



Environmental Impact Assessment Agricultural Land Quality and Soil:

**Proposed Sandland Extension (Phase 9) -
Brickworth Quarry, Wiltshire**

Prepared for:
Raymond Brown Quarry Products Limited

Prepared by:
**R W Askew BSC(Hons) MSc F. I. Soil Sci CSci
Askew Land & Soil Limited**

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CONTENTS

1	INTRODUCTION	1
1.1	Background	1
1.2	Scheme Proposal	1
1.3	Competency	2
1.4	Methodology for Agricultural Land Classification (ALC) and Soil Resource Survey (SRS)	2
2	NATIONAL PLANNING POLICY FRAMEWORK AND BEST PRACTICE	4
2.1	Background	4
2.2	National Planning Policy Framework (NPPF) December 2024	4
2.3	Soil Functions and Soil Health	5
3	AGRICULTURAL LAND CLASSIFICATION AND SOIL RESOURCE SURVEY	8
3.1	Background	8
3.2	Climate	8
3.3	Site	9
3.4	Soil	10
3.5	Interactive Limitations	12
3.6	ALC Grading at the Site	12
4	ALC AT THE SITE IN A WIDER GEOGRAPHICAL CONTEXT	14
4.1	Introduction	14
4.2	Post-1988 ALC Information	14
5	EMBEDDED MITIGATION: SOIL MANAGEMENT PLAN	15
5.1	Aims and Objectives	15
5.2	General Requirements for Soil Handling	15
5.3	Haul Roads	17
5.4	Ground Preparation	17
5.5	Soil Stripping	17
5.6	Soil Storage	18
5.9	Drainage	20
5.10	Accidental spillages	20
5.11	Biosecurity	20
6	ASSESSMENT OF RESIDUAL EFFECTS	21
6.1	Predicting Effects	21
6.2	Predicting Residual Effects	27
7	NON TECHNICAL SUMMARY	28

FIGURES

- Figure 1: Sample Locations
Figure 2: Agricultural Land Classification
Figure 3: Soil Handling Units

APPENDICES

- Appendix 1: Restoration Scheme
Appendix 2: Soil Profile Logs
Appendix 3: Soil Pit Description
Appendix 4: Topsoil Particle Size Distribution (PSD)
Appendix 5: Institute of Quarrying Supplementary Note 4 – Soil Wetness

1 INTRODUCTION

1.1 Background

- 1.1.1 Raymond Brown Quarry Products Limited ('the Applicant') commissioned this report to provide an Environmental Impact Assessment (EIA) of proposed sand extraction (the 'Proposed Scheme') from the Sandland Extension (Phase 9) at Brickworth Quarry, Whiteparish, Wiltshire ('the Study Area') on agricultural land quality and soil. The location of the Study Area is shown on the Restoration Scheme (Drawing number 3404-5-2, dated 28th August 2025), which is given in **Appendix 1**.
- 1.1.2 This EIA report follows the Applicant's '*Regulation 15 Scoping Opinion Request to determine the scope of an Environmental Impact Assessment: Brickworth Quarry, Whiteparish, Wiltshire SP5 2QG*' of April 2025, and Wiltshire Council's Scoping Opinion Application Reference Number PL/2025/04038, decision dated 11th July 2025.
- 1.1.3 The assessment has involved an Agricultural Land Classification (ALC) grading of agricultural land within an approximately eight-hectare (ha) Study Area, including approximately three hectares of land proposed for sand extraction ('the Extraction Site'), which is currently in agricultural use, as shown in **Appendix 1**. It is centred at British National Grid (BNG) reference SU226234. At the time of the ALC survey in August 2025, the land was under rough grassland.
- 1.1.4 The assessment was made following the Agricultural Land Classification (ALC) system for England and Wales (see 'Methodology' below).
- 1.1.5 Sections 3.0 and 4.0 describe the '*Baseline Environmental Conditions*' regarding agricultural land quality and soil. A Soil Management Plan (SMP) has been devised and set out in Section 5.0 '*Embedded Mitigation*'. It is provided as an inherent design mitigation to identify and safeguard the soil resources (topsoil and subsoil) at the Extraction Site before mineral extraction. The SMP then identifies suitable locations and a methodology for storing topsoil and subsoil stripped from within the Extraction Site, and for restoring a soil profile of at least the same ALC grade as before mineral extraction, as outlined in the 'Restoration Scheme' provided in **Appendix 1**. Section 6.0 of this report assesses the '*Significance of residual effects*' of the Proposed Scheme on agricultural land quality and soil, assuming the inherent design mitigation set out in Section 5.0 is implemented successfully.

1.2 Scheme Proposal

- 1.2.1 A complete description of the Proposed Scheme is given in the introductory chapters of the Environmental Statement (ES). The main elements of the scheme relevant to this assessment of agricultural land quality and soil are summarized below.
- 1.2.2 As shown on the '*Restoration Scheme*' given in **Appendix 1**, the Proposed Scheme occupies land to the north of the existing quarry. The land is currently used for agriculture as arable farmland and is separated from the existing quarry site by a remnant strip of woodland,

through which Sandland Drove passes. The quarry extension would be worked similarly to the existing Brickworth Quarry, with extraction of sand followed by restoration to original ground level through the use of site-derived by-products and the importation and placement of inert materials.

- 1.2.3 Top and subsoils will be stripped before mineral extraction and stored following best practice within soil storage bunds around the site perimeter, or within a designated temporary storage area. The soils will be replaced during site restoration.

1.3 Competency

- 1.3.1 The work has been carried out by a Chartered Scientist (CSci), who is a Fellow (F.I. Soil Sci) of the British Society of Soil Science (BSSS). The soil surveyor meets the requirements of the BSSS Professional Competency Standard (PCS) scheme for ALC (see BSSS PCS Document 2 *'Agricultural Land Classification of England and Wales'*¹). The BSSS PCS scheme is endorsed, amongst others, by the Department for Environment, Food and Rural Affairs (Defra), Natural England, the Science Council, and the Institute of Environmental Assessment and Management (IEMA). The author is also a Registered Environmental Impact Assessor with the IEMA, now known as the Institute of Sustainability and Environmental Professionals (ISEP).

1.4 Methodology for Agricultural Land Classification (ALC) and Soil Resource Survey (SRS)

- 1.4.1 This assessment is based upon the findings of a study of published information on climate, geology, and soil in combination with a soil investigation carried out following the Ministry of Agriculture, Fisheries and Food (MAFF)² *'Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land'*, October, 1988 (henceforth referred to as the 'the ALC Guidelines')³. The ALC system 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 ALC system divides agricultural land into five grades (Grade 1 *'Excellent'* to Grade 5 *'Very Poor'*), with Grade 3 subdivided into Subgrade 3a *'Good'* and Subgrade 3b *'Moderate'*. Agricultural land classified as Grade 1, 2, and Subgrade 3a falls in the *'best and most versatile'* category in Paragraphs 187 and 188 of the National Planning Policy Framework (NPPF) revised on the 12th of December 2024. Further details of the ALC system and national planning policy implications are set out in Natural England's *'Guide to assessing development proposals on agricultural land'* online⁴.
- 1.4.2 A detailed survey of the Extraction Site was carried out on the 13th August 2025. The ALC and SRS survey involved examination of the soil's physical properties at a sampling density of one auger bore per hectare of agricultural land. The soil profile was examined at each sample location to a maximum depth of approximately 1.2 m by hand using a 5cm diameter Dutch (Edleman) soil auger. One soil pit was excavated by hand with a spade near auger bore 1 to examine certain soil physical properties, such as stone content and the structural condition of the subsoil, more closely. The location of the auger bores and the soil pit is shown in **Figure 1**.
- 1.4.3 The auger bore locations were located using a hand-held Garmin E-Trec Geographic Information System (GIS) to enable the sample locations to be relocated for verification, if necessary. Where auger locations on a 100 m grid pattern fall on headland, tramlines, or

within 3 m of a hedgerow or tree, they were relocated on agricultural land close by, i.e., to avoid compacted ground or land affected by tree roots, etc.

- 1.4.4 The soil profile at each sample location was described using the '*Soil Survey Field Handbook: Describing and Sampling Soil Profiles*'⁵. Each soil profile was assigned an ALC grade according to the MAFF ALC Guidelines.
- 1.4.5 The texture of the topsoil was determined on site by hand-texturing, as described in Natural England's Technical Information Note 037 '*Soil Texture*'⁶. To substantiate the hand-texturing carried out on site, a sample of topsoil was collected at three locations, i.e., auger bores 1 and 3, as shown in **Figure 1**. The soil samples were sent to an accredited laboratory for particle size analysis, which involved determining the proportions of sand, silt, and clay. This is to determine the definitive texture class of the topsoil, and to help distinguish between certain texture classes, for example, medium clay loams (i.e., <27% clay) and heavy clay loams (i.e., 27% to 35% clay).

2 NATIONAL PLANNING POLICY FRAMEWORK AND BEST PRACTICE

2.1 Background

- 2.1.1 This section of the report sets out the national and local planning framework in which to assess the opportunities and constraints to development at the Site in agricultural land quality terms.

2.2 National Planning Policy Framework (NPPF) December 2024

- 2.2.1 National planning policy guidance on development involving agricultural land is set out in National Planning Policy Framework (NPPF), which was revised on the 20th of December 2023. The NPPF aims to provide a simplified planning framework which sets out the Government's economic, environmental and social planning policies for England. The NPPF includes policy guidance on 'Conserving and Enhancing the Natural Environment' (Section 15). Paragraph 187 is of relevance to this assessment of agricultural land quality and soil and states that:

'187...Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;...'

- 2.2.2 Paragraph 188 of the NPPF (2024) describes that:

'188. Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework⁶⁵ ...' Footnote number 65 states that *'Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.'*

- 2.2.3 Section 17 of the NPPF (2024) 'Facilitating the sustainable use of minerals' includes paragraphs 223 (h), and 224 (e), which state that:

'223. Planning policies should: (h) ensure that worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place.'

'224. When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy⁷⁸. In considering proposals for mineral extraction, minerals planning authorities should: ...'

(e) provide for restoration and aftercare at the earliest opportunity, to be carried out to high environmental standards, through the application of appropriate conditions. Bonds or other financial guarantees to underpin planning conditions should only be sought in exceptional circumstances’.

2.3 Soil Functions and Soil Health

2.3.1 Aims and objectives for safeguarding and, where possible, improving soil health are set out in the Government’s ‘*Safeguarding our soils: A strategy for England*’⁷. The Soil Strategy for England, which builds on Defra’s ‘*Soil Action Plan for England (2004-2006)*’, sets out an ambitious vision to protect and improve soil to meet an increased global demand for food and to help combat the adverse effects of climate change.

2.3.2 The Soil Strategy for England states that ‘*...soil is a fundamental and essentially non-renewable natural resource, providing the essential link between the components that make up our environment. Soils vary hugely from region to region and even from field to field. They all perform a number of valuable functions⁸ or ecosystem services for society’.*

2.3.3 The main soil functions are:

- Food and other biomass production;
- Environmental Interaction: storage (including carbon sequestration), filtering, and transformation;
- Biological habitat and gene pool;
- Source of raw materials;
- Physical and cultural heritage; and
- Platform for man-made structures: buildings, highways.

2.3.4 The vision of the Soil Strategy for England has been developed in the Government’s 25-Year Plan for the Environment⁹. Soil is recognised as an important national resource, and the Plan states that:

‘We will ensure that resources from nature, such as food, fish and timber, are used more sustainably and efficiently. We will do this (in part) by:

....improving our approach to soil management: by 2030 we want all of England’s soils to be managed sustainably, and we will use natural capital thinking to develop appropriate soil metrics and management approaches...’

2.3.5 The maintenance and improvement of soil health is, therefore, a material consideration when deciding if development is appropriate on agricultural land. Soil health can be defined as a soil’s ability to function and sustain plants, animals, and humans as part of the ecosystem.

2.4 Soil Receptor Sensitivity / Resilience

- 2.4.1 When considering soil as a growing medium for food and biomass production (i.e., the land at the Site is currently in agricultural use), and a habitat that supports microbial, plant, and animal life, its sensitivity to change is mainly dependent on its resilience to structural damage during cultivation and soil handling (i.e., soil stripping, storing in stockpiles, and re-spreading).
- 2.4.2 As detailed in numerous guidelines for soil handling (see Section 2.5 'Best Practice Guidance'), the key to understanding soil resilience to structural damage during soil handling is the interaction between soil texture and soil moisture, as well as the effect of this interaction on soil structure.
- 2.4.3 For the SMP, the methodology for assessing soil wetness will be used to place the different soil types at the Site into one of three soil handling units which have different resilience (i.e., high resilience, medium resilience, and low resilience) to structural damage according to their respective soil cohesion and soil strength and resistance to compression and smear at different soil moisture contents. These three categories of resilience should be related to the prevailing climate, namely Field Capacity Days, as set out in Table 2.1.

Table 2.1: Soil handling units

Soil Handling Unit / Sensitivity	Resilience to structural damage during soil handling	Soil Texture Class
Unit 1 (Green) – Low Sensitivity	High	Light textured soils: sand (S), loamy sands (LS), sandy loam (SL), sandy silt loams (SZL); where fewer than 225 Field Capacity Days (FCD) (Average Annual Rainfall (AAR) less than 1000mm).
Unit 2 (Orange) – Medium Sensitivity	Moderate	Above textures where there are 225 FCD or more (AAR 1000mm or greater). Medium textured soils with less than 27% clay content: silt loam (ZL), medium silty clay loam (MZCL), medium clay loam (MCL), sandy clay loam (SCL); where there are 225 FCD or fewer (AAR 1000mm or less). Heavy textures below (i.e., more than 27% clay content) where fewer than 150 FCD (AAR less than 700mm).
Unit 3 (Red) – High Sensitivity	Low	Medium textures above where there are more than 225 FCD (AAR greater than 1000mm). Heavy textures soils with more than 27% clay content: heavy silty clay loams (HZCL), heavy clay loam (HCL), sandy clay (SC) silty clay (ZC) clay (C); where FCD are 150 or more (AAR 700mm or greater). Organic and peaty soils.

2.5 Best Practice Guidance

2.5.1 This assessment of agricultural land and soil has drawn on best practice guidance set out in the key documents below:

- The Institute of Civil Engineering (ICE) provides guidance on assessing agricultural land quality and soil in the *'Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities'*¹⁰.
- The Institute of Environmental Assessment and Management (IEMA) has produced a *'New Perspective on Land and Soil in Environmental Assessment'*¹¹, encouraging a new approach to assessing soil functions, ecosystem services and natural capital provided by land and soils.
- The Department for Environment, Food and Rural Affairs (Defra) has published *'Safeguarding our Soils – A Strategy for England'* (24th September 2009)¹². The Soil Strategy was published in tandem with a *'Code of Practice for the Sustainable Use of Soils on Construction Sites'*¹³. The Soil Strategy for England, which builds on Defra's *'Soil Action Plan for England (2004-2006)'*, sets out an ambitious vision to protect and improve soil to meet an increased global demand for food and to help combat the adverse effects of climate change.
- This project also follows best practice published by the British Society of Soil Science on *'Benefitting from Soil Management in Development and Construction'*¹⁴.
- Best practice will also be followed for soil handling published by the Institute of Quarrying (2021) *'Good Practice for Handling Soils in Mineral Workings'* (Sheets A to E are mainly relevant to this assessment)¹⁵.
- This assessment also considers recent guidance produced by the Soils in Planning Construction Task Force (Lancaster University *et al*) regarding *'Building on soil sustainability: Principles for soils in planning and construction'* (September 2022)¹⁶. This report contains guidance for local authorities, contractors, clients, developers, and design teams on managing soil in construction and planning. This guidance for conserving soil resources on-site follows the principles of sustainable development and the circular economy (defined as *'The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the **life cycle of products is extended**. In practice, it implies **reducing waste** to a minimum. When a product ends its life, its materials are kept within the economy wherever possible. These can be productively used repeatedly, thereby **creating further value**'*¹⁷.

3 AGRICULTURAL LAND CLASSIFICATION AND SOIL RESOURCE SURVEY

3.1 Background

3.1.1 This section of the report sets out the findings of the Agricultural Land Classification (ALC) and Soil Resource Survey (SRS). It is based on a desktop study of relevant published information on climate, topography, geology, and soil in conjunction with a soil survey.

3.1.2 As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:

- climate;
- site;
- soil; and
- interactive limitations.

3.1.3 These factors are considered in turn below.

3.2 Climate

3.2.1 Interpolated climate data relevant to the determination of the Agricultural Land Classification (ALC) grade of land at the Site is given in Table 3.1 below.

Table 3.1: ALC Climate Data for Brickworth Quarry Sandland Extension	
Climate Parameter	Grid Ref: SU226234
Average Altitude (m)	91
Average Annual Rainfall (mm)	849
Accumulated Temperature above 0°C (January – June)	1452
Field Capacity Days (FCD)	186
Moisture Deficit (mm) Wheat	98
Moisture Deficit (mm) Potatoes	89
Grade According to Climate	1

3.2.2 Regarding Figure 1 ‘Grade according to climate’ on page 6 of the ALC Guidelines, there is no overall climatic limitation to the quality of agricultural land in the ALC Study Area. This means that agricultural land could be graded as high as Grade 1 in overall climatic terms, without any other limiting factor, i.e., site, soil, and/or interactive limitations.

- 3.2.3 Agricultural land in the ALC Study Area is predicted to be at field capacity (i.e., the amount of soil moisture or water content held in the soil after excess water has drained away) for between 186 Field Capacity Days (FCD) per year, mainly over the late autumn, winter, and early spring.
- 3.2.4 The combination of topsoil texture, drainage status (Wetness Class) of the profile, and number of FCD affects the degree to which agricultural land is limited by soil wetness. The climate in the ALC Study Area falls in the 175-225 category (regarding Table 6 of the ALC Guidelines), as described in more detail under 'interactive limitations' below.

3.3 Site

- 3.3.1 As shown in **Appendix 1**, the Study Area is located to the north of the existing Brickworth Quarry. The A36 borders it to the north, and woodland separates it from the existing quarry to the south. At the time of the ALC survey in August 2025, the land was under rough grassland.

With regard to the ALC Guidelines, agricultural land quality can be limited by one or more of three main site factors as follows:

- gradient;
- micro-relief (i.e., complex change in slope angle over short distances); and
- risk of flooding.

I. Gradient and Micro-Relief

- 3.3.2 The land in the Study Area is domed, with higher ground near auger bores 2 and 3, as shown in **Figure 2**. The quality of agricultural land is not limited by gradient, which does not exceed 7° (as per Table 1 of the ALC Guidelines, 1988). Likewise, the quality of agricultural land is not limited by micro-relief, i.e., complex changes in slope angle and direction over short distances.

II. Risk of Flooding

- 3.3.3 From the Government Flood Map for Planning website¹⁸, the Study Area is in Flood Zone 1 with a low risk of flooding. The MAFF ALC Guidelines (1988) take account of the frequency, duration, and timing of flooding in the summer and winter (re Table 2 '*Grade according to flood risk in summer*' and/or Table 3 '*Grade according to flood risk in winter*'). There is no evidence the grade of agricultural land at the Site is limited by flood risk during the summer or winter following the ALC Guidelines.

3.4 Soil

I. Geology/Soil Parent Material

- 3.4.1 British Geological Survey (BGS) information available online¹⁹ has been utilised to identify the Bedrock underlying the ALC Study Area and any Superficial (Drift) Deposits over the Bedrock. This information helps to determine the parent material from which the soil has formed.
- 3.4.2 The BGS information indicates the Study Area is underlain predominantly by sand in the Reading Formation. The northern-most part of the Study Area borders chalk in the Portsdown Chalk Formation, although no chalk was encountered within the soil auger depth (i.e., 1.2m). Superficial deposits do not cover the bedrock.

II. Published Information on Soil

- 3.4.3 The National Soil Map²⁰ shows that agricultural land in the Study Area is covered by soils predominantly in the Fyfield 4 association. As described by the Soil Survey of England and Wales (SSEW)²¹, this association is widespread in the south of England. The main Fyfield soils are brown coarse loamy typical argillic brown earths which pass down to sand or sandstone, as do the associated Frilford and Standhill soils, which are brown medium and fine sandy argillic brown sands respectively. There are some Wickham and Kingston soils, mottled fine loamy over clayey typical stagnogley soils. Bursledon soils, slightly mottled fine loamy, stagnogleyic argillic brown earths over interbedded sands and clays occur in places. On Tertiary beds in London and north-west Kent, Fyfield and Standhill soils are the most common on Thanet Beds with finer-textured Bursledon, Kingston and Wickham soils on the overlying Woolwich and Reading Beds. Fyfield, Frilford and Standhill soils are permeable, well-drained (Wetness Class I) and readily absorb excess winter rain.

III. Soil Resource Survey

- 3.4.4 A log of the soil profiles recorded in the Study Area (see Figure 1) is given in **Appendix 2**. A description of Soil Pit 1 is given in **Appendix 3**. The detailed soil survey identified one predominant soil type/unit ('Soil Type 1'), characterized by a loamy medium sand topsoil over a similarly textured upper subsoil, and a medium sand lower subsoil/bedrock. The soil profiles are well-drained soils in Wetness Class I.

IV. Topsoil Particle Size Analysis

- 3.4.5 To substantiate topsoil texture determined during the ALC/SRS survey by hand-texturing, a sample of topsoil was collected at two locations, i.e., auger bore 1 (Pit 1) and auger bore 3, as shown in **Figure 1**. The soil samples were sent to an accredited laboratory for analysis of particle size distribution (PSD), based on the British Standard Institution particle size grades. The certificate of analysis is provided as **Appendix 4**, which also provides a detailed breakdown

of the sand fraction into coarse, medium, fine, and very fine fractions. The findings of the PSD analysis are shown in Table 3.2 below:

Table 3.2: Topsoil Texture (re Table 10, ALC Guidelines)				
Topsoil Sample Location (See Fig. 1)	% sand 0.063-2.0 mm	% silt 0.002- 0.063 mm	% clay <0.002 mm	ALC Soil Texture Class
1 (Pit 1)	80	11	9	Loamy Medium Sand

V. Soil Resources Available for Restoration to Agriculture

- 3.4.6 As described in Section 1.2, topsoil and subsoil will be stripped from the approximately 3.0ha Extraction Area. They will be stored in the remainder of the Study Area, as shown in **Appendix 1**.
- 3.4.7 From the soil profile data recorded on-site and given in **Appendix 2**, it is proposed to work the soil across the Extraction Area as a single unit, i.e., Soil Type 1. It has been determined that approximately 30cm of topsoil and 20cm of upper subsoil are available for stripping, storage, and reuse in the restoration scheme, as summarized in Table 3.3. The recovered soil will be used, in part, to restore approximately 1.9ha of agricultural land, which could be used for arable production. The remainder of the restoration area will be used for neutral grassland and swale areas (see **Appendix 1**). The following soil resources, listed in Table 3.3, are available for reuse in the restoration scheme.

Table 3.3: Soil Resources Available for Reuse in the Restoration Scheme (Soil Type 1)		
Area of Soil Type (ha and m² in the Extraction Area)	Approximate volume (m³)	Sensitivity of soil receptor (see Table 6.1 'Sensitivity of Receptors')
Total Volume of Type 1 Topsoil		
3.0 ha or 30,000 m ²	Thickness of topsoil layer = 0.30m x 30,000 m ² = 9,000 m³ (no bulking factor)	Loamy Medium Sand (Low Sensitivity)
Total Volume of Type 1 Upper Subsoil		
3.0 ha or 30,000 m ²	Thickness of upper subsoil layer = 0.20m x 30,000 m ² = 6,000 m³ (no bulking factor)	Loamy Medium Sand (Low Sensitivity)

3.5 Interactive Limitations

- 3.5.1 From the published information above, together with the findings of the detailed soil survey, it has been determined that the quality of agricultural land in the ALC Study Area is limited by soil droughtiness during the growing season, as described below.

I. Soil Droughtiness

- 3.5.2 From the ALC Guidelines, a soil droughtiness limitation exists '*in areas with relatively low rainfall or high evapotranspiration, or where the soil holds only small reserves of moisture available to plant roots.*' The ALC grade according to soil droughtiness is shown in Table 3.4 below (based on Table 8 '*Grade According to Droughtiness*' in the ALC Guidelines). To be eligible for Grades 1 to 3b the moisture balances (MBs) must be equal to, or exceed, the stated minimum values for both wheat and potatoes. If the MB for either crop is less (i.e., more negative) than that shown for Subgrade 3b, the soil is Grade 4 on droughtiness):

Table 3.4: ALC Grade According to Droughtiness (re Table 8 of the MAFF ALC Guidelines)		
Grade/Subgrade	Moisture Balance (MB) Limits (mm)	
	Wheat	Potatoes
1	+30	+10
2	+5	-10
3a	-20	-30
3b	-50	-55
4	<-50	<-55

- 3.5.3 As shown in the soil profile logs given in **Appendix 2**, it has been calculated that the soil profiles have moisture balance (MB) values of between +5mm and -20mm for wheat, and between -10mm and -30mm for potatoes, which limits the land to Subgrade 3a according to soil droughtiness.

3.6 ALC Grading at the Site

- 3.6.1 A detailed ALC survey has determined that agricultural land in the ALC Study Area is limited by soil droughtiness to Subgrade 3a.
- 3.6.2 The area of land in each ALC grade has been measured from **Figure 2** and the area (ha) and proportion (% of Site) is given in Table 3.5.

Table 3.5: Agricultural Land Classification – Bickworth Quarry Sandland Extension				
ALC Grade	Extraction Area (Ha)	Non-Extraction Area (Ha)	Application Area (Ha)	Application Area (%)
Grade 1 (Excellent)	0	0	0	0
Grade 2 (Very Good)	0	0	0	0
Subgrade 3a (Good)	3.0	0	3.0	37
Subgrade 3b (Moderate)	0	0	0	0
Grade 4 (Poor)	0	0	0	0
Grade 5 (Very Poor)	0	0	0	0
Other Land / Non-agricultural	0	5.1	5.1	63
Total	3.0	5.1	8.1	100

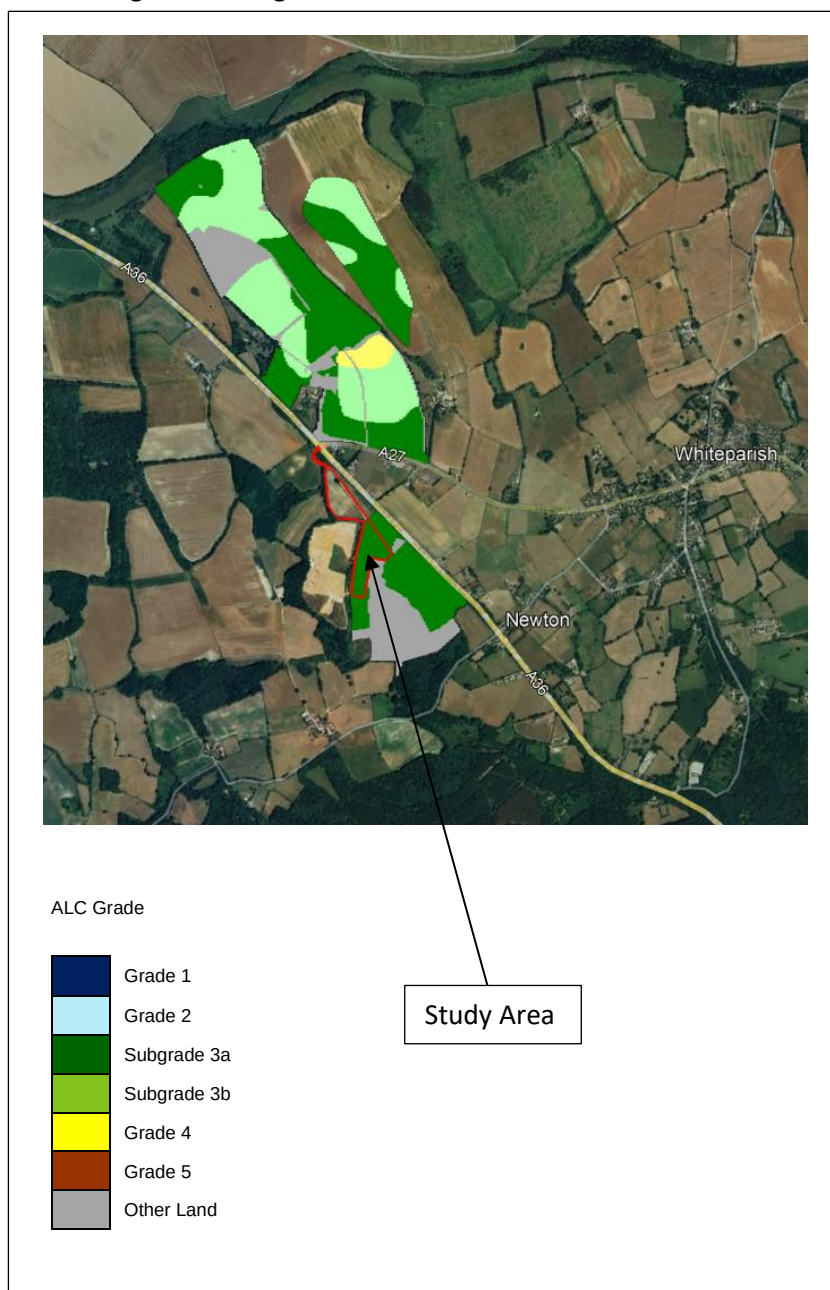
4 ALC AT THE SITE IN A WIDER GEOGRAPHICAL CONTEXT

4.1 Introduction

- 4.1.1 The aim of this section is to examine agricultural land quality in the ALC Study Area in a national, regional, county, and local context.

4.2 Post-1988 ALC Information

- 4.2.1 The former MAFF has not carried a Post-1988 ALC survey of agricultural land covering the Extraction Area, but has graded land in the remainder of the Application Area as Subgrade 3a (i.e., dark green). An extract from the Post-1988 Agricultural Land Classification map online²² surrounding the Site is given below.



5 EMBEDDED MITIGATION: SOIL MANAGEMENT PLAN

5.1 Aims and Objectives

5.1.1 The aim of this Soil Management Plan (SMP) is to maintain, and where possible improve, the quality and quantity of soil resources (i.e., topsoil and subsoil) at the Site in its current physical condition (e.g., soil depth, soil texture, soil structure, soil drainage status to maintain soil functions during (i) the mineral extraction phase, and (ii) land restoration.

5.1.2 The objective of this SMP is to set out an appropriate methodology to:

- (i) Determine the location, extent, and quality of *in-situ* soil resources (topsoil and subsoil) at the Extraction Site before mineral extraction (i.e., baseline soil status), as described in Section 3.0 'Agricultural Land Classification (ALC) and Soil Resource Survey (SRS)';
- (ii) Determine types (units) of soil according to their resilience to damage (e.g., compaction) during soil handling before the commencement of mineral extraction (see Soil Type 1 described in Section 3.0 also);
- (iii) Ensure vehicular traffic over the land is restricted to farm tracks, haul roads or on agricultural land in appropriate weather conditions and soil-wetness state during the mineral extraction and restoration phases;
- (iv) Where necessary, to strip, store, and respread soil resources in appropriate weather conditions and soil-wetness state during the mineral extraction and restoration phases.

5.2 General Requirements for Soil Handling

5.2.1 This section outlines general requirements for vehicular traffic over agricultural land, and where necessary, soil handling, i.e., soil stripping, storage, and placement/re-spreading, during the mineral extraction and land restoration phases.

5.2.2 The quality and quantity of soil resources (topsoil and subsoil) within the Site shall be maintained by following the approach of the DEFRA '*Code of Practice for the Sustainable Management and Use of Soil on Construction Sites*' (Defra, September 2009). This is to achieve the following principal objectives:

- (i) The avoidance of unnecessary damage to all soil layers, especially by compaction and smearing;
- (ii) The maintenance of a reasonable degree of fissuring, drainage, and aerobic conditions in stored soils;

- (iii) The reasonable replication of the original sequence of textural horizons and permeability of the soil profile when the materials are reinstated, based on a target restoration profile (i.e., the original/baseline soil profile determined in the SRS prior to commencement of construction);
 - (iv) The preservation of soil biodiversity and Soil Organic Matter (SOM).
- 5.2.3 All soil and soil-forming materials shall be handled following the Institute of Quarrying's Good Practice Guide for Handling Soil (2021), Sheets A – E (handling soil using backactors and dumptrucks)²³.
- 5.2.4 When a soil is handled when it is too wet (i.e., the moisture content is at or exceeds the lower plastic limit), then soil strength is reduced, and it becomes prone to structural damage, i.e., it has less resistance to compression and shear. By introducing a force, such as a mechanical excavator, the wet (or plastic) soil can lose its structure and become compacted. As described in Best Practice produced by the Institute of Quarrying (see 'Supplementary Note 4 – Soil Wetness' given as **Appendix 5**),
- '...The degree of effect due to soil handling is likely to vary between the soil textural class, structural condition, and organic matter content, the local climate and daily weather conditions, but also between the types and size of machinery used and handling practice adopted. The primary cause of compaction arises from the compression caused by trafficking by the machinery and stockpiling of soil in storage. Whilst some degree of remedial actions might be possible, experience has demonstrated that minimising compaction by handling soil in a dry condition is the more effective and reliable, and likely most cost-effective option.'*
- 5.2.5 Advice is given in **Appendix 5** on the general timing of operations. A field-based determination of when the actual operations should start, cease or restart based upon actual soil wetness is provided. The SMP should carefully consider the timing of (i) vehicle traffic over the land and soil, and (ii) land-work and soil handling operations. The SMP should provide mitigation measures to avoid or reduce damage to soil structure, especially when the soil is wet, including a method for determining when land-work and soil handling operations should start, cease and restart based upon actual soil wetness. This may include the determination of the Plastic Limit (see Section 1.5 (III) above) of the different soil types/units, which should be determined in a laboratory to British Standard 1377: 1990 'Methods of test for soils for civil engineering purposes'²⁴.
- 5.2.6 From an 'Indicative on-average months when vegetated mineral soils might be in a sufficiently dry condition according to geographic location, depth of soil and clay content' (Table 4.1, **Appendix 5**), the soil in the Denham Quarry North-East Extension Study Area is predicted to be in a sufficiently dry condition as follows (Note: this is a predicted period over the year when the soil is most likely to be suitable for handling:
- (i) Soil Handling Unit 1 (Low Sensitivity/High Resilience): <10% clay in Climatic Zone 2 = Late March to Early November.

- 5.2.7 Throughout the period of working, restoration, and Aftercare, the operator shall take all reasonable steps to ensure that drainage from areas adjoining the Site is not impaired or rendered less efficient by the permitted operations.
- 5.2.8 The operator shall take all reasonable steps, including the provision of any necessary works, to prevent damage by erosion, silting, or flooding and to make proper provision for the disposal of all water entering, arising on, or leaving the Site during the permitted operations.
- 5.2.9 Any oil, fuel, lubricant, paint, or solvent within the site shall be so stored as to prevent such material from contaminating topsoil, subsoil, soil-forming material, or reaching any watercourse.
- 5.2.10 Throughout the period of working, restoration, and aftercare, the operator shall have due regard to the need to adhere to the precautions for preventing the spread of plant and animal diseases published by the Government online²⁵.

5.3 Haul Roads

- 5.3.1 Vehicles, e.g., heavy goods vehicles (HGV) delivering restoration materials, should not be permitted to traffic over agricultural land and should be restricted to public highways, farm tracks, haul roads, and storage compounds.
- 5.3.2 It is recommended to use temporary haul road systems to minimise structural damage to the soil. This could involve a heavy-duty composite plastic trackway system on a thin layer of stone, or no stone, e.g., GroundGuards Xtreme Mats 4mx2m Large Mats²⁶, or SignaRoad 3mX2m Large Mats²⁷, or other similar geotextile material.

5.4 Ground Preparation

- 5.4.1 Before stripping agricultural topsoil, all above-ground vegetation should be cleared off the site in the areas to be stripped, so that the amount of vegetation within the topsoil strip is minimised (this is to minimise the amount of anaerobic decomposition of vegetation / organic matter that will occur within the topsoil stockpiles).

5.5 Soil Stripping

- 5.5.1 Before any part of the Excavation Site is excavated or is built upon, or used for the stacking of topsoil, subsoil or overburden, or as a machinery dump or plant yard, or for the construction of a road, all available topsoil and subsoil shall be stripped from that part.
- 5.5.2 A layer of topsoil 30cm deep shall be stripped from the Extraction Site (see **Appendix 1**) following the Institute of Quarrying's Good Practice Guide for Handling Soil (2021), Sheets A – E (handling soil using backactors and dumptrucks)²³. The topsoil shall be taken to the closest topsoil storage area.

- 5.5.3 Likewise, a layer of subsoil 20cm deep (i.e., a 20cm layer of subsoil below the exposed subsoil surface once the topsoil has been removed) shall be stripped from the Extraction Site (see **Appendix 1**) following the Institute of Quarrying's Good Practice Guide for Handling Soil (2021), Sheets A – E (handling soil using backactors and dumptrucks)²³. The subsoil shall be taken to the closest subsoil storage area.

5.6 Soil Storage

- 5.6.1 Bunds for the storage of soils shall conform to the following criteria:

- (i) Topsoil and subsoil shall be stored separately.
- (ii) Where continuous bunds are used, dissimilar soils shall be separated by a third material.

Soil Type 1 (Low Sensitivity/High Resilience)

- (iii) Topsoil and subsoil with low sensitivity/high resilience to soil handling shall be stored in bunds not exceeding 5m in height.
 - (iv) Materials shall be stored like upon like, so that topsoil shall be stripped from beneath subsoil bunds.
 - (v) All storage bunds containing soils which are intended to remain in situ for more than 6 months or over the winter period are to be grassed over with deep-rooted Italian ryegrass (*Lolium multiflorum*) and weed control and other necessary maintenance carried out.
- 5.6.2 All topsoil and subsoil shall be retained on the Site.

5.7 Restoration of Agricultural Land to BMV Subgrade 3a

- 5.7.1 As part of the Proposed Scheme, it is proposed to restore approximately 1.9ha of best and most versatile (BMV) agricultural land in Subgrade 3a to agrarian production by reinstating soil profiles capable of restoring agricultural land to its former ALC Subgrade 3a quality, following a five-year Aftercare and Drainage Scheme. The land to be restored to agricultural use is shown in the Restoration Scheme provided in **Appendix 1**.
- 5.7.2 It is proposed to utilise Soil Type 1 topsoil and subsoil resources identified in Section 3.0 earlier for restoring approximately 1.9ha (19,000 m²) to agricultural land of Subgrade 3a quality, following the implementation of a five-year Aftercare and Drainage scheme.
- 5.7.3 As determined in Table 3.3 earlier, it has been determined that up to approximately 9,000 m³ (no bulking factor) of Type 1 topsoil, and approximately 6,000 m³ (no bulking factor) of Type 1 subsoil, would be excavated on Site, and is thus available for use in restoring agricultural land as part of the Proposed Scheme.
- 5.7.4 In order to restore agricultural land to its former ALC Subgrade 3a classification, it is proposed to restore a 30cm layer of Type 1 topsoil over a 20cm layer of Type 1 subsoil, over a 70cm layer

of soil material available on site, e.g., screening material. This would produce a restored soil profile with a total depth of 120cm, i.e., taken to be the maximum rooting depth of winter wheat in the MAFF ALC Guidelines (October 1988).

- 5.7.5 The thickness of the restored soil layers, and corresponding volume of soil required for restoring Subgrade 3a agricultural land, is given in Table 5.1 (below).

Table 5.1: Proposed soil layers to be restored to agricultural land of BMV Subgrade 3a quality		
Depth of restored soil layer below ground level, and approximate thickness of layer (cm)	Description of soil resources required for agricultural land restoration to Subgrade 3a	Approximate volume of soil resources required for agricultural land restoration to Subgrade 3a
0cm-3cm (30cm)	Type 1 Topsoil	$19,000 \text{ m}^2 \times 0.3\text{m} = 5,700 \text{ m}^3$
30cm-50cm (20cm)	Type 1 Subsoil	$19,000 \text{ m}^2 \times 0.2\text{m} = 3,800 \text{ m}^3$
70cm-120cm (70cm)	Soil forming material on site	$19,000 \text{ m}^2 \times 0.7\text{m} = 13,300 \text{ m}^3$
120cm+	Inert infill	n/a

- 5.7.6 Therefore, it is demonstrated above that there are sufficient volumes of Type 1 topsoil and Type 1 Subsoil on site to restore approximately 1.9ha of ALC Subgrade 3a agricultural land (i.e., comprising a restored soil profile of 120cm deep).

5.8 Agricultural Aftercare and Drainage Scheme

- 5.8.1 Following the restoration of land to agriculture, it is proposed that the restored land would be the subject of a five-year aftercare and drainage scheme. The aftercare and drainage scheme would be the subject of a condition of planning consent and would be approved by the Mineral Planning Authority. An outline of the proposed aftercare and drainage scheme is given below:

- Soil cultivation and establishment of vegetation cover (year 1);
- Soil cultivation and vegetation management (year 2);
- Soil cultivation vegetation management (years 3-5);
- A five-year aftercare scheme to bring the land into a condition suitable for long-term agricultural management;
- Consideration of the drainage of the restored agricultural land to prevent flooding.

5.9 Drainage

- 5.9.1 The Operator/Principal Contractor shall take all reasonable steps to ensure that drainage from areas within and adjoining the Site is not impaired or rendered less efficient by construction activities.
- 5.9.2 The Operator/Principal Contractor shall take all reasonable steps, including the provision of any necessary works, to prevent damage by erosion, silting or flooding and to make proper provision for the disposal of all water entering, arising on or leaving the Site during the permitted operations.

5.10 Accidental spillages

- 5.10.1 Any oil, fuel, lubricant, paint or solvent within the Site shall be so stored as to prevent such material from contaminating topsoil, subsoil, soil forming material, or reaching any watercourse.

5.11 Biosecurity

- 5.11.1 The SMP will follow guidance on biosecurity set out in the Landscape Management Plan and the CEMP for Biodiversity. Accordingly, throughout the period of working, and restoration, the operator shall have due regard to the need to adhere to the precautions for preventing the spread of plant and animal diseases published by the Government online²⁸.

6 ASSESSMENT OF RESIDUAL EFFECTS

6.2 Predicting Effects

- 6.1.1. This assessment is based upon the findings of a desk-based study of published information on climate, geology and soil. The assessment follows the approach of the national '*Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*', October 1988 (henceforth referred to as the 'the ALC Guidelines')²⁹.
- 6.1.2. The ALC system 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 ALC system divides agricultural land into five grades, i.e., Grade 1 '*Excellent*', Grade 2 '*Very Good*', Subgrade 3a '*Good*', Subgrade 3b '*Moderate*', Grade 4 '*Poor*' and Grade 5 '*Very Poor*'.
- 6.1.3. The scope of this assessment is two-fold, covering the likely significant effects of the Proposed Scheme on:
- i. Agricultural land quality, particularly the likely significant effects on the best and most versatile (BMV) agricultural land, i.e., Agricultural Land Classification (ALC) Grade 1, Grade 2 and Subgrade 3a, as set out in paragraph 187 of the National Planning Policy Framework (NPPF) revised on 12th of December 2024; and
 - ii. Soil resources available for restoration of the Site, as per paragraph 188 of the NPPF (December 2024).
- 6.1.5 Consideration has been given to the Sensitivity of Receptor and Magnitude of Effect in relation to agricultural land quality and soil following the criteria in the Institute of Environmental Management and Assessment's (IEMA) '*A New Perspective on and Soil in Environmental Impact Assessment*' (2022)³⁰.

Sensitivity of Receptor

Agricultural Land Quality

- 6.1.6 For the purpose of this assessment, the sensitivity of the agricultural land quality receptors is assessed as '*High*', '*Medium*', '*Low*' or '*Very Low*' following the criteria given in Table 6.1.

Table 6.1: Determining the Sensitivity of the Receptors – Soil Resource and Soil Functions

Receptor value / sensitivity	Receptor type
Very High	Biomass production: ALC Grades 1 & 2 or LCA Classes 1 & 2 (for Wales all BMV (Grade 1, 2 and 3a) is considered Very High*) Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a European site (e.g., SAC, SPA, Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland Soil carbon: Peat soils Soils with potential for ecological/landscape restoration; Soil hydrology: Very important catchment pathway** for water flows and flood risk management; Archaeology, Cultural heritage, Community benefits and Geodiversity: SAMs and adjacent areas; World Heritage and European designated sites; Soils with known archaeological interest; Soils supporting community/recreational/educational access to land covered by National Park designation; Source of materials: Important surface mineral reserves that would be sterilised (i.e., without future access)
High	Biomass production: ALC Grade 3a (for Wales all BMV is considered as Very high*), or LCA Grade 3.1. Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a UK designated site (e.g., UNESCO Geoparks, SSSI or AONB, Special Landscape Area, and Geological Conservation Review sites); Native Forest and woodland soils; Unaltered soils supporting semi-natural vegetation (including UKBAP Priority habitats or Section 6 habitats in Wales) Soil carbon: Organo-mineral soils (e.g., peaty soils) Soil hydrology: Important catchment pathway** for water flows and flood risk management Archaeology, Cultural heritage, Community benefits and Geodiversity: Soils with probable but as yet unproven (prior to being revealed by construction) archaeological interest; Historic parks and gardens; RIGS; Soils supporting community/recreational/educational access to RIGS and AONBs Source of materials: Surface mineral reserves that would be sterilised (i.e., without future access)
Medium	Biomass production: ALC Grade 3b or LCA Grade 3.2

Receptor value / sensitivity	Receptor type
	Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected or valued features within non-statutory designated sites (e.g., Local Nature Reserves (LNR), Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), Special Landscape Areas; Non-Native Forest and woodland soils Soil carbon: Mineral soils Soil hydrology: Important minor catchment pathway** for water flows and flood risk management Archaeology, Cultural heritage, Community benefits and Geodiversity: Soils with possible but as yet unproven (prior to being revealed by construction) archaeological interest; Soils supporting community/recreational/educational access to land Source of materials: surface mineral reserves that would remain accessible for extraction
Low	Biomass production: ALC Grades 4 & 5 or LCA Grades 4.1 to 7 or Urban soils Ecological habitat, soil biodiversity and platform for landscape: Soils supporting valued features within non-designated notable or priority habitats/landscapes. Agricultural soils Soil carbon: Mineral soils Soil hydrology: Pathway** for local water flows and flood risk management Archaeology, Cultural heritage, Community benefits and Geodiversity: Soils supporting no notable cultural heritage, geodiversity nor community benefits; Soils supporting limited community/recreational/educational access to land Source of materials: Surface mineral reserves that would remain accessible for extraction
Very Low/Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions
<i>*All BMV in Wales is considered 'Very High' sensitivity due to the PPW wording '...significant weight to protect [BMV] from development'. Only if a development can demonstrate 'overriding need' would BMV grades need to be considered for the sequential test.</i>	
<i>**As defined by the site and catchment characteristics according to the professional judgement of a catchment hydrologist</i>	

Soil Resources

6.1.7 For the purpose of this assessment, the sensitivity of the soil resource receptors (i.e., topsoil and subsoil) is assessed as 'High', 'Medium', 'Low' or 'Very Low' in Table 6.2 following the Institute of Civil Engineers' (2019) 'Environmental Impact Assessment Handbook'³¹.

Table 6.2: Determining the Sensitivity of the Receptors – Soil Resources

Value (Sensitivity)	Descriptor
High	Soil types with low resilience to structural damage when being handled: Heavy soils with >27% clay content: heavy silty clay loam (HZCL), heavy clay loam (HCL), sandy clay (SC), silty clay (ZC), clay (C); where average annual rainfall is 700mm or greater.
Medium	Soil types with moderate resilience to structural damage when being handled: Light textured soils: sand (S), loamy sand (LS), sandy loam (SL), sandy silt loam (SZL); where average annual rainfall is more than 1000mm; Medium textured soils with <27% clay content: silt loam, medium silty clay loam (MZCL), medium clay loam (MCL), sandy clay loam (SCL); where average annual rainfall is 1000mm or greater; Heavy soils with >27% clay content: heavy silty clay loam (HZCL), heavy clay loam (HCL), sandy clay (SC), silty clay (ZC), clay (C); where average annual rainfall is less than 700mm.
Low	Soil types with high resilience to structural damage when being handled: Light textured soils: sand (S), loamy sand (LS), sandy loam (SL), sandy silt loam (SZL); where average annual rainfall is less than 1000mm.
Very Low	Soil types unsuitable for reuse in restoring agricultural land, reuse in residential gardens, reuse in landscaping schemes, or reuse in ecological schemes, etc. For example, Made Ground/contaminated land.

6.1.8 The magnitude of the predicted impact on agricultural land and soil resource/function is assessed as 'Major', 'Moderate', 'Minor', 'Negligible' or 'No Change' in Table 6.3.

Table 6.3: Magnitude of Impact Descriptors – Agricultural Land and Soil Resource/Function

Magnitude of Impact (degree of change)		Typical description
High	Adverse	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha or loss of soil-related features set out in Table 6.1 above (including effects from 'temporary developments'*)
	Beneficial	Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20ha, or gain in soil-related features set out in Table 6.1 (including effects from 'temporary developments'*)
Medium	Adverse	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20ha or loss of soil-related features set out in Table 6.1 above (including effects from 'Temporary Developments'*)
	Beneficial	Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20ha, or gain in soil-related features set out in Table 6.1
Low	Adverse	Permanent, irreversible loss over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes, or temporary, reversible loss of soil-related features set out in Table 6.1 above
	Beneficial	Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement, or temporary gain in soil-related features set out in Table 6.1 above
Negligible	Adverse	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use
	Beneficial	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use
No Change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.
*Temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soil		

6.1.9 The significance of the predicted impacts, which may be Beneficial (positive) or Adverse (negative), agricultural land quality and soils can be assessed as either 'Very large', 'Large', 'Moderate', 'Slight' or 'Neutral' according to the sensitivity of the receptor magnitude of the impact, as set out in the Impact Assessment Matrix (IAM) given as Table 6.4. This is based on IEMA's Guide: 'A New Perspective on Land and Soil in EIA'.

Table 6.4: Determining the Significance of Effects

	Magnitude of impact (degree of change)					
		No Change	Negligible	Low	Medium	High
Environmental value (sensitivity)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Geographical Scope

6.1.10 The geographic area for the assessment is the Study Area.

Temporal Scope

6.1.11 This assessment considers the likely significant effects of the Proposed Scheme on agricultural land quality and soils at the commencement of mineral extraction.

Consultation

6.1.12 As set out in the Government's *'Guide to Assessing Development Proposals on Agricultural Land'*, it should be noted that planning authorities must consult Natural England on all non-agricultural applications that result in the loss of more than 20 hectares (ha) of BMV land if the land is not included in a development plan. For example, this includes the likely cumulative loss of BMV land from the proposed Scheme if it's part of a phased development. This is required by schedule 4(y) of the Order.

6.1.13 Natural England maintains the national ALC database, and ALC information publicly available ALC online (MAGIC) has been utilised as baseline information in this assessment.

Assumptions and Limitations

6.1.14 This assessment assumes the main impacts of the Proposed Scheme on agricultural land quality and soil occur during the mineral extraction phase. It is assumed the Proposed Scheme is reversible, i.e., agricultural land quality and soil will be returned to at least its former quality following land restoration and aftercare.

6.2 Predicting Residual Effects

- 6.2.1 This section of the report assesses the significance of the residual effects of the Proposed Scheme on agricultural land quality and soil assuming that inherent design / embedded mitigation is implemented successfully for safeguarding soil in a Soil Management Plan (SMP) and agricultural land in the mineral extraction area is restored to at least its former Subgrade 3a quality, as set out in Section 5.0. Following mitigation, the significance of the residual effects of the Proposed Scheme on agricultural land and soil is set out below (following the approach of IEMA's '*A New Perspective on Land and Soil in Environmental Impact Assessment*' (February 2022)).

Mineral Extraction Phase

Agricultural Land

- 6.2.2 It has been assessed that the Proposed Scheme would temporarily adversely affect approximately 3.0ha (low magnitude) of Subgrade 3a (high sensitivity) in the mineral extraction area. The land in the mineral extraction area would be restored to its former Subgrade 3a quality for approximately 1.9ha of agricultural land that could be used for arable production; the remainder of the Extraction Area would be restored to neutral grassland and swale areas (see Restoration Scheme in **Appendix 1**). Therefore, the Proposed Scheme would result in the net loss of approximately 1.1ha of Subgrade 3a, which will be restored to neutral grassland and swale area. The significance of the residual, temporary, adverse effect of the Proposed Scheme on approximately 1.1ha of Subgrade 3a agricultural land is assessed as **slight, which is not significant** regarding the national resource of agricultural land.

Soil Resources

- 6.2.3 The quality and quantity of soil resources (topsoil and subsoil) available for reuse in the Proposed Scheme will be and safeguarded on site following the Soil Management Plan/Soil Management Plan set out in 'Mitigation' above. This follows the approach of DEFRA's '*Construction Code of Practice for the Sustainable Management of Soil* (2009), and the Institute of Quarrying (2021) '*Good Practice for Handling Soils in Mineral Workings*' (Sheets A to E are of relevance to this assessment). By protecting soil resources in this way, the significance of the residual effect of the Proposed Scheme on soil resources would be **negligible, which is not significant**.
- 6.2.4 There will be no further requirement of agricultural land (land take) once the soil has been stripped at the commencement of mineral extraction phase.

7 NON TECHNICAL SUMMARY

- 7.1.1 Raymond Brown Quarry Products Limited ('the Applicant') commissioned this report to provide an Environmental Impact Assessment (EIA) of proposed sand extraction (the 'Proposed Scheme') from the Sandland Extension (Phase 9) at Brickworth Quarry, Whiteparish, Wiltshire ('the Study Area') on agricultural land quality and soil. The location of the Study Area is shown on the Restoration Scheme (Drawing number 3404-5-2, dated 28th August 2025), which is given in **Appendix 1**.
- 7.1.2 This EIA report follows the Applicant's 'Regulation 15 Scoping Opinion Request to determine the scope of an Environmental Impact Assessment: Brickworth Quarry, Whiteparish, Wiltshire SP5 2QG' of April 2025, and Wiltshire Council's Scoping Opinion Application Reference Number PL/2025/04038, decision dated 11th July 2025.
- 7.1.3 This involved an Agricultural Land Classification (ALC) grading of agricultural land within the approximately eight hectares (ha) Study Area, including approximately three hectares of land currently in agricultural use as arable farmland, as shown in **Appendix 1**. It is centred at British National Grid (BNG) reference SU226234. At the time of the ALC survey in August 2025, the land was under rough grassland.
- 7.1.4 British Geological Survey (BGS) information indicates the Study Area is underlain predominantly by sand in the Reading Formation, and no Superficial Deposits over the bedrock. The National Soil Map shows the Study Area is covered by soils in the Fyfield 4 association, i.e., deep, well-drained (Wetness Class I), often stoneless, coarse loamy and sandy soils.
- 7.1.5 The quality of agricultural land in the Extraction Area (i.e., approximately 3.0ha) is limited by soil droughtiness to Subgrade 3a; the remainder of the Application Area is classified as 'other/non-agricultural'. The area of land in each ALC grade has been measured from **Figure 2**, and the area (ha) and proportion (% of Site) are given in Table 7.1.

Table 7.1: Agricultural Land Classification – Bickworth Quarry Sandland Extension				
ALC Grade	Extraction Area (Ha)	Non-Extraction Area (Ha)	Application Area (Ha)	Application Area (%)
Grade 1 (Excellent)	0	0	0	0
Grade 2 (Very Good)	0	0	0	0
Subgrade 3a (Good)	3.0	0	3.0	37
Subgrade 3b (Moderate)	0	0	0	0
Grade 4 (Poor)	0	0	0	0
Grade 5 (Very Poor)	0	0	0	0
Other Land / Non-agricultural	0	5.1	5.1	63
Total	3.0	5.1	8.1	100

Agricultural Land Quality

- 7.1.6 It has been assessed that the Proposed Scheme would temporarily adversely affect approximately 3.0ha (low magnitude) of Subgrade 3a (high sensitivity) in the mineral extraction area. Approximately 1.9ha of land in the mineral extraction area would be restored to its former Subgrade 3a quality and could be used for arable production; the remainder of the Extraction Area would be converted to neutral grassland and swale areas (see Restoration Scheme in **Appendix 1**). Therefore, the Proposed Scheme would result in the net loss of approximately 1.1ha of Subgrade 3a, which will be restored to neutral grassland and swale area. The significance of the residual, temporary, adverse effect of the Proposed Scheme on approximately 1.1ha of Subgrade 3a agricultural land is assessed as **slight, which is not significant** regarding the national resource of agricultural land.

Soil Resources

- 7.1.7 In line with current EU and UK Government thinking, the quality and quantity of soil resources (topsoil and subsoil) available for reuse at the site should be identified and safeguarded in the Soil Resource Strategy (SRS) set out in Section 5.0. This follows best practice set out in DEFRA's 'Construction Code of Practice for the Sustainable Management of Soil on Construction Sites' (2009), MAFF 'Good Practice Guide for Handling Soils' (Sheets 1 to 4) and best practice for the restoration of agricultural land is set out in DEFRA (1999) 'Guidance for Successful Reclamation of Mineral and Waste Sites'. By protecting soil resources in this way, the significance of the residual effect of the Proposed Scheme on soil resources would be **negligible, which is not significant**.

Figures



Key

- Study Area
- Auger Location
- ⊙ Auger and Topsoil Sample Location
- Soil Pit

ASKEW LAND+SOIL

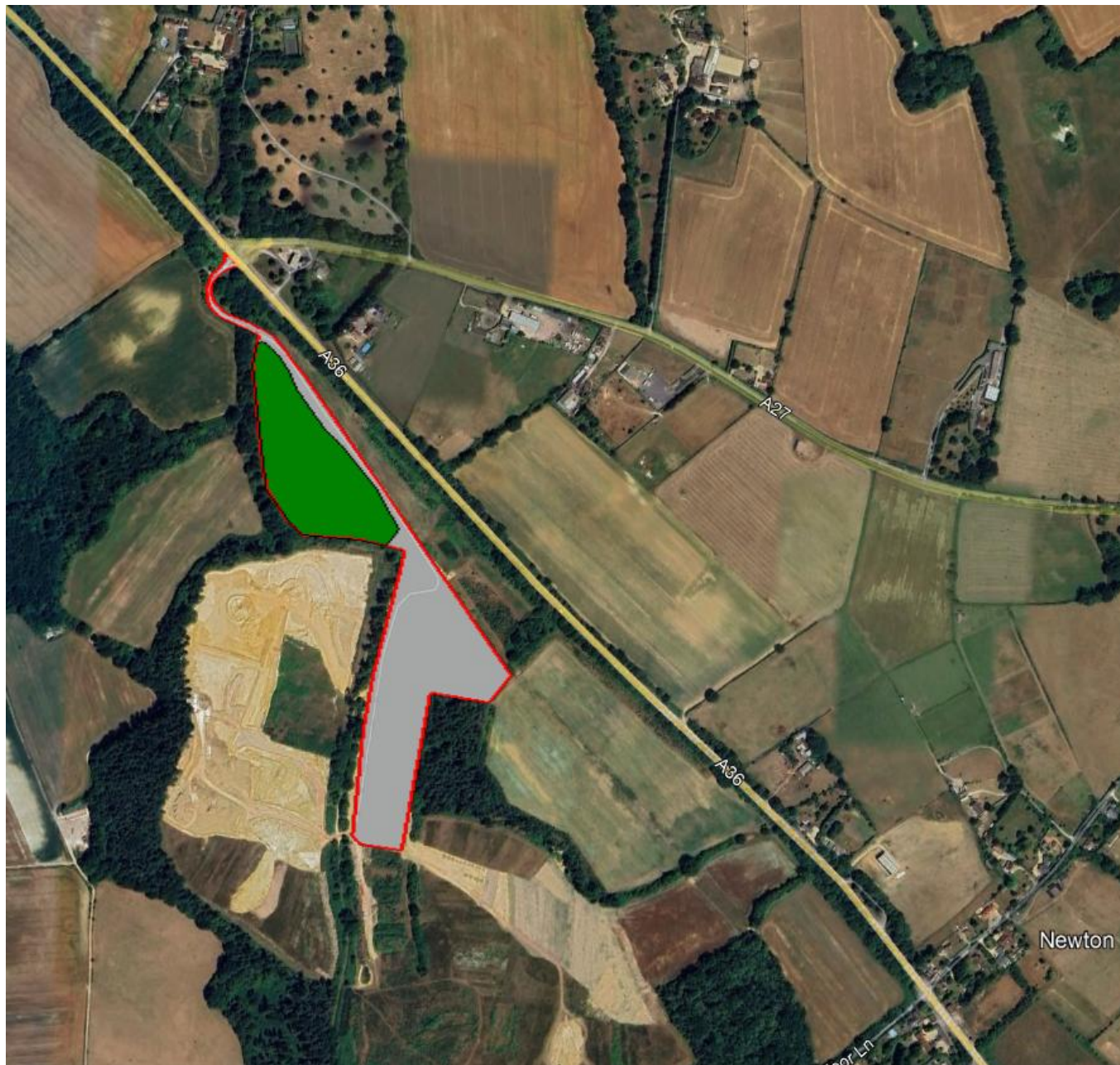
T: +44 01392 861474
E: robaskew@askewlandandsoil.onmicrosoft.com

Client:
Raymond Brown Quarry Products Limited

Project:
Brickworth Quarry Sandland Extension, Wiltshire

Title:
Figure 1: Sample Locations

Scale @ Size: Not to Scale	Date: 27/08/2025
Project No: C1268	Drawing No: RWA/01



Key:

— Study Area

ALC Grade

	Grade 1
	Grade 2
	Subgrade 3a
	Subgrade 3b
	Grade 4
	Grade 5
	Other Land

ASKEW LAND+SOIL

T: +44 01392 861474

E: robaskew@askewlandandsoil.onmicrosoft.com

Client:

Raymond Brown Quarry Products Limited

Project:

Brickworth Quarry Sandland Extension, Wiltshire

Title:

Figure 2: Agricultural Land Classification

Scale @ Size:

Not to Scale

Date:

27/08/2025

Project No: C1268

Drawing No: RWA/01



Key

- Study Area
- Soil Handling Unit 1 – High Resilience to Structural Damage
- Soil Handling Unit 2 – Medium Resilience to Structural Damage
- Soil Handling Unit 3 – Low Resilience to Structural Damage

Figure 1:
Soil Handling Units

Project Name:
Brickfield Quarry Sandland Extension

Client:
Raymond Brown Quarry Products Limited

Project Number: **C1268**

Date: 29/08/2025

Drawn By: RWA

ASKEW LAND+SOIL

M: 07753 227224
E: robaskew@askewlandandsoil.onmicrosoft.com

Appendix 1: Restoration Scheme

Appendix 2: Soil Profile Logs

Project Number	Project Name	Parcel
C1268	Brickworth Quarry - Sandland Extension	

Date of Survey	Survey Type	Surveyor(s)	Company
13/08/2025	Detailed ALC	RWA	Askew Land and Soil

Weather	Relief	Land use and vegetation
Hot, dry, cloudy.	Mound in south end.	SCR (Scrub)

Grid Reference	Postcode	Altitude	Area
SU226234	SP5 2QE	91	8

MAFF prov	MAFF detailed	Flooding
Grade 3	3.1ha in east is Subgrade 3a	Flood Zone 1 - Low Risk

AAR	ATO	MDw	MDp	FCD	Climate grade
849	1452	98	89	186	1

Bedrock	Superficial deposits
Rading Formation - Sand	None recorded

Soil association(s) 1:250,000	Detailed soil information
Predominantly Fyfield 4; Andover 1 to the northwest	1:250K

Revision Number	Date Revised
2	27/08/2025

[illegible]

Mottle form

FF - Few Faint
FD - Few Distinct
FP - Few Prominent
CF - Common Faint
CD - Common Distinct
CP - Common Prominent
MF - Many Faint
MD - Many Distinct
MP - Many Prominent
VF - Very many Faint
VD - Very many Distinct
VP - Very many Prominent

Texture

C - Clay
CHK - Chalk
CS - Coarse Sand
CSL - Coarse sandy loam
CSZL - Coarse sandy silt loam
FP - Fibrous and semifibrous peats
FS - Fine Sand
FSL - Fine sandy loam
FSZL - Fine sandy silt loam
HCL - Clay loam (heavy)
HP - Humified peats
HZCL - Silty clay loam (heavy)
IMP - Impenetrable to roots
LCS - Loamy Coarse Sand
LFS - Loamy fine sand
LMS - Loamy medium sand
LP - Loamy peats
MCL - Clay loam (medium)
MS - Medium Sand
MSL - Medium sandy loam
MSZL - Medium sandy silt loam
MZ - Marine Light Silts
MZCL - Silty clay loam (medium)
OC - Organic clays
OL - Organic loams
OS - Organic sands
PL - Peaty loams
PS - Peaty sands
SC - Sandy clay
SCL - Sandy clay loam
SP - Sandy peats
ZC - Silty clay
ZL - Silt loam

Stone Type

CH - Chalk or chalk stones
FSST - Soft fine grained sandstones
GH - Gravel with non-porous (hard) stones
GS - Gravel with porous stones (mainly soft stone types listed above)
HR - All hard rocks or stones (i.e. those which cannot be scratched with a finger nail)
MSST - Soft, medium or coarse grained sandstones
SI - Soft 'weathered' igneous or metamorphic rocks or stones
SLST - Soft oolitic or dolomitic limestones
ZR - Soft, argillaceous or silty rocks or stones

Ped. Shape

SG - Single grain
GRA - Granular
SAB - Subangular Blocky
AB - Angular Blocky
PRIS - Prismatic
PLAT - Platy
MASS - Massive
NA - N/A

Subsoil Structure Condition

Not Applicable
Good
Moderate
Poor

Soil or Ped. Strength

Loose
Very friable
Friable
Firm
Very firm
Extremely firm
Extremely hard
N/A

Calcareousness

NON - Non-calcareous (<0.5% CaCO₃)
VSC - Very slightly calcareous (0.5 - 1% CaCO₃)
SC - Slightly calcareous (1 - 5% CaCO₃)
MC - Moderately calcareous (5 - 10% CaCO₃)
VC - Very calcareous (>10% CaCO₃)

Ped. Size

VF - Very Fine
F - Fine
M - Medium
C - Coarse
VC - Very Coarse
NA - N/A

Degree of Ped. Development

W - Weak
M - Moderate
S - Strong
NA - Not applicable

Wetness Class

WC I
WC II
WC III
WC IV
WC V
WC VI

ALC Grades

1
2
3a
3b
4
5
Non-Ag

Gley

None
Gley
N/A

Appendix 3:

Soil Pit Description

Soil Survey				Surveyor	RWA
Easting (X)	422563	Northing (Y)	123527	Alt (m)	81
Land Use	CER	Reference	1 (Pit 1)	Slope °	≤7
Bedrock	Portsdown Chalk Formation - Chalk	Superficial	None recorded	Aspect	Level
				Date	13/08/2025

Layer		Topsoil	2	3	4	5	6	7
Lower Depth (cm)		29	54	120				
Texture		LMS - Loamy me	LMS - Loamy medium sand	MS - Medium Sand				
Matrix Colour		10YR5/4	10YR5/4	10YR7/4				
Gley (Y/N)		No	No	No				
Ochreous Mottles	Form							
	Munsell Colour							
Grey Mottles	Form							
	Munsell Colour							
Manganese (Y/N)		No	No	No				
% Stones (type 1)		4	0	0				
Stones > 2cm		2						
Stones > 6cm		0						
Stone Type		GH - Gravel with	GH - Gravel with non-poro	GH - Gravel with non-porous (hard) stones				
% Stones (type 2)								
Stones > 2cm								
Stones > 6cm								
Stone Type								
CaCO3		NON - Non-calca	NON - Non-calcareous (<0	NON - Non-calcareous (<0.5% CaCO3)				
Shape of Peds.		GRA - Granular	GRA - Granular	SG - Single grain				
Size of Peds.		M - Medium	M - Medium	M - Medium				
Subsoil Structure		Not Applicable	Moderate	Moderate				
Soil or Ped. Strength		Friable	Very friable	Loose				
Degree of Ped. Development		M - Moderate	M - Moderate	M - Moderate				
Slowly Permeable Layer (Y/N)		No	No	No				

MDw	MDp	FCD
98	89	186

Wetness	Class (WC)	WC I
	Grade (WE)	1

Notes	Moisture Balance (MB): Wheat = -18mm; Potatoes = -26mm (Subgrade 3a according to soil droughtiness)
-------	---

Appendix 4:

Topsoil Particle Size Distribution (PSD)

ANALYTICAL REPORT

Report Number	14485-25	N717	ROB ASKEW
Date Received	15-AUG-2025		RW ASKEW
Date Reported	26-AUG-2025		THE OLD STABLES
Project	C1268		UPEXE
Reference	BRICKFIELD QUARRY		EXETER
Order Number	C1268		DEVON EX5 5ND

Laboratory Reference		SOIL761998									
Sample Reference		3									
Determinand	Unit	SOIL									
Coarse Sand 2.00-0.60mm	% w/w	5									
Medium Sand 0.60-0.212mm	% w/w	51									
Fine Sand 0.212-0.106mm	% w/w	20									
Very Fine Sand 0.106-0.063mm	% w/w	4									
Silt 0.063-0.002mm	% w/w	11									
Clay <0.002mm	% w/w	9									
Textural Class **		LmS									

Notes

Analysis Notes	The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated.
Document Control	This test report shall not be reproduced, except in full, without the written approval of the laboratory.

Reported by	** Please see the attached document for the definition of textural classes. Ella Knowles Natural Resource Management, a trading division of Cawood Scientific Ltd. Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS Tel: 01344 886338 Fax: 01344 890972 email: enquiries@nrm.uk.com
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ADAS (UK) Textural Class Abbreviations

The texture classes are denoted by the following abbreviations:

Class	Code
Sand	S
Loamy sand	LS
Sandy loam	SL
Sandy Silt loam	SZL
Silt loam	ZL
Sandy clay loam	SCL
Clay loam	CL
Silt clay loam	ZCL
Clay	C
Silty clay	ZC
Sandy clay	SC

For the *sand*, *loamy sand*, *sandy loam* and *sandy silt loam* classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

vf	Very Fine (more than 2/3's of sand less than 0.106 mm)
f	Fine (more than 2/3's of sand less than 0.212 mm)
c	Coarse (more than 1/3 of sand greater than 0.6 mm)
m	Medium (less than 2/3's fine sand and less than 1/3 coarse sand).

The subdivisions of *clay loam* and *silty clay loam* classes according to clay content are indicated as follows:

M	medium (less than 27% clay)
H	heavy (27-35% clay)

Organic soils i.e. those with an organic matter greater than 10% will be preceded with a letter O.

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.

Appendix 5:

Institute of Quarrying Supplementary Note 4 – Soil Wetness

Supplementary Note 4 Soil Wetness

Soil wetness is a major determinant of land use, and environmental and ecosystem services in the UK. It is also a factor in the occurrence of significant compaction arising from handling soils with earth-moving machines and the practices used (Duncan & Bransden, 1986).

Relative soil wetness can range from the waterlogged to moist (mesic) or dry (xeric) depending on rainfall distribution and depth to a water-table and duration of waterlogging. In the UK, soil wetness is largely seasonal with higher evapo-transpiration rates potentially exceeding rainfall in the summer resulting in the soil profile becoming drier where there is vegetation. Whilst soil wetness is largely weather system and equinox (climate) driven, it varies with geographical and altitudinal locations, and importantly the physical characteristics of the soil profile, such as texture structure, porosity, and depth to the water-table and topography including flood risk (MAFF, 1988). The Soil Wetness Class is based on the expected average duration of waterlogging at different depths in the soil throughout the year (days per year), and can be determined by reference to soil characteristics and local climate (MAFF, 1988). The likely inherent wetness and resilience status of a soil should be indicated in the SRMP (see **Part 1, Table 2 & Supplementary Note 1**), reflecting potential risks for soil handling such as low permeability, permanently high groundwater, or a wet upland climate.

Wet soils can also be a result of other circumstances. For example, the interception of water courses, drainage ditches and field land drains. Where these occur, the provisions are to be made in the SRMP to protect the soils being handled and the operational area.

Soils, when in a wet condition generally have a lower strength and have less resistance to compression and smearing than when dry. Lower strength when soils are wet also affects the bearing capacity of soils and their ability to support the safe and efficient operation of machines than when in a

dry state.

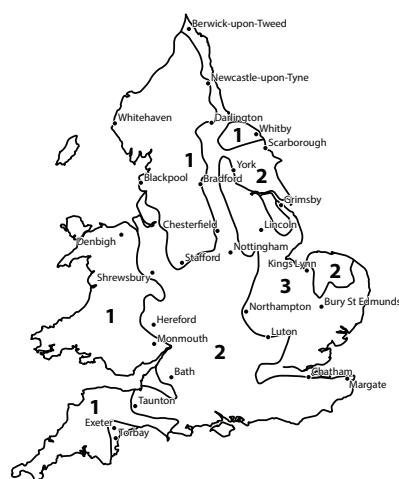
In terms of resilience and susceptibility to soil wetness, the clay content of the soil largely determines the change from a solid to a plastic state (the water content at which this occurs is called the 'plastic limit' (MAFF, 1982)). This is the point at which an increasing soil wetness has reduced the cohesion and strength of the soil and its resistance to compression and smearing.

Whilst coarse textured sandy soils are not inherently plastic when wet, they are still prone to compaction when in a wet condition. Hence, handling all soils when wet will have adverse effects on plant root growth and profile permeability, which may be of significance for the intended land use and the provision of services reliant on soil drainage and plant root growth. It may be less so in other circumstances where wet soil profiles, perched water tables and ponding are the reclamation objectives, though drainage control, for example to control flooding, may still be important in these contexts.

In cases of permanently wet soils, such as riverine sites, upland or deep organic soils where there is a persistent high water-table throughout the seasons within the depth of soil to be stripped and/or the soil profile remains too wet, a strategic decision has to be made to be able to proceed with the development of the mineral resource. This may mean alternative and less favourable soil handling practices have to be agreed with the planning authority.

Predicting & Determination of Soil Wetness

There are well established methods to predict and determine soil wetness of undisturbed and restored soil profiles (Reeve, 1994). The challenge has been the prediction of the best time for soil stripping. Models based on soil moisture deficits and field capacity dates for a range of soil textures can provide indicative regional summaries (**Table 4.1**) that can help with planning operations at broad scale but cannot be relied upon in practice for deciding operationally whether to proceed on the ground given the actual variation in weather events from year to year and within years.



	Climatic Zones		
Soil Clay Content	1	2	3
Soil Depth <30cm			
<10%	Mid Apr - Early Oct	Late Mar – Early Nov	Late Mar – Early Dec
10 -27%	Late May - Early Oct	Early May – Early Nov	Early Apr – Early Dec
Soil Depth 30-60cm			
<10%	Late Apr - Early Oct	Mid Apr – Early Nov	Early Apr – Early Dec
10-27%	Late May - Early Oct	Early May – Early Nov	Early Apr – Early Dec
>27%	Late June – Early Oct	Early June – Early Nov	Late May – Early Dec
Soil Depth >60cm			
<10%	Late Apr - Early Oct	Mid Apr – Early Nov	Early Apr – Early Dec
10-18%	Late May - Early Oct	Early May – Early Nov	Early Apr – Early Dec
18-27%	Late June – Early Oct	Early June – Early Nov	Late May – Early Dec
>27%	Mid July – Mid Sept	Early July – Mid Oct	Late June – Mid Oct

Table 4.1: Indicative on-average months when vegetated mineral soils might be in a sufficiently dry condition according to geographic location, depth of soil and clay content

The timing of most soil handling operations takes place between April and September. Although in western (Zone 1) and central (Zone 2) areas it typically can be a later start in May with an earlier termination in August. Whilst the return to climatically 'excess rainfall' is later in the eastern counties (Zone 3) and can be as late as November/early December, there is a need to maintain transpiring vegetation to keep the soils being handled in a dry as possible condition and to establish new vegetation covers as soon as possible (on replaced soils and storage mounds). Hence, soil handling operations generally need to be completed no later than the end of September (Natural England, 2021), unless appropriate provisions can be assured.

Where data is available, more realistic local and real-time predictions can be made, however, because weather patterns and events differ between and within years, and soils can be vary locally in their condition. Experience has shown that the most practical approach for operations is to inspect the site and soils in question near to/ at the time when soil handling is to take place. Professional soil surveyors can advise on the best time for soil handling (stripping, storage & replacement) and carry out site assessments of soil wetness condition prior to the start of operations.

A Practical Method for Determining Soil Wetness Limitation

During the soil handling season (see Table 4.1 above), prior to the start or recommencement of soil handling soils should be tested to confirm they are in suitably dry condition (**Table 4.2**). The 'testing' during operations can be done by suitably trained site staff and reviewed periodically by the professional soil surveyors.

The method is simply the ability to roll intact threads (3mm diameter) of soil indicating the soils are in a plastic and wet condition (MAFF, 1982; Natural England, 2021). Representative samples are to be taken through the soil profile and across the area to be stripped. It is the best available indicator of soils being too wet to be handled and operations should be delayed until a thread cannot be formed. For coarse textured soils which do not roll into threads, a professional's view as to soil wetness and the risk of compaction may have to be taken.

Table 4.2: Field Tests for Suitably Dry Soils

Soil tests are to be undertaken in the field. Samples shall be taken from at least five locations in the soil handling area and at each soil horizon to the full depth of the profile to be recovered/replaced. The tests shall include visual examination of the soil and physical assessment of the soil consistency.

i) Examination

- If the soil is wet, films of water are visible on the surface of soil particles or aggregates (e.g. clods or peds) and/or when a clod or ped is squeezed in the hand it readily deforms into a cohesive 'ball' means **no soil handling to take place**.
- If the sample is moist (i.e. there is a slight dampness when squeezed in the hand) but it does not significantly change colour (darken) on further wetting, and clods break up/crumble readily when squeezed in the hand rather than forming into a ball means **soil handling can take place**.
- If the sample is dry, it looks dry and changes colour (darkens) if water is added, and it is brittle means **soil handling can take place**.

ii) Consistency**First test**

Attempt to mould soil sample into a ball by hand:

- Impossible because soil is too dry and hard or too loose and dry means **soil handling can take place**.
- Impossible because the soil is too loose and wet means no soil handling to take place.
- Possible - Go to second test.

Second test

Attempt to roll ball into a 3mm diameter thread by hand:

- Impossible because soil crumbles or collapses means soil handling can take place.
- Possible means no soil handling can take place.

N.B.: It is possible to roll most coarse loamy and sandy soils into a thread even when they are wet. For these soils, the Examination Test alone is to be used.

A Rainfall Protocol to Suspend & Restart Soil Handling Operations

Local weather forecasts of possible rainfall events during operations and the occurrence of surface lying water have been used to advise on a day-to-day basis if operations should stop (Natural England, 2021). Single events such as >5mm/day in spring and autumn months, and >10mm/day in the summer have been suggested as more precise triggers for determining soil handling operations (Reeve, 1994). However, in practice the following generic guidelines are often used:

- In light drizzle soil handling may continue for up to four hours unless the soils are already at/near to their moisture limit.
- In light rain soil handling must cease after 15 minutes.
- In heavy rain and intense showers, handling shall cease immediately.

In all of the above it is assumed that soils were in a dry condition. These are only general rules, and it is at the local level decisions to proceed or stop should be based on the actual wetness state of the soils being handled. After the above rain event has ceased, the soil tests in **Table 4.2** above should be applied to determine whether handling may restart, provided that the ground is free from ponding and ground conditions are safe to do so. There can be extreme instances where soil horizons have become very dry and are difficult to handle resulting in dust and windblown losses. In these conditions the operation should be suspended. The artificial wetting of extremely dry soils is not usually a practice recommended but has been successful in some cases.

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Key

- Study Area
- Auger Location
- ⊙ Auger and Topsoil Sample Location
- Soil Pit

ASKEW LAND+SOIL

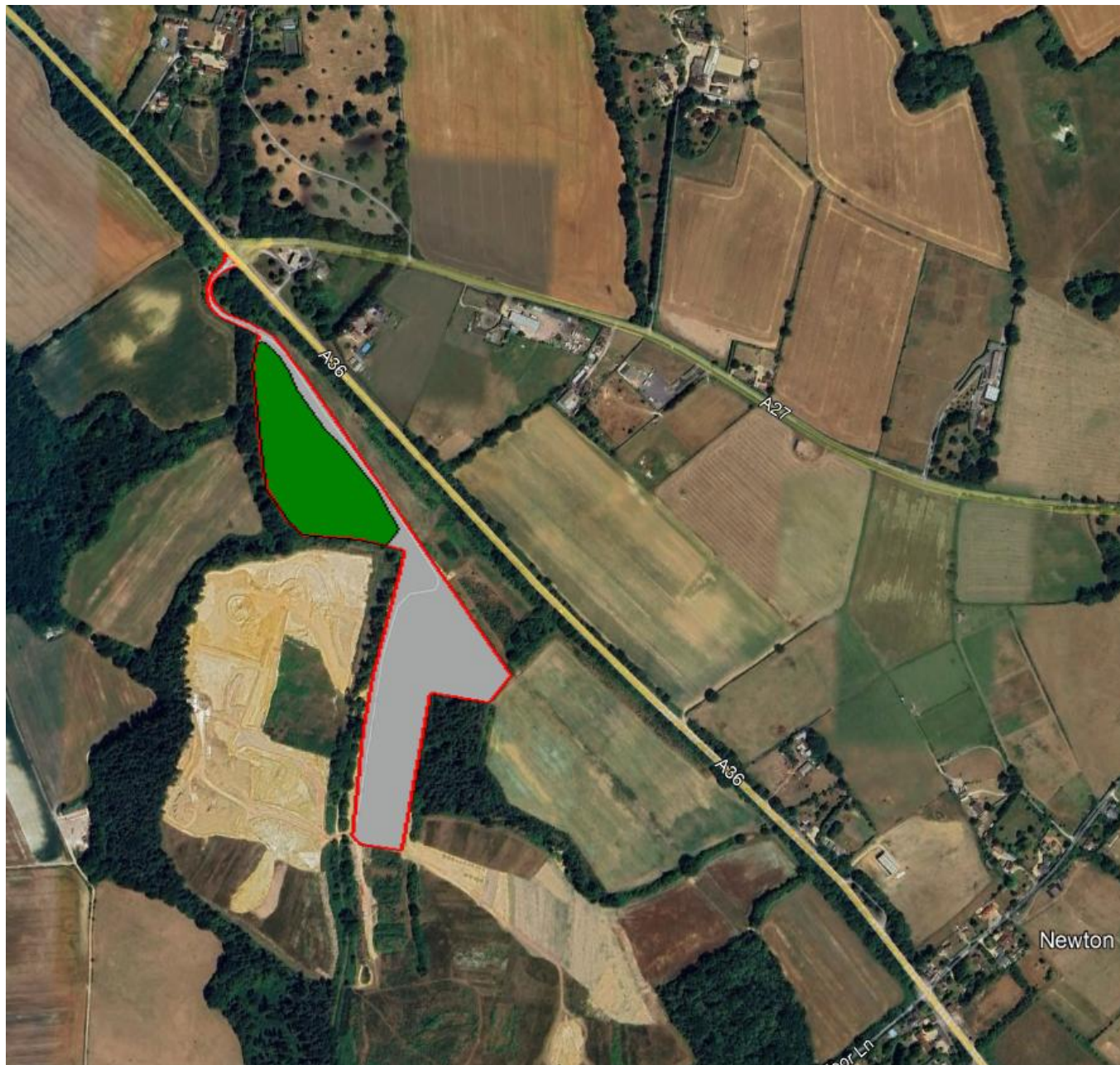
T: +44 01392 861474
E: robaskew@askewlandandsoil.onmicrosoft.com

Client:
Raymond Brown Quarry Products Limited

Project:
Brickworth Quarry Sandland Extension, Wiltshire

Title:
Figure 1: Sample Locations

Scale @ Size: Not to Scale	Date: 27/08/2025
Project No: C1268	Drawing No: RWA/01



Key:

— Study Area

ALC Grade

	Grade 1
	Grade 2
	Subgrade 3a
	Subgrade 3b
	Grade 4
	Grade 5
	Other Land

ASKEW LAND+SOIL

T: +44 01392 861474

E: robaskew@askewlandandsoil.onmicrosoft.com

Client:

Raymond Brown Quarry Products Limited

Project:

Brickworth Quarry Sandland Extension, Wiltshire

Title:

Figure 2: Agricultural Land Classification

Scale @ Size:

Not to Scale

Date:

27/08/2025

Project No: C1268

Drawing No: RWA/01

Project Number	Project Name	Parcel
C1268	Brickworth Quarry - Sandland Extension	

Date of Survey	Survey Type	Surveyor(s)	Company
13/08/2025	Detailed ALC	RWA	Askew Land and Soil

Weather	Relief	Land use and vegetation
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Grid Reference	Postcode	Altitude	Area
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Rading Formation - Sand	None recorded

Soil association(s) 1:250,000	Detailed soil information
Predominantly Fyfield 4; Andover 1 to the northwest	1:250K

Revision Number	Date Revised
2	27/08/2025

[illegible]

Mottle form

FF - Few Faint
FD - Few Distinct
FP - Few Prominent
CF - Common Faint
CD - Common Distinct
CP - Common Prominent
MF - Many Faint
MD - Many Distinct
MP - Many Prominent
VF - Very many Faint
VD - Very many Distinct
VP - Very many Prominent

Texture

C - Clay
CHK - Chalk
CS - Coarse Sand
CSL - Coarse sandy loam
CSZL - Coarse sandy silt loam
FP - Fibrous and semifibrous peats
FS - Fine Sand
FSL - Fine sandy loam
FSZL - Fine sandy silt loam
HCL - Clay loam (heavy)
HP - Humified peats
HZCL - Silty clay loam (heavy)
IMP - Impenetrable to roots
LCS - Loamy Coarse Sand
LFS - Loamy fine sand
LMS - Loamy medium sand
LP - Loamy peats
MCL - Clay loam (medium)
MS - Medium Sand
MSL - Medium sandy loam
MSZL - Medium sandy silt loam
MZ - Marine Light Silts
MZCL - Silty clay loam (medium)
OC - Organic clays
OL - Organic loams
OS - Organic sands
PL - Peaty loams
PS - Peaty sands
SC - Sandy clay
SCL - Sandy clay loam
SP - Sandy peats
ZC - Silty clay
ZL - Silt loam

Stone Type

CH - Chalk or chalk stones
FSST - Soft fine grained sandstones
GH - Gravel with non-porous (hard) stones
GS - Gravel with porous stones (mainly soft stone types listed above)
HR - All hard rocks or stones (i.e. those which cannot be scratched with a finger nail)
MSST - Soft, medium or coarse grained sandstones
SI - Soft 'weathered' igneous or metamorphic rocks or stones
SLST - Soft oolitic or dolomitic limestones
ZR - Soft, argillaceous or silty rocks or stones

Ped. Shape

SG - Single grain
GRA - Granular
SAB - Subangular Blocky
AB - Angular Blocky
PRIS - Prismatic
PLAT - Platy
MASS - Massive
NA - N/A

Subsoil Structure Condition

Not Applicable
Good
Moderate
Poor

Soil or Ped. Strength

Loose
Very friable
Friable
Firm
Very firm
Extremely firm
Extremely hard
N/A

Calcareousness

NON - Non-calcareous (<0.5% CaCO₃)
VSC - Very slightly calcareous (0.5 - 1% CaCO₃)
SC - Slightly calcareous (1 - 5% CaCO₃)
MC - Moderately calcareous (5 - 10% CaCO₃)
VC - Very calcareous (>10% CaCO₃)

Ped. Size

VF - Very Fine
F - Fine
M - Medium
C - Coarse
VC - Very Coarse
NA - N/A

Degree of Ped. Development

W - Weak
M - Moderate
S - Strong
NA - Not applicable

Wetness Class

WC I
WC II
WC III
WC IV
WC V
WC VI

ALC Grades

1
2
3a
3b
4
5
Non-Ag

Gley

None
Gley
N/A

Soil Survey				Surveyor	RWA
Easting (X)	422563	Northing (Y)	123527	Alt (m)	81
Land Use	CER	Reference	1 (Pit 1)	Slope °	≤7
Bedrock	Portsdown Chalk Formation - Chalk	Superficial	None recorded	Aspect	Level
				Date	13/08/2025

Layer		Topsoil	2	3	4	5	6	7
Lower Depth (cm)		29	54	120				
Texture		LMS - Loamy me	LMS - Loamy medium sand	MS - Medium Sand				
Matrix Colour		10YR5/4	10YR5/4	10YR7/4				
Gley (Y/N)		No	No	No				
Ochreous Mottles	Form							
	Munsell Colour							
Grey Mottles	Form							
	Munsell Colour							
Manganese (Y/N)		No	No	No				
% Stones (type 1)		4	0	0				
Stones > 2cm		2						
Stones > 6cm		0						
Stone Type		GH - Gravel with	GH - Gravel with non-poro	GH - Gravel with non-porous (hard) stones				
% Stones (type 2)								
Stones > 2cm								
Stones > 6cm								
Stone Type								
CaCO3		NON - Non-calca	NON - Non-calcareous (<0	NON - Non-calcareous (<0.5% CaCO3)				
Shape of Peds.		GRA - Granular	GRA - Granular	SG - Single grain				
Size of Peds.		M - Medium	M - Medium	M - Medium				
Subsoil Structure		Not Applicable	Moderate	Moderate				
Soil or Ped. Strength		Friable	Very friable	Loose				
Degree of Ped. Development		M - Moderate	M - Moderate	M - Moderate				
Slowly Permeable Layer (Y/N)		No	No	No				

MDw	MDp	FCD
98	89	186

Wetness	Class (WC)	WC I
	Grade (WE)	1

Notes	Moisture Balance (MB): Wheat = -18mm; Potatoes = -26mm (Subgrade 3a according to soil droughtiness)
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ANALYTICAL REPORT

Report Number	14485-25	N717	ROB ASKEW
Date Received	15-AUG-2025		RW ASKEW
Date Reported	26-AUG-2025		THE OLD STABLES
Project	C1268		UPEXE
Reference	BRICKFIELD QUARRY		EXETER
Order Number	C1268		DEVON EX5 5ND

Laboratory Reference		SOIL761998									
Sample Reference		3									
Determinand	Unit	SOIL									
Coarse Sand 2.00-0.60mm	% w/w	5									
Medium Sand 0.60-0.212mm	% w/w	51									
Fine Sand 0.212-0.106mm	% w/w	20									
Very Fine Sand 0.106-0.063mm	% w/w	4									
Silt 0.063-0.002mm	% w/w	11									
Clay <0.002mm	% w/w	9									
Textural Class **		LmS									

Notes

Analysis Notes	The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated.
Document Control	This test report shall not be reproduced, except in full, without the written approval of the laboratory.

Reported by	** Please see the attached document for the definition of textural classes. Ella Knowles Natural Resource Management, a trading division of Cawood Scientific Ltd. Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS Tel: 01344 886338 Fax: 01344 890972 email: enquiries@nrm.uk.com
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ADAS (UK) Textural Class Abbreviations

The texture classes are denoted by the following abbreviations:

Class	Code
Sand	S
Loamy sand	LS
Sandy loam	SL
Sandy Silt loam	SZL
Silt loam	ZL
Sandy clay loam	SCL
Clay loam	CL
Silt clay loam	ZCL
Clay	C
Silty clay	ZC
Sandy clay	SC

For the *sand*, *loamy sand*, *sandy loam* and *sandy silt loam* classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

- vf Very Fine (more than 2/3's of sand less than 0.106 mm)
- f Fine (more than 2/3's of sand less than 0.212 mm)
- c Coarse (more than 1/3 of sand greater than 0.6 mm)
- m Medium (less than 2/3's fine sand and less than 1/3 coarse sand).

The subdivisions of *clay loam* and *silty clay loam* classes according to clay content are indicated as follows:

- M medium (less than 27% clay)
- H heavy (27-35% clay)

Organic soils i.e. those with an organic matter greater than 10% will be preceded with a letter O.

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.