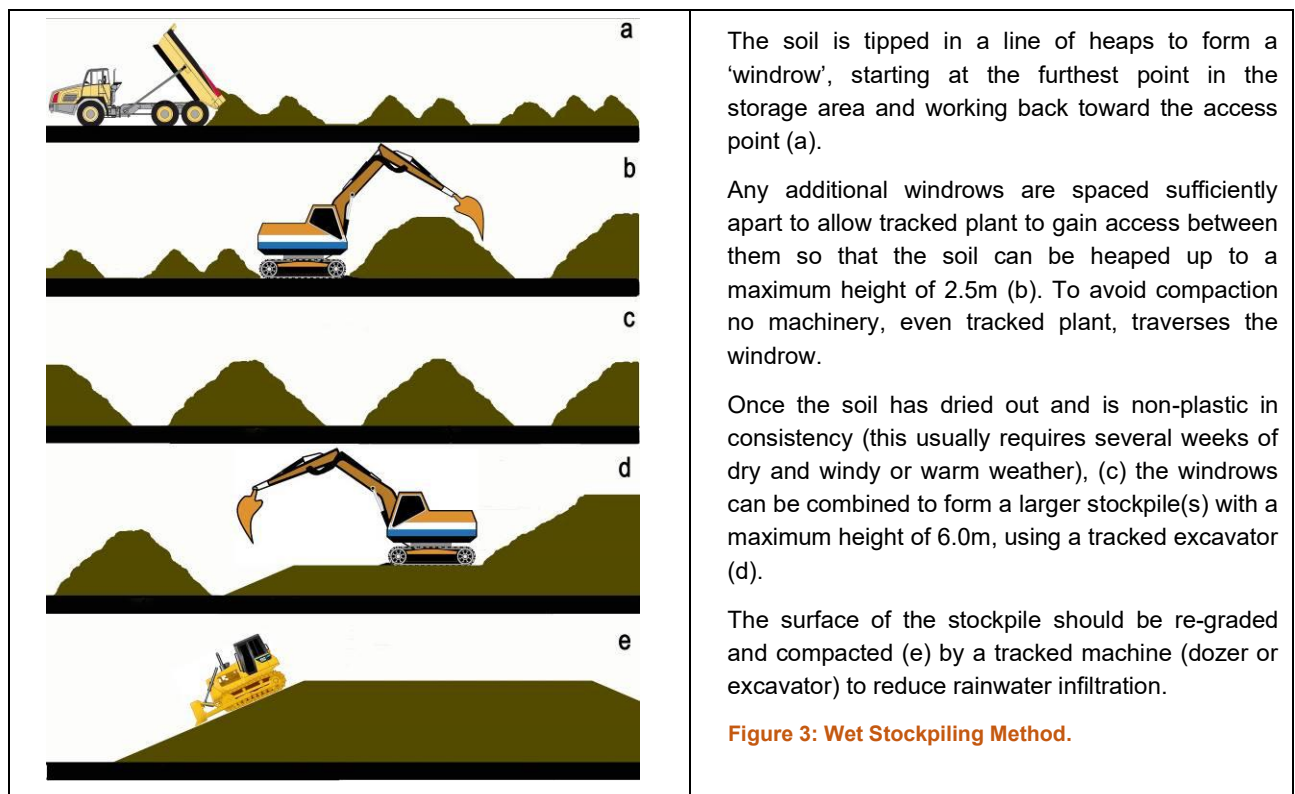
4.6 Topsoil Stockpiling

- 4.6.1 The topsoil should be stockpiled prior to re-spreading into the residential back gardens and landscape areas when they become available.
- 4.6.2 The topsoil should be stored in an area of the site where it will not interfere with other site operations so that it can be left undisturbed during other construction activities. The area that is to be used for storing the topsoil will be cleared of vegetation, in-situ topsoil and any waste arising from the development e.g. building rubble and fill materials.
- 4.6.3 The topsoil should be transported to the storage area in a dump truck and be 'loose tipped' in a series of heaps, starting at the furthest point and working back towards the storage area access.
- 4.6.4 There are two options for stockpiling the topsoil depending on the **moisture content** and **plasticity**. These are referred to here as *dry soil stockpiling* and *wet soil stockpiling*.

4.6.5 The dry stockpiling method is illustrated below (*Figure 2*).



4.6.6 The wet stockpiling method is illustrated below (*Figure 3*); the wet soils are tipped for temporary storage as windrows until the topsoil has dried out. This technique minimises the amount of compaction caused by stockpiling as well as maximising the surface area of the stockpile to enable the soil to dry out. The reconditioning operation would ideally be timed during the summer months (May to September), to allow enough time for the topsoil to dry out effectively.



4.7 Subsoil Preparation – General

- 4.7.1 Prior to any subsoil preparation works, the location and depth of all services shall be determined and clearly marked out to ensure that all services are avoided and not damaged.
- 4.7.2 Any concrete haunching at the edges of landscape areas should be trimmed to the required minimum. The trimmings should be collected and removed off-site to a suitably licensed waste recycling facility.
- 4.7.3 The site subsoil should be placed and graded in accordance with the Engineer's requirements. Grade to smooth flowing contours to achieve the desired formation levels and falls and the specified finished levels of topsoil.
- 4.7.4 Any large stones and other debris larger than 75mm brought to the surface during site subsoil spreading should be stone picked or raked and removed. The stones should either be re-used on site or they should be removed off-site to a suitably licensed waste facility.
- 4.7.5 Any drainage for residential back gardens and landscape areas should be installed at this stage.
- 4.7.6 It is likely that the site subsoil will have been heavily compacted following the construction period and, as such, the subsoil should be prepared or thoroughly decompacted using the appropriate method.

4.8 Residential Back Gardens (Winter/ Wet Months) – Subsoil Preparation

- 4.8.1 For residential back gardens constructed winter / Wet months, the surface of the site subsoil should be 'roughed up' (to a depth of 100mm) using the teeth of a bucket attached to an excavator. This will help to 'key in' the imported topsoil.

4.9 Residential Back Gardens (Summer) and Soft Landscape Areas – Subsoil Preparation

- 4.9.1 For residential back gardens constructed in summer and soft landscape areas (e.g. field boundaries, corners of the site, steep slopes or adjacent to roads and pathways), a tracked excavator fitted with a single tine ripper attachment (ripper tooth) should be used to loosen the site subsoil. A toothed bucket is not an acceptable alternative. The subsoil should be loosened to a depth of at least **300mm at 300mm centres** to break up any panning.
- 4.9.2 Repeated passes may be needed to break up the site subsoil sufficiently. This will be largely dependent on the strength of the soil and its resistance to cultivation at the time of the operation.
- 4.9.3 Any large stones and other debris >75mm brought to the subsoil surface by this cultivation should be stone picked or raked and removed. The stones (and other debris) should be removed off-site to a suitably licensed waste recycling facility.
- 4.9.4 Following decompaction and stone picking, any large subsoil clods should be broken up using a toothed excavator bucket and then the subsoil surface should be roughly levelled and lightly firmed (without recompacting) to provide a reasonably level surface to place the topsoil.



Plate 1: Excavator arm fitted with a Single Tine Ripper Attachment



Plate 2: Single Tine Ripper working



Plate 3: Toothed bucket breaking up large subsoil clods.



Plate 4: Back of excavator bucket lightly firming up the subsoil post ripping.

4.10 Topsoil Respreading – Residential Back Gardens and Landscape Areas

4.10.1 The aim of this operation is to respread the approved topsoil and to minimise and eliminate any soil compaction caused during the process.

- All residential back gardens – combination of *Site Topsoil* and *Imported Topsoil*
- Landscape areas: *Site Topsoil*

4.10.2 For *residential back gardens*, the non-plastic site topsoil shall be placed as a 'lower topsoil' with a thickness of 250mm, with a layer of imported topsoil placed as an 'upper topsoil' to achieve 50mm thickness.

4.10.3 Following topsoil respreading, the soil profile shall comprise a minimum of 400mm decompacted soil (topsoil and subsoil combined) for handover to the Landscape Contractor. The aim of the decompaction operation is to break up compacted soil layers, prior to the final topsoil cultivation.

4.10.4 Prior to commencement, the Groundworks Contractor shall set out a proposed Method Statement to respread the approved topsoil onto prepared subsoil based on the following guidelines.

- The approved topsoil should be spread using a combination of tracked excavator and dump truck.
- During topsoil spreading, all plant should work from the site subsoil layer only.
- Trafficking over the prepared subsoil with either tracked or wheeled vehicles will cause further compaction. Therefore, all operations should be organised to minimise trafficking over prepared subsoil.
- Trafficking by wheeled vehicles is more damaging to soils than tracked equipment and should therefore be kept to an absolute minimum. Dump trucks should run on pre-designated access routes only. Drivers should be disciplined to keep to these routes at all times.
- A larger excavator (e.g. 8 tonne) with a longer reach may be beneficial to reduce tracking over the subsoil. Wherever possible, the reach of the excavator should be utilised to minimise tracking on the subsoil.

- Following topsoil spreading, the access routes should be decompacted to break up the compaction caused during placement, e.g. by ripping using the excavator fitted with the single rigid tine attachment to a **minimum depth of 300 mm at 300 mm centres**.
- 4.10.5 The proposed Method Statement shall be submitted to the BDW Southampton site management team for review.
- 4.10.6 A photographic record shall be made of all operations and submitted to the BDW Southampton site management team upon completion of topsoil spreading in each area.
- 4.10.7 An example sequence of the required operations is presented below. It is advisable to work within the reach of the excavator, i.e. completing the whole process from start to finish for a single 'section' before moving the excavator to the next point and starting the process again. This reduces the amount of trafficking on prepared soil.

Example Sequence of Operations: Subsoil Preparation / Decompaction and Topsoil Spreading

1. Remaining in one location, the site subsoil is prepared:
 - Residential back gardens – (Winter/Wet months) - roughed with teeth of bucket
 - Residential back gardens – (Summer) – decompacted with single rigid tine.
2. Running on a designated access route, the dump truck deposits the first soil layer by the excavator:
 - Residential back gardens – site topsoil (250mm)
3. Remaining in one location, the excavator respreads the approved topsoil to the required thickness.
4. **Each soil layer is lightly firmed (not over compacted) before placing the next soil layer.**
5. Running on a designated access route, the dump truck deposits the second soil layer in a small heap by the excavator:
 - Residential back gardens – imported topsoil (50mm)

- 4.10.9 Before commencing any turfing, the Landscape Contractor shall check and record the topsoil depth in each Plot to confirm it meets the minimum requirement of **300mm**.
- 4.10.10 The Landscape Contractor shall confirm in writing to BDW Southampton that they are satisfied with the quality and condition of the topsoil in each plot for lawn turf, before commencing any turfing.

4.11 Topsoil FIRMING

- 4.11.1 After the topsoil has been respread, the topsoil should be 'firmed' to reduce future settlement, without causing over-compaction.
- 4.11.2 For residential back gardens, suitable methods may include the back of the excavator bucket and/or 'toe and heel' by operatives.

4.12 Topsoil Depths

4.12.1 The topsoil depths after firming and settlement should be:

- 300mm for the residential back gardens
- 300mm for planting purposes
- 150mm for seeded areas

4.12.2 If surplus topsoil is expected to be generated on site, then the topsoil thickness for seeded areas may be increased from 150mm to 300mm.

4.12.3 Topsoil thickness should only exceed these specified depths with the approval of the project Soil Scientist.

4.13 Final Topsoil Cultivation

4.13.1 After resspreading and regrading the topsoil, any large, compacted lumps should be broken down using suitable tillage equipment to produce a fine tilth suitable for planting (<40mm), turfing and seeding (<10mm).

4.13.2 For small confined areas such as individual back gardens, examples of appropriate equipment to use for this cultivation include *pedestrian power harrow* or *rotavator*.



Plate 5: Example of power harrow



Plate 6: Example of pedestrian rotovator

4.13.3 Within each area/plot, cultivation should begin at the point farthest from the plot access, working backwards. Once the topsoil has been cultivated, **no further machinery should traffic over the soil surface**. Unnecessary foot trafficking must also be minimised.

4.13.4 Any undesirable material brought to the surface during this exercise should be removed by picking or hand raking. For example, fill materials and stones larger than 50mm in any dimension.

4.14 Soil Ameliorants – Site Won Topsoil (Residential Back Gardens and Landscape Areas)

- 4.14.1 For tree and shrub planting, we recommend applying and incorporating suitable compost (e.g. PAS100:2018 /Landscape Institute/WRAP grade (10mm screened) green compost) into the upper 200mm of topsoil (ensuring the soil is dry and friable) at a rate of **15%** by volume. This application should address the deficiencies in plant nutrients.
- 4.14.2 A **Pre-Seeding Grass Fertiliser** should be applied prior to seeding and turfing, following the manufacture's recommendations.

4.15 Soil Ameliorants – Imported Topsoil (Residential Back Gardens)

- 4.15.1 The use of green compost, fertilisers or any other soil ameliorants is dependent on the findings of the soil tests and the recommendations of the Soil Scientists report (see attached *Specification for Imported Topsoil* - Section 4.3).

- **Compost for Planting – Provisional Item**

- 4.15.2 Apply and incorporate a suitable compost (e.g. PAS100:2011 /Landscape Institute/WRAP grade (10mm screened) green compost) into the topsoil to achieve the specified levels of organic matter and fertility. Provisional rate: 20% incorporated to a depth of 200mm.

- **Fertiliser for Planting – Provisional Item**

- 4.15.3 Apply and incorporate the compound, slow release fertiliser *ICL Enmag CRF* (11%N:22%P₂O₅:9%K₂O:6%MgO) to achieve the specified levels of fertility. Provisional rate: 70g/m² and to a depth of 250mm.

- **Fertiliser for Amenity Grass Establishment – Provisional Item**

- 4.15.4 Apply and incorporate the pre-seeding grass fertiliser *ICL Sportsmaster Pre-seeder* (8%N:12%P₂O₅:8%K₂O+3%MgO) prior to seeding or turfing. Provisional rate: 35 g/m² and to a depth of 100mm.

4.16 Turf Installation

- 4.16.1 Lay new turf (with foot traffic only) in accordance with Turfgrass Growers Association (TGA) specification (www.turfgrass.co.uk).
- 4.16.2 As soon as the turf is anchored into the topsoil and the prevailing weather conditions are suitable, the surface of the lawn should be spiked to a **minimum depth of 75mm**. This will improve aeration and drainage through the turf layer. This can be achieved using a powered pedestrian aerator.



Plate 7: Pedestrian aerator



Plate 8: Pedestrian aerator fitted with solid tines

Document Qualifications

This document considers the re-use of the site soils for landscape purposes at the Lidsey Road site in Woodgate. It should not therefore be relied on for alternative end-uses or for other schemes. This report has been prepared solely for the benefit of our client BDW Southampton. No warranty is provided to any third party and no responsibility or liability will be accepted for any loss or damage in the event that this report is relied upon by a third party or is used in circumstances for which it was not originally intended.

Appendix 1

Specification for Imported Topsoil

1.0 INTRODUCTION

This Soil Specification document sets out the requirements for imported soils, and the measures and techniques for sampling and testing soil to be sourced for the landscape scheme for the Lidsey Road site in Woodgate.

All imported soils should be obtained which comply with both the horticultural requirements (as detailed in Section 2.0) and environmental requirements (as detailed in Section 3.0).

1.1 Soil Types

Imported topsoil and subsoil should be used for the construction of the back gardens and landscape scheme to ensure that each planting environment has the correct growing conditions.

The soil materials covered by this specification document are:

Soil Type	Landscape Type
Imported Topsoil	Back Gardens Trees >12-14cm girth Amenity grass (high footfall)
Imported Subsoil	Trees >12-14cm girth

2.0 HORTICULTURAL SOIL REQUIREMENTS

2.1 Imported Topsoil

Imported Topsoil shall meet the following criteria:

Visual Examination

The topsoil shall be free from non-soil material, brick and other building materials and wastes, sharps, hydrocarbons, plant matter, weed seeds or roots, and any other foreign matter or material or substance that would render the topsoil unsuitable for horticultural use.

Parameter	Unit	Lower Limit	Upper Limit
Clay (<0.002mm)	%	5	18
Silt (0.002-0.05mm)	%	5	20
Sand (0.05-2.0mm) Of which at least 50% shall fall into fine to medium sand range (0.15-0.50mm)	%	65	85
Stones (2-20mm)	%DW	--	15
Stones (20-50mm)	%DW	--	5
Stones (>50mm)	%DW	--	0
pH Value	Unit	6.0	8.5
Electrical Conductivity (1:2.5 water extract)	µS/cm	--	1500
Electrical Conductivity (CaSO ₄ extract)	µS/cm	--	3300
Exchangeable Sodium Percentage	%	--	9
Organic Matter	%	4.0	8.0
Total Nitrogen	%	0.20	--
Carbon: Nitrogen Ratio	--	--	20:1
Extractable Phosphorus	mg/l	26	100
Extractable Potassium	mg/l	240	1500
Extractable Magnesium	mg/l	80	600

2.2 Landscape Subsoil

Imported Subsoil shall meet the following criteria:

Visual Examination

The subsoil shall be free from non-soil material, topsoil, brick and other building materials and wastes, sharps, hydrocarbons, plant matter, weed seeds or roots, and any other foreign matter or material or substance that would render the subsoil unsuitable for horticultural use.

Parameter	Unit	Lower Limit	Upper Limit
Combined Clay and Silt (<0.05mm)	%	10	30
Sand (0.05-2.0mm) Of which at least 50% shall fall into medium to coarse sand range (0.25-1.0mm)	%	70	90
Stones (2-50mm)	%DW	--	30
Stones (>50mm)	%DW	--	0
Saturated Hydraulic Conductivity	mm/hr	10	150
pH Value	Unit	5.5	8.5
Electrical Conductivity (1:2.5 water extract)	µS/cm	--	1500
Electrical Conductivity (CaSO ₄ extract)	µS/cm	--	3300
Exchangeable Sodium Percentage	%	--	15
Organic Matter	%	--	2.0

3.0 ENVIRONMENTAL REQUIREMENTS

The following Generic Assessment Criteria (GAC) shall be used as Tier 1 screening values for the assessment of soil(s) to be used.

In circumstances where any of these values are exceeded, further risk assessment and/or testing should be undertaken to confirm the significance of the non-compliance.

Parameter	Unit	GAC
Inorganic Arsenic	mg/kg	37
Boron (soluble)	mg/kg	3
Cadmium	mg/kg	11
Chromium (III)	mg/kg	910
Chromium (IV)	mg/kg	6
Copper	mg/kg	100
Lead	mg/kg	200
Mercury	mg/kg	1.2
Nickel	mg/kg	60
Selenium	mg/kg	250
Zinc	mg/kg	200
Phenol	mg/kg	550
Benzene	mg/kg	0.17
Toluene	mg/kg	51
Ethylbenzene	mg/kg	39
Xylene - m	mg/kg	74
Xylene - o	mg/kg	67
Xylene - p	mg/kg	69
Aliphatics C5-C6	mg/kg	78
Aliphatics C6-C8	mg/kg	230
Aliphatics C8-C10	mg/kg	65
Aliphatics C10-C12	mg/kg	330
Aliphatics C12-C26	mg/kg	2400
Aliphatics C16-C35	mg/kg	92000
Aromatics C5-C7	mg/kg	140
Aromatics C7-C8	mg/kg	290
Aromatics C8-C10	mg/kg	83
Aromatics C10-C12	mg/kg	180
Aromatics C12-C16	mg/kg	540
Aromatics C16-C21	mg/kg	1500
Aromatics C21-C35	mg/kg	1500
Acenaphthene	mg/kg	85
Acenaphthylene	mg/kg	69
Anthracene	mg/kg	950
Benzo(a)anthracene	mg/kg	6.5
Benzo[a]pyrene	mg/kg	2.0
Benzo(b)fluoranthene	mg/kg	2.1
<i>Continued</i>		

Parameter	Unit	GAC
Benzo[a]pyrene	mg/kg	2.0
Benzo(b)fluoranthene	mg/kg	2.1
Benzo(g,h,i)perylene	mg/kg	340
Benzo(k)fluoranthene	mg/kg	75
Chrysene	mg/kg	9.4
Dibenzo[a,h]anthracene	mg/kg	0.27
Fluoranthene	mg/kg	130
Fluorene	mg/kg	67
Indeno(1,2,3-cd)pyrene	mg/kg	21
Naphthalene	mg/kg	5.6
Phenanthrene	mg/kg	38
Pyrene	mg/kg	270
Asbestos screen	Detected / Not Detected	Not Detected

* GAC values derived from LQM CIEH S4ULs (2015), DEFRA SP1010, BS3882:2015 and HSE Control of Asbestos Regulations 2012.

4.0 SOIL SAMPLING AND TESTING

The soil materials considered for importation shall be sampled while stockpiled off site at their source or manufacture location. The Contractor shall carry out verification tests on the soil materials and await written approval from the clients representative prior to importing the soil to site.

All sources of topsoil / subsoil shall be independently sampled, tested and approved before import to site.

A suitably qualified and approved Soil Scientist shall be commissioned by the Contractor at his cost to undertake the sampling and testing of the soil materials considered for importation. An approved Soil Scientist is: Tim O'Hare Associates LLP Howbery Park, Wallingford, Oxon, OX10 8BA Tel: [REDACTED] Website: www.toha.co.uk.

4.1 Sampling Protocol

The samples shall be truly representative of the soil to be offered. One *Composite Sample* shall be taken for every **250m³** of soil to be used.

Each composite sample should be made up of **10 No. sub-samples** taken from evenly spaced locations across the stockpile. The sub-samples shall be mixed together and quartered down to form a **5kg** composite sample. Each composite sample shall be placed in a clean, strong plastic bag and a 500ml brown glass, wide-necked jar (for organics testing) and each labelled with the source reference and date of sampling. Glass jar samples shall be stored and delivered to the laboratory in a cool box within 24hrs of sampling.

Soils of different types should never be mixed to form a composite sample.

The sample results should be analysed on a 10 working day turnaround and the Contractor should incorporate this into their programme.

The sampled soil materials shall be temporarily stockpiled at the source location while the Contractor awaits receipt of the soil analysis results and until the Clients representative has reviewed the results and provided written approval on its suitability for use within the project.

4.2 Testing Schedules

The composite samples shall be sent to a UKAS and MCERTS accredited laboratory(s) with a request for each sample to be analysed strictly in accordance with relevant *Testing Schedule* given below.

4.2.1 Imported Topsoil

The following testing parameters shall be requested for the composite *Imported Topsoil* samples (methods in accordance with BS3882:2015 or as indicated):

1. Visual examination to record Munsell colour, moisture status, aerobic state, the presence of any deleterious materials (incl. invasive weeds) or unusual odours (e.g. petroleum hydrocarbons).
2. Detailed Particle Size Analysis (clay, silt, 5 sands – USGA sieve sizes)
3. Stone Content by % weight (2-20mm, 20-50mm, >50mm)
4. pH Value (1:2.5 soil/water extract)
5. Electrical Conductivity (1:2.5 soil/water extract)
6. Electrical Conductivity (1:2.5 soil/CaSO₄ extract)
7. Exchangeable Sodium Percentage
8. Organic Matter (%)
9. Total Nitrogen (% - Dumas Method)
10. Extractable Phosphorus, Potassium & Magnesium (RB427 Method)
11. **Potential Contaminants** – See parameters in **Section 3.0**

4.2.2 Imported Subsoil

The following testing parameters shall be requested for the composite *Imported Subsoil* samples (methods in accordance with BS8601:2013 or as indicated):

1. Visual examination to record Munsell colour, moisture status, aerobic state, the presence of any deleterious materials (incl. invasive weeds) or unusual odours (e.g. petroleum hydrocarbons).
2. Detailed Particle Size Analysis (clay, silt, 5 sands – USGA sieve sizes)
3. Stone Content by % weight (2-20mm, 20-50mm, >50mm)
4. pH Value (1:2.5 soil/water extract)
5. Electrical Conductivity (1:2.5 soil/water extract)
6. Electrical Conductivity (1:2.5 soil/CaSO₄ extract)
7. Exchangeable Sodium Percentage
8. Organic Matter (%)
9. Saturated Hydraulic Conductivity (Modified percolation test. (Saturated Hydraulic Conductivity on Manufactured Topsoil. Method based on *ASTM F1815:2011*. Percolation Test – 40cm tension)
10. **Potential Contaminants** – See parameters in **Section 3.0**

4.3 Reporting

The results of analysis for each proposed source of soil shall be presented in an interpretive report. Each report shall contain the following information:

- Source name and location
- Date of sampling;
- Description of the soil (and components used if a manufactured topsoil);
- Photographs of the stockpile and the soils;
- Visual examination;
- Certificates of Analysis.
- Interpretation of all results with comments on the suitability of the material for use in the proposed scheme.

SPECIFICATION QUALIFICATIONS

This document considers the proposal to use imported soils for soft landscaping purposes at the Lidsey Road site in Woodgate. This document should not therefore be relied on for alternative end-uses or for other schemes.

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