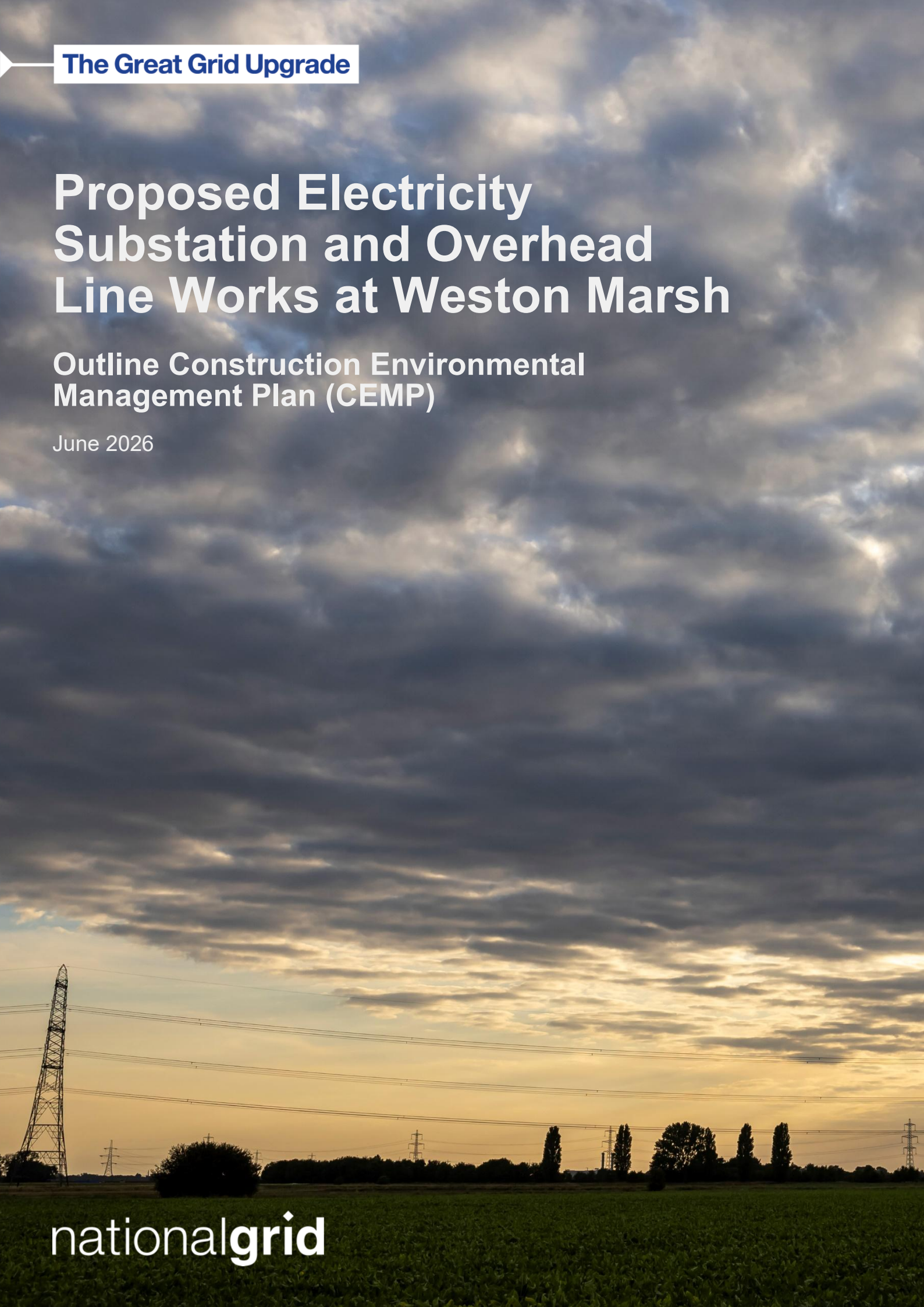
The Great Grid Upgrade

Proposed Electricity Substation and Overhead Line Works at Weston Marsh

Outline Construction Environmental Management Plan (CEMP)

June 2026



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Contents

1. Introduction

1.1 Overview

1.1.1 This Outline Construction Environmental Management Plan (CEMP) has been prepared on behalf of National Grid Electricity Transmission plc (National Grid).

1.1.2 National Grid are proposing to undertake works to construct a new electricity substation, new sections of overhead line and modification of existing overhead lines west of the Spalding Tee-Point in the Weston Marsh area, within the administrative boundary of South Holland District Council (SHDC) in Lincolnshire.

1.1.3 This Outline CEMP will provide the basis for the CEMP adopted by the appointed Main Works Contractor(s), which will set out a comprehensive and overarching management procedure to be followed during construction. The Outline CEMP details National Grid's proposals to ensure any potential adverse effects upon the environment during construction would be minimised as far as reasonably practicable.

1.2 Summary of the Scheme

1.2.1 In totality, the Scheme consists of four components, each planned to be progressed via separate consenting routes. These are summarised in **Table 1.1**.

Table 1.1 Components of the Scheme

Works Required	Consenting Regime
Construction of the new Air Insulated Substation (AIS) – 400kV Weston Marsh Substation A, associated landscaping and environmental mitigation works, drainage, highways and other associated works	Town and Country Planning Act 1990 (TCPA) (Ref 1) Component referred to as '**Substation Works'**
Construction of new sections of overhead line to connect the new substation into the existing 4ZM overhead line Removal of a section of the existing 4ZM overhead line Other associated works	Section 37 of the Electricity Act 1989 (Ref 2) and deemed consent pursuant to section 90(2) of the Town and Country Planning Act 1990. Component referred to as '**S37 4ZM Overhead Line Works**'
Construction of a new sections of overhead line to connect the existing 2WS overhead line into the new substation. Removal of a section of the existing 2WS overhead line Other associated works	Section 37 of the Electricity Act 1989 and deemed consent pursuant to section 90(2) of the Town and Country Planning Act 1990 Component referred to as **'S37 2WS Overhead Line Works'**

Works Required	Consenting Regime
Reconductoring works required on the existing 4ZM overhead line Two spans of temporary overhead lines	Town and Country Planning (General Permitted Development) (England) Order 2015 (Ref 3) and The Overhead Lines (Exemption) (England and Wales) Regulations 2009 (Ref 4). Component referred to as '**Exempt Overhead Line Works'**

1.2.2 The Substation Works will require consent from SHDC under the TCPA.

1.2.3 The new S37 4ZM Overhead Line Works and S37 2WS Overhead Line Works components of works (collectively referred to as the S37 Overhead Line Works) will require consent from the Secretary of State for Energy Security and Net Zero under Section 37 of the Electricity Act 1989 (Section 37).

1.2.4 The Exempt Overhead Line Works constitute permitted development under Part 15 Class B of the Town and Country Planning (General Permitted Development) (England) Order 2015 and The Overhead Lines (Exemption) (England and Wales) Regulations 2009.

1.2.5 The Scheme in its totality is a standalone development to enable connection of the Outer Dowsing Offshore Wind Farm (ODOW) to the national electricity transmission system. Each component stated in **Table 1.1** above is required for the Scheme to fully function as part of the national electricity transmission system (NETS).

1.3 Purpose of the Outline Construction Environmental Management Plan

1.3.1 The Outline CEMP has been prepared to support the applications for the Scheme referred to at **Section 1.2**. It provides the relevant consenting authorities with information relating to the environmental management measures which are proposed to be adopted during construction of the Scheme.

1.3.2 The measures set out within this Outline CEMP aim to ensure that any potential adverse effects upon the environment during construction would be minimised as far as reasonably practicable. To achieve this, the Outline CEMP establishes a framework within which the Main Works Contractor(s), and any sub-contractors or suppliers involved in the delivery of the works, will plan, implement and deliver environmental management, mitigation and monitoring requirements during the construction phase of the Scheme. The objectives of the controls and procedures set out within the Outline CEMP are to:

1) Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental impacts are implemented;

2) Ensure that environmental good practices are adopted throughout the construction of the Scheme;

3) Provide a means for mitigating impacts that may not have been previously anticipated or become apparent until construction is underway;

4) Provide assurance to consultees and stakeholders that environmental mitigation is being addressed;

5) Provide a mechanism for compliance auditing to ensure mitigation measures are being effectively implemented and maintained;

6) Implement a policy of potential re-use of all waste with disposal off-site being a last resort (aligned to the waste hierarchy); and

7) Enable full compliance to be maintained with all relevant legislation and any relevant conditions attached to the required consents.

1.3.3 It is intended that the CEMP will be a 'live document' and will be updated as and when there are changes to the project team or where additional information becomes available. This Outline CEMP is intended to provide the basis of a final CEMP, which would be prepared and agreed with the relevant consenting authorities in advance of the start of construction. It is considered this can be satisfactorily addressed by way of an appropriately worded condition(s).

1.4 Structure of the CEMP

1.4.1 This Outline CEMP is split into five sections as detailed below:

1) **Section 1: Introduction** – provides background information about the Scheme and an overview of the contents of this Outline CEMP;

2) **Section 2: Scheme Information** – provides an overview of the Scheme including a description of construction methods;

3) **Section 3: Roles and Responsibilities** – Sets out the roles and responsibilities of the parties involved in construction;

4) **Section 4: Communications, Reporting and Training** – Sets out the requirements for regular communications and reporting as well as staff training; and

5) **Section 5: Construction Environmental Management** – Sets out the general and specific environmental requirements identified by each topic discipline with respect to environmental management during construction.

1.5 Compliance with Environmental Management Systems (EMS) and Sustainability Requirements

1.5.1 National Grid is committed to delivering sustainability and good environmental stewardship. In accordance with this proactive approach to sustainable design and construction, National Grid and the Main Works Contractor(s) will seek to maximise resource efficiency through reducing the amount of waste generated, minimising water consumption and making the most efficient use of energy.

1.5.2 National Grid manages and reduces their effects on the environment via an Environmental Management System (EMS). The EMS is accredited to ISO14001:2015 and provides a framework for National Grid to deliver continual environmental assessment and improvement and comply with current legislation and environmental commitments. The Main Works Contractor(s) will prepare their own Scheme specific EMS in accordance with National Grid's EMS prior to construction

commencing. The Scheme EMS is expected to be integrated into the Main Works Contractor(s)'s own EMS arrangements and will address:

1) Compliance with the CEMP and any other control and management documents;
2) Compliance with environmental consents and permits;
3) Overall compliance with environmental legislation, approved codes of practice, British Standards and industry best practice;
4) Detailed environmental management procedures to deliver the CEMP and other control and management plans including roles and responsibilities;
5) Monitoring and review arrangements;
6) Emergency procedures that are defined and adopted; and
7) Appropriate training and information for personnel.

1.6 Considerate Constructors Scheme (CCS)

1.6.1 The Scheme will be registered with the CCS. CCS is a national initiative through which construction sites and companies (Main Works Contractor(s), subcontractors and suppliers) are monitored against a Code of Considerate Practice. The code is designed to encourage environmental and social best-practice during the construction period, beyond statutory requirements.

1.7 Other Construction Management Plans

1.7.1 In addition to the CEMP, the following management plans detailed in **Table 1.2** will be produced for the Scheme prior to construction. It is considered that the following management plans would be prepared by way of an appropriately worded condition(s).

Table 1.2 Other Construction Management Plans

Plan	Description
Construction Traffic Management Plan (CTMP)	To detail the control measures to be implemented in relation to the traffic generated during the construction phase of the Scheme. The CTMP will include, but not be limited to: • measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions; measures for the maintenance and upkeep of the public highway; • identification of access routes for emergency vehicles; • measures to reduce safety risks through construction vehicle and driver quality standards; and • measures to manage abnormal loads. An Outline CTMP has been submitted in support of the consent applications for the Scheme.

Plan	Description
Landscape and Ecological Management Plan (LEMP)	To detail the control measures and maintenance measures required for landscape and ecological management, including, but not limited to: • the identification of vegetation to be retained as part of the proposals; • mitigation planting required for landscape and ecology; and • details of the management of landscaping required for the Scheme. The LEMP will be prepared prior to construction via a planning condition, and will be in accordance with details included on the **Indicative Landscape and Ecological Mitigation Proposals** submitted with the Planning Application.
Soil Management Plan (SMP)	To detail management measures to minimise adverse effects on the soil resource. The SMP will include, but not be limited to the following: • details of the soil resources present; • roles and responsibilities (and required competencies and training); • how topsoil and subsoil will be stripped and stockpiled; • suitable conditions for when handling soil will be undertaken, for example avoiding handling of waterlogged soil; • indicative soil storage locations; • how soil stockpiles will be designed taking into consideration site conditions and the nature/composition of the soil; • specific measures for managing sensitive soils; • suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works; • approach to reinstating soil that has been compacted, where required; • details of measures required for soil restoration; and requirements for monitoring; and • provision of a soils aftercare plan. An Outline SMP is included in **Annex A** of this Outline CEMP.
Site Waste Management Plan (SWMP)	To detail management measures to manage material assets and waste, in accordance with both legal and best practice requirements, during construction. As a minimum this will include: • The waste streams that will be generated; • How the waste hierarchy will be applied to these wastes;

Plan	Description
	• Identified storage areas for waste and methods to contain waste within storage areas, preventing rainwater ingress, weathering and pest access where appropriate; • Implement pest control if required; • Storage requirements for waste documentation, such as waste transfer notes and consignment notes; • Good practice measures for managing waste; and • Roles and responsibilities for managing and monitoring waste management.
Materials Management Plan (MMP)	To support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse/offsite disposal of materials and ensure compliance with regulatory guidelines.
Biosecurity Management Plan	Outlines the biosecurity controls to be implemented for the Scheme. The Biosecurity Management Plan will identify relevant invasive non-native species within the area to ensure that all necessary precautions are taken to prevent their spread.
Drainage Management Plan (DrMP)	Controls runoff from working areas using SuDS principles, promoting infiltration wherever possible and ensuring any discharges to watercourses are clean and restricted to greenfield rates. It will cover all construction works and temporary infrastructure.
Dust Management Plan (DMP)	Details management measures to avoid dust nuisance during construction for surrounding human and ecological receptors.
Incident Response Plan (IRP)	Sets out how the Scheme will respond to incidents and pollution events during construction and sets out how these are to be reported.

1.7.2 The management plans set out in **Table 1.2** will form annexes to the final CEMP. As part of the discharge of planning conditions with SHDC, some of these management plans may also be combined into one document, as appropriate.

2. Scheme Information

2.1 Permanent Works

2.1.1 The Scheme comprises the following principal components (as summarised in Section 1). Multiple sub-contractors will be appointed to construct or install the different elements of the Scheme due to the specialist electrical components required.

Substation Works

2.1.2 The new Weston Marsh Substation A would be an Air Insulated Switchgear (AIS) substation. AIS substations use air as the insulation medium for electrical equipment meaning that equipment is predominantly located outdoors. The new Weston Marsh Substation A would be located within a secured fenced compound. The total footprint of the new Weston Marsh Substation A would be approximately 10.6 ha including a 5 m buffer around the fence line, with dimensions for the main compound of approximately 530 m by 190 m, (approximately 10 ha). Extra areas of approximately 110 m by 50 m (approximately 0.6 ha) near the entrance for ancillary equipment and car parking and 50 m by 55 m (approximately 0.3 ha) along the southern fence line for an overhead line gantry and high voltage plant, would also be required. Within the new Weston Marsh Substation A there would be a range of specialist electrical equipment.

2.1.3 A permanent new access road approximately 390 m in length would be constructed as part of the Scheme to provide operational access to the new Weston Marsh Substation A. This would be situated from Marsh Road to the north of the new Weston Marsh Substation A. During operation, workers would enter the new permanent access road via the A151, Stone Gate and Marsh Road.

2.1.4 Landscaping would be installed along the northern, western and southern facades of the new Weston Marsh Substation A to screen views of the new Weston Marsh Substation A from the surrounding landscape. Additional areas of filtering vegetation would be planted to the north west and south of the new Weston Marsh Substation A as well as alongside Marsh Road to further reduce visibility of the Scheme.

2.1.5 Several measures have also been proposed to protect skylarks, barn owls, great crested newts and otters, as follows:

1) Approximately 35 hectares of agricultural land near Crowtree Farm would be converted to a different cropping regime to benefit skylarks;

2) An indicative habitat area for great crested newts and otter would be created in the same vicinity; and

3) One barn owl box would also be installed situated a suitable distance away from the Scheme.

2.1.6 Road improvement works are also required in places of Stone Gate to widen the road for construction traffic and/or to introduce passing places along the route (also required for the S37 Overhead Line Works).

2.1.7 Drainage, ancillary works and other associated temporary construction works would also form part of the Substation Works.

S37 4ZM Overhead Line Works

2.1.8 The reconfiguration of the existing 4ZM overhead line would be necessary to turn it in to and out of the new Weston Marsh Substation A. The new sections of overhead line would not exceed 0.9 km in total, split into two sections of up to 0.5 km and 0.4 km respectively. The first section would originate from new pylon 4ZM414-N and extend south to tie into the northern façade of the new Weston Marsh Substation A. The second section would originate from the new Weston Marsh Substation A and extend east where it would tie into the new pylon 4ZM407-N.

2.1.9 In addition, 0.7 km of existing 4ZM overhead line and three existing pylons (4ZM414-N – 4ZM407-N) that currently runs in parallel with the new Weston Marsh Substation A would be removed.

S37 2WS Overhead Line Works

2.1.10 The reconfiguration of the existing 2WS overhead line would be necessary to turn it into and out of the new Weston Marsh Substation A. This new section of overhead line would not exceed 0.9 km, originating from the new Weston Marsh Substation A and extending south east where it would tie into the existing 2WS line at pylon 2WS015.

2.1.11 In addition, approximately 0.8 km of existing 2WS overhead line and one existing pylon (2WS017 - 2WS015) that currently runs south east of the new Weston Marsh A Substation would be removed.

Exempt Overhead Line Works

2.1.12 The Exempt Overhead Line Works would consist of 2.4 km of the existing 4ZM overhead line being reconductored with triple Araucaria conductor.

2.1.13 In addition, approximately 1.4 km of temporary overhead line, including two temporary pylons will be required to facilitate the overhead line turn-ins into Weston Marsh Substation A.

Site Location and Description

2.1.14 The majority of the land required for construction of the Scheme (i.e. that within the Scheme Site Boundary), is located approximately 2.5 km north of Weston, 2.2 km east of Surfleet Seas End, and 2.3 km west of Moulton Seas End, west of the Spalding Tee-Point and the existing 4ZM and 2WS overhead lines.

2.1.15 The Scheme Site Boundary is centred on Grid Reference 529446, 328696. Land within the Scheme Site Boundary primarily consists of agricultural land that is Provisional Grade 1 Best and Most Versatile land. Access to the proposed construction works would be provided via Marsh Road and Stone Gate, which provide connections to the south via the A151. Highway improvement works are anticipated to be required in places along Marsh Road and Stone Gate and as such, these links are included within the Scheme Site Boundary.

2.1.16 The Scheme Site Boundary covers an area of approximately 168 ha in total. Much of this area would be required temporarily to facilitate construction of each component of the Scheme. Land required permanently for the S37 Overhead Line Works would include the extents of each new pylon foundation/base. Permanent easements would also be required over maintenance access routes and land under the new overhead line routes. Land would also be required permanently within the extents of the new Weston Marsh Substation A and associated works, including a permanent access road and environmental mitigation areas (e.g. landscape mitigation planting). Subject to ongoing design and environmental surveys, the Scheme Site Boundary also includes land for drainage, ecological mitigation and landscaping.

2.2 Construction Programme

2.2.1 Subject to the necessary consents being secured in 2026, it is anticipated that construction of the Scheme would commence in 2028, starting with enabling works. It is expected that the main construction works (construction of substation and overhead line) would continue through to the Q2 2031 (approximately two and a half years).

2.3 Construction Site Access

2.3.1 From the A151 and Stone Gate a temporary haul road would provide access to the Scheme Site Boundary for HGVs and LGVs. The haul road would be 7.5m wide and would include temporary stone road, soil storage, drainage and fencing. This would typically consist of stone laid on geotextile membrane. The total assumed width of the stone haul road and associated working area is 21 m. Other surfaces may also be used, comprising of interlocking temporary panels, depending on ground conditions and the duration and type of use. Soil stabilisation techniques could be considered subject to local conditions.

2.3.2 Cars/vans (and therefore workers) would also be able to access the compounds and working areas via Marsh Road and Stone Gate, which run along the western and southern extents of the Scheme Site Boundary and continue to the south before joining the A151, which provides connections to the A16 and A17.

2.4 Construction Compound

2.4.1 Four construction compounds would be required for the construction of the Scheme The main compound is situated to the north west of the new Weston Marsh Substation A and approximately 4 ha. This compound would provide parking, site offices and welfare facilities. Two satellite compound areas are also required. The larger of these is approximately 3 ha, located to the south east of the new Weston Marsh Substation A, primarily for the storing of construction materials and equipment. The second is located north of the main construction compound and approximately 2 ha in area. This satellite compound would be used primarily to support the overhead line works. These compounds would be required for the entirety of the construction period and reinstated once construction is complete.

2.4.2 A further temporary satellite compound of approximately 2 ha is required to the north of Stone Gate and in the vicinity of the proposed haul road. This compound would be established first and is required specifically for the establishment of the haul road and associated bellmouth. This compound would not be required for the entirety of the

construction period and would be scaled back once the construction of the haul road is complete.

2.4.3 The temporary construction compounds would be fenced off (as required) during the Main Works Contractor(s)'' working hours.

2.5 Site Offices and Welfare Facilities

2.5.1 A site office and welfare facilities will be located on-Site, within the main construction compound. Fencing will be installed around the perimeter of the Site, with designated secure access for personnel, visitors and maintenance staff. Temporary parking for construction workers will be located in designated locations.

3. Roles and Responsibilities

3.1 Introduction

3.1.1 This section of the Outline CEMP explains the roles and responsibilities of the parties involved in the construction of the Scheme. It is intended that the final version of the CEMP should include contact details for key members of staff.

3.2 Key Roles

3.2.1 The exact roles and responsibilities will be confirmed prior to construction; however, the following section provides an indication of the roles which are envisaged. Clearly establishing roles and responsibilities is vital to ensure the successful construction of the Scheme, including the implementation of the final version of the CEMP. The key roles and responsibilities are included in **Table 3.1**.

Table 3.1 Key roles and responsibilities

Role	Organisation	Responsibilities
Environmental Manager(s)	Main Works Contractor(s)	The Environmental Manager(s) will be responsible for the maintenance of all environmental plans and registers, including monitoring that the environmental measures and mitigations are implemented on-site and as recorded within the CEMP. They will be the main point of contact for all environmental matters on the Scheme. They will develop good working relationships with external stakeholders such as the Environment Agency (EA), Natural England, and the relevant planning authorities. They will also manage production and submission of any applications for necessary permits and secondary consents on behalf of the Scheme, track the progress, provide updates, and communicate approvals.
Health and Safety Manager	Main Works Contractor(s)	The Health and Safety Manager will monitor health and safety during the construction of the Scheme. They will hold weekly Safety, Health and Environment (SHE) meetings.
Environmental Clerk of Works (EnvCoWs)	To be Confirmed	The EnvCoWs will monitor that the works proceed in accordance with relevant environmental planning conditions and adhere to the required mitigation measures. The EnvCoWs will be supported by appropriate technical specialist advisors depending on the location and potential effects.
Ecological Clerk	To be Confirmed	The ECoWs will monitor the works to ensure compliance with any licenses, permits and consents

Role	Organisation	Responsibilities
of Works (ECoW)		obtained to avoid effects on protected species and habitats, along with ensuring compliance with environmental legislation. The ECoWs will oversee ecological pre-construction surveys and will also manage ecological operatives engaged in ecological mitigation activities, such as undertaking ecological watching briefs and translocation of protected species.
Project Manager	Main Works Contractor(s)	The Project Manager will be responsible and accountable for the delivery of the Scheme.
Arboricultural Clerk of Works (ACoWs)	To be Confirmed	The ACoWs will monitor works conducted by a suitably qualified and experienced arborist to/within proximity to high grade trees, including trees under Tree Preservation Orders and veteran trees, to ensure relevant control measures are in place to protect these trees.
Archaeological Clerk of Works	To be Confirmed	The Archaeological Clerk of Works will monitor works undertaken by a suitably qualified and experienced archaeological contractor in areas where known archaeological assets have been identified, to ensure that relevant control measures are in place and that the works are undertaken in accordance with agreed archaeological Written Schemes of Investigation (WSI). In the event that previously unknown archaeological remains are encountered the Archaeological Clerk of Works will attend site and advise on requirements for any further control measures that may need to be followed.
Works Supervisor	Main Works Contractor(s)	The Works Supervisor(s) will be responsible for delivering the works in accordance with the requirements of the CEMP and implementing good environmental practices required by the Environmental Manager(s). They are responsible for managing operatives, plant, and their areas of work in accordance with the principles of good environmental practice.
Agricultural Liaison Officer	Main Works Contractor(s)	The Agricultural Liaison Officer will have an agricultural background and experience of working with utility companies. They will provide a single point of contact for both the Main Works Contractor(s) and the landowner/occupier of the land. They will be responsible for coordinating site access in line with pre-agreed timescales, help facilitate the dialogue between the Main Works Contractor(s) and the landowner/occupier as necessary and will be the first point of contact for any issues escalated by the landowner/occupier or the Main Works Contractor(s).

Role	Organisation	Responsibilities
		They will be responsible for witnessing and agreeing all land condition surveys conducted by the Main Works Contractor(s).
Soil Scientist / Practitioner	To be Confirmed	The appointed Soil Scientist / practitioner will be responsible for the provision of expert and technical soils advice throughout the earthworks and the subsequent site restoration activities. The role includes liaison with the Environmental Manager and any other personnel/organisations as relevant to works affecting soils. The appointed Soil Scientist / Practitioner will be responsible for training key site staff in identification of topsoil and subsoil resources which are suitable for re-use so that accurate segregation of topsoil and subsoil resources can be achieved. The Soil Scientist / Practitioner will also provide training on the assessment of soil plasticity status based on the field technique provided in the Outline SMP, provided in **Annex A**.
Technical Specialist Advisors	Main Works Contractor(s)	These will have the relevant experience to supervise the relevant aspects of the works, which might include an arboriculturist, land contamination specialist, soil specialist, ecologist, or archaeologist.

3.3 Objectives and Targets

3.3.1 Environmental objectives and targets will be established by the Main Works Contractor(s). Compliance with these objectives will be monitored during Site Inspections and audits, and will be discussed in management meetings and through toolbox talks.

4. Communications, Reporting and Training

4.1 Communication

Scheme Delivery Team

4.1.1 The final CEMP would be prepared by National Grid pursuant to an appropriately worded condition(s). Following the discharge of conditions and approval by SHDC/the Secretary of State for the Department for Energy Security and Net Zero, the approved document would be issued to the Main Works Contractor(s) (including all subcontractors). This would ensure that all parties involved in the construction of the Scheme are aware of the environmental mitigation measures, controls and reporting requirements agreed within the final CEMP.

4.1.2 The CEMP will be maintained within the SHE management system and a hard copy kept within the site office.

4.1.3 Weekly SHE meetings will be held, which the Health and Safety Manager and Environmental Manager will attend, along with any other specialist roles when required. These meetings will communicate, discuss and consult any change in conditions, working practices, health, safety and environmental arrangements, procedures and overall environmental performance. The meetings will include any near misses or hazards that have been identified and any residual risks that have been identified in conjunction with the implemented environmental protection measures. The meetings will be minuted and will include attendance records.

4.1.4 The weekly SHE meetings will be supplemented by additional meetings at intervals dictated by the requirements of the contract or at key stages of the works. Minutes of all such meetings will be produced and held on file for record purposes, with copies supplied to all relevant parties that are internal to the Scheme. The Project Manager will ensure that lessons learnt on one element of the Scheme (for example the Substation Works) are communicated to other areas to ensure best practice across the Scheme.

4.1.5 Environmental constraints will be further communicated within the Scheme delivery team by means such as the following:

1) Environmental Policy Statement (to be displayed on a dedicated Environmental Notices Board as a minimum);
2) Scheme Environmental Plan, including site specific EMP's, and associated documents;
3) Key environmental constraints maps, including exclusion zones to be displayed on site notice boards (whilst maintaining confidentiality of sensitive species and/or landowner requirements);
4) RAMS (risk assessments and method statements);
5) Site Coordination Meetings;

6) Management Review Meetings;

7) Environmental briefings and Tool Box Talks (including the presentation of a weekly environmental log that includes a look ahead to the activities required in the following week and the specific mitigation required);

8) Site induction and training sessions;

9) Audits;

10) KPI reporting to National Grid and the Main Works Contractor(s).

Public Communications and Liaison

4.1.6 Prior to commencing works on site, the Main Works Contractor(s) will develop and implement a Stakeholder Communications Plan that includes community engagement. All public communications will be co-ordinated through and agreed in advance with National Grid.

4.1.7 The Main Works Contractor(s) will provide details (postal and email address) of the named contacts to which all written complaints would be addressed and will also be responsible for the implementation of an appropriate system for logging and recording any complaints received. This log must be made available to SHDC if requested. A 24-hour free telephone complaints helpline and a project website may also be established. The key contact details and the head or regional office contact information of the Main Works Contractor(s) will be visible on boards placed around the perimeter of the construction site(s) in appropriate locations where they would be visible to the public.

4.1.8 It is also anticipated that staff will be provided with project Contact Cards, to pass out if questioned or approached by public. The cards would include relevant project contact information, such as the contact details of key site personnel dealing with the complaints and/or the complaints helpline (details of which will be confirmed within the final CEMP), and links to sources of information such as the project website.

4.1.9 Residents situated within 200 m of the Scheme Site Boundary would receive advanced notification of project works at each key stage of construction. If members of the public directly approach a member of site staff and raise a concern regarding the site works, the staff member will direct them, via a Contact Card or similar, to the key site personnel dealing with the complaints and/or the complaints helpline as well as recording details. In all cases, staff will inform the Works Supervisor and Project Manager as soon as possible and always respect landowners' and residents' concerns.

4.1.10 Any complaints received will be acknowledged within 24 hours during all hours when works, including deliveries, are taking place. The Main Works Contractor(s) will ensure that all complaints receive a written response, including details of any action undertaken (if such action is deemed appropriate). The Main Works Contractor(s) will provide National Grid with a monthly report that details all complaints, who they were filed by and the actions taken.

4.1.11 Where required, in addition to ensuring that the public is fully informed of the proposed programme of works (including working hours), the Main Works Contractor(s) will ensure that procedures are established for notifying the public in advance of planned works. It should also be noted that the agreed period of advanced notification will similarly apply to any alterations in the construction

programme or working hours that have been agreed with the Main Works Contractor(s) and the relevant departments at the Local Authority.

4.1.12 Any environmental complaints received will be investigated, with appropriate action taken and recorded, so that a full audit trail is available should the complainant raise the issue(s) with the appropriate local authority. The complainant would be provided with a response outlining the results of the investigation and any action taken.

Local Authorities and Statutory Environmental Bodies

4.1.13 Where required, the Main Works Contractor(s) would notify the relevant authorities in the event of an incident during the construction of the Scheme. Environmental incidents would be reported via the Government website (https://www.gov.uk/report-environmental-problem) in accordance with the associated guidance.

4.1.14 Specific incidents which would require notification to the relevant authorities are detailed in **Section 5**.

4.2 Communication with Other Sites

4.2.1 The Main Works Contractor(s) must ensure that regular liaison and coordination meetings are held with developers/ contractors of other projects in the vicinity of the Scheme. This will include but is not limited to the Outer Dowsing Project Delivery Team. The meetings would ensure that activities are coordinated, and the potential for in-combination environmental impacts (for example dust and particulate matter emissions) are reduced as far as practicable. It is also important to understand the interactions of the off-site transport / deliveries which might be using the same strategic road network routes.

4.3 Inductions and Training

4.3.1 The Main Works Contractor(s) will develop an environmental communication and training plan prior to physical works. It will include training requirements for all employees, sub-contractors, suppliers and other visitors to promote environmental awareness throughout the Scheme. Details of the proposed training will be provided to National Grid prior to commencement of construction works. Additional training/ toolbox talks may be required outside of this based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc. A record of all training and attendees will be maintained within the SHE management system.

4.3.2 All construction personnel will be required to hold a current valid Construction Skills Certification Scheme (CSCS) Card or equivalent and to have received a site-specific induction, prior to gaining regular access. Site specific logistics, safety and environmental information will be provided at the induction, so that all personnel including visitors are aware of the potential environmental issues. The induction will also include measures required to be undertaken to respect the local community and to outline any risks and preventative measures associated with their operations.

4.3.3 Information from the site induction will be displayed prominently on noticeboards at suitable locations around the site, such as the site canteen and reception, so that all personnel and visitors are reminded and informed of any changes to the existing systems and informed of any new procedures.

4.3.4 The induction will include the following topics, as a minimum:

1) Waste management;
2) Concrete management;
3) Ecology (including species and/or habitat protection);
4) De-watering of excavations;
5) Working in or near watercourses;
6) Surface water and groundwater pollution and control;
7) Spill response (including a spill drill);
8) Sediment and dust management;
9) Noise management (prevention of nuisance);
10) Archaeology;
11) Soil management including ground stability as well as stripping and storage;
12) Environmental incident and emergency response procedures (see below); and
13) Reinstatement techniques.

4.3.5 Delivery drivers will also be required to undergo a site induction; however this may be reduced in scope/detail due to the nature of their works on site.

4.3.6 In addition to the site induction, the Main Works Contractor(s) will ensure all personnel are suitably trained on general site good practice and emergency procedures. Training will be provided by a suitably qualified person on a regular basis. Training and awareness raising will include, but will not be limited to:

1) Briefing staff on the Plans through presentations;
2) Method Statements are to include environmental elements including, but not limited to, (as appropriate) surface water management (including appropriate sediment control methods), task specific risk assessments, biosecurity, and reinstatement methods;
3) Pollution prevention training to include practical element for site-based staff (including the practical use of spill kits and training on the consideration and selection of appropriate sediment mitigation installation); and
4) Emergency training to include fire prevention techniques particularly for land cable operators.

4.3.7 In order to provide on-going reinforcement and awareness training, the topics outlined in the site induction, along with any other environmental issues which arise on site, will be discussed at regular Toolbox Talks, which will be site specific where required. The Health and Safety Manager will maintain a schedule of Toolbox Talks. The proposed schedule - to be considered as a live document - will be coordinated with the programme of works such that relevant training is presented in a manner timely to the risks presented by upcoming (or on-going) operations. Additional Toolbox Talks will be added to the schedule as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc. Toolbox talks will be provided by the SHE Advisor/ Manager and ECoW (or other relevant specialist such as archaeological clerk of

works) throughout construction of the Scheme to provide on-going reinforcement and awareness training of environmental sensitivities and issues likely to be encountered.

4.3.8 Appropriate personnel (such as site foremen and machine operators) will also receive additional environmental training in order to ensure project work is carried out with due regard to environmental protection and to minimise on environmental impact of the Scheme. For example, specific refuelling training for named refuellers, and waste management / Duty of Care training for any staff with responsibility for waste management.

4.3.9 An environmental risk map, showing all sensitive areas, exclusion zones, wash out areas, watercourses, refuelling locations and waste management facilities will be displayed on the site notice board(s). The map will remain 'live' and will be updated throughout the lifetime of the Scheme and re-issued as required. As well as being prominently displayed, it will be provided to site staff, for example foremen, as required. It is expected that an electronic version will be accessible to all site staff via a shared project site.

4.4 Environmental Monitoring and Reporting

4.4.1 In addition to audits carried out by National Grid, the Main Works Contractor(s) will implement its own programme of audit and inspections to check that site operations are in compliance with the CEMP, current procedures and legislation; are using Best Practice; and that the mitigation measures are being effectively implemented.

4.4.2 Inspections will be undertaken for the duration of construction of the Scheme and will provide a measure of performance towards achieving the project objectives and targets. The Incident Response Plan (IRP) will set out how the Scheme will respond to incidents and pollution events, for example silty run off to surface waters, and how these are to be reported (both internally to the project and externally).

Pre-construction Audit

4.4.3 Prior to construction a pre-construction audit will be undertaken by the EnvCoW and the ECoW to ensure that any specific requirements of this CEMP and relevant legislation, licenses and consents have been met. This audit will determine the adequacy of the system set up for management, mitigation and monitoring measures related to waste, pollution and the environment.

Site Inspections

4.4.4 A schedule of inspections and audits will be prepared as part of the final CEMP. This will detail the frequency and nature of inspections/audits undertaken on the site throughout the construction phase and roles and responsibilities. The schedule would be linked to risk factors identified on site and would be updated throughout the construction phase as necessary.

4.5 Records

4.5.1 The following records will be maintained to demonstrate conformance to the CEMP:

1) Induction and training records;

2) Site inspection reports;

3) Incident Reports;

4) Supplier and contractor records;

5) Audit reports on 3rd parties;

6) Drainage consents;

7) Licences/ Permits; and

8) Superseded copies of Environmental Plans.

4.6 Document Control

4.6.1 A document management system will be used by the Main Works Contractor(s) to process and manage documents associated with the Scheme. The system should process documents throughout their life cycle from inception through creation, review, storage and distribution, archiving or destruction.

5. Construction Environmental Management

5.1 Overview

5.1.1 This chapter of the Outline CEMP describes the general environmental management measures, best practice and topic specific measures that will be implemented during the construction of the Scheme to maximise ecological and environmental protection. The measures set out in this section are applicable to numerous environmental topics and have been considered within the environmental appraisal process where pertinent.

5.2 Health and Safety

5.2.1 National Grid are committed to ensuring the health and safety of site personnel and the protection of the environment in accordance with the Construction (Design and Management) Regulations 2015 (CDM) (Ref 5) and the principles and philosophy behind these. Therefore, a separate project specific Safety Health and Environment (SHE) Plan is expected to be produced in accordance with relevant legislation.

5.2.2 All staff, site visitors and delivery drivers will receive a relevant HSE induction to ensure they are aware of site hazards and health, safety, and environmental management requirements, in accordance with the procedures outlined in **Section 4.3**.

5.3 Security, Vandalism, Theft and Fly Tipping

5.3.1 The Main Works Contractor(s) will be permitted (subject to appropriate planning approvals) to use:

1) Perimeter fencing or hoarding for site security and public safety, placed so that Public Rights of Way (PRoW) are maintained or appropriately diverted; and
2) Motion sensor lighting in areas of high security risk.

5.3.2 The Main Works Contractor(s) will consult with local police on security proposals and review arrangements throughout the period of the contract.

5.3.3 The Main Works Contractor(s) will ensure that construction compounds including offices are adequately secured to protect the public and prevent unauthorised entry to or exit from the site; and will ensure that action is taken to securely store project plant and equipment so as not to attract opportunist thieves. Valuable materials, or those that are hazardous or attractive to thieves, will be stored in a secure area, out of sight of the public. All waste will be securely stored within a fenced enclosure, positioned away from public access to minimise the risk of vandalism and arson.

5.3.4 The Main Works Contractor(s) will undertake site-specific assessments of the security and trespass risk for each working area (Substation Works, S37 Overhead Line Works etc.) and will ensure that suitable security arrangements are implemented

where required to prevent unauthorised access to the sites. Access to the construction compounds will be limited to specified entry points only and personnel entries/exits will be recorded and monitored for both security and health and safety purposes, the gates will be kept secure unless they are being used.

5.3.5 Security units will patrol the construction works. Vandalism, theft and tipping are common causes of pollution and the site will be adequately protected by fencing and locked access to discourage unauthorised access. Any occurrence of tipping on the site will be reported to the site management who will then inform the local environmental authority and the police if necessary.

5.4 Emergency Procedures

5.4.1 This section of the CEMP sets out the response plan to follow in the event of an emergency incident. In accordance with GG20, a detailed Incident Response Plan (IRP) will be prepared by the Main Works Contractor(s), with documentation kept on Site. This plan would outline procedures to be implemented in case of unplanned events, including but not limited to site flooding and pollution incidents.

5.4.2 In the event of an emergency on site, the most senior person on Site will control the incident. This will include co-ordinating the response and logging details as appropriate. Unless instructed otherwise, other personnel will remain on Site. If required, all personnel will muster in a pre-arranged muster point, and witness statements may be required.

5.4.3 The responses undertaken during an emergency will be monitored to ensure that appropriate action can be taken. All environmental incidents and near misses will be logged by the Main Works Contractor(s) within 24 hours of the occurrence, and the Environmental Manager must be notified as soon as practicable.

5.4.4 The Environmental Manager will notify any required regulatory bodies in accordance with any licence or permit requirements. If the Environmental Manager is not available at the time of the emergency, then the most senior person on Site will take responsibility for completing this.

5.4.5 The emergency contact list, along with relevant contact numbers, would be displayed on the site notice boards. In the event of an emergency, those contact details would be used as appropriate. This list will be updated and revised as construction progresses, to ensure that any applicable contact details are included.

5.5 Working Hours

5.5.1 The majority of works activities would be completed under normal working hours/ restrictions as follows:

1) Monday to Friday: 07:00 to 19:00; and

2) Saturdays, Sundays, Bank Holidays and other Public Holidays: 08:00 to 17:00.

5.5.2 The core construction working hours would exclude start up and close down activities which would take up to one hour before or after the core construction working hours.

5.5.3 Some construction activities may take place outside of the proposed core working hours referred to above, to minimise disruption to the public. Examples of these works, may include, but are not limited to the following:

1) the jointing of underground cables for third party services, with the exception of cable cutting which would only take place during the core working hours;

2) the installation and removal of conductors, pilot wires and associated protection across highways, existing overhead lines or watercourses;

3) the continuation of operations commenced during the core working hours to a point at which they can be safely paused;

4) any highway works requested by the relevant highway authority as necessary to be undertaken outside of core working hours (where possible);

5) oil processing of transformers or reactors in substation sites;

6) the testing or commissioning of any electrical plant installed as part of the authorised development;

7) the completion of works delayed or held up by severe weather conditions which disrupted or interrupted normal construction activities;

8) security monitoring and surveys;

9) trenchless crossing operations; and

10) large concrete pours that cannot be reasonably completed within the core working hours.

5.6 Overarching Environmental Commitments

5.6.1 The Main Works Contractor(s) will comply with the following overarching environmental commitments during the construction of all elements of the Scheme, listed in **Table 5.1**.

Table 5.1 Overarching Environmental Commitments

Ref	Control and Management Measures	Responsibility
GG01	The Scheme will be compliant with all relevant legislation, consents and permits.	Environmental Manager EnvCOW
GG02	The Scheme will be designed to comply with existing National Grid standards, policies detailed in the National Planning Policy Framework (Ref 18) and the International Commission on Non-Ionizing Radiation Protection guidelines for electric and magnetic fields (EMFs) (Ref 19) and associated precautionary policy.	Project Manager
GG03	Suitably experienced Environmental Managers will be appointed for the duration of the construction phase. In addition, qualified and experienced EnvCoW(s) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the management plans listed in **Table 1.2**.	Project Manager EnvCoW

Ref	Control and Management Measures	Responsibility
	The EnvCoW(s) will monitor that the works proceed in accordance with relevant environmental requirements and adhere to the required good practice and mitigation measures. The EnvCoW shall undertake regular site inspections to check conformance to the Management Plans. The EnvCoW(s) will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.	
GG04	Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Scheme. Topics will include where appropriate: • pollution prevention and pollution incident response; • dust management and control measures; • location and protection of sensitive environmental sites and features; • adherence to protected environmental areas around sensitive features; • recognise and report any invasive plants or animals; • working hours, and noise and vibration reduction measures; • working with potentially contaminated materials; • waste management and storage; • flood risk response actions; • agreed traffic routes, access points, etc.; • soil management; and • drainage management.	Environmental Manager
Pre-Commencement		
GG05	A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.	Works Supervisor
GG06	In addition to the CEMP, a CTMP and SMP will be finalised post consent in accordance with the Outline CTMP and Outline SMP submitted with the	Environmental Manager

Ref	Control and Management Measures	Responsibility
	Applications. The Main Works Contractor(s) will also produce a SWMP and IRP post consent.	
GG07	A pre-construction site walkover will be conducted by the EnvCoW and ECoW to check for any changes on Site	EnvCoW ECoW
Construction Site Set-Up		
GG08	The name and contact details for the Scheme will be displayed at the entrance to all compounds. This will include an emergency number.	Works Supervisor
GG09	Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.	Works Supervisor Environmental Manager
GG10	Appropriate site layout and housekeeping measures will be implemented by the Main Works Contractor(s) at all construction sites. This will include but not be limited to: • preventing pests and vermin control and treating any infestation promptly, including arrangements for the proper storage and disposal of waste produced on-site; • inspecting and collecting any waste or litter found on-site; • locating or designing site offices and welfare facilities to limit the overlooking of residential properties; • locating designated smoking/vaping areas to avoid nuisance to neighbours; • managing staff/vehicles entering or leaving site, especially at the beginning and end of the working day; and • managing potential off-site contractor and visitor parking.	Works Supervisor Environmental Manager
GG11	Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.	Works Supervisor
GG12	Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials	Works Supervisor

Ref	Control and Management Measures	Responsibility
	from vehicles, including excavated materials, drop heights will be limited.	
GG13	Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >10 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >10 m distance, additional pollution control measures will be implemented as appropriate. All refuelling, oiling and greasing of construction plant and equipment will take place above a suitable drip/spill containment and also away from drains. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a minimum capacity of 110 per cent of the maximum stored volume. Spill kits will be located nearby.	Works Supervisor Environmental Manager
GG14	Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).	Environmental Manager
GG15	Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps, daily checks and ongoing monitoring.	Environmental Manager
GG16	Wheel washing facilities will be provided at the main compound, where appropriate. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits.	Works Supervisor
GG17	Earthworks and stockpiled soil will be managed as per the SMP.	Works Supervisor Soil Scientist / Practitioner

Ref	Control and Management Measures	Responsibility
GG18	Bonfires and the burning of waste material will be prohibited.	Works Supervisor
GG19	A SWMP will be developed prior to construction. The SWMP shall include but not be limited to: • waste forecasts; • identification of recovery routes; and • actual waste figures once work has begun. Consideration will be given to the guidance in the Code of Practice developed by Contaminated Land: Applications in Real Environments (CLAIRE) "A Definition of Waste: Development Industry Code of Practice (DoWCoP)" (Ref 15). Dedicated waste management areas will be designed to sufficiently accommodate the types and volumes of waste produced and to reduce the environmental risk of storing waste on-site (covered, secured and away from drainage, where required). The control of earthworks and the movement of excavated materials (including any re-use of excavated materials) will be achieved under appropriate Environmental Permits, exemptions, or the DoWCoP.	Environmental Manager EnvCoW
GG20	An Incident Response Plan will be developed for the construction phase which will outline procedures to be implemented in case of unplanned events, including but not limited to site flooding and pollution incidents.	Works Supervisor Environmental Manager EnvCoW
GG21	Stone pads or similar will be installed in areas where heavy equipment, such as cranes and piling rigs, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the SMP.	Project Manager
GG22	Working areas will be appropriately fenced. The type of fencing installed will depend on the area to be fenced and will take into consideration the level of security required in relation to the surrounding land and public access, rural or urban environment and arable or stock farming. For some locations the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas. Fencing will be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified.	Project Manager

Ref	Control and Management Measures	Responsibility
GG23	Members of the community and local businesses will be kept informed regularly of the works through active community liaison. This will include notification of noisy activities, heavy traffic periods and start and end dates of key phasing. A contact number will be provided which members of the public can use to raise any concerns or complaints about the Scheme. All construction related complaints will be logged in a complaints register, together with a record of the responses given and actions taken. Where practicable and subject to agreement with the landowner, construction works adjacent to the Wigwam Holiday facility would be undertaken outside of peak season in order to minimise the impact on users of the site.	Project Manager
GG24	If peaty soils are disturbed during construction of the Scheme, reinstatement would be required following construction to ensure the peat is returned to its previous health.	Environmental Manager Soil Scientist / Practitioner
GG25	Where sensitive features and protected habitats are to be retained within or immediately adjacent to the Site, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired, and replaced as necessary. The protective areas will be shown on the LEMP prepared as part of the final CEMP.	Works Supervisor ECoW
Construction		
GG26	Land used temporarily will be reinstated where practicable to its pre-construction condition (including Agricultural Land Classification (ALC) grade) and use. Hedgerows, fences, and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.	Works Supervisor ECoW Soil Scientist / Practitioner

5.7 Landscape and Visual

5.7.1 **Table 5.2** outlines the principles for the avoidance of visual disturbance during the construction period, as far as reasonably practicable.

Table 5.2 Landscape and Visual Control and Management Measures

Ref	Control and Management Measures	Responsibility
LV01	The Main Works Contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be	Environmental Manager

	replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid will be used as a replacement, in accordance with the **Indicative Landscape and Ecological Mitigation Proposals**. Replacement vegetation will be planted as close by as practicable and will complement landscape character and be sympathetic to the local habitat type in order to provide a high biodiversity value.	ACoW
LV02	The Main Works Contractor(s) will apply the relevant protective principles set out in BS 5837:2012: Trees in relation to design, demolition, and construction (Ref 20). This will be applied to trees within the Scheme Site Boundary which will be preserved through the construction phase, and to trees outside of the Scheme Site Boundary where such measures do not hinder or prevent the use of the relevant working width for construction. An ACoW will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist.	Environmental Manager ACoW
LV03	Arboricultural removals during construction will be undertaken in accordance with a strict method statement prepared as part of the final CEMP. The method statement will include details on working methods near trees, protection measures, supervision of works, a schedule of tree removals/pruning, a staged programme of works and a Tree Protection Plan.	Environmental Manager ACoW
Aftercare		
LV04	A five-year aftercare period will be established for all reinstatement and mitigation planting, details of which is set out in the **Indicative Landscape and Ecological Mitigation Proposals** and will be set out in a LEMP prepared prior to construction.	Environmental Manager EnvCoW
Lighting		
LV05	The Main Works Contractor(s) will provide and maintain all lighting for the construction works and the site welfare and site security cabins. Task specific lighting will be required for winter working (due to the short-day lengths when lighting will be required at the beginning and end of the day).	Project Manager
LV06	Lighting will be directional with care to minimise potential for light spillage beyond the site particularly towards houses, live traffic, and neighbouring habitats especially where there are known populations of sensitive species (e.g., bat foraging areas, etc.) and will be designed with reference to the Institute of Lighting Professionals Guidance Notes (in particular GN-8: Bats and Artificial Lighting (Ref 29) which was produced in collaboration with the Bat Conservation Trust, and GN-1: Reduction of Obtrusive Light (Ref 30) in so far as it is reasonably practicable.	Environmental Manager EnvCoW

LV07	The following measures will be applied by the Main Works Contractor(s) at all times for any lighting provided at or above ground level: • Lighting will be used only when required and will comprise lighting of work areas and access and egress with low level directional lighting; • Lights installed will be of the minimum brightness and/ or power rating capable of performing the desired function; • Light fittings will be used that reduce the amount of light emitted above the horizontal (reduce upward lighting); • Light fittings will be positioned correctly and directed downwards; • Direction of lights will seek to avoid spillage onto neighbouring properties or habitats; • Passive Infra-Red (PIR) controlled lights (motion sensors) will be considered for use where appropriate as these may be more acceptable to neighbours than those which are controlled by a time switch or are on all the time. These will be given particular consideration in areas of high security risk and access and egress; and • Unnecessary lights will be switched off.	Project Manager Environmental Manager EnvCoW

5.8 Ecology and Biodiversity

5.8.1 **Table 5.3** outlines the control and management measures for the protection of habitats and protected species during the construction phase of the Scheme:

Table 5.3 Ecology and Biodiversity Control and Management Measures

Ref	Control and Management Measures	Responsibility
B01	The Main Works Contractor(s) will comply with relevant protected species legislation. Appropriate licences will be obtained where necessary from Natural England for all works affecting protected species as identified by the **Ecological Impact Assessment** submitted in support of the Planning Application and through pre-construction surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences.	Environmental Manager ECoW
B02	In the event that vegetation or any other feature with the potential to support breeding birds is required to be removed during the main breeding bird season (01 March to 31 August) or, in the case of Schedule 1 birds (e.g. barn owl), is likely to be disturbed, then works will be undertaken in the presence of an ECoW(s). Appropriate protection measures will be put in place should active nests be found. These will include exclusion zones around active	ECoW

Ref	Control and Management Measures	Responsibility
	nests until chicks fledge or nests become inactive as determined by monitoring by the ECoW(s). Active nests of wild birds are protected at all times and therefore the same measures will be put in place if an active nest is identified at any time of year.	
B03	Where there will be a risk of animal entrapment, a means of escape will be installed into all excavations left open overnight.	ECoW Environmental Manager
B04	To control the spread of invasive weeds in accordance with the Wildlife and Countryside Act 1981, any plant or machinery that has been used in areas contaminated with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Himalayan balsam, will be thoroughly cleaned. Water used to clean vehicles, when necessary, will be discharged or emptied into the contaminated area to prevent the spread of the plant (through plant propagules, e.g. seeds, rhizomes, fragments). The area will be cordoned off to prevent any inadvertent spreading. Any plant material or soil contaminated with plant propagules if removed from a site is classified as controlled waste and will be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with Section 34 of the Environmental Protection Act 1990. Further detail will be set out in a Biosecurity Management Plan.	ECoW Works Supervisor
B05	Subject to the location and scale of impact, suitable habitat for common reptiles will be subject to two-stage habitat manipulation that will take place between mid-March and mid-October. Firstly, vegetation will be cut to approximately 150 mm (with the arisings removed) under the supervision of an ECoW and the site left for a minimum of two days to allow reptiles to naturally disperse from the area. Secondly, vegetation will be cleared down to ground level under the supervision of an ECoW. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring reptiles. Construction works could commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula will be timed to avoid the hibernation season (late October to early March). Replacement hibernacula and refugia will be provided prior to clearance of any suitable habitat.	ECoW
B06	Alternative roost structures (bat boxes) will be installed, prior to felling of trees with bat roost potential (with landowner consent), on retained trees within the Scheme Site Boundary or areas outside of the Scheme Site Boundary agreed with landowners. Unless specified otherwise by the provisions of any protected species licence for bats, two boxes will be provided for each tree to be felled where Potential Roost Features (PRF) on that tree are	ECoW

Ref	Control and Management Measures	Responsibility
	classified as PRF-I bat roost potential. Five boxes will be provided for each tree with PRF-M bat roost potential to be felled.	
B07	Alternative barn owl breeding sites (barn owl boxes) will be installed, prior to removal of nesting sites, (with landowner consent) on retained trees or poles within the Scheme Site Boundary or areas outside of the Scheme Site Boundary agreed with landowners.	ECoW
B08	Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.	ECoW
B09	Habitat translocation or any species translocation (if required) that is not covered by protected species licences will be undertaken in accordance with a strict method statement. The method statement will be specific to the habitat type or species affected and will detail the appropriate construction methods, timing, management, receptor site preparation and post construction habitat management and monitoring. The receptor site will be clearly identified and prepared in advance of translocation.	ECoW
B10	Where any in channel watercourse works are required, works will be completed between 16 June and September 30 to avoid key fish spawning and migration periods (species specific, depending on waterbody)	ECoW
B11	Where works require dewatering of waterbodies known to contain fish, fish removal and relocation will be required (which will require appropriate permits such as an FR2 licence from the EA). Where practicable, instream works should be completed in dry conditions, when fish are unlikely to be present. Any use of pumps for dewatering should be screened to prevent fish entrapment as per the Eels (England and Wales) Regulations 2009.	ECoW
B12	A method statement to ensure works within watercourse crossings include suitable measures to allow the passage of otters, water vole and fish throughout construction (i.e., during fluctuating water levels). Any watercourse diversion will be designed to allow appropriate flows and fish passage.	ECoW
B13	In the first instance reasonable avoidance measures will be incorporated to avoid impacting known otter holts/couches, badger setts and/or trees identified as having bat roosting potential and suitable buffer zones implemented.	ECoW

Ref	Control and Management Measures	Responsibility
B14	Where feasible, depending on ground conditions, piling activities should utilise soft-start non-percussive piling techniques to limit disturbance, which would assist in allowing sounds to increase gradually allowing fish in the immediate vicinity to swim away.	ECoW

5.9 Historic Environment and Buried Archaeology

5.9.1 There is the potential that, during construction works for the Scheme, previously unknown buried archaeology could be encountered. In this instance works should stop and advice would be sought from the Technical Specialist Advisors for the historic environment, and the Historic Environment Officer for the Local Authority would be consulted.

Human Remains

5.9.2 Should human remains be discovered during the course of construction, works will cease at the location, the area will be demarcated to prevent accidental disturbance, and the remains will be covered and protected and left in situ in the first instance, in accordance with current good practice. The removal of human remains will only take place in accordance with a licence from the Ministry of Justice and under the appropriate Environmental Health regulations and the Burial Act 1857 (Ref 8). In the event of the discovery of human remains the Main Works Contractor(s) will notify the Historic Environment Officer for the Local Authority, to establish whether it is necessary to contact the office of H.M. Coroner.

Treasure

5.9.3 Any artefacts which are recovered that fall within the scope of the Treasure Act 1996 (Ref 9) and Treasure (Designation) Order 2002 (Ref 10) will be reported to the H.M. Coroner immediately. The Main Works Contractor(s) will ensure that the requirements of the Treasure Act 1996 (Ref 9) and Treasure (Designation) Order 2002 (Ref 10) are enforced and that all the relevant parties are kept informed. In addition, the Main Works Contractor(s) shall maintain a list of finds that have been collected that fall under the Treasure Act and related legislation.

5.9.4 Artefacts that are classified as ‘treasure’ will be removed to a safe place. Where removal cannot be executed on the same working day as the discovery, suitable security measures must be taken by the Archaeological Contractor to protect the finds from damage or unauthorised removal.

Control and Management Measures

5.9.5 **Table 5.4** below outlines the control and management measures for the historic environment.

Table 5.4 Historic Environment Control and Management Measures

Ref	Control and Management Measures	Responsibility
H01	Known heritage assets and locations of known archaeological interest will have been identified by a programme of desk-based assessment and field evaluation prior to construction. Wherever possible identified heritage assets and archaeological remains will be avoided by the Scheme design. Where avoidance has not been possible, archaeological mitigation measures comprising the preservation of archaeological remains, or a programme of archaeological investigation will be implemented. The scope, objectives, methodology and report deliverables for each archaeological investigation will be set out in an archaeological project design/WSI prepared in consultation with and approved by the Historic Environment Officer for the Local Authority. Areas of archaeological preservation, or where archaeological work is planned, will be demarcated using appropriate fencing and signage to prevent unintentional damage. The fencing and condition of the areas will be inspected, repaired, and replaced as necessary. The areas of archaeological preservation or investigation will be identified on plans within the CEMP.	Environmental Manager Works Supervisor
H02	Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the Scheme will inform the relevant authorities and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the Scheme parameters. Where archaeological remains have been identified and mitigation measures agreed, an Archaeological Clerk of Works would be in attendance to monitor construction activities and archaeological works to ensure compliance with the approved WSI.	Environmental Manager Archaeological Clerk of Works
H03	An outline process for dealing with the unexpected discovery of archaeological remains including human remains and treasure during construction is set out above and would be adhered to during construction	Environmental Manager Archaeological Clerk of Works
H04	Where practicable, the Scheme will maintain elements within the historic landscape such as vegetation and hedgerows (including re-instating hedgerows and fences).	Environmental Manager

5.10 Water Environment and Flood Risk

The following section outlines the principles for the protection of the water environment, in relation to flood risk, drainage and WFD water bodies.

Table 5.5 Water Environment and Flood Risk Control and Management Measures

Ref	Control and Management Measures	Responsibility
W01	All works affecting watercourses or within the relevant permitting stand-off distance from the top of bank or landward toe of a flood defence on main rivers and Internal Drainage Board (IDB) maintained watercourses will be in accordance with a method approved under consents issued under the Environmental Permitting Regulations 2016 (Ref 21) or Land Drainage Act 1991 (Ref 22), IDB Byelaws (where relevant) for the benefit of the EA, Lead Local Flood Authorities (LLFAs) and IDBs . Where practicable, a stand-off distance from the top of bank of all watercourses/waterbodies will be established (with the exception of crossings and where existing field access roads are already located adjacent to watercourses are to be utilised). To align with EA and IDB consenting requirements, it is proposed that this will be: • 16 m for tidal main rivers; • 8 m for non-tidal main rivers; and • 9 m for IDB-maintained watercourses. No statutory stand-off distances are specified for ordinary watercourses, but any works liable to cause an obstruction to flow would be subject to consent under the Land Drainage Act 1991. Appropriate stand-off distances would also be implemented where Scheme construction activities coincide with water supply and sewerage infrastructure. These are to be agreed on a case-by-case basis. For any instances where the stand-off distances stated above cannot be achieved between construction works and watercourses, these works would be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activity Permit (FRAP) for main rivers, Ordinary Watercourse Consent (OWC) for ordinary watercourses).	Environmental Manager EnvCoW
W02	For open cut watercourse crossings and installation of vehicle crossing points for access roads, good practice measures will include but not be limited to, where practicable: • reducing the working width for open cut crossings of a main or ordinary watercourse as far as practicable whilst still providing sufficient safe working area; • installation of a pollution boom downstream of open cut works; • the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;	Environmental Manager EnvCoW

Ref	Control and Management Measures	Responsibility
	• readily available spill kits and straw bales readily at all crossing points for downstream emergency use in the event of a pollution incident; • the use of all static plant, such as pumps, in appropriately sized spill trays; • prevention of refuelling of any plant or vehicle within 15 m of a watercourse; • prevention of storing of soil stockpiles within 15 m of a main river; • inspection of all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and • reinstatement of the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used.	
W03	Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Natural substrate will be provided through temporary watercourse crossings culverts.	Environmental Manager EnvCoW
W04	Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. Trenchless methods will be used where feasible, and if open-cut is unavoidable, working width will be minimised, flows isolated with flume pipes or over-pumping, silt controls installed, and works will be scheduled during low-flow periods to reduce sediment disturbance. Where flood defences are present, crossing design should ensure that their integrity and standard of protection are preserved. Watercourse bed and banks will be subject to full reinstatement on removal of temporary watercourse crossings on completion of construction works. Specific detailed designs for each watercourse crossing, consistent with these design principles, will be prepared by the Main Works Contractor(s). These will be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activities Permit from the EA for main	Project Manager EnvCow

Ref	Control and Management Measures	Responsibility
	rivers, Ordinary Watercourse Consent from the Lead Local Flood Authority or Internal Drainage Board for ordinary watercourses).	
W05	The Main Works Contractor(s) will comply with all relevant consent conditions regarding de-watering and other discharge activities. This will particularly be with regard not only to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers. It is assumed that temporary discharges generated from dewatering activities, for example, around pylon bases and in underground cable sections, would be made to ground, rather than to watercourses. Where this is not practicable in localised areas, any discharge to surface water would be made in compliance with relevant consents.	Environmental Manager EnvCoW
W06	The Scheme incorporates appropriate surface water drainage measures into its final design for the haul roads, access tracks, works compounds and laydown areas so that they do not lead to a significant increase in flood risk. Access roads (and working areas) in the floodplain are to be as close to ground level as possible (a slight raised surface, relative to the adjacent land, is often required to allow for drainage). This is to minimise the loss of floodplain storage volumes associated with raised structures such as raised access roads, working areas and associated topsoil stockpiles. Cross drainage would be provided as necessary at topographic low points. Stockpiles would be located outside of the undefended floodplain as far as reasonably practicable. Stockpile impacts in the floodplain, where unavoidable, will be mitigated through appropriate positioning (e.g. aligned parallel with flow pathways), leaving gaps and cross-drainage. Approaches to bridges and culverts in Flood Zones would minimise ramping up to the bridge deck so as not to impede flood flow conveyance.	Environmental Manager EnvCoW
W07	The Main Works Contractor(s) will subscribe to the EA's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The Main Works Contractor(s) will implement a suitable flood risk action plan, which would form part of the Emergency Procedures, and will include appropriate evacuation procedures should a flood occur or be forecast.	Environmental Manager EnvCoW
W08	Active private water supplies will be identified with landowners through the landowner discussions. Appropriate measures would be considered during construction to prevent any water quality deterioration from pollution. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response will be provided within 24 hours. Where the installation	Environmental Manager EnvCoW

Ref	Control and Management Measures	Responsibility
	works have affected a private water supply, an alternative water supply will be provided, as appropriate.	
W09	In the event of a significant spill during construction, all relevant landowners, tenants will be contacted within 24 hours, within 250m of the spill, to determine if there are any private water supplies that might be affected; an assessment of the likelihood of groundwater contamination reaching identified private water supplies will be undertaken, and where a private water supply is judged likely to be affected, an alternative water supply will be provided, as appropriate. Pollution incidents would be reported to the Environment Agency immediately.	Project Manager Works Supervisor Environmental Manager EnvCoW
W10	Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes, and these drainage systems would be permanently reinstated to ensure their existing function is maintained.	Works Supervisor EnvCoW
W11	Appropriate control of runoff from working areas will be achieved through implementation of a DrMP for the construction phase. The DrMP will use sustainable urban drainage systems (SuDS) principles, promoting infiltration of runoff wherever possible and specifying appropriate treatment and attenuation storage to ensure any discharges to watercourses are uncontaminated and limited to greenfield rates. The DrMP will cover all aspects of construction works and temporary infrastructure. Drainage measures will be phased to be completed before the commencement of earthwork operations, in a specific area, and will be retained until the drainage system of the Scheme is fully operational, or site restoration works are completed. This will include the temporary diversion of existing agricultural drainage around working areas, if required, followed by reinstatement on completion of works.	Environmental Manager EnvCoW
W12	Any proposed temporary flow diversion and realignment works would be supervised by a suitably qualified fluvial geomorphologist.	Technical Specialist Advisor
W13	Foul water and sewage effluents produced by the construction workforce will be contained by temporary foul drainage facilities (such as a septic tank) and disposed off-site by a licensed contractor. The Environment Agency's approach to groundwater protection guidance document (Ref 31) and other relevant guidance will be followed, as appropriate.	Project Manager Works Supervisor
W14	The Main Works Contractor(s) will implement the following best practice control measures to manage (non-foul) site effluent or wastewater: • Any (non-foul) site effluent or wastewater is to be retained on site within an intermediate bulk container (IBC) or holding	Project Manager Works Supervisor

Ref	Control and Management Measures	Responsibility
	tank and taken away for disposal by a registered waste carrier. No discharge of wastewater to ground or water will occur; • All wash down of vehicles and equipment will take place in designated areas; • Where wheel washes and boot washes are installed adjacent to site accesses or egresses, these will be self-contained, will recycle wash water as much as possible and will not directly discharge to the environment; • All active drainage points within and adjacent to the site will be clearly identified and where necessary appropriate interceptors to trap silt and accidental pollutants must be installed; • A specialist wastewater contractor will be employed to dispose of any hazardous liquid wastes found on site and disposed of in accordance with those regulations.	

5.11 Geology and Hydrology

5.11.1 The following section outlines the principles for the avoidance of contamination and creation of new pathways as a result of the construction of the Scheme.

Table 5.6 Geology and Hydrogeology Control and Management Measures

Ref	Control and Management Measures	Responsibility
GH01	Intrusive ground investigations and assessment will be undertaken prior to construction which will inform appropriate geotechnical design in relation to the site/structure specific ground conditions including ground instability/adverse ground conditions. Pre-construction ground investigation will be undertaken at the substation site, including gas monitoring.	Technical Specialist Advisor (Ground Conditions)
GH02	Construction methods such as appropriate piling techniques will be required to minimise the risk of mixing of groundwater through the creation of new pathways. This includes the provision of a Foundation Works Risk Assessment (FWRA), which would be undertaken once the proposed foundation solutions are known, in accordance with EA guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (Ref 24).	Project Manager Works Supervisor Technical Specialist Advisor (Ground Conditions)
GH03	Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks.	Environmental Manager

Ref	Control and Management Measures	Responsibility
GH04	All use and storage of chemicals to be undertaken in accordance with The Control of Pollution (Oil Storage) Regulations 2001 (Ref 23) and EA guidance 'Protect groundwater and prevent groundwater pollution' (Ref 25).	Environmental Manager
GH05	Any temporary dewatering activities during construction will be undertaken in accordance with EA guidance, and if required, an Abstraction Licence and Environmental Permit (for the discharge) and will be limited to the depth and time required to facilitate construction activities.	Environmental Manager
GH06	Application of salt grit (for example, to prevent access tracks freezing) to comply with recommended rates in CIRIA 648 'Control of water pollution from linear construction projects (C648)' (Ref 26).	Environmental Manager
GH07	At any trenchless crossings where horizontal directional drilling is required, a pre-construction Hydrogeological Risk Assessment will be carried out to inform the detailed design of the crossing and ensure that this does not present an unacceptable environmental risk. This will include the provision of a drilling fluid breakout management plan. The nature and scope of control or remediation measures will be agreed with the EA, as appropriate.	EnvCoW Technical Specialist Advisor (Ground Conditions)
GH8	A protocol for dealing with any unexpected contamination will be included in the final CEMP. This will include best practice in line with the EA's Land Contamination Risk Management guidance (Ref 27) and the EA's approach to groundwater protection (Ref 25). This includes identifying the source of contamination, details of how any affected area will be delineated, protected, investigated and assessed.	Environmental Manager Health and Safety Manager
GH9	Where there may be ground gases associated with anticipated Made Ground and identified contamination sources or natural gases (within deposits with a high organic matter content), control measures would include PPE for enclosed spaces, including gas monitors where required to alert staff of potential risks.	Environmental Manager Health and Safety Manager
GH10	No sources of asbestos have been identified in reports to date, but there is potential for buried/unrecorded asbestos to be present, associated with agricultural activities. Should any suspected asbestos or suspicious materials be identified during construction, works would be paused and appropriate samples taken to confirm its nature and advise of next steps, i.e. removal from site and appropriate disposal. The control measures would include appropriate PPE in the instance of encountering asbestos.	Environmental Manager Health and Safety Manager

5.12 Agriculture and Soils

5.12.1 The Main Works Contractor(s) will follow best practice principles to minimise any disruption to agricultural activities.

Table 5.7 Agriculture and Soils Control and Management Measures

Ref	Control and Management Measures	Responsibility
AS01	Access to and from residential, commercial, community and agricultural land uses will be maintained, where practicable, throughout the construction period or as agreed through the landowner discussions. The latter may require signed diversions or temporary restrictions to access. Although not envisaged at this stage it may be that temporary access is not maintained but, in all instances, those impacted will be consulted on the proposals. The means of access to affected properties, facilities and land parcels will be communicated to affected parties during the pre-construction period, with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access (if required) will be provided in consultation with the landowner/occupier.	Agricultural Liaison Officer
AS02	Any existing water supplies for livestock will be identified pre-construction. Where supplies will be lost or access compromised by construction works, temporary alternative supplies will be provided. Water supplies will be reinstated following construction. By providing alternative supplies during construction, it allows farm operations to continue and reduces any potential significant effects to Agricultural Landholdings.	Project Manager Works Supervisor
AS03	A scheme of pre-construction land drainage will be designed with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working area during construction. The Scheme will also take into account surface water runoff measures.	EnvCoW Works Supervisor
AS04	Should animal bones be discovered during construction, which may indicate a potential burial site (relating to mass graves of cloven-hooved animals or birds as result of disease/disease spread prevention), works will cease, and advice will be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.	Environmental Manager Technical Specialist Advisors
AS05	All movement of plant and vehicles between fields will cease in the event of a notification by Department for Environment, Food and Rural Affairs (Defra) of a disease outbreak in the vicinity of the site that requires the cessation of activities.	Environmental Manager Works Supervisor

Ref	Control and Management Measures	Responsibility
	Advice will be sought from Defra in order to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works.	
AS06	Stone pads or alternatives such as soil stabilisation / temporary matting will be installed in areas where heavy equipment, such as cranes and piling rigs, and access routes are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of topsoil before installation; this will be stored and reinstated in accordance with the soil management measures detailed in the final SMP, including management measures specific to stoneless soils.	Project Manager Works Supervisor
AS07	Soil management measures will be set out in the final SMP. The SMP will include, but not be limited to the following: • details of the soil resources present; • roles and responsibilities (and required competencies and training); • how topsoil and subsoil will be stripped and stockpiled; • suitable conditions for when handling soil will be undertaken, for example avoiding handling of waterlogged soil; • indicative soil storage locations; • how soil stockpiles will be designed, taking into consideration site conditions and the nature/composition of the soil; • specific measures for managing sensitive soils including stoneless ; • suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works; • approach to reinstating soil that has been compacted, where required; • details of measures required for soil restoration; and • requirements for monitoring and aftercare. An Outline SMP is included in **Annex A**	EnvCoW Soil Scientist / Practitioner
AS08	Soil excavated as part of the Scheme will be reused on site for backfilling where needed, for the reinstatement of land required temporarily and for landscaping where practicable and where soil is suitable for reuse (for example, not contaminated and giving consideration to land holdings and applicable biosecurity measures). It is intended that all soil will be reused on site, and within the same field where possible, practicable and required; however, if it arises that excess spoil topsoil or subsoil cannot be reused on site, this	EnvCoW Soil Scientist / Practitioner Project Manager Works Supervisor

Ref	Control and Management Measures	Responsibility
	soil will be taken off site in accordance with measures outlined within the final SMP and in line with the requirements of the Scheme Site Waste Management Plan.	

5.13 Traffic and Movement

5.13.1 The following measures will be implemented to reduce traffic and movement impacts during the construction of the Scheme.

Table 5.8 Traffic and Movement Control and Management Measures

Ref	Control and Management Measures	Responsibility
TT01	The Main Works Contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP. An **Outline CTMP** has been developed in support of the consent applications for the Scheme [document reference GWNC-WSP-ZZZZ-ZZZZZZ-PLN-PM-000002].	Environmental Manager EnvCoW
TT02	All designated PRoWs crossing the working area will be managed with access only closed for periods while construction activities occur. Any required diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns. Access disruption would be reduced as far as reasonably practicable while construction activities occur.	Environmental Manager Works Supervisor
TT03	All affected PRoWs will be confirmed in advance of commencement of construction, informed by engagement with the LPA PRoW Office. PRoWs crossed by the working areas will be managed in discussion with the relevant local authorities. Public footpath Wstn/7/1 will require a temporary suspension and diversion for the duration of the construction period. The diversion route and consents for temporary suspension will be applied for and agreed with the relevant local authority prior to the period of suspension, including requirement for signing, monitoring and the PRoW reinstatement. New planting is proposed in fields around public footpath Wstn8/1, however the route will be retained throughout the works	Environmental Manager EnvCoW
TT04	The CTMP will set out measures to manage travel to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions,	Environmental Manager EnvCoW

Ref	Control and Management Measures	Responsibility
	as far as reasonably practicable. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards. An **Outline CTMP** has been developed in support of the consent applications for the Scheme [document reference GWNC-WSP-ZZZZ-ZZZZZZ-PLN-PM-000002].	

5.14 Noise and Vibration

5.14.1 The following measures will be implemented to reduce impacts from noise and vibration during the construction of the Scheme.

Table 5.9 Noise and Vibration Control and Management Measures

Ref	Control and Management Measures	Responsibility
NV01	Construction working will be undertaken in accordance with the working hours set out in **Section 5.5**, unless the works are under an exception to the set working hours in which case they will be carried out in a manner that minimises noise and vibration at all times. Best practicable means to reduce construction noise will be confirmed within the final CEMP. Measures to be implemented will include, but not be limited to, the following: • Consideration of construction plant and methodology utilised during construction; • Siting semi-static equipment as far as reasonably practicable away from sensitive areas; and • Consideration of screening, enclosures and temporary restrictions for noisy activities.	Environmental Manager EnvCoW
NV02	Best Practicable Means measures, as defined by The Control of Pollution Act 1974 (Ref 28) and detailed in BS 5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise (Ref 13), and Part 2: Vibration (Ref 14) will be employed by the Main Works Contractor(s) to reduce any potential adverse impacts. These means may include consideration of construction plant and methods, siting semi-static equipment as far as reasonably practicable away from sensitive areas, screening, enclosures, and temporal restrictions.	Environmental Manager EnvCoW

Ref	Control and Management Measures	Responsibility
NV03	The Main Works Contractor(s) will conduct detailed construction noise and vibration assessments to determine whether there are likely to be any new or different significant adverse effects at noise sensitive receptors (NSR) and therefore whether additional measures, including site-specific best practicable means (BPM), may be required.	Environmental Manager Technical Specialist Advisors EnvCoW

5.15 Air Quality

5.15.1 The Main Works Contractor(s) will ensure that appropriate measures to mitigate any air quality impacts due to the construction of the Scheme are implemented.

5.15.2 These mitigation measures are designed to protect human health, avoid dust nuisance, and mitigate impacts to surrounding ecological habitats and species. For instance by preventing the smothering of vegetation and limiting the deposition of dust that may be re-suspended beyond the Scheme Site Boundary or become mixed with run off (creation of silty water). Exhaust gases contain oxides of nitrogen (NO_X) and ammonia (NH_3) which can also alter the nutrient status of surrounding habitats when deposited in sufficient quantities.

Table 5.10 Air Quality Control and Management Measures

Ref	Control and Management Measures	Responsibility
AQ01	A Dust Management Plan (DMP) will be included as part of the final CEMP. The DMP, will include, but not be limited to the following: • communications to include display of the name and contact details of person(s) accountable for air quality and dust issues on the Site; • daily on-site and off-site inspections will be undertaken by the Main Works Contractor(s), where receptors are nearby, to monitor dust. This would include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of the Scheme Site Boundary, with cleaning to be provided if necessary. The frequency of site inspections will be increased by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out, during prolonged dry or windy conditions or in response to complaints or an incident resulting in dust emissions. Inspection results will be recorded, and an inspection log made available to the local authority upon request; • site management will document all dust and air quality complaints, identify causes and take measures to reduce emissions in a timely manner, and record the measures taken;	Environmental Manager Technical Specialist Advisors EnvCoW

Ref	Control and Management Measures	Responsibility
	• preparation and management of the site ensuring that machinery and dust causing activities are located as far as possible away from receptors, screens/barriers are erected around dusty activities/materials and are at least as high as any stockpiles, use wet methods to keep site fencing, barriers and scaffolding clean, remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site where they must be covered, seeded, or fence stockpiles used to prevent wind whipping; • monitoring and inspections to include evolving evaluation of the Scheme phases as required and practicable; and • construction operations will only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, for example, suitable local exhaust ventilation systems. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	
AQ02	During construction, bulk cement and other fine powder materials are to be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. Sand and other aggregates are stored in bunding areas and not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate control measures to reduce dust are in place. For smaller supplies of fine powder materials, bags are to be sealed after use and stored appropriately.	Project Manager Works Supervisor Environmental Manager
AQ03	The Main Works Contractor(s) is to inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Works Supervisor
AQ04	To minimise the impact from trackout, on-site activities will: • impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures, subject to the approval of the nominated	Works Supervisor EnvCoW

Ref	Control and Management Measures	Responsibility
	undertaker and in agreement with the local authority, where appropriate); • use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use; • avoid dry sweeping of large areas; • ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; • inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; • record all inspections of haul routes and any subsequent action in a site log book; • install haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned, where required; • implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); • ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and • access gates to be located at least 10 m from receptors where practicable.	
AQ05	Dust pollution from earthworks activities will be limited through the use of the following measures, as appropriate: • topsoil will be stripped as close as reasonably practicable to the period of excavation or other earthworks activities to avoid risks associated with run-off or dust generation; • materials will be compacted after deposition, with the exception of topsoil and subsoil on land to be restored for agriculture, forestry, landscaping and wildlife habitats; • cover will only be removed in small areas during work and not all at once where practical; and • soil spreading, seeding, planting or sealing of completed earthworks will be undertaken as soon as reasonably practicable following completion of the earthworks.	Works Supervisor EnvCoW
AQ06	Operating vehicle/machinery will follow the below: • construction vehicles will be required to meet Euro VI emissions standards which reduce NO_X and particulate matter emissions; • all Non-Road Mobile Machinery (NRMM) with an engine power rating of 37 kW to 560 kW will be required to meet Euro Stage IV standards as a minimum;	Works Supervisor EnvCoW

Ref	Control and Management Measures	Responsibility
	• avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable to limit emissions from plant and NRMM; • low and zero emission vehicles will be used where possible for site use; • produce a Construction Logistics Plan to manage the sustainability of goods and materials; • implement a Construction Workforce Travel plan to support and encourage sustainable travel; • ensure all vehicles switch off engines when stationary - no idling vehicles; and • all vehicles, plant and NRMM will be regularly inspected, serviced and maintained.	

5.16 Energy Use, Efficiency and Carbon Reduction

5.16.1 The production of energy is closely linked to greenhouse gas (GHG) emission and climate change, which requires construction projects to identify and implement wherever practicable measures to increase energy efficiency.

5.16.2 Energy consumption during the construction phases can be attributed to a variety of operations. These operations are identified below, with the measures that can be taken to reduce the energy consumption.

5.16.3 The following section also identifies practicable measures to reduce GHG emissions and contribute to minimise the impacts from projected climate change as a result of the construction of the Scheme.

Table 5.11 Energy Use, Efficiency and Carbon Reduction Control and Management Measures

Ref	Control and Management Measures	Responsibility
CC01	The final CEMP will confirm measures to manage carbon emissions resulting from construction activities, this will include: • proposed measures to reduce significant sources of construction energy use (fuel/electricity) and associated emissions; • the approach to securing energy from renewable and/or zero or low emission sources; • the approach to energy and carbon dioxide reporting from relevant site activities including construction activities and the transportation of materials and waste; and	Environmental Manager

Ref	Control and Management Measures	Responsibility
	• consideration of the procurement, maintenance and use of energy and carbon efficient construction plant.	
CC02	Mitigation measures to reduce carbon produced from the construction of the Scheme will include: • the specification of materials with fewer embodied GHG emissions within the Main Works Contractor(s) contracts (e.g. where practical, sustainable materials (materials with a higher recycled content) and locally sourced materials should be selected), including where feasible, design for end of component reuse; • use of renewable/zero or low carbon energy sources for construction vehicles, plant and machinery where reasonably practicable, e.g. electric vehicles and plant; • efficient use of construction plant and machinery, i.e. using appropriately sized plant and machinery, and switching off when not in use; • fuel use monitoring; • employing low carbon construction techniques as far as reasonably practicable; • plant and machinery to be kept in good working order to maintain power efficiency; • using appropriate size generators for plant and any temporary buildings etc.; • commitments to reduce water use and disposal; • provision of suitable thermal insulation for site accommodation to minimise energy demand for heating; • early connection to grid electricity to reduce use of mobile diesel energy generation, where reasonably practicable; • efficient transportation of construction materials and waste transport, with the aim to use electric vehicles wherever practicable; and • sourcing construction materials from local suppliers where practicable to reduce transport emissions.	Environmental Manager
CC03	The Main Works Contractor(s) will pay due consideration to the impacts of extreme weather events and related conditions during construction. Measures will include, for example: • health and safety plans to prevent worker exhaustion due to heat supportive measures for working in high temperatures might include the provision of sunblock, sun hats and lightweight clothing, refreshment breaks and cooled water supply; • temporary buildings designed with measures to cool summertime overheating; and	Environmental Manager

Ref	Control and Management Measures	Responsibility
	• safety measures to mitigate against issues caused by high winds such as increase dust or damage to structures/construction plant.	
CC04	The Main Works Contractor(s) should use a short to medium range weather forecasting service from the Met Office, or other approved meteorological data and weather forecast provider, to inform short to medium term programme management, environmental control and impact mitigation measures e.g. health and safety plans to include supportive measures for working in extreme high or low temperatures. The Main Works Contractor(s)'s Environmental Manager will consider all measures deemed necessary and appropriate to manage severe weather events and should as a minimum cover training of personnel and prevention and monitoring arrangements to manage severe weather events. As appropriate, construction method statements should also consider severe weather events where risks have been identified.	Environmental Manager
CC05	An early warning system for wildfire detection and evacuation procedures for construction workers should be implemented alongside fire safety measures such as clearance of vegetation around temporary structures (where appropriate), access to fire extinguishing equipment, and evacuation protocols developed.	Works Supervisor EnvCoW

5.17 Waste Management

5.17.1 The Scheme will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy.

Table 5.12 Waste Management Control and Management Measures

Ref	Control and Management Measures	Responsibility
WM01	A Site Waste Management Plan (SWMP) will be produced by the Main Works Contractor(s) post consent, which will set out: • The waste streams that will be generated; • How the waste hierarchy will be applied to these wastes; • Identified storage areas for waste and methods to contain waste within storage areas, preventing rainwater ingress, weathering and pest access where appropriate; • Implement pest control if required; • Storage requirements for waste documentation, such as waste transfer notes and consignment notes;	Environmental Manager Technical Specialist Advisors EnvCoW

Ref	Control and Management Measures	Responsibility
	• Good practice measures for managing waste; and • Roles and responsibilities for managing and monitoring waste management.	
WM02	All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste carriers, to waste management sites which hold the necessary regulatory authorisation such as exemptions or permits, for those wastes transferred or consigned to them – the Main Works Contractor(s) will perform audits to confirm compliance with the applicable legislation. Waste will be accompanied by the appropriate waste transfer note or consignment note.	Environmental Manager
WM03	If required, a Materials Management Plan (MMP) will be developed under the CL:AIRE Definition of Waste: Development Industry Code of Practice (Ref 15) by the Main Works Contractor(s) to support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse/offsite disposal of materials and ensure compliance with regulatory guidance.	Environmental Manager Technical Specialist Advisors EnvCoW

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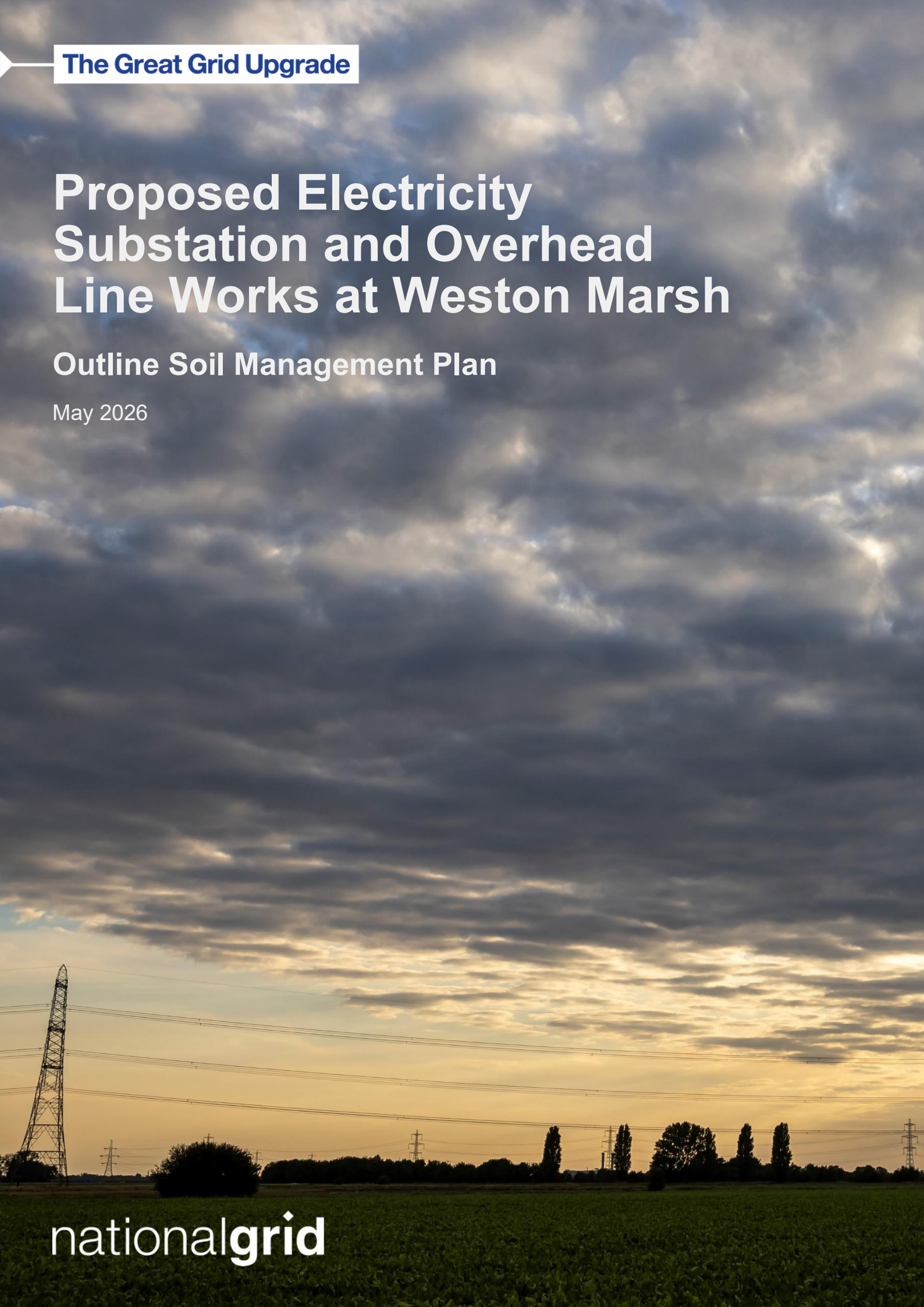
Annex A Outline Soils Management Plan

The Great Grid Upgrade

Proposed Electricity Substation and Overhead Line Works at Weston Marsh

Outline Soil Management Plan

May 2026



nationalgrid

Proposed Electricity Substation and Overhead Line Works at Weston Marsh
Document control

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Contents

1. Introduction

1.1 Overview

1.1.1 This Outline Soil Management Plan (SMP) has been prepared on behalf of National Grid Electricity Transmission plc (National Grid).

1.1.2 National Grid are proposing to undertake works to construct a new electricity substation, new sections of overhead line and modification of existing overhead lines south west of the Spalding Tee-Point in the Weston Marsh area, within the administrative boundary of South Holland District Council (SHDC) in Lincolnshire.

1.2 Summary of the Scheme

1.2.1 In totality, the Scheme consists of four components, each planned to be progressed via separate consenting routes. These are summarised in **Table 1.1**.

Table 1.1 Components of the Scheme

Works Required	Consenting Regime
Construction of the new Air Insulated Substation (AIS) – 400 kV Weston Marsh Substation A, associated landscaping and environmental mitigation works, drainage, highways and other associated works	Town and Country Planning Act 1990 (TCPA) (Ref 1) Component referred to as '**Substation Works'**
Construction of new sections of overhead line to connect the new substation into the existing 4ZM overhead line Removal of a section of the existing 4ZM overhead line Other associated works	Section 37 of the Electricity Act 1989 (Ref 2) and deemed consent pursuant to section 90(2) of the Town and Country Planning Act 1990 Component referred to as '**S37 4ZM Overhead Line Works**'
Construction of a new section of overhead line to connect the existing 2WS overhead line into the new substation. Removal of a section of the existing 2WS overhead line Other associated works	Section 37 of the Electricity Act 1989 and deemed consent pursuant to section 90(2) of the Town and Country Planning Act 1990 Component referred to as '**S37 2WS Overhead Line Works**'
Reconductoring works required on the existing 4ZM overhead line Two spans of temporary overhead lines	The Town and Country Planning (General Permitted Development) (England) Order 2015 (Ref 3) and The Overhead Lines (Exemption) (England and Wales) Regulations 2009 (Ref 4) Component referred to as '**Exempt Overhead Line Works'**

1.2.2 The Substation Works will require consent from SHDC under the TCPA.

1.2.3 The S37 4ZM Overhead Line Works and the S37 2WS Overhead Line works (collectively referred to as 'the S37 Overhead Line Works') will require consent from the Secretary of State for Energy Security and Net Zero under Section 37 of the Electricity Act 1989 (Section 37).

1.2.4 The Exempt Overhead Line Works constitute permitted development under Part 15 Class B of the Town and Country Planning (General Permitted Development) (England) Order 2015 and The Overhead Lines (Exemption) (England and Wales) Regulations 2009.

1.2.5 The Scheme in its totality is a standalone development to enable connection of the Outer Dowsing Offshore Wind Farm to the national electricity transmission system. Each component stated in **Table 1.1** is required for the Scheme to fully function as part of the National Electricity Transmission System (NETS).

1.3 Purpose of this Outline Soils Management Plan

1.3.1 This Outline SMP has been prepared in support of the required consent applications for the Scheme and has been informed by engagement between National Grid and the relevant consenting authorities.

1.3.2 The Outline SMP has been prepared to protect soil resources during the preconstruction, construction and reinstatement stages for the Scheme in its entirety.

1.4 Structure

1.4.1 This Outline SMP is structured as follows:

1) Legislation, Policy and Guidance – This section provides an overview of the legislation, national, regional and local policy of relevance to this Outline SMP; and the guidance under which it has been developed;
2) Soil Protection Strategy – This section gives an overview of the main risks of soil degradation and their wider environmental consequences which can be caused if appropriate mitigation and management measures are not followed during soil handling;
3) Roles and Responsibilities – This section defines the specific roles, including required training, expertise and responsibilities, for individuals who will have responsibility for the implementation of soil protection measures identified later in the document;
4) Soil Baseline – This section describes the baseline soil conditions for the Scheme, drawing on desk study and field survey information;
5) Soil Protection Measures – This section sets out the measures, controls and procedures for soil stripping, handling, transport, storage, reconditioning, reinstatement, monitoring and aftercare to protect soil quality and ensure soils are restored to a condition suitable for their intended end use; and
6) Monitoring – This section sets out the monitoring, record-keeping and reporting procedures required to verify that soil stripping, stockpiling and reinstatement are undertaken to the required standard, and to identify and address and non-compliances through corrective action and re-assessment.

2. Legislation, Policy and Guidance

2.1 Overview

2.1.1 Legislation and national policy relevant to the Scheme and this Outline SMP is described in the **Planning, Design and Access Statement (TCPA application) and Section 37 (S37 applications)**. Key legislation and policy relevant to ALC is summarised in the following sections.

2.2 Legislation and National Policy

2.2.1 This report is consistent with the direction given by paragraph 187, Section 15: Conserving and enhancing the natural environment, of the National Planning Policy Framework (NPPF) (Ref 5) as follows:

2.2.2 *"Planning policies and decisions should contribute to and enhance the natural and local environment by: a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;"*

2.3 Regional and Local Policy

2.3.1 The South East Lincolnshire Local Plan 2011-2036 (Ref 6) includes the following which are relevant to the Scheme:

1) Section 2.6.1, Strategic Priority 9: *"To promote the more efficient use of land, prioritise the re-use of previously developed land and to minimise the loss of South East Lincolnshire's high quality agricultural land by developing in sustainable locations, at appropriate densities."*
2) Policy 3, Design of New Development, requires proposals, where relevant, to *"protect best and most versatile soils".*

2.4 Guidance

2.4.1 The guidance which has been followed in developing the requirements set out in this document are as follows:

1) Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 7);
2) The Safeguarding our Soils: A Strategy for England (Ref 8);
3) Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings (Ref 9);
4) BS 3882 Specification for topsoil (Ref 10); and
5) BS 8601 Specification for subsoil and requirements for use (Ref 11).

3. Soil Protection Strategy

3.1.1 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 are protected and conserved for future use. Many construction activities have the potential to damage soils. The following sections of this Outline SMP describe how the management of soils will be controlled and how soils will be protected, and how their quality conserved throughout all stages of the work.

3.1.2 Failure to protect soils during soil handling can lead to their degradation with consequential environmental impacts, both on-site and off-site, such as:

1) soil erosion, which reduces soil volume, rooting depth and nutrient availability and increases sediment loading to adjacent watercourses;
2) loss of soil organic matter, leading to a loss of nutrients, a reduction in soil moisture-holding capacity and a decline in soil fertility, potentially resulting in poor establishment and long-term survival of vegetation;
3) soil compaction leading to loss of soil structure, reduced permeability to water (leading to waterlogging) and restricted aeration and rooting potential; and
4) loss of soil biological activity.

3.1.3 These impacts on soils can have wider environmental consequences, including:

1) alteration to hydrology;
2) increased sediment loading to adjacent watercourses;
3) poor establishment and long-term growth of vegetation; and
4) visual impact of slope failure or soil erosion leading to bare soil surfaces.

3.1.4 Measures provided in this Outline SMP on how soils on site will be stripped, handled, and stored appropriately for reuse (where relevant) will be developed further in the final SMP. It is considered this can be satisfactorily addressed by way of an appropriately worded planning condition.

4. Roles and Responsibilities

4.1.1 The effective implementation of the soil management measures will be the responsibility of the Environmental Manager(s) of the Main Works Contractor(s). This individual will have sufficient training and expertise in assessing soils, soil conditions and soil handling operations to ensure the measures outlined within the final SMP can be implemented, supervised, and monitored effectively.

4.1.2 The Environmental Manager will be supported by a Soil Scientist or Practitioner appointed by the Main Works Contractor(s) who will provide any training required and who will undertake monitoring visits and audits. The Soil Scientist or Practitioner will be a qualified soil scientist or practitioner with the necessary training, qualifications, and experience, having achieved the Soil Professional Competence Standards No. 1 (Foundation skills in field soil investigation, description, and interpretation) and No. 4 (Soil science in soil handling and restoration) as set out by the British Society of Soil Science (**Appendix A**).

4.1.3 Further details of the responsibilities of these roles are set out below. The final SMP will describe the roles of all who have responsibility for the implementation of the requirements of the final SMP.

4.2 Environmental Manager

4.2.1 The Environmental Manager will be responsible for planning, over-seeing and carrying out routine inspections of soil management activities to ensure these are being undertaken in line with the requirements of the SMP.

4.2.2 The Environment Manager will be responsible for ensuring:

1) adherence to access/haul route alignments and compliance with no off-route access throughout the works;
2) effective vegetation and foreign matter clearance prior to soil stripping commencing;
3) soil plasticity testing is undertaken ahead of soil handling and/or trafficking commencing, with additional checks undertaken if rainfall results in works having to be stopped / recommenced due to rainfall/wet ground conditions;
4) effective separation of soil types and layers during stripping and in stockpiles;
5) effective stockpile construction and monthly inspections of stockpile condition; and
6) effective reinstatement of each layer in the correct sequence (where backfilling is required).

4.2.3 The Environmental Manager will be responsible for reporting on all soil stripping and stockpiling activities through recording the following:

1) confirmation of effective vegetation clearance and the removal of arisings;
2) confirmation that topsoil and subsoil resources have been correctly identified;

3) records of soil plasticity test results;

4) data relating to the volume and type of topsoil and subsoil excavated transported and stockpiled;

5) stockpile location and condition with reference to finalised site and landscaping plans; and

6) thickness of each layer replaced where soil reinstatement is required with reference to finalised site and landscaping plans.

4.2.4 The Environmental Manager may delegate these activities to individuals with sufficient training and expertise where required. The Environmental Manager and anyone with delegated responsibility will undertake training provided by the appointed Soil Scientist or Practitioner.

4.3 Soil Scientist or Practitioner

4.3.1 The appointed Soil Scientist or Practitioner will be responsible for the provision of expert and technical soils advice throughout the earthworks and the subsequent site restoration activities. The role includes liaison with the Environmental Manager and any other personnel/organisations as relevant to works affecting soils.

4.3.2 The appointed Soil Scientist or Practitioner will be responsible for training key site staff in identification of topsoil and subsoil resources which are suitable for re-use so that accurate segregation of topsoil and subsoil resources can be achieved. The Soil Scientist or Practitioner will also provide training on the assessment of soil plasticity status based on the field technique provided in **Appendix B**.

4.4 Roles and Responsibilities Checklist

4.4.1 **Table 4.1** summarises the split of responsibilities across the two roles described above.

Table 4.1 Roles and responsibilities matrix

Main Activity	Sub-activities	Frequency	Responsible	Qualifications
Training	Presentation of key aspects of soil management	Once, at start of site preparation works	Soil Scientist or Practitioner	An individual with the necessary "Foundation Skills", having achieved the soil professional competence standards set out by the British Society of Soil Science.
	Identification of topsoil and subsoil resources	Once, at start of site preparation works		
	Soil plasticity assessment	Once, at start of site preparation works		
	Toolbox talks	To be agreed with Environmental Manager		
Inspections and monitoring	Adherence to access/haul route alignments and compliance with no off-route access.	Continuous until soil stripping complete	Environmental Manager	In-house training provided by qualified Soil Scientist or Practitioner (with monitoring by the Soil Scientist or Practitioner to check works).
	Vegetation and foreign matter clearance	Ahead of soil stripping		
	Soil plasticity	Ahead of soil stripping for each stripping unit. Additional checks required if rainfall results in works having to be stopped prior to soil stripping recommencing within that stripping unit		
	Appropriate separation of soil layers as required (topsoil, upper subsoil, lower subsoil) and accurate documentation of depths stripped, and volumes	Continuous until soil stripping complete		

Main Activity	Sub-activities	Frequency	Responsible	Qualifications
	transported from each stripping unit			
	Appropriate segregation of soil materials in stockpiles by stripping unit, layer and plasticity, and accurate documentation of material source and stockpile location	Continuous until soil stockpiling complete		
	Stockpile construction	Continuous until soil stockpiling complete, and stockpiles prepared for storage period		
	Inspection of soil storage stockpiles	Monthly		
	Assessment of soil condition (including plasticity) within stockpiles prior to re-use	Prior to re-use from each stockpile	Soil Scientist or Practitioner	An individual with the necessary “Foundation Skills”, having achieved the soil professional competence standards set out by the British Society of Soil Science.
	Inspection of soil reconditioning windrows (where required)	Continuous until soil reconditioning complete		
	Inspections of restored soil profiles	Continuous until soil placement complete. Checks should be undertaken as each layer is placed		
Reporting	Condition reports detailing works undertaken and replaced soil conditions (in relation to target)	On completion of soil replacement activities for each asset	Soil Scientist or Practitioner	An individual with the necessary “Foundation Skills”, having achieved the soil professional competence

Main Activity	Sub-activities	Frequency	Responsible	Qualifications
Monitoring	All the above activities will be monitored	Weekly checks of soil handling operations (either combined with site visit or through review of reporting documentation)		standards set out by the British Society of Soil Science.
Auditing	All above activities will be audited	Monthly audits will be undertaken of activities which have taken place in the preceding month. Annual audits of all activities will be undertaken.		

5. Soil Baseline

5.1.1 The soil baseline has been established through a desk study and an ALC survey, reported in the **Agricultural Land Classification Survey Report**. This provides detail in relation to soil physical properties, which supports decisions regarding the approaches to soil handling and possible soil reuse options (i.e. supporting landscape design and planting) and soil export if required.

5.1.2 The baseline will be incorporated into the final SMP to include soil data from the ALC survey and soil survey data collected from a Soil Resources Survey to be undertaken post consent / pre-construction. The soil baseline in the final SMP will include (but not be limited to) the following:

1) Soil types (including soil textures and the main soil types present onsite);
2) Soil type map of the different topsoil and subsoil resources;
3) Soil depths of topsoil and subsoil;
4) Soil depth map;
5) Potential site-won soil volume; and
6) Soil balance.

5.2 Desk Study

5.2.1 Bedrock geology is mapped (Ref 17) as West Walton Formation (sedimentary mudstone and siltstone) and Oxford Clay Formation (detrital mudstone with interbedded carbonates), both formed during the Jurassic Period between 157.3 and 163.5 million years ago.

5.2.2 Clay and silt tidal flat deposits form the superficial drift present, which are sedimentary superficial deposits formed during the Quaternary period (between 11.8 thousand years ago and the present).

5.2.3 Available national soil survey mapping data indicates that the Soil Association present within the Scheme Site Boundary is predominantly the Wisbech Association (Ref 14). The Wisbech Association comprises deep stoneless calcareous coarse silty soils. Groundwater is usually controlled by ditches or pumps as the land is flat with low ridges. There is a risk of wind erosion locally associated with these soils. They are seasonally waterlogged and affected by a shallow fluctuating groundwater-table. These soils are developed mainly within or over permeable material and have prominently mottled or greyish coloured horizons within 40 cm depth of the surface.

5.2.4 The England Peat Map Portal (Ref 17) shows that there is not expected to be any peat present within the Scheme.

5.2.5 Provisional 1:250,000 scale ALC mapping (Ref 13) shows the Scheme to be on land predominantly mapped as Provisional ALC Grade 1 (excellent quality agricultural land); however no detailed published ALC mapping exists. Grade 1 ALC land is considered to be a receptor of very high sensitivity.

5.2.6 Flood risk at the site of the Scheme is described in detail in the **Flood Risk Assessment**. Government long term flooding risk service information (Ref 16) indicates that the Proposed Development lies within an area which is predominantly at low risk of flooding, with areas at medium and high risk (as presented in the **Agricultural Land Classification Survey Report**, Appendix D).

5.2.7 The permanent land take for the Scheme is approximately 19.7 ha, which accounts for the substation, substation access swathe and SUDS basin, land required for drainage diversion and outfall pipe, a net increase of three pylons, and two areas required for permanent mitigation: a small area for permanent mitigation to the north-west of the substation and a panel of screening planting to the east of the substation the substation (see **Agricultural Land Classification Report** for more information). This area can be used, along with results from the ALC survey, to estimate the volumes of soil which may be permanently affected. Augers in the area of the Weston Marsh Substation A determined topsoil depth to be approximately 30 cm. In combination with the permanent land take area of approximately 19.7 ha, this represents around 60,000 m^3 of soil which is estimated to be permanently impacted. It must be noted that this is an estimate based on the current design and existing ALC survey results. The actual volumes of topsoil disturbed will be recalculated based on final designs and survey data and presented in the final Soil Management Plan.

5.3 Detailed Surveys

5.3.1 Detailed results of ALC surveying for the Scheme are presented in the **Agricultural Land Classification Survey Report**.

5.3.2 In summary, ALC surveys confirmed that the Scheme and associated works would be sited on ALC Grade 1 land, with no identified limitations in relation to the Agricultural Land Classification system. It should be noted that although the assessment was based on linear point data, the homogeneity of the surveyed area indicates that the boundaries would be unlikely to change upon surveying a wider area.

5.3.3 Prior to construction, detailed soil resource surveys will be undertaken to determine topsoil and subsoil thickness and to collect samples for analysis of pH, texture, plant available nutrients and soil carbon as a minimum. Detailed soil baseline information from ALC and soil resources surveys will be incorporated into the final SMP.

6. Soil Protection Measures

6.1.1 This Outline SMP describes procedures for 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. There will be a number of control measures at each stage of the works.

6.1.2 A summary of these measures is outlined in bullet form below and described in more detail in the following sections.

6.1.3 Early soil protection measures:

1) Measures for in-situ soil protection during early site clearance activities;
2) Soil recovery and storage (soil stripping and stockpiling);
3) In-situ soil protection ahead of stripping;
4) Pre-treatment of existing vegetation;
5) Measures for handling and stockpiling;
6) Measures to ensure correct segregation of different topsoil and subsoil resources;
7) Measures for separate storage of different soil types; and
8) Method and locations of stockpiling.

6.1.4 Soil reconditioning (for use where required):

1) Measures to recondition wet and plastic soil resources before reuse; and
2) Measures to ensure correct segregation of different topsoil and subsoil resources; measures for handling and to optimise soil drying and re-aeration.

6.1.5 Soil restoration methods:

1) Soil prescriptions for each different land use;
2) Soil handling/replacement methods;
3) In situ soil treatments for each different land use; and
4) Clear re-use strategy for all soil resources taken off-site.

6.1.6 Monitoring:

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

6.1.7 Quality control and auditing measures:

1) Quality control, auditing procedures and plans; criteria for cessation of works;

2) Non-compliances and corrective actions; and

3) Use of toolbox talks for staff training.

6.2 Use of toolbox talks

6.2.1 Toolbox talks will be used so that all site personnel are aware of the SMP and applicable soil handling and soil protection procedures. The toolbox talks will be site- and task- specific, discussing soil conditions and approaches to soil handling at the site.

6.2.2 Toolbox talks must include at least the following topics:

1) Key aspects of the SMP;

2) Identification of topsoil and subsoil resources (to ensure accurate soil stripping and prevention of topsoil/subsoil mixing);

3) Stockpile creation;

4) Assessment of soil plasticity using the techniques set out in **Appendix B**;

5) Soil reinstatement approach (where required); and

6) The suite of toolbox talks will be developed by the Soil Scientist or Practitioner in collaboration with the Environmental Manager.

6.3 Wet weather working and cessation of works

6.3.1 Soils shall only be trafficked and handled when they are in a reasonably dry and friable state, where they have passed the test for soil plasticity (as described in **Appendix B**), which is when soil structural units are least susceptible to damage by compaction and smearing (Ref 9).

6.3.2 The soil plasticity tests shall apply to all soil materials that are to be tracked over and handled (to include stripping, stockpiling and reinstatement). All soil plasticity tests shall be carried out by a competent Soil Scientist or Practitioner, or their nominated representative who will have been trained by the Soil Scientist or Practitioner.

6.3.3 Soil stripping operations must be suspended under the following conditions and not restarted until the ground has had at least a full dry day, or the soil moisture criteria set out in **Appendix B** have been met to allow the restarting of soil handling operations:

1) Sustained heavy rainfall (e.g. >10 mm in 24 hours) which leads to waterlogged soils or pools or water on the ground surface.

2) The ground surface is frozen or covered by snow.

6.3.4 The Environmental Manager (in collaboration with the Soil Scientist or Practitioner where required) will ensure there is continuous awareness of ground conditions as weather patterns change and take pro-active decisions regarding whether soil handling operations should be suspended/restarted.

6.3.5 ALC surveying, reported in the **Agricultural Land Classification Survey Report**, has identified the soil across the area of the Scheme to be Wisbech Association, with no wetness limitation to potential productivity. However, these soils are

predominantly silty loam, with areas of clay and clay/silty clay loam, and so will be plastic at times and potentially for prolonged periods.

6.3.6 In some exceptional cases, it may be necessary to traffic over or handle soils when they are in a plastic state, or under the conditions described above. This may be due, for example, to programme, engineering or due to the specific nature of the soil. In these cases, location-specific methods will be agreed with the Soil Scientist or Practitioner prior to work commencing. Any works during such conditions should take into account health and safety implications of working in very wet conditions and the potential elevated risk of surface runoff and the generation and spread of silt-laden runoff.

6.3.7 Where soil handling operations continue when soils have become plastic the soil materials will be clearly tracked as plastic and plans for effective reconditioning measures to be implemented at the appropriate time will be agreed with the Soil Scientist or Practitioner. The final SMP will identify within the Roles and Responsibilities section the project requirements for approval from a Project Manager or Senior Project Manager for any works planned to be undertaken when soils are plastic.

6.4 General Soil Management Measures

6.4.1 Outlined below are further details of soil management measures.

General Soil Protection Measures

6.4.2 Plant and other site vehicles will be managed so that they do not directly traffic across in situ topsoil. The exception to this would be where vehicles are required to track over in situ topsoil for access to enable specific works to be undertaken (to include access required to strip topsoil), and either the activity will not result in damage to soil resources, or the consequences can be managed through the measures set out in this Outline SMP. In these cases, prior approval will be sought from the Soil Scientist or Practitioner.

6.4.3 Where required, trackway will be used if vehicle access is necessary over unstripped soils, and the access could result in compaction/rutting, particularly if soils are in a plastic state (based on the soil plasticity test set out in **Appendix B**). Where trackway has been used (irrespective of the soil's plasticity at the time of laying trackway), an assessment of the level of compaction under the trackway will be made by the Soil Scientist or Practitioner once the trackway is lifted. The assessment will identify the required remedial measures (such as depth of loosening required) and will be used to develop an archaeological mitigation strategy, where required. Archaeological mitigation will be put in place prior to any soil decompaction measures being implemented. If site access arrangements change as works progress, all personnel should be made aware of the new arrangements through a toolbox talk.

6.4.4 There will be no lay-down of materials, except for those materials required for specific on-going construction activities outside designated storage areas.

6.4.5 Subject to ground conditions and confirmation from the Environmental Manager and/or Soil Scientist or Practitioner, materials can be temporarily stored on topsoil if it is considered that this (both storage and access) will not be detrimental to soil quality.

6.4.6 All areas that will not be stripped will be clearly demarcated with appropriate signage to ensure that plant and other site vehicles do not track across in situ topsoil. Other potential constraints, such as those relating to landowner boundaries, flood zones or archaeologically/ecologically sensitive features will also be clearly demarcated, recorded on an operations site plan and specific toolbox talks delivered in relation to any additional requirements. For all locations where soils will be disturbed (through stripping, tracking over or topsoil storage) reference should be made to the Detailed Written Schemes of Investigation to ensure all required archaeological mitigation is in place for that location if it is deemed necessary by the WSI.

6.4.7 If site access arrangements change as works progress, all personnel will be made aware of the new arrangements through a toolbox talk which will be prepared by the Soil Scientist or Practitioner and delivered prior to the commencement of the works.

6.4.8 As detailed in the **Outline CEMP**, surface water drainage measures will be installed to manage surface water runoff.

Clearance of Existing Vegetation

6.4.9 Prior to soil stripping commencing or the laying of trackway, any vegetation will be cleared to a suitable level and arisings removed. This is to ensure that large quantities of green vegetative material do not get mixed with or lie underneath the stockpiled soils.

6.4.10 The method used will depend on the nature of the vegetation present. The clearance operation should ensure the vegetation is removed to a suitable level and all arisings (including chipped wood material) are removed. Vegetation clearance will be undertaken by best practicable methods; however, blading off vegetation using a bulldozer will not be permitted.

6.4.11 All vegetation clearance works will be undertaken ensuring, where possible, that the soils are not damaged through the creation of ruts or mixing or compaction of topsoil and subsoil resources. This is particularly important where the soils are of a heavier texture and more prone to compaction and smearing (i.e. the compression and smoothing of clay-rich materials, removing structural units, drainage routes through the soil etc.).

6.4.12 The approach to vegetation clearance will be identified by the Soil Scientist or Practitioner (or suitably briefed delegate) in a toolbox talk prior to the works commencing. Soil plasticity tests will be undertaken as detailed in **Appendix B** to minimise the risk of soil damage (as vegetation clearance will require tracking over unstripped topsoil).

Stoneless soils management

6.4.13 Stoneless soils are those identified through physical soil surveys as having less than 1% stones by volume. Soils are stone-sensitive where the mechanical constraints imposed by the presence of stones are high enough that it becomes a key limitation on its use and management. Stoneless soils are commonly used to grow crops sensitive to the presence of stones, such as potatoes, sugar beet and carrots; in these cases farmers may have invested in “destoning” at least once in every crop rotation to create a stone-picked cultivated layer.

6.4.14 The Soil Association mapped as being present (and confirmed by ALC survey) within the boundary of the Scheme is Wisbech Association, which is defined as a stoneless

soil. Therefore, all soils affected by the Scheme must be managed according to the recommendations in this section.

6.4.15 Stoneless soils will be treated as a high-sensitivity resource. There will be particular focus on ensuring both temporary and permanent works do not result in imported stone becoming incorporated into these soils. Requirements for stone importation and use will be reviewed by the Soil Scientist or Practitioner and measures agreed to minimise the risk and to ensure measures are in place to remediate should there be vertical or lateral migration of imported stone. Once the designs are known full details of these measures will be set out in the final SMP.

Archaeological Works

6.4.16 The specification for each stage/sub-stage of the pre-commencement archaeological works will be detailed in an Archaeological Written Scheme of Investigation (WSI) prepared in consultation with and approved by the Local Authority Historic Environment Advisor. The completed pre-commencement archaeological works would require sign-off by the Local Authority prior to any further soil stripping in that area. Soil management measures to be implemented during these works will be described in a Intrusive Surveys Soil Management Plan appended to the WSI, accounting for soil handling measures described in this Outline SMP or the final SMP as appropriate at the time of the works taking place.

6.4.17 Where archaeological works are being carried out as part of the main construction period (i.e. not pre-commencement works), the measures in this Outline SMP will be followed. As noted in **Paragraph 6.4.2**, there may be additional archaeological investigations/mitigation required in areas where topsoil has not been stripped but the surface has been tracked over and soil compacted. Where soil compaction is identified, an archaeological mitigation strategy will be developed and implemented.

Soil Stripping

6.4.18 Before any soil stripping activities take place, any proposed works and phasing likely to impact soil will be detailed by the Main Work Contractor(s) in the final SMP (to include Method Statements, Drawings, Specifications etc.). The final SMP will also provide timescales and sequencing of soil stripping.

6.4.19 The earthworks will be phased to ensure that the topsoil is stripped in each part of the site ahead of subsoil materials, and that all topsoils are stripped from a designated area prior to bulk excavation and earthwork activities within that area.

6.4.20 All stripped materials will be logged, tracked and labelled.

6.4.21 All stripped soils will be free from foreign matter or other materials which would make the soils unsuitable for their intended re-use. Foreign matter is defined as construction materials (such as wood, metal and plastic) that have been imported onto the site. It also includes large natural stone fragments (>50 mm longest dimension) that have been brought to the surface. For areas in which archaeological remains have been identified and mitigation measures agreed with the LPA, an archaeologist will be in attendance to supervise or monitor soil stripping activities and to assess any foreign material to determine whether it is of archaeological origin. If it is determined to have been of archaeological origin, then the Local Authority Archaeological Advisors will be notified and consulted on an appropriate mitigation strategy.

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

6.4.23 Soil will be stripped using a hydraulic excavator or tracked dozer – the approach using a tracked dozer is set out in **Appendix C** and the final SMP will provide details of all approaches to be used in line with published guidance.

6.4.24 Prior to soil stripping commencing, a toolbox talk will be provided by the Soil Scientist or Practitioner (or suitably briefed delegate) in conjunction with the construction lead, to set out how topsoil and subsoil resources will be stripped and stockpiled separately. This will ensure that any differences between the topsoil/subsoil boundary are understood.

6.4.25 If required, dump trucks will be used to transport the soils to stockpile locations.

Soil Stockpiling

6.4.26 Key issues for soil handling, storage and eventual re-use are soil moisture content and soil consistency (plasticity). During the works, soil plasticity status will be determined in situ prior to stripping (see **Appendix B**) and the test results recorded.

Stockpile Formation

6.4.27 Locations of stockpiles will be determined by the Environmental Manager and/ or Soil Scientist or Practitioner when pre-construction information is available and will be decided in line with the SMP.

6.4.28 Appropriate stockpile heights should be used for topsoil that can be stripped and stockpiled in a dry state. Good practice recommendations include topsoil stockpiles no higher than 3 m and subsoil no higher than 5 m (Ref 7). The precise size and height of the stockpile should be determined by the Environmental Manager and/or Soil Scientist or Practitioner, taking into account the amount of space available, the nature and composition (including plasticity) of the soil, and planning conditions associated with the works, in line with the SMP.

6.4.29 The following principles will be followed for all stockpiled materials, following the indicative methodology presented in **Appendix D**:

1) Topsoil and subsoil materials will not be mixed; separate stockpiles will be created for topsoil and subsoil (if subsoil stripping is required);

2) Documentation and physical control measures (such as signing of stockpiles) will be put in place to prevent accidental mixing, to ensure soils are segregated according to source location, and to protect soils from being trafficked by plant or vehicles;

3) 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 marker layer (such as straw or clear recording of ground level information) so that no mixing occurs, and the different materials can be effectively separated. The use of geotextiles should be avoided where practicable due to the risks of material becoming incorporated with soil and resulting in cross-contamination;

4) Soil materials will also be stored on like for like (i.e. topsoil can be stockpiled on topsoil but subsoil should only be stockpiled on subsoil). A suitable marker layer (such as straw or clear recording of ground level information) will be used where

topsoil is stockpiled in topsoil to ensure the in situ soils are not disturbed on stockpile removal. The use of geotextiles should be avoided where practicable due to the risks of material becoming incorporated with soil and resulting in cross-contamination;

5) Appropriate buffers will be maintained between stockpiles and water courses/ditches. This is to protect watercourses and water quality, particularly against construction run-off and to support local biodiversity as described in the Anglian River Basin Management Plan. Buffers of 10 m will be applied where reasonably practicable; however, this may not be viable in all instances given that direct interaction with a number of existing watercourses is required to implement the Scheme;

6) Soil resources will be loose tipped where dumper trucks are used;

7) The sides of stockpiles will be smoothed using the back of an excavator bucket to ensure they shed water and to reduce the risk of waterlogging within the core of the stockpile; and

8) 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 as set out in the SRP.

Stockpile maintenance

6.4.30 Soil stockpiles will be managed and monitored throughout their lifetime so that they can be maintained in relation to stability and integrity. Measures to manage stockpiles are as follows:

1) Soil stockpiles that will be in place for longer than six months will be seeded with an appropriate grass / clover mix to be agreed with the relevant clerk of works, to be detailed in the relevant stage-specific appendix, as soon as practical to maintain slope stability and to prevent erosion of dust generation;

2) Stockpiles without vegetation cover should be sprayed with water where necessary to firm the surface of the stockpile and create a crust to prevent the generation of dust; and

3) 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.

6.4.31 Further measures on the management of dust are provided in the **Outline CEMP**.

Stockpile Reconditioning

6.4.32 Prior to restoration activities taking place, soil resources may have been stored in stockpiles for extended periods and in some exceptional cases, soils may have been handled and stockpiled in a plastic state. To confirm suitability of stockpiled soils for restoration, they should be visually inspected, and assessments carried out before their reinstatement (see **Section 7**).

6.4.33 If any soil is found to be plastic or displaying excessive anaerobic conditions the materials should be reconditioned using the methodology presented in **Appendix E**.

6.4.34 It will be the responsibility of the Soil Scientist or Practitioner to assess soil in each stockpile and to recommend and record appropriate pre-treatment prior to soil placement, should it be required.

Soil reinstatement

6.4.35 The works required to effectively reinstate a soil profile suitable for the proposed end use and to ensure the required soil structure is present and that there is no compaction, will depend on what soil layers have been stripped and the extent of the trafficking over the exposed surface that has occurred.

6.4.36 The sequence required to reinstate the soil profile will be detailed by the Environmental Manager and/or Soil Scientist or Practitioner and communicated as a toolbox talk.

6.4.37 Subsoil and topsoil re-use will aim to achieve the following:

1) Creation of the required combination of topsoil and/or subsoil to create a soil profile with the characteristics required for the proposed use, or re-create the soil profile in line with pre-existing soils where restoration to previous land use and land quality is required; and

2) Ensure, through careful handling and placement of soils, no compaction within the restored soil profiles that may limit vegetation establishment and growth, restrict water infiltration etc.

6.4.38 The approach for the checks required and the methodology to be used to reinstate the land at the end of the construction phase will depend on the thickness of soils stripped and the results of compaction testing, etc. The approaches set out will be in line with published guidance and will ensure the following:

1) Deep ripping of the overburden where required prior to the placement of subsoil; and

2) The soil profile created will be checked by suitably qualified personnel to ensure it is suitable for the proposed end use (**Table 4.1**).

6.4.39 Where soils stripped during the construction phase will not be reinstated and cannot be re-used on site, they will be removed off-site. Prior to any removal off-site, the quantity and characteristics of available soil materials will be assessed.

6.4.40 The soil profiles being reinstated will be designed to maximise soil re-use as far as possible, while ensuring that placing more soil does not have any detrimental effects. For example, it will be assessed whether a thicker topsoil layer can be placed. The final soil profile requirements will be detailed within the final landscape plans and a soil re-use summary report produced by the Environmental Manager and/or Soil Scientist or Practitioner to demonstrate how off-site disposal has been minimised.

6.4.41 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. Soil replacement will be undertaken in accordance with the indicative methodology set out in **Appendix F** and the final SMP will detail all approaches to be used in line with published guidance

Aftercare

6.4.42 An aftercare period will be required where soils are reinstated to ensure they recover structure and function and meet the condition required for their end use (e.g., agricultural production, landscaping or habitat creation). Soil aftercare focuses on identifying and rectifying issues such as compaction, poor drainage, inadequate soil depths, or nutrient imbalance during the establishment period.

6.4.43 The Main Works Contractor(s) will prepare an Aftercare Management Plan relating to soils, which will define:

1) Purpose and scope of the Aftercare Plan, including the aftercare parcels and their intended end uses. End uses may include (but are not limited to) agriculture, landscaping, habitat, biodiversity net gain (BNG) and this information will be used to inform appropriate soil aftercare;
2) Links to other management plans (e.g. Landscape Management Plan, BNG) as required;
3) Aftercare stages and duration: duration should be up to 5 years, with scope for early completion if success criteria are met. The Aftercare Plan should set out in tabular format activities for each year/season;
4) Success criteria (including anticipated timeframe) for each area/land use;
5) Roles and responsibilities: who delivers aftercare measures (e.g. contractor / operator / landowner) and who oversees it (e.g. soils specialist);
6) Management commitments: controls on trafficking, timing of operations, vegetation establishment / management, and access controls (e.g. fencing);
7) Monitoring programme: soil parameters (e.g. structure, depths / mixing, compaction, drainage / wetness, debris / contamination, vegetation performance, fertility) and frequency / timing of monitoring (to include post-reinstatement and periodic checks);
8) Methods: e.g. Visual evaluation of soil structure (VESS) / soil pits, augering and sampling, penetrometer testing, visual drainage / erosion checks;
9) Triggers and remedial actions: define how issues will be identified and required corrective measures (e.g. cultivation / subsoiling, drainage repairs, amendments, targeted imports as last resort); and
10) Reporting and sign-off criteria, including requirements for aftercare monitoring reports, records of interventions, and completion criteria. Completion criteria will include post-reinstatement soil profile checks, and ALC verification. The timing of these is likely to be after 1-3 seasons as a minimum where land returns to agriculture.

7. Monitoring

7.1.1 To ensure that the quality of the soil materials is not detrimentally affected during soil stripping, stockpiling and re-use/restoration works, monitoring will be undertaken as detailed in **Table 7.1**.

7.1.2 Responsibility for some repeated tasks, as indicated in **Table 7.1** can be delegated to a suitable experienced and trained person following the initial monitoring. Training would be provided by the Soil Scientist or Practitioner.

Table 7.1 Monitoring Requirements

No.	Monitoring requirement	Responsible
1	Effective clearance of vegetation and arisings from the soil surface – once prior to soil stripping commencing	Soil Scientist or Practitioner (can be delegated)
2	Soil plasticity state – prior to soil stripping commencing with additional tests following rainfall events	Soil Scientist or Practitioner (can be delegated)
3	Topsoil stripping – correct identification of base of topsoil and minimisation of subsoil incorporation throughout the soil stripping operations	Soil Scientist or Practitioner (can be delegated)
4	Subsoil stripping (if required) - correct identification of base of subsoil and minimisation of overburden incorporation throughout the soil stripping operations	Soil Scientist or Practitioner (can be delegated)
5	Stockpile construction to ensure no mixing of topsoil and subsoil – throughout the stockpile construction period	Soil Scientist or Practitioner (can be delegated)
6	Stockpile condition – checks to record signs of vehicle tracking, erosion, and weed growth and set out remedial measures should issues be identified	Soil Scientist or Practitioner (can be delegated)
7	General monitoring of soil handling operations	Soil Scientist or Practitioner
8	Reinstated soil profiles – check to confirm profile and soil condition is suitable for the proposed end use	Soil Scientist or Practitioner

7.1.3 A record of monitoring visits will be created to include those listed in **Table 7.2**.

Table 7.2 Items for Monitoring Records

No.	Information to be Recorded
1	Confirm successful treatment of vegetation.
2	Confirmation of soil type (topsoil or subsoil).
3	Soil depth stripped.
4	Soil plasticity (determined as 'plastic' or 'non-plastic').
5	Date(s) stripped, weather conditions during stripping, equipment/plant used for stripping.
6	Stockpile location. Designate each stockpile or stockpile portion as 'plastic' or 'non-plastic'.
7	Record any stockpile non-compliance from stockpile inspections. Detail, date, and stockpile location code (refer to Stockpile Inspection Checklist and Stockpile Plan).
8	Reinstated soil profiles characteristics and condition.
9	Sign off for each stage.

7.1.4 The final SMP will include a detailed monitoring plan, setting out frequency and duration of each aspect of the monitoring programme.

7.2 Reporting of Findings

7.2.1 The findings of all examinations and assessments will be recorded and held by the Main Works Contractor(s) for record keeping and to enable actioning of any necessary corrective actions.

7.3 Failures of Acceptability Criteria and Corrective Actions

7.3.1 Where the soils are found to be non-compliant in any respect, appropriate means of remediation will be proposed by the Main Works Contractor(s), with guidance provided by the Soil Scientist or Practitioner; once the affected area has been treated it will be reassessed before sign-off.

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Appendix A British Society of Soil Science Competency Standards

DOCUMENT 1

Foundation skills in field soil investigation, description and interpretation

WORKING WITH SOIL
setting standards in soil science

The investigation of soils in the field, their consistent description according to a recognised scheme, and the interpretation of soil profiles, properties and conditions are generic foundation skills for professional scientists and engineers employed on tasks that relate to the use and/or management of land. This document identifies the minimum qualifications, skills and knowledge which the British Society of Soil Science (BSSS) considers to be required of scientists and engineers conducting field soil investigations.

Qualifications

Professional soil scientists with competence in these foundation skills are likely to have graduated in a relevant science subject. They will also have a number of years of relevant, regular field soil-based experience and will have, or be adequately qualified for, membership of a relevant professional body such as the BSSS.

Skills:

1. The ability to dig and/or auger a soil, or to instruct others to do this, so as to **expose a soil profile** to a relevant depth and to then accurately **identify the sequence of horizons** that comprise the soil profile (natural or manmade) using standard reference documents such as The Soil Survey Field Handbook[1]
2. The **design and development of a soil investigation strategy** that is appropriate to the site or landscape to be investigated, and will generate representative soil information at an appropriate scale. This should be based upon the objectives and context of the study, and an understanding of the likely patterns of soil variability
3. The ability to **read and interpret maps/spatial data** of topography, geology, soil and aerial photography in relation to the interpretation of soil conditions; where and when appropriate, conversance with the use of GIS, GPS and mobile technology

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4. The application of a relevant scheme of **field soil description** (such as Soil Survey Field Handbook) and the production and recording of accurate, consistent descriptions of soil profiles or materials. This should normally include the ability to describe soil colour (e.g. using a Munsell soil colour chart[2]) including mottling, soil texture, the properties of the soil surface, soil structure, consistence and porosity
5. The consistent **hand texturing** of particle size distribution in the fine earth, and the description of stones by their frequency, size, shape and rock type
6. The ability to **interpret soil horizons, features and materials** and whole profile descriptions to develop an understanding of the soil environment and its variability within a landscape
7. The ability and understanding required to **sample a soil or the soils of a site** for one or more relevant determinands representative of the soil or site and relevant to the objectives of the study. This may involve the collection of aggregated topsoil samples or horizon bag or tin samples
8. The ability and knowledge required to interpret the results of any soil chemical, physical or microbial analysis
9. The ability to **interpret the relationships between soil and landscape, land use and climate**
10. The ability to **produce accurate and understandable verbal and written reports** of the soil conditions (text and map information as appropriate) at or across the investigation site, with an interpretation of these in a way that is relevant to the context of the investigation (this is amplified by other BSSS PCSS documents in this series)

1 Hodgson, J M (1997) Soil Survey Field Handbook. Soil Survey Technical Monograph No 5, Silsoe

2 Munsell Soil Colour Book, Munsell Colour (2009)

Knowledge:

1. An understanding of **soil development processes** and of the influence of relief, geology, climate, vegetation and soil organisms on soil development
2. A basic knowledge of world and European soils and their taxonomy, and a more detailed knowledge of soil development and taxonomy within the United Kingdom
3. An understanding of the potential for **soil heterogeneity** in space and time, and of the factors that cause and influence variability
4. Knowledge of **soil horizon notation** and, where appropriate, of a relevant scheme for soil classification including the identification of diagnostic horizons, features and materials
5. Knowledge of **local soils and land use history affecting the soils** and of the range of soils developed across the UK and Europe, and of information sources for more detailed information
6. Knowledge of **natural soil properties and conditions** that is sufficient to set soil conditions at an investigation site within the context of natural variability
7. Knowledge and application of relevant **Health and Safety, Environmental and Biosecurity regulations,** including any animal or plant health restrictions in force and all relevant safe working practices
8. Knowledge of the **potential impacts of human activity and of land management** on soil properties and processes
9. Particular specialist knowledge of soil and crop nutrition, soil hydrology, and of the influence of soil on plant and animal ecology may be required in particular circumstances and these are detailed in related PCSS competency documents

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Background

Large amounts of soil are disturbed during the development of land for urban, industrial/retail and transport uses, for installation of energy networks and for the quarrying of aggregates and minerals. In addition, previously excavated soils are re-instated after mineral working and in the restoration of previously despoiled land to green after-use and to create parks, gardens and landscaped areas within the built environment. Professional soil science has an important role to play in ensuring a successful outcome. Professional competence in managing the restoration of land after soil disturbance builds upon foundation skills in field soil investigation, description and interpretation (BSSS PCSS Document 1). The competencies outlined in BSSS PCSS Documents 6 (Soil science in the establishment, management and/or conservation of natural habitats and ecosystems) and 8 (Soil science in landscape design and construction) will also be relevant depending on the intended after-use of a site.

Qualifications

Professional soil scientists and engineers with competence in soil handling and land restoration will have graduated in a relevant science subject. They will also have a second degree and/or a number of years relevant field experience and will have or be adequately qualified for full membership of a relevant professional body such as the British Society of Soil Science (BSSS).

Minimum competencies

Skills and knowledge:

These are described under a number of sub-headings that relate to different tasks. A professionally-competent scientist or engineer should have the skills and knowledge identified under the **General heading** and **all other headings that are relevant** to the tasks required. Professional soil scientists and engineers working in this sector should be familiar with the Defra Construction Code of Practice for the Sustainable use of Soils on Construction Sites (Defra 2009).

General

1. The ability to investigate, sample, describe and interpret soils in the field in a consistent manner and to professional standards (BSSS PCSS Document 1)
2. The ability and knowledge required to interpret the results of any soil chemical, physical or microbiological analyses

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3. Knowledge of relevant European and national regulations and policies, including national and local land use planning policy and guidance, and soil protection policy
4. A working knowledge of the industry being advised, whether quarrying, development, infrastructure installation or landscaping
5. The ability to effectively communicate soil information in a simple and relevant form to developers, planners, landscape architects and earthmoving contractors with clear statements as to the reliability and certainty of the results
6. The ability to write accurate reports and/or method statements, written in clear terms, that communicate the relevant information to site planners, site managers, site personnel and eventual users of restored land
7. An awareness of the importance of systems of quality assurance and control in all aspects of professional work

The characterisation of soil resources

1. The know-how to select appropriate survey and sampling densities to characterise *in situ* and stockpiled soil resources to required levels of certainty
2. Understanding of Health and Safety requirements on site and the ability to compile a risk assessment when requested
3. Familiarity with the use and limitations of GPS for determining sampling locations on site
4. Proficiency in fieldwork practices and procedures such as soil texturing, soil description and the delineation of soil resource units (see BSSS PCSS Document 1)

The provision of advice on soil handling

1. A knowledge of the machines used for handling soils, their capabilities and limitations
2. An awareness of methods of soil handling that minimise physical damage to soils and guidance[1] that describes such methods, including management of stockpiled soil
3. An understanding of soil hydrology and physical and engineering properties such as plastic limit, and their relevance to soil handling
4. The ability to calculate volumes of *in situ* soil layers to be moved as well as soil stored in stockpiles
5. A knowledge and understanding of waste management and/or contaminated land regulations that might restrict the export of soil materials off-site or their management within site
6. Familiarity with British Standards relevant to characterising soil materials already on site or being imported to site[2]
7. The ability to prepare a Soil Management Strategy/Soil Resource Plan[3] and simple method statements for site personnel

The restoration of land

1. The ability to characterise existing substrates on site and make best use of them, including chemical or physical amelioration where necessary
2. Knowledge and experience of the uses of manufactured soils and the use of organic materials for soil creation where natural soils are in short supply
3. Understanding of the specific soil chemical and physical conditions (including the principles of soil engineering) necessary for various restored after uses and landforms, such as woodland, Best and Most Versatile agricultural land, wet meadow, species-rich grassland, commercial landscaping, etc.

The aftercare and assessment of restored land

1. The ability to prepare and/or interpret aftercare plans (for those restored land uses where one is required)[1]
2. The ability to assess soil physical quality and make any recommendations for amelioration to create a 'fit-for-purpose' soil profile[2]
3. The ability to take representative soil samples for chemical analysis and to interpret the results to make recommendations for the use of fertilisers[4], lime or other chemical ameliorants[3]

1 for example the MAFF (2000) Good Practice Guide for Handling Soils
2 e.g. BS3882:2007 Specification for Topsoil and Requirements for Use
3 Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites
4 Might necessitate a FACTS qualification where the use is agricultural; see BSSS PCSS Document 10 Soil science in crop and livestock production

Appendix B Field assessment of soil plasticity

B.1.1. This appendix 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:

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

B.1.2. The procedure is outlined as:

1) Walkover / visual examination;
2) Soil sampling; and
3) Sample assessment.

B.2. Walkover/visual examination

B.2.1. 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 or surface water ponding on saturated soils, or distribution of moisture loving plant species such as Juncus) and to identify suitable locations for sampling.

B.2.2. 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.

B.2.3. Site observations relating soil moisture content and soil plasticity and the distribution of any significant variability shall be recorded.

B.3. Soil Sampling

B.3.1. For undisturbed areas, the topsoil and upper subsoil shall be sampled at several locations using an Edelman soil auger. Separate samples from each soil layer shall be taken from their full depth.

B.3.2. For stockpiles and windrows, the soil shall be sampled at representative locations using an Edelman soil auger at a range of depths depending on the stockpile size. Where deemed necessary by the site Soil Scientist or Practitioner, samples from greater depths shall obtained using a suitable sized mechanical excavator.

B.3.3. For each layer, approximately a double handful of soil shall be collected and mixed up in a suitable container.

B.3.4. A minimum of five locations shall be sampled and assessed per field or stockpile/windrow.

B.4. Sample assessment

B.4.1. The following assessment is taken from information in Ref 9.

B.4.2. 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 1 mm. Any significant quantity of very fine roots (<1 mm) shall be removed.

B.4.3. 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 **Table B.1**.

Table B.1 First stage of sample assessment for plasticity

Soil description	Handling recommendation
Peds (structures) break up/crumble readily when squeezed in the hand rather than forming into a ball.	Handling ok.
The sample looks dry and is brittle and changes colour (darkens) if water is added.	Handling may be ok: undertake consistency test (**Section B.5**).
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. Handling by tracked excavators may be ok: undertake consistency check (**Section B.5**).
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.

B.5. Consistency check

B.5.1. An attempt shall be made to mould the soil sample into a ball by hand. The outcome of this attempt determines whether the soil should be handled, in accordance with the descriptions in **Table B.2**.

Table B.2 Descriptions of outcome from the consistency check

Rolling soil into a ball is:	Handling recommendation	
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	Undertake final test: attempt to roll the ball into a thread of 3 mm diameter on a flat non-adhesive surface using light pressure from the flat of the hand.	Impossible to form thread: handling ok
		Possible to form thread: handling not recommended. If handled, stockpiled material to be recorded as plastic.

Appendix C Soil stripping methodology (indicative)

C.1.1. This appendix sets out the approach to be followed for soil stripping using tracked dozers. Other methods may be used and will be detailed in the final SMP, following published guidance. Before stripping commences, the soil shall be confirmed as being in a non-plastic state, i.e. suitable for handling. The assessment shall be made using guidance in **Appendix B** and will be overseen by the Environmental Manager.

C.2. Existing vegetation

C.2.1. Woodlands/hedges shall be pre-treated before soil stripping, in two stages:

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

C.2.2. 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 principles for waste management outlined in the **Outline CEMP**. Excessive amounts of woody material will not be incorporated with the stripped soils. The only exception would be where deadwood forms a component of the surface features; in such circumstances a proportion of existing dead wood will be salvaged and used to recreate this habitat.

C.2.3. Any temporary stockpiles of woody materials shall be constructed with a small 'core' to minimise the risk of spontaneous combustion and monitored as appropriate.

C.2.4. Other vegetation will be cleared using an appropriate method. All arisings will be removed prior to soil stripping commencing to ensure significant quantities of green materials are not incorporated with the stripped topsoil as this can lead to the development of anaerobic conditions within the stockpiled soil.

C.3. Access routes

C.3.1. 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.

C.3.2. Access shall be created wide enough to permit access for the dump trucks which shall transport the stripped soils to the storage area.

C.4. Topsoil stripping

C.4.1. In advance of stripping, the topsoil shall be cleared of all foreign matter or waste materials e.g. building rubble and fill materials.

C.4.2. All topsoil shall be stripped using tracked dozers and transported using dump trucks, unless being stockpiled to one side of the construction area. If this is undertaken, it will be in accordance with the guidance set out in Ref 9 and as shown in **Image C.1** and **Image C.2**.

C.4.3. The tracked dozer shall run on the surface of the subsoil and push up the topsoil in a single pass into a temporary row at the end of its run. Using a hydraulic exactor, the stripped topsoil shall be loaded onto a dump truck for transportation to the designated stockpile location.

Image C.1 Soil stripping with bulldozers and dump trucks using modified layer by layer practice.

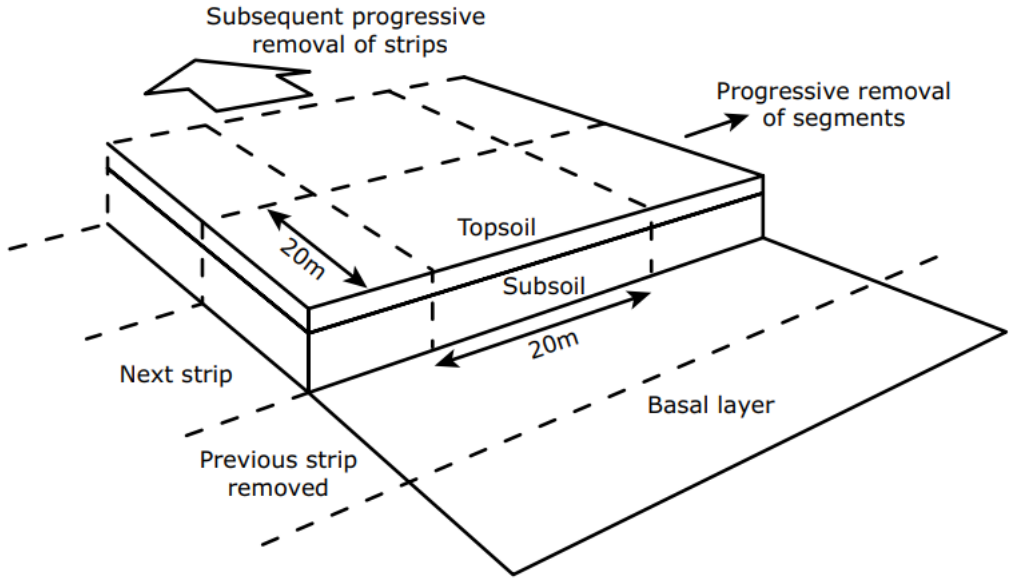
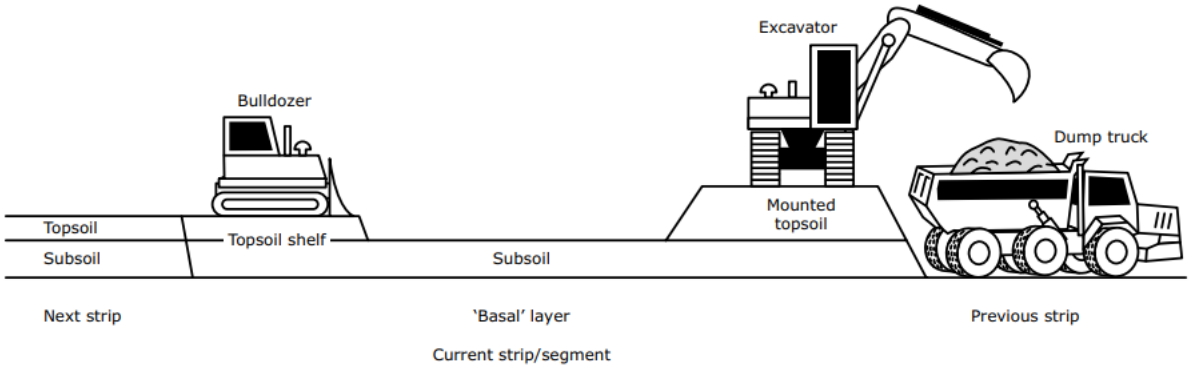


Image C.2 Soil stripping with bulldozers and dump trucks: topsoil



C.4.4. The depth of strip shall be as set out on the Soil Stripping Plan. The aim of the topsoil strip is to enable the majority of the topsoil to be recovered without the inclusion of significant quantities of underlying subsoil. 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.

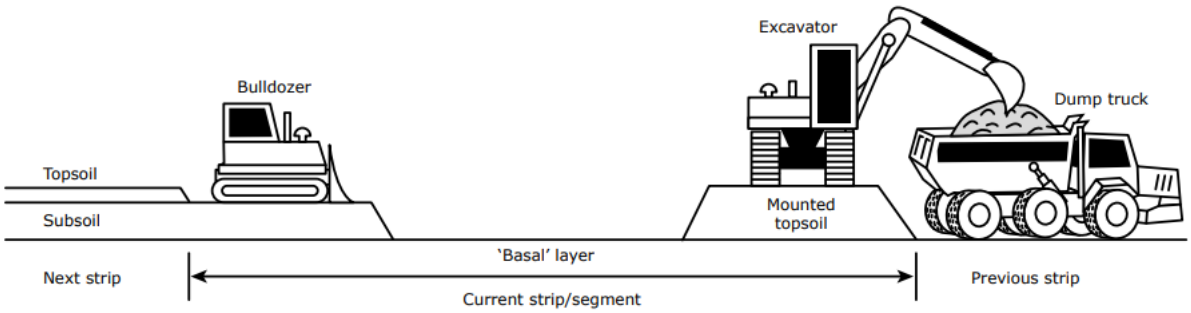
C.4.5. Once loaded, the dump truck shall transport the topsoil along the pre-designated access route to the desired stockpile location.

C.4.6. These operations shall be closely monitored to ensure that the correct soil type is recovered without the inclusion of other soils or wastes. Cross contamination with subsoil could significantly degrade the quality of the topsoil.

C.5. Subsoil stripping

C.5.1. All subsoil shall be stripped using tracked dozers and transported using dump trucks (**Image C.3**).

Image C.3 Soil stripping with bulldozers and dump trucks: subsoil



C.5.2. The tracked dozer shall run on the surface of 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 exactor fitted with a toothed bucket, the stripped subsoil shall be loaded onto a dump truck for transportation.

C.5.3. Once loaded, the dump truck shall transport the subsoil along the pre-designated access route to the desired stockpile location.

C.5.4. These operations shall be closely monitored to ensure that the correct soil type is recovered without the inclusion of other soils or wastes. Cross contamination with deeper subsoil/parent material could significantly degrade the quality of the subsoil.

Appendix D Soil stockpiling methodology (indicative)

D.1. Introduction

D.1.1. This appendix sets out the approach for the storage (stockpiling) of soils. Full details of proposed approach will be set out in the final SMP in line with published guidance.

D.1.2. Stockpiling will ensure that topsoil and subsoil resources are stored separately and, where required, soil resources with differing characteristics are also stockpiled separately.

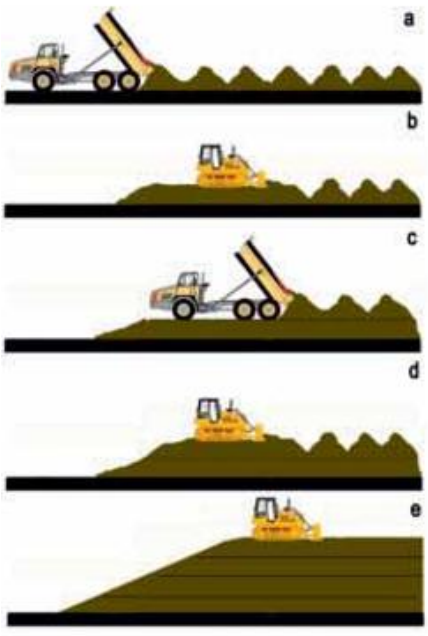
D.1.3. Stockpile locations will be identified in advance and clearly shown on relevant plans such that they do not interfere with other site operations and the risk of stockpiled soil resources becoming contaminated, tracked over etc. is minimised.

D.1.4. The area(s) designated for soil storage shall be cleared of vegetation and stripped, where required, ahead of stockpile construction. Topsoil will be stored on top of in situ topsoil, with a marker layer of straw placed first to ensure, at the time of soil recovery, it is clear where the base of the stockpiled material lies. Subsoil will only be stored on subsoil (i.e. in an area where topsoil has been stripped).

D.2. Stockpiling method

D.2.1. The approach illustrated in **Image D.1** will be used to stockpile non-plastic soils. Ideally, plastic soils will be reconditioned as shown in **Appendix E** prior to final stockpile creation.

Image D.1 Approach used to stockpile non plastic soils.



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.
Any emergent vegetation shall be managed to a maximum height of 300 mm and not allowed to 'set seed'.

Appendix E Soil reconditioning methodology

E.1. Introduction

E.1.1. This appendix presents the approach to be used for reconditioning plastic soils. This Outline SMP requires all soils to be handled when non-plastic but should this not happen, or should plastic soils be identified in stockpiles prior to re-use, reconditioning will be required.

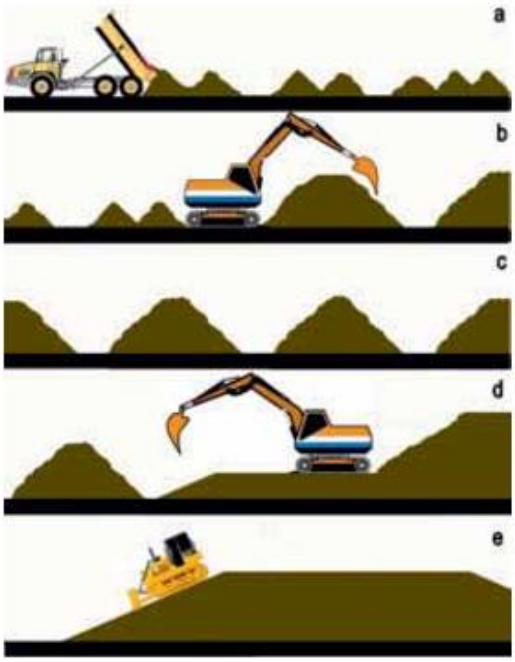
E.1.2. Reconditioning will be undertaken in area(s) of the site where it will not interfere with other site operations to minimise the risk of soils being reconditioned becoming contaminated, tracked over etc.

E.1.3. The area(s) designated for soil reconditioning shall be cleared of vegetation. Soil materials will only be windrowed on compatible soil types / layers. Where possible, reconditioning at the re-use location will reduce the amount of handling required.

E.2. Soil reconditioning method

E.2.1. The approach illustrated in the graphic below shall be applied through placing the plastic soils into windrows and allowing the soil to dry over a period of several weeks (assuming suitable weather conditions). The reconditioned soil can then be used to reinstate areas or re-stockpiled in a non-plastic state, as shown in the **Image E.1**.

Image E.1 Approach used to place the plastic soils into windrows and allowing the soil to dry.



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 (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.

Appendix F Soil placement methodology (indicative)

F.1.1. This appendix presents the methods for the placement of the soils. It comprises the following:

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

7.3.2 Full details of the proposed approach will be set out in the final SMP once detailed design is available and areas to be reinstated and proposed end uses are clearly set out.

F.2. Soil handling considerations

F.2.1. To avoid further physical degradation during all phases of soil placement and handling (e.g. re-spreading/placement, overburden ripping/subsoiling and topsoil cultivation), these operations will be carried out when soil is non-plastic in consistency. As such, soil handling will be stopped during and after heavy rainfall and not continue until the soil is again non-plastic in consistency.

F.2.2. Monitoring of the soil placement will be undertaken to ensure the placed soil is not structurally damaged and so any required remedial measures can be implemented as the works progress.

F.3. Placement and treatment of overburden

F.3.1. The finished surface, prior to the placement of subsoil and topsoil materials, will be loosened through the use of appropriate plant, such as a heavy duty subsoiler/ripper fixed to a tracked dozer. If access is limited, a single rigid tine fitted to a hydraulic excavator will be used to undertake this operation.

F.3.2. The depth of ripping of the overburden will be to 0.4 m, with tine spacing at a maximum of 1 m centres. Any oversized rocks (greater than 0.2 m diameter) that are uplifted to the soil surface during ripping will be picked and removed for use as infill elsewhere.

F.3.3. To ensure effective drainage, ripping shall include a straight run across the width of the area being reinstated at an angle of approximately 45° to any slope followed by a subsequent oblique pass. If assessed as necessary by the Soil Scientist or Practitioner, 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.

F.3.4. As the areas being reinstated are generally narrow linear corridors, ripping will be undertaken to ensure tie in with adjacent, non-worked land parcels such that the ripping does not result in subsequent drainage issues on those land parcels.

F.4. Subsoil and topsoil placement

F.4.1. A sequential approach to subsoil and topsoil placement will be undertaken as outlined below.

Subsoil placement

1) Using hydraulic excavator fitted with toothed bucket (to avoid smearing), remove subsoil from stockpiles;
2) Transport with dump truck to the appropriate re-use location;
3) Tip subsoil in a line of heaps at the edge of the ripped/subsoiled area to avoid re-compaction of the overburden;
4) Spread the subsoil using either a tracked dozer or tracked excavator; and
5) Subsoil depths to be checked by Soil Scientist or Practitioner to ensure correct subsoil depth is achieved across the reinstatement area.

Topsoil placement

F.4.2. Once satisfactory subsoil placement has been achieved, topsoil shall be removed from stockpiles and spread following the same procedures for subsoil above, ensuring that placed and loosened subsoil and overburden is not tracked over.

F.4.3. Topsoil depths to be checked by Soil Scientist or Practitioner to ensure correct topsoil depth is achieved.

Cultivations and monitoring

F.4.4. Once the soil profile has been formed, final cultivation will be undertaken. Cultivation will only be undertaken when the soils are dry and friable to the full depth of working to avoid the risk of smearing the soil.

F.4.5. An appropriate tracked machine or tractor fitted with a wing-tine subsoiler will be used for loosening the subsoil (subsoiling). For inaccessible areas, a suitable tracked excavator, fitted with a single rigid tine (ripper tooth) will be used. Loosening will be undertaken to a minimum depth of 0.6 m below surface level at maximum 0.6 m centres.

F.4.6. To ensure good drainage, subsoiling will include a straight run across the width of the reinstatement area at an angle of approximately 45° to any slope followed by a subsequent oblique pass. If assessed as necessary by the Soil Scientist or Practitioner, 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.

F.4.7. After subsoiling, the Soil Scientist or Practitioner shall assess the subsoil layer to check the effectiveness of the operation. If compaction is still recorded, the above process will be repeated until this is removed.

F.4.8. Once subsoiling has been undertaken successfully, the topsoil will then be cultivated (with repeat cultivations as required) to its full depth using appropriate tillage equipment (e.g. chisel plough, power harrow or set of discs) to produce a suitable tilth. This operation will also help to re-aerate the topsoil after storage (if applicable).

F.4.9. Where access is limited, the topsoil may be cultivated using a landscape rake attachment fitted to a suitable hydraulic excavator.

F.4.10. 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 50 mm in any dimension.

F.4.11. After topsoil cultivation, the Soil Scientist or Practitioner shall assess the topsoil horizon to check the effectiveness of the operation and to confirm the condition of the topsoil is suitable for the intended end use.

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