
**LIDSEY ROAD, WOODGATE, WEST
SUSSEX**

SOIL RESOURCE SURVEY

Prepared on behalf of:

BDW SOUTHAMPTON

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1.0 INTRODUCTION

Tim O'Hare Associates (TOHA) LLP was commissioned by BDW Southampton to undertake a Soil Resource Survey at the Lidsey Road site in Woodgate, West Sussex.

The authority to carry out the work was confirmed by Kieran McGuire of BDW Southampton via email, with receipt of a signed Authority to Proceed form dated 14/01/2025.

1.1 Purpose

TOHA understands that a residential development is to be constructed at this site, which will comprise of a number of residential units, with associated infrastructure, soft landscape areas and residential back gardens.

As part of the development strategy, the site topsoil will be stripped and stored in temporary stockpiles before it is re-used for landscape purposes.

The existing site currently comprises agricultural land and, as such, contains quantities of topsoil and subsoil. There is no information available on the horticultural quality and suitability of the soils for landscape purposes within this development. Therefore, the purpose of this survey was to assess the quality of the site soils to advise on their suitability for re-use for the proposed landscape purposes, including residential back gardens.

1.2 Actions

TOHA has evaluated the quality and suitability of the soils for the proposed landscape scheme by a combination of desk study review, on-site investigation and laboratory analysis.

This report issues the findings of the Soil Resource Survey for the Lidsey Road site in Woodgate, including the site observations and soil descriptions, results and interpretation of all analyses, discussion on the soil's quality and its suitability for future landscape construction.

2.0 DESK STUDY REVIEW

2.1 Documents Reviewed

Prior to commencing the site investigation work, the following documents were reviewed:

- *Soil Map of England and Wales – Sheet 6- South East England (1:250,000);*
- *British Geological Survey Website (Geology of Britain);*
- *Ashdown Site Investigation Limited; Land West of Lidsey Road (A29)- Combined Geotechnical and Quantitative Ground Contamination Risk Assessment. Project Ref:P16305 Report Ref: R15924. Issue Date: 13/12/2023;*
- *Green Landscape Studio Limited - Lidsey Road, Woodgate Phase 1 & Phase 2- Planting Plan Sheet 1-7 – Drawing No. GLS_020_170_P1 & P2_1501-1507- Date:25.10.2024;*
- *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;*
- *Green Landscape Studio Limited- Lidsey Road, Woodgate-Landscape Specifications- Phase 1 & Phase 2- Document number. GLS_020_170_P1&P2_1801- Date: 28/10/2024;*
- *Siteline Geospatial- Site Survey - Land West of Lidsey Road, Woodgate-Sheets 1-9 - Drawing No.36WJ01 – Date: November 2024.*

2.2 Soils and Geology

Soils

The Soil Map of England and Wales (1:250,000 scale) classifies the soils as:

Major Group	Ground water gley soils
Group	<i>Argillic gley soils</i>
Subgroup	<i>Typical argillic gley soils</i>
Series	Park Gate (841e)

Ground water gley soils are normally developed within or over permeable materials, that have prominently mottled or uniformly grey subsoils resulting from periodic waterlogging by a fluctuating groundwater table. Argillic gley soils have a clay enriched subsoil.

The PARK GATE series soils are 'deep stoneless silty soils variably affected by groundwater' .

Geology

The British Geological Survey 1:50,000 Solid and Drift map indicates that the site is underlain by *London Clay Formation - clay, silt and sand*, a sedimentary bedrock formed between 56 and 33.9 million years ago during the Palaeogene period.

Superficial deposits of *River Terrace Deposits* - sand, silt and clay overlay the bedrock. This is a sedimentary deposit formed between 2.588 million years ago and the present during the Quaternary period.

2.3 Ground Investigation Report

A Ground Investigation of the site was carried out by Ashdown Site Investigation Limited between September 2023 to November 2023, with a series of dynamic sampler boreholes and hand dug pits.

Ground conditions recorded by Ashdown Site Investigation Limited are summarised below:

<i>Topsoil</i>	<i>In general, each of the exploratory holes was excavated through a surface cover of topsoil up to some 300mm in thickness.</i>
<i>Subsoil</i>	<i>Subsoil, comprising slightly gravelly slightly sandy silty clay, was encountered to depths of between 0.30m and 0.70m below ground level within the exploratory holes located in the field. The gravel fraction generally comprised chalk and flint, although locally anthropogenic material of brick and plastic was encountered within the subsoil. Subsoil was not encountered within trial pits TP601 to TP609.</i>
<i>Made Ground</i>	<i>Made ground, generally comprising slightly gravelly slightly sandy silty clay, was encountered to depths of between 0.35m and 0.60m in the boreholes along the northern boundary and to the full depth (0.60m below ground level) of each of the trial pits in this area of the site. The gravel fraction comprised variable quantities of sandstone, chalk, flint, brick, clinker-like material, charcoal-like material, ash-like material, ironstone, plastic and organic material. In addition, a layer of made ground was encountered between the topsoil and subsoil in borehole WS612, located within the northeastern corner of the main part of the site. This layer of made ground comprised slightly gravelly slightly sandy silty clay to a depth of 0.30m below ground level. The gravel fraction comprised variable quantities of brick, flint, ash-like material, clinker like material and chalk. Made ground was not encountered elsewhere on the site.</i>
<i>River Terrace Deposits</i>	<i>Underlying the subsoil and made ground (where penetrated), the investigation progressed into undisturbed slightly gravelly slightly sandy silty clay. These soils were generally recorded to be of firm to stiff consistency, locally becoming very stiff, and were typically recorded to depths of between 1.00m and 2.20m below ground level.</i> <i>Beneath these clay soils, loose to medium dense and medium dense silty sand soils were encountered to the full depth of the majority of the boreholes, with the exception of borehole WS610 and previous borehole WS104, where these soils persisted to a depth of 3.10m and 3.30m below ground level, respectively. These deposits are considered to represent the River Terrace Deposits indicated to underlie the site on BGS geological maps.</i> <i>Below the sand soils, boreholes WS610 and WS104 progressed into a firm to stiff dark grey clay which continued to the full depth of the borehole. It is possible that these soils represent the transition zone between the River Terrace Deposits and the underlying London Clay Formation.</i>

Samples of Made Ground were submitted to a laboratory for a general suite of contaminant testing, including metals, speciated PAHs, inorganics and asbestos. The report concluded *'The concentrations of PAH compounds within the made grounds soils are therefore considered to represent less than a "low level of toxicological concern" as discussed within the SP1010 report. No suspected asbestos materials were noted within the made ground soils.'*

2.4 Proposed Landscape Uses

From the supplied *Lidsey Road, Woodgate Phase 2- Landscape General Arrangement Rev B* the current landscape proposals the following planting types:

- 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.

These landscape environments will require a number of soil types (varying in terms of drainage characteristics and fertility status) in order to meet their demands. The soil requirements of each landscape type are considered below.

Residential Back Gardens

Residential back gardens are often areas of high foot-trafficking and, as such, can receive high levels of 'wear and tear'. The soils therefore need to be able to resist the compaction caused by such activities. Therefore free-draining, sandy soils are usually preferred.

Where grass is established as turf rather than seed, new turf comes with a dense root/soil mat which is usually smeared/compacted from cutting/handling/laying. After it is initially laid, it can form a very slowly permeable cover over the ground. In order to address this problem, decompaction / aeration measures are important as part of the turf's initial maintenance.

In addition, residential back gardens are considered to be a 'sensitive' end-use in relation to concentrations of potential contaminants (e.g. heavy metals, hydrocarbons). As such, the contaminant levels in the soils used should comply with the project's environmental requirements.

Extra Heavy Standard and Semi-mature Trees

Extra heavy standard and semi-mature trees (20-25cm girth) are a demanding planting environment to construct. Trees of this size and age have grown accustomed to optimum growing conditions in the nursery, and these need to be replicated when the rootballed or containerised tree is planted in the pit. In particular, aeration and drainage around the rootball as well as moderate to high fertility status are critical. Without these properties, trees will very quickly suffer and possibly die during their first few growing seasons after planting.

Given their demanding nature all rootballed trees should be planted with well-aerated and free-draining soils to the full rooting depth (normally considered to be 1.0m).

Standard and Heavy Standard Trees

Standard and heavy standard trees (up to 14-16 cm girth) prefer well drained / aerated and nutritious soil. Smaller tree stock such as these do not tend to compact the underlying soils and have relatively compact rootballs, requiring less extensive planting pits.

Ornamental Planting Mix, Native Shrub, Ornamental Shrub Planting, Ornamental Hedge

Ornamental planting mix, native shrub and ornamental shrub and hedge planting typically come in the form of containerised stock. This planting type requires shallower depths of soil than trees and the plants themselves can be variable in their specific soil requirements. Depending on the species selected, certain ornamental and native shrubs may not be tolerant of adverse soil conditions and would require soils which are fertile, well drained and aerated.

Native Hedgerow

Native hedgerows comprise indigenous woodland plant species, planted as bareroot whips and feathered trees. These are less demanding than containerised stock. As such, a broader range of soil types may be re-used for these, provided the species selected do not require any specific growing conditions. The soils must possess a satisfactory structure to support plant growth. The topsoil and subsoil should have suitable pH and drainage characteristics for the selected species.

Marginal/Aquatic planting

Marginal/ Aquatic planting are located around pond edges and within wetland areas. The plant species selected are normally suited to intermittent/permanent periods of waterlogging. They are not typically tolerant of drought/ or periods during which the soils dry out. Given their close association with water bodies, highly fertile soils are not normally used for marginal planting to minimise risk of water enrichment.

Lawn areas

Lawn areas anticipated to receive low rates of foot traffic (e.g. on road verges / embankments) can typically be established on a wide range of soil types provided the soil has a reasonable structure and no significant compaction to a depth of at least 300mm. Soil with low stone contents is normally required for seeded lawn areas, and moderate to high levels of fertility are required to promote a healthy grass sward.

Free-draining, sandy soils are usually preferred, for areas of anticipated to receive high levels of 'wear and tear' and land drainage may be required for sites with poor drainage.

Wetland wildflower meadow

The plant species selected are normally suited to intermittent/permanent periods of waterlogging. They are not typically tolerant of drought or periods during which the soils dry out. Given their close association with water bodies, highly fertile soils are not normally used for marginal planting to minimise risk of water enrichment.

Species rich long grassland, Mown species rich grassland, Tussocky grassland, Wildflower Meadow

Species rich grasslands, tussocky grassland and wildflower meadow occur in the UK on soils with a low fertility status (infertile), but typically containing moderate to high quantities of organic matter and total nitrogen.

Plant available phosphorus is the key nutrient when considering the fertility status of soil in relation to these meadow types. Whereby low levels of phosphorus are preferred to prevent domination of the sward by grasses and aggressive weeds such as broad-leaved dock (*Rumex obtusifolius*) and stinging nettle (*Urtica dioica*).

The required soil drainage performance/moisture retention characteristics vary according to the grassland type and selected species / seed mix.

SuDS Features

We understand that SuDS features are proposed to be constructed on site. Details concerning the required functioning and properties of the back-fill media for the SuDS features have not been provided for this review.

Existing Vegetation

Existing trees and hedgerows are well established and will therefore have an extensive root network. For all retained vegetation, it is essential to protect the roots (including management of soils surrounding them) to safeguard its health and longevity. Therefore, disturbance of the soils around their roots should be minimised and ideally avoided. The project landscape architect or ecologist should be consulted to confirm the required extent of root protection zones and these shown on relevant drawings and protected on the ground using suitable fencing.

3.0 SITE INVESTIGATION

3.1 Site Visit

The site visit took place on Tuesday 1st May 2025 during a period of clear and dry weather.

The site (approx. 3.5 ha) is located to the west of Lidsey Road and comprised two agricultural fields. The site was bordered on all sides by Heras fencing and mature hedgerows, the fields were separated by gated access. Both fields were reasonably level and vegetated with short grass.

For the purpose of this survey, these fields are referred to as *Northern field* and *Southern field* as indicated on the site plan in **Appendix 1**.



Plate 1: Typical view of the northern field (south facing).



Plate 2: Typical view of the northern field (east facing).



Plate 3: View of silo / hardstanding area in southern field (north facing).



Plate 4: Typical view dry soil surface in southern field.

3.2 Soil Conditions

The soils were examined by constructing a total of 13 No. hand-dug trial holes (TH) at representative locations within the survey area. Trial holes were dug to a maximum depth of 1000mm where possible. The locations of our trial holes are indicated on the site plan in **Appendix 1**.

At each trial hole, the soils were examined with reference to the Soil Survey Field Handbook. Important physical soil characteristics were recorded, including soil texture, structure, compaction, waterlogging, anaerobism, topsoil depths, stone content and the presence of deleterious materials. At the same time, representative soil samples were taken for laboratory analysis.

3.3 Soil Descriptions

A single soil profile was encountered, which was described as below.

Topsoil 0 – 300/430mm Average Depth: 320mm	Greyish brown (Munsell Colour 10YR 5/2), dry (at surface) to slightly moist, non-plastic to slightly plastic, non-calcareous SILTY CLAY LOAM with a well developed, fine to very coarse subangular blocky and granular structure (weak structural strength). The topsoil had a low stone content which included occasional subrounded and subangular flints up to 50mm in size. No observable deleterious materials were encountered.
Subsoil 300/430mm – 1000mm	Dark yellowish brown (Munsell Colour 10YR 4/6), slightly moist, friable to slightly plastic, slightly calcareous CLAY LOAM and rarely SANDY SILT LOAM with a poor to moderately developed fine to medium granular, and coarse subangular blocky structure (weak structural strength). Distinct ochreous mottling and manganese concretions from between 350mm. Virtually stone-free, with no observable deleterious materials encountered.



Plate 5: Typical trial pit – TH7.



Plate 6: Typical topsoil arisings.



Plate 7: Typical subsoil arisings.

3.4 Topsoil Depths

The following topsoil depths (mm) were recorded during the survey:

Trial Hole Ref.	Topsoil Depth (mm)	Field location
TH1	430	Southern Field
TH2	300	
TH3	300	
TH4	350	
TH5	310	
TH6	330	
TH7	300	
TH8	320	
TH9	350	
TH10	300	
TH11	300	Northern Field
TH12	300	
TH13	300	

Average topsoil depth: 320mm

3.5 Soil Sampling

A total of 3 No. samples of topsoil and 3 No. samples of subsoil were composited from site. The following table details the locations of the samples for each of the 6 No. samples.

Sample Reference	Sample Trial Hole Locations
<i>Sample 1 (Topsoil and Subsoil)</i>	TH11, TH12, TH13
<i>Sample 2 (Topsoil and Subsoil)</i>	TH1, TH2, TH3, TH9, TH10
<i>Sample 3 (Topsoil and Subsoil)</i>	TH4, TH5, TH6, TH7, TH8

The trial hole locations can be viewed on the site plan located within **Appendix 1**.

4.0 LABORATORY ANALYSIS

4.1 Analytical Schedule

Representative samples of topsoil and subsoil were submitted to the laboratory for analysis. The samples were analysed in accordance with the following schedule:

- particle size analysis (clay, silt, sand);
- stone content (2-20mm, 20-50mm, >50mm);
- pH value;
- electrical conductivity values;
- exchangeable sodium percentage (topsoil only);
- major plant nutrients - N, P, K, Mg (topsoil only);
- organic matter content;
- C:N ratio (topsoil only).

The results are presented on the Certificates of Analyses in **Appendix 2** and an interpretation of the results is given below.

4.2 Results of Analysis

Particle Size Analysis

The topsoil samples fell into the SILTY CLAY LOAM texture classes, and the subsoil samples fell into the CLAY LOAM and SANDY SILT LOAM texture classes. These soils would be described as being heavy in texture, with high silt contents (46-63%).

Such soils have severe physical limitations for use in soft landscaping purposes, in particular residential back gardens, areas of amenity grass with high footfall and other demanding uses e.g. backfilling tree pits.

Silty soils, such as these, typically have low structural strength and are therefore prone to structural degradation and self-compaction when handled intensively (e.g. stripping, stockpiling, resspreading). In addition, unlike clay soils, silty soils do not possess the same ability to 'self-repair' by the *shrink and swell* mechanism (an important soil structure forming process), and they usually do not respond well to mechanical cultivation. As a consequence, once structurally damaged, it can be difficult to improve the physical condition of silty soils, particularly in the short-term, to a level fit for re-use in residential back gardens.

The restricted drainage properties of the topsoil and subsoil, particularly following disturbance and reinstatement, would need to be overcome to promote a healthy rooting environment, particularly for residential back gardens. This would include decompacting the subsoil, increasing topsoil depths and consideration should be given to the use of an alternative topsoil.

These soil types may be considered suitable for more robust landscape applications, including hardy trees and shrubs and amenity grass (low foot traffic only), provided the physical condition of the soils is maintained and provided species tolerant of moisture retentive, heavy soil are selected. The topsoil and subsoil are not suited to more demanding planting environments (e.g. residential back gardens) or plant species that require or prefer light or free-draining soil.

In addition, smaller plant stock, such as whips and transplants, would be more suited than containerised or rootballed stock, as they tend to be more tolerant of adverse soil conditions. The soils would not be suitable for use in tree pits.

Stone Content

The stone contents of the topsoil samples were low, including occasional stones up to 50mm in size. As such, it is advisable to reduce the number stones greater than 20mm in size for residential back gardens and seeded areas of amenity grass by raking or picking.

The stone contents of the subsoil samples were virtually stone-free and, as such, stones are unlikely to constitute a limitation for use as subsoil for landscape purposes.

pH and Electrical Conductivity

The topsoil samples were slightly acid in reaction (pH 6.6 to 6.9), with a pH range that would be considered suitable for landscape purposes.

The subsoil samples were slightly alkaline in reaction (pH 7.2 to 7.3), with a pH range that would be considered suitable for landscape purposes.

The electrical conductivity (salinity) values (water and CaSO₄ extracts) were all low, which indicates that soluble salts were not present at levels that would be harmful to plants.

Organic Matter and Nutrient Status

The topsoil samples typically contained adequate levels of organic matter and most major plant nutrients and low levels of extractable potassium. The extractable potassium deficiency may be addressed by either a suitable green compost application.

The C:N ratios of the topsoil samples would be considered suitable for landscape purposes.

The organic matter contents of the subsoil samples were low.

5.0 DISCUSSION AND RECOMMENDATIONS

A residential development is proposed at the Lidsey Road site in Woodgate, which will comprise the construction of a number of residential units, with associated infrastructure and soft landscape areas.

The purpose of this survey was to assess the quality of the site soils and to advise on their suitability for re-use for landscape purposes, including soft landscape areas and residential back gardens.

5.1 Summary of Findings

From our site visit and subsequent laboratory analysis, the topsoil was recorded to an average depth of 320mm and was found to be reasonably consistent in composition. The topsoil was described as a slightly acid, non-saline, non-calcareous *silty clay loam* ('silty') with a weak structure and low stone content, including occasional stones up to 50mm in size. The topsoil contained sufficient reserves of organic matter and most major plant nutrients with low levels of extractable potassium.

The subsoil was described as a slightly alkaline, non-saline, slightly calcareous *clay loam* to *sandy silt loam* with an adequate structure and virtually stone-free. The organic matter contents were low.

5.2 Soil Suitability for Re-Use

Soil Texture

The site topsoils and subsoils are characterised by their **heavy** soil textures.

The silty character of the site soils (moisture retentive, with weak soil structures and tendency to self-compact following disturbance) makes them **severely problematic for landscape construction purposes, including residential back gardens**.

The proposals to strip the topsoil will result in a loss of soil structure and so further reduces its quality. Minimising areas of topsoil strip, and any associated vehicle trafficking, will therefore be advisable to protect the soils.

If these soils (topsoil and subsoil) become physically degraded (e.g. they lose soil structure or are left compacted) their drainage and aeration potential will be reduced and this is likely to cause waterlogging and/or anaerobic conditions, both of which are detrimental to plant health, and particularly at the early establishment phase. In addition, other important soil functions (e.g. water attenuation and filtration, carbon sequestration, soil fauna, nutrient cycling) would also be adversely affected.

This damage has been taken into account with respect to their re-use for landscape purposes. Following disturbance, these soils will have a reduced potential for landscape purposes and would be suitable for non-demanding landscape environments only, provided the soils are suitably prepared for planting/seeding/turfing and the plants selected are tolerant of heavy, moisture retentive soils. It may be possible to increase the re-use potential of these soils (e.g. for shrub beds and for smaller rootballed trees) by improving the overall drainage functioning of the soil profile.

Nutrient deficiency

The topsoil was deficient in extractable potassium. For all high fertility landscape types, this deficiency should be addressed by a suitable green compost application.

5.3 Back Garden Construction

On most housebuilding sites, back gardens are typically constructed throughout the year, with little flexibility to the construction programme (e.g. to allow for wet weather conditions). This often results in soil handling operations (subsoil preparation, topsoil placement and cultivations) being performed during winter / wet months of the year, when the soils are often *plastic* in consistency. Working with plastic soils severely increases the damage done to their soil structures and reduces the effectiveness of any cultivations.

Once placed, topsoil is often compacted by pedestrian trampling, both by tradespeople 'passing through' and others working within the garden (e.g. fence erection). When soils, such as these, are compacted, they will perform poorly in the new back gardens, resulting in waterlogging and turf failures. When combined with scrutiny from new owners, this can generate high levels of customer complaints.

As such, given the limitations of the site soils highlighted in section 4.2 – *Results of Analysis – Particle Size Analysis*, the potential to re-use the soils at this site will be dependent on a number of factors. These being:

1. the quality of the soil management practices and workmanship employed;
2. on-site inspections by site management to maintain standards;
3. the degree of soil protection post installation of soils into gardens;
4. the tolerance of the business for customer complaints.

These factors should be understood in detail and discussed at a meeting. The findings would be used to inform the relevant section of the Soil Management Plan.

For all options to re-use the site topsoil, it will be essential that it has an adequate soil structure following stripping and storage and that this is maintained after placement.

5.4 Tree Planting

The following consideration is given to the re-use of the site soils for semi-mature trees.

Given the anticipated poor drainage properties of the topsoil and subsoil, it would be important that tree pits do not act as sumps for surface draining water. As a minimum, an appropriate free-draining sand or sandy subsoil should be used as subsoil within the lower portion of the tree pits. Consideration should be given to constructing tree pits with appropriate drainage media and positive drainage where necessary. Other measures such as shallow topsoil mounding should also be considered where necessary.

The topsoil would not be considered suitable for backfilling the upper portion of tree pits.

5.5 Lawn with High Footfall

The heavy texture of the topsoil is not suited to lawn areas with high footfall. The topsoil typically has a adequate soil structure, but this should be expected to be degraded during earthworks and when subject to high rates of usage, particularly when moist / wet and plastic in consistency. It's plastic consistency at relatively low moisture contents makes it prone to smearing and compaction during wet weather conditions. This smearing can effectively seal the surface of the soil and reduces infiltration, percolation drainage and aeration capabilities through the soil profile. Such conditions are unfavourable for root growth and would subject the grass to significant stress. Continual or intensive use when wet is likely to damage/destroy grass cover, further compounding the problem of poor aeration and impeded infiltration.

5.6 Species-Rich Habitats

With regard to species-rich wildflower neutral 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.

As an alternative, consideration could be given to re-using the site subsoil for this purpose. In this instance the subsoil would require thorough cultivation to prepare a suitable tilth for seeding and establishment should be expected to be slow, requiring a number of years to create a new sward. The rate of establishment could be improved by a light compost application before seeding.

No application of either compost or fertiliser should be made to areas species-rich habitats and marginal planting.

5.7 SuDS Features

The soil requirements for soft landscape SuDS are dependent on the anticipated moisture regime of these features, presence of pipework and the type of planting within them. If for instance, the SuDS features are intended to receive and attenuate rainwater, and then enable it to infiltrate efficiently into the underlying ground or to pipework, light sandy soils are normally preferred to facilitate water drainage. Alternatively, it may be desirable to encourage formation of ephemeral or permanent water bodies, or marshy conditions in such areas, for which more moisture retentive soil (such as these) might be preferable.

5.8 Summary of Soil Suitability

The horticultural suitability of the site topsoil and subsoil for various landscape environments 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 should be 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)	See Section 5.5	See Section 5.5
SUDS features	See Section 5.7	See Section 5.7

✓ = 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.

5.9 Soil Structure & Physical Degradation

It is essential to provide a structured, uncompacted profile for the successful establishment and subsequent growth of plants and grass. Adequate soil structure is a key element for healthy plant growth to ensure aeration and drainage within the rooting zone. Where the site's development programme requires the soils to be disturbed by activities such as excavation, storage and resspreading, soil structure can easily be destroyed by compaction. Any damage to soil structure will reduce the drainage rate of this topsoil.

Almost all soils are physically degraded during intensive handling and the potential quality and the ultimate suitability of the topsoil for re-use will depend on how well its soil structure is preserved during the earthworks phase. In this situation, the larger (air containing) soil pores are destroyed and replaced by smaller (water retentive) pores. This will restrict gaseous exchange with the atmosphere and cause the topsoil to become anaerobic (oxygen depleted). In addition, the lack of larger pores prevents effective drainage and results in an increased risk of waterlogging.

Additionally, soil amelioration with compost will also assist in improving the overall soil structure.

5.10 Topsoil Handling & Programming

If the site topsoil is to be re-used successfully, structural degradation should be kept to a minimum. In order to achieve this, it is considered best practice to only handle the topsoil when it is reasonably **dry and friable** in consistency.

The most appropriate time to carry out the topsoil strip will therefore be during the summer months (May/June to September/October), and then only when the topsoil is dry. If the topsoil is dry when it goes into the temporary stockpile, it can be kept dry until it is resspread.

If the development's programme requires the topsoil to be handled when moist/wet and plastic, it is inevitable that significant damage is likely to occur to its structure. This damage will be potentially irreparable (particularly in the short to medium term) and planning the programme of earthworks should therefore be carefully considered by the project team at the earliest stage.

Should the topsoil become damaged through wet handling, it may still be possible to repair the damage provided there is sufficient time and dry weather. It will therefore be essential that the *Topsoil Resspreading Phase* take place during a summer season, to allow enough time for the soil to dry out effectively and be thoroughly cultivated before soil cultivation and planting/seeding/turfing takes place in autumn (grass seeding) and winter (planting).

If the project's programme results in wet topsoil being resspread for planting/seeding/turfing in the wetter/colder, winter or following spring months, there is unlikely to be any opportunity to recondition and prepare the topsoil to address the structural degradation caused by the stripping/stockpiling process. Planting/turfing into such adverse conditions

is likely to result in waterlogging, anaerobism, poor establishment rates and possibly plant failures. As such, consideration should be given to using an alternative, imported sandy 'manufactured' topsoil if any residential back gardens or amenity grass areas (high footfall) are to be topsoiled during the wetter/colder winter months.

5.11 Conclusion

In summary, the following observed conditions may limit the re-use potential of the soils in their current state:

Major Issues

- Poor drainage and aeration properties and high risk of surface water ponding and flooding;
- High risk of compaction and settlement following reinstatement;
- Limited plant species suitability – only plant species that prefer/require moisture retentive soils with a wide pH tolerance;
- Increased risk of lawn failures in residential back gardens.

Minor Issues

- Deficient in extractable potassium – topsoil;
- Slightly elevated organic matter content- subsoil.

The anticipated poor drainage of site soils makes them severely problematic and have a low potential for landscape re-use, including residential back gardens.

5.12 Soil Management Plan

Careful management of topsoil and subsoil is an important aspect for the sustainable use of soils. With reference to the DEFRA's *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (2009), a **Soil Management Plan** will be prepared.

The Soil Management Plan will include the following:

1. Specification for imported topsoil.
2. Treatment of existing vegetation.
3. Methods for stripping and stockpiling soils.
4. Appropriate topsoil depths.
5. Methods for resspreading soils.
6. Soil treatment techniques to ensure a well structured, uncompacted rooting zone is provided for future landscape construction.
7. Soil amelioration measures including options to improve the quality of the soils by adding fertiliser, compost or sand etc.

We would like to thank BDW Southampton for entrusting the practice with this commission. We trust this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned for further assistance.

Ebony Gheorghe

*BSc Msc
Soil Scientist*

Tim White

*BSc MSc MSc SoilSci CSci
Senior Associate*

For & on behalf of Tim O'Hare Associates LLP

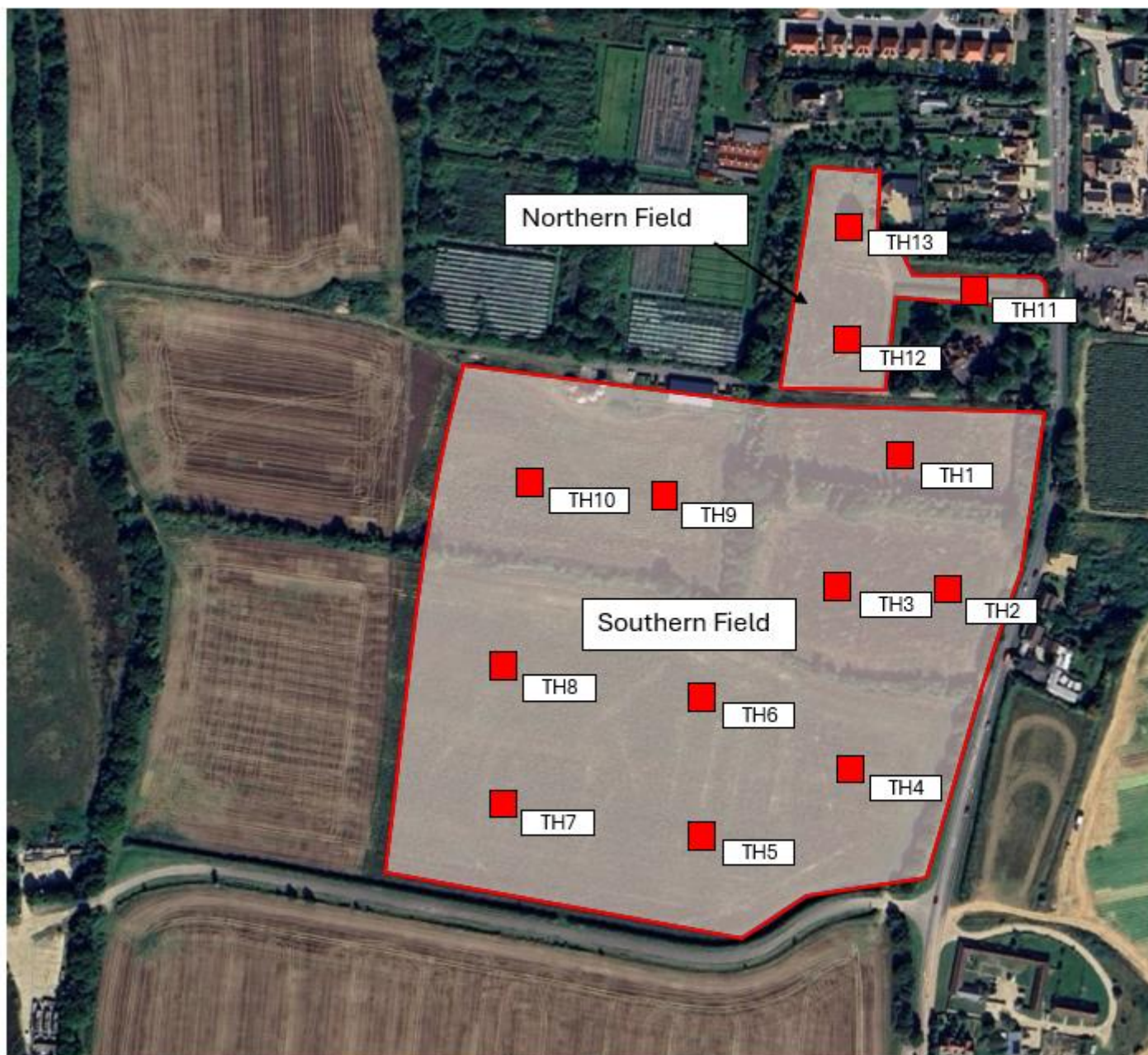
Report Qualifications

TOHA's interpretation of the soil conditions is based on observations made during the site investigation and the results of laboratory tests. This report presents TOHA's site observations and test results and the interpretation of those observations and results. On any site there may be variations in soil conditions between these exploratory positions. TOHA can therefore not accept any responsibility for soil conditions that have not been exposed by this investigation.

This investigation considers the re-use of the site soils for back garden and soft landscape purposes at the Lidsey Road, Woodgate site. 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 the 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

Site Plan showing Trial Hole locations



■ - Approximate Trial Hole Locations



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	BDW Southampton		
Project:	Lidsey Road, Woodgate, West Sussex		
Job ref no.:	TOHA/25/2014/EG		
Drawing no.:	2014/EG		
Drawing title	Site Plan showing trial holes		
Date:	May 25	Scale:	NTS
Drawn by:	EG	Checked by:	HS

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Appendix 2

Laboratory Analysis Results



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	BDW Southampton
Project:	Lidsey Road, Woodgate
Job:	Soil Resource Survey
Date:	May 2025
Job Ref No:	TOHA/25/2014/EG

Sample Reference		
Trial Hole Location		
Soil Type		
		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	–	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP
pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Sample 1
TH13, TH11, TH12
Topsoil

21
61
18
ZCL
2
4
0

6.6
74
2031
0.8

4.5
0.23
12
27
69
52

Sample 2
TH1, TH2, TH3, TH9, TH10
Topsoil

20
62
18
ZCL
1
1
0

6.9
243
2077
0.8

4.2
0.21
12
23
106
59

Sample 3
TH4, TH5, TH6, TH7, TH8
Topsoil

21
63
16
ZCL
0
0
0

6.6
98
2068
0.9

4.2
0.21
12
26
152
95

ZCL = SILTY CLAY LOAM

Results of analysis should be read in conjunction with the report they were issued with

Ebony Gheorghe
BSc MSc MSoilSci
Soil Scientist



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	BDW Southampton
Project:	Lidsey Road, Woodgate
Job:	Soil Resource Survey
Date:	May 2025
Job Ref No:	TOHA/25/2014/EG

Sample Reference		
Trial Hole Location		
Soil Type		
		Accreditation
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Texture Class (UK Classification)	–	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP
pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Organic Matter (LOI)	%	UKAS

SZL = SANDY SILT LOAM
CL = CLAY LOAM

Sample 1
TH13, TH11, TH12
Subsoil

17
46
37
SZL
1
0
0

7.3
81

2.1

Sample 2
TH1, TH2, TH3, TH9, TH10
Subsoil

20
51
29
CL
0
0
0

7.3
69

2.2

Sample 3
TH4, TH5, TH6, TH7, TH8
Subsoil

20
49
31
CL
0
0
0

7.2
74

2.2



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Results of analysis should be read in conjunction with the report they were issued with