



## Appendix 14.2

### FRAMEWORK SOIL MANAGEMENT PLAN

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### 1.1 Aims and Objectives

1.1.1 The aim of this Framework Soil Management Plan (FSMP) is to maintain, and where possible improve, the quality and quantity of soil resources (i.e., topsoil and subsoil) at the Site in its current physical condition (e.g., soil depth, soil texture, soil structure, soil drainage status), chemical condition (e.g., pH level, nutrient status of available phosphorus, available potassium, available magnesium, total nitrogen, and potentially toxic elements (PTE)) and soil organic matter (SOM) content, in order to maintain soil functions during the construction phase.

1.1.2 Post-consent, the FSMP Plan will require updating in accordance with approved documentation by the appointed contractor prior to any construction commencing onsite. A detailed **Construction Phase Soil Management Plan** would be submitted to the Local Planning Authority (LPA) for approval prior to the start of construction and this will sit alongside the Construction Environmental Management Plan (CEMP), or similar.

4.1.1 The objective of this FSMP is to set out appropriate methodology to:

- (i) Determine the location, extent and quality of *in-situ* soil resources (topsoil and subsoil) at the Site prior to construction (i.e., baseline soil status) by carrying out a detailed Soil Resource Survey (SRS) on Site prior to the commencement of construction;
- (ii) Determine types (units) of soil according to their resilience to damage (e.g., compaction) during soil handling prior to the commencement of construction;
- (iii) Produce maps showing the location and extent of soil resources in separate units identified in (ii) prior to the commencement of construction;
- (iv) Ensure vehicular traffic over the land is restricted to farm tracks, haul roads or on agricultural land in appropriate weather conditions and soil-wetness state during the construction, operational and decommissioning phases;
- (v) Where necessary, to strip, store and respread soil resources in appropriate weather conditions and soil-wetness state during the construction phase;

### 1.2.1 General Requirements for Soil Handling

1.2.2 This section outlines general requirements for vehicular traffic over agricultural land, and where necessary soil handling, i.e., soil stripping, storage and placement/re-spreading, during the construction phase.

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

- (i) The avoidance of unnecessary damage to all soil layers, especially by compaction and smearing;
- (ii) The maintenance of a reasonable degree of fissuring, drainage and aerobic conditions in stored soils;
- (iii) The reasonable replication of the original sequence of textural horizons and permeability of the soil profile when the materials are reinstated, based on a target restoration profile (i.e., the original/baseline soil profile determined in the SRS prior to commencement of construction);
- (iv) The preservation of soil biodiversity and Soil Organic Matter (SOM).

1.2.4 All soil and soil forming materials shall be handled in accordance with the Institute of Quarrying's Good Practice Guide for Handling Soil (2021), Sheets A – E (handling soil using backacters and dumptrucks).

1.2.5 When a soil is handled when it is too wet (i.e., the moisture content is at or exceeds the lower plastic limit), then soil strength is reduced, and it becomes prone to structural damage, i.e., it has less resistance to compression and shear. By introducing a force, such as a mechanical excavator, the wet (or plastic) soil can lose its structure and become compacted. As described in Best Practice produced by the Institute of Quarrying (see *'Supplementary Note 4 – Soil Wetness'*),

*'...The degree of effect due to soil handling is likely to vary between the soil textural class, structural condition, and organic matter content, the local climate and daily weather conditions, but also between the types and size of machinery used and handling practice adopted. The primary cause of compaction arises from the compression caused by trafficking by the machinery and stockpiling of soil in storage. Whilst some degree of remedial actions might be possible, experience has demonstrated that minimising compaction by handling soil in a dry condition is the more effective and reliable, and likely most cost-effective option.'*

1.2.6 Advice is given in the Institute of Quarrying (see *'Supplementary Note 4 – Soil Wetness'*) on the general timing of operations. A field-based determination of when the actual operations should start, cease or restart based upon actual soil wetness is provided. The SMP should carefully consider the timing of (i) vehicles trafficking over the land and soil, and (ii) land-work and soil handling operations. The SMP should provide mitigation measures to avoid or reduce damage to soil structure, especially when the soil is wet, including a method for determining when land-work and soil handling operations should start, cease and restart based upon actual soil wetness. This may include determination of the Plastic Limit (see Section 1.5 (III) above) of the different soil types/units should be determined in a laboratory to British Standard 1377: 1990 *'Methods of test for soils for civil engineering purposes'*<sup>1</sup>.

- 1.2.7 From an *'Indicative on-average months when vegetated mineral soils might be in a sufficiently dry condition according to geographic location, depth of soil and clay content'* in the Institute of Quarrying *'Supplementary Note 4 – Soil Wetness'*, the soil at the Site is predicted to be in a sufficiently dry condition as follows (Note: this is a predicted period over the year when the soil is most likely to be suitable for handling):
- (i) Soil Handling Unit 1 (Moderate Resilience): Less than 27% clay in Climatic Zone 2 = Early May to Early November; and
  - (ii) Soil Handling Unit 2 (High Resilience): Less than 10% clay in Climatic Zone 2 = Late March to Early November.
- 1.2.8 Throughout the period of working, the operator shall take all reasonable steps to ensure that drainage from areas adjoining the Site is not impaired or rendered less efficient by the permitted operations.
- 1.2.9 The contractor shall take all reasonable steps, including the provision of any necessary works, to prevent damage by erosion, silting or flooding and to make proper provision for the disposal of all water entering, arising on or leaving the Site during the permitted operations.
- 1.2.10 Any oil, fuel, lubricant, paint or solvent within the site shall be so stored as to prevent such material from contaminating topsoil, subsoil, soil forming material, or reaching any watercourse.
- 1.2.11 Throughout the period of working, restoration and aftercare, the contractor shall have due regard to the need to adhere to the precautions for preventing the spread of plant and animal diseases published by the Government online<sup>2</sup>.

### **1.3 Ground Preparation**

- 1.3.1 Prior to stripping agricultural topsoil (e.g., access roads, inverters, cable-routes and the sub-station), all above-ground vegetation should be cleared off Site in the areas to be stripped, so that the amount of vegetation within the topsoil strip is minimised (this is to minimise the amount of anaerobic decomposition of vegetation / organic matter that will occur within the topsoil stockpiles).

### **1.4 Haul Roads**

- 1.4.1 Vehicles, e.g., heavy goods vehicles (HGV) delivering construction materials should not be permitted to traffic over agricultural land and be restricted to public highways, farm tracks, haul roads and storage compounds.
- 1.4.2 Construction machinery should not traffic over agricultural land which is left in-situ (i.e., where the topsoil has not been stripped) when the soil is too wet. This is to avoid causing soil

structural damage by compaction and smearing, and to avoid creating ruts/vehicle wheelings at the ground surface. See '*General Requirements for Soil Handling*' above for guidance on appropriate soil moisture content for soil handling.

- 1.4.3 It is recommended using temporary haul road systems during construction to minimise structural damage to the soil. This could involve the a heavy-duty composite plastic trackway system on a thin layer of stone, or no stone, e.g., GroundGuards Xtreme Mats 4mx2m Large Mats<sup>3</sup>, or SignaRoad 3mX2m Large Mats<sup>4</sup>, or other similar geotextile material.

## **1.5 Soil Stripping**

- 1.5.1 Before any part of the Site is excavated or is built upon, or used for the stacking of topsoil, subsoil or overburden, or as a machinery dump or plant yard, or for the construction of a road, all available topsoil and subsoil shall be stripped from that part.

## **1.6 Soil Storage**

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

- (i) Topsoil and subsoil (referred to as overburden) in the different soil handling units shall be stored separately.
- (ii) Where continuous bunds are used, dissimilar soils shall be separated by a third material.

### **Soil with Low Sensitivity/High Resilience**

- (iii) Topsoil and subsoil with low sensitivity/high resilience shall be stored in bunds which do not exceed 5m in height.

### **Soil with Medium Sensitivity/Moderate Resilience**

- (iv) Topsoil and subsoil with medium sensitivity/moderate resilience to soil handling shall be stored in bunds which do not exceed 4m in height.

### **Soil with High Sensitivity/Low Resilience**

- (v) Topsoil and subsoil with high sensitivity/low resilience to soil handling shall be stored in bunds which do not exceed 3m in height.
- (vi) Materials shall be stored like upon like, so that topsoil shall be stripped from beneath subsoil bunds.
- (vii) All storage bunds containing soils which are intended to remain in situ for more than 6 months or over the winter period are to be grassed over and weed control and other

necessary maintenance carried out. The seed mixture and the application rates are to be set out in the SMP.

(viii) All topsoil and subsoil shall be retained on the Site.

## References

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<sup>1</sup> British Standard 1377: 1990 *'Methods of test for soils for civil engineering purposes'*

<sup>2</sup> Government Guidance (2022) *'How to stop invasive non-native plants from spreading'*. Available online at <https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants> Last accessed June 2023

<sup>3</sup> GroundGuards Xtreme Mats 4mx2m Large Mats. Available online at <https://www.groundguards.co.uk/product/xtreme-4m-x-2m-mat/> Last accessed June 2023

<sup>4</sup> SignaRoad 3mX2m Large Mats. Available online at <https://www.groundguards.co.uk/product/signaroad/> Last accessed June 2023