

SOILS RESOURCES OF LAND

OFF DE BRAOSE CLOSE

CARDIFF

Report 1602/1

27th September, 2019

Land
Research
ASSOCIATES
www.lra.co.uk

**SOILS RESOURCES OF LAND
OFF DE BRAOSE CLOSE, CARDIFF**

L Thomas, MSc

Report 1602/1
Land Research Associates Ltd
Lockington Hall,
Lockington,
Derby
DE74 2RH
www.lra.co.uk

27th September, 2019

SUMMARY

This report provides information on the soils of 2.7 ha of land off De Braose Close, Cardiff.

The site is underlain by two main soil types.

Land underlying the woodland in the north of the site comprises loamy soils with high stone content and evidence of disturbance (brick fragments etc). These soils are not well suited for reuse in landscaping.

Land in the south of the site comprises well draining medium loamy soils with low stone content: high quality resources for reuse. There are sufficient on site soil resources to complete the proposed landscaping plan. Detailed recommendations on soil stripping and handling is provided in this report.

1.0 Introduction

- 1.1 This report provides information on the soils and agricultural quality of 2.7 ha of land off De Braose Close, Cardiff. The report is based on a survey of the land in September 2019.

SITE ENVIRONMENT

- 1.2 The survey area comprises rough grass and woodland. The site is bordered to the north-east by a railway line and the River Taff, to the south by Radyr Court Road, to the west by Blethin Close and to the north-west by adjoining woodland.

PUBLISHED INFORMATION

- 1.3 1:50,000 scale BGS information records the site to be underlain by glacial till over Brownstones Formation (interbedded sandstone and argillaceous rocks).

2.0 Soils

2.1 A detailed soil resource survey was carried out in September 2019. It was based on eleven observations evenly distributed across the site. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.0 m. A log of the sampling points and a map (Map 1) showing their location is in an appendix to this report.

2.2 The survey found soils across the site to vary in stoniness.

MEDIUM LOAMY SOILS

2.3 These soils are found under the rough grass in the south of the site. They comprise medium clay loam topsoils with low stone content, over well draining subsoils of the same texture.

2.4 An example profile is described below from a pit at observation 2 (Map 1).

0-17 cm	Dark reddish brown (5YR 3/3) medium clay loam; slightly stony (medium and large rounded and tabular hard stones); well developed fine subangular blocky structure; very friable; smooth clear boundary to:
17-70 cm	Reddish brown (5YR 5/4) medium clay loam with few fine faint yellowish red mottles; slightly stony with medium and large rounded and tabular hard stones; well developed medium subangular blocky structure; friable; smooth gradual boundary to:
70-100cm+	Reddish brown (5YR 5/3) medium clay loam; with common fine yellowish red (5RY 5/8) and dark reddish grey (5YR 4/2) mottles; very slightly stony with small and medium rounded hard stones; moderately developed medium subangular blocky structure; friable.

LOAMY STONY/DISTURBED SOILS

2.5 These soils are located in the north of the site under the woodland. They are difficult to penetrate with hand auger/spade due to the high concentration of tree roots and stones. The soils broadly comprise medium clay loam topsoils over sandy clay loam subsoils that are well draining and moderately to very stony. In places near the rail embankment soils appear to be disturbed with brick fragments, glass etc incorporated.

3.0 Soil resources and their use

TOPSOIL (TS1)

- 3.1 The topsoils under the rough grassland are of medium clay loam texture with low stone content (see Map 2). This topsoil represents a high quality resource for reuse in gardens and landscaping. The soils should be stripped and stockpiled as one resource to a depth of **200 mm**.

Estimated yield: 1,600 m³

SUBSOIL (SS1)

- 3.2 The subsoils in the south of the site under the rough grassland have good structure and drainage with low stone content and moderate clay content (see Map 2). They provide a high quality resource for reuse in landscaping and gardens, including use in tree pit planting. They should be stripped to a maximum thickness of 800 mm and stockpiled separately to other soil.

Estimated maximum yield: 6,400 m³

4.0 Soils and landscape design

TREE STANDARDS

- 4.1 Root protection areas will be set up around existing trees. A 10 x 10 m area will be ripped to de-compact subsoil in places where new tree planting is taking place. 900 mm tree planting pits will be backfilled with 600 mm of subsoil material (SS1) and 300 mm of the site-won topsoil (TS1).

AMENITY GRASSLAND

- 4.2 Amenity grassland will use between 150-300 mm of the onsite topsoil resource (TS1), rotovated to a depth of 100 mm, laid over de-compacted subsoil.

SHRUB/HEDGE PLANTING

- 4.3 Where planting is taking place on undisturbed areas in-situ soils will be retained. Elsewhere, subsoil de-compaction will take place prior to planting. Shrub and hedge planting will require a 300-450 mm deep trench, backfilled with site-won topsoil resource (TS1).
- 4.4 There are sufficient topsoil and subsoil resources of high quality within the site to satisfy all landscaping requirements.

5.0 Soil Handling

- 5.1 The moderate clay content of the topsoils and subsoils means the land is susceptible to structural damage under machinery handling. The high annual rainfall (1534 mm/yr) and field capacity days (240 days) for the area means the soils are best handled between May and September in an average year. Stripping should not take place during or just after (within 24 hours) of heavy rainfall and should be carried out using the excavator and dumper method described by Sheet 1 in the MAFF Good Practice Guide for Handling Soils.
- 5.2 Soil handling will be undertaken when soils are sufficiently dry to be friable and not plastic (this can be judged by whether a 3 mm thick thread can be rolled under current site conditions). All soil handling would be best conducted during dry weather between late May and early September, when the soils are likely to be in their best handling condition.
- 5.3 Construction traffic will be restricted to designated roadways to avoid soil compaction.
- 5.4 Stripped topsoil should be kept in a separate bund to any imported subsoils and not stored any more than 4 m high. The soil stockpiles should be kept grassed and free from construction traffic until required for reuse/ The bunds will be constructed either by excavator or bulldozer (Sheets 2 and 14 in the MAFF Good Practice Guide) avoiding over-compaction. Where in use for greater than six months, they will be sown with grass to help maintain biological activity and prevent water erosion. The Construction Code of Practice for Sustainable Use of Soils on Construction Sites (Defra, 2009) guidance on good practice in soil handling will be fully adhered to.
- 5.5 The soils will be removed from storage (Sheet 3 in the MAFF Good Practice Guide) and replaced by excavator using the loose tipping technique (Sheet 4 in MAFF Good Practice Guide), which avoids traffic on the restored surfaces.
- 5.6 Upper subsoils on stripped areas will be loosened before topsoil is replaced. De-compaction would be best performed with a tined ripper pulled by an earth-mover or excavator, undertaken when soils are sufficiently dry to be friable and not plastic (this can be judged by whether a 3 mm thick thread can be rolled under current site conditions).

MONITORING

- 5.7 A suitably qualified practitioner will meet with the groundworks team prior to soil stripping to discuss soil handling. Site will be visited once stripping works are underway to confirm methods used and that the soil resources have been separated effectively/are suitable for use in the landscaping scheme. Site works will be signed off by the qualified practitioner following a final visit post groundworks completion. Auditable monitoring reports will be provided to the LPA demonstrating the site teams compliance with the Soil Resources Report.

APPENDIX
MAPS AND DETAILS OF OBSERVATIONS

Land off De Braose Close, Cardiff: Details of observations at each sampling point

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope (°)	Wetness Class
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling		
1	0-12	MCL	5-10	12-40	SCL mod st	xxx	40+	Stopped on stone		2	III
2	0-17	MCL	<5	17-70	MCLr	o	70-100+	MCLr	xx	1	II
3	0-20	MCL	<5	20-80+	MCL	xxx				2	III
4	0-19	MCL	<5	19-56	MCL	xx	56-100+	SCL	xxx	1	II
5	0-20	MCL	<5	20-40+	MCL	x	50+	Stopped on stone		2	II
6	0-21	MCL	<5	21-50+	MCL	x	50+	Stopped on stone		1	II
7	0-20	MCL	<5	20-60+	SCL	xxx	60+	Stopped on stone		11	III
8	0-20	MCL	10-15	20-42	SCL	xxx	<u>42-55</u> 55-80+	Cr SCL dist.	xx xxx	10	IV
9	0-15	MCL	10-15	15+	V dist brick etc					2	II/III
10	0-12	MCL	5-10	12-50+	SCL mod st	xx				4	II
11	0-20	MCL	5-10	20-45+	SCL v st	xx				10	II

Key to table

Mottle intensity:

- o unmottled
- x few to common rusty root mottles (topsoils) or a few ochreous mottles (subsoils)
- xx common to many ochreous mottles and/or dull structure faces
- xxx common to many greyish or pale mottles (gleyed horizon)
- xxxx dominantly grey, often with some ochreous mottles (gleyed horizon)

a depth underlined (e.g. 50) indicates the top of a slowly permeable layer
(a wavy underline indicates the top of a layer borderline to slowly permeable)

Texture:

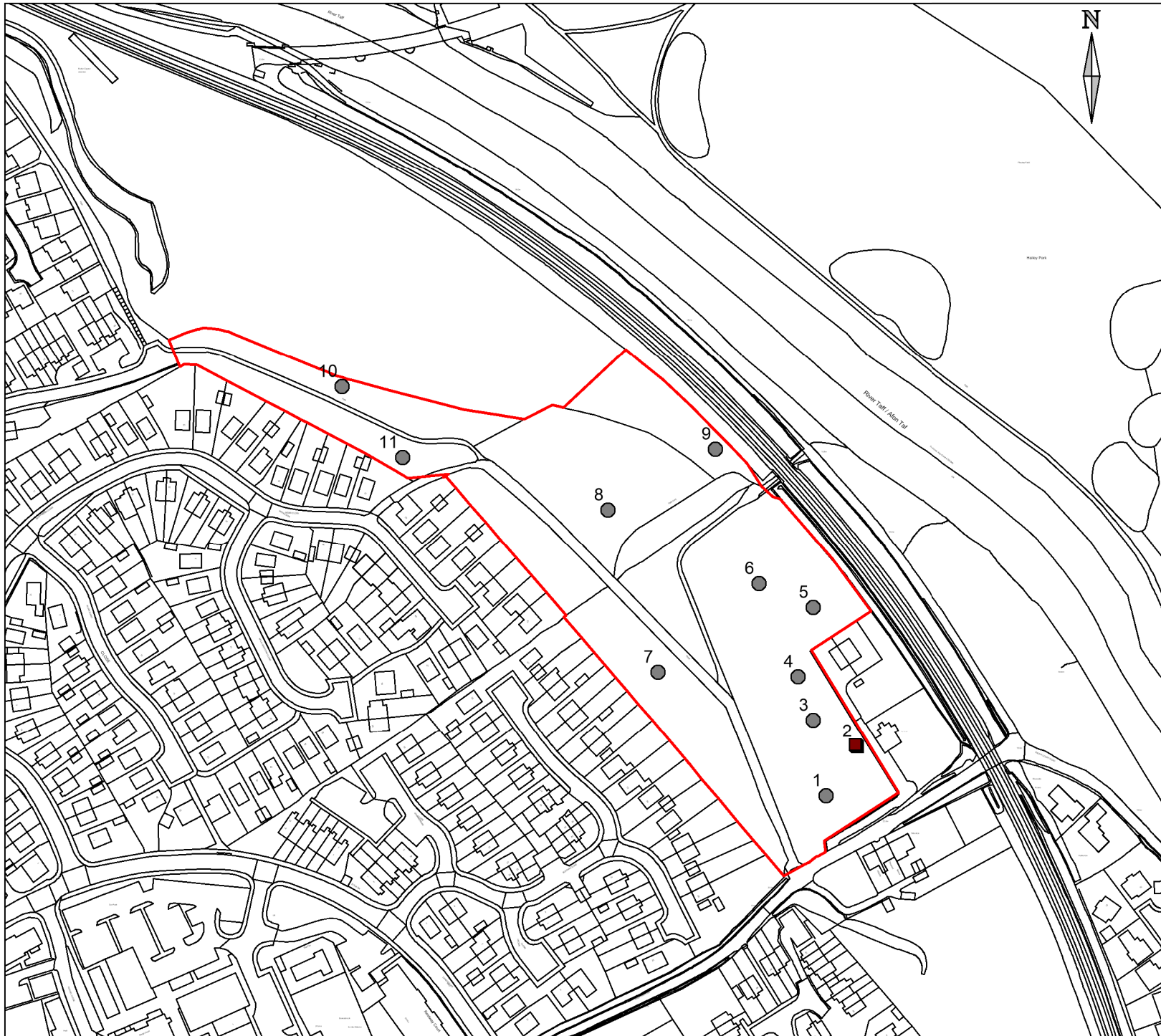
- C - clay
- ZC - silty clay
- SC - sandy clay
- CL - clay loam (H-heavy, M-medium)
- ZCL - silty clay loam (H-heavy, M-medium)
- SCL - sandy clay loam
- SZL - sandy silt loam (F-fine, M-medium, C-coarse)
- SL - sandy loam (F-fine, M-medium, C-coarse)
- LS - loamy sand (F-fine, M-medium, C-coarse)
- S - sand (F-fine, M-medium, C-coarse)
- P - peat (H-humified, SF-semi-fibrous, F-fibrous)
- LP - loamy peat; PL - peaty loam
- R - bedrock

Limitations:

- W - wetness/workability
- D - droughtiness
- De - depth
- St - stoniness
- SI - slope
- F - flooding
- T - topography/microrelief

Texture suffixes & prefixes:

- ca - calcareous: x-extremely, v-very, sl-slightly
- (ca) marginally calcareous
- mn - ferrimanganiferous concentrations
- gn - greenish, yb - yellowish brown, rb - reddish brown
- r - reddish; (v)st - (very) stony; sdst - sandstone; lst - limestone
- dist - disturbed soil layer; mdst - mudstone



KEY

- Auger observation
- Soil/land grade description pit
- Survey area

Client:



Taff Housing Association
Cymdeithas Tai Taf

Site:

**Land off De Braose Close,
Cardiff**

Map title:

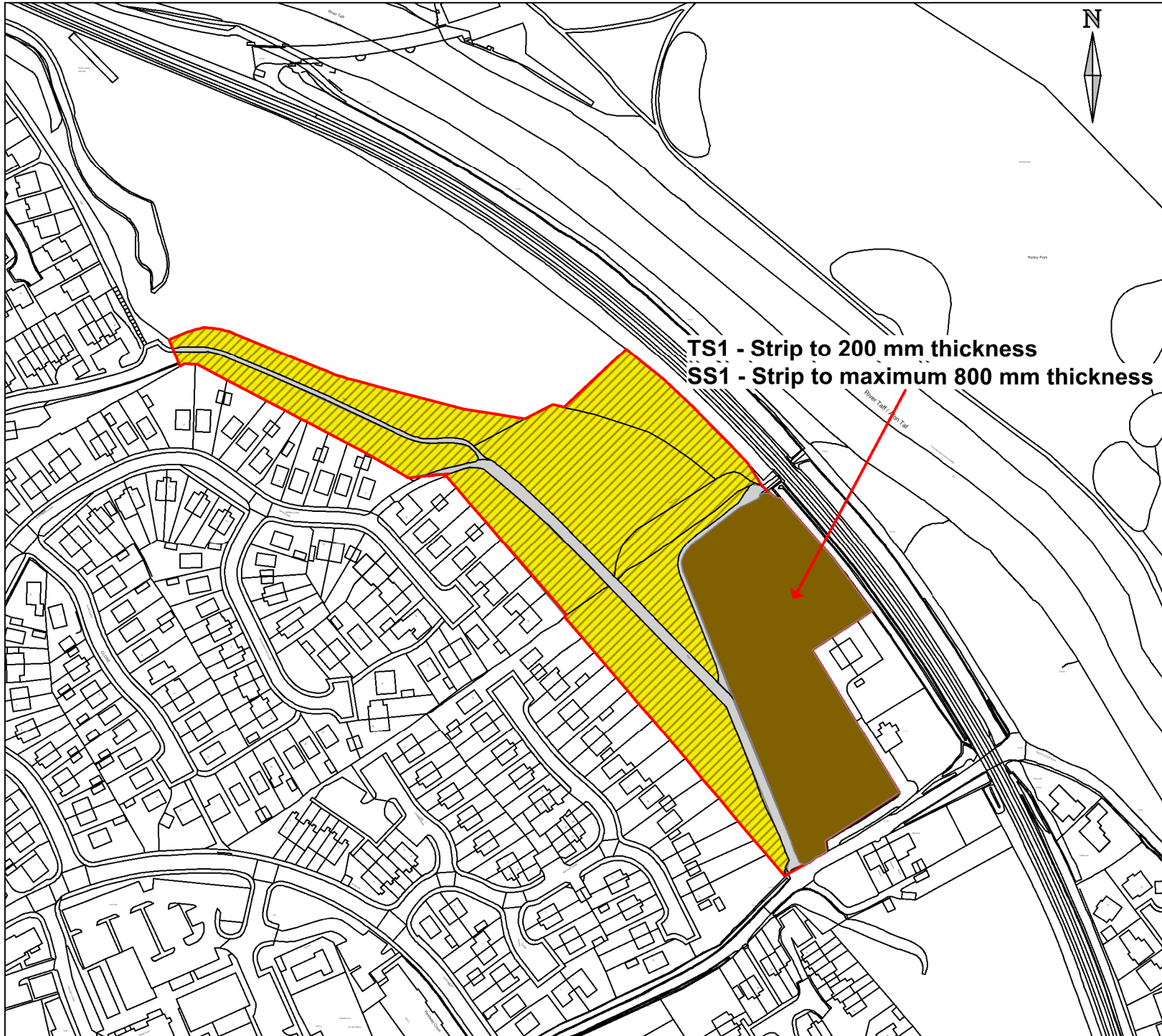
**Map 1
Survey observations**







Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:2,500

Date: 27/09/2019



KEY

-  Medium loamy soils (TS1 & SS1)
-  Loamy over stony / slightly disturbed soils
-  No soil resource
-  Survey area

TS1 - Strip to 200 mm thickness
SS1 - Strip to maximum 800 mm thickness

Client:



Taff Housing Association
 Cymdeithas Tai Taf

Site:

**Land off De Braose Close,
 Cardiff**

Map title:

**Map 2
 Soil resources**



Land Research Associates
 Lockington Hall
 Derby DE74 2RH
 01509 670570

Scale: 1:2,500

Date: 27/09/2019