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Agricultural Land Classification (ALC) Report

Land to the West of Grimethorpe

December 2024

Enviromena

Reference: 221103.AC.02

Agricultural Land Classification (ALC) Report

Land to the West of Grimethorpe

Client: Enviromena

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Reference:	Previous Versions	Date
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Position: Principal Consultant	**Position:** Managing Director

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1. Scope & Objectives

The Services	Agricultural Land Classification (ALC) Report	
The Client	Enviromena	
Appointment Details	The Services have been carried out in accordance with the Proposal dated 1 November 2022 and REL's Terms and Conditions of Engagement, (together "**the Agreement**") as accepted by the Client on 1 November 2022.	
Site Name	Land to the West of Grimethorpe	
Site Address	Grimethorpe, S72 7BN ("**the Site**")	
Proposed Use	It is understood that the site is to be developed for a solar array.	
Planning Application	None currently available for viewing (Barnsley Metropolitan Borough Council planning portal).	
Information Sources (Where appropriate documents are contained in Appendix II with data extracts provided and summarised within pertinent sections of this report. List not exhaustive)	**Online Source**	Magic Web Mapping Service, DEFRA, 2022.
		British Geological Survey (BGS) Database and Mapping.
		BGS Geoindex Web Mapping Service.
		BGS 1: 50,000 scale Provisional Series, Geological Map, England and Wales, Sheet 87 (Barnsley), available on the BGS map portal.
		Ministry of Agriculture, Fisheries and Food (MAFF), Post-1988 Agricultural Land Classification Surveys Database and Mapping.
		Google Aerial Imagery.
		National Library of Scotland Historical Ordnance Survey England and Wales, 1855-1956 Maps.
	Documentation Source	Soil Classification for Soil Survey, Monographs on Soil Survey, Butler, B E (1980), Clarendon Press, Oxford.
		Soil Survey Field Handbook, Describing and Sampling Soil Profiles, Soil Survey of England and Wales, Technical Monograph No. 5, 1976.
		Meteorological Office (Met Office), 1989, Climatological Data for Agricultural Land Classification – Gridpoint Datasets of Climatic Variables, at 5km intervals, for England and Wales.
		MAFF, 1988, Agricultural Land Classification of England and Wales – Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.
		Soils and their use in Northern England, 1984, Soil Survey of England and Wales Memoir and accompanying 1:250,000 scale map.
	Previous Reports	A previous ALC survey was undertaken for 44.20ha of land across the west of the subject site. The report identifies the site comprises mainly Grade 3b (27ha), with some Grade 3a (15.20ha) and small areas of Grade 4 noted (0.90ha). The report was available on the Magic Web Mapping Service.
	Site Works	The site works were undertaken by REL over 15 and 16 November 2022. The submission site boundary has been altered since the site works were undertaken, as indicated in Figure 2 and 3 which indicate both the survey boundary and the submission boundary.

2. Site Details

National Grid Ref.	Approximate centre of Site: 440211, 409340
Ground Level Topography	Average for Site: c.40m AOD.
Site Area	88.50 hectares (ha).
Survey Area	132.60 ha.
Usage	Majority in agricultural rotation for crop, with some grazing land for livestock.
Location	The subject site is located c.800m west of Grimethorpe village centre and c.5.70km northeast of Barnsley town centre.

Figure 1: Approximate Site Location, highlighted in red

Figure 2: Site Submission Boundary (defined in red).

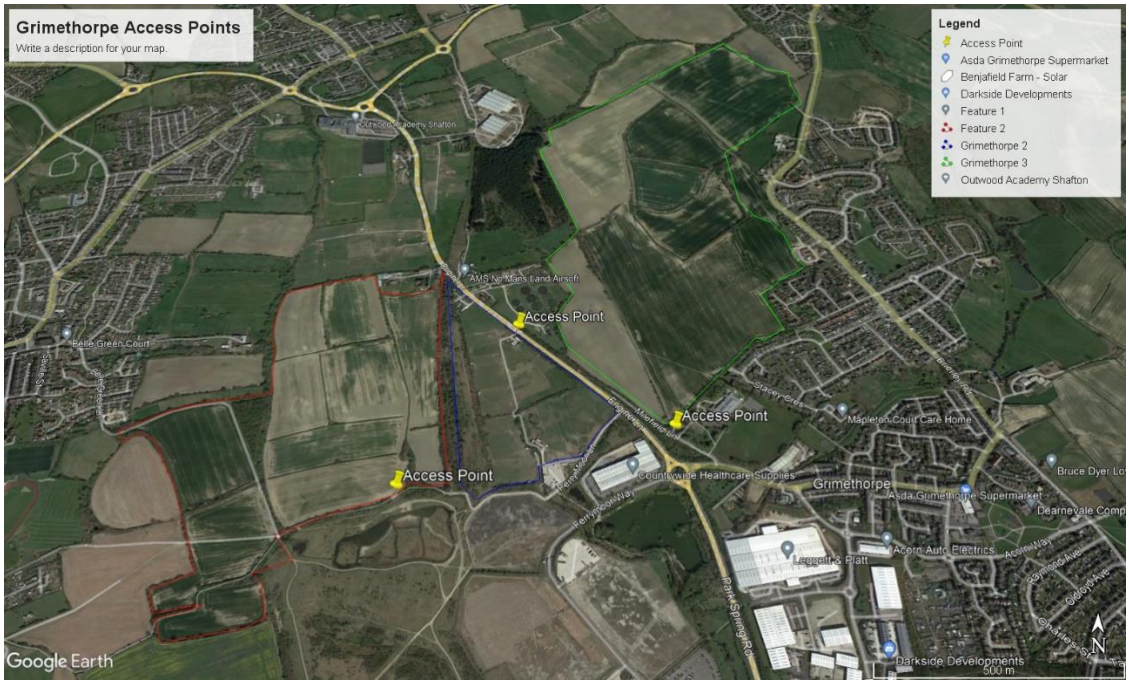


Figure 3: Survey and Reporting Boundary (defined in red, blue and green – all areas).

Current Site Description and Activities	The subject site comprises agricultural fields which are currently in use for arable crop on the west and east of the site and the centre of the site is currently used for grazing.
Surrounding land uses	Surrounding land uses comprise a mix of agricultural fields with residential developments to the west, north and east and industrial estates to the south.

Site History	From earliest mapping dated 1885, the site is shown as agricultural land. Mapping dated 1937 indicated a tramway (linked to Ferrymoor Colliery) running across the western side of the eastern part of the site until 1949 when it was denoted as 'Dismantled'. From 1949 a railway is noted dividing the western part of the site from the central site area, which is now denoted as 'Dismantled'. Mapping dated 1955 indicates areas of Made Ground on the north western part of the eastern side of the site.
Current Grading	The site is currently mapped as **Grade 3** on the provisional 1: 250,000 scale ALC map (MAFF, 1983).

3. Methodology

Desk Study

An initial desk-based study has been undertaken to provide a reconnaissance of the general site characteristics, including soil type(s) and agricultural classification, using published data sources.

Where available, Post-1988 ALC Surveys (undertaken at varying scales and levels of detail, ranging from 1:5,000 to 1:50,000 scale) have been consulted. Surveys included on this map provide the most detailed and up to date ALC grading following surveys between 1989 and 1999 by MAFF (now part of DEFRA).

Climatological data provided by the Met Office has been used to determine the overriding agroclimatic site limitations, using interpolated values based on the central point of the site.

Intrusive Soil Survey

The intrusive soil survey comprised at least one hand auger boring per 1 ha to a depth of 1.20m below ground level (where possible) as per the guidance. These were undertaken to examine the soil profiles, using standard soil survey methods.

In addition, to determine subsoil structure, at least one pit excavation per soil type has been conducted.

The application boundary has altered since the site survey works were undertaken, therefore the survey boundary differs to the submission boundary.

ALC Grade Assessment

All factors have been considered, including those which pose no limitation on the ALC grading for the site.

Using the information collected during the site survey and the MAFF ALC guidance documents, an ALC grade was then determined for the site (**Appendix I**). The survey boundary has been assessed as part of the assessment, rather than the submission boundary.

A brief overview of relevant terminology is included in **Appendix V**.

4. Desk Based Reconnaissance

Prior to the intrusive site investigation, a review of available desk-based information was undertaken. Pertinent information has been summarised below.

Climate Data

Using the climatological data set (Met Office, 1989) the following information (**Table 1**) has been calculated for the site. Calculations comprised altitude adjustment and interpolation, using the formula presented within the data set.

***Table 1**: Summary of Agroclimatic Data for the Site*

Land at Grimethorpe (Site Centre Grid Reference: 440211, 409340)		
Average Annual Rainfall (mm)	AAR	631.25
Accumulated Temperature (˚C)	ATO	1381.00
Field Capacity Duration (Days)	FCD	136.39
Moisture Deficit Wheat (mm)	MDWHT	105.53
Moisture Deficit Potatoes (mm)	MDPOT	96.41

The site is identified to have average ATO and AAR, with below average FCD when compared to the mapped values for the area between Barnsley and Doncaster (Soils and their Use in Northern England, 1984).

Using the AAR and ATO values within **Table 1,** the site is considered to be Grade 1 according to climate (Figure 1 of the MAFF guidance document). Therefore, climate is considered to not be a limiting factor on the site.

Topography

The majority of the site was identified to be relatively flat with gradients of up to 2°, however, a small area of the land on the northern edge of the eastern section of the site was identified to have a slope between 8 and 11°.

The area in the north would be limited to ALC Grade 3b due to topography, with the remainder of the site having no limitation due to topography (Table 1, MAFF ALC Guidance 1988).

BGS Published Data

A review of BGS information has identified that an area of Made Ground is indicated in the centre of the site between the dismantled railway and Engine Lane (A6195). No other Made Ground areas are indicated across the remainder of the site. The site is situated within an area mainly free from superficial deposits, with a small area in the centre of the site is underlain by

Alluvium (clay, silt, sand and gravel) superficial deposits. The bedrock geology is indicated as the Pennine Middle Coal Measures Formation of either sandstone or interbedded sandstone, mudstone and siltstone.

Published Soils Data

The location of the site is shown below in **Figure 4**. The majority of the site is recorded as having soils of the Bardsey Association (713a) across the majority of the site, described as slowly permeable seasonally waterlogged loamy over clayey and fine silty soils over soft rock. On the west of the site, soils of the Rivington 1 Association (541f) are mapped, described as well drained coarse loamy soils over sandstone.

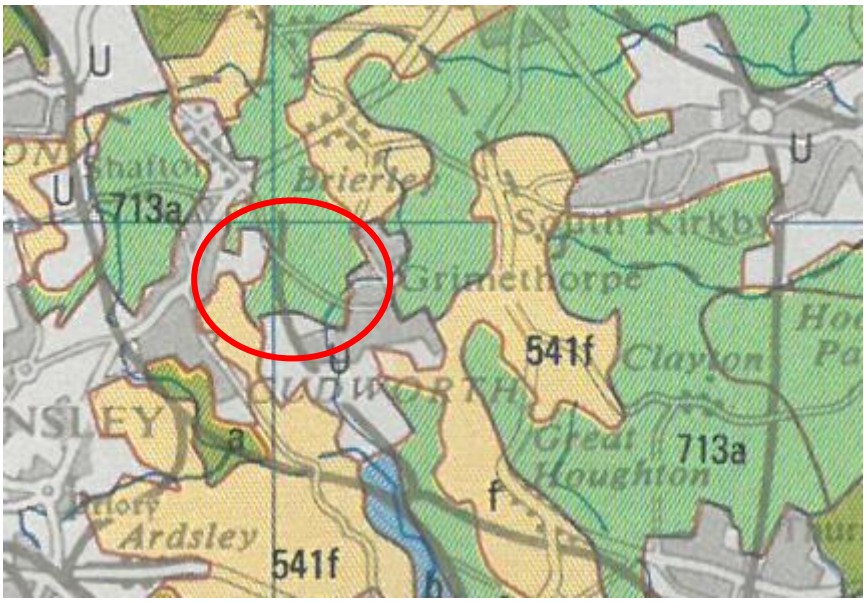


Figure 4: Soils Mapping for the Site and Surrounding Area (site location indicated in red).

Previous Reports

A review of the MAGIC Post 1988 ALC (England) Surveys map identified that the western part of the site has previously been surveyed. The report (reference: Ferry Moor OCCS – Resource Planning Team, Northern Region, FRCA, Leeds (July 1998) 27/98) was requested from DEFRA and reviewed by REL as part of this report.

The previous report which comprises 44.20 ha of land on the west of the subject site, identifies mainly Grade 3b, with some Grade 3a and small areas of Grade 4 noted where a steep site gradient was recorded.

Flood Risk Assessment

Since the ALC guidance document was published in 1988, the Environment Agency (EA) has updated the way the risk of flooding is assessed. Therefore, the terms used in the 1988 guidance (Table 2, MAFF ALC Guidance 1988) have been paired to the current EA flood risk classifications below.

Table 2: *Summary of Flood Risk for the Site*

EA Flood Classification	MAFF Flood Classifications
Zone 3a High Probability	Frequent
Zone 3b Functional Floodplain	Frequent
Zone 2 Medium Probability	Occasional
Zone 1 Low Probability	Rare to Very Rare

The interactive EA Flood Map for Planning on the UK Government website identifies the site to be within a Flood Zone 1, Low Probability, area, see below Figures.

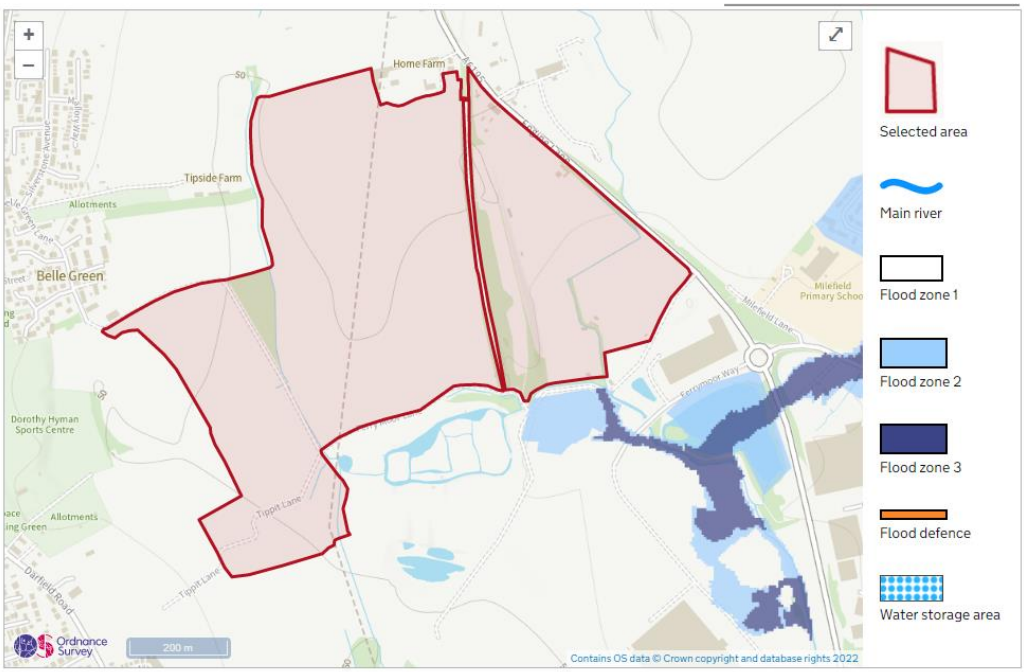


Figure 5: Flood Risk Present for the Western Part of the Site (site boundary defined in red).

Figure 6: Flood Risk Present for the Eastern Part of the Site (site boundary defined in red).

The impact of flood risk is not identified to pose any limitation to the ALC grade of the site.

5. Intrusive Survey Findings

The survey, undertaken by representatives of REL in November 2022 identified Two Soil Types across the site, with the majority of the site comprising Soil Type 1, with discrete areas of the shallow rock Soil Type 2. Generalised profiles of the Soil Types encountered are described as below (**Table 3**) however, please note some localised variations were recorded. Complete soil logs are provided in **Appendix II** and photographs of the surveyed soils are presented in **Appendix III**.

Table 3: *Summary of Soils Identified on Site*

	Depth (cm)	Texture	Colour	Stones (%)	Mottles	Structure
Soil Type 1	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
Soil Type 2	0-20	Medium Silty Clay Loam (MZCL)	Very Dark Grey (2.5Y 3/1)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very Dark Grey (10YR 3/1)	35	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK-Sandstone	N/A	N/A	N/A	N/A

The general profile for each of the soil types identified on the site has been used to assess the Wetness Class (WC) of each Soil Type. The general profile is reflective of the findings in the soil pit associated with the Soil Type identified on site. The assessment process and results of the in-field wetness assessment is provided within **Table 4** below.

Table 4: *Wetness Class assessment for Soil Types 1 and 2encountered on site*

Parameters (Figure 6, MAFF) Soil Type	Findings	
	Type 1	**Type 2**
Disturbed	Yes ✓ No	Yes ✓ No
FCD	136.39	136.39
SPL < 80cm	✓ Yes No	✓ Yes No
Justification	At a depth of 20cm, the SPL was identified to be present due to the following characteristics: Silty Clay (ZC) coarse prismatic structure moderately developed less than 0.50% biopores greater then 0.50 mm diameter evidence of wetness in the layer; ochreous mottles	At a depth of 20cm, the SPL was identified to be present due to the following characteristics: Silty Clay (ZC) coarse prismatic structure strongly developed less than 0.50% biopores greater then 0.50 mm diameter evidence of wetness in the layer; ochreous mottles
Soil Type	Peat Red ✓ Other	Peat Red ✓ Other
Gleyed	✓ Yes No	✓ Yes No
Depth to Gleying	<40cm ✓ >40cm <70cm >70cm	✓ <40cm >40cm <70cm >70cm
Justification	Few Fine Ochreous Mottles from 20cm with pale ped face colours dominant	Few Fine Ochreous Mottles from 20cm with pale ped face colours dominant
Resulting Reference	Figure 7 ✓ Figure 8 Table 12 Table 13 NA	✓ Figure 7 Figure 8 Table 12 Table 13 NA
Wetness Class	**III**	**IV**

Notes: This Table follows the flow chart of Figure 6 of the MAFF ALC guidance to identify the wetness classification per Soil Type.

Using the MAFF 1988 Agricultural Land Classification of England and Wales – Revised guidelines, the above Wetness Classes, combined with the texture of the top 25cm results in the following ALC Grades:

Soil Type 1 –Heavy Clay Loam topsoil, Wetness Class III, 138.39 Field Capacity Days, results in **Sub Grade 3b**.

Soil Type 2 – Medium Silty Clay Loam topsoil, Wetness Class IV, 138.39 Field Capacity Days, results in **Sub Grade 3b**.

6. Conclusions and Recommendations

The ALC grading for the site area is summarised below within **Table 5**, overall findings of this assessment can be found in **Appendix IV**. The table identifies the grade of the areas of agricultural land and also provides the area of the non-agricultural land present across the site (**Appendix I**).

Table 5: *ALC Classification*

ALC Grade	Area (Ha)	Percentage
Grade 1	0.00	0.00%
Grade 2	0.00	0.00%
Subgrade 3a	0.00	0.00%
Subgrade 3b	**108.70**	**81.98**%
Grade 4	**6.80**	**5.13**%
Grade 5	0.00	0.00%
Non-Agricultural	**17.10**	**12.89**%
Total	**132.60**	**100%**
Total BMV	**0.00**	**0%**

The site has been identified to comprise two soil types, summarised in **Table 3.**

Soil Type 1 – Wetness Limitation

The combination of the topsoil texture (Heavy Clay Loam), Wetness Class (IV) and the number of Field Capacity Days (138.39) results in **ALC Grade 3b** for Type 1 soils.

Soil Type 2 – Droughtiness Limitations

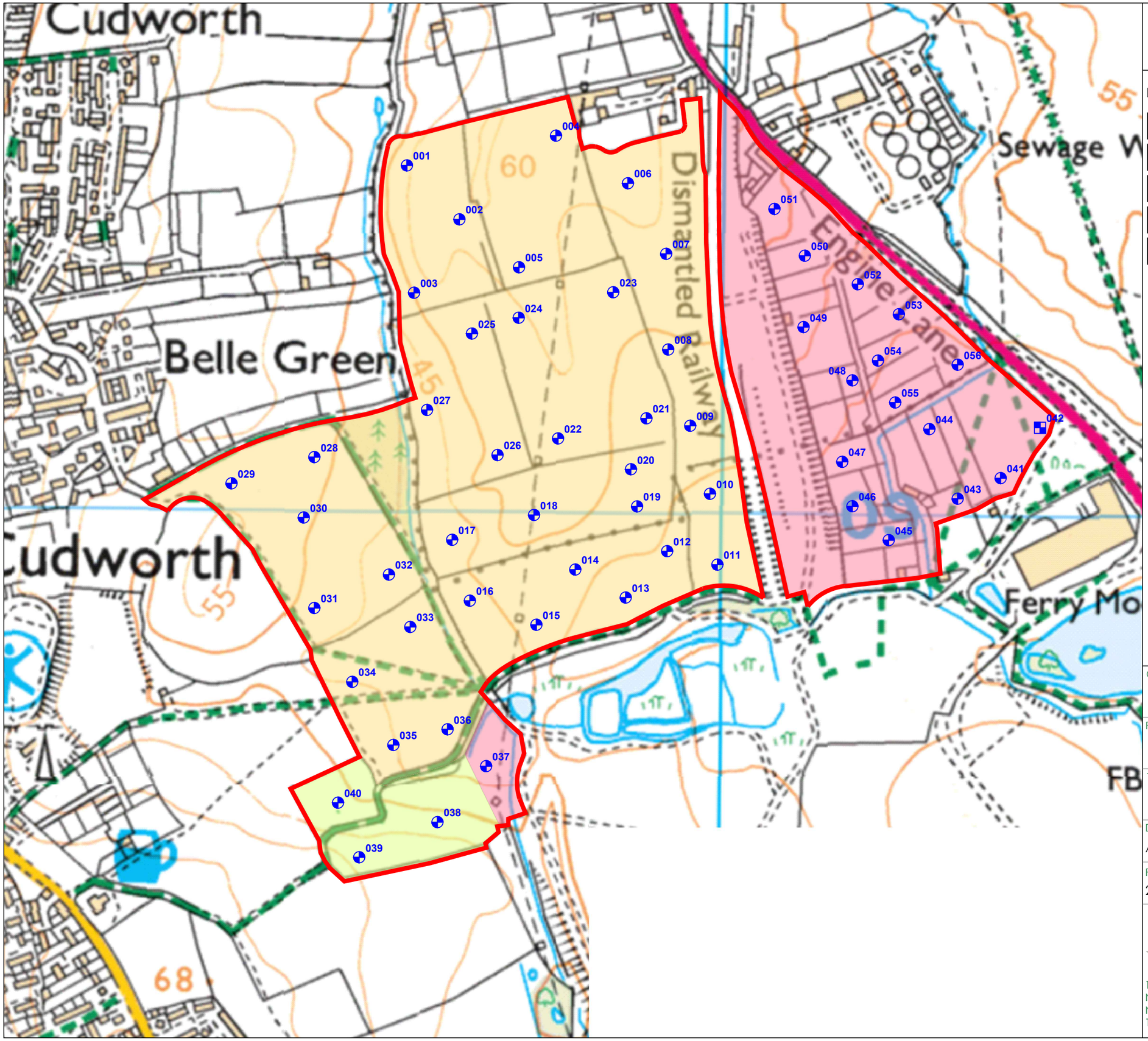
The combination of the topsoil texture (Medium Silty Clay Loam) and the number of Field Capacity Days (138.39) results in **ALC Grade 4** for Type 2 soils with a Droughtiness limitation for Wheat on these soils.

Overall Site ALC Grade and Conclusions

The soils on the subject site are identified to be 58.10% ALC Sub Grade 3b and 6.80% ALC Grade 4. with the remaining soils classified as non-agricultural land. No Best and Most Versatile agricultural land has been identified across the site.

The land on the west of the site has previously been classified as Grades 3b, 3a and 4, however this has been reassessed as Grades 3b and 4 by this survey.

APPENDIX I BOREHOLE LOCATION PLAN AND ALC GRADING



N

0 5 10 20

metres 1:500

Legend

- 000 Auger Location & Reference
- 000 Pit Location & Reference
- Non Agricultural Land
- Soil Type 1
- Soil Type 2

CLIENT:	Enviromena
PROJECT:	Land to the West of Grimethorpe
TITLE:	Auger/ Pit Location Plan and Soil Type [Site West]

DRAWN BY:	CHECKED BY:	DATE:	SCALE:
AB	LM	12/12/2022	1:500

PROJECT NO:	DRAWING NO:
221103	221103-01

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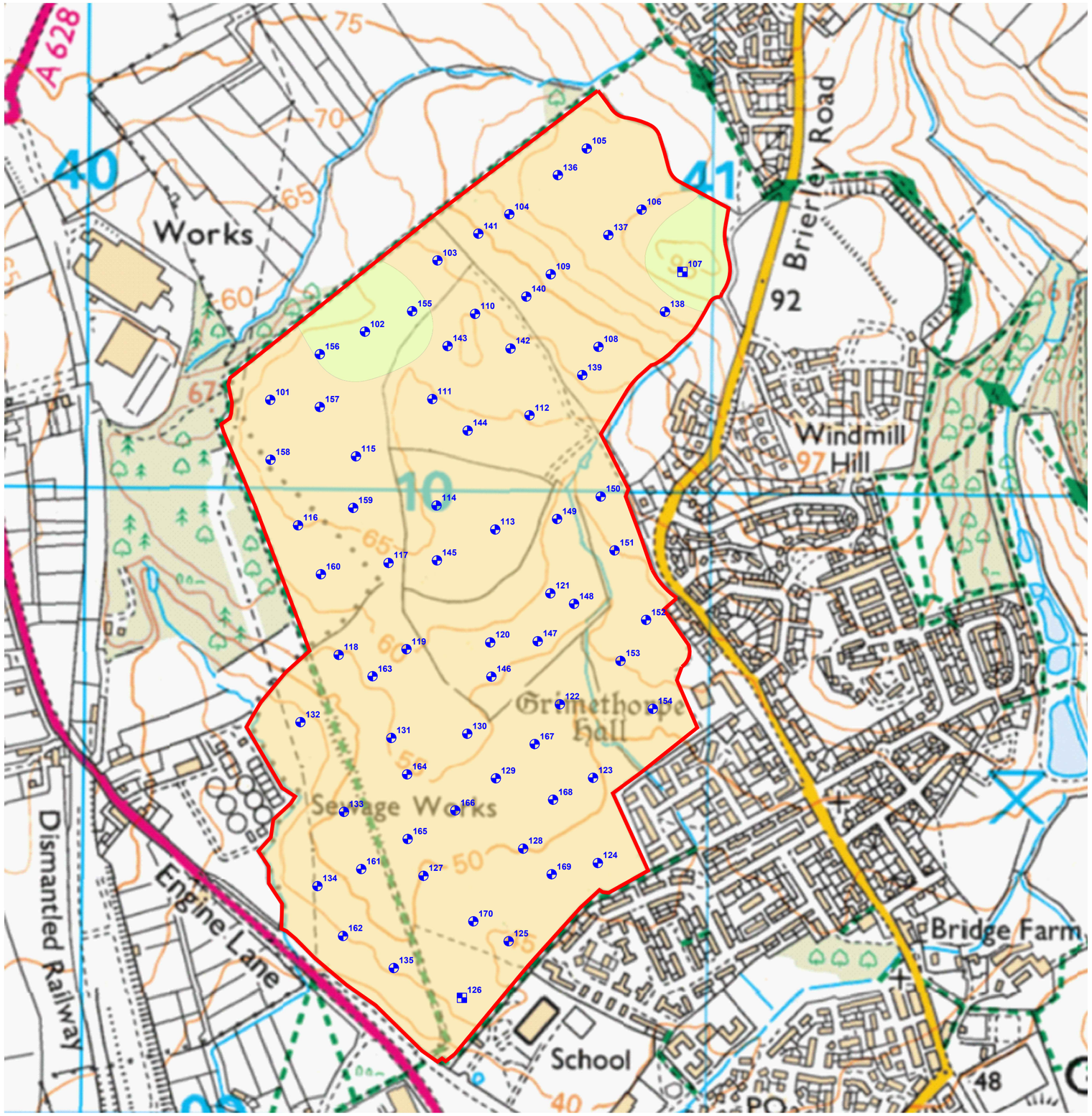

0 5 10 20
metres 1:500

Legend

- 000 Auger Location & Reference
- 000 Pit Location & Reference
- Non Agricultural Land
- Soil Type 1
- Soil Type 2

CLIENT: Enviromena			
PROJECT: Land to the West of Grimethorpe			
TITLE: Auger/ Pit Location Plan and Soil Type [Site East]			
DRAWN BY: AB	CHECKED BY: LM	DATE: 12/12/2022	SCALE: 1:500
PROJECT NO: 221103		DRAWING NO: 221103-02	

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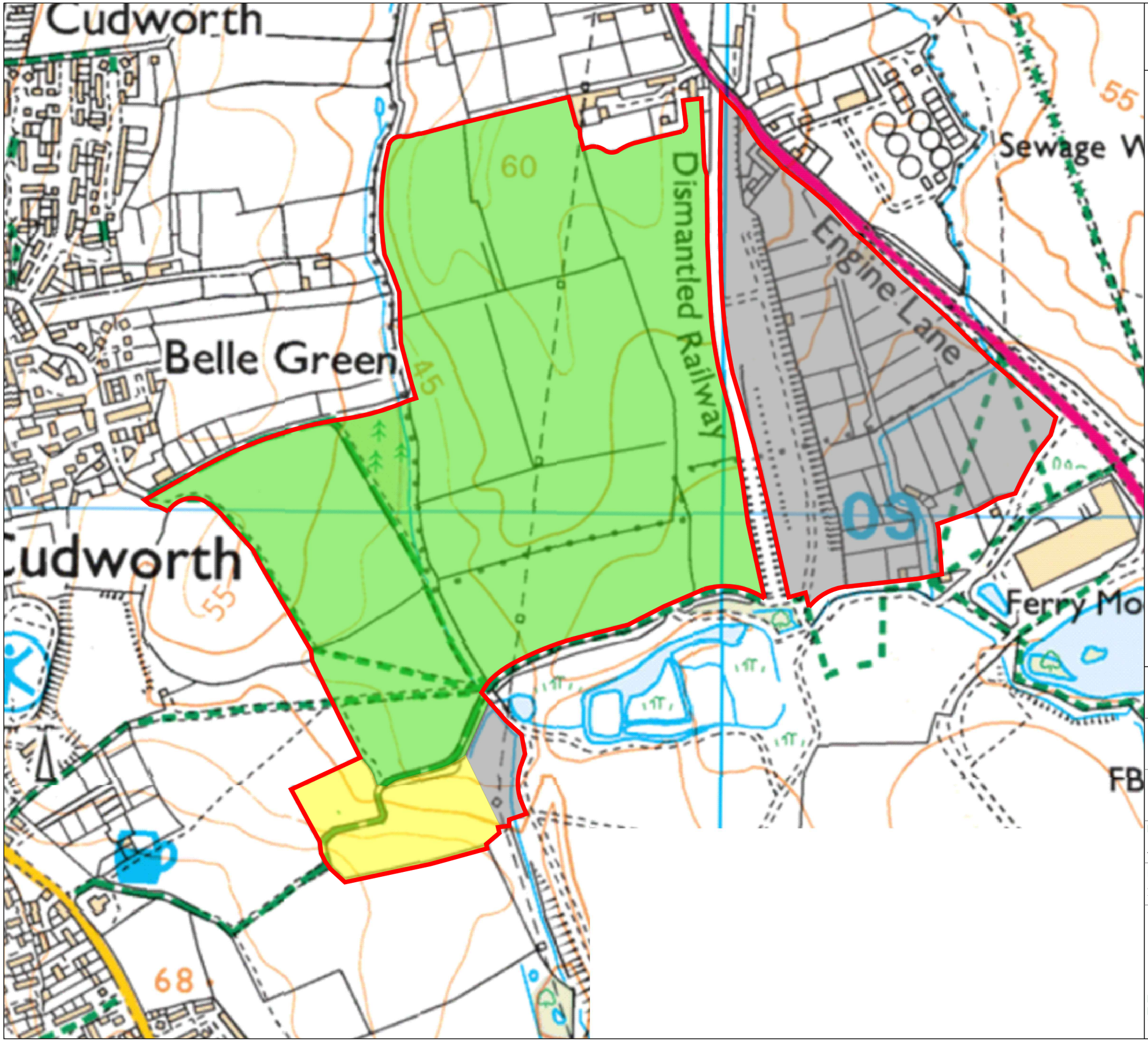

N

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metres 1:500

Legend

- ALC Grade 3b
- ALC Grade 4
- Other

CLIENT:	Enviromena
PROJECT:	Land to the West of Grimethorpe
TITLE:	Agricultural Land Classification Plan [Site West]

DRAWN BY:	CHECKED BY:	DATE:	SCALE:
AB	LM	12/12/2022	1:500

PROJECT NO:	DRAWING NO:
221103	221103-03

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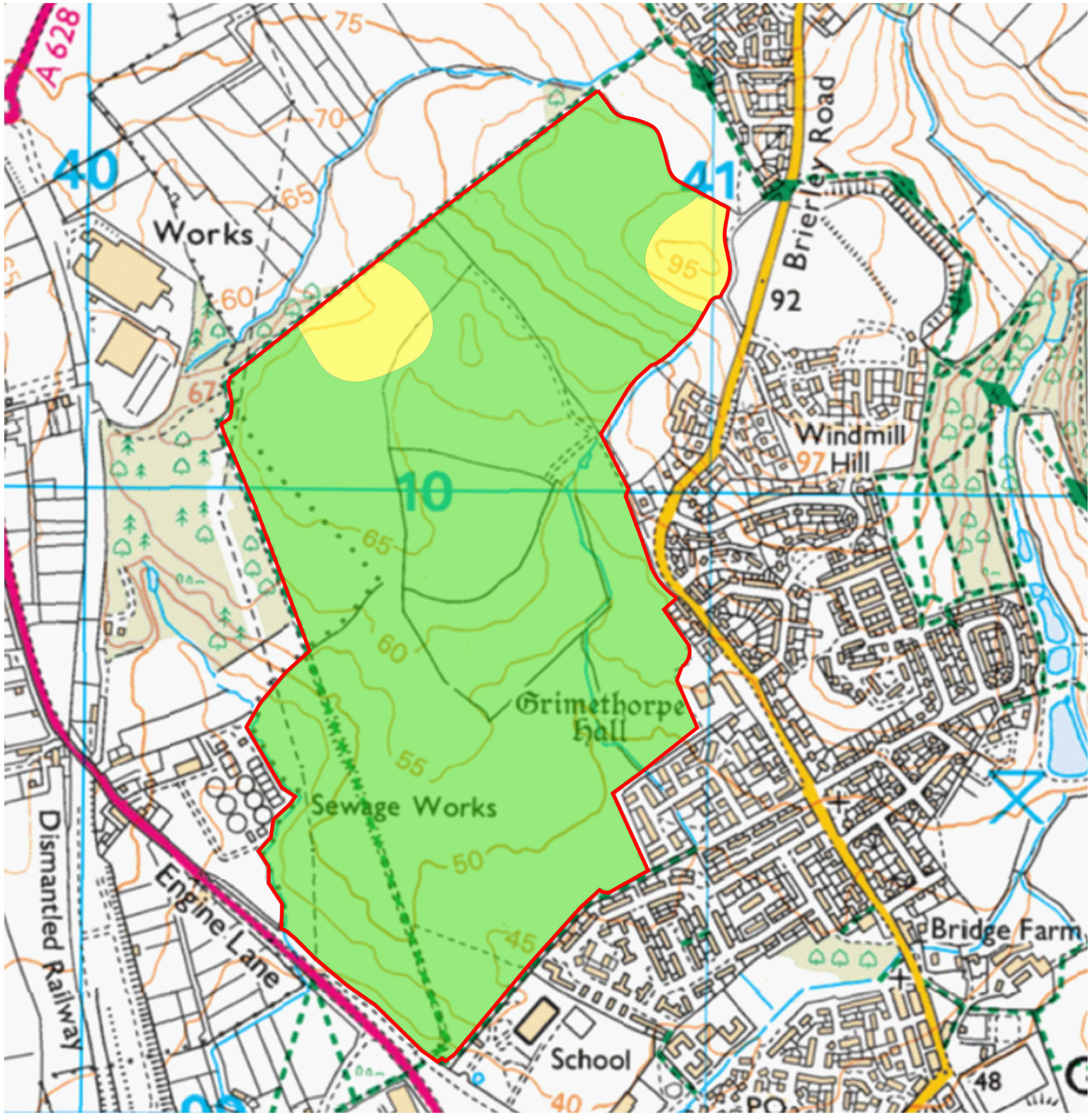

N

0 5 10 20
metres 1:500

Legend

- ALC Grade 3b
- ALC Grade 4

CLIENT: Enviromena			
PROJECT: Land to the West of Grimethorpe			
TITLE: Agricultural Land Classification Plan [Site East]			
DRAWN BY: AB	CHECKED BY: LM	DATE: 12/12/2022	SCALE: 1:500
PROJECT NO: 221103		DRAWING NO: 221103-04	

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APPENDIX II SITE SURVEY LOGS

BH No.	Depth (cm)	Texture	Colour	Stones (%)	Mottles	Structure
1	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
2	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
3	0-15	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	15-120	Silty Clay (ZC)	Brown (10YR 4/3)	5	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
4	0-35	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
5	0-35	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
6	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-80	Sandy Clay (SC)	Reddish brown (2.5YR 4/4)	0	Many Medium Ochreous (10YR 6/6)	Friable Moderate Medium Prismatic
	80-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
7	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
8	0-45	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	45-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
9	0-26	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	5	No	Moderate Medium Angular Blocky
	26-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
10	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
11	0-22	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	22-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
12	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
13	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
14	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/4)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
15	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	5	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	15	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
16	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	5	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	15	Few Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
17	0-25	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Brown (10YR 4/3)	35	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
18	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	35	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
19	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	35	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
20	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky

20	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	35	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
21	0-22	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	22-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
22	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
23	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
24	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
25	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	15	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
26	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
27	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
28	0-25	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
29	0-20	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Brown (10YR 4/3)	15	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
30	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
31	0-10	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	10-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
32	0-10	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	10-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
33	0-10	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	10-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
34	0-20	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
35	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
36	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
37				Non-Agricultural Land		
38	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	5	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	15	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
39	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	5	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	15	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
40	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	15	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
41				Non-Agricultural Land		
Pit 42				Non-Agricultural Land		
43				Non-Agricultural Land		
44				Non-Agricultural Land		
45				Non-Agricultural Land		
46				Non-Agricultural Land		
47				Non-Agricultural Land		
48				Non-Agricultural Land		
49				Non-Agricultural Land		
50				Non-Agricultural Land		
51				Non-Agricultural Land		

525				Non-Agricultural Land		
53				Non-Agricultural Land		
54				Non-Agricultural Land		
55				Non-Agricultural Land		
56				Non-Agricultural Land		
101	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
102	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	15	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
103	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
104	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
105	0-20	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-50	Sandy Clay (SC)	Dark grey (10YR 4/1)	15	Many Medium Ochreous and Grey (7.5YR 4/6 and 10YR 6/1)	Moderate Coarse Angular Blocky
	50-95	Sandy Clay (SC)	Grey (2.5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/8)	Moderate Coarse Prismatic
	95-120	Sandy Clay (SC)	Grey (2.5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/8)	Friable Strong Coarse Prismatic
106	0-20	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-50	Sandy Clay (SC)	Dark grey (10YR 4/1)	15	Many Medium Ochreous and Grey (7.5YR 4/6 and 10YR 6/1)	Moderate Coarse Angular Blocky
	50-95	Sandy Clay (SC)	Grey (2.5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/8)	Moderate Coarse Prismatic
	95-120	Sandy Clay (SC)	Grey (2.5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/8)	Friable Strong Coarse Prismatic
Pit 107	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	35	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
108	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
109	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
110	0-30	Heavy Clay Loam (HCL)	Light grey (2.5Y 7/2)	15	Numerous Medium Ochreous (7.5YR 6/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
111	0-30	Heavy Clay Loam (HCL)	Light grey (2.5Y 7/2)	15	Numerous Medium Ochreous (7.5YR 6/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
112	0-30	Heavy Clay Loam (HCL)	Light grey (2.5Y 7/2)	15	Numerous Medium Ochreous (7.5YR 6/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
113	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
114	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
115	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
116	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
117	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
118	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
119	0-40	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky

119	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
120	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
121	0-40	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-50	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
	50-70	Peat	Black	0	No	Massive
	70-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
122	0-30	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
123	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
124	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
125	0-50	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	50-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
Pit 126	0-12	Heavy Clay Loam (HCL)	Grey (7.5YR 4/1)	5	No	Moderate Medium Sub Angular Blocky
	12-30cm	Clay (C)	Light grey (10YR 7/2)	5	Many Medium Ochreous and Grey (2.5YR 6/6 and 2.5Y 7/1)	Moderate Coarse Angular Blocky
	30-120	Clay (C)	Light grey (10YR 7/2)	5	Many Medium Ochreous and Grey (2.5YR 6/6 and 2.5Y 7/1)	Strong Coarse Prismatic
127	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
128	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
129	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
130	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
131	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
132	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
133	0-10	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	15	No	Moderate Medium Angular Blocky
	10-120	Silty Clay (ZC)	Brown (10YR 4/3)	0	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic
134	0-50	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	50-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
135	0-50	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	50-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
136	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
137	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
138	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
139	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Clay (C)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
140	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky

140	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
141	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Clay (C)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
142	0-25	Heavy Clay Loam (HCL)	Light grey (2.5Y 7/2)	15	Numerous Medium Ochreous (7.5YR 6/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
143	0-30	Heavy Clay Loam (HCL)	Light grey (2.5Y 7/2)	5	Numerous Medium Ochreous (7.5YR 6/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
144	0-30	Heavy Clay Loam (HCL)	Light grey (2.5Y 7/2)	5	Numerous Medium Ochreous (7.5YR 6/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
145	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
146	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
147	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
148	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
149	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
150	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
151	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
152	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
153	0-20	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	20-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
154	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
155	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	35	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
156	0-20	Medium Silty Clay Loam (MZCL)	Very dark grey (2.5Y 3/1)	15	Very Few Fine Ochreous (7.5YR 4/4)	Moderate Medium Sub Angular Blocky
	20-35	Silty Clay (ZC)	Very dark grey (10YR 3/1)	35	Very Few Fine Ochreous (5YR 4/4)	Strong Coarse Prismatic
	35-120	ROCK - Sandstone	N/A	100	N/A	N/A
157	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
158	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
159	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
160	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
161	0-50	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	50-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic

162	0-50	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	50-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
163	0-40	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
164	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
165	0-25	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	25-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
166	0-40	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	40-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
167	0-30	Heavy Silty Clay Loam (HZCL)	Very dark greyish brown (2.5Y 3/2)	5	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
168	0-35	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	35-120	Silty Clay (ZC)	Grey (5Y 6/1)	15	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
169	0-30	Heavy Clay Loam (HCL)	Very dark greyish brown (2.5Y 3/2)	15	Few Fine Ochreous (2.5YR 4/6)	Moderate Medium Angular Blocky
	30-120	Silty Clay (ZC)	Grey (5Y 6/1)	5	Numerous Medium Ochreous (7.5YR 5/6)	Moderate Coarse Prismatic
170	0-50	Heavy Clay Loam (HCL)	Dark grey (10YR 4/1)	5	No	Moderate Medium Angular Blocky
	50-120	Silty Clay (ZC)	Brown (10YR 4/3)	5	Many Fine Ochreous (5YR 5/3)	Friable Moderate Coarse Prismatic

Appendix III Site Survey Photographs

Photograph Number	Photograph Description	Photograph
1.	**Land at Grimethorpe** General view of the northern area of the site.	
2.	**Land at Grimethorpe** General view of the site from the north towards the central area.	
3.	**Land at Grimethorpe** View of the central Made Ground area of the site.	

Photograph Number	Photograph Description	Photograph
4.	**Land at Grimethorpe** View of the central Made Ground area of the site.	
5.	**Land at Grimethorpe** View of the central Made Ground area of the site.	
6.	**Land at Grimethorpe** General view of the southern part of the eastern site.	

Photograph Number	Photograph Description	Photograph
7.	**Land at Grimethorpe** View of the southern part of the eastern site towards the public footpath (dismantled railway).	
8.	**Land at Grimethorpe** View of the Non-Agricultural area in the south western part of the site.	

9.	**Land at Grimethorpe** Profile of Soil Type 1.	
10.	**Land at Grimethorpe** Profile of Soil Type 2.	
11.	**Land at Grimethorpe** Pit 126 – Soil Type 1.	
12.	**Land at Grimethorpe** Pit 126 – Soil Type 1; structure of subsoil.	

13.	**Land at Grimethorpe** Pit 107 – Soil Type 2.	
14.	**Land at Grimethorpe** Pit 107 – Soil Type 2; structure of subsoil.	

APPENDIX IV SUMMARY OF FINDINGS

Job Name:	Grimethorpe
Job Number:	221103
Date:	12/12/2022
Completed By:	Lauren Manning

Site Altitude:	40
Centre Grid Ref:	4402 4093

AAR	631.25
ATO	1381.00
FCD	136.39
MDMWHT	105.53
MDMPOT	96.41

	Soil Type 1	Soil Type 2	Soil Type 3
AP WHT	132.50	54.04	0.00
MB WHT	26.97	-51.49	-105.53
AP POT	106.5	59.9	0
MB POT	10.09	-36.51	-96.41

Site Limitations Summary

	Soil Type 1	Soil Type 2	Soil Type 3
Wetness Class	IV	IV	
Wetness Grading	3b	3b	
Droughtiness Wheat	2	4	
Droughtiness Potato	1	3b	
Gradient Limitaion	1	1	
Soil Depth Limitation	1	3a	
Stoniness Limitation	1	3a	
		Overall	
Site Climatic Limitation	1	1	
Flooding Limitation	1	1	
Overall Grade	**3b**	**4**	

APPENDIX V TERMINOLOGY

Agricultural Land Classification (ALC)

The Agricultural Land Classification (ALC) provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long- term limitations on agricultural use. The limitations can operate in one or more of four principal ways: they may affect the range of crops which can be grown; the level of yield; the consistency of yield and the cost of obtaining it. The classification system gives considerable weight to flexibility of cropping, whether actual or potential, but the ability of some land to produce consistently high yields of a somewhat narrower range of crops is also taken into account.

These factors form the basis for classifying agricultural land into one of five grades (with Grade 3 land divided into Subgrades 3a and 3b since the guidelines were revised in 1988), ranked from Excellent (Grade 1) to Very Poor (Grade 5). ALC grading is determined using the Ministry of Agriculture Food and Fisheries (MAFF) ''*Agricultural Land Classification of England and Wales – Revised guidelines and criteria for grading the quality of agricultural land*'.

Definition of Agricultural Land Classification Grades

ALC Grade	Description
Grade 1	**Excellent quality agricultural land** No or very minor limitations to agricultural use.
Grade 2	**Very good quality agricultural land** Minor limitation which affect crop yield, cultivation or harvesting.
Subgrade 3a (pre-1988 Grade 3)	**Good quality agricultural land** Capable of producing moderate to high yields of a narrow range of arable crops or moderate yields of a wider range of crops.
Subgrade 3b (pre-1988 Grade 3)	**Moderate quality agricultural land** Capable of producing moderate yields of a narrow range of arable crops and/or lower yields of a wider range of crops.
Grade 4	**Poor quality agricultural land** Severe limitations which significantly restrict the range of crops and/or levels of yield.
Grade 5	**Very poor quality agricultural land** Very severe limitations which restrict use to permanent pasture or rough grazing.

Best and Most Versatile (BMV) Agricultural Land

The National Planning Policy Framework (NPPF) (Department for Communities and Local Government, 2012) defines Best and Most Versatile (BMV) agricultural land as land of Excellent (ALC Grade 1), Very Good (Grade 2) and Good (Grade 3a) agricultural quality. BMV land is provided a degree of protection against development within planning policy, with most Local Plans including specific policies which refer to the protection of BMV agricultural land.

Non-BMV agriucltural land, i.e. Moderate, Poor and Very Poor quality agricultural land is designated subgrade 3b or Grades 4 and 5 respectively, and is restricted to a narrower range

of agricultural uses. Limited to no protection is provided against development on this grade land within planning policy.

Soil Series

Soil series is the lowest categorical level used for classifying soils in England and Wales. According to the Soil Survey of England and Wales 1984:

> *"Soil series are defined using a combination of three main properties, the broad type of parent material present (substrate type), the texture of the soil material (textural grouping) and the presence or absence of material with a distinctive mineralogy."*

Higher categories are: Major Soil Group, Soil Group, and Soil Subgroup, which are not explicitly used in this report.

Soil Association

A soil association is a geographic grouping of soils identified by the name of the most frequently occurring soil series and by the combination of additional soil series.

Gleying

Gleying is the process of iron reduction (opposite to oxidation) in soils from ferric (reddish in colour) to ferrous compounds (grey or colourless), by microorganisms or by-products of decomposing organic matter. Gleying occurs in areas devoid of oxygen when the soil is waterlogged. The resulting mottling (spots or blotches of colour) can therefore be used to identify the existence of a Slowly Permeable Layer (SPL); as defined within the MAFF ALC guidance.