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Agricultural Land Classification (ALC) Report

Land at Fairgreen BESS, Basildon

March 2025

Pegasus Group

Reference: 250119.AC.01

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1. Scope & Objectives

The Services	Agricultural Land Classification (ALC) Report	
The Client	Pegasus Group	
Appointment Details	The Services have been carried out in accordance with the Proposal dated 13 December 2024 and REL's Terms and Conditions of Engagement, (together "**the Agreement**") as accepted by the Client on 15 January 2025.	
Site Name	Land at Fairgreen BESS	
Site Address	Fairgreen, Basildon, Essex, SS6 7NG ("**the Site**")	
Proposed Development	It is understood that the site is to be developed for a battery energy storage system and associated infrastructure, engineering works, access and landscaping.	
Information Sources (Where appropriate documents are contained in appendices with data extracts provided and summarised within pertinent sections of this report. List not exhaustive)	**Online Source**	Natural England Provisional Agricultural Land Classification Grade (pre-1988), accessed via Magic Web Mapping Service, DEFRA, 2025.
		Natural England Agricultural Land Classification Grades Post-1988 Surveys (Polygons) Database and Mapping, accessed via Magic Web Mapping Service, DEFRA, 2025.
		British Geological Survey (BGS) Database and Mapping.
		BGS Geoindex Web Mapping Service.
		BGS 1: 50,000 scale Provisional Series, Geological Map, England and Wales, Southend (258), available on the BGS map portal.
		Google Historic Satellite Imagery.
		National Library of Scotland Historical Ordnance Survey England and Wales, 1880 – 1969 Maps.
	Documentation Source	Soil Classification for Soil Survey, Monographs on Soil Survey, Butler, B E (1980), Clarendon Press, Oxford.
		Hodgson, J.M (ed.) (2022). *Soil Survey Field Handbook*. Soil Survey Technical Monograph No. 5, Cranfield.
		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.
		Natural England, Technical Information Note TIN049 Second Edition, 2012.
		Soils and their use in Eastern England, 1984, Soil Survey of England and Wales Memoir and accompanying 1:250,000 scale map.
	Site Works	The site works were undertaken by REL in January 2025.

2. Site Details

National Grid Ref.	Approximate centre of the site: 577664, 190578.
Ground Level Topography	Range 8m AOD, average for site: c.17 m AOD.
Site Area	10.1 hectares (ha).
Location	The subject site is bounded by the A127 to the north, A1245 to the east and A130 to the west, with the latter two meeting at the south of the site boundary. The town centre of Basildon is located approximately 7.5km west of the site, whilst the town centre of Rayleigh is located approximately 2.5km to the east.

Figure 1: Site Boundaries (highlighted in red)

Current Site Description and Usage	The subject site comprises largely agricultural fields which are currently used for arable crop. A small area in the northeast of the site is shown to be used for storage of associated agricultural materials.
Surrounding Land Uses	Surrounding land uses comprise a mix of residential, agricultural and commercial uses. The immediate surrounding land comprises the remainder of the agricultural fields, bounded by dual carriage ways in all directions.
Site History	From the earliest mapping dated 1880, the site is shown as agricultural land.
Current Grading	The site is currently mapped as **Grade 3** on the provisional 1: 250,000 scale ALC map (MAFF, 1983) see **Appendix V** for key to the gradings.

3. Methodology

Desk Study

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

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 hectare to a depth of 1.20m below ground level (where achievable) in accordance with current guidance. These were undertaken to examine the soil profiles, using standard soil survey methods.

In addition, in order to determine subsoil structure, at least one inspection pit has been excavated for each soil type encountered.

ALC Grade Assessment

All potential limiting ALC grade factors (listed in **Appendix V**) have been considered as part of the assessment, 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, or for each soil type based on the most limiting ALC grade (**Appendix I**). 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

(Site Centre Grid Reference: 577664, 190578)		
Average Annual Rainfall (mm)	AAR	579.02
Accumulated Temperature (˚C)	ATO	1470.75
Field Capacity Duration (Days)	FCD	105.96
Moisture Deficit Wheat (mm)	MDWHT	123.57
Moisture Deficit Potatoes (mm)	MDPOT	120.59

The site is identified to have an approximate average AAR, ATO and FCD when compared to the mapped values for the area east of Southend on Sea (Soils and their Use in Eastern England, 1984).

Using the AAR and ATO values within **Table 1,** the site is not considered to be limited by climate (Figure 1, MAFF 1988).

Topography

The site was identified to have a gradient between 0˚ and 6˚, therefore topography is not identified to be a limiting factor of the ALC grade of the site (Table 1, MAFF 1988).

BGS Published Data

A review of BGS information has identified that no Made Ground areas are indicated across the site.

The site is situated within an area recorded to be free from superficial deposits.

The bedrock geology is indicated as the London Clay Formation, comprising clay, silt and sand.

Published Soils Data

Soils mapping for the area as shown on *Soils and their use in Eastern England*, 1984, Soil Survey of England and Wales Memoir and accompanying 1:250,000 scale map has been reviewed as part of this assessment. The location of the site is shown in the soils mapping extract below in **Figure 2**.

The soils mapping suggests the soils on site comprise the Windsor Association (712c). There is potential for the Ratsborough Association (572r) to encroach from the west of the site.

- **Windsor Association (712c) –** Slowly permeable clayey soils, with grey and ochreous mottled clayey subsurface horizons. Usually stoneless and well structured.
- **Ratsborough Association (572r) –** Fine silty over clayey soils, slowly permeable subsoils cause seasonal waterlogging.

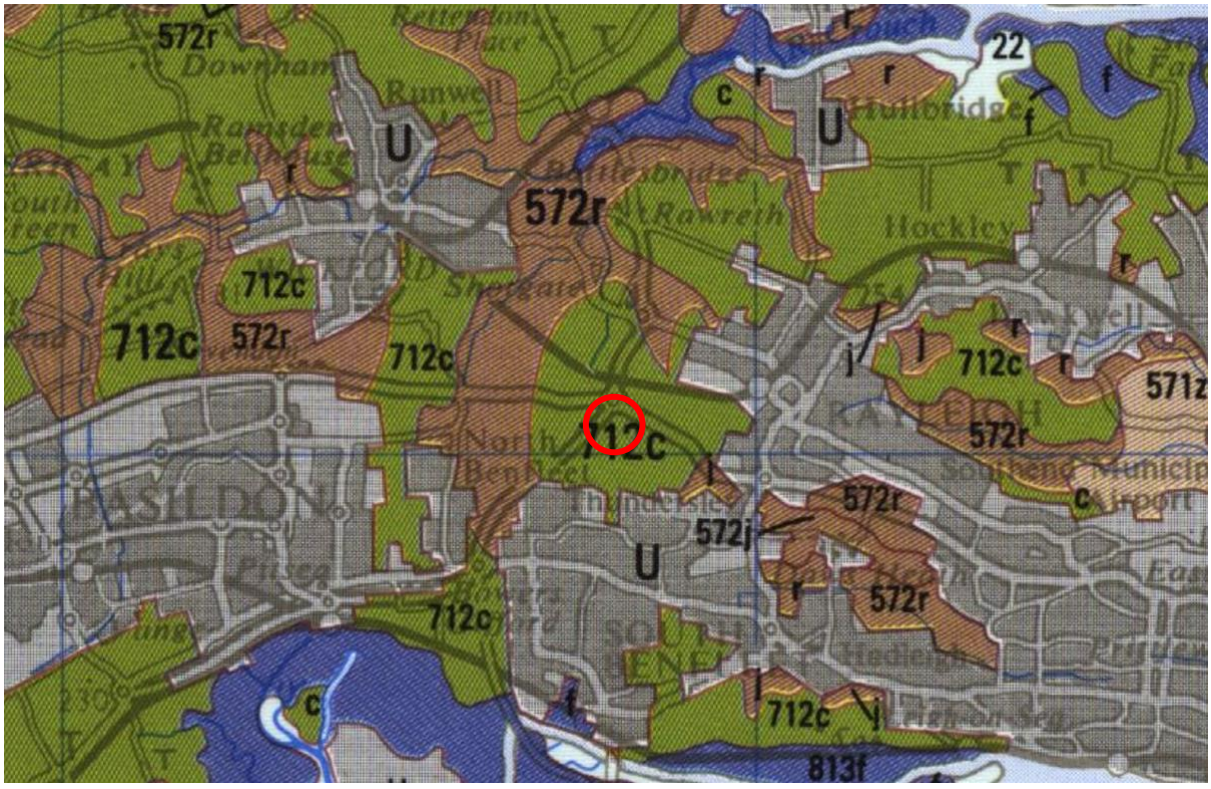


Figure 2: Soils Mapping for the Site and Surrounding Area (site location indicated in red)

Previous Reports

No previous ALC reports are available for the site or adjacent surrounding areas.

Flood Risk Assessment

A preliminary assessment of the potential flood risks on site is provided below.

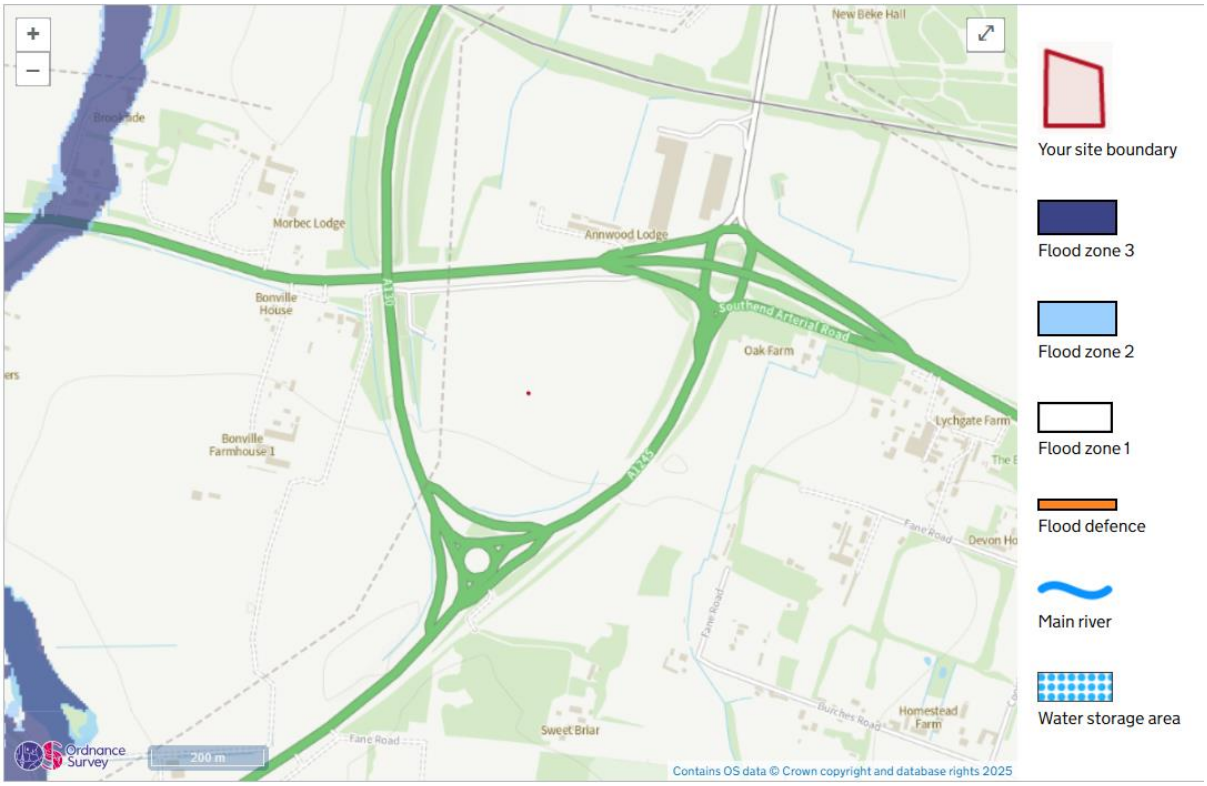


Figure 3: Flood Risk Present from Rivers and the Sea for the Site (site boundary defined in red)

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 (**Figure 3**).

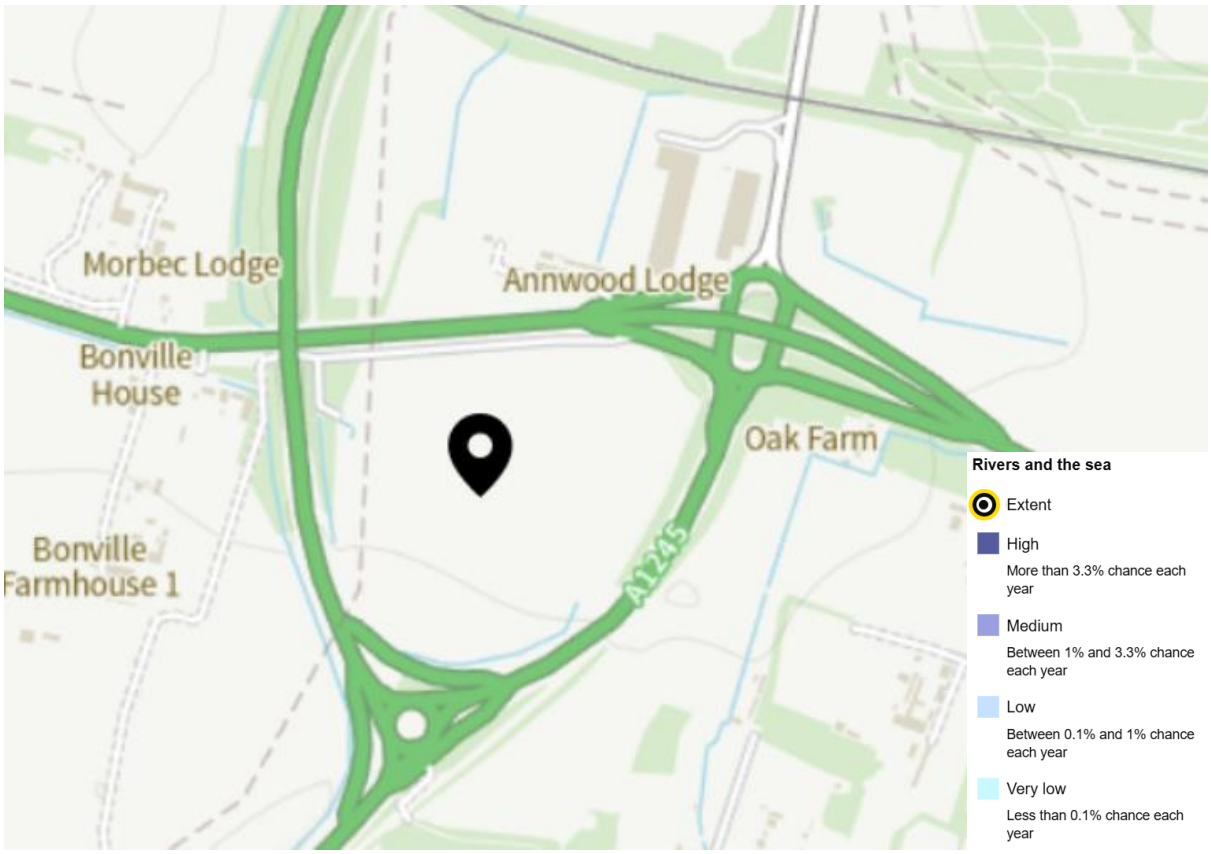


Figure 4: Long Term Local Flood Risk from Rivers or the Sea for the Site and Surrounding Area

After reviewing the long-term flood risk map (**Figure 4**) REL considers that the site cannot be classed as having a high probability of flooding from rivers and sea.

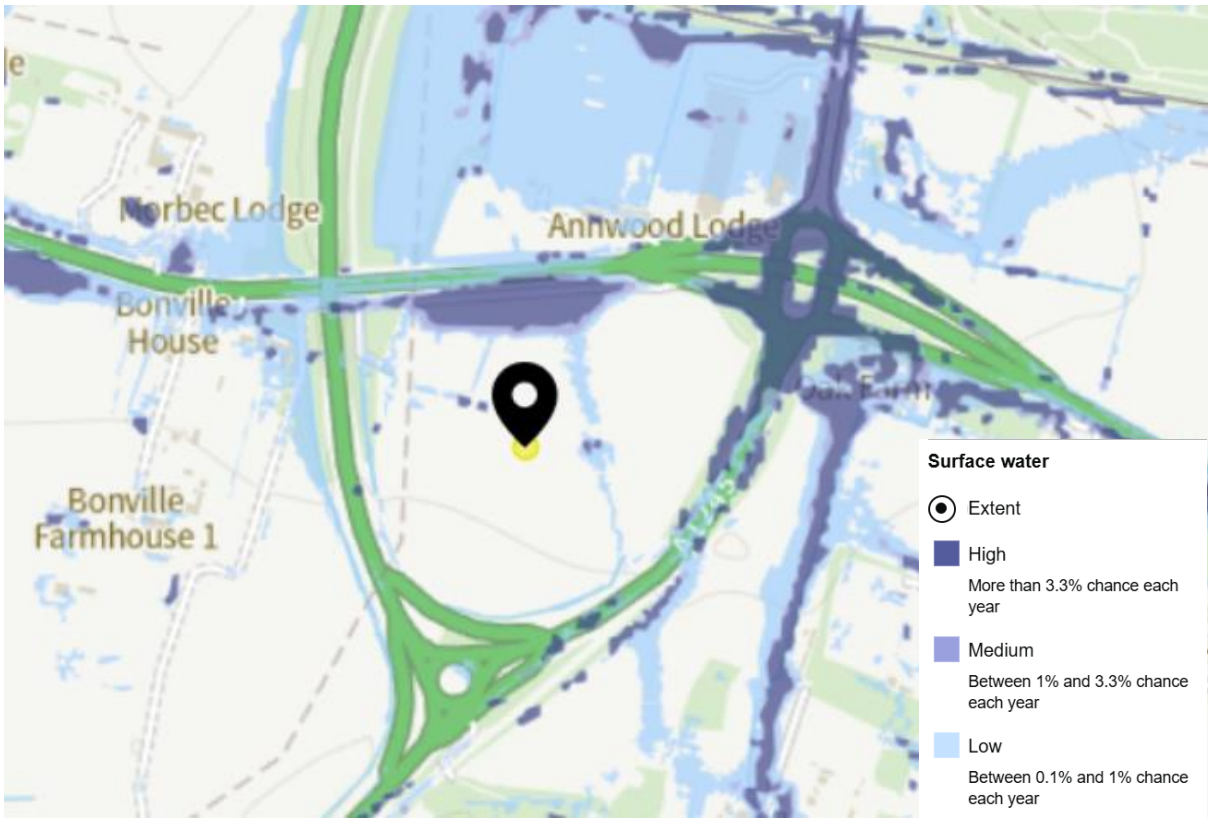


Figure 5: Flood Risk Present from Surface Water for the Site (approximate site centre indicated by cross)

Figure 5 shows that the site is at a high risk from surface water flooding on the northern boundary of the site and north of the site. Some small areas across the site are indicated as having a low risk from surface water flooding.

The impact of flood risk is assessed to confirm if it can pose a limitation to the ALC grade of the site, in accordance with the guidance available in Tables 2 and 3 (MAFF, 1988).

The mapping identifies a Low risk of flooding from rivers and the sea within the boundary of the site and a High risk of surface water flooding in some areas across the site, therefore there is a potential for some areas of the site to have an ALC Grade limitation due to flood risk. However, due to the lack of detailed information relating to the duration and frequency of on-site flooding, the potential flood risk limitation cannot be fully determined. It is recommended that a site-specific Flood Risk Assessment is provided to conduct a justifiable assessment.

5. Intrusive Survey Findings

The survey identified One Soil Type across the entire site. Generalised profiles of the soil types encountered have been described as below (**Table 2**) 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 2: Summary of Soils Identified on Site

	Depth (cm)	Texture	Colour	Stones (%)	Mottles	Structure
Soil Type 1	0-20	Silty Clay (ZC)	Dark Greyish Brown (10YR 4/2)	0	No	Medium Subangular Blocky
	20-50	Silty Clay (ZC)	Dark Yellowish Brown (10YR 4/4)	0	Few Fine Ochreous Mottles (5YR 6/6)	Weak Coarse Prismatic
	50-120	Silty Clay (ZC)	Brown (10YR 5/3)	5	Few Ochreous Mottles (2.5YR 5/6)	Weak Coarse Prismatic

The general profiles for the soil types identified on the Site has been used to assess the Wetness Class (WC) for the Soil Type (see **Appendix V** for the MAFF decision flow chart). 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 3** below with a plan of the distribution of the soil types across the site shown in **Appendix I**.

Table 3: Wetness Class Assessment for Soil Types Encountered on Site

Soil Type	Parameters (Figure 6, MAFF)						
	Disturbed	**FCD**	**SPL (depth cm) Justification**	**Colour**	**Gleying (depth cm) Justification**	**Ref**	**Wetness Class**
Soil Type 1	No	105.96	At a depth of 20cm, the SPL was identified to be present due to the following characteristics: Silty Clay (ZC) coarse prismatic structure weakly developed less than 0.50% biopores greater than 0.50mm diameter evidence of wetness in the layer; ochreous mottles	Other	At a depth of 50cm, gleying was identified to be present due to the following characteristics: Pale colours dominant in the matrix and at least 2% ochreous mottles	Figure 8	II

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

6. Conclusions

The ALC grading for the site area is summarised below within **Table 4**, overall findings of this assessment can be found in **Appendix IV**. The table below identifies the grades of the areas of agricultural land present across the site (**Appendix I**).

Table 4: ALC Classification

ALC Grade	Area (Ha)	Percentage
Grade 1	0.0	0.0%
Grade 2	0.0	0.0%
Subgrade 3a	9.5	94.1%
Subgrade 3b	0.0	0.0%
Grade 4	0.0	0.0%
Grade 5	0.0	0.0%
Non-Agricultural	0.6	5.9%
Total BMV	9.5	94.1%
Total Non-BMV	0.6	5.9%
Total Site Area	**10.1**	**100%**

Soil Type 1 – Wetness Limitation

The combination of the topsoil texture (Silty Clay), Wetness Class (II) and the number of Field Capacity Days (105.96) results in **ALC Grade 3a** for Type 1 soils.

Soil Type 1 – Droughtiness Limitation

The combination of the local climate and soil textures results in **ALC Grade 3a** with a Droughtiness limitation.

Overall Site ALC Grade and Conclusions

9.5ha land surveyed as part of this assessment has been identified as **ALC Grade 3a** and 0.6ha have been identified as **Non-Agricultural**. As such, 94.10% of land surveyed as part of this assessment has been identified as BMV land.

APPENDIX I SITE PLANS

Legend

- Site Boundary
- Borehole Locations
- Soil Type 1
- Non Agricultural

0 20 40 60 80 100 m

-N-

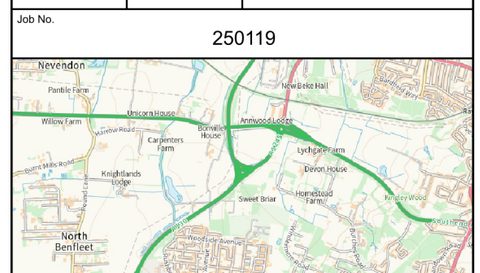
Figure: Soil Type

Job: Land at Fairgreen BESS, Basildon

Client: Pegasus Group

Figure No.	Revision	Date
1	1	05 March 2025
Drawn by	**Checked by**	**Scale**
JN	LM	1:2,009.345698

Job No.: 250119



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Legend

- Site Boundary
- Borehole Locations
- ALC Grade 3a
- Non Agricultural

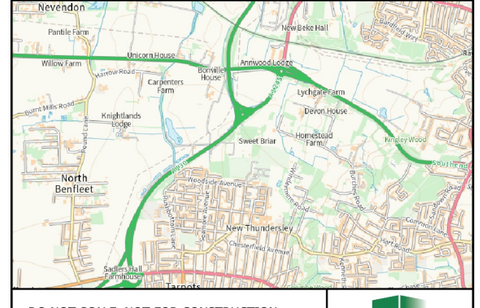
0 20 40 60 80 100 m

-N-

Figure	ALC Grade
Job	Land at Fairgreen BESS, Basildon
Client	Pegasus Group

Figure No.	Revision	Date
2	1	05 March 2025
Drawn by	Checked by	Scale
JN	LM	1:2,009.345698

Job No.
250119



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APPENDIX II SITE SURVEY LOGS

250119 - Basildon															
No.	Depth (cm)	Texture	Stones	Mottling	Structure	Depth (cm)	Texture	Stones	Mottling	Structure	Depth (cm)	Texture	Stones	Mottling	Structure
1	non agricultural														
2	0-10	ZC	0	*	MSAB	10-65	ZC	0	FFO	CP	65-120	ZC	5	FO	CP
3	0-20	ZC	0	*	MSAB	20-45	ZC	5	*	CP	45-120	ZC	5	FO	CP
4	0-20	ZC	0	*	MSAB	20-45	ZC	5	*	CP	45-120	ZC	5	FO	CP
5	0-10	ZC	0	*	MSAB	10-50	ZC	0	MO	CP	50-120	ZC	0	MO	CP
6	0-15	ZC	0	*	MSAB	15-50	ZC	0	FFO	CP	50-120	ZC	0	O	CP
7	0-20	ZC	0	*	MSAB	20-50	ZC	5	FO	CP	50-120	ZC	5	O	CP
8	0-25	ZC	0	*	MSAB	25-70	ZC	0	FFO	CP	70-120	ZC	0	MO	CP
9	0-20	ZC	0	*	MSAB	20-65	ZC	0	FFO	CP	65-120	ZC	0	MO	CP
10	0-20	ZC	0	*	MSAB	20-55	ZC	5	*	CP	55-120	ZC	5	FO	CP

Structure	
MSAB	Medium Subangular Blocky
AB	Angular Blocky
CP	Coarse Prismatic
MSAB	Massive
SAB	Subangualr Blocky
CP	Coarse
W	Weak

Stones	
5	Very Slightly Stony
15	Slightly Stony
35	Moderately Stony

Texture	
C	Clay
ZC	Silty Clay
SC	Sandy Clay
CL	Clay Loam
ZCL	Silty Clay Loam
SCL	Sandy Clay Loam
SZL	Sandy Silty Loam
SL	Sandy Loam
LS	Loamy Sand
S	Sand
ZS	Silty Sand
MG	Made Ground
F (sand)	Fine
M (sand)	Medium
C (sand)	Coarse
H (clay)	Heavy
M (clay)	Medium

Rock Type	
Ca	Calcareous

Mottling	
*	No Mottling
X	Fine Grey
O	Fine Ochreous
N	Numerous Mottles
F	Few Mottles
D	Fine Brown

Cell Colours	Reason
	Livestock in field - not accessed
	Woodland/Made Ground/Urban
	Inaccesible areas
	N/A

APPENDIX III SITE SURVEY PHOTOGRAPHS

Photograph Number	Photograph Description	Photograph
1.	**Land at Fairgreen, Basildon** General site view.	
2.	**Land at Fairgreen, Basildon** General site view. Note surface water in tramlines.	
3.	**Land at Fairgreen, Basildon** Soil Type 1	
4.	**Land at Fairgreen, Basildon** Area of Non-Agricultural land.	

Photograph Number	Photograph Description	Photograph
5.	**Land at Fairgreen, Basildon** Soil Type 1 pit.	

APPENDIX IV SUMMARY OF FINDINGS

Job Name:	Land at Fairgreen, Basildon
Job Number:	250119
Date:	12/03/2025
Completed By:	JN

Site Altitude:	17
Centre Grid Ref:	577664 190578

AAR	579.02
ATO	1470.75
FCD	105.96
MDMWHT	123.57
MDMPOT	120.59

	Soil Type 1
AP WHT	132.20
MB WHT	8.63
AP POT	107.6
MB POT	-12.99

Site Limitations Summary

	Soil Type 1
Wetness Class	II
Wetness Grading	3a
Droughtiness Wheat	2
Droughtiness Potato	3a
Gradient Limitation	1
Soil Depth Limitation	1
Stoniness Limitation	1
	Overall
Site Climatic Limitation	1
Overall Grade	**3a**

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.

Limiting Factors

Main Factor	Sub Factor	Explanation
Climatic Limitations	Overall Climatic Limitation	Using a dataset of five parameters, as set on a 5km grid for the whole of the UK, the site climatic values are used to determine if there is an overriding limiting factor for the site with regard to the wider climate.
	Local Climatic Factors	Where the above climatic factors are liable to be modified by local factors such as aspect, gradient and elevation then one or more of these factors may become a limiting factor for the site.
Site Limitations	Gradient	Gradient may have an impact on mechanised farm operations and also on soil erosion. The ALC grade limitations with reference to gradient are given in Table 1 of the MAFF guidance.
	Microrelief	Complex changes in slope angle and direction over short distances may have an impact on agricultural machinery. The effect of microrelief is considered in conjunction with overall gradient.
	Flooding	The extent, duration, frequency and timing of flooding may have an influence over the ALC Grade and could become the limiting site factor. The ALC grade limitations with reference to flooding are given in Tables 2 and 3 of the MAFF guidance.
Soil Limitations	Soil Texture and Structure	Soil texture and structure can influence the water retention, water movement and aeration of the soil and therefore affect the workability, trafficability, poaching risk and suitability for plant growth. Soil texture is determined by the proportions of sand, silt and clay and is used to assess the wetness class of the soil.
	Soil Depth	Soil depth can influence the available water capacity of the soil, restrict nutrient uptake, root growth and root anchorage. The ALC grade limitations with reference to soil depth are given in Table 4 of the MAFF guidance.
	Stoniness	Stone content can influence the cultivation, harvesting and crop growth and may negatively impact machinery. The ALC grade limitations with reference to stoniness are given in Table 5 of the MAFF guidance.
	Chemical Limitations	Certain physical limitations may limit soil chemical properties, such as saline conditions, organic matter and toxic elements.
Interactive Limitations	Soil Wetness	Soil wetness is assessed using a combination of factors including climate, soil water regime and soil texture. The ALC grade limitations with reference to soil wetness are given in Tables 6 and 7 of the MAFF guidance.
	Droughtiness	Soil droughtiness is assessed using a combination of factors including available water capacity, moisture deficit, moisture balance and irrigation. The ALC grade limitations with reference to droughtiness are given in Table 8 of the MAFF guidance.
	Soil Erosion	Soil erosion may be caused by wind or water action and is determined by interactions between weather, soil type, topography and vegetation cover.

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.

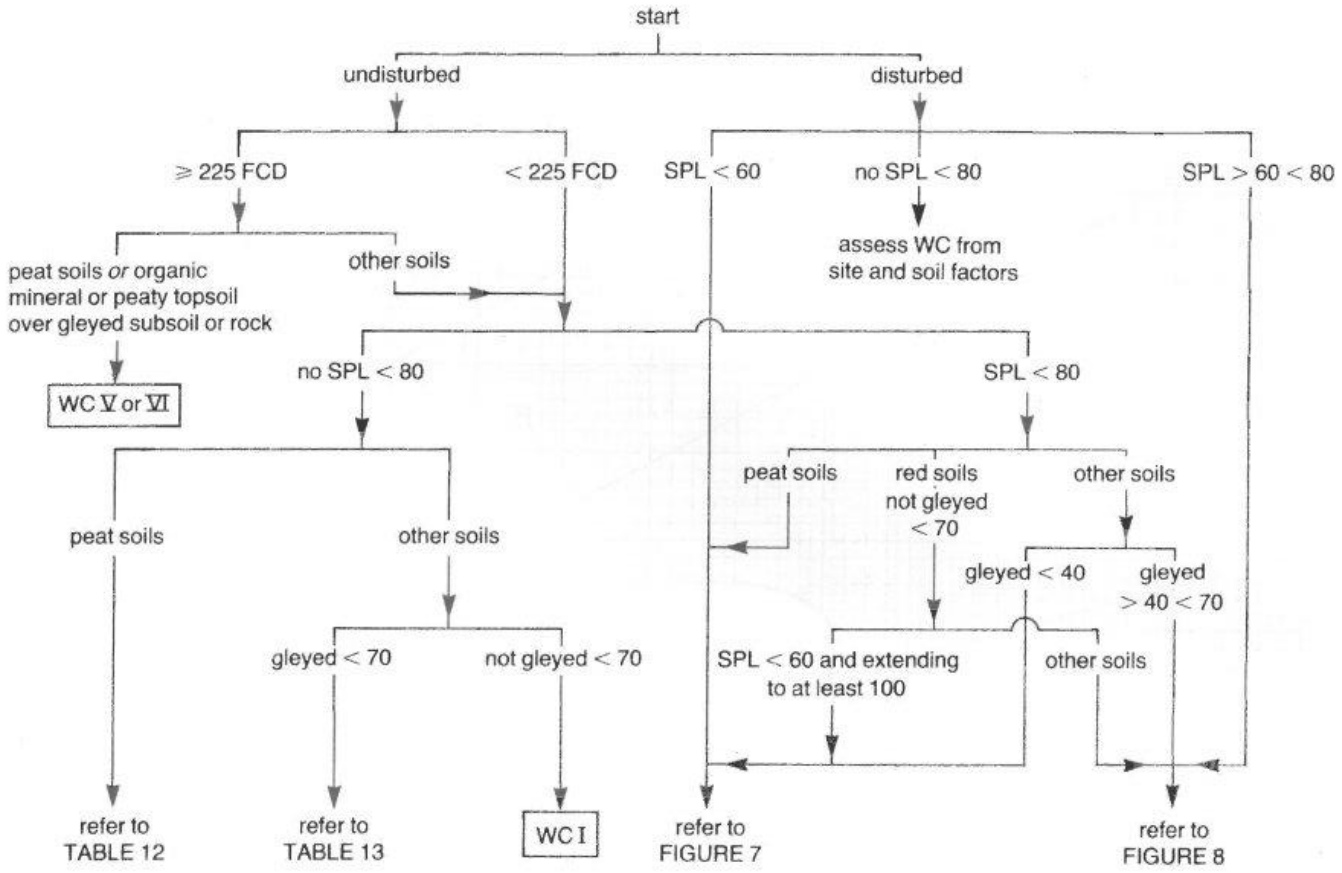

Figure 6. Flow diagram for assessing soil wetness class (WC) from field capacity days (FCD), depth to gleying (in cm) and depth to a slowly permeable layer (SPL, in cm)