WEST OF ORKNEY WINDFARM

Onshore Design and Access Statement

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West of Orkney Windfarm

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Revision Record

Revision Number	Revised Section	Description of Changes
2	Throughout	Edits in response to OWPL and Shepherd and Wedderburn comments.

Contents

1. Introduction and Background

1.1 Introduction

Offshore Wind Power Limited (OWPL) (hereafter referred to as 'the Applicant') has submitted an application for Planning Permission in Principle (PPP) to The Highland Council (THC) under the Town and Country Planning (Scotland) Act 1997 (as amended). The application is to construct and operate the onshore infrastructure to export electricity from the West of Orkney Windfarm to the National Grid (hereafter referred to as the onshore Project).

The export cables from the West of Orkney Windfarm will landfall to the east of the Dounreay Nuclear Facility in Caithness, approximately 3.7 km to the west of Thurso. Underground cables will transport power to the new substation infrastructure at Spittal, approximately 33 km inland of the cable landfall. The onshore Project comprises:

- Up to five underground cable circuits (each cable circuit consisting of three power cables and one fibre optic communications cable);
- Up to five transition joint bays (TJBs);
- Up to 288 cable joint bays (CJBs);
- An onshore substation; and
- Temporary access tracks to facilitate construction and up to seven permanent access tracks.

Further information regarding the Project description is detailed in chapter 5: Project description of the Onshore Environmental Impact Assessment Report (EIA) Report which accompanies the PPP application.

1.2 Purpose of Design and Access Statement

Under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 applications for 'national' or 'major' developments must be accompanied by a Design and Access Statement. Although a Design and Access Statement is not required for applications for PPP. The West of Orkney Windfarm Project has opted to submit a Design and Access Statement alongside this application.

- To describe the design principles and approach that have guided the Project proposals;
- To consider access to the Project and how the needs of all users have been incorporated into the design process;
- To demonstrate how the site and its surroundings have been fully assessed to ensure that the final design solution is the most suitable for the surrounding site; and
- To describe the starting point for the onshore Project design, and subsequent alterations to the layout that have been made in response to the issues identified through the EIA Scoping and consultation processes.

This Design and Access Statement should be read in conjunction with the Onshore EIA Report accompanying the PPP, particularly chapter 4: Site selection and alternatives, chapter 5: Project description, chapter 15: Noise and vibration chapter 16: Access, traffic and transport and chapter 17: Landscape and visual.

1.3 The applicant

OWPL is comprised of the following companies working together in a consortium to deliver the Project.

CORIO	**CORIO –** Corio Generation is a Macquarie Green Investment Group portfolio company, operating on a standalone basis. Corio has a project pipeline of over 20 GW. Their global team of offshore wind specialists take projects from origination, through development and construction, and into operations.
TotalEnergies	**TotalEnergies** – one of the largest offshore operators on United Kingdom (UK) continental shelf, majority owner of Seagreen OWF and the Shetland Gas Plant. Targeting 35 GW of renewables by 2025 and 100 GW by 2030.
RIDG	**Renewable Infrastructure Development Group (RIDG)** – Scottish offshore wind project developer whose management team collectively provide over 40 years' experience in the sector, set up to deliver high value projects alongside strategic partners.

1.4 The onshore Project

1.4.1 The site and surroundings

The onshore Project area is located along the north Caithness coast in the Crosskirk / Forss area running in a south easterly direction just north of Westfield where it then splits round the village of Halkirk and meets at the existing SHET-L Spittal converter station and is within the administrative area of THC. The nearest settlements include Halkirk, Thurso and Reay located approximately 0.15 km (surrounded by, but not within, the onshore Project area), 3.7 km east and 5 km west from the onshore Project area, respectively. The site character varies from coastal, rural to agricultural and comprises a patchwork of fields defined by fencing and drystone walling.

The main land use is farming, with mixed agriculture including cereal crops and rough pasture and mixed livestock. Angling takes place along Forss Water and the River Thurso. The existing SHET-L Spittal Converter Station is located in the southern portion of the onshore Project area, additionally adjacent to this portion of the onshore Project area is the preferred location for the SHET-L Spittal 2 substation which will be the grid connection point for the Project.

The onshore Project area avoids all designated sites with the exception of one, The River Thurso Special Area of Conservation (SAC) which runs across a portion of the onshore Project area.

1.4.2 Project description summary

An overview of the key design parameters is outlined in Table 1-1. A complete description of the Project is provided in chapter 5: Project description of the Onshore EIA Report. The onshore Project area and associated development zones are illustrated in Figure 1-1.

Table 1-1 Overview of the key onshore design parameters

Onshore Infrastructure	Maximum Parameters
Cable landfall	Up to six (five plus one spare) HDD cable landfall ducts.
Export cable circuits	Up to five (each consisting of three power cables and one fibre optic communications cable) with a maximum export voltage of 420 kV.
Cable length	Total of 198 km, average of 33 km per cable circuit.
Cable installation methods	Open cut trenching (OCT) where possible and trenchless activities such as Horizontal Directional Drilling (HDD) at major crossing and landfall locations.
Transition Joint Bays (TJBs)	Up to five at approximately 900 m^2 each.
CJB dimensions per bay	Up to 288 at 90 m^2 each.
Permanent access tracks	Up to seven permanent access tracks to substation and landfall and major crossing locations.
Substation	23.92 ha maximum footprint of either Air Insulated Switchgear (AIS) or Gas Insulated Switchgear (GIS) design.
Working corridor width for cable installation	100 m
Temporary construction compounds	Temporary construction compounds required at the cable landfall, along the cable route and at the substation, Some temporary access tracks may also be required to the cable working corridor.
Construction period	Four years.

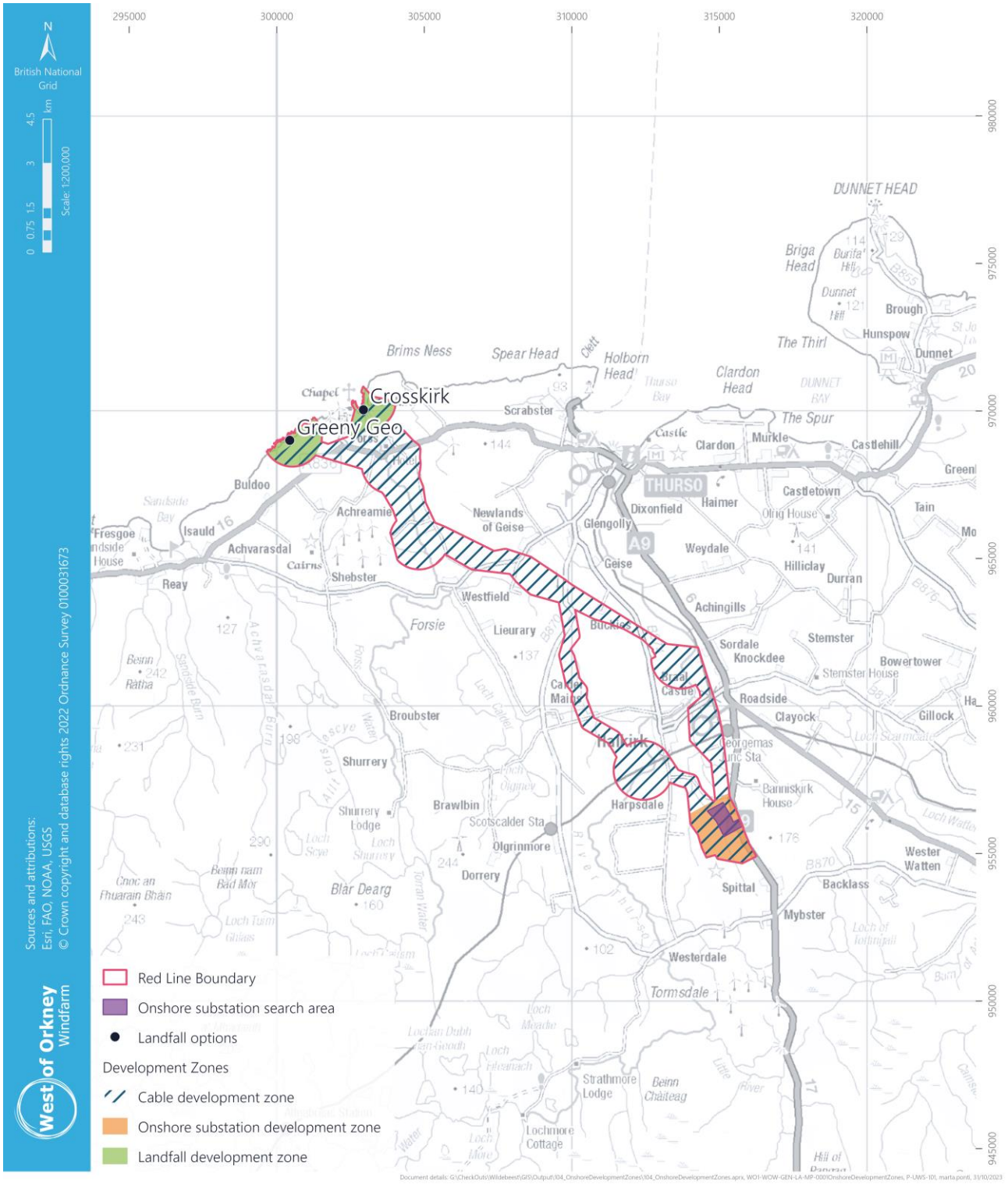

Figure 1-1 Map of the onshore Project area and associated development zones

2. The Design Statement

2.1 Key design considerations

The Project, as mentioned, will consist of the three development zones: landfall, onshore export cables and the onshore substation. Each development zone has been influenced by some key design considerations such as cables being installed underground, appropriate screening of the substation, use of HDD at landfalls and major crossing locations. Primarily the onshore Project area has been designed in such a way as to avoid almost all designated sites, with the exception of the River Thurso SAC where impacts will be mitigated by methods such as HDD cable installation and best practice working methods.

2.2 Planning policy context

The design of the onshore Project has taken account of design planning policies and guidance of relevance. A separate onshore Planning Statement has been prepared to support this PPP application, this should be referred to for a detailed planning policy appraisal. Chapter 3: Planning policy and legislative context within the Onshore EIA Report describes the legislation and policy relevant to the West of Orkney Windfarm Project. For the purposes of this Design and Access Statement, a summary of the key local planning policy context is provided below.

A summary of the planning policy context relevant to the onshore Project has been included in sections 2.2.1 and 2.2.2.

2.2.1 National Planning Framework 4 (NPF4)

The National Planning Framework 4 (NPF4), recently adopted in February 2023, is Scotland's long-term spatial strategy. The spatial strategy is aimed at helping to support the planning and delivery of sustainable, liveable and productive places and forms part of the statutory development plan. The six spatial principles have been split into three categories; sustainable places, liveable places and productive places. There are six spatial principles within NPF4;

- Just transition (Sustainable places);
- Conserving and recycling assets (Sustainable places);
- Local living (Liveable places);
- Compact urban growth (Liveable places);
- Rebalanced development (Productive places); and
- Rural revitalisation (Productive places).

2.2.2 Local Development Plans (LDPs)

At a local level, the key policy is provided within the following documents and their associated supplementary guidance:

- The statutory development plan for the site is the Highland-wide Local Development Plan (the HwLDP) (adopted April 2012);
- The Caithness and Sutherland Local Development Plan (the CaSPlan) (adopted August 2018)
- The Highland Council Supplementary Planning Guidance.

The HwLDP provides detailed policies to guide developers on how land in THCs district may be utilised. The vision of the HwLDP is similar to that of NPF4. The CasPlan is tailored and more specific to Caithness and Sutherland and should be read in conjunction with HwLDP and NPF4 guidance as it reflects how the policies within HwLDP and NPF4 can be applied at a local level. The relevant policies contained within the statutory LDP, the HwLDP, in relation to design are set out in Table 2-1 below.

Table 2-1 Overview of HwLDP policies relevant to design

Policy		Overview
Policy 28	Sustainable design	Sustainable design is to be taken into consideration in the design of all development particularly in relation to enhancing the social, economic and environmental wellbeing of the people of the Highlands.
Policy 29	Design quality and place-making	The development proposal should be designed to make a positive contribution to the architectural and visual quality of the place in which it is located. Where this is not possible It encourages applicants and developers to demonstrate sensitivity and respect towards the local distinctiveness of the landscape, architecture, design and layouts in their proposals.
Policy 61	Landscape	Landscape characteristics and special qualities identified in the Landscape Character Assessment should be reflected in development design, while measures to enhance the landscape characteristics of the area are also encouraged.
Policy 67	Renewable Energy Developments	Outlines the considerations against which the Council will assess and support renewable energy developments. The Council will support proposals where it has been reasonably demonstrated that there will not be significant adverse effects on specific environmental designations and receptors. Proposals for renewable energy developments will be assessed against the development plan, the Highland Renewable Energy Strategy (HRES) and Planning Guidelines. See chapter 2: Need for the Project in the Onshore EIA Report, for further details.
Policy 69	Electricity Transmission Infrastructure	Proposals for electricity transmission infrastructure will be considered having regard to their level of strategic significance, and proposals 'which are assessed as not having an unacceptable significant impact on the environment, including natural, built and cultural heritage features' will be supported.

2.3 Environmental considerations

Additionally, from the policy considerations identified, key environmental issues and constraints from a number of topic specific receptors have been considered in the design process and were identified through a combination of desk-based research, field surveys and consultation (through the EIA Scoping process and further consultations).

The design process considered the following environmental issues:

- Geology and hydrology, including Groundwater Dependent Terrestrial Ecosystems (GWDTEs), Private Water Supplies (PWSs), Drinking Water Protected Areas (DWPAs), peat management and flood risk and drainage (chapter 8: Geology and hydrology of the Onshore EIA Report);
- Freshwater ecology, including diadromous fish such as Atlantic salmon (*Salmo salar*), freshwater pearl mussel and freshwater habitats (chapter 9: Freshwater ecology of the Onshore EIA Report);
- Terrestrial non-avian ecology, including protected habitat, GWDTEs and protected species (chapter 10: Non-avian ecology of the Onshore EIA Report):
- Terrestrial ornithology, including raptors and owls, breeding bird and wintering bird species (chapter 11: Terrestrial ornithology of the Onshore EIA Report);
- Land use and other users (including forestry), including core paths, tourism, recreational activities and forestry (chapter 12: Land use and other users (including forestry) of the Onshore EIA Report);
- Terrestrial archaeology and cultural heritage, including listed buildings, scheduled monuments and setting assessment (chapter 13: Terrestrial archaeology and cultural heritage);
- Air quality, including dust management (chapter 14: Air quality of the Onshore EIA Report);
- Noise and vibration, including HDD, general construction and substation operation (chapter 15: Noise and vibration);
- Access, traffic and transport, including construction traffic routes, abnormal loads, temporary and permanent access tracks, railway lines and ports (chapter 16: Access, traffic and transport of the Onshore EIA Report); and
- Landscape and visual, including construction impacts and substation screening for residential properties and cultural heritage receptors (chapter 17: Landscape and visual of the onshore EIA Report).

2.4 Technical Considerations

So far as has been practicable efforts have been made to limit the development footprint. Although the onshore Project area is large, which is considered further in following sections, this has been done to retain flexibility as engineering design and site investigations and land negotiations are ongoing.

Engineering and technical work undertaken to date has included the following:

- Desktop geotechnical assessment;
- Onshore reconnaissance geotechnical site investigations;
- Review of cable installation methodologies; and
- Cable routeing studies.

2.5 Design evolution and alternatives

The refinement of the onshore Project has been an iterative process that commenced before the ScotWind application and EIA Scoping. The process has taken into consideration policy, environmental and engineering constraints and will continue to do so throughout ongoing detailed design. Further detail of the site selection and alternatives process is outlined in chapter 4: Site selection and alternatives of the Onshore EIA Report.

A summary of the refinement process of the site layout is detailed below.

2.5.1 Substation site selection

The Project's site selection has been guided and influenced by not only policy, environmental and engineering constraints but also by commercial engagement through the awarding of the Option Agreement Area (OAA) where the offshore Project will be situated and securing a grid connection agreement with National Grid Electrical System Operator (NGESO).

The grid connection offer for the Project indicated connection to the grid would be 'at or near Spittal'. This was therefore the basis of the site selection assessment for the OWPL substation. The preferred location for the substation has been identified immediately to the north of the existing SHET-L Spittal Converter Station. This decision was supported by site visits and field surveys (geology and hydrology, ecology and archaeology). It was confirmed in early 2023 that the preferred location for the SSEN Spittal 2 converter station would be located immediately east of the onshore Project's preferred substation location.

2.5.2 Landfall site selection

With a target grid connection area known this triggered and influenced the site selection process for the cable landfalls. Prior to EIA Scoping an initial 6 potential cable landfall options (Murkle Bay, Dunnet Bay, Melvich, Dounreay, Greeny Geo and Crosskirk) were selected along the north coast of Caithness and subsequently a number of associated onshore routes between the landfalls and the grid connection location, at or near Spittal. Technical and environmental constraints analysis conducted ahead of the ScotWind bid application led to discounting Murkle Bay and Dunnet Bay leaving the four remaining that were the subject of the EIA Scoping process.

Following EIA Scoping and the receipt of the Scoping Opinion, further desk-based research and analysis resulted in discounting a further two landfalls (Melvich and Dounreay) leaving only Greeny Geo and Crosskirk to progress through the EIA and associated planning process where one or both may be used following post-consent detailed design (i.e. all five cables to landfall at one of the two options or two cables landfall at one and three at the other).

2.5.3 Cable route selection

Similar to the landfall site selection process, as landfalls were discounted the corridors / area between the coast and the substation could be refined. Once Greeny Geo and Crosskirk were identified as the two landfall options to be progressed, the wide corridor / area to the potential substation location was refined to the Red Line Boundary for the PPP application, following site visits, desk-based research and onshore environmental and geotechnical surveys.

The cable corridor presented in the PPP application has been designed to avoid all designated sites with the exception of the River Thurso SAC. Additionally, it has been designed to avoid settlements (such as the village of Halkirk) and other energy infrastructure (such as the Forss and Baillie onshore windfarms).

The cable corridor (as defined by the Red Line Boundary) has the potential for multiple different route options and will be refined to a 100 m working corridor during detailed design.

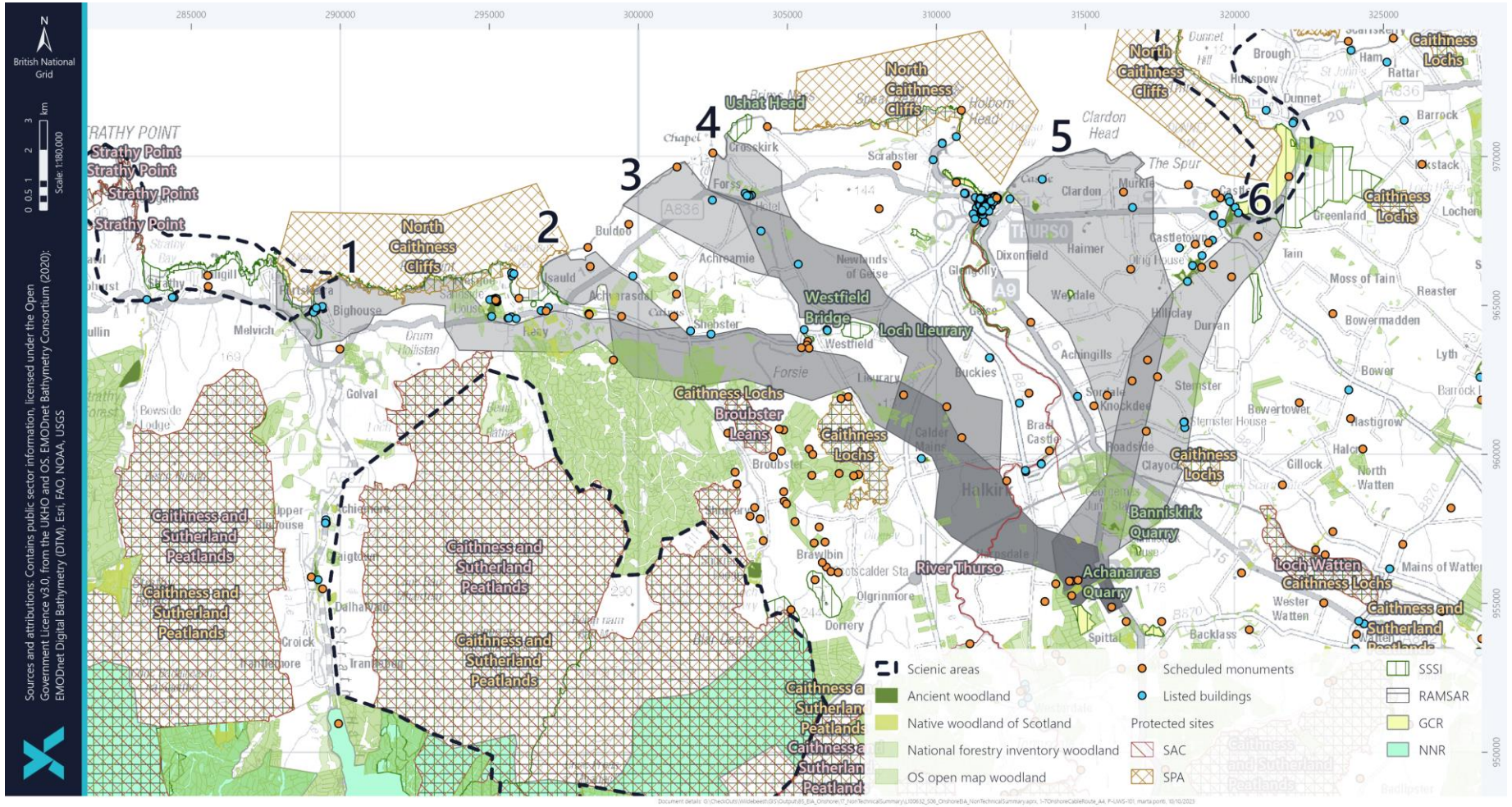

Figure 2-1 Onshore Project area landfall and route options prior to EIA Scoping

2.6 The onshore Project design

The following sections outline the design proposed at the stage of PPP application. For further detail on the onshore Project design, see chapter 5: Project description of the Onshore EIA Report.

2.6.1 Landfall design

There are currently two landfall locations options for the Project (one or both may be used) located at Greeny Geo and Crosskirk. The exact location of the landfall will be established following the detailed engineering studies. The installation of the ducts (six, five plus one spare) will be conducted through the technique of HDD and the drilled ducts will exit out past Mean Low-Water Springs (MLWS) ready for the offshore cables to be pulled through. The HDD temporary compound and laydown area will be approximately 7,500 m^2. There will also be installation of up to five TJBs where the offshore and onshore cables will connect. The TJBs will be installed underground leaving the top surface flush with the ground for access to the cables for pull through and maintenance works. They will comprise an area approximately 6 m long, 3 m wide and 3 m deep to 30 m long x 6 m wide x 5 m deep. Following construction of the TJBs the area will then be reinstated. Following reinstatement, the top of the TJB (a manhole cover) will be the only surface level structure visible. This will provide access for maintenance purposes during the operational lifetime of the Project.

The worst case parameters for the landfall are summarised in Table 2-2.

Table 2-2 Landfall design parameters

Parameter	Description / dimensions
Landfall location	Greeny Geo and / or Crosskirk
HDD temporary compound and laydown area	7.500 m^2
HDD bore outer diameter	1.2 m
Number of drilled ducts	Six (five plus one spare)
Number of TJBs	Up to five
TJB dimensions	6 m long x 3 m wide x 3 m deep to 30 m long x 6 m wide x 5 m deep.
Maximum excavated materials from each HDD ducts	1,630 m^3

Crosskirk landfall option

- This landfall development area avoids overlap with the Ushart SSSI protected area, located immediately to the east and designated for coastal vegetation habitats. In addition, all ground-breaking works will be set back 50 m from the coastline in order to minimise / avoid impacts on protected plant species, specifically Scottish Primrose, and other sensitive habitats;
- Farmland areas immediately to the east of the Crosskirk landfall development zone are known to be important and preferred feeding areas for the protected wintering Greenland white-fronted goose, appropriate mitigation measures will be implemented in order to ensure this species, including those associated with the nearby Caithness Lochs Special Protection Area (SPA) and Ramsar sites will not be adversely affected during construction;
- Potential bat roosts have been identified in the landfall development zone and therefore mitigation measures have been identified to avoid impacts on this protected species;

- The landfall development zone avoids any landscape designations;
- There is a core path from the car park to St Mary's Chapel scheduled monument (located to the west of the Crosskirk landfall development area) which is routed through the landfall development area and there are known archaeological assets within the landfall development zone. Mitigation measures have been proposed that will where possible avoid or otherwise minimise impacts to the core path and archaeological assets;
- There are a number of residents in close proximity to where construction activities, including HDD, may take place. The noise and vibration assessment has identified mitigations that will ensure any impacts on local residents will be minimised; and
- All areas that will be disturbed during construction will be reinstated to their pre-construction state.

Greeny Geo landfall option

- This landfall avoids any overlap with protected areas and all ground breaking works will be set back 50 m from the coastline in order to minimise / avoid impacts on communities of conservation importance, specifically Scottish Primrose and other sensitive habitats;
- Groundwater dependent terrestrial ecosystems (GWDTE) are present in the landfall development zone, therefore mitigation measures have been proposed that will where possible avoid or otherwise minimise impacts on these habitats;
- The landfall development zone avoids any landscape designations;
- There are known archaeological assets within the landfall development zone. Mitigation measures have been proposed that will where possible avoid or otherwise minimise impacts to the archaeological assets; and
- All areas that will be disturbed during construction will be reinstated to their pre-construction state.

2.6.2 Cable route design

There will be a maximum of five HVAC onshore cable circuits (each consisting of three core power cables and one fibre optic communications cable) connecting the offshore cables to the proposed onshore substation. These cables will be installed across five trenches within a 100 m (see Figure 2-2) wide working corridor. The maximum length of the onshore cable circuits will be 33 km. There will be use of HDD at major crossings such as the River Thurso, Forss Water and the railway line.

The worst-case parameters for the onshore cables are summarised below in Table 2-3.

Table 2-3 Cable route design parameters

Parameter	Description / dimensions
Number of cables	Up to five
Cable type	HVAC
Voltage	Maximum 420 kV
Length	33 km per cable
Number of trenches	Up to five

Parameter	Description / dimensions
Installation method	Open-cut trenching, cased auger boring, thrust boring, pipe jacking or HDD
Width of trench	2 m wide at the bottom tapered to 8 m wide at the top.
Depth	1.0 m – 1.8 m
Export cable Construction compound	22,500 m^2
Working corridor	100 m wide (see Figure 2-2 for indicative schematic)
Excavated materials	162,525 m^3 per cable circuit

Specific environmental design considerations for the cable route corridors identified to date are summarised below:

- The cable development zone has been designed to avoid all protected areas, with the exception of the River Thurso SAC, which is unavoidable. Therefore, mitigation measures have been proposed that will where possible avoid or otherwise ensure no adverse effects on the qualifying interests of the site, including protection of salmonid spawning and incubation via avoidance of sensitive areas and timings where appropriate and maintenance of fish passage during works and watercourse crossings;
- Cables will be installed underground which removes the potential for bird collisions with overhead wires;
- The Project has committed to avoiding designated and non designated archaeological assets (of medium and high value). Potential impacts on other known or unknown archaeological assets will be avoid or otherwise minimised through the Project's Written Scheme of Investigation (WSI) and Protocol for Accidental Discoveries (PAD);
- All areas of ancient woodland will be avoided, however the final cable route may not be able to avoid two areas of woodland present in the able route corridors, i.e. woodland at Hill of Howe and Sibster Forest, the latter of which is owned and managed by Forestry and Land Scotland. Where woodland remove can't be avoided compensatory planting will be undertaken;
- There are two core paths in the cable development zone. Mitigation measures have been proposed that will where possible avoid or otherwise minimise impacts to these core paths during construction, full access will be reinstated following construction;
- Minimisation of watercourse crossings wherever possible. Where these can't be installation methods and mitigation measures will be implemented in order to where possible avoid or otherwise reduce potential environmental impacts;
- There are a number of residents and other noise sensitive receptors in the cable development zone. The noise and vibration assessment has identified mitigations, including core working hours that will ensure any impacts on local residents during construction will be minimised;
- All areas that will be disturbed during construction will be reinstated to their pre-construction state; and
- Selection of the final cable route will take account of all constraints and sensitivities that have been identified during the EIA to ensure environmental considerations are balanced with technical requirements and constraints.

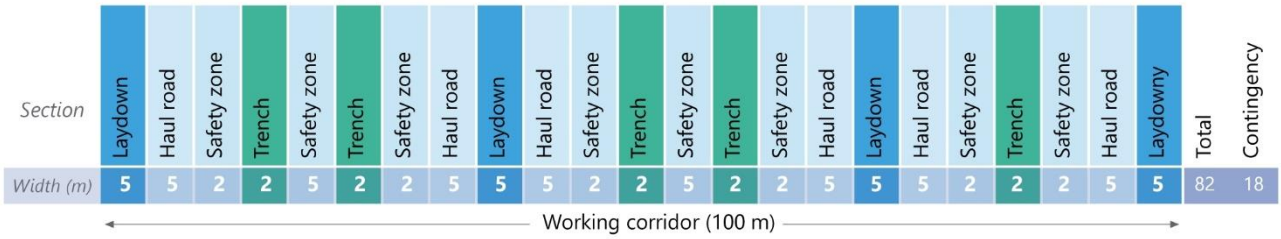

Figure 2-2 Indicative schematic of working corridor

2.6.3 Substation design

The indicative onshore substation design includes the electrical equipment, access and landscape mitigation, however, it should be noted that further engineering studies will be conducted post-consent, where a refined and detailed design will be provided and consulted upon with THC and relevant stakeholders. There are two types of substations being considered in this application, an Air Insulated Substation (AIS) or a Gas Insulated Substation (GIS). The onshore substation will be a High Voltage Alternating Current (HVAC) system which may include switchgear, transformers, harmonic filters, synchronous compensators, busbars, protection equipment, batteries and other auxiliary equipment and control systems. There may be up to 12 buildings / areas that will include this electrical equipment.

The onshore substation and associated landscape mitigation will have a footprint of approximately 24 ha. During construction there will be a temporary compound and welfare facilities equating an additional to 62,500 m^2. The onshore substation will be above ground and will have a maximum height of 14 m. Due to the nature of surrounding area, i.e. flat agricultural land with the existing SHET-L substation, landscape mitigations in the form of bunding and vegetation planting has been proposed.

An indicative layout for the onshore substation is proposed at this stage, with detailed design to be undertaken at a later stage. Despite this, there has been a process of landscape and visual led design evolution to address the landscape and visual effects and established mitigation principles that from embedded mitigation for the onshore substation and minimise the amount of land required.

Following the early identification of an area of search for the substation, in order to maximise natural screening the indicative location and platform was amended to address the following recommendations:

(i) Locate the substation as low as possible in the landscape;

(ii) Undertake land forming to screen the site from key sensitive views as far as reasonable practical; and

(iii) Introduce planting in order reenforce the screening.

Taking into account the above the indicative design onshore substation was defined to be a long thin arrangement that could be located on the lower part of the substation areas of search and maximise its distance from the A9 trunk road.

Based on design development and consultation with THC and other stakeholders with regards to landscape and visual, archaeological and cultural heritage and noise receptors, the following presents the design principles:

- **Site location**: The preferred location for the development platform location has been identified within the substation area of search, located to the north-west where it would make use of the natural enclosure provided by the Achanarras Burn and Achanarras and Spittal Hills. The preferred location for the development platform is located north of the access track to reduce the extent of cut and fill required and enable the development platform to be relatively low-lying in the landscape and set back from the A9(T);

- **Site design**: A linear arrangement is the preferred arrangement to enable the onshore substation to be set back from the A9(T) and respond to the existing terrain to reduce the extent of cut and fill required and ensure a better 'landscape fit';
- **Development platform height and levels**: The preferred level for the development platform level is set at 70 m AOD to balance cut and fill and achieve the best 'landscape fit' for a large, linear platform, with a maximum development height of 13.5 m (83.5 m AOD);
- **Colours**: Buildings and structures will be coloured in a recessive colour such as dark brown or dark grey;
- **Landscape screening**: Landscape bunds will be the principal means of screening the onshore substation. Whilst Figure 17 7 shows an indicative bunding layout, the following principles for the bunding design have been agreed:
    - Slopes will be varied, with an average slope of 1:6, and a recommended maximum slope of 1:4 to the outer faces;
    - 'Internal' slopes adjacent to the development platform can be steeper and/or make use of retention;
    - The bunds will have rounded and varied tops and toes, and their shape will respond to the existing landforms within the surrounding context where possible;
    - The maximum height of the landscape bunds will be determined by the requirement to screen the onshore substation from the surrounding visual receptors and for noise mitigation;
    - No level changes are possible within the flood plain; and
    - No bunding is possible over the cable corridors around the development platform.
- **Landscape planting**: Proposed native planting will be used to soften views of the proposed bunds and to integrate the bunds into the wider landscape. The planting will be designed to enhance biodiversity within the onshore substation area, including a mix of wildflower meadow, shrub planting and mixed native woodland; and
- **Landscape restoration**: Areas temporarily disturbed during construction will be restored to their previous condition.

External lighting for the onshore substation will range from 2.2 lux to 150 lux in order to illuminate the building and external area. 2.5 lux will be required around the perimeter fencing. There may also be a need for up to 150 lux at areas requiring higher illumination. Passive infrared (PIR) sensor lighting will be used or similar, however consideration will be given to permanent lighting of certain areas. All lighting will be designed to minimise light pollution with use of flat glass luminaires asymmetrical optics.

The main components and worst case parameters for the onshore substation are summarised within Table 2-4.

Table 2-4 Substation design parameters

Parameter	Description / dimensions
Substation width	250 m
Substation length	520 m
Substation height	14 m
Substation footprint	23.9 ha

Parameter	Description / dimensions
Construction compound footprint	62,500 m^2
Voltage	420 kV
Foundation depth (concrete)	0.3 – 0.5 m
Electrical equipment	Up to five shunt reactors, five static synchronous compensator transformers, five harmonic filters and associated busbars.

There will be staff car parking within the onshore substation however, the nature of the Project infrastructure to be constructed onshore doesn't lend itself to the provision of public parking or public electric vehicle charging points. However, the Project will work with THC in the development of visitor information stops from which the offshore Project will be visible. These stops will include provision of Project information boards, public parking and electric vehicle charging points amongst other amenities.

3. The Access Statement

3.1 Introduction

As part of the Onshore EIA Report the Project has undertaken a full traffic and transport assessment for the construction, operation and maintenance and decommissioning stages of the onshore Project and has produced a draft Construction Traffic Management Plan (CTMP) which accompanies this application. Full details are provided in chapter 16: Access, traffic and transport of the Onshore EIA Report.

3.2 Onshore Project area access

The onshore Project will extend over approximately 33 km in length and will require a number of access roads during both the construction and operation and maintenance stages of the Project. The following sections highlight the proposed indicative permanent and temporary access roads / routes that are known at the PPP application stage, further detailed access plans will be provided post-consent and detailed within an Access Management Plan.

3.2.1 Construction access

There are a number of roads that are within or adjacent to the onshore Project area, of these, the key roads that will be utilised, particularly during the construction stage, are outlined below;

- The A836 between Lybster and Burnside A9 junction;
- The A9 between SSE Spittal Converter Station and the Burnside A836 junction;
- The U2052 between the Hallam Burn four-arm junction and the A836;
- The U2090 between St Mary's Chapel Car Park and the A836;
- The U2105 between the A836 and C1001;
- The U2110 between Lythmore and Forss Water;
- The C1001 between the U2105 junction and the B874 junction;
- The B874 between the A9 in central Thurso, and the A9 Roadside junction;
- The C1018 between the Harpsdale Fishery Park and the B874 junction in Halkirk; and
- The C1014 between the A9 and C1018 junctions.

Of these roads, the majority of construction traffic will be routed through main roads such as the A836, B874 and the A9, particularly when transporting heavy goods / abnormal loads (further details of which are outlined in section 3.3). There will be road conditions surveys conducted pre-construction and post-construction across all construction routes and passing places (with the exception of the A9 and A836[1]) to identify areas of damage caused by construction vehicles, OWPL will be responsible for any repairs that are required.

[1] The A9 and A836 are considered to be of low sensitivity to wear and tear and due to the volume of other users on these roads any wear and tear cannot be apportioned to the Project alone.

Temporary access tracks will be required within the cable route working corridor in order to minimise the use of existing roads. This will enable a reduction in delays and structural damage likely to be cause by use of the existing roads.. These temporary access tracks will direct construction traffic back onto the main roads and away from the minor / unclassified roads. Once construction is complete, the land will be reinstated including fences, gates, vegetation, tracks, roads or hard standings in accordance to planning consent, licences and to the Landowner's satisfaction.

Up to seven permanent access tracks, required for the operational stage of the Project, have been proposed for access to HDD works at the landfall, crossing locations and the onshore substation. Indicative track locations have been proposed for the purpose of the PPP application. Detailed design will inform the final permanent access track locations. These tracks will equate to approximately 5 km in total length. Of this 24% (1.2 km) are existing tracks, 44% (2.21 km) are existing tracks that require improvements and 32% (1.67 km) will be newly installed tracks.

3.2.2 Operations and maintenance access

During normal operation there will be a very limited amount of traffic across the onshore Project area. There will be routine maintenance activities for the substation, cables, CJBs and TJBs, these will be accessed via the permanent access roads that will be constructed as part of the final design. For any unplanned maintenance activities, the first point of access will be via the permanent access roads, however, should there be the requirement to use temporary access this will be consulted on with THC at the time. Other than this, the onshore substation will be unmanned during operation and there will be no day-to-day personnel on site in normal operation. Although the site will be an operational area and the substation will be accessible to authorised personnel only, the remainder of the Site will be accessible to the public with no restrictions.

3.3 Vehicle access

Access to the construction areas for all works of the onshore Project is subject to detailed design but will likely be from the key roads outlined in section 3.2.1.

Abnormal loads such as the substation transmission infrastructure will be transported to the site from Scrabster Harbour using specialist vehicles via the A9. An Abnormal Load Assessment was undertaken to assess the implications of transporting the components along the proposed route, further details of which can be found in the Abnormal Loads Assessment (ALA) Supporting Study (SS15: ALA). Visibility splays and swept path plans for the junction leading off the A9 down to the existing SHET-L Spittal Converter Station (which is proposed to be used to access the onshore Project's substation) have been produced following consultation with Transport Scotland. These swept path plans indicate that should access be taken from the north by the abnormal loads then the existing junction layout can accommodate this, however, should access be taken from the south by the abnormal loads then additional modification would be required (see figures in SS15: ALA). The visibility splays are shown to be in line with the expected standards for driver visibility when emerging from this access location (see figures in SS15: ALA).

During construction the Project will implement a number of measures to help mitigate the effects of the abnormal load vehicles and construction traffic. These measures will be discussed and agreed with THC and Transport Scotland prior to construction; proposed measures are included in the outline CTMP which is submitted alongside the PPP application.

Traffic levels during the operation and maintenance stage would be subject to the maintenance activity being conducted and will involve consultation with the relevant stakeholders should the maintenance require ground-breaking works. Traffic levels during the decommissioning of the proposed development are expected to be lower than during the construction phase as some elements could be left in situ.

3.4 Public access

Within the Project area, consideration has been given to pedestrians and cyclists due to potential interactions between construction traffic, construction works and users of core paths. There are three identified core paths within the onshore Project area: St Mary's Chapel, Forss roadside and Halkirk railside to river link. Sibster forest, owned and managed by Forestry and Land Scotland (FLS) also provides recreational opportunities, including walking, for local residents and visitors. These core paths and Sibster forest will remain accessible to the public, although there may be via minor diverted routes, this however is subject to the final design. An Access Management Plan will be developed post consent where consideration of access to these core paths will be given and mitigation measures will be captured.

3.5 Access for all

Under the Disability and Discrimination Act 1995 there are legal obligations that must be taken into account when making reasonable adjustments to physical barriers and services. The final design of the onshore Project will be designed (as appropriate) to be inclusive for those with accessibility restrictions. As the majority of the onshore Project is located underground the only area that will require such adjustments / design will be the onshore substation. This site will be for authorised personnel only but will include the following:

- Parking bays designated for disabled people, which will be as close as feasible to the entrance of any buildings;
- The access route to the substation will be ramped, and will be level or have the shallowest possible gradient, with a width suitable for wheelchair use;
- Appropriate signage for clear notification of access routes; and
- Doorways and entrances to the substation will have suitable clearance for wheelchair users.

4. Programme

4.1 Construction

The estimated construction period for the onshore Project is expected to be approximately four years and includes full reinstatement works. Normal construction hours will be between 0800 to 1900 Monday to Friday and 0800 to 1300 on Saturdays for noisy activities. Quiet on-site working activities have been assumed to extend outside the core working times noted above where required. Noisy activities that may extend outside of the hours indicated (such as HDD works) will be subject to consultation with THC. The Project is committed to proper rest periods for the workforce during the work cycle.

Details of the construction programme will be provided to THC in a Construction Environmental Management Plan (CEMP) prior to the commencement of construction; and this requirement will be addressed through separate appropriately worded planning conditions. An outline CEMP has been provided alongside this PPP application.

An indicative construction programme is shown in Figure 4-1.Figure 1-1

4.2 Operation and maintenance

The West of Orkney Windfarm Project has an assumed operational lifespan of 30 years (not including construction). It is anticipated that there will be regular maintenance checks for the onshore infrastructure during this period such as bi-annual visual inspections of CJBs and TJBs and visual inspections of the onshore substation infrastructure. Additionally, there may be the need for unplanned minor and major maintenance works, which will be consulted on beforehand as appropriate.

4.3 Decommissioning

On conclusion of the operational period, the West of Orkney Windfarm and associated infrastructure will be appropriately decommissioned. Prior to this a Decommissioning, Restoration and Aftercare Plan will be developed and agreed with THC. The environmental effects of decommissioning are generally considered to be the same, or less, as during construction and have been assessed as part of all topic specific assessments (chapters 8 to 17) presented in the Onshore EIA Report.

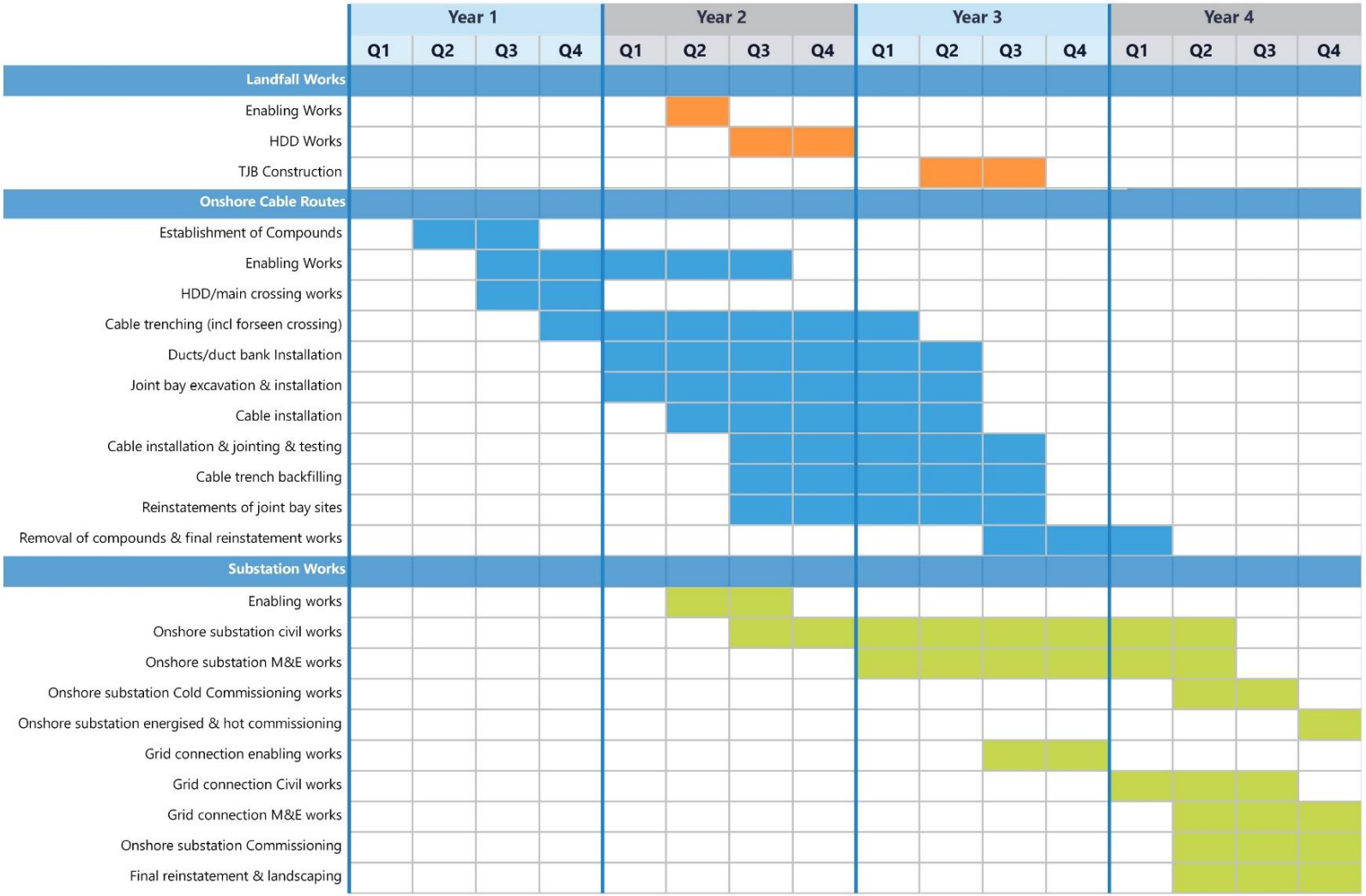

Figure 4-1 Indicative construction programme

5. Conclusion

The onshore Project has been informed by a robust EIA and design refinement process, taking into account potential environmental impacts and their effects, physical constraints, engineering constraints and health and safety considerations. The information used to inform the design refinement process has included and will continue to include consultation, baseline data, survey results and further engineering studies.

It is acknowledged that in practice every Project has some local impacts; however, the design has prioritised, and will continue to prioritise, the minimisation of these where possible and mitigation in order to, where possible, avoid significant impacts is detailed within the topic specific chapters of the Onshore EIA Report (chapters 8-17). A summary of the mitigation measures and monitoring is set out in chapter 19: Summary of mitigation and monitoring.

West of Orkney
Windfarm