

***SOIL RESOURCES, MANAGEMENT
and
OPTIONS APPRAISAL***

Axis P. E. D. Ltd

***Land to the South of Sperberry Hill,
St Ippolysts***



Client:

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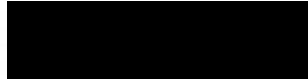
***Land to the South of Sperberry Hill,
St Ippolysts***

Tested on behalf of Soil Environment Services by:



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CONTENTS

	Page
1. INTRODUCTION	
1.1 Methodology	4
1.2 Previous site surveys	4
2. SOIL RESOURCES	5
2.1 Topsoil	5
2.2 Subsoil	5
3. MANAGEMENT	6
3.1 Stripping	6
3.2 Storage	6
3.3 Grading or amelioration	7
3.4 Replacement	7
4. OPTIONS	8
4.1 Use on site	8
4.2 Export off site	8
4.3 Options Appraisal Summary	8
5. CONCLUSIONS	9

DRAWING 1 ALC Borehole Locations

GENERAL INFORMATION SOURCES

1. INTRODUCTION

This Soils Resources, Management and Options Appraisal report has been prepared by Soil Environment Services Limited (SES) to accompany a full planning application for enabling works at Land South of Sperberry Hill, St Ippolysts (the site). The report follows the DEFRA guidance Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.

An assessment of the soils present on site and the options available for their use in a sustainable manner has been investigated for a total site area of 34 ha (Drawing 1).

In the first instance, an Agricultural Land Classification (ALC) was conducted for the site by Soil Environment Services Ltd in September of 2021. This investigation involved a site visit to examine the soils in detail to 1.2 m depth and hence provide the basic soil information. This report is based on the findings of the ALC survey.

1.1 Methodology

The general methodology is based on examination of the soil texture and depth of the particular horizons within identified soil types across the site and then assessment of how these may:

1. have a use on or off the development site,
2. meet or exceed the volumes which are available and which are needed,
3. be amenable to stripping, storage and replacement,
4. require any special treatments or amelioration,
5. need excessive transport distances for soils to be used off site.

A basic options appraisal is presented which ranks the above points in terms of sustainability with regard to soil conservation and energy use.

1.2 Previous soil survey

The ALC survey (Soil Environment Services Ltd, SES/AP/RS/2021#1) found soils of three main soil types; either sandy loam over sandy loam, sandy clay loam over sandy clay, or sandy silt loam over sandy clay loam over clay.

ALC Grade 3a was concluded due to a droughtiness or wetness limitation and Grade 2 for droughtiness.

2. SOIL RESOURCES

Hand texturing analysis results from all of the locations concluded predominantly sandy loam over sandy loam (9 ha) on the north-west and east, sandy clay loam over sandy clay on the north-west and south-east (16 ha) and sandy silt loam over sandy clay loam over clay on the east (9 ha) (See Drawing one for soil type locations).

Table 1 Soil volumes (m3)

	Sandy loam/ sandy loam - 9 ha
Topsoil 0-25 cm,	22,500
Subsoil 25-120 cm	85, 500
	Sandy clay loam/ sandy clay – 16 ha
Topsoil 0-50 cm,	80,000
Subsoil 50-120 cm	112,000
	Sandy silt loam/ sandy clay loam/ clay – 9 ha
Topsoil 0-30 cm,	27,000
Subsoil 30-70 cm,	36,000
Subsoil 70-120 cm	45,000

2.1 Topsoil

The topsoil would be expected to or nearly meet the requirements of BS3882 Topsoil Specification. The volume of the topsoil based on the total land area of 34 ha; volume would equate to 129,500 m3 of topsoil in total.

2.2. Subsoil

The approximate volume based on the total land area of 34 ha; this equates to 278,500 m3 of subsoil in total.

Subsoil to be reinstated beneath topsoil shall be free-draining or suitably drained and non-toxic and of suitable physical condition to support any proposed landscape planting.

There is expected to be sufficient volumes of the subsoil based on the depth to meet general specifications for any landscaping needs.

3 MANAGEMENT

3.1 Stripping

The soil removal operations will need to strictly follow the guidance (Ministry for Agriculture, Fisheries and Food (2000): *Good Practice Guide for Handling Soils* and Department of the Environment Food and Rural Affairs. *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*).

Key point to adhere to will be:

1. the type of machinery to use. No heavy compaction machinery should be permitted in stripped areas.
2. the weather conditions during stripping. Soil stripping should only occur in dry weather to minimise structural damage
3. careful operations to avoid mixing topsoil with subsoil. Topsoil and subsoil will be re-spread in the same sequence as stripped (topsoil on top of subsoil)

3.2 Storage

Soil storage mounds/stockpiles in general will damage the soil and hence the height needs to be minimised. A maximum mound height of 2 m should be used if the soil is stored. Soil should be stored in dry conditions and low, gently sloping mounds to minimise degradation and compaction and reduce waterlogging.

Stockpiles should be clearly identified and kept separately.

The stockpile shape and formation will need special care to detail and Section 5.4 of the guidance: *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* will need to be followed.

Stockpiles may need to be grassed with a suitable seed mix to prevent erosion if stored for long periods.

3.3 Grading or amelioration

Amelioration should be carried out in dry conditions to prevent structural damage. All graded or ameliorated soils shall be re-tested or visually inspected to confirm compliance prior to placement. Grading out of stones is unlikely to be need for this site.

Adding organic matter may improve sandy clay by improving drainage and creating airspace to improve workability. It is recommended that the topsoil is tested to the BS3882 specification to assess if any organic matter additions are needed. Approximately 5% - 10% organic matter should be present.

During the survey, no significant volume of stones were encountered in the topsoil or subsoil. If encountered, soil grading to remove any oversize stones present should be undertaken. Any oversized particles shall be mechanically screened to a maximum diameter of 50 mm (preferably 20 mm) for topsoil and 75 mm for the upper 300 mm of subsoil. Residual stone content shall not exceed 20 % by volume for topsoil and 50 % (preferred 35 %) for subsoil.

3.4 Replacement

The same degree of care and attention is needed during replacement as is the case for stripping with particular attention to:

1. the weather during operations. Placement should be undertaken in dry or friable soil conditions wherever practicable.
2. the placement method. Topsoil should be placed loosely in layers no thicker than 300 mm and lightly tracked in (no heavy compaction).
3. Subsoil will be graded to required contours prior to topsoil placement to allow for free drainage.
4. no traffic over freshly placed topsoil will occur.
5. compaction tests or simple penetrometer checks may be carried out before landscaping to confirm adequate porosity.
6. newly placed soils will be protected from trafficking, erosion and contamination.
7. drainage and run-off will be managed to avoid siltation.
8. in landscaping areas, soils will be allowed to settle naturally prior to planting and final cultivation.
9. Written and documented quality control and verification should be undertaken.

The key issues are covered in Sec 6.1 of the guidance *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*.

4 OPTIONS

4.1 Use on site

The soils are generally suitable to be used on site for any proposed development landscaping needs (to be confirmed as part of the main works application). Some organic matter amelioration may be needed in certain areas pending planting choice.

4.2 Export off site

Topsoil should be targeted as the most likely material to be kept on site. The key decider on any use is a demand within a cost-effective distance from the site and this option should be sought before a decision to send to landfill. The subsoil is more likely to be excavated as part of the bulk earthworks during the enabling works and presents a less significant loss than topsoil.

4.3 Options appraisal summary

Table 2. Options

	Use on site with no changes	Use on site with grading	Use on site with o.m. amelioration*	Bury on site as fill	Remove off site and use as soil	Removal off site to landfill
Sustainability	Fully sustainable	A	B	C	D	Not sustainable
Topsoil	1	NA	NA	4	5	6
Subsoil	1	NA	NA	2	5	6

Topsoil:

Sandy Loam, Sandy Clay Loam or Sandy Silt Loam Loam

Subsoil:

Sandy Loam, Sandy Clay, Clay

Sustainability scale:

- 1 Fully sustainable
 - 2 Compromise A Lowest energy use, no significant soil loss
 - 3 Compromise B Higher energy use
 - 4 Compromise C Low energy use but non sustainable soil loss
 - 5 Compromise D Possible higher energy use pending distance
 - 6 Not sustainable High energy use and non sustainable soil loss
 - 7 NA – not applicable/ not needed
- *- organic matter addition

5. CONCLUSIONS

1. The soils on site are generally of a high quality sandy loam, sandy clay loam or sandy silt loam and can be mostly retained on site and used for most proposed landscaping development needs with maybe some organic matter amelioration. There is a sufficient quantity to meet the likely needs.
2. Laboratory testing should be undertaken to confirm compliance with BS 3882 if needed.
3. Provided that soils are stripped, handled, stored, and reinstated under suitable ground and weather conditions, the majority of soils are considered capable of beneficial reuse within any development. Soil handling operations should maintain clear separation between topsoil and subsoil materials, as per the depths in this report, to preserve soil integrity.
4. Include soil handling protocols in accordance with Natural England guidance. Where degradation occurs through trafficking, storage, or reinstatement activities, appropriate amelioration measures should be implemented. These may include ripping or subsoiling to alleviate compaction, cultivation, organic matter incorporation, drainage improvement, and nutrient or pH correction, depending on the intended end use and post-development landscape requirements.
5. If there is a possibility to use all topsoil within landscaping schemes (to be confirmed as part of the future main application), this should be sought. Any selective strip and stockpile should be undertaken in dry conditions to preserve soil structure.

DRAWING 1

ALC Survey Borehole Locations

Key

ALC Grades

- Grade 1
- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Grade 5
- Non agricultural land

- Boring
- Pit

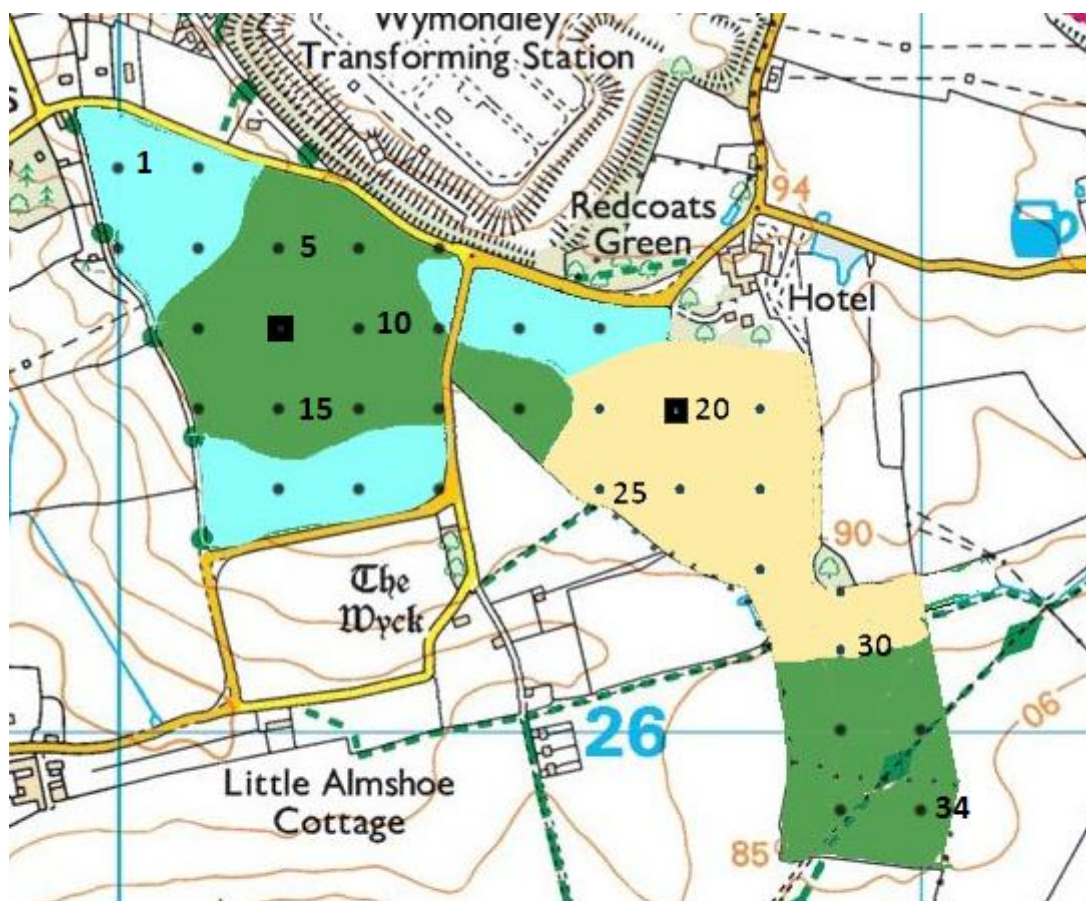
Soil Environment Services

Drawing Title: ALC Borehole Locations

Drawing No.: 1

Scale: 1:10000

Date: 28/09/2021



- Sandy loam over sandy loam
- Sandy clay loam over sandy clay
- Sandy silt loam over sandy clay loam over clay

Ordnance Survey copy licence PMR0046161

GENERAL INFORMATION SOURCES

Ministry for Agriculture, Fisheries and Food (2000): ***Good Practice Guide for Handling Soils***. FRCA Cambridge April 2000.

Department of the Environment Food and Rural Affairs. ***Construction Code of Practice for the Sustainable Use of Soils on Construction Sites***. DEFRA London 2009.

British Standards Institute (2015): BS3882:2015 ***Specification for Topsoil*** . BSI London 2015.

British Standards Institute (2013):BS 8601:2013 ***Specification for subsoil and requirements for use***. BSI London 2013.