The Sizewell C Project

SZC Co.'s Response to the Secretary of State's Request for Further Information dated 31 March 2022: Appendix 1 - Outline Soil Management Plan (tracked change version), submitted in response to Question 7.1

Document Reference: 6.3
Revision: 3.0

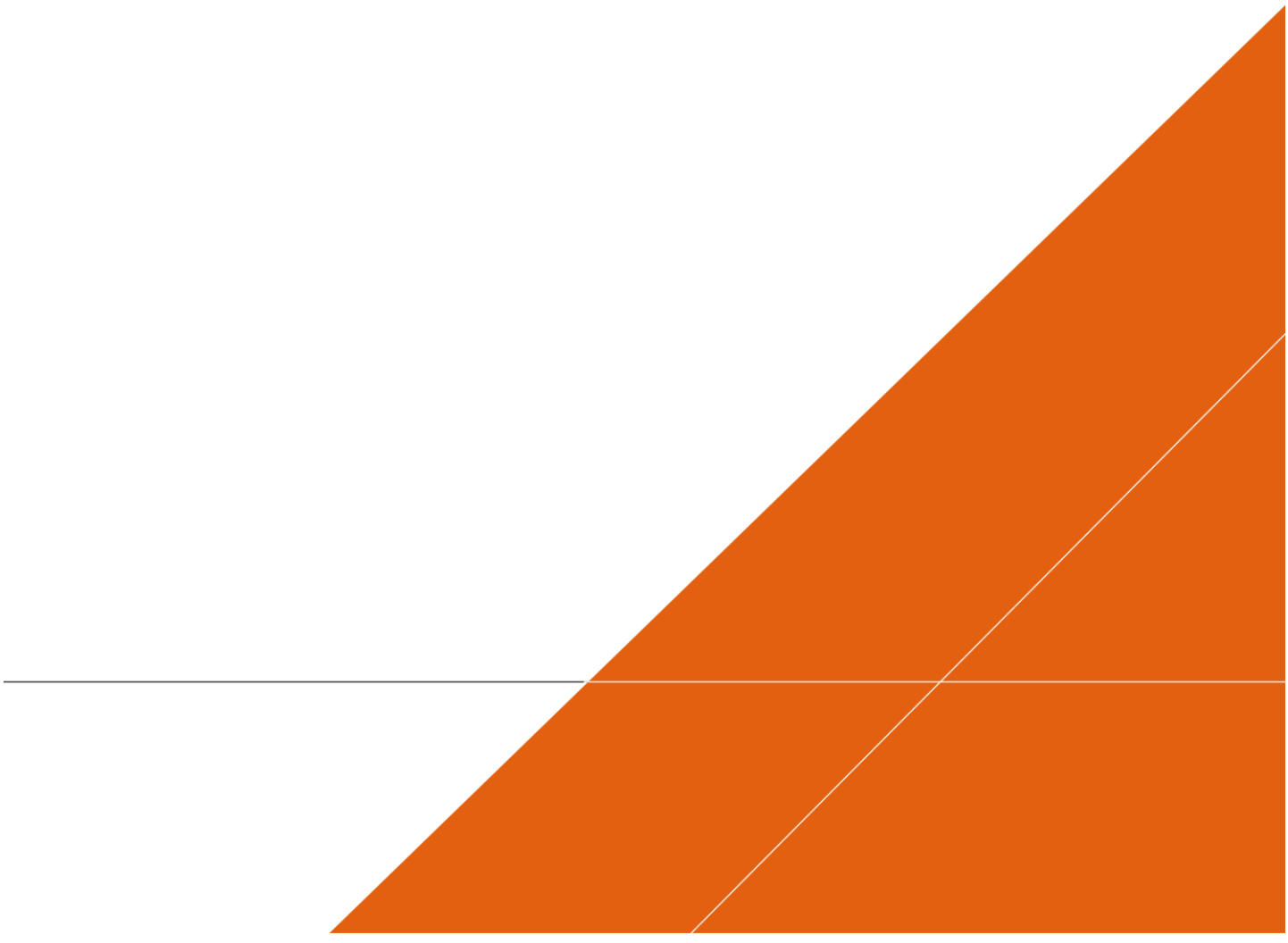
April 2022

SizewellC
Doing the power of good for Britain
EDF CGN

OUTLINE SOIL MANAGEMENT PLAN

Sizewell C

~~June 2021~~April 2022



CONTENTS

1 INTRODUCTION

1.1 Context

1.1.1 This outline Soil Management Plan (SMP) has been updated (April 2022) following the Secretary of State's invitation (letter dated 31 March 22) to provide a final outline Soil Management Plan that reflects the areas identified for further amendment by Natural England [REP7-140 and REP7-144].

1.1.2 The updates are based on SZC Co.'s response to Natural England's comments in [REP7-140 and REP7-144] set out in the **Response to the Examining Authority's Third Written Questions (ExQ3)** question Ag.3.1 [REP8-116].

~~1.1.1~~ This follows an update during the Examination [REP3-018] to reflect post-DCO submission discussions with and consultation responses received from Natural England and the National Farmers Union (NFU~~).~~

~~1.1.2~~1.1.3 ~~The updates have~~), which focused on the following aspects:

- Ensuring there is clarity, where land is being returned to agriculture at the end of the construction phase, that this land should be returned to the pre-construction Agricultural Land Classification (ALC) grade.
- Providing clarity on how different soil types and/or soil layers (topsoil and subsoil) may be handled, stockpiled and restored in different ways depending on the soil profile and associated characteristics required to support the proposed end use.
- A commitment to undertake further ALC and soil surveys to:
  - update survey results where historical data has been used;
  - complete surveys where ALC and soil surveys were not undertaken during the assessment presented in the ~~DCO~~application for development consent;
  - update surveys results where previous survey data used is currently presented at a semi-detailed level (i.e. to ensure all areas have been surveyed at a density of 1 auger per hectare) with an updated Soil Resource Survey report provided for each element of the project.
- Providing more detail of the experience and qualifications required from the soil scientists who will be supervising, monitoring and auditing the works covered by the SMP.
- Confirmation of the role of the Agricultural Liaison Officers.
- Confirmation that the relevant soil information set out in the SMP will be provided as part of the Farm Packs issued to landowners prior to entry.

~~1.1.3~~1.1.4 The ~~Outline~~outline Soil Management Plan states that a prior to any soil stripping works commencing this outline SMP will be updated by the Contractor and detailed Soil Resources Plans (SRP) will be produced for each part of the Sizewell C Project to provide the required detail (as highlighted throughout this document). **Table 9.1** of the **Code of Construction Practice (CoCP** ~~(Doc Ref.~~

~~8.11(B))~~**)** (dated April 2022) then sets out the further measures to mitigate impacts on soil and agriculture impacts~~, which~~. The **CoCP** (dated April 2022) and measures therein are secured by Requirement 2 of the **draft** ~~DCO (Doc Ref. 3.1(C)).~~**Development Consent Order** (dated April 2022).

1.2 Background

1.2.1 The purpose of the SMP is to provide details of the methodology, control measures and monitoring programme for the site preparation and reinstatement work phases of the Sizewell C Project. This document provides the over-arching principles that are applicable to all schemes that form part of the Sizewell C Project with regard to soil management. This includes all land within the site boundary where soils will be disturbed by the construction works.

1.2.2 The SMP will be used as a tool by SZC Co. and the appointed Agent(s), Contractor(s) or sub-contractor(s) acting on their behalf, as a method to control, record and audit activities relating to soil conditions and soil quality for future re-use. It includes requirements and standards for any imported topsoil and subsoil required~~.~~ (the final SMP will detail the anticipated soil balance and the specification for any imported material to ensure it is suitable for the required use).

1.2.3 The SMP draws on key guidance documents as follows:

- Defra Construction Code of Practice for the sustainable use of soils on construction sites
- MAFF Good Practice Guide for Soil Handling
- BS 3882:2015 – Specification for topsoil
- BS 8601:2013 – Specification for subsoil and requirements for use

1.2.4 The SMP is based on the SMP developed and implemented on the Hinkley Point C nuclear new build project.

1.2.5 This document is an outline SMP. ~~Prior~~As set out in paragraph 1.1.4 above, prior to any soil stripping works commencing this outline SMP will be updated by the Contractor and detailed Soil Resources Plans (SRP) will be produced for each part of the Sizewell C Project to provide the required detail (as highlighted throughout this document). These SRPs will form part of the SMP and will also form part of the Farm Packs provided to individual landowners prior to entry.

1.2.6 The SRPs will be produced by the Contractor to include:

- Maps showing the existing (pre-construction) ALC grades and the soil sampling points to show the expected ALC grade where land is to be returned to agriculture;
- Maps of the soil handling units for topsoil, upper subsoil and lower subsoil;
- Maps showing the areas to be stripped and those to be left *in situ*;
- Soil test data;
- Details of proposed vegetation clearance/management prior to soil stripping;

- Maps with supporting text showing the proposed final landform, land uses and target ALC grades, where applicable;
- The volumes of the different types of soil resources that will be stripped, stored and re-used;
- The proposed location, content and volumes of stockpiles;
- Any changes to methods to be used (including machinery);
- A target specification for the restored soils (i.e. depth of soil profile, horizon thickness, textures, available soil nutrients where applicable, etc.); and
- The person(s) responsible for supervising the soil management.

1.2.7 The final SMP and each SRP will be produced by the works contractor prior to any soil stripping commencing for review, comment and acceptance by SZC ~~CO~~Co.

1.2.8 Assessment of the current agricultural drainage, and the drainage reinstatement plans, will be dealt with under a separate report.

2 ROLES AND RESPONSIBILITIES

2.1 Context

2.1.1 The implementation and audit of the SMP will require certain key responsibilities to be assigned to defined roles. ~~EDF~~SZC Co. and the works contractor will have in place individuals with sufficient training and expertise in assessing soils, soil conditions and soil handling operations to ensure the measures outlined herein can be implemented, supervised and monitored effectively.

2.1.2 In advance of any soil stripping works commencing full details of roles and reporting mechanisms will be set out in each SRP. A table will be provided detailing the key activities and sub-activities, the frequency they will be undertaken and who is responsible for each, along with the expertise required.

2.1.3 The two key roles in ensuring the appropriate implementation of the SMP will be the Contractor's Site Environmental Lead and the Contractor's Soil Scientist. Outline requirements for each role in relation to soils are detailed below. These works will also be monitored by the Client's Soil Scientist who will provide support and guidance and undertake monitoring visits and audits.

2.2 Contractor's Site Environmental Lead

2.2.1 The Contractors Site Environmental Lead is responsible for planning, over-seeing and carrying out routine inspections of soil management activities to ensure adherence to SMP protocols including:

- Treatment of site vegetation before topsoil stripping;
- Determination of topsoil plasticity status ahead of soil stripping (plastic or non-plastic);
- Soil segregation during stripping and storage according to ownership, soil horizon (topsoil/subsoil) where the land will be returned to agricultural use, soil type and plasticity status;
- Stockpile and windrow construction, where required;

- Soil tracking from stripping, storage, reconditioning (where applicable) to re-use; and
- Re-use of soils (transportation, placement, decompaction) and ensuring the creation of a soil profile and associated characteristics suitable for the proposed end use.

2.2.2 The Site Environmental Lead, in liaison with the Contractor's Soil Scientist, will be responsible for providing plans and reports on all soil stripping, stockpiling and restoration activities (to be included within the SRP) to SZC ~~CO~~Co. including:

- Soil Stripping Plan;
- Soil Stockpile Plan;
- Compilation of data relating to the volume and type of topsoil and subsoil excavated, transported and stockpiled;
- Soil Reconditioning Plan;
- Restoration plans; and
- Report for the Earthworks phase, including supporting drawings, photographs, observations.

2.2.3 These activities will be the responsibility of the Site Environment Lead but may be delegated to individuals with sufficient training and expertise where required. The Site Environment Lead and anyone with delegated responsibility will undertake training provided by a qualified soil scientist, with the activities monitored at an agreed frequency by the soil scientist.

2.3 The Contractor's Soil Scientist

2.3.1 The Contractor's Soil Scientist is responsible for the provision of expert and technical soils advice and supervision throughout the earthworks and the subsequent site restoration activities. The role includes liaison with the Site Environmental Lead and review and approval of method statements and risk assessments with regards to soil management.

2.3.2 The Soil Scientist will have the necessary training, qualifications and experience, having achieved the soil professional competence standards set out by the British Society of Soil Science.

2.3.3 The Soil Scientist is responsible for training key site staff in identification of topsoil and subsoil resources which are suitable for re-use so that accurate segregation of materials can be achieved. The Soil Scientist will also provide training on the assessment of soil plasticity status based on the field technique provided in Annex G.

2.3.4 The Soil Scientist will conduct targeted supervision, site inspections and monitoring of stripping works based on observations made by the Site Environmental Lead during key operations, including, but not limited to:

- treatment of existing vegetation;
- soil stripping and temporary storage;
- soil reconditioning (where necessary);

- overburden treatment;
- subsoil placement;
- topsoil placement;
- decompaction measures;
- surface cultivations; and
- soil amelioration.

2.3.5 Where necessary and particularly during the replacement of soils and overburden for restoration, the Soil Scientist will excavate inspection pits at representative locations in order to check important in-situ pedological soil properties (e.g. compaction levels, soil structure, anaerobism, drainage characteristics, soil depths).

2.3.6 The Soil Scientist will provide Inspection Reports (including photographs and plans) for each site visit and will confirm that soil conditions are compliant with this SMP / landscape design or identify non-compliances that need to be addressed.

2.4 Agricultural Liaison Officer

2.4.1 An Agricultural Liaison Officer (ALO) will be appointed by SZC ~~CO~~Co. prior to the commencement of the project. The ALO will be the prime contact for ongoing engagement on practical matters, contactable by all landowners and occupiers through a direct phone number during daytime working hours defined by the contractor during the construction. During out of hours times contact details will be provided for a team or company for use in the event of an emergency.

2.4.2 In relation to the SMP, the ALO will coordinate the provision of a detailed pre-construction condition survey of the parts of the landholding affected by construction activities, to include a collation of all soil survey data associated with owner/occupiers' land. The ALO will ensure the information provided on soils as part of the Farm Pack is clear and understandable and will ensure all landowner queries are responded to in a timely manner by the appropriate person.

3 BASELINE CONDITIONS

3.1.1 ALC information is available for the majority of the land affected by the project. ALC maps are provided with each relevant Environmental Statement chapter, with the associated auger logs for each location also provided. These have been collated and are presented in **Annex A**.

3.1.2 To ensure the information is up to date and to complete the surveys in those areas where it was not possible to survey previously, further ALC and soil surveys will be undertaken. This will include the collection and analysis of samples in relation to the target specification for the proposed end uses. A report on these surveys and analyses and a final collation of all available information will be made available to inform the development of the final SMP.

3.1.3 This information will then be used to develop each scheme-specific SRP, enabling stripping depths and stockpile volumes to be detailed.

4 CALCULATION OF SOIL VOLUMES

4.1.1 The SRPs will detail soil stripping, storage and restoration plans based on soil volume calculations using the data presented from the baseline surveys (see above).

4.1.2 The clear tracking of actual moved and stockpiled volumes of both topsoil and subsoil will be undertaken to allow restoration re-use plans to be revised based on actual volumes (including required actions in relation to the overall topsoil / subsoil balance).

4.1.3 Where land is to be returned to agricultural use, clear segregation and storage of topsoil and subsoil resources will be critical to maximizing re-use. All necessary topsoil, subsoil and underlying strata will be stripped and stockpiled separately.

4.1.4 Where land is to be restored in accordance with the relevant (outline) Landscape and Ecological Management ~~Plan (LEMP~~Plans ((o)LEMPs), which ~~details~~detail the habitats which will be created, topsoil and subsoil resources may need to be mixed to create the suitable soil resources for the restoration of the land. The final SMP will align with the ~~LEMP~~(o)LEMPs and detail where soil horizons need to be mixed to ensure both adequate volumes of material for the restoration and minimisation of any surplus soil material.

5 SOIL PROTECTION STRATEGY

5.1 Introduction

5.1.1 Since soil is a vulnerable and non-renewable resource, care must be taken throughout all handling, transporting and stockpiling activities so that the soil resources of the site are protected and conserved. Many construction activities have the potential to damage soils. The purpose of this section of the outline SMP is to describe how the management of soils will be controlled and to specify how soils will be protected and their quality conserved throughout all stages of the work.

5.1.2 Failure to protect soils during disturbance can lead to their degradation with consequential environmental impacts both on-site and off-site, such as: (a) soil erosion, (b) loss of soil organic matter; leading to loss of nutrients and a decline in soil fertility, (c) soil compaction leading to loss of soil structure and reduced permeability to water (leading to waterlogging) and restricted aeration and rooting potential, and (d) loss of soil biological activity.

5.1.3 Degradation of soils can lead to adverse impacts on the landscape, including: (a) alteration to the hydrology of the site caused by changes in surface runoff, (b) increased sediment loading to adjacent watercourses, (c) poor re-establishment of vegetation, and (d) visual impact of slope failure or soil erosion leading to bare soil surfaces.

5.1.4 Measures are provided in this outline SMP to manage how soils on site will be stripped, handled and stored appropriately so that they can be re-used in restoration of the site.

5.2 Outline Soil Protection Measures

5.2.1 This outline SMP describes procedures for soil stripping, handling, transporting, storing, and restoration of soils to maintain, as far as practicable, their soil quality and viability as required for the proposed end uses.

5.2.2 There will be a number of control measures at each stage of the works. A summary of these measures is outlined in bullet form below and described in more detail in the following sections.

Early soil protection measures

- Measures for *in-situ* soil protection during early site clearance activities

Soil recovery and storage (soil stripping and stockpiling)

- In-situ soil protection ahead of stripping;
- Pre-treatment of existing vegetation;
- Measures for handling and stockpiling;
- Measures to ensure correct segregation of different topsoil and subsoil resources
- Measures for separate storage of different soil types; and
- Method and locations of stockpiling.

Soil reconditioning (for use where required)

- Measures to recondition wet and plastic topsoil and subsoil resources before re-use;
- Measures to ensure correct segregation of different topsoil and subsoil resources; measures for handling and to optimise soil drying and re-aeration; and
- Methods to monitor the process.

Soil restoration methods

- Soil prescriptions for each different land use; soil handling/replacement methods; and in situ soil treatments for each different land use.

Monitoring

- Monitoring programme; soil assessment procedures for (a) soil stripping and storage (b) soil reconditioning and (c) restoration activities;
- Acceptability criteria for soil storage, reconditioning and soil replacement activities; and
- Failures of acceptability criteria and corrective actions.

Quality control and auditing measures

- Quality control, auditing procedures and plans; criteria for cessation of works;
- Non-compliances and corrective actions; and
- Use of tool box talks for staff training.

5.3 Wet Weather Working and Cessation of Works

5.3.1 There is no requirement for the cessation of earthworks identified under this outline SMP. However adverse weather can cause difficult and/or dangerous working conditions and therefore may warrant a cessation of works. Criteria for the cessation of works will be agreed with relevant stakeholders in advance of any site operations commencing.

5.4 Use of Tool Box Talks

5.4.1 Regular Tool Box talks will be used so that all site staff are aware of the SMP and applicable soil handling and soil protection procedures. The Tool Box Talks will be site-specific, discussing soil conditions and approaches to soil handling at the site.

5.4.2 Examples of tool box talks to be used are listed in **Appendix I**.

6 SOIL MANAGEMENT MEASURES

6. 01 Outlined below are further details of soil management measures.

6.1 Early Soil Protection Measures

6.1.1 During the earthworks it is essential that soils are adequately protected. Plant and vehicles servicing these activities will be managed so that they do not traffic across *in situ* soils. Demarcated access routes will be detailed to provide single points of access to soil strip and storage areas to minimise compaction of underlying soils.

6.1.2 There will be no vehicle access to areas of the site outside the marked access routes (except for light vehicles for site checks and vehicles directly involved with topsoil / subsoil / overburden stripping and transportation). The access plan will be prepared and added to the SRP prior to start of works by the Contractor and issued to SZC ~~CO~~Co. for acceptance.

6.1.3 There will be no lay-down of materials except for those materials required for specific on-going construction activities either within the route corridors or anywhere outside designated storage areas. Subject to ground conditions, materials can be temporarily stored on topsoil if it is considered this will not be detrimental to soil quality.

6.2 Soil Recovery and Storage (Stockpiling)

6.2.1 Before any soil stripping activities take place, a soil strip phasing plan will be prepared by the Contractor, added to the SRP and issued to SZC ~~CO~~Co. for acceptance.

6.2.2 The plan will provide timescales and sequencing of soil stripping and proposed haul routes. The earthworks will be phased to ensure that, where the land is to be returned to agriculture, topsoil is stripped in each part of the site ahead of subsoil materials and that all soils are stripped from a designated area prior to bulk excavation and earthworks activities within that area.

6.2.3 All topsoil and subsoil stripping depths will be based on the information from the ALC surveys and will be monitored by the Contractors Soil Scientist.

6.3 Soil Segregation

6.3.1 To ensure that the correct soil depths are stripped and stockpiled tool box talks will be used to provide the required information and works will be supervised by suitably qualified personnel. The sources of all soil stockpiled will be logged/tracked and will be subject to the auditing process described in the SMP.

6.3.2 Where the land is to be returned to agriculture, separate stockpiles will be created for topsoil and subsoil. Documentation and physical control measures (such as signing of stockpiles) will be put in place to prevent accidental mixing and so that soils are segregated according to source location. Where there are spatial constraints, it may be required to stockpile soils up against each other, with physical separation being achieved by means of a geomembrane barrier / marker layer to so that no mixing occurs.

6.3.3 Where land is to be restored as part of the ~~Landscape and Ecological Management Plan (LEMP),~~(o)LEMPs, which ~~details~~detail the habitats which will be created, topsoil and subsoil resources may need to be mixed to create the suitable soil resources for the restoration of the land. The final SMP will align with the ~~LEMP~~(o)LEMPs and detail where soil horizons need to be mixed (and thus could be stripped and stockpiled as a single resource) to ensure both adequate volumes of material for the restoration and minimisation of any surplus soil material.

6.3.4 All soils to be re-used for restoration will be free from significant quantities of foreign matter or other materials which would render the soils unsuitable for re-use.

6.4 Pre-treatment of Existing Vegetation

6.4.1 It is good practice to reduce the quantity of vegetation entering the storage stockpiles to minimise the formation of anaerobic conditions during storage. As such, in advance of soil stripping, the topsoil will be cleared of surface vegetation and arisings removed by a method suited to the vegetation type present. The effectiveness of these operations will be assessed by suitably qualified personnel.

6.5 Methods of Soil Stripping

6.5.1 Soil will be stripped using a hydraulic excavator or tracked dozer following the methodology set out in **Appendix B**. ~~Tracked dozers~~Low ground pressure plant will ~~only~~ be used, as far as is practicable, where the soil condition (texture and plasticity) is such that the soil resource is ~~resilient~~susceptible to damage~~, as far as is practicable).~~. Dump trucks will be used to transport the soils to their allocated storage location. All procedures will be planned to involve minimum tracking to minimise compaction. Access for dump trucks will be via dedicated marked routes to prevent compaction of non-stripped topsoil and subsoil.

6.5.2 Immediately prior to stripping the soil shall be tested for plasticity, using the methodology presented in **Appendix C**.

6.6 Soil Storage

6.6.1 Key issues for soil handling, storage and eventual re-use are soil moisture content and soil consistency (plasticity). Soils that are stripped when plastic will require to be reconditioned before re-use for restoration. During the works, soil plasticity status will be determined in situ prior to stripping (see **Appendix C**).

6.6.2 Stockpiling will be undertaken in accordance with the methodology set out in **Appendix D**.

6.6.3 The general principles governing stockpile location and stability which will be adhered to are as follows:

- All areas designated as stockpiling areas will be stripped of topsoil and subsoil resources prior to stockpiling;
- Stockpiles will not be positioned within the root or crown spread of trees, or adjacent to ditches, within 10m of watercourses or existing or future excavations;
- Topsoil and subsoil stockpiles (or mixed material stockpiles where appropriate) will be seeded with a neutral grassland seed mix to maintain slope stability and to prevent erosion or dust generation;
- Grass seeded and maintained stockpiles will have a maximum side slope that is based on geotechnical stability; and
- Soil stockpiles will be managed and monitored throughout their lifetime so that they can be maintained in relation to stability and integrity and any weed growth can be managed in a timely manner.

6.6.4 In relation to stockpile heights and storage situation, stockpile heights will be limited where the soil resources are required to be returned to the pre-construction agricultural use. The maximum heights will be set out in the final SMP. It is likely that the maximum height proposed will be set based on the soil texture and the resilience this gives the soil to structural damage as a result of soil handling.

6.6.5 Soil materials will also be stored on like for like where restoration to agricultural use is required. However, to deliver the ~~Landscape and Ecological Management Plan (LEMP)~~(o) s the soil resources available will need to be adapted to be suitable for the proposed habitat types. This may, for example, require the mixing of topsoil and subsoil resources to reduce the fertility of the restored profile. Where these resources are coarse textured it may be necessary and appropriate to stockpile the materials higher.

6.6.6 Measures to manage and treat site runoff and prevent erosion and dust generation during soil stripping and stockpiling works will be set in place through a series of specific control measures. These ~~will be~~are described in the ~~Code of Construction Practice (~~**CoCP** (dated April 2022). Construction methodologies will be such that appropriate bio-security (disease and pest control) and weed control measures are in place to protect both on-site soils and adjacent land holdings.

6.6.7 When required prior to soil re-use, plastic soils will require reconditioning as set out in **Appendix E**. Windrows for soil drying will be no more than 2m in height. Only once the soil moisture content of windrowed soil has reduced sufficiently and the soil is non-plastic in consistency will it be moved to its final stockpile location or final re-use location

6.7 Stockpile Locations, Treatment Areas and Access Routes

6.7.1 The location of topsoil, subsoil or mixed soil resource stockpiles will be clearly set out on stockpile plans as part of the SRP and issued to SZC ~~CO~~Co. for acceptance. Once agreed, locations will be clearly marked out on the ground.

6.7.2 This will include clear mapping of required access routes to stockpile locations for all phases of the soil stripping, transport and stockpiling activities. As works progress and change location, the access route demarcation and signage will be changed as required in advance.

7 SOIL RESTORATION METHODS

7.1 Introduction

7.1.1 The primary objective of soil restoration is to provide soil profiles suitable for the reinstated land use. The final SMP will include a set of specifications for the required characteristics of soil profiles for each defined end use. Where the end use is a return to agriculture the restoration will be informed by the preconstruction ALC survey information.

7.1.2 During the placement of soil resources in their final location the methods outlined above will be followed. This will include, but not be limited to, the implementation of an access and egress plan for vehicles and plant to prevent unnecessary trafficking of restored areas, use of appropriate scale plant, avoidance of double handling and avoidance of mixing topsoil and subsoil where these materials are required for the restoration of agricultural land.

7.1.3 Soil replacement will be undertaken in accordance with the methodology set out in **Appendix F**.

7.1.4 During restoration works, measures to manage and treat site runoff, and prevent erosion and dust generation will also be set in place through a series of specific control measures. These requirements ~~will be~~are set out in the detailed **CoCP**~~.~~ (dated April 2022). Specific issues will be around biosecurity (disease and pest control) and weed control to protect both on-site soils and adjacent land holdings during restoration.

7.1.5 These activities are detailed further in the following sections.

7.2 Placement and in situ Treatment of Soil Materials

7.2.1 Prior to restoration activities taking place, soil resources will have been stored in stockpiles for extended periods. To confirm continuing suitability of stockpiled soils for restoration, they will be visually inspected, and assessments carried out before their re-use (see Section 8 Monitoring). If any soil is found to be plastic or display excessive anaerobic conditions the materials will be reconditioned as

detailed above. It will be the responsibility of the contractor to assess soil conditions in each stockpile and to recommend appropriate pre-treatment prior to soil placement should it be required.

7.2.2 During topsoil and subsoil placement there are two fundamental requirements: (a) to replace and spread out the necessary combination of topsoil and/or subsoil to re-create the soil profile and (b) to ensure careful handling and re-placement of soils, avoiding compaction and any unnecessary damage to soil structure. The following procedure (which is further detailed in the Defra Construction Code of Practice) is designed so that these requirements are met.

7.2.3 The SRP will clearly set out the soil profile specifications for each required end use Acceptability criteria in terms of soil chemical characteristics will also be clearly set out.

7.2.4 After the placement of each soil layer (overburden, topsoil and/or subsoil) it is essential that it is mechanically cultivated using appropriate tillage equipment to loosen/break up compaction and restore soil structure. To be fully effective, these cultivations will be carried out when the soils are dry and friable, as far as is practicable, otherwise the cultivation tool/tine merely cuts and smears the soil rather than lifting, fracturing and loosening it.

7.2.5 Prior to the placement of stockpiled subsoil and topsoil, the re-profiled surface will be overlain with overburden material to create the required landform. After placement of overburden, the area will be deep ripped prior to placement of stockpiled subsoil and topsoil. This operation will be checked by suitably qualified personnel to ensure satisfactory decompaction has been achieved.

7.2.6 The various soil materials will be placed in layers over the ripped overburden using suitable machinery. The soil profile composition will be checked by suitably qualified personnel to ensure compliance with the appropriate parameters at this stage (soil type, soil depths and stoniness). Once the soil profiles have been formed, the topsoil and subsoil will be thoroughly decompacted, loosened and prepared using land restoration/agricultural machinery to ensure they meet soil structure and aeration criteria.

7.2.7 Subsoil cultivation is scheduled after the topsoil is placed to allow the subsoil to be decompacted without risk of re-compaction during topsoil spreading. This approach will also ‘key in’ the topsoil with the subsoil to produce a soil profile that displays continuity between each layer.

8 AFTERCARE PERIOD

8.1.1 The final SMP will detail the requirements for an aftercare period (including confirmation of the length of the aftercare period) in a specific Aftercare Management Plan. Detail will be provided on the suite of measures which would be used to ensure the soils are brought and maintained in a condition suitable for the land use in any given location.

8.1.2 The Aftercare Management Plan will set out the requirements for soils and ALC surveys, where applicable, to confirm the condition of the soil profiles and inform the need for any remedial measures.

~~8~~9 MONITORING

~~8.1~~9.1 Introduction

~~8.1.1~~9.1.1 So that soil quality is maintained throughout the works, key stages will be monitored by appropriately trained and experienced personnel.

~~8.2~~9.2 Monitoring Programme

~~8.2.1~~9.2.1 The monitoring programme shall incorporate the following:

Soil Recovery

- The effectiveness of vegetation pre-treatment in advance of soil stripping.
- An assessment of soil plasticity ahead of soil stripping. ~~This will determine whether a soil reconditioning stage is needed after storage and before re-use~~Soil will only be stripped when non-plastic where practicable, with the assessment of plasticity used to minimise handling of wet soils and to ensure clear identification of any soil handled when plastic so that an effective reconditioning stage can be implemented .

Storage

- Assessment of soil stockpiles to ensure the correct labelling is in place, soil quality is maintained during storage and to determine reconditioning requirements.

Reconditioning

- The effectiveness and progress of the soil reconditioning process.

Soil replacement

- Key stages of the soil placement and decompaction/cultivation sequence to check correct soil spreading and effectiveness of tillage operations.
- An assessment of the acceptability of the replacement soil profiles for the restoration design~~.~~ (where land is being returned to agriculture the replacement approach will be based on ensuring the correct ALC criteria can be restored).
- A post-reinstatement soil survey to record the restored soil profile characteristics and condition.

Aftercare period

- Confirmation during the aftercare period of any works required to bring and maintain soils in the required condition appropriate to the land use in any given location.

~~8.3~~9.3 Personnel

~~8.3.1~~9.3.1 The monitoring tasks shall be conducted by specialist personnel with appropriate experience and training for their role.

~~8.4~~9.4 Documentation

~~8.4.1~~9.4.1 **Appendix G** presents a checklist of the information which will be recorded during stockpile or windrow creation and following completion. **Appendix H** presents a list of the data to be included in soil stripping and stockpiling documentation.

~~8.4.2~~9.4.2 Inspection processes, checklists and acceptability criteria will be developed, based on the above, by the Contractor and issued to SZC ~~CO~~Co. for acceptance prior to any works commencing. Documentation of the monitoring undertaken, including clearly marked up plans, will be maintained and made available by SZC ~~CO.~~ Co..

~~8.5~~9.5 Reporting of Findings

~~8.5.1~~9.5.1 The findings of all examinations and assessments will be recorded and held by the Contractor for record keeping and to enable actioning of necessary corrective actions.

~~8.6~~9.6 Failures of Acceptability Criteria and Corrective Actions

~~8.6.1~~9.6.1 Where the soils are found to be non-compliant in any respect, appropriate means of remediation will be proposed by the appointed Contractor for acceptance by SZC ~~CO~~Co. Once the affected area has been treated, it will be reassessed before sign-off.

~~9~~10 AUDITING

~~9.1.1~~10.1.1 An audit checklist will be developed based on the checklist presented in Annex I by the Contractor and issued to SZC ~~CO~~Co. for acceptance. This will be updated in advance of works commencing to identify key dates and responsible persons. This will then be used during the works to ensure all checks have been undertaken and required records completed.

APPENDIX A

ALC Maps and auger logs

NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

PROVISIONAL AGRICULTURAL LAND CLASSIFICATION (ALC)

- GRADE 1
- GRADE 2
- GRADE 3
- GRADE 4
- GRADE 5
- NON AGRICULTURAL
- URBAN

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
PROVISIONAL ALC MAPPING

DRAWING NO:
FIGURE 17.2

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:20,000 @A3

SCALE BAR
0 0.2 0.4 0.6 0.8 1 KM

17.3.3

17.3.2

17.3.5

17.3.4

17.3.6

17.3.7

Theberton

Leiston

Sizewell

Dunwich Forest

Minsmere Haven

NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

MAPPING OF SURVEY POINTS

- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 1
- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4
- NOT SURVEYED
- OTHER

NOT PROTECTIVELY MARKED

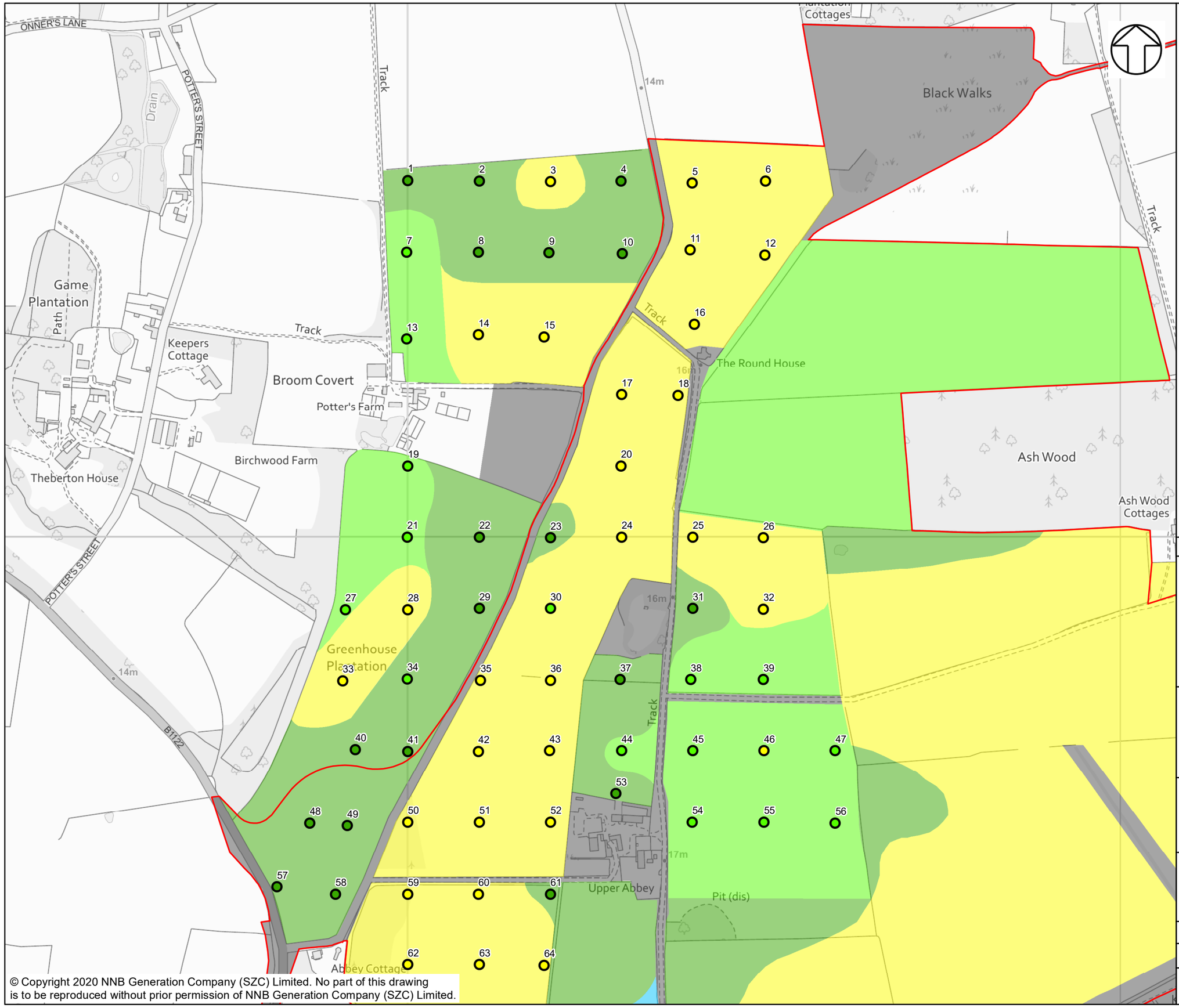
DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.1

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:15,000 @A3

SCALE BAR
0 150 300 450 600 750 M



NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these.
Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

MAPPING OF SURVEY POINTS

- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.2

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR
0 50 100 150 200 250 M

Dovehill Plantation
Sandypytle Plantation
Lower Abbey Farm
The Grove
Chapel (remains of)
Ash Wood
Ash Wood Cottages
Stonewall Belt
Walk Barn
Dunwich Forest
Track
Drain
FB

NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

AGRICULTURAL LAND CLASS (ALC)

- GRADE 3A
- GRADE 3B
- GRADE 4
- NOT SURVEYED
- OTHER

NOT PROTECTIVELY MARKED

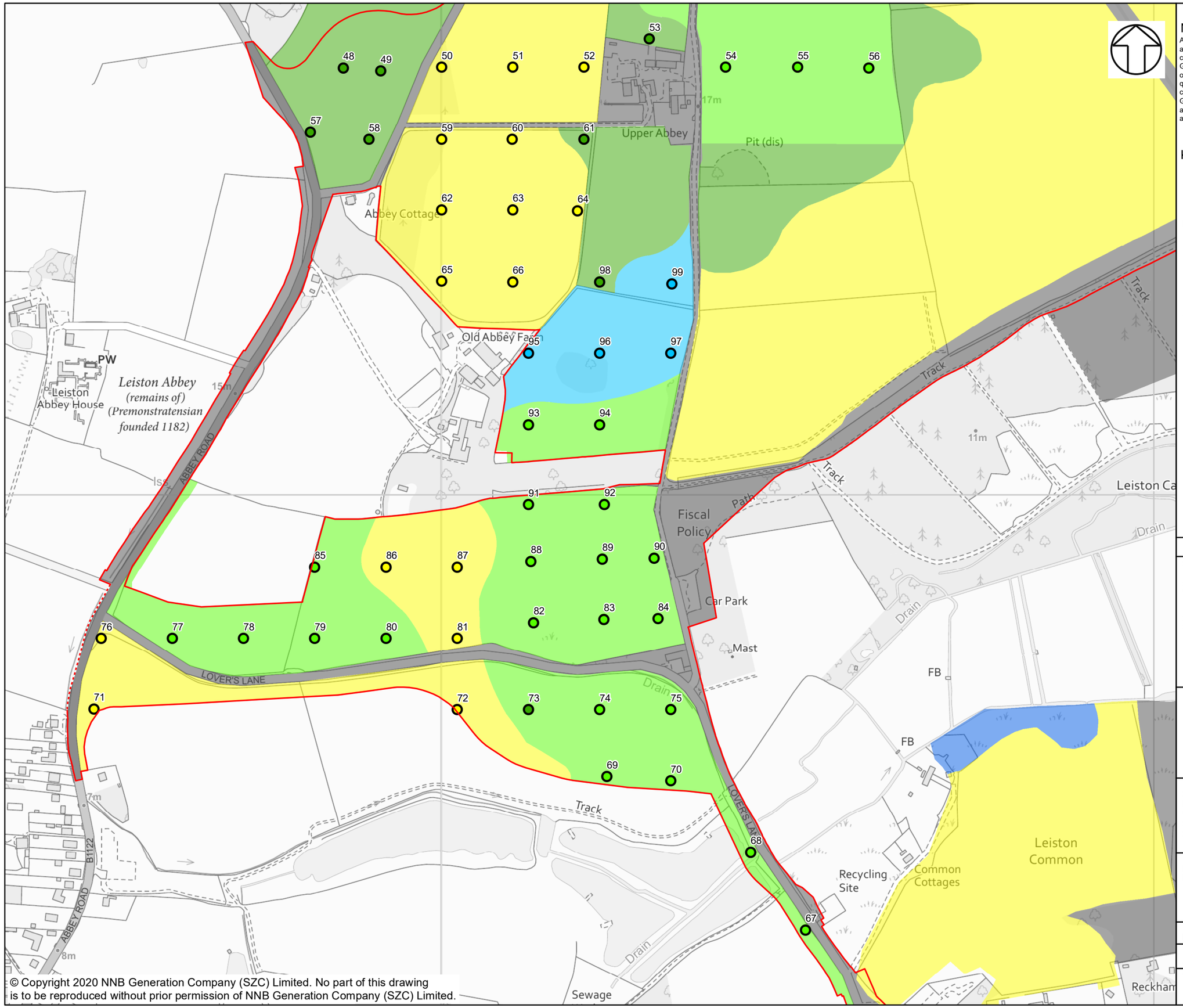
DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.3

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR
0 50 100 150 200 250 M



NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

MAPPING OF SURVEY POINTS

- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 1
- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

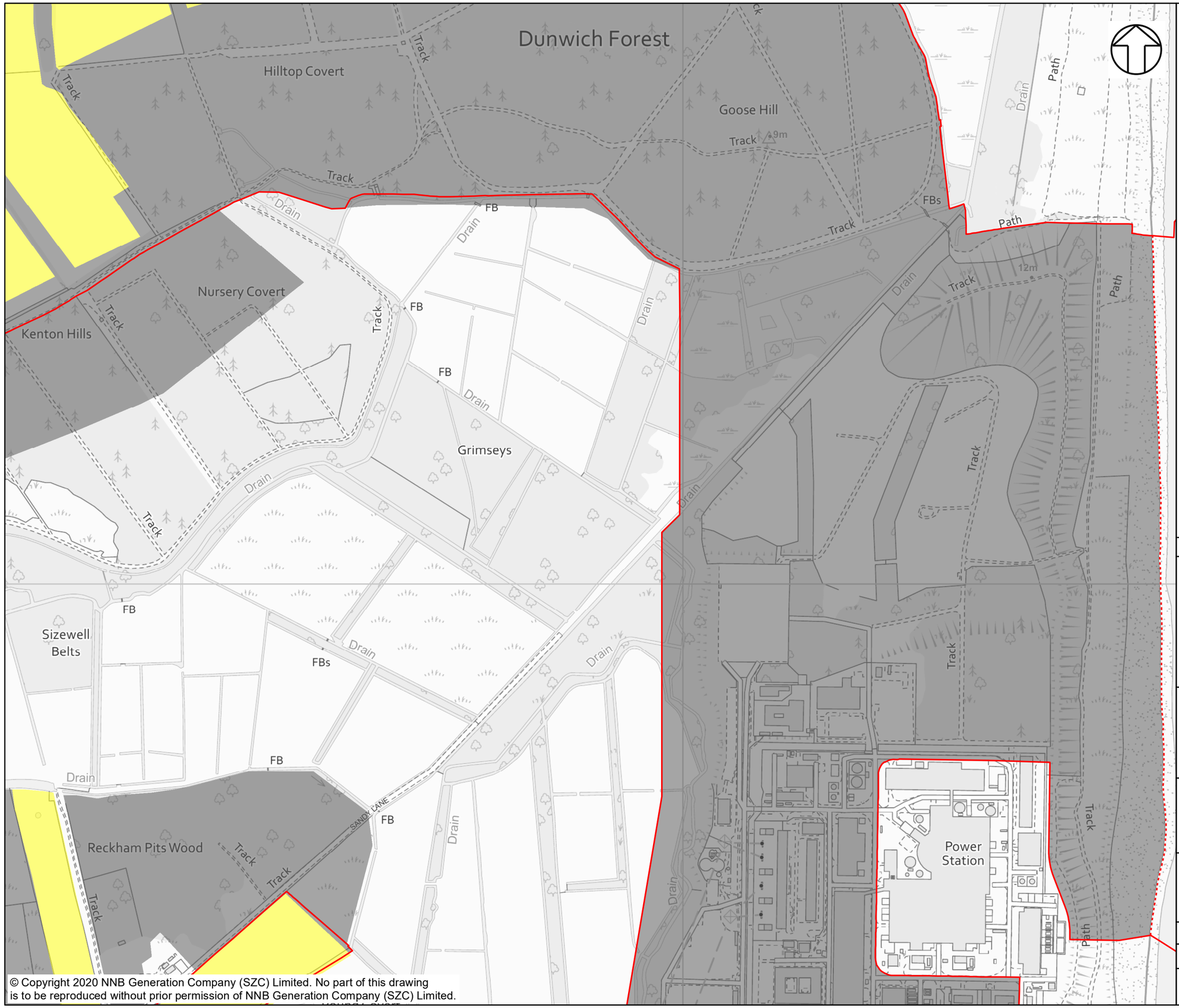
DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.4

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR
0 50 100 150 200 250 M



NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these.
Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

AGRICULTURAL LAND CLASS (ALC)

- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

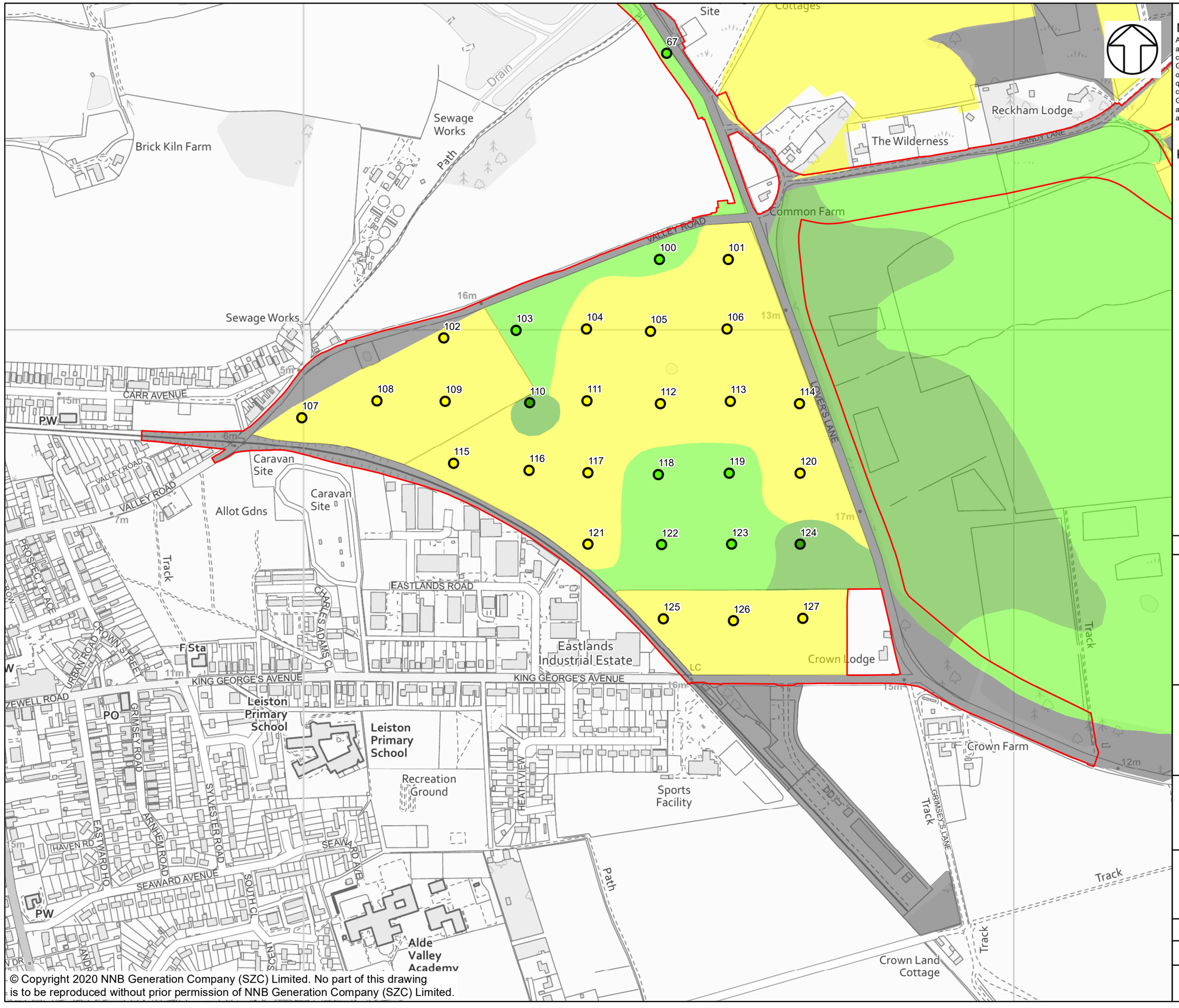
DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.5

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR
0 50 100 150 200 250 M



NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

MAPPING OF SURVEY POINTS

- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

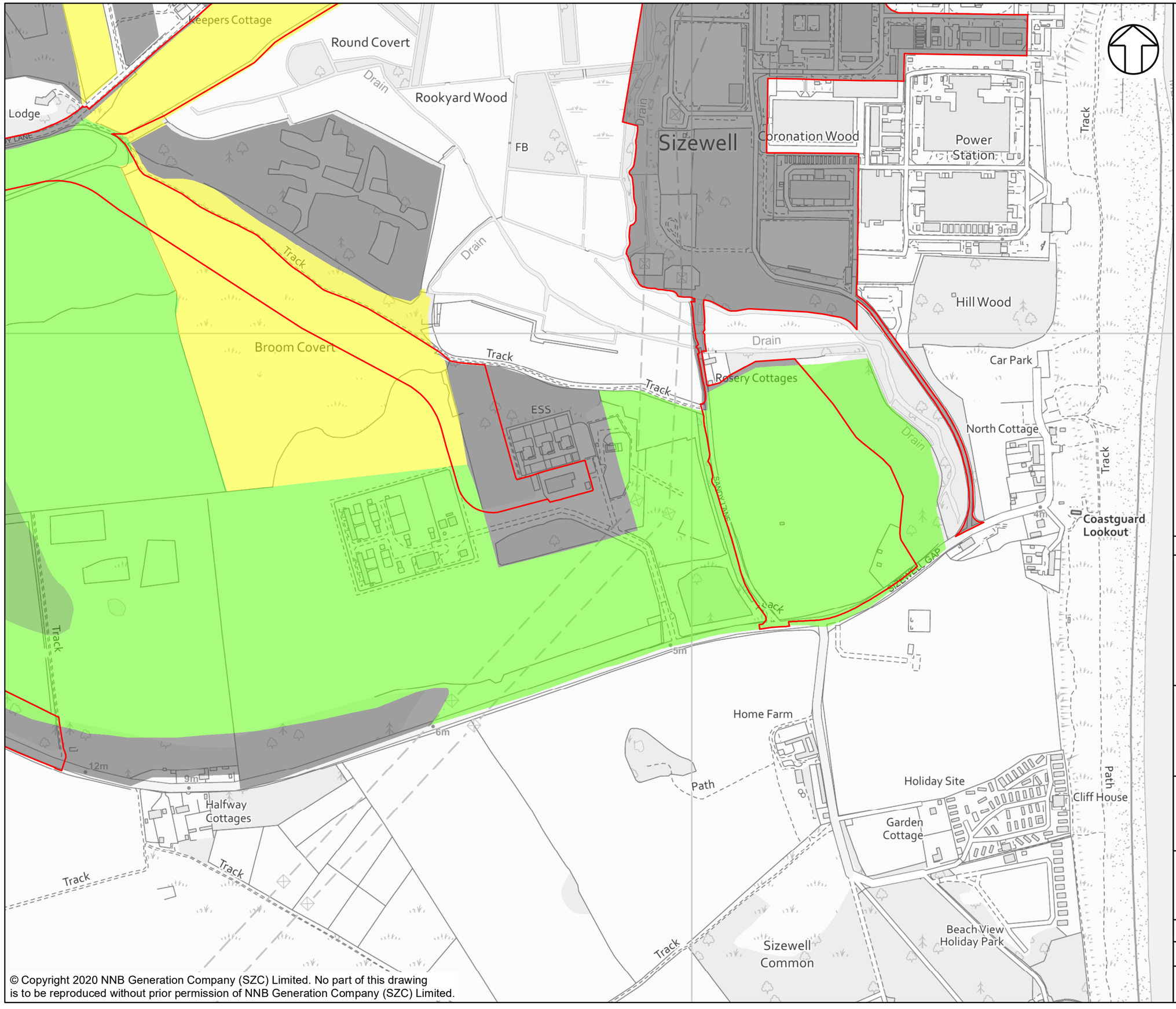
DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.6

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR

0 50 100 150 200 250 M



NOTES

Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

AGRICULTURAL LAND CLASS (ALC)

- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.7

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR

0 50 100 150 200 250 M

Auger Log key

Depth - Top

xx	Underlining denotes depth to the top of a slowly permeable layer

Land use

ARA	Arable
CER	Cereal
WHT	Wheat
BAR	Barley
MZE	Maize
OAT	Oats
OSR	Oilseed rape
LIN	Linseed
FBE	Field beans
POT	Potatoes
SBT	Sugar beet
BRA	Brassicas
FOD	Fodder crops
FRT	Soft and top fruit
HRT	Horticultural crops
PAS	Pasture
LEY	Ley grass
PGR	Permanent pasture
RGR	Rough grazing
SCR	Scrub
HTH	Heathland
BOG	Bog or marsh
DCW	Deciduous Woodland
CFW	Coniferous woodland
PLO	Ploughed
STB	Crop stubble
FLW	Fallow (inc. set aside)
SAS	Set aside (where known)
OTH	Other

Mottle 1,2 - Form

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

Texture

CS	Coarse Sand
MS	Medium sand
FS	Fine Sand
LCS	Loamy Coarse Sand
LMS	Loamy Medium Sand
LFS	Loamy Fine Sand
CSL	Coarse Sandy Loam
MSL	Medium sandy loam
FSL	Fine Sandy Loam
CSZL	Coarse Sandy Silt Loam
MSZL	Medium Sandy Silt Loam
FSZL	Fine Sandy Silt Loam
ZL	Silt Loam
SCL	Sandy Clay Loam
MCL	Medium Clay Loam
HCL	Heavy Clay Loam
MZCL	Medium Silty Clay loam
HZCL	Heavy Silty Clay Loam
SC	Sandy Clay
ZL	Silty Clay
C	Clay
P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts
IMP	Impenetrable to roots

Limitations

NN	None
OC	Overall climate
AE	Aspect
EX	Exposure
FR	Frost risk
GR	Gradient
MR	Microrelief
FL	Flood risk
TX	Texture
DP	Soil depth
CH	Chemical
WE	Wetness
WK	Workability
DR	Droughtiness
ER	Erosion risk
WD	Wetness/Droughtiness
ST	Topsoil stoniness

Stones - Type

HR	All hard rocks and stones
MSST	Soft, medium or coarse grained sandstone
SI	Soft weathered igneous or metamorphic rock
SLST	Soft oolitic or dolomitic limestone
FSST	Soft, fine grained sandstone
ZR	Soft, argillaceous or silty rocks
CH	Chalk or chalk stones
GH	Gravel composed of non-porous (hard) stones
GS	Gravel composed of porous (soft) stones

Subs Str (subsoil structural condition)

G	Good
M	Moderate
P	Poor

Calcareousness

N	Non-calcareous (<0.5% CaCO3)
VS	Very slightly calcareous (0.5 - 1% CaCO3)
S	Slightly calcareous (1 - 5% CaCO3)
M	Moderately calcareous (5 - 10% CaCO3)
V	Very calcareous (>10% CaCO3)
Y	Calcareous (>1% CaCO3)

Mn C (ferrimanganous concretions)

F	Few
C	Common
M	Many
V	Very many
Y	Common or greater

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
1	TM	45000	65501	13	1	W	CER	0	25	25	75YR32						MSL	5	HR		N			-5.27	-15.81	3a	I	1	3a	Drought	1>2,0>6
								25	50	25	75YR54						MCL	2	HR	M	N										
								50	70	20	75YR54						MSL	2	HR	M	N										
								70	90	20							MSL	20	HR	M											STONES
								90	120								IMP			P										
2	TM	45100	65500	14	0		CER	0	25	25	75YR32						MSL	8	HR		VS			14.67	-18.55	3a	I	1	3a	Drought	
								25	50	25	75YR43						MSL	5	HR	M											
								50	70	20	75YR54						HCL	2	HR	M											
								70	120	50	75YR56						HCL	20	CH	M											Large chalk stone at 100cm
3	TM	45200	65499	13	4	N	CER	0	20	20	75YR43						HCL	10	HR		S			-53.02	-49.055	4	III	3b	4	Drought	2>2,0>6
								20	45	25	10YR52	CM	10YR58	CM	5Y42	Y	HCL	5	CH	P	M		Y								Located in depression/old pit
								45	55	10	5YR54						MSL	2	CH	M	M										
								55																							Large stone/field drain
4	TM	45299	65500	14	0		CER	0	25	25	75YR32						MSL	5	HR		N			18.51	-13.85	3a	I	1	3a	Drought	1>2,0>6
								25	70	45	75YR54						HCL	2	HR	M	N										
								70	100	30	75YR66						HCL	20	HR	M	N										
								100	120	20	75YR56						MSL	2	HR	M	N										
5	TM	45399	65497	13	1	SE	SBT	0	25	25	75YR32						MS	10	HR		N			-71.895	-68.41	4	I	1*	4	Drought	2>2,0>6
								25	55	30	75YR54						MS	2	HR	M	N										
								55	75	20							MS	20	HR	M											STONES
								75	120								IMP			P										
6	TM	45502	65500	12	1	SW	SBT	0	25	25	75YR32						MS	5	HR		N			-70.52	-67.035	4	I	1*	4	Drought	1>2,0>6
								25	55	30	75YR54						MS	2	HR	M	N										
								55	75	20							MS	20	HR	M											STONES
								75	120								IMP			P										
7	TM	44998	65400	13	2	W	CER	0	30	30	75YR32						LMS	2	HR		N			-15.91	-44.5	3b	I	1*	3b	Drought	0>2
								30	60	30	75YR54						LMS	2	HR	M	N										
								60	100	40	75YR56						MCL	2	HR	M	N										
								100	120	20	75YR74						MS	0		M	V										Weathered limestone at depth
8	TM	45099	65400	13	3	S	CER	0	30	30	75YR32						SCL	10	HR		S			13.625	-18.15	3a	I	1	3a	Drought	2>2,0>6
								30	45	15	75YR33						SCL	8	HR	M	S										
								45	100	55	75YR44						MSL	5	HR	M	S										
								100	120	20	75YR66						MS	0		M	S										
9	TM	45198	65399	15	0		CER	0	25	25	75YR32						MSL	8	HR		N			14.6375	-18.975	3a	I	1	3a	Drought	2>2,0>6
								25	45	20	75YR44						MSL	5	HR	M	N										
								45	75	30	75YR56						HCL	5	HR	M	N										
								75	120	45	75YR56						HCL	20	CH	M	M										
10	TM	45301	65398	15	1	NE	CER	0	25	25	75YR32						MSL	5	HR		N			9.455	-27.57	3a	I	1	3a	Drought	0>2
								25	45	20	75YR44						LMS	2	HR	M	N										

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								45	75	30	75YR56						HCL	2	HR	M	N									
								75	120	45	75YR56						MSL	20	CH	M	M									
11	TM	45396	65403	13	1	NE	SBT	0	25	25	75YR32						MS	5	HR		N			-76.265	-72.295	4	I	1*	4	Drought	1>2,0>6
								25	50	25	75YR44						MS	2	HR	M	N									
								50	60	10	75YR53						MS	2	HR	M	N									
								60	120								IMP			P										Sandstone
12	TM	45501	65396	12	0		SBT	0	25	25	75YR32						MS	5	HR		N			-51.535	-64.415	4	I	1*	4	Drought	0>2
								25	55	30	75YR43						MS	2	HR	M	N									
								55	90	35	75YR33						MS	2	HR	M	N									Buried topsoil?
								90	110	20	75YR54						MS	0		M	N									or CS
								110	120								IMP			P										Sandstone
13	TM	44998	65278	13	1	W	FLW	0	25	25	75YR32						LMS	10	HR		N			-0.8675	-37.375	3b	I	1*	3b	Drought	1>2,0>6 locally greater stone%
								25	40	15	75YR44						LMS	5	HR	M	N									Close to farm and headland
								40	55	15	75YR56						HCL	5	HR	M	N									Used for vehicle turning/parking
								55	90	35	75YR56						MSL	2	HR	M	N									Compacted soil
								90	110	20	75YR56						HCL	2	HR	M	N									
								110	120	10	75YR56						LMS	2	HR	M	N									
14	TM	45099	65284	15	0		FLW	0	25	25	75YR32						LMS	2	HR		N			-40.59	-59.2	4	I	1*	4	Drought	Game cover vegetation?
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	120	80	75YR54						MS	2	HR	M	N									
15	TM	45191	65281	16	0		FLW	0	25	25	75YR32						LMS	2	HR		N			-40.59	-59.2	4	I	1*	4	Drought	Game cover vegetation?
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	120	80	75YR54						MS	2	HR	M	N									
16	TM	45402	65299	15	0		SBT	0	25	25	75YR43						LMS	10	HR		N			-65.085	-61.6	4	I	1*	4	Drought	3>2,1>6
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	75	35	75YR56						MS	2	HR	M	N									
								75	120								IMP			P										Sandstone
17	TM	45300	65200	16	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N									
								45	120	75							IMP														Compaction
18	TM	45379	65199	16	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N									
								45	120	75							IMP														Compaction
19	TM	45000	65100	13	1	NW	CER	0	25	25	75YR32						MSL	10	HR		N			-14.62	-43.07	3b	I	1	3b	Drought	3>2,1>6
								25	35	10	75YR42						MSL	5	HR	M	N									
								35	60	25	75YR54						LMS	2	HR	M	N									
								60	80	20	75YR64						MS	1	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								80	90	10	75YR56	FF	10YR61				HCL	2	HR	M	M	C									and CH
								90	120	30	75YR56	CF	10YR61			Y	HCL	2	HR	P	M	C	Y?								and CH
20	TM	45299	65100	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
21	TM	44999	65000	14	1	N	CER	0	25	25	75YR32						MSL	10	HR		N			-32.725	-29.28	3b	III	2	3b	Drought	3>2,1>6
								25	35	10	75YR44						MSL	5	HR	M	N										
								35	55	20	75YR54	CF	75YR62	FF	75YR56	Y	C	2	HR	P	N		Y								
								55	70	15	75YR54	CF	75YR62	FF	75YR56	Y	HCL	20	CH	P	M		Y								
								70	90	20							HCL	40	CH	P											AND FLINTS
								90	120								IMP			P											
22	TM	45100	65000	14	2	NE	CER	0	25	25	75YR32						MSL	10	HR		N			-16.265	-29.7	3a	II	1	3a	Drought	3>2,1>6
								25	40	15	75YR44						MSL	5	HR	M	N										
								40	65	25	75YR56	CF	10YR61			Y	HCL	2	HR	P	N		Y								
								65	90	25	75YR56	CF	10YR61			Y	HCL	10	CH	P	M		Y								
								90	110	20							HCL	20	HR	P											FLINTS
								110	120								IMP			P											
23	TM	45200	64999	16	0		WHT	0	25	25	75yr32						MCL	5	HR		N			3.93	-17.2	3a	II?	2	3a	Drought	
								25	35	10	75yr44						HCL	5	HR	M	N										
								35	45	10	10yr53	CF	10yr61	CF	10yr56	Y	C	5	HR	P	N	F	Y								not deep enough to be SP alone
								45	70	25	10yr53	CF	10yr61	CF	10yr56	Y	SCL	2	HR	M	N		N							
								70	120	50	10yr53	CM	10yr51	CM	10yr56	Y	C	5	CH	P	M	F	Y								
24	TM	45300	65000	17	0		WHT	0	25	25	75yr32						MSL	5	HR		N			-82.2	-80.2	4	I	1	4	Drought	
								25	30	5	75yr44						LMS	5	HR	M	N										
								30	120	90							IMP														Compaction
25	TM	45400	65000	18	1	S	STB	0	25	25	75YR43						LMS	5	HR		N			-49.435	-59.03	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	65	20	75YR54						MS	2	HR	M?	N										Very compact
								65	85	20	75YR56						MS	2	HR	M	N										
								85	105	20							MS	20	HR	M											STONES
								105	120								IMP			P											
26	TM	45499	64999	15	1	S	STB	0	25	25	75YR32						LMS	2	HR		N			-58.075	-55.6	4	I	1*	4	Drought	
								25	60	35	75YR44						LMS	5	HR	M	N										
								60	80	20							LMS	20	HR	M											STONES
								80	120								IMP			P											
27	TM	44912	64898	12	1	W	CER	0	25	25	75YR32						MSL	5	HR		N			-49.595	-48.81	3b	I	1	3b	Drought	0>2
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	60	15	75YR56						MS	1	HR	M	N										
								60	80	20							MS	20	HR	M	N										FLINTS
								80	120								IMP			P											
28	TM	45000	64898	16	0		CER	0	25	25	75YR42						LMS	5	HR		N			-41.115	-59.92	4	I	1*	4	Drought	0>2
								25	40	15	75YR44						LMS	2	HR	M	N										
								40	120	80	75YR54						MS	1	HR	M	N										

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
29	TM	45100	64900	13	0		CER	0	25	25	75YR32						MSL	5	HR		N			11.075	-18.26	3a	I	1	3a	Drought	1>2,0>6
								25	40	15	75YR44						MSL	2	HR	M	N										
								40	75	35	75YR56,66						MSL	2	HR	M	N										
								75	90	15	75YR56,66						MSL	5	CH	M	M										
								90	110	20							MSL	20	HR	M											
								110	120								IMP			P											
30	TM	45200	64900	16	0		WHT	0	25	25	75yr32						MSL	5	HR		N			-33.985	-23.64	3b	III	2	3b	Drought	
								25	35	10	75yr44						MSL	5	HR	G	N										
								35	75	40	10yr53	CF	10yr61	CF	10yr56	Y	C	2	CH	P	M		Y								
								75	120	45							IMP														Stony?
31	TM	45400	64900	16	1	S	STB	0	25	25	75YR32						MSL	5	HR		N			0.095	-13.85	3a	I	1	3a	Drought	
								25	70	45	75YR54						HCL	2	HR	M	N										
								70	85	15	75YR66						MCL	30	CH	M	N										
								85	105	20							MCL	50	CH	M											STONE
								105	120								IMP			P											
32	TM	45499	64899	14	1	S	STB	0	25	25	75YR32						LMS	5	HR		N			-29.445	-60.42	4	I	1*	4	Drought	
								25	70	45	75YR44						LMS	2	HR	M	N										
								70	95	25	75YR56						MS	2	HR	M	N										
								95	115	20							MSL	20	HR	M											STONES MSL
								115	120								IMP			P											
33	TM	44899	64850	14	2	W	CER	0	25	25	75YR32						MSL	5	HR		N			-60.94	-56.44	4	I	1	4	Drought	0>2
								25	40	15	10YR56						LMS	2	HR	M	N										
								40	60	20							LMS	20	HR	M											STONES
								60	120								IMP			P											
34	TM	44999	64801	16	0		CER	0	25	25	75YR32						MSL	5	HR		N			-38.87	-46.68	3b	I	1	3b	Drought	0>2
								25	60	35	10YR56						LMS	2	HR	M	N										
								60	100	40	10YR66						MS	2	HR	M	N										
								100	120								IMP			P											Sandstone
35	TM	45102	64799	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
36	TM	45200	64799	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
37	TM	45298	64800	17	1	N	SAS	0	30	30	75YR32						MSL	2	HR		N			27.63	-16.08	3a	I	1	3a	Drought	
								30	80	50	75YR54						MSL	2	HR	M	N										
								80	100	20	75YR64						MSL	2	HR	M	N										
								100	120	20	75YR66						MSL	10	CH	M	V										
38	TM	45397	64800	15	1	S	STB	0	25	25	75YR32						MSL	8	HR		N			-15.6	-45.6	3b	I	1	3b	Drought	
								25	50	25	75YR44						LMS	2	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							50	65	15	75YR64						MS	0		M	N										
							65	80	15	75YR54						MSL	0		M	N										
							80	110	30	75YR84						MS	0		M	N										
							110	120	10	75YR83						MSL	0		M	N										
39	TM	45499 64800	12	1	S	STB	0	25	25	75YR32						LMS	2	HR		N			-20.01	-53.32	3b	I	1*	3b	Drought	
							25	90	65	75YR44						LMS	2	HR	M	N										
							90	120	30	75YR56						MCL	2	HR	M	N										
40	TM	44926 64702	16	0		CER	0	25	25	75YR32						MSL	5			N			6.525	-26.05	3a	III	2	3a	Drought	1>2,0>6
							25	50	25	10YR54	CF	10YR62			Y	HCL	2		P	N	F	Y								
							50	75	25	10YR66						HCL	10		M	M										
							75	120	45	10YR66						HCL	30		M	M										
41	TM	45000 64699	17	0		CER	0	25	25	75YR32						MSL	2	HR		N			21.15	-19.3	3a	I	1	3a	Drought	0>2
							25	50	25	75YR44						MSL	2	HR	M	N										
							50	120	70	75YR66						MSL	10	HR	M	N										
42	TM	45099 64699	18	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
							25	45	20	75yr44						LMS	5	HR	G	N										
							45	120	75							IMP														Compaction
43	TM	45199 64700	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
							25	45	20	75yr44						LMS	5	HR	G	N										
							45	120	75							IMP														Compaction
44	TM	45300 64700	15	0		PGR	0	20	20	75YR42						LMS	2	HR		N			-18.24	-41.56	3b	I	1*	3b	Drought	
							20	50	30	75YR44						LMS	2	HR	M	N										
							50	70	20	75YR54						HCL	2	HR	M	N										
							70	90	20	75YR54	F	75YR62	F	75YR56	Y	HCL	2	CH	P	M		Y								
							90	120	30	75YR66						MSL	30	CH	M	V										
45	TM	45400 64700	15	0		CER	0	25	25	75YR32						LMS	2	HR		N			-30.03	-53.32	3b	I	1*	3b	Drought	
							25	70	45	75YR44						LMS	2	HR	M	N										
							70	80	10	75YR56						MSL	2	HR	M	N										
							80	100	20							MSL	20	HR	M											STONES
							110	120								IMP			P										
46	TM	45500 64700	14	0		CER	0	25	25	75YR32						LMS	2	HR					-63.2	-56.2	4	I	1*	4	Drought	
							25	50	25	75YR44						LMS	2	HR	M											
							50	70	20							MS	20	HR	P											Very compact and stony MS
							70	120								IMP			P										
47	TM	45600 64700	13	1	NE	CER	0	25	25	75YR32						LMS	2	HR		N			-30.975	-48	3b	I	1*	3b	Drought	
							25	50	25	75YR44						LMS	2	HR	M	N										
							50	85	35	75YR56						HCL	30	CH	M	N										
							85	105	20							HCL	50	CH	M											STONES

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								105	120								IMP			P											
48	TM	44862	64599	17	0		CER	0	25	25	75YR32						MSL	5	HR		N			18.97	-16.3	3a	I	1	3a	Drought	1>2,0>6
								25	50	25	75YR53						MSL	2	HR	M	N										
								50	120	70	75YR56						HCL	2	HR	M	N	C									
49	TM	44900	64599	17	0		CER	0	25	25	75YR32						MSL	5			N			6.55	-26.05	3a	III	2	3a	Drought	1>2,0>6
								25	50	25	10YR54	CF	10YR62			Y	HCL	2		P	N	F	Y								
								50	70	20	10YR66						HCL	10		M	M										
								70	120	50	10YR66						HCL	30		M	M										
50	TM	45000	64600	18	0		CFW	0	30	30	75yr42						LMS	10	HR		N			-76.8	-74.8	4	I	1*	4	Drought	recently established tree belt.
								30	50								LMS	20	HR	M	N										Stony
								50	120	90							IMP														
51	TM	45100	64600	18	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	pit showed platy structure LMS
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
52	TM	45200	64600	18	0		WHT	0	25	25	75yr32						LMS	10	HR		N			-64.5875	-61.15	4	I	1*	4	Drought	
								25	55	30	75yr44						LMS	5	HR	G	N										
								55	120	65							IMP														Compaction
53	TM	45292	64640	15	2	S	PGR	0	20	20	75YR42						LMS	2	HR		N			11.35	-23.92	3a	I	1*	3a	Drought	Heavily poached, near gate
								20	50	30	75YR56						MSL	2	HR	M	N										
								50	120	70	75YR66						MCL	2	HR	M	N										IMP @ 70cm for stone
54	TM	45399	64600	16	0		CER	0	25	25	75YR32						LMS	2	HR		N			-5.2	-50.38	3b	I	1*	3b	Drought	
								25	65	40	75YR54						LMS	2	HR	M	N										
								65	100	35	75YR54						MSL	2	HR	M	N										
								100	120	20	75YR66						MSL	10	CH	M	N										
55	TM	45500	64600	15	0		CER	0	25	25	75YR32						LMS	2	HR		N			-34.45	-53.32	3b	I	1*	3b	Drought	
								25	70	45	75YR44						LMS	2	HR	M	N										
								70	100	30	75YR54						MS	2	HR	M	N										
								100	120	20	75YR54						LMS	2	HR	M	N										
56	TM	45600	64599	15	1	E	CER	0	25	25	75YR32						LMS	2	HR		N			-9.82	-39.6	3b	I	1*	3b	Drought	
								25	50	25	75YR44						LMS	2	HR	M	N										
								50	90	40	75YR56						HCL	2	HR	M	N	F									
								90	120	30	75YR56	F	75YR51	F	75YR58	Y	C	2	HR	M	N	F	Y								

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
57	TM	44816	64509	17	0		CER	0	25	25	75YR32						MSL	5	HR		N			12.97	-23.96	3a	III	2	3a	Drought	0>2
								25	50	25	75YR62	CF	75YR58			Y	SCL	2	HR	M	N		N							
								50	60	10	75YR53	CF	75YR61	CF	75YR56	Y	HCL	2	HR	P	N		Y							
								60	80	20	75YR54	CF	75YR61	CF	75YR56	Y	C	2	HR	P	N	C	Y							
								80	120	40	10YR56						MSL	5	HR	M	N									
58	TM	44898	64499	17	1	S	CER	0	25	25	75YR32						MSL	5	HR		N			-0.78	-24.14	3a	III	2	3a	Drought	1>2,0>6
								25	35	10	75YR56						HCL	2	HR	M	N										Very saturated from surface
								35	90	55	75YR56	FF	10YR52			Y	C	2	HR	P	N	C	Y							
								90	120	30	75YR56						C	20	CH	M	M									
59	TM	45008	64500	19	0		CER	0	25	25	75YR32						LMS	5	HR		N			-24.9225	-58.74	4	I	1*	4	Drought	
								25	55	30	75YR44						LMS	5	HR	M	N										
								55	80	25	75YR64						MS	2	HR	M	N										
								80	90	10	75YR66						MS	2	HR	M	N										
								90	120	30	75YR56						MCL	2	CH	M	N										
60	TM	45099	64499	19	0		CER	0	25	25	75YR32						LMS	8	HR		N			-74.8	-72.8	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	50	5	75YR44						LMS	2	HR	P	N										
																	IMP													Compaction
61	TM	45200	64499	18	0		CER	0	25	25	75YR32						MSL	5	HR		N			-1.81	-26.9	3a	II	1	3a	Drought	
								25	45	20	75YR44						MSL	2	HR	M	N										
								45	60	15	75YR44						MSL	2	HR	P	N										
								60	120	60	10YR54	F	10YR62	F	10YR66	Y	HCL	2	HR	P	N		Y							
62	TM	45000	64400	19	0		CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										
								45	50	5	75YR54						LMS	5	HR	P	N										
																	IMP													Compaction
63	TM	45100	64400	18	0		CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										
																	IMP													Compaction
64	TM	45191	64399	17	0		CER	0	25	25	75YR32						MSL	2	HR		N			-63.2	-61.2	4	I	1	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	50	5	75YR44						LMS	2	HR	P	N										
																	IMP													Compaction
65	TM	45000	64400	18	0		CER	0	25	25	75YR32						LMS	5	HR		N			-78.32	-76.32	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
																	IMP													Compaction
66	TM	45100	64299	17	1	S	CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour		IMP	%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	Compaction
67	TM	45511 63390	6			Meadow	0	45	45	10YR43						LS	2	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	
						Habitat	45	75	30	10YR56						S	<1	HR	M	N										
						Creation	75	120	45	10YR68						S	<1	HR	M	N										
68	TM	45434 63499	1			Meadow	0	45	45	10YR22						SCL	<1	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	Highly organic/wet material
						Habitat	45	120	75	10YR21						LS	<1	HR	G	N										
						Creation																								
69	TM	45322 63599	6			Meadow	0	50	50	10YR53						LS	2	HR		V			-28.2745	-47.32	3b	I	1	3b	Drought	
						Grazing	50	65	15	10YR43						S	<1	HR	M	N										
							65	83	18	10YR36						S	<1	HR	M	N										
							83	120	37	10YR58						S	<1	HR	M	N										
70	TM	45322 63599	6			Meadow	0	15	15	10YR46						LS	<1	HR		N			-23.735	-43.155	3b	I	1	3b	Drought	
						Grazing	15	55	40	10YR32						LS	2	HR	G	M										
							55	65	10	10YR34						LS	<1	HR	G	N										
							65	90	25	10YR66						S	<1	HR	M	N										
							90	100	10	10YR56	C	2.5Y63	M	10YR58	Y	C	<1	HR	P	N										
							100	120	20	10YR66						S	<1	HR	M	N										
71	TM	44512 63700	7			Meadow	0	20	20	10YR43						LS	2	HR		N			-39.2725	-65.08	4	I	1	4	Drought	Flint; >2cm 1%
						Habitat	20	75	55	10YR56						S	2	HR	M	N										Flint; >2cm 1%
						Creation	75	110	35	2.5Y53	F	10YR56			Y	C	<1	HR	P	N		Y							
							110	120	10	2.5Y66						S	<1	HR	M	N										
72	TM	45022 63699	10			Meadow	0	42	42	10YR53						LS	2	HR		V			-65.874	-63.08	4	I	1	4	Drought	
						Habitat	42	54	12	10YR43						S	<1	HR	M	M										
						Creation	IMP																							STOP @ GRAVEL
73	TM	45122 63699	9			Meadow	0	42	42	10YR33						SL	2	HR		V			3.093	-21.652	3a	I	1	3a	Drought	
						Habitat	42	90	48	10YR54						LS	<1	HR	G	M										
						Creation	90	120	30	10YR34						S	<1	HR	M	N										
74	TM	45222 63699	11			Meadow	0	30	30	2.5Y64						LS	<1	HR		N			-6.135	-38.8	3b	I	1	3b	Drought	
						Habitat	30	110	80	10YR31						LS	<1	HR	G	N										
						Creation	110	120	10	10YR56						S	<1	HR	M	N										
75	TM	45322 63699	12			Meadow	0	50	50	10YR32						LS	2	HR		S			-28.515	-47.32	3b	I	1	3b	Drought	
						Habitat	50	95	45	10YR44						S	<1	HR	M	N										
						Creation	95	120	25	10YR54						S	<1	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
76	TM	44522 63799	8			Meadow	0	35	35	10YR43						LS	5	HR		N			-54.568	-46.618	4	II	1	4	Drought	Flint; >2cm 2%
						Habitat	35	43	8	10YR56						S	<1	HR	M	N									
						Creation	43	70	27	10YR53	M	7.5YR58			Y	SL	<1	HR	P	N		Y								STOP @ Gravel
							IMP																						
77	TM	44622 63799	13			Potatoes	0	50	50	10YR44						LS	2	HR		N			33.855	-23.56	3a	I	1	3a	Drought	Large flint on surface
							50	78	28	10YR46						SCL	<1	HR	G	N									
							78	120	42	10YR66						SCL	<1	HR	G	N									
78	TM	44722 63799	14			Potatoes	0	40	40	10YR43						SL	2	HR		N			-0.835	-17.66	3a	I	1	3a	Drought	
							40	60	20	10YR46						SL	<1	HR	G	N									
							60	120	60	10YR66						S	<1	HR	G	N									
79	TM	44822 63799				Cereals	0	50	50	10YR44						LS	5	HR		N			-30.414	-49.24	3b	I	1	3b	Drought	Large flint on surface
							50	72	22	10YR56						S	2	HR	G	N									
							72	120	48	10YR58						S	<1	HR	G	N									
80	TM	44922 63799	14			Cereals	0	50	50	10YR44						LS	5	HR		N			-31.305	-49.6	3b	I	1	3b	Drought	
							50	105	55	10YR56						S	5	HR	M	N									Flint; >2cm 2%
							105	120	15	10YR58						S	<1	HR	G	N									
81	TM	45022 63799	14			Cereals	0	45	45	10YR44						LS	5	HR		N			-56.48	-51.53	4	I	1	4	Drought	
							45	60	15	10YR34						LS	2	HR	G	N									
							IMP																						STOP @ GRAVEL
82	TM	45104 63807				Cereals	0	48	48	10YR32						LS	<1	HR		N			-39.961	-48.436	3b	I	1	3b	Drought	Flints on surface
							48	100	52	10YR56						S	5	HR	M	N									
							IMP																						STOP @ GRAVEL
83	TM	45151 63842	13			Spring	0	50	50	10YR33						LS	2	HR		N			-28.515	-47.32	3b	I	1	3b	Drought	Large flint on surface
						Onions	50	110	60	10YR64						S	<1	HR	G	N									
							110	120	10	2.5Y64						S	<1	HR	G	N									
84	TM	45267 63851	16			Spring	0	50	50	10YR32						LS	2	HR		S			-18.6325	-37.64	3b	I	1	3b	Drought	Large flint on surface
						Onions	50	75	25	10YR43						LS	2	HR	G	N									
							75	90	15	10YR56						S	<1	HR	M	N									
							90	120	30	2.5Y64						S	<1	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
85	TM	44822	63899	16			Cereals	0	50	50	10YR34						LS	5	HR		N			-7.9925	-38.465	3b	I	1	3b	Drought	Flint; >2cm 2%
								50	65	15	10YR46						LS	5	HR	G	N										
								65	110	45	10YR56						SC	2	HR	M	N	Y									
								IMP																						STOP @ GRAVEL
86	TM	44922	63899	17			Cereals	0	40	40	10YR44						LS	5	HR		N			-67.9825	-64.99	4	I	1	4	Drought	Flint; >2cm 2%
								40	55	15	10YR46						S	1	HR/CH	G	S										Some chalk present
								IMP																						STOP @ GRAVEL
87	TM	45022	63899	17			Cereals	0	45	45	10YR33						LS	<1	HR		N			-55.78	-49.84	4	I	1	4	Drought	Large flint on surface
								45	70	25	10YR46						S	2	HR	M	N										
								IMP																						STOP @ GRAVEL
88	TM	45122	63899	15			Spring	0	40	40	10YR33						LS	2	HR		N			-27.3675	-52.685	3b	I	1	3b	Drought	
							Onions	40	55	15	10YR44						LS	<1	HR	G	N										
								55	90	35	10YR56	F	10YR43				S	2	HR	M	N										Flint; >2cm 2%
								90	120	30	10YR76	F	10YR58				S	<1	HR	G	N										
89	TM	45222	63899	14			Spring	0	45	45	10YR32						LS	2	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	Flint; >2cm 1%
							Onions	45	85	40	10YR34						S	<1	HR	M	N										
								85	120	35	2.5Y66						S	<1	HR	G	N										
90	TM	45281	63911	14			Spring	0	45	45	10YR33						SL	<1	HR		N			-22.975	-31.87	3b	I	1	3b	Drought	Large flint on surface
							Onions	45	80	35	10YR44						S	<1	HR	M	N										
								80	100	20	7.5YR44	F	7.5YR56				S	<1	HR	M	N										
								IMP																						STOP @ GRAVEL
91	TM	45122	63999	17			Onions	0	40	40	10YR43						SL	2	HR		N			-16.395	-37.64	3b	I	1	3b	Drought	Flint; >2cm 1%
								40	70	30	10YR54						S	2	HR	M	N										Flint; >2cm 1%
								70	95	25	10YR58	F	10YR43				S	2	HR	M	N										
								95	110	15	10YR58						SCL	2	HR	M	N	Y									
								IMP																						STOP @ GRAVEL
92	TM	45230	63978	15			Onions	0	45	45	10YR43						SL	2	HR		N			-13.785	-32.59	3b	I	1	3b	Drought	Flint; >2cm 1%
								45	70	25	10YR56						S	<1	HR	M	N										
								70	120	50	10YR58						S	<1	HR	M	N										
93	TM	45122	64099	20			Grazing	0	45	45	10YR44						SL	<1	HR		N			-13.725	-32.47	3b	I	1	3b	Drought	
								45	80	35	7.5YR44						S	5	HR	M	N										Flint; >2cm 2%
								80	120	40	10YR56						S	<1	HR	M	N										
94	TM	45222	64099	16			Grazing	0	45	45	10YR43						SL	1	HR		N			-11.27	-32.47	3b	I	1	3b	Drought	
								45	80	35	7.5YR44						S	5	HR	M	N										Flint; >2cm 2%

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							80	110	30	10YR66						S	5	HR	M	N									Flint; >2cm 2%
							110	120	10	10YR54						C	5	HR	M	N									
95	TM	45122 64199	16			Grazing	0	50	50	10YR43						SL	1	HR		N			14.5375	-7.12	2	I	1	2	Drought	Flint; >2cm 1%
							50	85	35	10YR44						SL	1	HR	G	N									
							85	110	25	10YR56						S	2	HR	M	N									Flint; >2cm 1%
							IMP																						STOP @ Gravel
96	TM	45222 64199	16			Grazing	0	40	40	10YR43						SL	2	HR		N			17.985	-12.76	2	I	1	2	Drought	Flint; >2cm 2%
							40	50	10	10YR44						SL	2	HR	M	N	Y								Flint; >2cm 2%
							50	75	25	10YR54						SL	10	CH/HI	G	V									Flint; >2cm 2%
							75	90	15	10YR56						SL	2	CH/HI	G	V									
							90	120	30	10YR66						S	<1	CH/HI	M	V									
97	TM	45322 64199	14			Grazing	0	45	45	10YR43						SL	2	HR		N			22.71	-7.84	2	I	1	2	Drought	
							45	90	45	10YR44						SL	<1	HR	G	N									
							90	120	30	10YR56						S	2	HR	M	N									
98	TM	45222 64299	17			Grazing	0	40	40	10YR43						SL	1	HR		N			-15.054	-22.852	3a	I	1	3a	Drought	
							40	58	18	10YR44						SL	<1	HR	M	N									
							58	102	44	10YR56						S	5	HR	M	N									Flint; >5cm 1%
							IMP																						STOP @ GRAVEL
99	TM	45322 64199	15			Grazing	0	40	40	10YR43						SL	1	HR		N			11.685	-7.12	2	I	1	2	Drought	Flint; >5cm 1%
							40	75	35	10YR44						SL	<1	HR	G	N									
							75	120	45	10YR56						S	<1	HR	M	N									
100	TM	45501 63100	16	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-36.145	-54.19	3b	I	1	3b	Drought	
							25	35	10	75YR54						LMS	5	CH	M	M									
							35	55	20	7.5YR66						LMS	2	HR	M	M									
							55	80	25	10YR54						LMS	2	HR	M	N									
							80	120	40	7.5YR66						MS	0		M	N									
101	TM	45598 63100	14	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-38.96	-58.22	4	I	1	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	70	25	7.5YR44						MS	2	HR	M	N									Band of flint at 70 cm
							70	120	50	7.5YR66						MS	2	HR	M	N									
102	TM	45197 62989	15	2	W	WHT	0	25	25	7.5YR54						LMS	2	HR		N			-38.96	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR54						LMS	2	HR	M	N									
							45	70	25	7.5YR54						MS	2	HR	M	N									
							70	120	50	7.5YR66						MS	2	HR	M	N									
103	TM	45299 63000	17	0		WHT	0	25	25	7.5YR32						LMS	8	HR		N			-29.76	-48.48	3b	I	1*	3b	Drought	
							25	50	25	7.5YR54						LMS	8	HR	M	N									
							50	70	20	7.5YR53	CF	7.5YR68	CF	7.5YR62	Y	C	2	HR	P	N		Y							

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							70	95	25	7.5YR53	CF	7.5YR68	CM	7.5YR52		C	12	CH	M	M	F								
							95	115	20							C	20	CH	M										
							115	120								IMP			P										
104	TM	45398 63002	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-36.235	-55.46	4	I	1*	4	Drought	
							25	60	35	7.5YR54						LMS	2	HR	M	N									
							60	110	50	7.5YR56						MS	5	HR	M	N									
							110	120	10	10YR61	FC	10YR56			Y	C			P	N	F	Y							
105	TM	45488 62999	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	60	15	5YR44						MS	2	HR	M	N									
							60	120	60	7.5YR54						MS	2	HR	M	N									
106	TM	45596 63002	14	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-41.43	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	70	25	7.5YR44						MS	2	HR	M	N									
							70	100	30	7.5YR66						MS	2	HR	M	N									
							100	120	20							MS	20	HR	M										Flints
107	TM	44997 62877	11	4	NNW	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-54.35	-60.18	4	I	1*	4	Drought	
							25	35	10	7.5YR43						LMS	2	HR	M	N									
							35	70	35	7.5YR56						MS	2	HR	M	N									
							70	80	10	10YR62	CM	10YR56			Y	C	2	HR	P	N		N							
							80	90	10	7.5YR66						MS	2	HR	M	N									
							90	120								IMP			P										Sandstone
108	TM	45103 62901	11	3	NE	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-49.43	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	60	15	7.5YR44						MS	2	HR	M	N									
							60	100	40	7.5YR66						MS	2	HR	M	N									
							100	120								IMP			P										Sandstone
109	TM	45199 62900	13	2	WSW	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-51.885	-58.22	4	I	1*	4	Drought	
							25	40	20	7.5YR43						LMS	2	HR	M	N									
							40	90	50	7.5YR66						MS	2	HR	M	N									
							90	120								IMP			P										Sandstone
110	TM	45318 62898	15	2	SSE	WHT	0	25	25	7.5YR32						MSL	8	HR		N			-7.815	-29.89	3a	II	1	3a	Drought	
							25	50	25	7.5YR44						MSL	8	HR	M	N									
							50	65	15	7.5YR54						LMS	2	HR	M	N									
							65	95	30	10YR64		10YR62				C	2	HR	M	N	C	Y?							
							95	115	20							C	20	HR	M										Flints
							115	120								IMP			P										
111	TM	45399 62901	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
							25	60	35	7.5YR43						LMS	2	HR	M	N									
							60	120	60	7.5YR66						MS	2	HR	M	N									
112	TM	45502 62897	17	0		WHT	0	25	25	7.5YR32						LMS	8	HR		N			-67.2	-61.8	4	I	1*	4	Drought	
							25	50	25	7.5YR43						LMS	5	HR	M	N									
							50	70	20							MS	20	HR	M										Flints
							70	120								IMP			P										
113	TM	45601 62900	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-64.8	-59.4	4	I	1*	4	Drought	Close to depression
							25	50	25	7.5YR43						LMS	2	HR	M	N									
							50	70	20							MS	20	HR	M										Flints
							70	120								IMP			P										
114	TM	45698 62897	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-40.025	-58.7	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	55	10	7.5YR44						MS	2	HR	M	N									
							55	65	10	7.5YR44						MS	10	HR	M	N									
							65	120	55	7.5YR66						MS	2	HR	M	N									
115	TM	45211 62813	14	2	W	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
							25	60	35	7.5YR44						LMS	2	HR	M	N									
							60	100	40	5YR54						MS	2	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								100	120	20	7.5YR66						MS	2	HR	M	N										
116	TM	45300	02800	17	1	W	WHT	0	25	25	7.5YR43						LMS	2	HR		N			-17.07	-59.2	4	I	1*	4	Drought	
								25	40	15	7.5YR44						LMS	2	HR	M	N										
								40	80	40	7.5YR64						MS	2	HR	M	N										
								80	120	40	7.5YR64						MSL	2	HR	M	N										
117	TM	45400	62800	17	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-36.375	-57.02	4	I	1*	4	Drought	
								25	60	35	7.5YR44						LMS	5	HR	M	N										
								60	110	50	7.5YR66						MS	2	HR	M	N										
								110	120	10	7.5YR54						C	2	HR	M	N										
118	TM	45499	62797	17	0		WHT	0	25	25	7.5YR32						MSL	8	HR		N			-18.6825	-40.76	3b	III	2	3b	Drought	
								25	55	30	7.5YR44						LMS	5	HR	M	N										
								55	120	65	7.5YR54	FF	7.5YR62	FF	7.5YR56	Y	C	2	HR	P	N	F	Y								
119	TM	45599	62799	17	0		WHT	0	25	25	7.5YR32						MSL	2	HR		N			-28.84	-33.23	3b	I	1	3b	Drought	
								25	55	30	7.5YR44						LMS	2	HR	M	N										
								55	70	15	7.5YR66						C	2	HR	M	N										
								70	110	40	7.5YR66						MS	2	HR	M	N										
								110	120								IMP			P											
120	TM	45699	62799	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-41.52	-59.2	4	I	1*	4	Drought	
								25	40	15	7.5YR43						LMS	2	HR	M	N										
								40	80	40	7.5YR54						MS	2	HR	M	N										
								80	90	10	10YR64	FF	10YR62	FF	10YR66		MS	2	HR	M	N	F										
								90	120	30	7.5YR54						MS	8	HR	M	N										
121	TM	45400	62699	17	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-13.835	-55.06	4	I	1*	4	Drought	
								25	60	35	7.5YR44						LMS	5	HR	M	N										
								60	80	20	7.5YR64						LMS	2	HR	M	N										
								80	120	40	7.5YR54	C	10YR56			Y	MSL	2	HR	M	N										
122	TM	45504	62698	16	0		WHT	0	25	25	7.5YR32						MSL	5	HR		N			-45.765	-45.44	3b	I	1	3b	Drought	
								25	65	40	7.5YR44						LMS	2	HR	M	N										
								65	85	20							LMS	20	HR	M											Flints (3 attempts)
								85	120								IMP			P											
123	TM	45504	62698	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-6.645	-41.56	3b	I	1*	3b	Drought	
								25	50	25	7.5YR44						LMS	2	HR	M	N										
								50	95	45	7.5YR66						MSL	2	HR	M	N										
								95	115	20							MSL	20	HR	M											
								115	120								IMP			P											
124	TM	45699	62699	17	0		WHT	0	25	25	7.5YR32						MSL	10	HR					2.125	-20.75	3a	II	1	3a	Drought	
								25	60	35	7.5YR43						MSL	5	HR	M											
								60	100	40	10YR64	FF	10YR62	FF	10YR66		C	2	HR	M		F	Y?								
								100	120	20							C	20	HR	M											
125	TM	45499	62599	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
								25	45	20	7.5YR43						LMS	2	HR	M	N										
								45	120	75	7.5YR66						MS	2	HR	M	N										
126	TM	45599	62599	15	1	S	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
								25	45	20	7.5YR43						LMS	2	HR	M	N										
								45	120	75	7.5YR66						MS	2	HR	M	N										
127	TM	45684	62602	16	1	S	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
								25	60	35	7.5YR43						LMS	2	HR	M	N										
								60	120	60	7.5YR66						MS	2	HR	M	N										

APPENDIX B

Soil Stripping Method

This annex presents the methods for the following:

1. Treatment of existing vegetation
2. Access routes
3. Topsoil stripping
4. Subsoil stripping

Existing Vegetation

Woodlands/hedges shall be pre-treated before soil stripping, in two stages:

- Each tree shall be felled and removed from site, including all branches/brash;
- Tree stumps and associated large roots (>20mm diameter) shall be lifted using a suitable excavator.

All woody materials (tree trunks, stumps, branches and brash, etc), including wood chippings, shall be removed from the area being stripped and will be managed in accordance with the Site Waste Management Plan.

Woody materials shall not be incorporated with the soils during stripping. This includes any chippings left on the surface after recent woodland/hedges clearance works.

Any temporary stockpiles of woody materials shall be constructed with a small 'core' to minimise the risk of spontaneous combustion and monitored as appropriate.

Other vegetation will be cleared using an appropriate method. All arisings will be removed prior to soil stripping commencing.

Access routes

Access to each area/compartment to be stripped shall be created by stripping the topsoil, followed by subsoil, to expose the 'basal layer'. The intention is that the receiving dump truck for the rest of the area/compartment shall run on the basal layer to prevent damage to the topsoil or subsoil.

Access shall be created wide enough to permit access for the dump trucks which shall transport the stripped soils to the storage area.

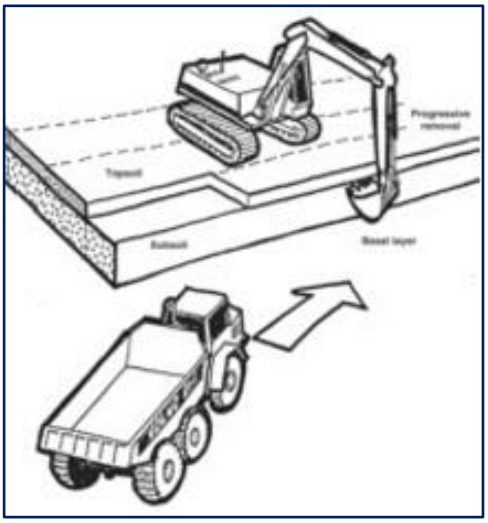
Topsoil and Subsoil Stripping

In advance of stripping the topsoil it shall be cleared of all foreign matter or waste materials e.g. building rubble and fill materials.

Topsoil and subsoil (separately or as mixed layers depending on the end use required for those materials) shall be stripped using ~~a~~ hydraulic ~~excavator~~excavators or tracked ~~dozer~~dozers and transported using dump trucks (unless being stockpiled to one side of the construction area) in accordance with the guidance set out in MAFF (2000), as summarised below. Low ground pressure plant will be used, as far as is practicable, where the soil condition (texture and plasticity) is such that the soil resource is susceptible to damage.

Where a hydraulic excavator is used (fitted with a flat-edged grading bucket), it shall stand on the surface of the topsoil or subsoil, digging into the layer to its maximum depth before loading it into a dump truck. See Figure B1 below (showing topsoil stripping).

Figure B1 – Topsoil Stripping using hydraulic excavator and dump truck



Where a tracked dozer is used it shall run on the surface of the subsoil and push up the topsoil / run on the basal layer and push up the subsoil in a single pass into a temporary row at the end of its run. Using a hydraulic excavator, the stripped material shall be loaded onto a dump truck for transportation to the designated stockpile location (see figures B2 and B3 below).

Figure B2 – Soil stripping with bulldozers and dump trucks: the bed and segment system

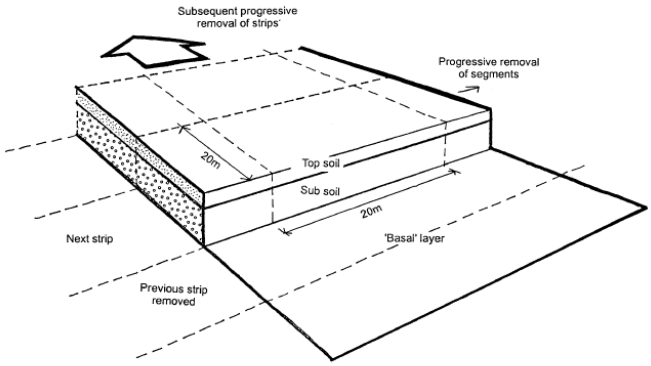
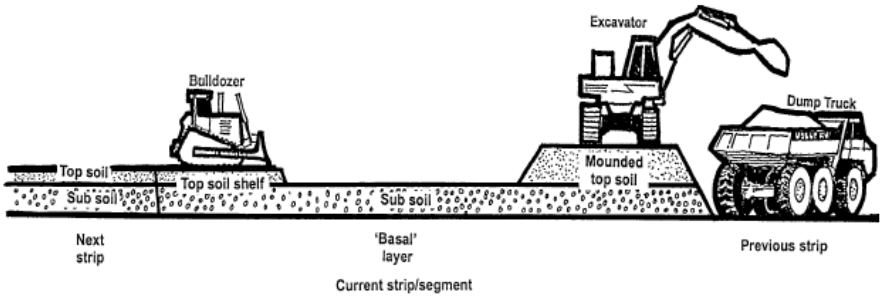


Figure B3 – Soil stripping with bulldozers and dump trucks: Topsoil



The depth of strip shall be as set out in the SRP. Some variation in topsoil depths is expected and therefore some discretion shall be made by the machine operator (based on soil colour and/or firmness) during the topsoil strip to maximise topsoil recovery without compromising the quality of the soil resource.

Once loaded, the dump truck shall transport the topsoil along the pre-designated access route to the desired stockpile location.

These operations shall be closely monitored to ensure that the correct soil type is recovered without the inclusion of other soils or wastes.

APPENDIX C

Field Assessment of Soil Plasticity

This annex presents the method for assessing the plasticity (consistency) of soils in the field. This method is to be used to assess soil plasticity at all pertinent stages of the earthworks programme including:

- In-situ before/during soil stripping
- Storage stockpiles (non-plastic soils only)
- Reconditioning windrows
- During soil re-spreading and decompaction/cultivation operations.

The procedure is outlined as:

- Walkover/visual examination
- Soil sampling
- Sample assessment

Walkover/visual examination

The assessor shall first walk over or along the area/field or stockpile/windrow to be assessed in order to identify any apparent significant variability (e.g. evidence of poaching incidents of surface water ponding saturated soils, or distribution of moisture loving plant species such as *Juncus*) and to identify suitable locations for sampling.

In addition to any areas identified from the walkover any locations likely to display varying plasticity to the majority (low lying spots, the base of stockpiles/windrows etc) shall be accounted for when sampling.

Site observations relating soil moisture content and soil plasticity and the distribution of any significant variability shall be recorded.

Soil Sampling

For undisturbed areas, the topsoil and upper subsoil shall be sampled at representative locations using an Edelman soil auger. Separate samples from each soil layer shall be taken from their full depth.

For stockpiles and windrows, the soil shall be sampled at representative locations using an Edelman soil auger from 0.0m to 0.5m and 0.5m ~~top~~to 1.0m. Where deemed necessary by the Site Soil Scientist, samples from greater depths shall obtained using a suitable sized mechanical excavator.

For each layer approximately, a double handful of soil shall be collected and mixed up in a suitable container.

A minimum of 5 No. locations shall be sampled and assessed per field or stockpile/windrow.

Sample Assessment

The test sample (small handful) shall be taken from the collected sample and prepared for assessment by removing stones and vegetation including all roots greater than 1mm. Any significant quantity of very fine roots (<1mm) shall be removed.

The test sample shall be kneaded to break down any structure and ensure the mass is all at the same moisture content and assessed in accordance with the table below.

Table 1

If the soil sample is wet, films of water are visible on the surfaces of grains and aggregates and/or when a soil sample is squeezed in the hand and it readily deforms into a cohesive "ball".	HANDLING NOT RECOMMENDED – IF HANDLED STOCKPILED MATERIAL TO BE RECORDED AS PLASTIC
Peds (structures) break up/crumble readily when squeezed in the hand rather than forming into a ball.	HANDLING OK

If the sample is moist, there is a slight dampness when squeezed between the fingers, but it does not significantly change colour (darken) on further wetting	NO HANDLING BY DOZERS BUT MAY BE HANDLED BY TRACKED EXCAVATORS IF CONSISTENCY TEST IS PASSED
If the sample is dry and brittle it will look dry and change colour (darken) if water is added	HANDLING OK IF CONSISTENCY TEST IS PASSED

Consistency Test

Attempt to mould a soil sample into a ball by hand:

Table 2

Impossible because the soil is too hard (dry)	HANDLING OK
Impossible because the soil is too loose (dry)	HANDLING OK
Impossible because the soil is too loose (wet)	HANDLING NOT RECOMMENDED – IF HANDLED STOCKPILED MATERIAL TO BE RECORDED AS PLASTIC

Possible	GO TO TABLE BELOW

Attempt to roll the ball into a thread of 3mm diameter on a flat non-adhesive surface using light pressure from the flat of the hand:

Table 3

Impossible; the soil crumbles or disintegrates	HANDLING OK
Possible	HANDLING NOT RECOMMENDED – IF HANDLED STOCKPILED MATERIAL TO BE RECORDED AS PLASTIC

APPENDIX D

Soil Stockpiling Method

Introduction

This annex presents the methods for the storage (stockpiling) of soils. All soil materials shall be stored in stockpiles following the method presented here.

Soils shall be stored in area(s) of the site where they will not interfere with other site operations so that they can be left undisturbed during other construction activities.

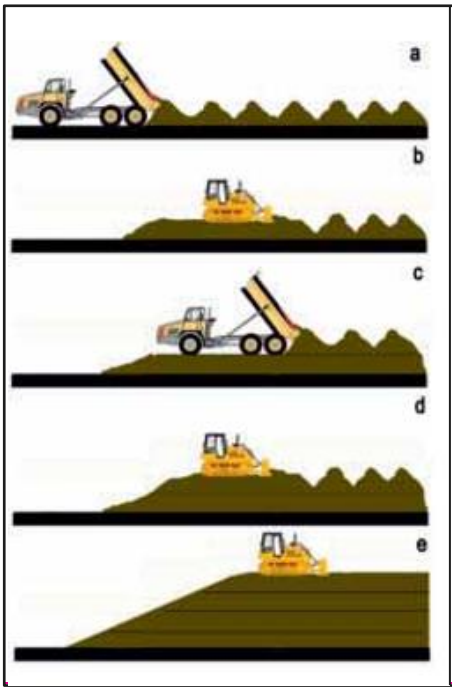
The area(s) designated for soil storage shall be cleared of vegetation and stripped, where required, ahead of stockpile construction. For the topsoil stockpile, which will be created on top of in situ topsoil, a marker layer of straw will first be placed to ensure, at the time of soil recovery, it is clear where the base of the stockpiled material lies.

Prior to storage, the consistency of each soil shall be assessed in-situ to determine soil consistency using the method provided in Annex C. All soils shall be stored using the following method, but soils found to be non-plastic shall be handled and stored separately to plastic soils.

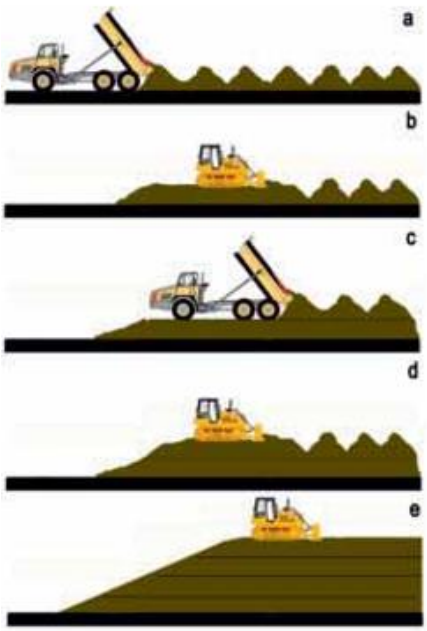
Stockpiling Method

The *Stockpiling Method* illustrated in Figure D1 below shall be used to store non-plastic soils, or plastic soils, unless otherwise agreed in the final Soil Management Plans.

Figure D1 – Stockpiling Method



~~The process requires the soil to be transported to the storage area in a dump truck, and 'loose tipped' in a line of heaps to form a windrow (a).~~
~~Once the heaps cover the storage area, a tracked dozer (e.g. D6 Caterpillar) shall level the heaps to form a level, stable platform for dump trucks to travel across to tip a second layer of topsoil. (b and c) This sequence shall be repeated until the maximum stockpile height is achieved (d).~~
~~Assuming that the topsoil is reasonably dry and friable during the stripping and storage operation, it shall be heaped to its maximum permitted height for this site.~~
~~To protect from wet weather once the final height is achieved, the excavator or blade shall regrade the sides and top of the stockpile to firm the surface by tracking across it to form a smooth gradient. The aim is to seal in the dry topsoil and reduce rainfall/infiltration and stabilise the surface (e).~~
~~Once the stockpile has been completed, the area shall be cordoned off to prevent any disturbance or contamination by other construction activities.~~
~~Emergent vegetation resulting from seeding/hydroseeding shall be managed to a maximum height of 300mm and not allowed to 'set seed'.~~



The process requires the soil to be transported to the storage area in a dump truck, and 'loose tipped' in a line of heaps to form a windrow (a). Once the heaps cover the storage area, a tracked dozer (e.g. D6 Caterpillar) shall level the heaps to form a level, stable platform for dump trucks to travel across to tip a second layer of topsoil. (b and c) This sequence shall be repeated until the maximum stockpile height is achieved (d). Low ground pressure plant will be used, as far as is practicable, where the soil condition (texture and plasticity) is such that the soil resource is susceptible to damage.

Assuming that the topsoil is reasonably dry and friable during the stripping and storage operation, it shall be heaped to its maximum permitted height for this site.
To protect from wet weather once the final height is achieved, the excavator or blade shall regrade the sides and top of the stockpile to firm the surface by tracking across it to form a smooth gradient. The aim is to seal in the dry topsoil and reduce rainfall/infiltration and stabilise the surface (e).
Once the stockpile has been completed, the area shall be cordoned off to prevent any disturbance or contamination by other construction activities.
Emergent vegetation resulting from seeding/hydroseeding shall be managed to a maximum height of 300mm and not allowed to 'set seed'.

This method enables soil to be stored with a minimum footprint with a maximum stockpile core volume. This reduces the soils exposure to precipitation and ensures that non-plastic soils are kept dry and their quality is maintained during the storage period.

Plastic soils stored using this method will remain in a plastic state until they have been reconditioned successfully by using the *Soil Reconditioning Method* (**Appendix E**).

APPENDIX E

Soil Reconditioning Method

Introduction

This annex presents the methods for reconditioning plastic soils. All topsoil and subsoil which are plastic in consistency shall be reconditioned using the method presented here.

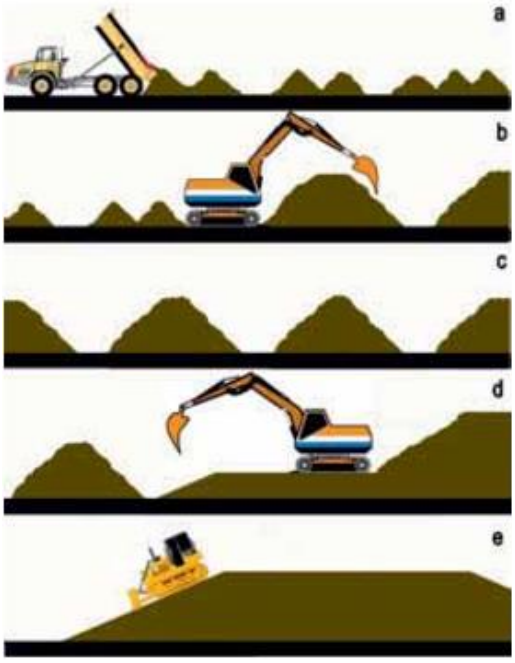
Soils shall be reconditioned in area(s) of the site where they will not interfere with other site operations so that they can be left undisturbed by other construction activities.

The area(s) designated for soil reconditioning shall be cleared of its' vegetation and stripped of topsoil and subsoil (see Annex B) ahead of soil reconditioning activities.

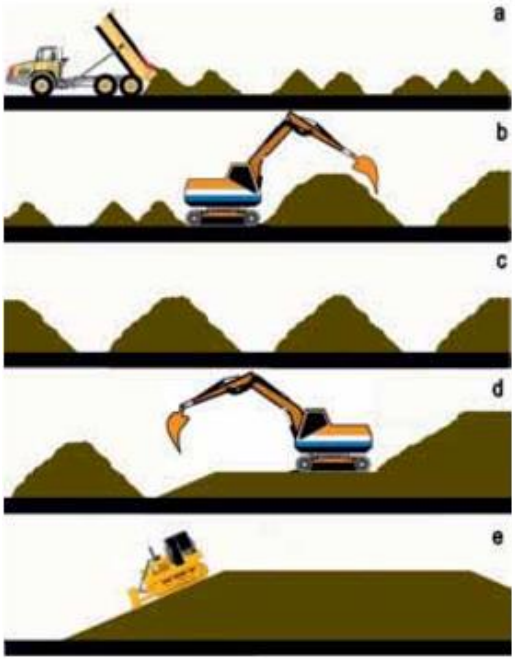
Soil Reconditioning Method

The Soil Reconditioning Method illustrated in Figure E1 below shall be applied to recondition plastic soils in windrows. The method below shows re-stockpiling of soils; once reconditioned soils can also be used in restoration immediately.

Figure E1 – Stockpiling Method 2



~~Excavate soil from existing stockpile using a hydraulic excavator fitted with a toothed bucket. Load into dump truck and move to reconditioning area.~~
~~The soil is tipped in a line of heaps to form a 'windrow', starting at the furthest point in the storage area and working back toward the access point (a).~~
~~Any additional windrows are spaced sufficiently apart to allow tracked plant to gain access between them so that the soil can be heaped up to a maximum height of approximately 2m (b). To avoid compaction no machinery, even tracked plant, traverses the windrow.~~
~~Once the soil has dried out and is non-plastic in consistency (this usually requires several weeks of dry and windy or warm weather and for the windrows to be turned at least once), (c) the windrows are combined to form large stockpiles to the maximum height for this site using a tracked excavator (d).~~
~~The surface of the stockpile is then regarded and compacted (e) by a tracked machine (dozer or excavator) to reduce rainwater infiltration.~~



Excavate soil from existing stockpile using a hydraulic excavator fitted with a toothed bucket. Load into dump truck and move to reconditioning area.
The soil is tipped in a line of heaps to form a 'windrow', starting at the furthest point in the storage area and working back toward the access point (a).
Any additional windrows are spaced sufficiently apart to allow tracked plant to gain access between them so that the soil can be heaped up to a maximum height of approximately 2m (b). To avoid compaction no machinery, even tracked plant, traverses the windrow.
Once the soil has dried out and is non-plastic in consistency (this usually requires several weeks of dry and windy or warm weather and for the windrows to be turned at least once), (c) the windrows are combined to form large stockpiles to the maximum height for this site using a tracked excavator (d).
The surface of the stockpile is then regarded and compacted (e) by a tracked machine (dozer or excavator) to reduce rainwater infiltration.
Low ground pressure plant to be used if required (see paragraph 6.5.1).

This method enables soil to be stored with a minimum footprint with a maximum stockpile core volume. This reduces the soils exposure to precipitation and ensures that non-plastic soils are kept dry and their quality is maintained during the storage period.

APPENDIX F

Soil Placement

This annex presents the methods for the placement of the soils for site restoration/reinstatement (overburden, topsoil and subsoil). It comprises the following:

1. Soil handling considerations;
2. Placement and treatment of overburden;
3. Subsoil and topsoil placement and spreading;
4. Cultivations and monitoring.

As per paragraph 6.5.1, low ground pressure plant will be used in the steps set out below, as far as is practicable, where the soil condition (texture and plasticity) is such that the soil resource is susceptible to damage.

Soil Handling Considerations

For the duration of the soil works, the following soil handling recommendations shall be followed. It is important to avoid further physical degradation during all phases of soil placement and handling (e.g. re-spreading/placement, overburden ripping/subsoiling and topsoil cultivation). As a consequence, soil handling operations shall be carried out when soil is non-plastic in consistency.

In particular, it is important to ensure that the soils are not unnecessarily compacted by trampling or trafficking by site machinery. In addition, soil handling shall be stopped during and after heavy rainfall, and not continue until the soil is again non-plastic in consistency.

If, during the course of the earthworks, the soil is structurally damaged, it will be important to ensure that it is suitably cultivated to relieve the compaction and restore the structure.

To maximise the effectiveness of the cultivation, all tillage operations (overburden ripping, subsoiling and topsoil cultivations) should be carried out when the soils being worked are non-plastic in consistency.

Placement and Treatment of Overburden

To achieve appropriate loosening of the overburden material over large accessible areas, a heavy duty subsoiler/ripper fixed to a tracked dozer will be used (D8 or equivalent). Where access is limited, a single rigid tine fitted to a hydraulic excavator is appropriate.

Overburden ripping depth shall be to 0.4m, with tine spacing at a maximum of 1m centres. Any oversized rocks (greater than 0.2m diameter) that are uplifted to the soil surface during ripping will be picked and removed for use as infill elsewhere.

To maximise drainage potential, ripping shall include a straight run across the width of the field/compartment at an angle of approximately 45° to any slope followed by a subsequent oblique pass. If assessed as necessary by the Site Soil Scientist, a third pass shall be run at an angle of 90° to the first pass to ensure that there are no remaining blocks of unbroken compacted soil. Once ripping is complete, the placement of subsoil, followed by topsoil can take place.

Placement of soil layers

An indicative sequential approach for replacement of the required layers for each soil profile in each field/compartment (agricultural and non-agricultural areas) is outlined below:

Subsoil Placement

Remove subsoil from stockpiles using hydraulic excavator fitted with toothed bucket to avoid excessive smearing. Transport with dump truck to the appropriate reinstatement/restoration compartment.

The dump truck shall transport the subsoil to the desired location and tip it in a line of heaps. It shall then be spread by either a tracked dozer or second tracked excavator.

Subsoil depths to be checked by Site Soil Scientist to ensure correct subsoil depth is achieved across the entire field/compartment.

Topsoil Spreading

Once satisfactory subsoil placement has been achieved, topsoil shall be removed from stockpiles and spread in the field/compartment, following the same procedures for subsoil above.

Topsoil depths to be checked by Site Soil Scientist to ensure correct topsoil depth is achieved across the entire field/compartment.

Cultivations and Monitoring

Once the soil profile has been formed, an appropriate tracked machine or tractor fitted with a wing-tine subsoiler shall be used for loosening the subsoil (subsoiling). For inaccessible areas, a suitable tracked excavator, fitted with a single rigid tine (ripper tooth) shall be used.

The soil profile should be loosened by subsoiling to a minimum depth of 0.6m below surface level at maximum 0.6m centres.

To maximise drainage potential, subsoiling shall include a straight run across the width of the field/compartment at an angle of approximately 45° to any slope followed by a subsequent oblique pass. If assessed as necessary by the Site Soil Scientist, a third pass shall be run at an angle of 90° to the first pass to ensure that there are no remaining blocks of unbroken compacted soil.

To be fully effective, this shall be carried out when soils are dry and friable to the full depth of working. Otherwise the tine merely cuts and smears the soil rather than lifting, fracturing and loosening it.

After subsoiling the Site Soil Scientist shall assess the subsoil layer to check the effectiveness of the operation.

If the subsoil is found to be compacted, it shall be re-ripped to loosen any residual panning.

Provided the physical condition of the subsoil is acceptable, the topsoil is to be cultivated to its full depth using appropriate tillage equipment (e.g. chisel plough, power harrow or set of discs) to break down any large, compacted lumps to produce a suitable tilth. This operation will also help to re-aerate the topsoil after storage. Repeat cultivation may be required to break down larger clods and achieve a suitable tilth.

Where access is limited, the topsoil may be cultivated using a landscape rake attachment fitted to a suitable hydraulic excavator.

Only when the soil has lost any sour odour and grey coloration will it be satisfactory.

Any undesirable material brought to the surface during this exercise shall be removed by picking or raking. For example, stones, fill materials and coarse vegetation larger than 50mm in any dimension.

After topsoil cultivation, the Site Soil Scientist shall assess the topsoil horizon to check the effectiveness of the operation.

If the topsoil is found to compacted or shows signs of anaerobism, it shall be re-cultivated to a suitable depth to eliminate any remaining compaction and assist the re-aeration process.

APPENDIX G

Soil Stockpile/Windrow Inspection Checklist

This annex presents the considerations for assessing the soil storage stockpiles.
All soil stockpiles shall be inspected during their construction and once completed. Afterwards each stockpile shall be inspected monthly.

Inspection checklist – during stockpile and window construction

The inspection checklist during stockpile and window construction shall include but may not be limited to the following:

Inspection Detail – During Stockpile / Window Construction	
1	Stockpile/window construction operations to ensure that a single soil type is stores per stockpile / windrow.
2	Soil plasticity to ensure non-plastic and plastic and plastic soils are properly segregated.
3	Non-compliant stockpile/windrow construction methods or machinery which cause additional or avoidable compaction or loss of soil structure.
4	Any signs of inappropriate vehicle tracking, indicating inappropriate access and trafficking, causing additional unnecessary compaction.
5	Stockpile surface following temporary or final sealing to ensure successful restriction of water infiltration.
5a	Windrow surface left rough/uneven to encourage drying.
6	Any locations where boundaries between segregated soil stockpiles/windrows have become amalgamated, causing contamination of one soil type with another.

Inspection checklist – after stockpile or windrow completion

The inspection checklist after stockpile/windrow construction will include but may not be limited to the following:

Inspection Detail – During Stockpile / Window Construction	
1	Any locations where boundaries between segregated soil stockpiles/windrows have become amalgamates, causing contamination of one soil type with another.
2	Vegetation – any plants over ~~300mmm~~300mm height or beginning to develop seeds.
3	Identification of any unacceptable weed colonisation.
4	Any signs of surface soil erosion – caused by surface water runoff or wind, or any locations of surface water pending indicating that stockpile is not shedding water correctly.
5	Any signs of water surface water run-off or soil wash out from the stockpiles.
6	Any signs of inappropriate vehicle tracking, indicating inappropriate access and trafficking, causing additional unnecessary compaction.
7	Monitor plasticity of reconditioning soil within windows to depth of 1m.

APPENDIX H

List of Data to be included in Soil Stripping/Stockpiling Documentation and Database

No	Information to be Recorded	Cross Reference
	All In-situ Soils	
1	Field or compartment identification code (refer to Soil Stripping Plan)	Soil Stripping Plan showing coded fields/compartment locations
2	Field/compartment vegetation type	Existing Landscape Features Plan
3	Successful treatment of vegetation?	SMP methods of vegetation treatment
4	Identification of soil ownership	SRP
5	Confirmation of soil type	SRP
6	Soil depth stripped	SRP
7	Soil plasticity (determined as 'plastic' or 'non-plastic')	SMP Field assessment of soil plasticity
8	Date (s) stripped, weather conditions during stripping, equipment/plant used for stripping.	
9	Date and location code when soil moved to stockpile (refer to Stockpile Plan). Designate each stockpile or stockpile portion as 'plastic' or 'non-plastic'	Soil Stockpiling Plan showing coded locations
	All Stockpiles	
10	Record any stockpile non-compliance from stockpile inspections. Detail, date and stockpile location code (refer to Stockpile Inspection Checklist and Stockpile Plan)	Stockpile Inspection Checklist Soil Stockpiling Plan showing coded locations
	Soil Reconditioning Windrows	
11	Date and location code of plastic soil stockpile when soil is removed from stockpile to	Soil Stockpiling Plan showing coded locations.

	reconditioning area. Record the location of code of soil within reconditioning area.	Soil Reconditioning Plan showing coded locations.
12	Plasticity status of each soil windrow within reconditioning area	SMP Field assessment of soil plasticity Soil Reconditioning Plan showing coded locations.
13	Record the location code of soil which meets the acceptability criteria and is moved to the storage area. Designate soil as 'non-plastic'. (If acceptability criteria are not achieved, schedule further soil reconditioning).	Soil Stockpiling Plan showing coded locations.
	Re-use	
14	Date and stockpile location code when non-plastic soil is removed from stockpile to reinstatement or restoration field/compartment. Record the location code of reinstatement or restoration field/compartment (refer to Landscape Reinstatement of restoration Plan)	Relevant Restoration Plan showing coded field/compartment locations.
15	Date and location code of reinstatement or restoration field/compartment for all soil sampling and analysis (*in situ* assessment and laboratory analysis). If acceptability criteria are achieved, sign off on reinstatement/restoration. If acceptability criteria are not achieved, schedule further soil management operations and further assessment suite of in situ testing.	Relevant Reinstatement Plan showing coded field/compartment locations.
	Sign-off	
17	Sign off final completion of soil reinstatement/restoration work.	

APPENDIX I

Soil Audit Checklist

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
A	**Training and Communication (See also Section E below)**				
1	Present key issues of Soil Management Plan to the Site Environmental Lead, the Earthworks Lead and his workforce	Once, at start of site prep works		Contractor's Soil Scientist	
2	Train key staff in identification of topsoil and subsoil resources to ensure accurate soil stripping and prevention of contamination	Once, at start of site prep works		Contractor's Soil Scientist	
3	Train Earthwork Lead or appointed delegate to assess soil plasticity using the prescribed Field Technique	Once, at start of site prep works		Contractor's Soil Scientist	
B	**Inspections**				
1	Check adherence to access/haul route + compliance with no off-route access (to prevent trafficking and compaction of off-route soil)	Continuous through site prep works		Site Environmental Lead	
2	Inspection of site vegetation and foreign matter in compartment ahead of sol stripping	Ahead of soil stripping		Site Environmental Lead	

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
3	Check that all soils designated as plastic and non-plastic are segregated and are accurately documented and annotated on soil stripping and stockpiling phasing plan.	Ahead of soil stripping		Contractor's Soil Scientist	
4	Inspection of soil storage stockpiles, using checklist	Monthly		Contractor's Soil Scientist	
5	Inspection of soil reconditioning windrows	Weekly or as frequently as required		Contractor's Soil Scientist	
C	**Monitoring Schedules**				
1	Acceptability Criteria – Site Vegetation and Foreign Matter	Prior to stripping – as required by the stripping programme		Contractor's Soil Scientist	
2	Determination of soil plasticity status + compartment/field location code	Prior to stripping – as required by stripping programme		Contractor's Soil Scientist	
3	Acceptability Criteria – Soil storage stockpiles	During construction, once completed. Monthly thereafter		Contractor's Soil Scientist	
4	Acceptability Criteria – Soil reconditioning windrows	During construction, once		Contractor's Soil Scientist	

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
		completed Monthly thereafter			
5	Acceptability Criteria – physical parameters of soil profile – landscape/habitat end-uses	During soil replacement and once completed		Contractor's Soil Scientist	
6	Acceptability Criteria – physical parameters of soil profile – agriculture end-use	During soil replacement and once completed		Contractor's Soil Scientist	
Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person	Sign-off and Date
D	**Interpretation of Findings**				
1	Interpretation and reporting of *in-situ* replaced soil physical conditions	To be agreed with Site Environment Lead		Contractor's Soil Scientist	
E	**Tool Box Talks Delivered**				
1	Why soil resources need to be protected. Where valuable soil resources are located on site. Site restrictions and good practice activities in order to protect soil resources	To be agreed with Site Environment Lead		Contractor's Soil Scientist	
2	Planning soil management. Access and egress routes	To be agreed with Site Environment Lead		Contractor's Soil Scientist	

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
3	Soil stripping. How to identify the difference between soil types. Why soil segregation is important	To be agreed with Site Environment Lead		Contractor's Soil Scientist	
4	Demonstration of field technique to assess soil plasticity. Importance of the distinction – vulnerability of wet/plastic soils	To be agreed with Site Environment Lead		Contractor's Soil Scientist	
5	Soil storage techniques – formation of stockpiles	To be agreed with Site Environment Lead		Contractor's Soil Scientist	
6	Soil reconditioning techniques – formation of windrows	To be agreed with Site Environment Lead		Contractor's Soil Scientist	

*Delegated authorities will be confirmed and authorised by the Site Environment Lead