Introductory Chapters

Chapter 05: Description of Development

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Glossary

Application Site	The area within the red line Planning Boundary comprising the Onshore Transmission Works (OnTW), as defined.
Construction Compound	An indicative area within the Application Site used to accommodate the temporary work site including; construction parking, construction welfare facilities, construction meeting room, construction laydown and storage area, construction security facilities (fenced area/gate and security access) and construction security lighting.
EIA Report	Report presenting the findings of the Environmental Impact Assessment (EIA).
ICOL's Offshore Transmission Works (OfTW)	Offshore substation platforms (OSPs) and their foundations and substructures, interconnector cables and Offshore Export Cables. This refers to either the Consented OfTW or Revised OfTW, as defined.
ICOL's Offshore Wind Farm	This includes proposed wind turbine generators, foundations and substructures and inter-array cables. This refers to either the Consented Offshore Wind Farm or Revised Offshore Wind Farm, as defined.
Landfall	Point where up to two Offshore Export Cables from ICOL's Offshore Wind Farm will be brought ashore.
Offshore Export Cable	The subsea, buried or protected electricity cables running from ICOL's Offshore Wind Farm offshore substation to the Landfall.
Onshore Export Cables	Electricity cables from the Onshore Substation to the grid connection point.
Onshore Export Cable Corridor	The area within the Application Site where the proposed Onshore Export Cables will be laid.
Onshore Substation	The electrical substation comprising of all the equipment and associate infrastructure required to enable connection to the electrical transmission grid.
Onshore Substation Site/Substation Site	The indicative area within the Application Site where the Onshore Substation and screening will be located.
Onshore Transmission Works (OnTW)	All proposed works within the Application Site, typically including the Onshore Substation, cables transition pits, cable jointing pits, underground electricity transmission cables connecting to the Onshore Substation and further underground cables required to facilitate connection to the national grid. This includes all permanent and temporary works required. See *Chapter 5: Description of Development* for full details.
Original OnTW	The OnTW, as was granted planning permission in principle in September 2014, under ELC reference 14/00456/PPM.
Scoping Opinion	The Scoping Opinion adopted by ELC as to the scope and information to be provided in support of an application for the OnTW, as defined.
Scoping Report	Report prepared as the first stage of the EIA process in support of a request for a Scoping Opinion from East Lothian Council, under Regulation 17 of the EIA Regulations. The Report was submitted in July 2017.

Abbreviations and Acronyms

AC	Alternating Current
CEMP	Construction Environmental Management Plan
ECoW	Ecological Clerk of Works
ELC	East Lothian Council
EIA	Environmental Impact Assessment
HDD	Horizontal Directional Drilling
ICOL	Inch Cape Offshore Limited
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NETS	National Electricity Transmission System
OnTW	Onshore Transmission Works
PPP	Planning Permission in Principle
STATCOM	Static Synchronous Compensator
XLPE	Cross-Linked Polyethylene

5 Description of Development

5.1 Introduction

1 This chapter of the EIA Report provides a description of the Inch Cape Onshore Transmission Works (OnTW) proposed to connect Inch Cape Offshore Limited (ICOL)'s Offshore Wind Farm to the existing onshore National Electricity Transmission System (NETS).

2 As ICOL is applying for Planning Permission in Principle (PPP) only, it is not possible at this stage to provide a detailed description of all elements of the OnTW e.g. precise building dimensions, colours, footprints etc. The description of development presented in this chapter provides as much detail as possible about the OnTW, while leaving matters of detail to a further approval process, should PPP be granted. To ensure the Environmental Impact Assessment (EIA) is carried out on a worst case scenario, certain assumptions about the OnTW have been built into the assessment process, as detailed in the following sections, thus ensuring the EIA is based around pre-defined parameters for all elements of the OnTW.

5.2 Application Site Location

3 The Application Site is located within the East Lothian Council (ELC) area, on the site of the former Cockenzie Power Station which was decommissioned in 2013 and has been demolished. It is situated between the Cockenzie village harbour to the east, and Preston Links to the west and is bypassed by the coastal path, which forms part of the John Muir Way (see Figure 1.1 in *Chapter 1: Introduction*). The B1348 (the Edinburgh Road) runs through the Application Site.

4 The Application Site extends to an area of approximately 10.2 ha, and ranges from sea level to approximately 6 m above ordnance survey datum. The area is vacant brownfield land, consisting of mostly concrete. Preston Links to the west is an undulating landscape which was formed by the South of Scotland Electricity Board over the original links surface.

5 Directly opposite the Application Site is the existing 275 kV substation, which forms ICOL's grid connection point. The proximity of this grid connection point is a key factor in ICOL's decision to locate the OnTW at Cockenzie.

6 It is anticipated that there will be no utilities present either in or in close vicinity of the Application Site. *Chapter 7: Hydrology, Geology and Hydrogeology* confirms that no Scottish Water infrastructure lies within the Application Site. Checks for all services will also be undertaken and services identified during the detailed design phase of the OnTW and suitably accommodated (see *Chapter 7: Hydrology, Geology and Hydrogeology*). The Onshore Export Cables from the Onshore Substation to grid connection will be routed under the B1348.

7 The closest residential property is located 245 m from the Application Site. Other properties in proximity to the Application Site include;

- Residential properties on Edinburgh Road, situated east of the Application Site and 437 m from the Onshore Substation;

- Residential properties on West Harbour Road, situated east of the Application Site and 341 m from the Onshore Substation;
- Properties on Hawthorn Terrace and Whin Park, situated south-east of the Application Site and 247 m from the Onshore Substation; and
- Properties on Atholl View, situated south of the Application Site and 296 m from the Onshore Substation.

5.3 Project Elements

8 The OnTW comprises of the following primary elements:

- Landfall where two Offshore Export Cables from ICOL's Offshore Wind Farm will be brought ashore and will run underground to the Cable Transition Pits (see *Section 5.4.1*);
- Cable Transition Pits where two Offshore Export Cables interface with two sets of Onshore Export Cables (see *Section 5.4.2*);
- Onshore Export Cables, laid in two trenches running between the Onshore Substation to the grid connection point (see *Section 5.4.3*);
- If the Onshore Export Cables are installed in sections, jointing pits will be required to join the sections together (see *Section 5.4.4*);
- Onshore Substation: which is required to process the electricity from ICOL's Offshore Wind Farm and to comply with the requirements of the NETS (see *Section 5.4.5*);
- Onshore Substation screening measures including walls and earth mounding parts of which will be planted with a mix of mainly native tree and shrub species (see *Section 5.4.5*);
- Security fencing will be erected around the perimeter of the Onshore Substation (see *Section 5.4.5*);
- Onshore Export Cables from the Onshore Substation to the grid connection point, laid in trenches and/or ducts for running the underground Onshore Export Cables between the Onshore Substation and the grid connection point (see *Section 5.4.6*);
- Construction compound to accommodate a temporary work site (see *Section 5.4.7*);
- Application Site Access will be via an existing access from the B1348 (see *Section 5.4.8*); and
- Remedial/enabling work will be required prior to any OnTW works commencing which will include the raising of the Onshore Substation construction elevation above the ground water table to overcome risk of flooding (see *Section 5.4.9*).

9 The OnTW will also comprise of other elements including mitigation measures. This includes all embedded mitigation and specific mitigation assumed to be in place during the relevant phases of construction, operation and decommissioning of the OnTW. Embedded mitigation is that which has been recognised as having benefits in reducing impact significance, and is generally regarded as industry standard or best practice. Specific mitigation is included in each

technical chapter and a summary of mitigation included within the EIA Report is listed in Table 5.1 below.

Table 5.1: Mitigation Measures

Embedded Mitigation	Description	Chapter Discussed
Construction Environmental Management Plans (CEMP)	The CEMP will set out procedures to ensure all activities with potential to affect the environment are appropriately managed and will include, Pollution Prevention Plan, Oil Spill Contingency Plan, Noise Management Plan.	*Chapter 6: Ecology*
Pre-Construction Protected Species Survey	Within 6 months prior to the commencement of the OnTW construction a protected species survey will be undertaken to re-establish baseline conditions in respect to protected species.	*Chapter 6: Ecology*
Best Practice Measure in relation to locally occurring terrestrial mammals	All trenches and excavations will be fenced or covered-over at night to prevent any animals from falling in and becoming trapped. If this is not possible an adequate means of escape must be provided (i.e. a gently graded side wall or provision of gently sloped wooden plank or equivalent). Any large diameter pipes will be capped at the end of each working day to reduce the potential for animals to enter them and become trapped inside. Vehicle speeds within the Application Site will be limited to a maximum of 15 mph. If any wildlife burrows are discovered within 50 m of the Application Site during construction works then all activities will be temporarily suspended and a member of the ECoW Team contacted immediately.	*Chapter 6: Ecology*
Best Practice in relation to breeding birds	Site clearance timed to take place outside the breeding bird season where possible to avoid nest destruction and disturbance to nesting birds.	*Chapter 6: Ecology*

Embedded Mitigation	Description	Chapter Discussed
	Where avoiding the breeding season is not possible, pre-clearance/pre-construction check to be carried out by a suitably qualified ecologist ahead of work taking place. Where active nests are identified exclusion zones of suitable distances for the species concerned (up to 20 m for scrub and tree nesting birds and up to 50 m for open-ground nesting species) will be set up and work in these areas will be postponed until the nests are vacant.	
Onshore Substation Design	Shape and form of switchgear building has been designed in relation to neighbouring buildings and surrounding landscape Indicative colour treatment and textural finishes have been selected to relate to the existing Cockenzie substation and final design will be agreed in consultation with ELC. Walls of up to 7 m constructed either side of the switchgear building in order to screen external components from the B1348. Some components of the Onshore substation will be enclosed within cooling tanks such as the transformers and shunt reactors, this provides attenuation of the sound power levels of these sources.	*Chapter 8: Landscape and Visual* *Chapter 10: Noise and Vibration*
Landscape Mitigation Plan	Earth mounding of up to 4 m above existing ground level will be created on the perimeter of the Application Site. Parts of the mounds planted with a mix of native species reflecting tree and shrub species identified in the surrounding area during field surveys as well as species considered to be fast growing and suitable for the conditions at the Application Site.	*Chapter 8: Landscape and Visual* (*Figure 8.6*) *Chapter 9: Cultural Heritage* *Chapter 10: Noise and Vibration*

Embedded Mitigation	Description	Chapter Discussed
Noise Barrier	Temporary noise barrier around the Application Site assumed to mitigate against construction noise.	*Chapter 10: Noise and Vibration*
Construction Traffic Management Plan (CTMP)	Method Statement detailing and controlling the approved access routes, frequencies and timings of deliveries and any necessary restrictions. Details of access and management for the onshore cabling works including the potential for traffic management on Edinburgh Road. Details of proposed alterations to the existing vehicular access onto the B1348 Edinburgh Road for large component deliveries. Temporary signage in the vicinity of the Application Site warning of construction traffic. Arrangements for road maintenance and cleaning. Wheel cleaning arrangements and regular road sweeping runs within the site to ensure dust and dirt is minimised and is not spread onto the public roads, etc. A Green Travel Plan to include measures to minimise dependency on the private car to and from the construction compounds.	*Chapter 11: Traffic and Transport*
Diversions/ Access Modifications	Where public access will be temporarily disrupted during construction, maintenance or decommissioning activities, a suitable diversion which minimises the length of path affected will be put in place along with the display of signage at each end of the route where the route is diverted.	*Chapter 12: Socioeconomics, Tourism, Land Use and Recreation*

10 The locations of the elements described above are indicative only. The final locations of the components of the OnTW will be determined based on a further approval process, should PPP be granted.

11 A schematic representation of the overall OnTW and the Offshore Wind Farm is shown in Figure 5.1

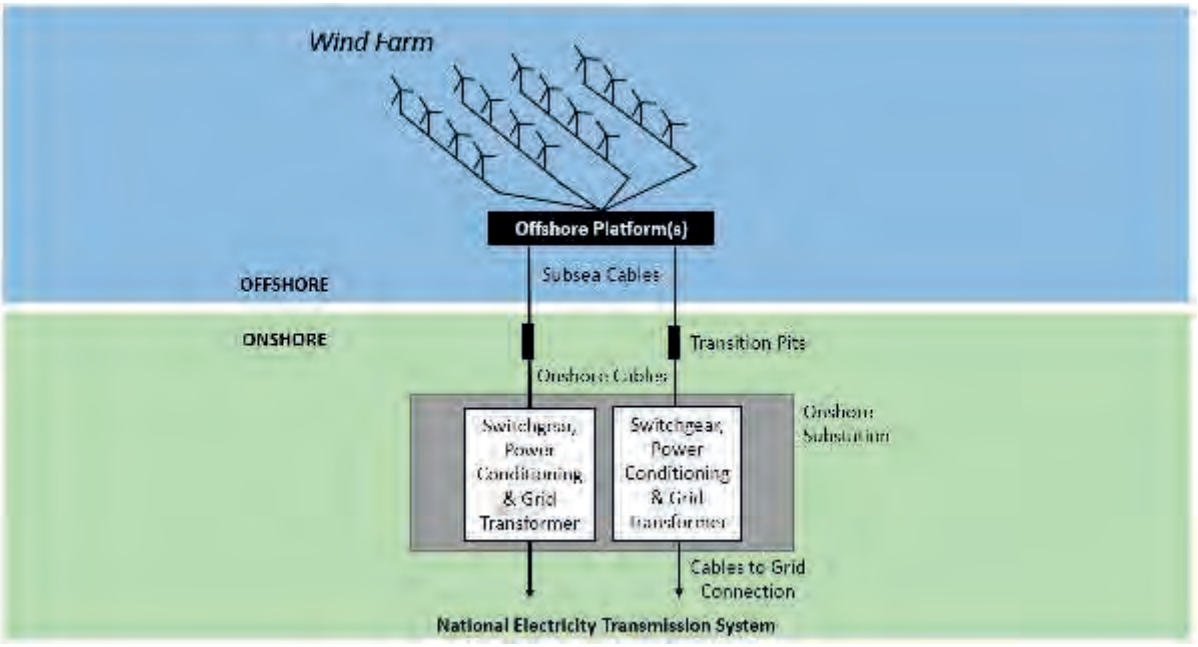

Figure 5.1: Schematic Representation of OnTW and Offshore Wind Farm

5.4 Onshore Transmission Works – Construction Phase

12 This section provides a description of the infrastructure and construction works from Landfall to the grid connection point, comprising those works that form the OnTW.

5.4.1 Landfall

13 The Landfall will be located on the north-west boundary of the Application Site. Two Offshore Export Cables will be brought from the offshore laying vessel, across the intertidal area, under the existing seawall and into the Cable Transition Pits (*Section 5.4.2*) located above Mean High Water Springs (MHWS).

14 Each of the Offshore Export Cables contains three cores wrapped in a single large outer sheath as shown in Figures 5.2 and 5.3. The Offshore Export Cables typically have steel wires on the outer edge of the cables for protection and strength.

15 The cable cores are insulated by cross-linked polyethylene (XLPE) or a rubber insulation such as ethylene propylene rubber and do not contain oil insulant or pressurised gasses. The design will likely contain a lead sheath for water protection and will have an outer jacket, typically for the offshore cables a woven material using Polypropylene or Polyethylene yarn layers and Polyethylene outer jacket for the onshore cables. The cable material consists of metal and XLPE which contains no fluid and the materials used do not dissolve in seawater; any damage to the cable will not adversely affect the local environment.

Figure 5.2: Offshore Three Core Cable (Source: JDR Cable Systems Ltd)

Figure 5.3: Example of Onshore Single Core Cable (Source: ABB)

16 The exact location of the Landfall and the method for landing the cables will be established following the detailed investigation of environmental and technical factors.

17 During these works ICOL commits to maintaining access to the majority of the Prestonpans Links, with the exception of the area adjacent to the export cable Landfall.

18 There will be no access to the John Muir Way in the vicinity of the Landfall while construction activities (such as excavation or cable pull-in) are taking place. Where appropriate, a diversion will be agreed with East Lothian Council.

19 There are two main options for export cable Landfall construction methodologies, either open cut trenching or horizontal directional drilling (HDD).

Open Cut Trenching

20 The landfall construction consists of excavating an open trench from a point approximately 7 m below MLWS to the Cable Transition Pits. The marine section would be created by a dredging vessel while the onshore section would be created by land based earth moving equipment. The onshore section shall feature a pair of conduits through which the export cables will subsequently be pulled ashore. These onshore trenches will be backfilled over the conduits and left until the arrival of the offshore cable lay vessel. The Offshore Export Cables are brought ashore by pulling them from the cable laying vessel through the conduits and into the Cable Transition Pits. Once in position, the underwater section of the cables is buried by backfilling the trench via the dredging vessel. Subject to the detailed site investigation findings, weather conditions and the time of year, the open cut trenching option will take approximately eight weeks to prepare the ground, install the ducts and cover. The cable installation would require approximately two weeks per cable, the timing of the cable installation activities will occur sometime after the trenching works are complete.

Horizontal Directional Drilling

21 HDD involves drilling a hole from the landward side of the Landfall to a point below MLWS where marine equipment can operate. A small diameter pilot hole is initially drilled under directional control and the hole is widened to accommodate a conduit pipe through which the cable will be pulled.

22 HDD requires a temporary landward working area of up to 15 m x 15 m per cable during construction to accommodate the drilling equipment. This will be above MHWS within the Onshore Export Cable Corridor. Once installed the working area will be restored to pre-construction conditions.

23 Indicative HDD activities are illustrated in Figure 5.4. Depending on detailed geotechnical characteristics of the Onshore Export Cable Corridor and final cable design for the project, the length of the drilling (from the landward side of the Landfall to a point below MLWS where marine equipment can operate) will be around 500 m in length.

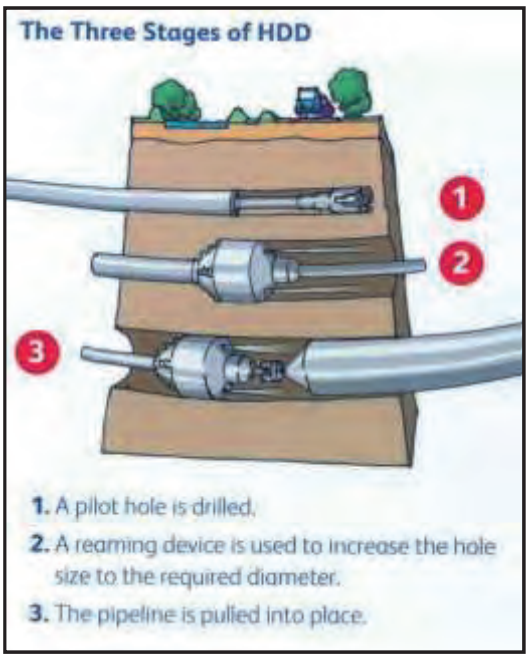

Figure 5.4: Stages of Horizontal Directional Drilling (Source: Stockton Drilling)

24 Bentonite will be used as a lubricant for the HDD works and as a space filler within the ducts once the cable is installed.

25 Subject to detailed site investigation findings, the HDD option will take approximately three weeks to prepare the ground plus an additional two weeks for each of the two HDD duct installation, giving a total construction period for this phase of the works of approximately seven weeks. The cable installation would require approximately two weeks per cable, however the timing of the cable installation activities will occur sometime after the HDD works are complete.

5.4.2 Cable Transition Pits

26 There will be a separate Cable Transition Pit for each of the Offshore Export Cables or both may be accommodated within a single, larger Cable Transition Pit. Within the Cable Transition Pits each of the Offshore Export Cables will be unbundled to separate its three cores; each of these will be jointed to a single-core Export Cable and these cables, together with an earth cable and fibre optic cable, will then run from the Cable Transition Pit(s) to the Onshore Substation.

27 Each Cable Transition Pit is typically 13 m long by 3 m wide per cable and up to 1.5 m high (see Figure 5.5). Typically, these are constructed from reinforced concrete with a thermally designed filler material to control the temperature of the cable and the joints. The pit will be covered (underground) following construction and the area restored as far as practicable to its original appearance. Each Cable Transition Pit has an associated link pit and link box to allow access for future maintenance to the Cable Transition Pit. The link pit typically has a plan area of around 1.5 m^2.

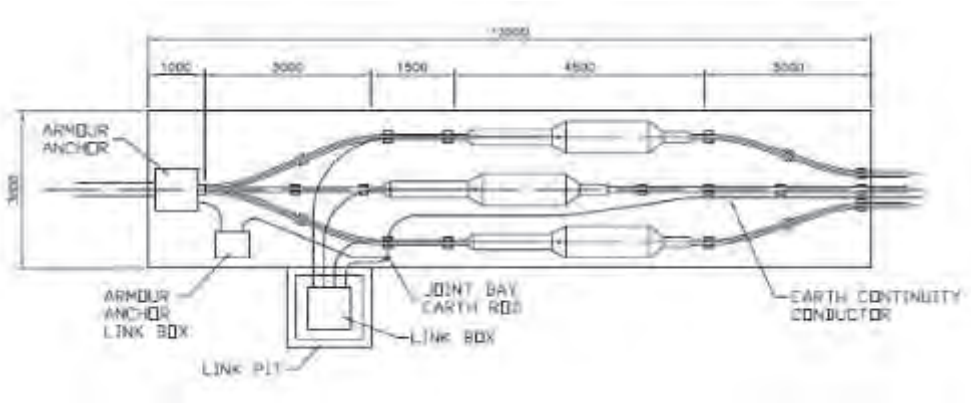

Figure 5.5: Transition Pit Detail

5.4.3 Onshore Export Cables between the Cable Transition Pits and the Onshore Substation

28 The exact location of the Onshore Export Cables will be determined based on further engineering, site investigation, the conclusions of Environmental Impact Assessment and feedback from stakeholders.

29 The Onshore Export Cables will be laid in two separate trenches or ducts (see Figure 5.6 and Figure 5.7). Each of these trenches will be approximately 1 m wide and between 1.5 to 3 m deep. Depending on the final route selected, the Onshore Export Cables between the Cable Transition Pits and the Onshore Substation are expected to be approximately 100 m long.

Figure 5.6: Onshore Cable Trench for Trefoil Layout

Figure 5.7: Onshore Cable Trench (Source: Balfour Beatty)

30 Onshore cabling is typically installed in either a flat or trefoil arrangement as shown in Figure 5.8.

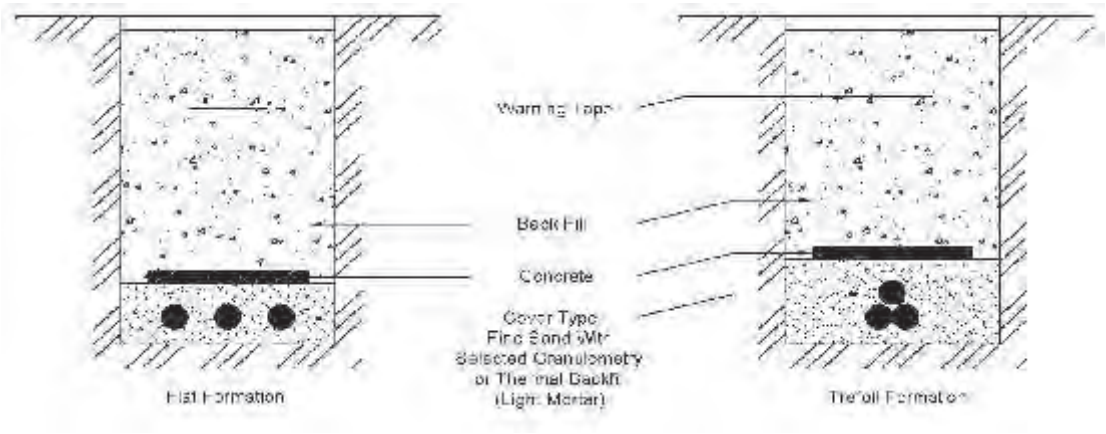

Figure 5.8: Onshore Cable Formations Flat or Trefoil

31 The Onshore Export Cables will generally be installed using surface cut trenching which will require temporary disturbance of the Onshore Export Cable Corridor. The Onshore Export Cables will be surrounded by a fine sand, or cement bound sand or similar (i.e. thermal backfill). Once installed the trench will be backfilled and the surface restored as far as practicable to the original condition or a condition as agreed with ELC. All temporary areas will be reinstated after use and any site material will generally be used on site as part of a balanced cut and fill operation where possible.

32 It is expected that the installation of the Onshore Export Cable between the Cable Transition Pits and the Onshore Substation will require approximately 10 days per cable.

5.4.4 Jointing Pits

33 Ideally, the Onshore Export Cables will be laid in continuous sections. However, the route alignment may require that the cable is installed in a number of sections. If this arises, these sections will have to be connected. Each cable connection will take place within a jointing pit. The jointing pits will be typically up to 3 m x 13 m by 1.5 m deep. These will be located within the Onshore Export Cable Corridor. The exact location of the jointing pits is dependent on ground conditions and route alignment and will be confirmed during detailed design.

34 A typical construction will have the joints fixed to a concrete foundation floor with the pit backfilled with a thermally designed inert filler material (sand/soil) to control the cooling of the cable and the cable joints. The thermally designed filler material will be covered with protection tiles, typically concrete or plastic, and the area reinstated after use. Any site material will generally be used on site as part of a balanced cut and fill operation where possible. Each jointing pit has an associated link pit and link box to allow for access to the jointing pit. The link pit is typically around 1.5 m^2. Each link pit will have a surface mounted manhole cover for future maintenance access to the link pit.

35 The jointing pits will be designed with warning material (similar to that shown in Figure 5.8 which details warning tape, and concrete protective cover) to avoid any accidental unearthing of the cable.

5.4.5 Onshore Substation

36 The Onshore Substation Site will comprise both the Onshore Substation and appropriate screening measures including:

- Walls of up to 7 m will be constructed on either side of the switchgear building (switchgear building described in *Section 5.4.5* below). These walls will be clad in a material similar to that of the Onshore Substation buildings.
- Earth mounding up to 4 m above existing ground level will also be created on the perimeter of the Onshore Substation. Parts of these mounds will be planted with a mix of mainly native species reflecting tree and shrub species identified in the surrounding area during field surveys as well as species considered to be fast growing and suitable for the site conditions. Full details of this can be found in *Chapter 8: Landscape and Visual*.

37 The Onshore Substation will be an Alternating Current (AC) System located within the Onshore Substation Site. The Onshore Substation must contain a variety of electrical equipment to:

- Terminate the power cables;
- Ensure compliance with the national grid code; and
- Ensure connection to the NETS at the existing Scottish Power Transmission substation, at Cockenzie.

38 The application is for Planning Permission in Principle (PPP) (*see Section 5.1*). The final detailed design for the Onshore Substation will be subject to a further approval process, should PPP be granted.

39 The layout of the proposed Onshore Substation shown in Figure 5.9 is therefore indicative at this stage and certain assumptions have been made to allow the EIA to be progressed. The location of the Onshore Substation within the Application Site has however been chosen taking account of local environmental constraints and the opportunity for mitigation. As the detailed design is progressed it will be necessary that the environmental effects of the developed design are no greater than those assessed in this EIA Report taking account of any additional mitigation. ICOL will commit to further consultation events as part of a future detailed design process to gain the opinion of local stakeholders and the design will be detailed taking account of environmental factors, comments from the local community, community councils, local businesses and other consultees, and the findings of ongoing technical assessments.

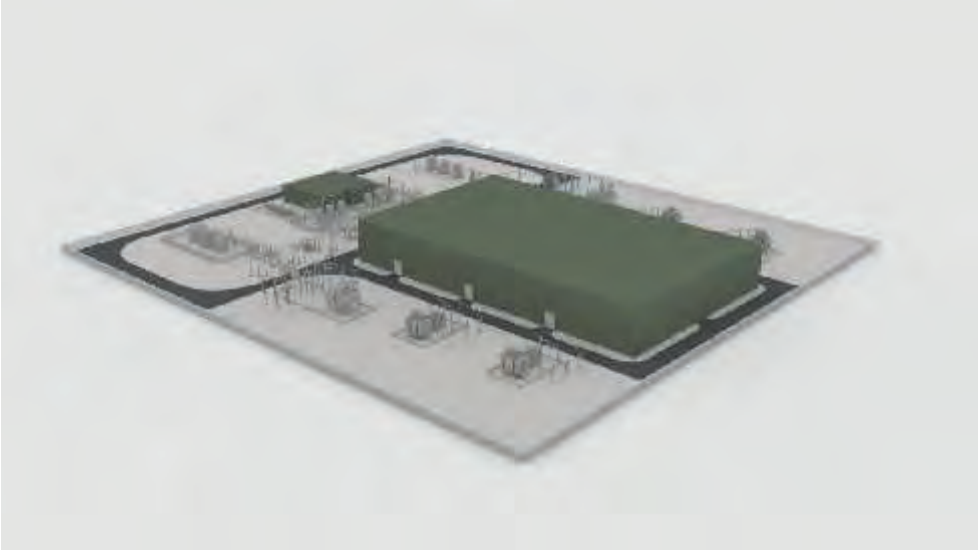

Figure 5.9: Indicative 3D Representation of the Onshore Substation Layout (Source: Siemens)

40 The Onshore Substation will be required to meet strict grid compliance criteria and this will vary depending on the characteristics and interaction of the grid and ICOL's Offshore Wind Farm electrical system. Depending on the characteristics (such as harmonic issues and reactive power requirements) of the electricity generated offshore, the balancing equipment onshore can change, which in turn can affect the total footprint, maximum height and total fenced area of the Onshore Substation.

41 It is anticipated that the Onshore Substation will be approximately 185 m x 185 m, resulting in a footprint of approximately 3.5 ha (excluding the embankment and landscaping) and will consist typically of the following elements (note that design is still at an early stage and provided dimensions and component list are indicative only at this stage):

- The largest building on this indicative layout would be the enclosure for the two harmonic filters, which is combined with the switchgear and control building. This is approximately 100m long x 60m wide x 14m high. This would contain switchgear (consisting of circuit breakers and disconnectors), busbars and protection/instrument measuring equipment

(consisting of protection/instrument equipment consists of CT, VT, surge arrestors). An illustration of substation switchgear is provided in Figure 5.10

- Control Room building. Typically, this would have the approximate dimensions of 30 m long x 7.5 m wide x 7 m high but in the layout shown it has been combined with the switchgear building.
- Incoming Onshore Export Cables terminated within the building;
- Outgoing Onshore Export Cables terminated within the building;
- Internal site electrical cables;
- Concrete hardstandings, concrete plinth, foundations;
- Grid Transformers (see Figure 5.11). The transformer and radiator sit in a bunded area which typically has a footprint of 30 m x 12 m with a 0.5 m high wall around the perimeter. The main body of transformer would be 6.5 m long x 3.5 m wide x 5 m high. The main body of the transformer radiator will be approximately 3 m long x 3 m wide x 9 m high. The transformer and radiator are connected together by pipes;
- Oil filled shunt reactors (see Figure 5.12) are similar to transformers in appearance. The main body (including radiators) will be approximately 10 m (long) x 5 m (wide) x 4.5 m (high);
- Steel support stands: all electrical equipment apart from the transformers will be mounted on either insulators or steel supports. Many support stands will be approximately 2.4 m in height or lower. The busbar supports may be up to 9 m high;
- Air Cooled Reactors. Round cylinders typically 3 m to 5 m in diameter and up to 4 m in height;
- Filters (consisting of capacitor banks and air cooled reactors);
- Reactive power compensation equipment is typically Static Synchronous Compensators (STATCOM). These devices are software controlled and allow the system to compensate for changes to the electrical loads that will occur throughout the operation of the site. These will be situated in a building which will be up to 23 m (long) x 22 m (wide) x 4 m (high).
- Car Park;
- Office and personal welfare facilities;
- Auxiliary transformer. Typically, this would be 2.5 m (long) x 1.5 m (wide) x 2 m (high) and may sit on top of a support stand of height 1 m to 1.5 m. (see Figure 5.13);
- 11 kV Connection or diesel generator (which may require fuel and a fuel bund) for providing operational power to the Onshore Substation;
- Security fencing and a minimum of two gates (one main entrance and other emergency exit);
- Spares room for housing spare equipment; and

- Internal access roads.

Figure 5.10: Example of Substation Switchgear from Inside

Figure 5.11: Example of Grid Transformer and Radiators

Figure 5.12: Example of Shunt Reactor

Figure 5.13: Example of Auxiliary Transformer

Onshore Substation Description of Works

42 Further ground investigations will be undertaken to assess the ground conditions in more detail and identify what remedial action, if any, is required prior to the commencement of works.

43 Cable routes and internal access road works will be established, followed by the construction of the necessary switchgear/control building then installation of external components, internal components and finally cable installation. After testing and commissioning, reinstatement works will be carried out to the temporary work areas.

44 Once the initial Onshore Substation Site and external access track are established, initial ground works will be undertaken to prepare the location for the Onshore Substation. This will involve raising the construction level above the existing reinforced concrete slab as described in *Section 5.4.9*. Once the foundations are laid, internal access roadways will be constructed followed by the delivery and installation of the Onshore Substation components. Other enabling works may be required onsite such as relocation of services.

45 All electrical infrastructure will be manufactured offsite and transported to site for subsequent assembly. A security fence of up to 3 m height will be erected around the perimeter of the Onshore Substation and warning signs posted. Twenty-four hour security will be in place for the duration of the construction period.

5.4.6 Onshore Export Cable between the Onshore Substation and the grid connection point

46 It is anticipated that the two Onshore Export Cables from the Onshore Substation to the grid connection point each be approximately 170 m long and may require jointing pits at appropriate locations which are yet to be determined (*Section 5.4.4*).

47 The Onshore Export Cables that run from the Onshore Substation to the grid connection point will be laid in up to two trenches or ducts in the same manner as that described in *Section 5.4.3*.

48 It is anticipated that the Onshore Export Cables from the Onshore Substation to the grid connection point will use the existing ducts which run under the B1348. These previously connected the former Cockenzie Power Station to the grid connection point. There are known to be four existing ducts of which two will be required.

49 If the ducts cannot be re-used, then the crossing of the B1348 may require a trench or HDD. Selection of the road crossing methodology will be largely determined by the nature and locations of the existing services accommodated within the highway and verges.

50 If trenching is required, it is likely that a trench will be created through the B1348, immediately to the north of the grid connection. These works will take between 4 to 12 weeks depending on the existing services in the road and would be carried out in consultation with ELC, local communities and other stakeholders and avoid complete road closure. A local traffic management scheme will be designed in consultation with ELC, Transport Scotland, the local community including community councils and local businesses. The road will be restored to an agreed specification with the ELC's Roads Authority. All relevant discussions with ELC, Transport Scotland, the local community including community councils and local businesses will take place prior to the commencement of any works to ensure appropriate measures are put in place to minimise disruption to road users, the local community and local businesses during the construction works. The exact timing of works will be consulted on and advertised in advance through local media and other notices. The anticipated completion date of the works will be communicated as work progresses to ensure the local community including community councils, local businesses and road users are fully informed.

51 If HDD is required, there will be no road closure. HDD will require an excavated area either side of the road approximately 3.5 m deep and 10 m x 12 m in footprint. Following completion of the work the area will be restored to its original condition as far as practicably possible. All relevant discussions with ELC, Transport Scotland, the local community including community councils and local businesses will take place prior to the commencement of any works to ensure appropriate measures are put in place to minimise disruption to road users, the local community and local businesses during the construction works. The exact timing of works will be consulted on and advertised in advance through local media and other notices. The anticipated completion date of the works will be communicated as work progresses to ensure the local community including community councils, local businesses and road users are fully informed.

52 The Onshore Export Cable installation rate including trench digging, cable laying and backfilling the trench, is around 30 - 45 m/day. If the existing road crossing ducts can be re-used, it is expected that the installation between the Onshore Substation and the grid connection point will require approximately 10 days per cable.

5.4.7 Construction Compound Description of Works

53 An area of approximately 6 hectares adjacent to the Onshore Substation will be used to accommodate a temporary work site, known as the Construction Compound and will include:

- Construction parking (located to the north east of the Onshore Substation, close to the Application Site Access);
- Construction welfare facilities (kitchen/cafeteria/drying room);
- Construction meeting room;
- Construction laydown and storage area;
- Construction security facilities (CDM fenced area/gate and security access);
- Construction lighting (dependent upon the time of year for construction works. In winter time external/flood lighting will be required for up to four hours per day to enable safe working procedures to be carried out. All lighting will be directional and facing to the areas which require to be accessed. It will also be designed to take account of neighbours);
- Construction security lighting; and
- Construction security guards 24/7.

54 All construction parking will be located within the construction compound.

55 The area for the Construction Compound will require preparation of the top ground surface layer and introducing a layer of stone capping.

56 All temporary areas will be reinstated after use and any site material will generally be used on site as part of a balanced cut and fill operation where possible.

57 The Construction Compound shall be bounded by fencing. Additional security measures shall be provided during construction to prevent trespass, vandalism and theft of materials and equipment.

5.4.8 Application Site Access

58 The main site access route for construction traffic will be via the A1, A198, B6371 and B1348. Access onto the Application Site will be via the existing access off the B1348. The existing verge and fence posts will be modified in liaison with the ELC's Roads Authority to provide access for large delivery vehicles.

59 Most Onshore Substation equipment will be delivered into the Construction Compound or directly to its installation location within the Onshore Substation Site. Typically, assembly of equipment will occur in both the Onshore Substation Site and in the Construction Compound.

5.4.9 Enabling Works

60 To prepare the Application Site, remedial/enabling work will be required prior to any project works commencing. It is thought that the level of the area where the now demolished power station stood is approximately 4 m below typical surrounding ground level. As a result, this area will be at risk of flooding. To overcome this risk, it is anticipated that this area is to be backfilled with free draining material raising the Onshore Substation construction elevation to approximately 3.5 m AOD which is above the ground water table. Note, the construction elevation may change subject to results of future ground water table height site investigation. A flood prevention earth embankment will also surround the Onshore Substation. This will provide protection from abnormally high tides and burst local watercourses. It is anticipated that the flood prevention berm will have a height of around 1 m above typical ground level.

5.4.10 Construction Working Hours

61 The permitted working hours for noisy operations on the Application Site that are audible at the Application Site boundary will be restricted to between 0700 – 1900 Monday to Friday inclusive, and 0800 – 1300 on Saturdays unless otherwise agreed with ELC. It is assumed there will be no working on Sunday, unless with prior arrangement with ELC. However, twenty four hour working, seven days per week has been assumed for the installation of the Offshore Export Cables at the Landfall. Local residents with the potential to be disturbed by noise will be consulted with regards to work patterns and appropriate controls will be implemented.

5.4.11 Construction Environmental Management Plan

62 Prior to the construction works a Construction Environmental Management Plan (CEMP) will be prepared by the Principal Contractor and submitted to ELC for their approval. This will be in addition to any more generic environmental management systems (EMS) such as ISO 140011 which the contractor works under. The CEMP will set out procedures to ensure all activities with potential to affect the environment are appropriately managed. The CEMP will incorporate any submissions such as method statements or work procedures relating to mitigation as agreed with ICOL and other statutory consultees as part of the planning consent conditions. All environmental risks and necessary protection measures (including mitigation measures set out in this EIA Report) will be required to be identified and integrated in the contractor's method statements for all major construction activities. The CEMP will be included as part of the overall site management and operational procedures. An outline of the contents of the CEMP is provided in Table 5.1.

Table 5.2 Key Elements of the CEMP

The CEMP provides a framework for environmental management and protection during construction and future decommissioning of the project. It will typically include: • Policies and objectives • Regulatory controls and guidance to be followed • Responsibilities of the contractor and developer • Roles (including key role of the Ecological clerk of Works (ECoW)) and management structure of the parties on site • Identification of key activities, associated environmental risks and targets • Procedures (including emergency contingency) and method statements • Mitigation measures and other commitments (eg terms of consents, licences etc) and actions to ensure delivery • Environmental monitoring and reporting • Training plans • Communication (on site, key stakeholders, neighbours and community) including the role of a community liaison officer • Management system reporting

63 The CEMP will include a suite of plans in addition to the main document which will be agreed with ELC and other relevant consultees prior to the commencement of the main construction activities. The CEMP documents will comply with good industry practice and include preventative, mitigation, monitoring and emergency procedures to be adopted during the construction and reinstatement phases. The suite of documents is expected to include the following:

[1] ISO 14001 is an international standard for environmental management

- Pollution Prevention Plan;
- Site Waste Management Plan;
- Oil Spill Contingency Plan;
- Landscape Mitigation Plan;
- Construction Traffic Management Plan;
- Noise Management Plan;
- Dust Management Plan
- Site Compound and Welfare Plan; and
- Construction Method Statements.

64 Further reference to these plans and to the key mitigation and principles underpinning them is provided and clearly identified in each topic specific chapter. These principles and mitigation measures have been developed in an integrated manner to reflect the linkages between different aspects of the site's environment including the hydrology, habitats, ground conditions and soils.

65 All site staff will receive appropriate environmental training at the beginning of the contract and throughout the construction period as required. The contractor's compliance with environmental procedures including measures for pollution prevention and monitoring of performance will be implemented by the contractor and monitored independently by ICOL and their environmental team.

5.4.12 Community Liaison

66 The contractor will be required to establish and maintain effective liaison with the local community throughout construction. This will include information about the ongoing activities and provision of contact telephone numbers to contact the site for information during working hours. A person will be identified with appropriate authority to resolve any problems. A log of complaints and actions taken to remedy these will be available for inspection.

67 The contractor will be required to ensure disturbance to the local community from construction activities is minimised, while also having responsibility for the safe implementation of the works.

68 A community liaison officer will be appointed prior to and for the duration of the works as part of the CEMP and to promote communication with the local community and businesses.

5.4.13 Construction Programme

69 A detailed construction programme will be developed as design and procurement activities progress however, at this stage, it is anticipated that the main construction activities will take place over approximately a two year period, although not all activities will be continuous, as outlined in Figure 5.14.

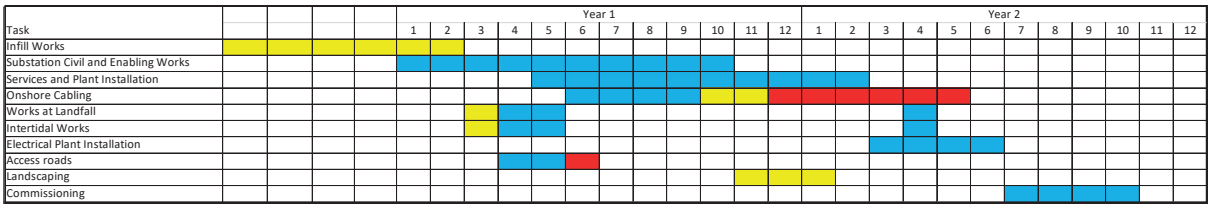

Figure 5.14: Programme of Works

*Timing dependent on offshore programme

*+ May be phased or in one year

Note: All durations are shown for illustration. Activities will not be continuous during these windows. Overall duration may increase or decrease and the sequence may change. Start and end dates may change.

5.5 Onshore Transmission Works – Operational Phase

70 The Onshore Substation will not normally be manned and staff will only be on site during maintenance or for repair work. Typically, these activities will require visits by two to three staff on two to three occasions per month.

71 In addition, there may be occasions for day visits to the Onshore Substation by one or two staff.

72 No maintenance will be required on the Onshore Export Cables other than an inspection of the link boxes. This will take place approximately one day every year.

73 If a cable fault occurs during the operation of the OnTW, cable repair or replacement work will be undertaken. Cable replacement will require that trenching, cable laying and backfilling operations will be carried out. Cable repair work will usually require a temporary working facility to be established. This would typically be a container similar in size to a shipping container e.g. 6 m (long) x 2.5 m (wide) x 2.5 m (high). The container would be located within the proximity of the fault for approximately seven days. Approximately five staff would be required to excavate and cover the cable, and three staff to repair the fault. The container would be sited sensitively in consultation with ELC and to avoid environmental constraints where possible.

74 During the operational phase, the Onshore Substation will not normally be illuminated. However, if repair or maintenance activities extend into the hours of darkness then the necessary area(s) of the Onshore Substation will be lit as necessary.

75 Security during operations will typically be supplied by a contractor supplying services such as site attendance within 15 minutes of security alarm and weekly walk round site and cable route. CCTV may be installed for the operational stage of the Onshore Substation.

76 During the operational phase, building on land overlying the Offshore and Onshore Export Cables would not be permitted.

5.6 Onshore Transmission Works – Decommissioning Phase

77 The OnTW will be decommissioned following the end of their operational life which is not fixed but would be for the lifetime of ICOL's Offshore Wind Farm. A draft decommissioning plan will be prepared prior to construction and a final plan prior to decommissioning. The draft decommissioning plan at the pre-construction stage will be a high level plan and will only address the principles of decommissioning, as the ultimate decommissioning activity will be undertaken in accordance with applicable guidance at the relevant time.