WAKELIES FIELD AND PALMERS FIELD

SELSEY, CHICHESTER

SOIL RESOURCE SURVEY

Prepared on behalf of:

LANDLINK ESTATES LTD

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Prepared by: Tim O'Hare Associates LLP
Howbery Park, Wallingford
Oxfordshire, OX10 8BA
Tel: 01491 822653
Email: info@toha.co.uk
www.toha.co.uk

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

CONTENTS

1.0 INTRODUCTION

Tim O'Hare Associates LLP was commissioned by Landlink Estates Ltd to undertake a Soil Resource Survey at Wakelies Field and Palmers Field, Selsey, Chichester.

The authority to carry out the work was confirmed via a formal appointment letter from Jacintha Carty (Landlink Estates), dated 4th January 2022 and Landlinks Estates Purchase Order 3000912.

1.1 Purpose

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

As part of the development strategy, the site topsoil will be stripped and stored in a temporary stockpile(s) before it is re-used for landscape purposes, including residential back gardens.

The existing site comprises agricultural land and, as such, contains significant reserves of topsoil and subsoil. However, there is currently no information available on the horticultural quality, variability and suitability of the soils for landscape purposes within this development. Therefore, the purpose of this *Soil Resource Survey* is to assess the quality of the site soils to advise on their suitability for re-use for the proposed landscape types, including residential back gardens.

1.2 Actions

Tim O'Hare Associates LLP has evaluated the quality and suitability of the soils for landscape construction by desk study review, on-site investigation and laboratory analysis.

This report issues the findings of the *Soil Resource Survey* for Wakelies Field and Palmers Field, Selsey, including the site observations and soil descriptions, results and interpretation of all analyses, discussion on soil's quality and suitability for landscape purposes and recommendations for handling, treating and re-using the soils for 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);*
- *Harrison Group Environmental Limited – Land West of Park Farm, Selsey – Ground Investigation Factual Report – Report Ref. GL24781 – Date: December 2021;*
- *Campbell Reith Consulting Engineers – Land West of Park Farm, Selsey – Constraints – Drawing No. 999140-CRH-XX-XX-FG-G-7000 – P1 – Date: 15th October 2021.*

2.2 Summary of Findings

Soils

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

Major Group	*Brown soils*
Group	*Argillic brown earths*
Subgroup	*Typical argillic brown earths*
Series	*HAMBLE 2 (571z)*

Brown soils are soils are soils in which pedogenic processes have produced dominantly brownish or reddish subsurface horizons with no prominent mottling or greyish colours (gleying) above 40cm depth. *Typical argillic brown earths* are loamy or loamy over clayey soils with an unmottled subsurface horizon showing significant clay enrichment.

The *HAMBLE 2* series is composed of '*deep, stoneless, well drained silty soils and similar soils affected by groundwater; over gravel locally*.'

Geology

The British Geology Survey shows that the bedrock geology of the majority of the site is part of the *Earnley Sand Formation – Sand, Silt and Clay*, and the south western half of Wakelies Field is part of the *Marsh Farm Formation – Clay, Silt and Sand*. These formations comprise *Sedimentary Bedrock* formed approximately 41 to 48 million years ago in the Palaeogene Period.

Superficial deposits of *River Terrace Deposits (undifferentiated) - Sand, Silt And Clay* were recorded across the site, formed up to 3 million years ago in the Quaternary Period.

Ground Investigation Report

The initial ground investigation carried out on site (*Harrison Group Environmental Limited – Ground Investigation Factual Report*) found the ground conditions to comprise the following:

Strata	Location	Thickness Range (m)	Description
Topsoil	WS01, WS02, WS03, WS04, WS06	0 – 0.30 / 0.50	Firm, dark brown, slightly sandy CLAY with occasional subangular to subrounded fine to coarse gravel of flint.
Topsoil	WS05	0 – 0.50	Dark brown, slightly gravelly clayey fine and medium SAND. Gravel is subangular to subrounded fine to coarse flint.
Made Ground	TP01, TP02, TP03	0 – 0.50	Firm, friable, dark brown, slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint with rare brick.
Clay	WS01, WS02, WS03, WS04, WS05, WS06, TP01, TP02, TP03	0.30 / 0.50 – 1.20 / 3.06	Soft to very stiff, greyish brown to orangish brown, mottled, light grey, slightly sandy CLAY / SILT, silty CLAY, with occasional dark brown mottling and occasional subangular to subrounded fine to coarse gravel of flint.
Gravel	WS03, TP03	1.20 / 1.40 – 1.30 / 1.90	Very dense, light brown to brown, clayey, angular to subrounded fine to coarse GRAVEL of flint.
Sand	WS01	1.90 – 5.00	Loose to medium dense, grey, orange mottled, slightly gravelly, slightly clayey fine and medium SAND. Gravel is subangular to subrounded fine flint.

Proposed Landscape Uses

The landscape design is at an early stage and was not provided for review. As such, at this stage the soft landscape scheme is likely to include the following:

- Residential back gardens;
- Tree planting;
- Shrub planting;
- Amenity grass.

The soil requirements of the anticipated landscape types are considered below.

Tree Planting

Semi-mature trees are demanding planting types. Good aeration and drainage around the rootball, as well as moderate to high fertility status are critical at planting and during the establishment period. 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).

Shrub Planting

Shrubs are planted as container grown stock. This planting type normally requires shallower depths of soil than trees and the plants themselves can be variable in their specific soil requirements. Ornamental shrubs are typically less tolerant of adverse soil conditions and normally require soils which are fertile, well drained and aerated.

Amenity Grass

The soil requirements for amenity grass areas depend on the level of anticipated usage, whereby grass in 'low use' areas, e.g. road verges, is a robust planting type that does not require a specialist soil type. Grass in 'high use' areas, e.g. residential back gardens, requires soil that is resistant to wear and compaction. However, in both instances, the topsoil and subsoil should possess adequate structures, without excessive compaction, to allow sufficient drainage and aeration to sustain healthy grass growth.

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.

3.0 SITE INVESTIGATION

3.1 Site Visit

The site visit took place on Thursday 13th January 20221, during a period of cold and dry weather.

The site was located to the north east of Selsey and to the south of Chichester, and was accessed off Chichester Road. Agricultural land bordered the site to the north west, residential properties to the south west and Chichester Road boarded the site to the north and east.

The site comprised 2 No. reasonably level agricultural fields (Wakelies Field and Palmers Field – see Site Plan in **Appendix 1**), which were planted with parsley and a cover crop.

Plate 1: View across Wakelies Field to the south west.

Plate 2: View across Palmers Field to the north east.

3.2 Soil Conditions

The soils were examined by constructing a total of 12 No. hand-dug trial holes (TH) at representative locations within the survey area. Trial holes were excavated to a maximum depth of 1.0m (ground conditions permitting). The sample locations are shown 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

The soil profile was consistent in appearance between trial hole locations and was described as below:

Topsoil GL – 260/340mm Average: 300mm	Brown to dark brown (Munsell colour 10YR 4/3 – 3/3), moist, plastic, non-calcareous SILTY CLAY LOAM, and rarely SANDY SILT LOAM, with a moderately developed, fine to coarse subangular blocky and occasional *'cloddy'* structure, with weak structural strength. Slight to moderately stony, including occasional subrounded and subangular stones up to 65mm in size. No deleterious materials were observed. Clear Boundary to:
Subsoil 260/340 – 1000mm	Yellowish brown (Munsell colour 10YR 5/4), slightly moist to moist, plastic, non-calcareous SILTY CLAY LOAM, and rarely CLAY LOAM, with a moderately developed, subangular blocky structure. Slightly stony, including subrounded and subangular stones up to 30mm in size. No deleterious materials were observed. Occasional faint mottling was recorded throughout the *Subsoil*.

Plate 3: Typical trial pit – TH4.

Plate 4: Typical *Topsoil* arisings.

Plate 5: Typical *Subsoil* arisings.

3.4 Topsoil Depths

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

Trial Hole Ref.	Topsoil Depth (mm)	Trial Hole Ref.	Topsoil Depth (mm)
TH1	340	TH7	300
TH2	330	TH8	300
TH3	300	TH9	300
TH4	300	TH10	310
TH5	330	TH11	290
TH6	260	TH12	280

Average *Topsoil* Depth: 300mm

3.5 Soil Sampling

A total of 4 No. composite samples of *Topsoil* and 4 No. composite samples of *Subsoil* were collected from site. The following table provides the locations of the sub-samples for each of the 8 No. composite samples.

Sample Reference	Sub-Sample Trial Hole Locations
Topsoil	
Topsoil Sample 1	TH1, TH2, TH3
Topsoil Sample 2	TH4, TH5, TH6
Topsoil Sample 3	TH7, TH8, TH9
Topsoil Sample 4	TH10, TH11, TH12
Subsoil	
Subsoil Sample 1	TH1, TH2, TH3
Subsoil Sample 2	TH4, TH5, TH6
Subsoil Sample 3	TH7, TH8, TH9
Subsoil Sample 4	TH10, TH11, TH12

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 (4 No. *Topsoil* and 4 No. *Subsoil*) were submitted to the laboratory for analysis. The samples were analysed in accordance with the following schedule:

- particle size analysis (% sand, silt, clay);
- 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

Topsoil and Subsoil

The *Topsoil* samples fell into the SILTY CLAY LOAM and rarely SANDY SILT LOAM texture classes, and the *Subsoil* samples fell into the SILTY CLAY LOAM and rarely CLAY LOAM texture classes. These soils would be described as 'silty' in texture (50 – 64% silt).

Such soils have 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, respreading). 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 soils are unlikely to perform well in residential back gardens, where they will be prone to compaction and at higher risk of waterlogging, surface water ponding and poor grass growth.

Stone Content

The stone contents of the *Topsoil* samples were low to moderate, including occasional stones up to 65mm in size. It would be advisable to remove all stones greater than 50mm for landscape planting purposes and greater than 20mm for residential back gardens and areas of seeded amenity grass, for example by raking or picking.

The *Subsoil* samples were slightly stony and, as such, stones should not restrict the use of the *Subsoil* for use as subsoil in general landscape purposes.

pH and Electrical Conductivity

The *Topsoil* samples were slightly acid in reaction (pH 6.7-6.9) and the *Subsoil* samples were slightly acid to slightly alkaline in reaction (pH 6.7-7.3). These pH ranges would be suitable for general landscape purposes.

The electrical conductivity (salinity) values were low, indicating that soluble salts were not present at levels that would be harmful to plants.

Organic Matter and Fertility Status

The *Topsoil* samples were adequate to well supplied with extractable phosphorus, extractable potassium and extractable magnesium, however were deficient in organic matter and total nitrogen.

The organic matter and total nitrogen deficiencies may be addressed by a suitable compost application.

The C:N ratio results of the *Topsoil* samples are considered acceptable for landscape purposes.

The organic matter contents of the subsoil samples were low and consistent with that of subsoil.

5.0 DISCUSSION

A residential development is to be constructed at Wakelies Field and Palmers Field, Selsey which will comprise the construction of a number of residential units, with associated infrastructure, soft landscaping and residential back gardens.

The purpose of this investigation is to assess the quality of the site soils by visual examination and laboratory analysis and to advise on their suitability for re-use for landscape purposes, including residential back gardens.

5.1 Summary of Findings

From the site visit and subsequent laboratory analysis, 1 No. *Topsoil* type and 1 No. *Subsoil* type were encountered.

Topsoil

The *Topsoil* was recorded to an average depth of 300mm and was described as a slightly acid, non-saline, non-calcareous SILTY CLAY LOAM, and rarely SANDY SILT LOAM, with a moderate structure (weak structural strength) and low to moderate stone content, including occasional stones up to 65mm in size.

The *Topsoil* contained sufficient reserves of extractable phosphorus, extractable potassium and extractable magnesium, and contained moderately low levels of total nitrogen and organic matter.

Subsoil

The *Subsoil* was described as a slightly acid to slightly alkaline, non-saline, non-calcareous SILTY CLAY LOAM, and rarely CLAY LOAM, with a moderate structure and low stone content. The organic matter content was low and consistent with that of subsoil.

5.2 Soil Suitability for Re-Use

Topsoil and Subsoil

The silty character of the site *Topsoil* and the *Subsoil* (moisture retentive, with weak soil structures and tendency to self-compact) makes them **particularly problematic** and of a **low quality for landscape uses**. The moisture retentive character of the *Topsoil* and its vulnerability to physical degradation following disturbance by soil stripping, limits the potential to re-use this soil to non-demanding, hardy species and planting types.

The requirement to strip the topsoil results in a loss of soil structure and will further reduce its quality as a 'landscape soil'. This damage has been taken into account with respect to its re-use for landscape purpose, and it will be essential that it is minimised and repaired following respreading. For all future uses, it is important that following the earthworks phases that all soils are left in an uncompacted condition with adequate soil structure.

The *Topsoil* contained occasional stones up to 65mm in size. Any large stones in the *Topsoil* (>50mm in soft landscape areas and >20mm in residential back gardens and areas of seeded amenity grass) should be removed by raking or picking prior to re-use.

In addition, the *Topsoil* was deficient in organic matter and total nitrogen. These deficiencies should be addressed for landscape purposes, by a suitable application of compost.

Given the physical limitations presented by the *Topsoil* for re-use for back garden construction, several options are presented below for further consideration (Section 5.3).

5.3 Options for Garden Construction

The *Subsoil* is anticipated to offer severe drainage restrictions following the normal construction phases. **Therefore, for all options below, we recommend that the subsoil is thoroughly decompacted and prepared prior to spreading the topsoil.**

Drainage installation may be required for all options at vulnerable locations, e.g. base of slopes and tree pits, as well as other measures to avoid flooding, including sloping patios and gardens away from houses and installation of interceptor drains between topsoil and pathways/patios.

Option 1 – Placement of 300mm Imported Topsoil

Imported topsoil should be a *'sandy loam'* or *'loamy sand'* texture and be compliant with *BS3882:2015*.

Option 1 would be considered to be most preferrable in relation to the quality of the completed back gardens (and therefore customer satisfaction) and present the lowest 'risk' of delays due to bad weather during construction.

This option potentially generates unusable site topsoil as surplus spoil which would need to be accommodated on-site or incur disposal costs off-site. Additional costs for imported topsoil would be incurred.

Option 2 – Placement of 150mm Imported Topsoil over 150mm Site Topsoil

An imported *'sandy loam'* or *'loamy sand' BS3882:2015* compliant topsoil and placing 150mm of this material over 150mm of the site-won topsoil.

This option allows for some of the site topsoil to be re-used which reduces the potential volume of surplus spoil.

This option is reliant on the site topsoil having an adequate 'soil structure' following stripping, storage and respreading. If the earthworks programme dictates the topsoil to be stripped and stored during the wetter periods of the year, this option may not be viable due to the damage (compaction) caused to the structure of the topsoil by intensive soil handling. Once the topsoil is damaged, this option could still be feasible if the topsoil can be successfully 'reconditioned' prior to placement.

Additional costs are incurred to import topsoil. Where site-won topsoil cannot be accommodated on-site, any surplus topsoil would need to be disposed of off-site with the associated costs.

Option 3 – Re-Use of 300mm Site Topsoil

If the site topsoil is to be used for the full topsoil depth (300mm).

For this option we recommend that the **upper 50mm** of the upper topsoil layer is ameliorated with a suitable source of sand. The aim is to improve the physical condition of the topsoil surface to help turf establishment.

The sand used should be dominated by *medium sand* (0.25 – 0.50mm) and should be a washed quarried sand. Marine dredged sand or a recycled sand should not be used.

This option allows for the maximum re-use of the available site topsoil, with additional costs for the importation of sand only.

As for Option 2, the success of this option is completely dependent on the physical condition of the topsoil being maintained through the earthworks stages. Therefore, this option carries the highest risk of delays through inclement weather and/or severe damage being caused to the structure of the topsoil where the topsoil is handled when moist/plastic.

This treatment will not improve the overall drainage capacity of the topsoil, and therefore the final quality of the back gardens should be anticipated to be not as good as Option 1 or Option 2, with the highest risks of waterlogging, turf failure and customer complaints.

5.4 Tree Planting

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

Semi-mature trees are the most 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.

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

Given the anticipated poor drainage of the site subsoil, it would be important that the 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. 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 be considered where necessary.

5.5 Re-use of the Site Soils – Summary

A summary of the re-use potential of the site soils for particular landscape types is given in the table below. This summary is on the proviso that the considerations discussed above are adhered to. It is important to note that for all planting, turfing and seeding, the soils must be uncompacted and have an adequate structural condition.

Planting Environment	***Topsoil***	***Subsoil***
Tree Planting (≥16cm girth)	X	X
Tree Planting (<16cm girth)	O	O
Ornamental Shrub Planting	O	O
Native Shrub Planting	✓	✓
Amenity Grass (high foot traffic – including residential back gardens)	See Section 5.3	See Section 5.3
Amenity Grass (low foot traffic)	✓	✓

✓ Soil suited to this landscape type **provided** it is in good physical condition, large stones are removed, plant species are tolerant of moisture retentive soils with a wide pH tolerance and the organic matter and nutrient deficiencies are addressed.

O Soil may be suitable for this landscape type provided the soil is in its optimum condition and drainage improvements are made where necessary. Species selected must be hardy and suited to moisture retentive soils with a wide pH tolerance. The organic matter and nutrient deficiencies should be addressed.

X Not suited to this landscape type.

5.6 Compliance with British Standards

The *Topsoil* was **not fully compliant** with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil)* on account of the presence of stones >50mm and deficiencies in organic matter and total nitrogen.

The *Subsoil* was **largely compliant** with the requirements of the British Standard for Subsoil *(BS8601:2013 – Specification for Subsoil – Table 1, Multipurpose Subsoil),* with the exception of a slightly elevated organic matter content.

5.7 Soil Structure & Physical Degradation

It is essential to provide a structured, uncompacted soil 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 rootzone. Where the site's development programme requires the soils to be disturbed by activities such as excavation, storage and respreading, soil structure can easily be destroyed by compaction. Any damage to soil structure will reduce the drainage rate of these soils.

Almost all soils are physically degraded during intensive handling and the potential quality and the ultimate suitability of the site soils for re-use will depend on how well their soil structures are preserved during the earthworks phase. This topsoil is particularly prone to structural damage if handled and moved when wet. 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.

5.8 Topsoil Handling & Programming

If the site topsoil is to be re-used successfully, structural degradation must 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 respread.

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 Respreading 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 respread for planting/seeding/turfing in the wetter/colder, winter or following spring months, there will be no opportunity to recondition and prepare the topsoil to address the structural degradation caused by the stripping/stockpiling process. Planting into such adverse conditions is likely to result in plant/lawn failures and greater instances of flooded back gardens and other low lying areas of the development.

5.9 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), it is recommended that a **Soil Management Plan** is prepared.

The Soil Management Plan would include the following:

- Treatment of existing vegetation;
- Procedures and equipment for stripping and stockpiling remaining in-situ topsoil;
- Techniques in subsoil preparation;
- Appropriate topsoil depths for different planting types;
- Topsoil cultivations;
- Soil amelioration requirements (e.g. fertiliser, lime, compost application types and rates).

We would like to thank Landlink Estates Ltd for entrusting our 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 if you require further assistance.

Rebecca Hollands
BSc MSc MISoilSci
Senior Soil Scientist

Tim White
BSc MSc MISoilSci CSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP

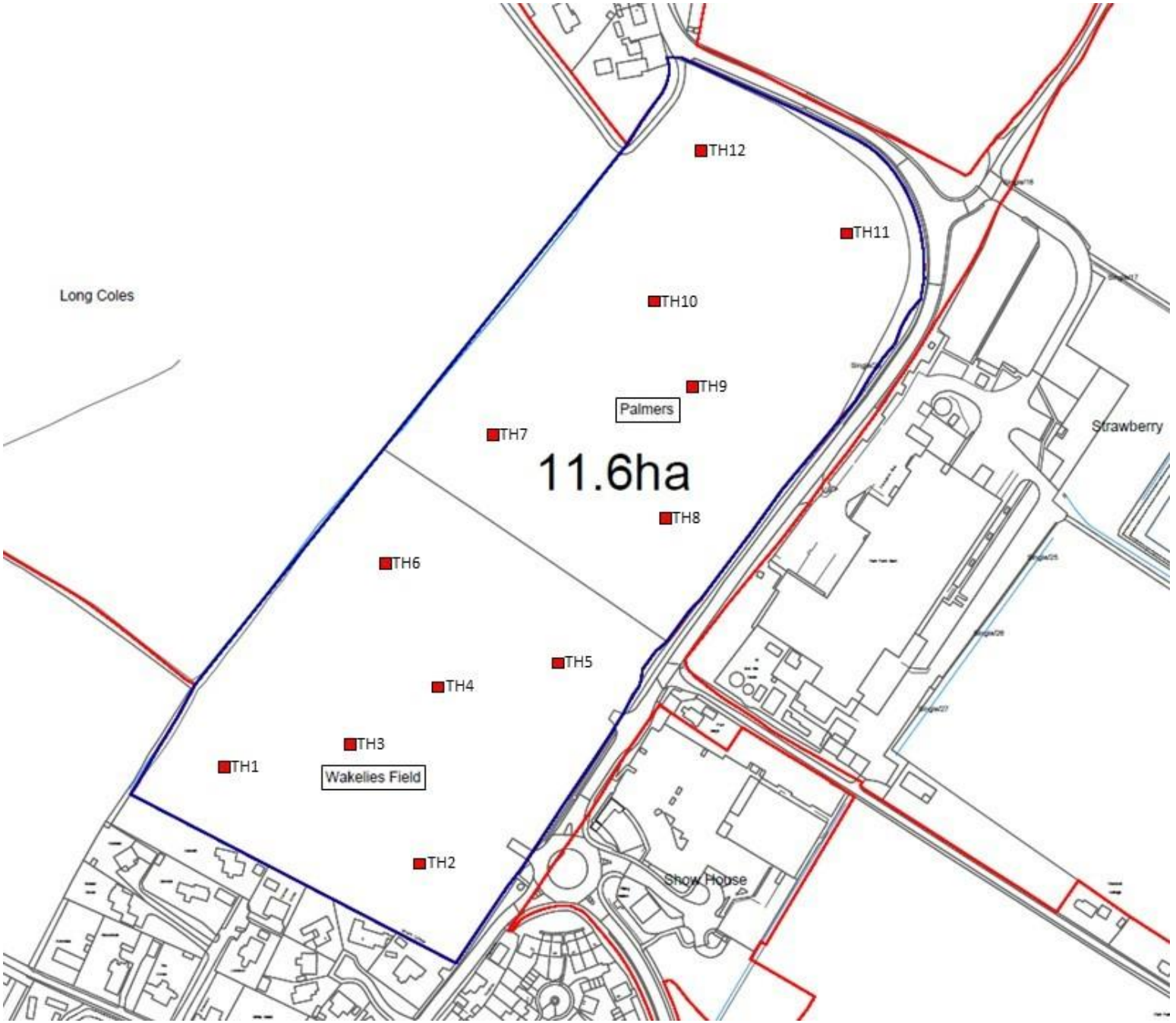
Report Qualifications

This 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 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 landscape purposes for the Wakelies Field and Palmers Field, Selsey 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 TOHA's client Landlink Estates Ltd. 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 - Trial Hole Locations



THx

Approximate Trial Hole Location

Site Boundary

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Landlink Estates Ltd		
Project:	Wakelies Field and Palmers Field, Selsey		
Job ref no.:	TOHA/22/6240/RH		
Drawing no.:	6240/1		
Drawing title	Soil Resource Survey		
Date:	Jan '22	Scale:	NTS
Drawn by:	RH	Checked by:	TW

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T: 01491 822653 E:info@toha.co.uk
www.toha.co.uk

Appendix 2

Laboratory Analysis Results

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**Landlink Estates Limited**
Project:	**Wakelies Field and Palmers Field, Selsey**
Job:	**Soil Resource Survey - Topsoil**
Date:	**January 2022**
Job Ref No:	**TOHA/22/6240/RH**

Sample Reference			**Topsoil Sample 1**	**Topsoil Sample 2**	**Topsoil Sample 3**	**Topsoil Sample 4**
Field Ref.			**Wakelies Field**	**Wakelies Field**	**Palmers Field**	**Palmers Field**
Trial Hole Ref.			**TH1-TH3**	**TH4-TH6**	**TH7-TH9**	**TH10-TH12**
		Accreditation				
Clay (<0.002mm)	%	UKAS	18	23	21	20
Silt (0.002-0.05mm)	%	UKAS	52	64	61	61
Sand (0.05-0.2.00mm)	%	UKAS	30	13	18	19
Texture Class (UK Classification)	--	UKAS	SZL	ZCL	ZCL	ZCL
Stones (2-20mm)	% DW	GLP	10	10	9	11
Stones (20-50mm)	% DW	GLP	3	2	1	2
Stones (>50mm)	% DW	GLP	0	1	6	0
pH Value (1:2.5 water extract)	units	UKAS	6.7	6.7	6.8	6.9
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	127	81	145	116
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	2144	2106	2159	2103
Exchangeable Sodium Percentage	%	UKAS	1.6	1.4	1.9	1.9
Organic Matter (LOI)	%	UKAS	3.1	3.2	3.1	2.9
Total Nitrogen (Dumas)	%	UKAS	0.13	0.13	0.13	0.12
C : N Ratio	ratio	UKAS	14	15	14	14
Extractable Phosphorus	mg/l	UKAS	43	49	51	39
Extractable Potassium	mg/l	UKAS	275	235	227	205
Extractable Magnesium	mg/l	UKAS	116	117	130	121

ZCL = SILTY CLAY LOAM
SZL = SANDY SILT LOAM

Rebecca Hollands
BSc MSc MISoilSci
Senior Soil Scientist

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

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**Landlink Estates Limited**
Project:	**Wakelies Field and Palmers Field, Selsey**
Job:	**Soil Resource Survey - Subsoil**
Date:	**January 2022**
Job Ref No:	**TOHA/22/6240/RH**

Sample Reference			**Subsoil Sample 1**	**Subsoil Sample 2**	**Subsoil Sample 3**	**Subsoil Sample 4**
Field Ref.			**Wakelies Field**	**Wakelies Field**	**Palmers Field**	**Palmers Field**
Trial Hole Ref.			**TH1-TH3**	**TH4-TH6**	**TH7-TH9**	**TH10-TH12**
		Accreditation				
Clay (<0.002mm)	%	UKAS	27	26	26	26
Silt (0.002-0.05mm)	%	UKAS	50	62	63	63
Sand (0.05-0.2.00mm)	%	UKAS	23	12	11	11
Texture Class (UK Classification)	--	UKAS	CL	ZCL	ZCL	ZCL
Stones (2-20mm)	% DW	GLP	7	6	5	6
Stones (20-50mm)	% DW	GLP	3	5	4	4
Stones (>50mm)	% DW	GLP	0	0	0	0
pH Value (1:2.5 water extract)	units	UKAS	6.7	6.8	7.0	7.3
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	170	169	179	146
Organic Matter (LOI)	%	UKAS	2.2	2.3	2.3	2.2

ZCL = SILTY CLAY LOAM
CL = CLAY LOAM

Rebecca Hollands
BSc MSc MISoilSci
Senior Soil Scientist

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