





WHITE CROSS

# White Cross Offshore Windfarm ES Addendum

**Appendix R: Agricultural Land Classification  
Onshore Export Cable - Saunton Sands, Devon**



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## Glossary of Acronyms

Acronym	Definition
<b>AAR</b>	Average Annual Rainfall
<b>ALC</b>	Agricultural Land Classification
<b>AOD</b>	Above Ordnance Datum
<b>ATO</b>	Accumulated Temperature
<b>BGS</b>	British Geological Survey
<b>BMV</b>	Best and Most Versatile
<b>BSI</b>	British Standards Institution
<b>cm</b>	Centimetre
<b>DEFRA</b>	Department for Environment, Food and Rural Affairs
<b>EA</b>	Environment Agency
<b>FCD</b>	Field Capacity Days
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare
<b>m</b>	Metre
<b>MAFF</b>	Ministry of Agriculture, Fisheries and Food
<b>Met Office</b>	Meteorological Office
<b>MDPOT</b>	Moisture Deficit Potatoes
<b>MDWHT</b>	Moisture Deficit Wheat
<b>NE</b>	Natural England
<b>NPPF</b>	National Planning Policy Framework
<b>OS</b>	Ordnance Survey
<b>PSD</b>	Particle Size Distribution
<b>SAC</b>	Special Area of Conservation
<b>SPL</b>	Slowly Permeable Layer
<b>SSSI</b>	Site of Special Scientific Interest
<b>UXO</b>	Unexploded Ordnance
<b>WC</b>	Wetness Class

## Glossary of Terminology

Defined Term	Description
<b>Applicant</b>	White Cross Offshore Windfarm Limited
<b>Export Cable Corridor</b>	The area in which the export cables will be laid, either from the Offshore Substation or the inter-array cable junction box (if no offshore substation), to the NG Onshore Substation comprising both the Offshore Export Cable Corridor and Onshore Export Cable Corridor.

Defined Term	Description
<b>Onshore Development Area</b>	The onshore area above MLWS including the underground onshore export cables connecting to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland. The onshore development area will form part of a separate Planning application to the Local Planning Authority (LPA) under the Town and Country Planning Act 1990.
<b>Onshore Export Cable Corridor</b>	The proposed onshore area in which the export cables will be laid, from MLWS at the Landfall to the White Cross Onshore Substation and onward to the NG grid connection point at East Yelland.
<b>Site</b>	Area included within the Red Line Boundary provided by the Applicant. As shown in Annex 1

## 1. Introduction

1. White Cross Offshore Windfarm Limited (WCOWL) commissioned Roberts Environmental Ltd, a specialist geo-environmental consultancy, on behalf of Dalcour Maclaren to undertake an Agricultural Land Classification (ALC) survey of land which lies within the route of the proposed Onshore Export Cable Corridor.
2. This assessment has been undertaken in response to concern that the proposed works related to the Onshore Export Cable Corridor may impact upon Best and Most Versatile (BMV) agricultural land.

### 1.1 Best and Most Versatile (BMV) Agricultural Land

3. The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, September 2023) is followed in the UK. The NPPF sets out national planning practice guidance with reference to agricultural land, which regulators need to consider when making planning decisions about applications involving agricultural land.
4. The NPPF Annex 2 – Glossary defines BMV agricultural land as '*Land in grades 1, 2 and 3a of the Agricultural Land Classification*'. 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.
5. Non-BMV agricultural 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.

### 1.2 Purpose of the Document

6. The purpose of this document is to present the results of the ALC survey to identify the ALC Grade of land within the Onshore Export Cable Corridor.
7. This document includes the following sections:
  - **Section 1:** Introduction
  - **Section 2:** Site Details
  - **Section 3:** Assessment Approach
  - **Section 4:** ALC Desk Based Reconnaissance
  - **Section 5:** Intrusive Survey Findings

- **Section 6:** Conclusions
- **Annexes**

### 1.3 Information Sources

#### 8. Online Sources:

- Natural England (NE) Provisional Agricultural Land Classification Grade (pre-1988), accessed via Magic Web Mapping Service, DEFRA, 2024.
- NE Agricultural Land Classification Grades Post-1988 Surveys (Polygons) Database and Mapping, accessed via Magic Web Mapping Service, DEFRA, 2024.
- 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 Number 292 (Bideford & Lundy), available on the BGS map portal.
- Google Historic Satellite Imagery.
- National Library of Scotland Historical Ordnance Survey England and Wales.

#### 9. Documentation Sources:

- 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.
  - Ministry of Agriculture, Fisheries and Food (MAFF), 1988, Agricultural Land Classification of England and Wales – Revised Guidelines and Criteria for Grading the Quality of Agricultural Land.
  - NE, Technical Information Note TIN049 Second Edition, 2012.
  - Soils and their use in South West England, 1984, Soil Survey of England and Wales Memoir and accompanying 1:250,000 scale map.
10. A Flood Risk Assessment report by Flotation Energy (Flood Risk Assessment, Document Code: FLO-WHI-RP-0016-18, Dated: 8 May 2024) was provided for review as part of this assessment. The findings of the Flood Risk Assessment were used to inform the ALC flood risk assessment in Section 4.5.
11. A ground investigation report by Igne (Report on Ground Investigation, Contract Number: 26508, Dated: 21 December 2023) was provided for review as part of this

assessment. The findings of the ground investigation report were used to inform and confirm the shallow soil conditions across the site.

12. Site works were undertaken by REL in April 2024.

## 2. Site Details

13. The approximate centre of the site is at 246409, 134994 (Ordnance Survey Great Britain).
14. Topography of the site varies between 0 to 14m AOD, with an average elevation of 7m AOD.
15. The site is estimated to have an area of circa 67 ha.
16. The site is located to the south of Saunton village and runs south adjacent to Braunton Burrows through Braunton Marshes, across the River Taw estuary, to an area to the north of Instow village. Site boundaries are included in **Annex 1**.
17. The site comprises agricultural fields which are currently used for arable crop, grazing of livestock, and a turf nursery (based on observations made during the site visit).
18. Surrounding land comprises largely undeveloped agricultural land. Braunton Burrows Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is located adjacent to the west of the site. An area adjacent to the south-east of the site is currently in industrial use.
19. The site has historically comprised predominantly undeveloped agricultural land.
20. The majority of the site is currently mapped as Grade 4 on the provisional 1: 250,000 scale ALC map (MAFF, 1983), with Grade 3 encroaching on to the east and south-east of the site. The land adjacent to the west of the site is recorded as Non-Agricultural Land. See **Annex 5** for key to the gradings.
21. A post-1988 Agricultural Land Classification survey (ref: 031\98) is available for land adjacent to the south-east of the site. This nearby land was recorded as Grade 3b.

## 3. Assessment Approach

### 3.1 ALC Desk Study

22. 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.

23. 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).
24. 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.

### 3.2 Intrusive Soil Survey

25. The intrusive soil survey was undertaken during April 2024, during which time the weather conditions were fine and dry. The 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.
26. In addition, in order to determine subsoil structure, at least one inspection pit per soil type has been excavated.
27. In a small number of locations the water table was very high, causing the soils to be saturated and making recovery of any sample not possible in these locations.

### 3.3 ALC Grade Assessment

28. All factors have been considered (listed in **Annex 5**), including those which pose no limitation on the ALC grading for the site.
29. Using the information collected during the site survey and the MAFF ALC guidance documents, an ALC grade was then determined for the site (**Annex 1**). A brief overview of relevant terminology is included in **Annex 5**.

#### 3.3.1 ALC Survey Limitations

30. Due to the presence of livestock, access to areas of some of the fields was restricted. Where a borehole location was not accessible due to the presence of livestock, it was adjusted to a nearby accessible location.
31. The majority of the site is located adjacent to the Braunton Burrows SAC/SSSI, with the north-western section of the site running through the SSSI golf course and sand dunes. Due to the sensitivity of the SAC/SSSI, at the request of the client no boreholes were undertaken in this area.

32. The field in which BH1, BH2, BH3 and BH4 were located comprised a turf nursery. In order to avoid damaging the turf, the client requested that the boreholes located within this field were kept to the field boundary.
33. An area in the centre of the site in which locations BH33, BH34, BH35 and BH36 were positioned was very marshy and not possible to traverse / access. As such, it was not possible to carry out the aforementioned boreholes. However, due to the consistency of soil profiles within nearby boreholes, it is considered that an extrapolation of data to cover this area will be satisfactorily representative.
34. The site is located in an area considered to be at high risk from Unexploded Ordnance (UXO). As such, each borehole and hand pit location was first cleared by a UXO specialist prior to the commencement of any intrusive works. Where there were indications that a location was unsuitable due to perceived UXO risk, borehole locations were adjusted to a nearby suitable location.
35. The survey locations are indicated on the plans in **Annex 1**, with a table providing details for any locations moved in **Annex 2**.

## 4. ALC Desk Based Reconnaissance

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

### 4.1 Climate Data

36. 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

Cable Route, Saunton Sands (Site Centre Grid Reference: 246409, 134994)		
<b>Average Annual Rainfall (mm)</b>	AAR	858.05
<b>Accumulated Temperature (°C)</b>	ATO	1584.55
<b>Field Capacity Duration (Days)</b>	FCD	179.84
<b>Moisture Deficit Wheat (mm)</b>	MDWHT	104.65
<b>Moisture Deficit Potatoes (mm)</b>	MDPOT	97.42

37. The site is identified to have an average AAR, ATO and FCD when compared to the mapped values for the area west of Barnstaple (Soils and their Use in South West England, 1984).
38. 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.

## 4.2 Topography

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

## 4.3 BGS Published Data

40. Information gathered from the British Geological Survey (BGS) Geology Sheet 292 (Bideford & Lundy) and the BGS Onshore GeoIndex suggests the site is located in an area mapped as being absent of significant Artificial/Made Ground.
41. The site is located in an area in which superficial deposits are primarily Tidal Flat Deposits comprising clay, silt and sand. Superficial deposits in the north-west of the site are named as Blown Sand and these may encroach onto the west of the site. Additionally, Alluvium deposits comprising clay, silt, sand and gravel may encroach onto the south-east of the site.
42. The bedrock geology in the north of the site is named as the Charmouth Mudstone Formation comprising Mudstone. The centre of the site is underlain by the Doddiscombe Formation and Codden Hill Chert Formation (undifferentiated) comprising mudstone. The south of the site is underlain by the Ashton Mudstone Member and Crackington Formation (undifferentiated) comprising mudstone and siltstone.

## 4.4 Published Soils Data

43. Soils mapping for the area as shown on Soils and their use in South West England has been reviewed as part of this assessment.
44. The soils mapping suggests the soils on site comprise the Newnham Association in the north, the Isleham 1 Association in the centre of the site, and Hallsworth 2 Association in the south of the site. There is also the potential for soils of the Sandwich Association to encroach onto the west of the site, and for soils of the



Wallasea 1 Association to encroach onto the east of the site. The soils are described as follows:

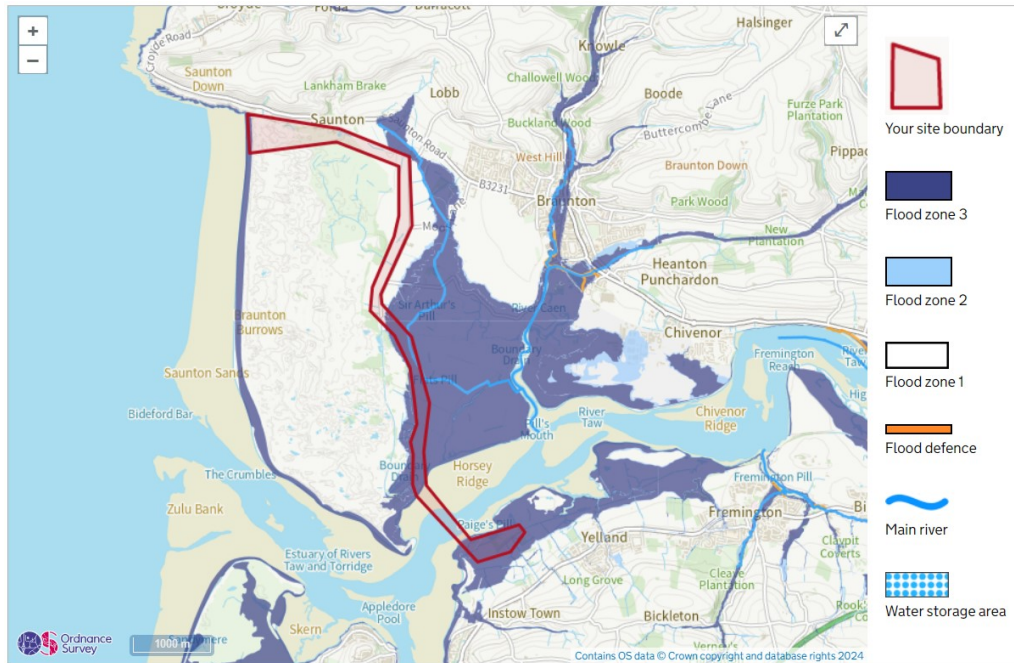
- **Newnham Association** - Well drained reddish coarse and fine loamy soils over gravel, locally deep. Some similar soils affected by groundwater.
- **Isleham 1 Association** - Deep permeable sandy soils with humose or peaty surface horizon affected by groundwater. Some deep acid peat soils.
- **Hallsworth 2 Association** - Slowly permeable seasonally waterlogged clayey, fine loamy and fine silty soils.
- **Sandwich Association** – Mainly deep well drained calcareous and non-calcareous sandy soils. Some sparsely vegetated unstable soils. Waterlogged soils in hollows locally. Shingle bars and spits locally extensive. Risk of wind erosion.
- **Wallasea 1 Association** - Deep stoneless non-calcareous and calcareous clayey soils. Soils locally have humose or peaty surface horizons. Groundwater controlled by ditches and pumps. Flat land. Slight risk of flooding.

## 4.5 Flood Risk Assessment

45. The potential limitations due to flood risk on the site have been assessed using publicly available flood risk mapping. 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.

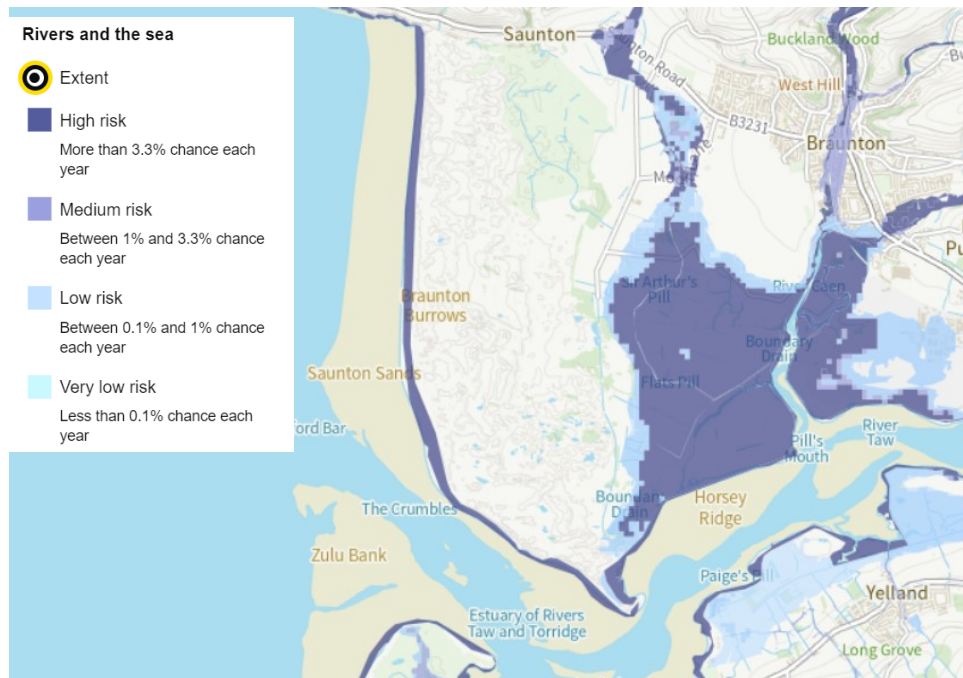
*Table 2: Summary of Flood Risk for the Site*

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



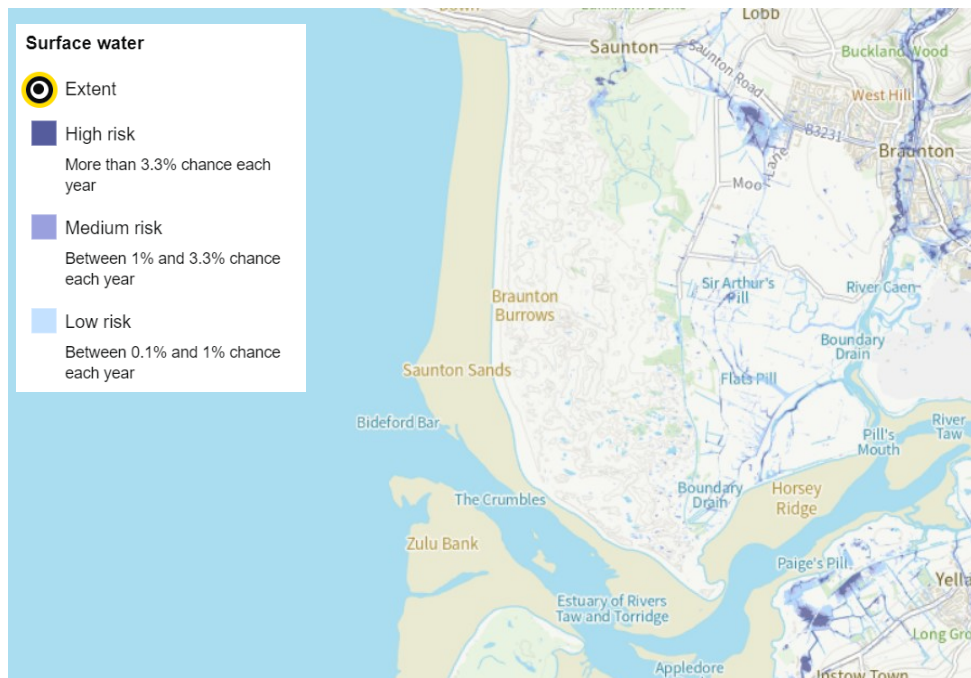
**Figure 1:** Flood Risk Map for Planning for the Site (approx. site boundary defined in red)

46. The interactive EA Flood Map for Planning on the UK Government website identifies the north of the site to be within a Flood Zone 1 area, and the south of the site to be within a Flood Zone 3 area (**Figure 1**).



**Figure 2: Long Term Flood Risk from Rivers or the Sea for the Site and Surrounding Area**

47. The interactive EA Long Term Flood Risk from Rivers or the Sea Map on the UK Government website identifies the southern half of the site to be in a with Low to High Long Term Flood Risk from Rivers or the Sea (**Figure 2**).



**Figure 3:** Flood Risk Present from Surface Water for the Site

48. There are parts of the site which are indicated to be at Low to High risk of flooding from surface water, particularly in the south of the site and those areas south of the River Taw (**Figure 3**).
49. 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 (MAFF, 1988).

**Table 3:** Summary of Flood Risk from Environment Agency Data

ALC Grade	Frequency and Duration
<b>1</b>	Rare (short)
<b>2</b>	Rare (medium)
	Occasional (short)
<b>3a</b>	Rare (long)
	Occasional (medium)
	Frequent (short)
<b>3b</b>	Occasional (long)
	Frequent (medium)
<b>4</b>	Frequent (long)

50. The mapping identifies a High risk of flooding from rivers and the sea within the south of the site and a Low to High risk of surface water flooding in some areas particularly in the south of the site.
51. For the purpose of grading, due to the lack of detailed site information relating to the duration of flooding, the areas impacted by flooding are considered to be impacted on a Frequent frequency and Medium duration during the Winter period. As such this would limit areas of the site to ALC Grade 3b based on a potential flood risk limitation. These findings correlate with the conclusions drawn from the Flood Risk Assessment report provided.

**Table 4:** Flood Risk Limitation in Winter for the Site

ALC Grade	Frequency and Duration	Area Affected (ha)
<b>1</b>	Rare (short)	0.0
<b>2</b>	Rare (medium)	0.0
	Occasional (short)	

ALC Grade	Frequency and Duration	Area Affected (ha)
<b>3a</b>	Rare (long)	0.0
	Occasional (medium)	
	Frequent (short)	
<b>3b</b>	Occasional (long)	~31.0
	Frequent (medium)	
<b>4</b>	Frequent (long)	0.0

## 4.6 Available ALC Data

### Pre-1988 ALC Grade

The site is indicated as having a mixture of ALC Grades 2, 3 and 4 using the existing mapping.

### Post-1988 ALC Grade

No post-1988 surveys are available for or adjacent to the site.

### Previous Site Reports

No previous ALC reports have been made available to REL during the compilation of this report.

## 5. Intrusive Survey Findings

52. The survey, undertaken by REL in April 2024, identified Three Soil Types across the entire site. Generalised profiles of the soil types encountered have been described as below (**Table 5**) however, please note some localised variations were recorded. Complete soil logs are provided in **Annex 2** and photographs of the surveyed soils are presented in **Annex 3**.

*Table 5: Summary of Soils Identified on Site*

	Depth (cm)	Texture	Colour	Stones (%)	Mottles	Structure
Soil Type 1	0-35	Fine Sand (FS)	Brown (7.5YR 5/4)	5	No	Single Grain
	35-120	Medium Sand (MS)	Dark Yellowish Brown (10YR 4/4)	5	Few Fine Ochreous (10YR 5/3)	Single Grain
Soil Type 2	0-30	Heavy Silty Clay Loam (HZCL)	Dark Brown (7.5YR 3/2)	5	Few Fine Ochreous (7.5YR 4/6)	Angular Blocky
	30-50	Coarse Sand (CS)	Dark Yellowish Brown (10YR 4/4)	5	Few Medium Ochreous (7.5YR 4/6)	Single Grain
	50-120	Clay (C)	Dark Greyish Brown (2.5Y 4/2)	5	Few Medium Ochreous (10YR 4/1)	Massive
Soil Type 3	0-25	Medium Clay Loam (MCL)	Dark Greyish Brown (10YR 4/2)	15	No	Medium Subangular Blocky
	25-65	Silty Clay (ZC)	Brown (10YR 4/3)	5	Few Medium Ochreous (7.5YR 5/6)	Coarse Prismatic
	65-120	Silty Clay (ZC)	Grey (2.5Y 6/1)	15	Numerous Medium Ochreous (10YR 5/6)	Coarse Prismatic

53. Soil Textures assessed in the field were correlated with Particle Size Distribution testing undertaken and reported by Stocktons. The field textures recorded were

found to be generally in line with the PSD results reported by Stocktons, copies of which are included in **Annex 2**.

54. The general profiles for the soil types identified on the Site have been used to assess the Wetness Class (WC) for the Soil Types (see **Annex 5** for the MAFF decision flow chart). The general profiles are reflective of the findings in the soil pits associated with the Soil Types identified on site. The assessment process and results of the in-field wetness assessment is provided within **Table 6** overleaf with a plan of the distribution of the soil types across the site shown in **Annex 1**.

**Table 6: Wetness Class Assessment for Soil Types Encountered on Site**

Soil Type	Parameters (Figure 6, MAFF)						
	Disturbed	FCD	SPL (depth) Justification	Colours	Gleying (depth) Justification	Ref	WC
1	No	179.8 4	No slowly permeable layer (<80cm)	N/A	Not Gleyed (120cm)	N/A	<b>I</b>
2	No	179.8 4	At a depth of 50cm, the SPL was identified to be present due to the following characteristics: Clay (C) massive structure less than 0.50% biopores greater than 0.50 mm diameter evidence of wetness in the layer; gleying and evidence of wetness in the layer above; ochreous mottles	Other	Gleyed (50cm), greyish colours dominant in the matrix with ochreous mottles.	Figure 8	<b>III</b>
3	No	179.8 4	At a depth of 25cm, the SPL was identified to be present due to	Other	Gleyed (65cm), greyish colours	Figure 8	<b>III</b>

Soil Type	Parameters (Figure 6, MAFF)						
	Disturbed	FCD	SPL (depth) Justification	Colours	Gleying (depth) Justification	Ref	WC
			the following characteristics: Silty Clay (ZC) coarse prismatic structure less than 0.50% biopores greater than 0.50 mm diameter evidence of wetness in the layer; ochreous mottles		dominant in the matrix with ochreous mottles.		

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

55. The ALC grading for the site area is summarised below within Table 7, overall findings of this assessment can be found in **Annex 4**. 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 (**Annex 1**).

**Table 7: ALC Classification**

ALC Grade	Area (Ha)	Percentage
<b>Grade 1</b>	0.0	<b>0.0%</b>
<b>Grade 2</b>	0.0	<b>0.0%</b>
<b>Subgrade 3a</b>	0.0	<b>0.0%</b>
<b>Subgrade 3b</b>	67.0	<b>100.0%</b>
<b>Grade 4</b>	0.0	<b>0.0%</b>
<b>Grade 5</b>	0.0	<b>0.0%</b>
<b>Non-Agricultural</b>	0.0	<b>0.0%</b>
<b>Total BMV</b>	0.0	<b>0.0%</b>
<b>Total Non-BMV</b>	67.0	<b>100.0%</b>
<b>Total Site Area</b>	<b>67.0</b>	<b>100.0%</b>

### 6.1 Soil Type 1 – Droughtiness and Topsoil Texture Limitation

56. The combination of the soil textures and the climate results in ALC Grade 3b for Type 1 soils with a Droughtiness limitation for potato and wheat.
57. The combination of the topsoil texture (Fine Sand), Wetness Class (I) and the number of Field Capacity Days (179.84) results in ALC Grade 3b for Type 1 soils. Sand topsoil is not eligible for ALC Grades 1, 2 or 3a, and therefore Soil Type 1 is limited to ALC Grade 3b based on soil wetness and topsoil texture.

### 6.2 Soil Type 2 – Wetness Limitation

58. The combination of the topsoil texture (Heavy Silty Clay Loam), Wetness Class (III) and the number of Field Capacity Days (179.84) results in ALC Grade 3b for Type 2 soils.

### 6.3 Soil Type 3 – Flood Risk Limitation

59. The flood risk relating to flooding from rivers and the sea results in ALC Grade 3b for Type 3 soils.

## **6.4 Overall Site ALC Grade and Conclusions**

60. All land surveyed as part of this assessment has been identified as ALC Grade 3b and as such, no BMV land has been identified on this site.
61. This differs to the previous ALC grading of the site which indicated a mixture of ALC Grade 2, 3 and 4 from north to south across the site.

## **Annex 1: Site Plans**





ALC Grade 3b

- Boreholes
- Alternative Borehole
- Red Line Boundary
- Hand Pits
- Non-Agricultural Land
- Not Accessible
- ALC Grade 3b

0 200 400 600 800 1,000 m

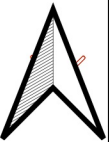


Figure Proposed Exploratory Hole Location Plan		
Job Cable Route Souton Sands, Devon		
Client Dalcour Maclaren		
Figure No. 1	Revision 3	Date 10 June 2024
Drawn by SC	Checked by LM	Scale 1:22,000
Job No. 240305		



DO NOT SCALE. NOT FOR CONSTRUCTION

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Soil type 1, Soil type 2 and Soil ty

- Boreholes
- Alternative Borehole
- Red Line Boundary
- Hand Pits
- Non-Agricultural Land
- Not Accessible
- Soil Type 1
- Soil Type 2
- Soil Type 3

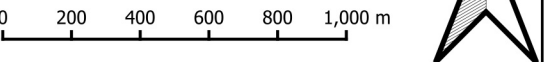


Figure Proposed Exploratory Hole Location Plan		
Job Cable Route Souton Sands, Devon		
Client Dalcour Maclaren		
Figure No. 2	Revision 3	Date 10 June 2024
Drawn by SC	Checked by LM	Scale 1:22,000
Job No. 240305		



DO NOT SCALE. NOT FOR CONSTRUCTION

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## **Annex 2: Site Survey Logs**

## 240305 - Saunton Sands, Devon

No.	Depth (cm)	Texture	Stones	Mottling	Structure	Depth (cm)	Texture	Stones	Mottling	Structure	Depth (cm)	Texture	Stones	Mottling	Structure	Depth (cm)	Texture	Stones	Mottling	Structure	Depth (cm)	Texture	Stones	Mottling	Structure
1	0-35	MSL		5 FFO	SAB	35-120	MS	5 FFO	SG																
2	0-30	FS		5 *	SG	30-95	MS	5 FMO	SG		95-120	MS	5	FMO	SG										
3	0-30	FS		5 *	SG	30-95	MS	5 FMO	SG		95-120	MS	5	FMO	SG										
4	0-30	FS		5 *	SG	30-95	MS	5 FMO	SG		95-120	MS	5	FMO	SG										
5	0-30	FS		5 *	SG	30-95	MS	5 FMO	SG		95-120	MS	5	FMO	SG										
6	0-30	FS		5 *	SG	30-95	MS	5 FMO	SG		95-120	MS	5	FMO	SG										
7	0-40	FSL		5 *	SAB	40-120	MS	5 FFO	SG																
8	0-30	FS		5 *	SG	30-95	MS	5 FMO	SG		95-120	MS	5	FMO	SG										
9	0-35	FS		5 *	SG	35-120	MS	5 FFO	SG																
10	0-40	FSL		5 *	SAB	40-120	MS	5 FFO	SG																
11	0-35	FS		5 *	SG	35-120	MS	5 FFO	SG																
12	0-35	FS		5 *	SG	35-120	MS	5 FFO	SG																
13	0-35	FS	35	5 *	SG	35-100	FS	5 *	SG		100-120	MS	5	NCO	SG										
14	0-20	FS		5 *	SG	20-120	MS	5 *	SG																
15	0-20	FS		5 *	SG	20-120	MS	5 *	SG																
16	0-20	FS		5 *	SG	20-120	MS	5 *	SG																
17	0-20	FS		5 *	SG	20-120	MS	5 *	SG																
18	0-20	FS		5 *	SG	20-120	MS	5 MCO	SG																
19	0-45	FS		5 *	SG	45-65	FS	5 *	SG		65-120	MS	5	MCO+G	SG										
20	0-45	FS		5 *	SG	45-120	MS	5 MCO+G	SG																
21	0-25	CS		0 *	AB	25-80	CS	0 *	AB		75-120	CS	0 *		SG										
22	0-25	CS		0 *	AB	25-80	CS	0 *	AB		80-120	CS	0 *		SG										
23	0-25	CS		0 *	AB	25-80	CS	0 *	AB		80-120	CS	0 *		SG										
24	0-25	CS		0 *	AB	25-80	CS	0 *	AB		80-120	CS	0 *		SG										
25	0-30	LMS		5 *	AB	30-110	CS	5 *	AB		110-120	CS	0 *		SG										
26	0-25	LMS		5 *	AB	25-65	LMS	5 *	AB		65-120	CS	0 *		SG										
27	0-25	LMS		5 *	AB	25-65	LMS	5 *	AB		65-120	CS	0 *		SG										
28	0-25	LMS		5 *	AB	25-65	LMS	5 *	AB		65-120	CS	0 *		SG										
29	0-25	LMS		5 *	AB	25-65	LMS	5 *	AB		65-120	CS	0 *		SG										
30	0-25	LMS		5 *	AB	25-65	LMS	5 *	AB		65-120	CS	0 *		SG										
31	0-35	MSZL		5 FMO	AB	35-75	CSL	5 *	AB	NO FURTHER RECOVERY-WET															
32	0-25	SCL		5 *	SAB	25-50	MSL	5 FMO	AB		50-120	CS	5 *		SG										
33	COULD NOT ACCESS																								
34	COULD NOT ACCESS																								
35	COULD NOT ACCESS																								
36	COULD NOT ACCESS																								
37	0-30	MSL		5 *	SAB	30-50	CS	5 FMO	SG		50-120	CS	5	FMO	SG										
38	0-30	MSL		5 *	SAB	30-50	CS	5 FMO	SG		50-120	CS	5	FMO	SG										
39	0-20	HZCL		5 FFO	AB	20-35	CS	5 FMO	SG		35-120	C	5	FMO	M										
40	0-25	MSL		5 *	SAB	25-50	C	5 *	M		50-120	CS	0 *		SG										
41	0-30	MCL		5 FMO	SAB	30-50	C	5 *	M		50-120	CS	0 *		SG										
42	0-40	HZCL		5 FFO	AB	40-120	CS	5 FMO	SG																
43	0-25	SCL		5 *	SAB	25-120	CS	5 *	SG																
44	0-50	HZCL		5 FFO	AB	50-120	CS	5 FMO	SG																
45	0-35	HZCL		5 FFO	AB	35-60	CS	5 FMO	SG		60-120	C	5	FMO	M										
46	0-20	HZCL		5 FFO	AB	20-50	CS	5 FMO	SG		50-120	C	5	FMO	M										
47	0-15	HZCL		5 FFO	AB	15-65	CS	5 FMO	SG		65-120	C	5	FMO	M										
48	0-40	HZCL		5 FFO	AB	40-55	CS	5 FMO	SG		55-120	C	5	FMO	M										
49	0-60	HZCL		5 FFO	AB	60-90	CS	5 FMO	SG		90-120	C	5	FMO	M										
50	0-60	HZCL		5 FFO	AB	60-90	CS	5 FMO	SG		90-120	C	5	FMO	M										
51	0-60	HZCL		5 FFO	AB	60-90	CS	5 FMO	SG		90-120	C	5	FMO	M										
52	0-25	MCL		5 *	SAB	25-45	ZC	15	FMO	CP															
53	0-25	MCL		5 *	SAB	25-75	SC	5	MMG	CP															
54	0-25	MCL		5 *	SAB	25-35	ZC	5	FMO	CP		35-65	ZC	5	NMO+G	CP		65-100	ZC	5	NMO	CP			
55	0-30	MCL	35	FMO	SAB	30-40	ZC	VERY STON	NMO	AB															
56	0-25	MCL		5 *	SAB	25-65	ZC	5	FMO	CP		65-100	ZC	5	NMO	CP									
57	0-25	MCL		5 *	SAB	25-35	ZC	5	FMO	CP		35-65	ZC	5	NMO+G	CP		65-100	ZC	5	NMO	CP			
58	0-15	MCL		5 *	SAB	15-30	ZC	5	FMO	CP		30-50	ZC	5	NMO+G	CP		50-95	ZC	15	NMO	CP			
59	0-25	MCL		5 *	SAB	25-35	ZC	5	FMO	CP		35-65	ZC	5	NMO+G	CP		65-70	ZC	15	NMO	CP			
60	0-25	MCL		5 *	SAB	25-50	ZC	5	FMO	CP		50-75	ZC	5	NMO+G	CP		75-100	SC	5	MMG	CP		100-120	ZC
61	0-25	MCL		5 *	SAB	25-35	ZC	5	FMO	CP		35-65	ZC	5	NMO+G	CP		65-70	ZC	15	NMO	CP			
50/51 30/31	0-30	HZCL		5 FFO	AB	30-35	HZCL	5	NMO	AB															
	0-30	CSL		5 *	SAB	30-40	CS	0	FCO	SG															

Location	What3words	Reason
BH1	socialite.silent.dude	Not completed - location moved
BH1a	reckon.committed.fiery	Borehole undertaken around edge of field
BH2	limbs.hobbyists.teamed	Not completed - location moved
BH2a	quickly.escapes.blink	Borehole undertaken around edge of field
BH3	fuels.carriage.relax	Not completed - location moved
BH3a	soda.vintages.fattest	Borehole undertaken around edge of field
BH4	loudness.uncle.fillers	Not completed - location moved
BH4a	month.comet.skirting	Borehole undertaken around edge of field
BH5	gladiators.posting.kilt	
BH6	division.unsettled.starlight	
BH7	spillage.rafters.caged	
BH8	brambles.compound.worry	
BH9	wool.simulator.constants	
BH10	basin.folks.bluff	
BH11	lodge.clays.relaxing	
BH12	rudder.emulating.surging	
BH13	tycoons.pinging.fortnight	
BH14	mimed.unique.shred	
BH15	immune.complies.cunning	
BH16	covers.unicorns.lawfully	
BH17	loyal.hunk.tinkle	
BH18	sprinkler.scouting.bags	
BH19	straying.fall.palms	Not completed - location moved
BH19a	prevented.allowable.dial	Borehole undertaken on edge of field due to ploughing activities
BH20	react.flasks.continues	Not completed - location moved
BH20a	treatment.curry.narrow	Borehole undertaken on edge of field due to ploughing activities
BH21	braked.aunts.innovate	
BH22	berated.loom.tiling	Not completed - location moved
BH22a	coveted.darkens.surpasses	Borehole undertaken on edge of field to avoid crop
BH23	breathing.mock.obtain	
BH24	frail.salary.steroids	
BH25	snored.sues.share	
BH26	cello.neck.people	
BH27	harder.quantity.assembles	
BH28	lashed.armrests.voices	
BH29	shield.woodstove.being	
BH30	dusty.hurricane.return	
BH31	suitcase.caked.majors	
BH32	magma.charts.invisible	
BH33	thumb.prospers.bonus	Not completed - ground too wet to access
BH34	supply.stereos.trump	Not completed - ground too wet to access
BH35	retina.newer.erupts	Not completed - ground too wet to access
BH36	loves.rationed.camera	Not completed - ground too wet to access
BH37	preoccupied.tasters.canal	
BH38	punk.surpasses.arena	
BH39	wells.jungle.clogging	
BH40	footsteps.watched.continues	
BH41	harnessed.cavalier.streetcar	Not completed - location moved
BH41a	keyboards.caravan.today	Borehole moved to avoid livestock
BH42	promoting.scores.parsnips	
BH43	deferring.manicured.splits	
BH44	define.shimmered.throwaway	
BH45	paler.award.rollers	
BH46	stammer.burglars.toys	
BH47	method.motoring.nozzle	



BH48	skip.passively.departure	
BH49	onwards.backyards.grazes	
BH50	commended.risky.kidney	
BH51	flitting.dress.reduce	
BH52	uniforms.smashes.shameless	
BH53	perfumed.speeches.uncle	
BH54	nothing.dustbin.endings	
Pit 2/BH55	starred.refuse.reseller	
BH55a	trifling.waltzed.notebook	
BH56	corporate.label.sharper	
BH57	theory.belonging.spice	
BH58	surveyors.perfumes.stuns	
BH59	tenses.tributes.vote	
BH60	lifetimes.teachers.spilling	
BH61	diner.mimes.directors	
Pit 1	deeds.blackbird.tearfully	
Pit 3	nightcap.troll.dared	

Structure	
MSAB	Medium Subangular Blocky
AB	Angular Blocky
CP	Coarse Prismatic
M	Massive
SAB	Subangular Blocky
SG	Single Grain
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	(- indicates location in acronym)
*	No Mottling
F-	Few Mottles
M-	Many Mottles
N-	Numerous Mottles
-F-	Fine Mottles
-M-	Medium Mottles
-C-	Coarse Mottles
-O	Ochreous Mottles
-G	Grey Mottles

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

	Site	WHITE CROSS FLOATING WINDFARM - ONSHORE CABLE ROUTE GROUND INVESTIGATION	Contract No	26508
	Client	Stockton Drilling Limited	Hole	TP04
	Engineer	Waterman Infrastructure & Environment Limited	Depth (m)	1.00
			Sample Type	B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
630 µm	100
425 µm	99
300 µm	98
200 µm	92
150 µm	59
63 µm	7

Non Engineering Description	
Brown silty SAND.	

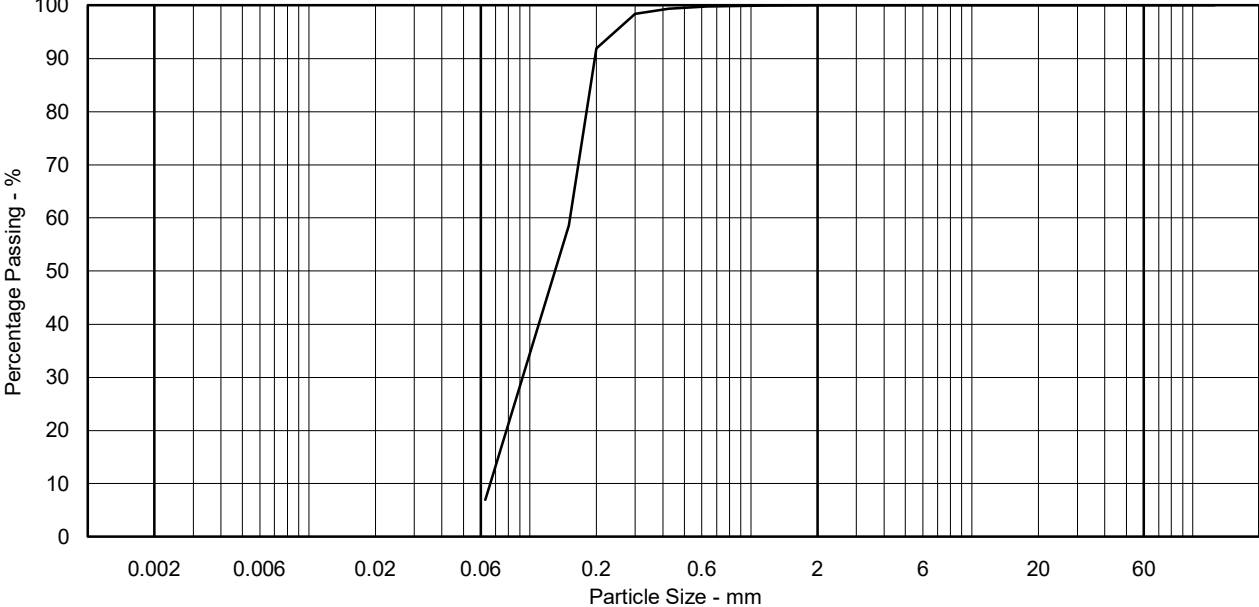
Sample Proportions - %	
Cobbles	0.0
Gravel	0.0
Sand	93.0
Silt & Clay	7.0


Particle Density -	Assumed	2.70	Mg/m³
--------------------	---------	------	-------

Particle Diameter - mm	
D100	2.0
D60	0.15
D10	0.066
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	2.3

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

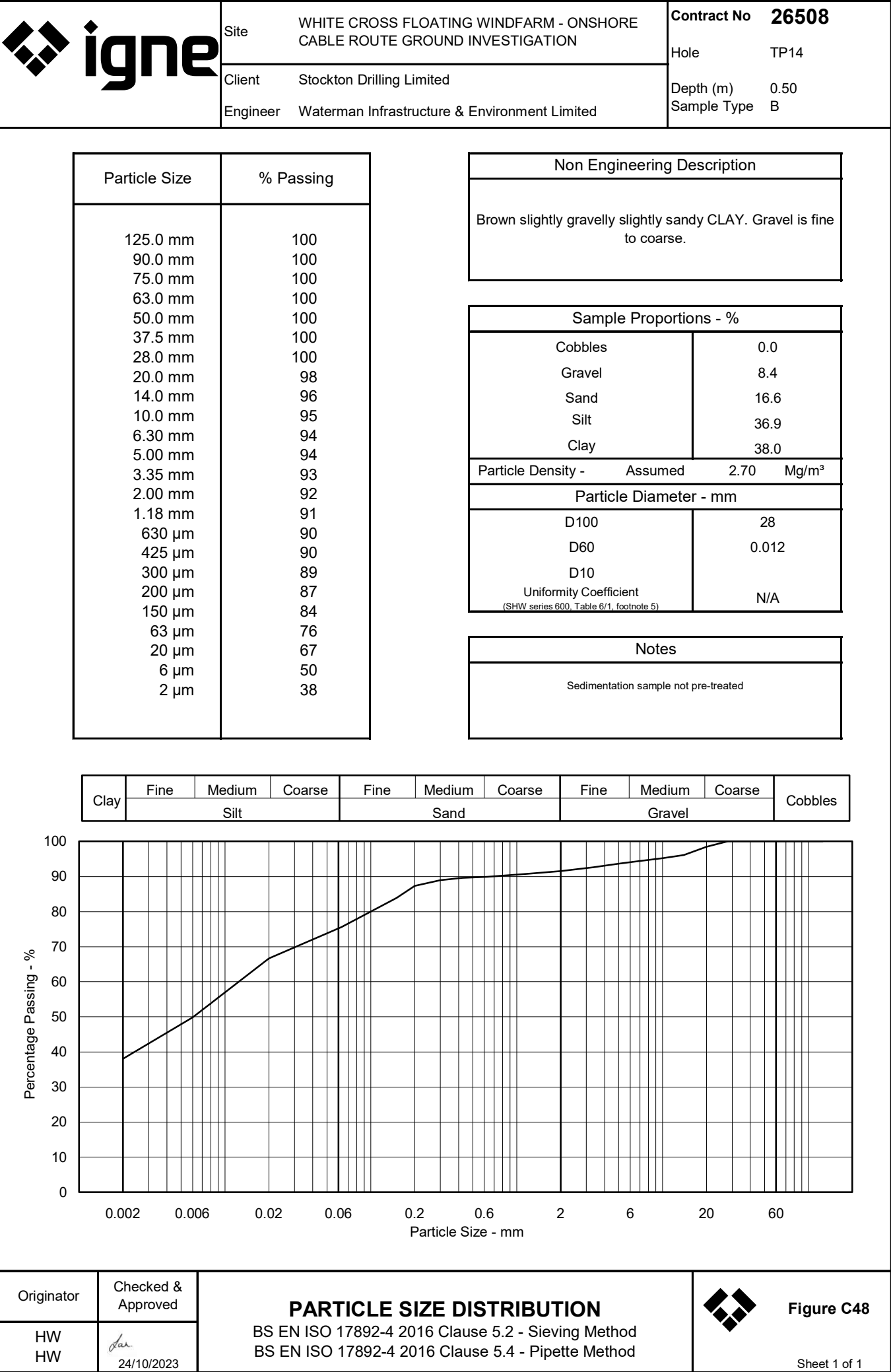


Originator	Checked & Approved	<b>PARTICLE SIZE DISTRIBUTION</b> BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 <b>Figure C41</b>
HW HW	<i>Jan</i> 24/10/2023		


Sheet 1 of 1










## **Annex 3: Site Survey Photographs**

Photograph Number	Photograph Description	Photograph
1.	<b>Saunton Sands, Devon</b> General view of the southern part of the land north of the estuary.	
2.	<b>Saunton Sands, Devon</b> General view of the marshy land around locations BH32-BH37.	
3.	<b>Saunton Sands, Devon</b> General view of area around locations BH24-BH25.	





Photograph Number	Photograph Description	Photograph
4.	<b>Saunton Sands, Devon</b> General view of area south of the estuary.	
5.	<b>Saunton Sands, Devon</b> View of location BH2 representative of Soil Type 1.	
6.	<b>Saunton Sands, Devon</b> View of location BH49 representative of Soil Type 2.	




Photograph Number	Photograph Description	Photograph
7.	<b>Saunton Sands, Devon</b> View of location BH60 representative of Soil Type 3.	
8.	<b>Saunton Sands, Devon</b> View of location Pit 1, representative of Soil Type 1.	
9.	<b>Saunton Sands, Devon</b> View of topsoil structure at location Pit 1.	




Photograph Number	Photograph Description	Photograph
10.	<b>Saunton Sands, Devon</b> View of subsoil structure at location Pit 1.	
11.	<b>Saunton Sands, Devon</b> General view of soil profile at location Pit 2/BH55, representative of Soil Type 3.	



Photograph Number	Photograph Description	Photograph
12.	<b>Saunton Sands, Devon</b> View of topsoil structure at location Pit 2/BH55.	
13.	<b>Saunton Sands, Devon</b> View of subsoil structure at location Pit 2/BH55.	
14.	<b>Saunton Sands, Devon</b> General view of size and number of stones in subsoil at location Pit 2/BH55.	

Photograph Number	Photograph Description	Photograph
15.	<b>Saunton Sands, Devon</b> General view of soil profile at location Pit 3, representative of Soil Type 2.	
16.	<b>Saunton Sands, Devon</b> View of topsoil structure at location Pit 3.	



Photograph Number	Photograph Description	Photograph
17.	<b>Saunton Sands, Devon</b> View of subsoil structure at location Pit 3.	

## **Annex 4: Summary of Findings**

<b>Job Name:</b>	Saunton Sands
<b>Job Number:</b>	240305
<b>Date:</b>	21/05/2024
<b>Completed By:</b>	RS

<b>Site Altitude:</b>	7
<b>Centre Grid Ref:</b>	246409 134994

<b>AAR</b>	858.05
<b>ATO</b>	1584.55
<b>FCD</b>	179.84
<b>MDMWHT</b>	104.65
<b>MDMPOT</b>	97.42

	<b>Soil Type 1</b>	<b>Soil Type 2</b>	<b>Soil Type 3</b>
<b>AP WHT</b>	83.73	117.10	123.25
<b>MB WHT</b>	-20.93	12.45	18.60
<b>AP POT</b>	63.525	94.4	102.275
<b>MB POT</b>	-33.89	-3.02	4.86



<b>Site Limitations Summary</b>			
	<b>Soil Type 1</b>	<b>Soil Type 2</b>	<b>Soil Type 3</b>
<b>Wetness Class</b>	I	III	III
<b>Wetness Grading</b>	1*	3b	3a
<b>Droughtiness Wheat</b>	3b	2	2
<b>Droughtiness Potato</b>	3b	2	2
<b>Gradient Limitation</b>	1	1	1
<b>Soil Depth Limitation</b>	1	1	1
<b>Stoniness Limitation</b>	1	1	3a
<b>Site Climatic Limitation</b>	1	1	1
<b>Flooding Limitation</b>	1	3b	3b
<b>Overall Grade</b>	<b>3b*</b>	<b>3b</b>	<b>3b</b>

\*Sand topsoil is not eligible for Grade 1, 2, or 3a



## **Annex 5: 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	<b>Excellent quality agricultural land</b> No or very minor limitations to agricultural use.
Grade 2	<b>Very good quality agricultural land</b> Minor limitation which affect crop yield, cultivation or harvesting.
Subgrade 3a (pre-1988 Grade 3)	<b>Good quality agricultural land</b> 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)	<b>Moderate quality agricultural land</b> Capable of producing moderate yields of a narrow range of arable crops and/or lower yields of a wider range of crops.
Grade 4	<b>Poor quality agricultural land</b> Severe limitations which significantly restrict the range of crops and/or levels of yield.
Grade 5	<b>Very poor quality agricultural land</b> 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 agricultural 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
<b>Climatic Limitations</b>	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.
<b>Site Limitations</b>	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.
<b>Soil Limitations</b>	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.
<b>Interactive Limitations</b>	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.

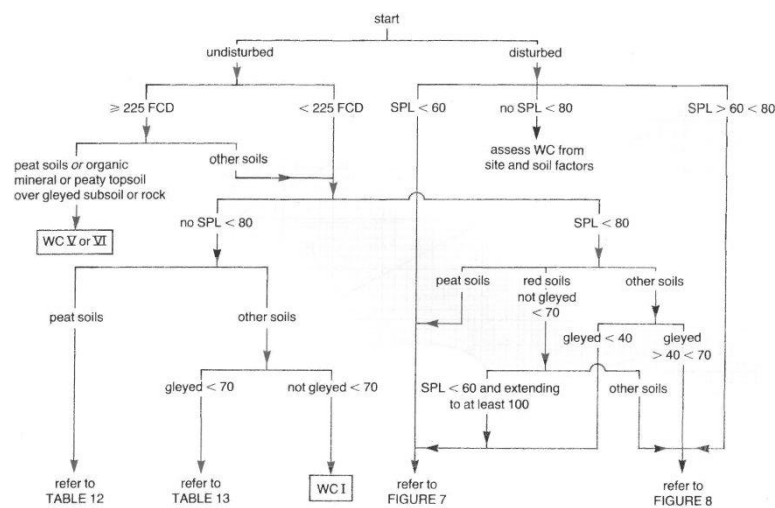


Figure 6

**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)