



# Drumlins Park Wind Farm Substation & Grid Connection

## Chapter 3: Description of the Proposed Development

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## Contents

<b>3.1</b>	<b>Introduction</b> .....	<b>1</b>
<b>3.2</b>	<b>Project Duration</b> .....	<b>1</b>
<b>3.3</b>	<b>Site Location &amp; Context</b> .....	<b>2</b>
<b>3.4</b>	<b>Description of the Proposed Development</b> .....	<b>5</b>
	3.4.1 Substation .....	6
	3.4.2 Underground Electricity Line .....	11
	3.4.3 Lattice-type End Masts .....	15
	3.4.4 Earthworks.....	16
	3.4.5 Construction Drainage Management & Disposal .....	18
	3.4.6 Landscaping .....	19
	3.4.7 Micro-siting.....	19
<b>3.5</b>	<b>Off-Site &amp; Secondary Developments</b> .....	<b>20</b>
	3.5.1 Aggregates Sources & Construction Materials Haul Route .....	20
<b>3.6</b>	<b>Construction Phase</b> .....	<b>21</b>
	3.6.1 Construction Method .....	22
	3.6.2 Site Entrances & Access Tracks.....	23
	3.6.3 Temporary Construction Compound .....	24
	3.6.4 Chemical Storage and Refuelling .....	24
	3.6.5 Construction Waste Management .....	25
	3.6.6 Construction Employment.....	25
	3.6.7 Construction Traffic .....	25
<b>3.7</b>	<b>Operational Phase</b> .....	<b>26</b>
<b>3.8</b>	<b>Decommissioning Phase</b> .....	<b>26</b>



### 3.1 Introduction

The purpose of this chapter is to provide a description of the proposed development in sufficient detail, which, when taken together with the descriptions of the existing environment provided in this EIAR, will allow an independent reader to understand the significant environmental effects likely to arise from the proposed development.

The description considers the location of the proposed development together with its main physical characteristics including design, size, scale and land-use requirements of all relevant phases of the existence of the project from its construction through to operation and decommissioning. The proposed development described in this chapter was arrived at following the consideration of various reasonable alternatives described in **Chapter 2**.

This chapter should also be read in conjunction with the technical plans and drawings submitted with the planning application and photomontages provided in **Annex 9.2** of this EIAR. Further descriptions of specific elements of the proposed development and the existing baseline environment are also provided in individual chapters of this EIAR as they relate to particular environmental factors including, for example, in combination with other proposed developments; the nature and quantity of materials and natural resources used; and the possible production of residues, waste, pollution, noise and nuisances etc.

The description of the proposed development also addresses other off-site/secondary developments which occur as a direct result of the proposed development, including the immediately adjacent permitted Drumlins Park Wind Farm, together with haul routes for the importation of aggregates, materials and electrical equipment to facilitate construction of the proposed development.

The proposed development will be commissioned as a single construction phase with the Drumlins Park Wind Farm and the construction period is likely to last for approximately 15-18 months. The description of the proposed construction phase includes land-use requirements; proposed site construction works; off-site/secondary developments; description of materials, plant and equipment used to facilitate construction together with a description of likely emissions; waste and traffic etc.

### 3.2 Project Duration

A ten-year planning permission is being sought for this proposed development. That is, planning permission would remain valid for ten years following the final grant of permission by the Board. The *Wind Energy Development Guidelines for Planning Authorities 2006* (DoEHLG, 2006) state that "*Planning Authorities may grant permission for a duration longer than 5 years if it is considered appropriate, for example, to ensure that the permission does not expire before a grid connection is granted. It is, however, the responsibility of the applicants in the first instance to request such longer durations in appropriate circumstances*". A ten-year planning permission is considered appropriate for a development of this nature to ensure all other required licenses and consents are in place and to ensure that the Drumlins Park Wind Farm is at an advanced stage of construction/commissioning.

The proposed substation has been determined by An Bord Pleanála to be SID (see **Section 1.2 (Chapter 1)**) and will, once operational, become a 'node' on the national electricity network and will be largely operated and maintained by Eirgrid as part of the national electricity network. As a result, the proposed substation does not have a specified operational period and it is highly likely that it will continue to

be operated following the decommissioning of the Drumlins Park Wind Farm (i.e. after its 30-year operational period) and, therefore, decommissioning of the electricity substation is not proposed.

### 3.3 Site Location & Context

The proposed development site is located in northwest County Monaghan approximately 4km southwest of the village of Newbliss, 8km southeast of Clones and 7km northwest of Cootehill. The proposed development will be located within the townlands of Drumanan and Cornawall, County Monaghan; and approximately centred at Irish Transverse Mercator (ITM) Grid Reference 655369, 819888.

The general location of the proposed development site, in a regional context, is illustrated in **Figure 3.1**.

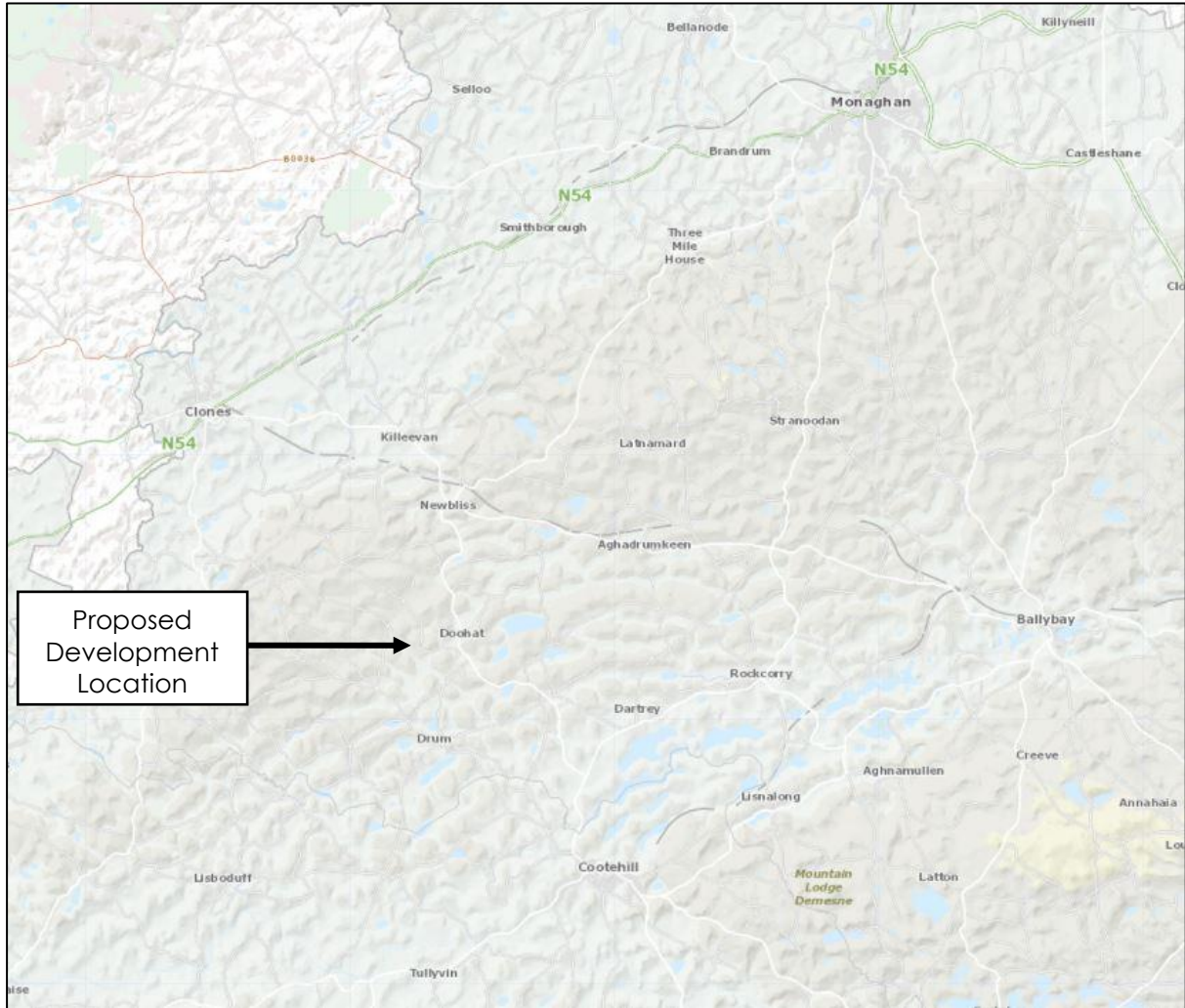
There are also a number of smaller nucleated and crossroad settlements throughout the wider environs of the subject site together with numerous dispersed 'one-off' dwellings and farmsteads outside of any identified settlements. The proposed development site is located in a relatively remote location and benefits from good separation distances to residential dwellings, with just 5 no. inhabited dwellings within 500m of the proposed electricity substation; the nearest of which is c. 290m southeast. 3 no. of the abovementioned dwellings are also located within 100m of the proposed grid connection infrastructure (i.e. underground electricity cabling and end masts).

The local landscape comprises a mosaic of small-to-medium sized agricultural fields consisting predominately of improved and semi-improved grassland. Field boundaries consist of generally dense hedgerow with hawthorn, gorse and blackthorn the common species.

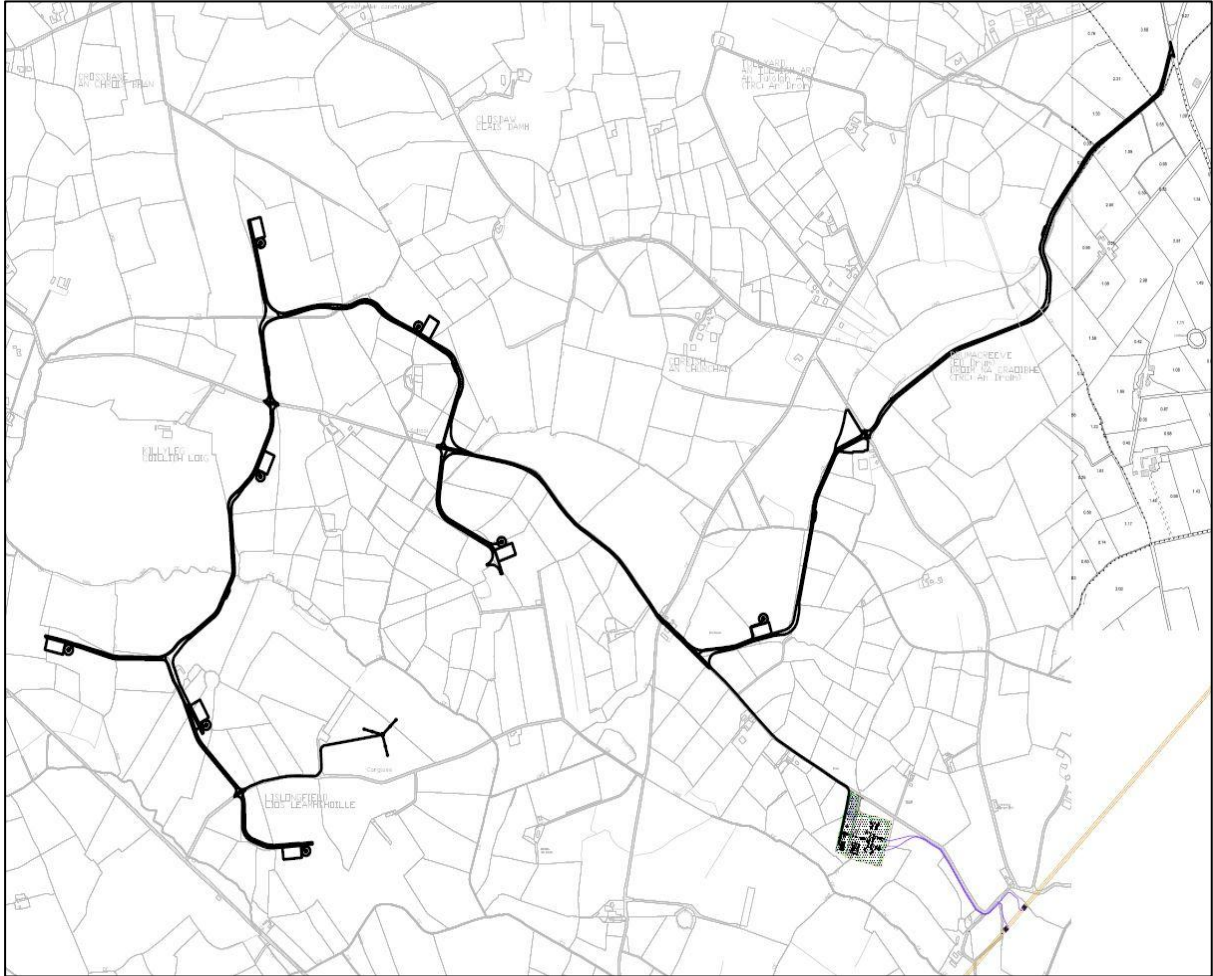
The proposed development site and surrounding environment are typical of a rolling drumlin landscape, with undulating terrain interspersed by small loughs and small watercourses but with no significant watercourses present. The topography of the proposed development site is gently undulating with elevations ranging between approximately 99m and 105m above ordnance datum (AOD) across the proposed substation site.

While undulating, the landscape generally slopes to the south/southeast towards the Bunnoe River and also the Dunaluck stream, located c. 700m south of the proposed electricity substation. The proposed development site is drained by man-made agricultural drains with the nearest natural watercourse being the Bunnoe River, located approximately 125m southeast of the proposed end masts at its nearest point.

The proposed development site is accessed via a local-tertiary road, the LT62013, which generally experiences extremely low volumes of vehicular movements.



**Figure 3.1: Proposed Development Location**



**Figure 3.2: Overall Site Location**



**Plate 3.1: General View across the Proposed Development Site**

### **3.4 Description of the Proposed Development**

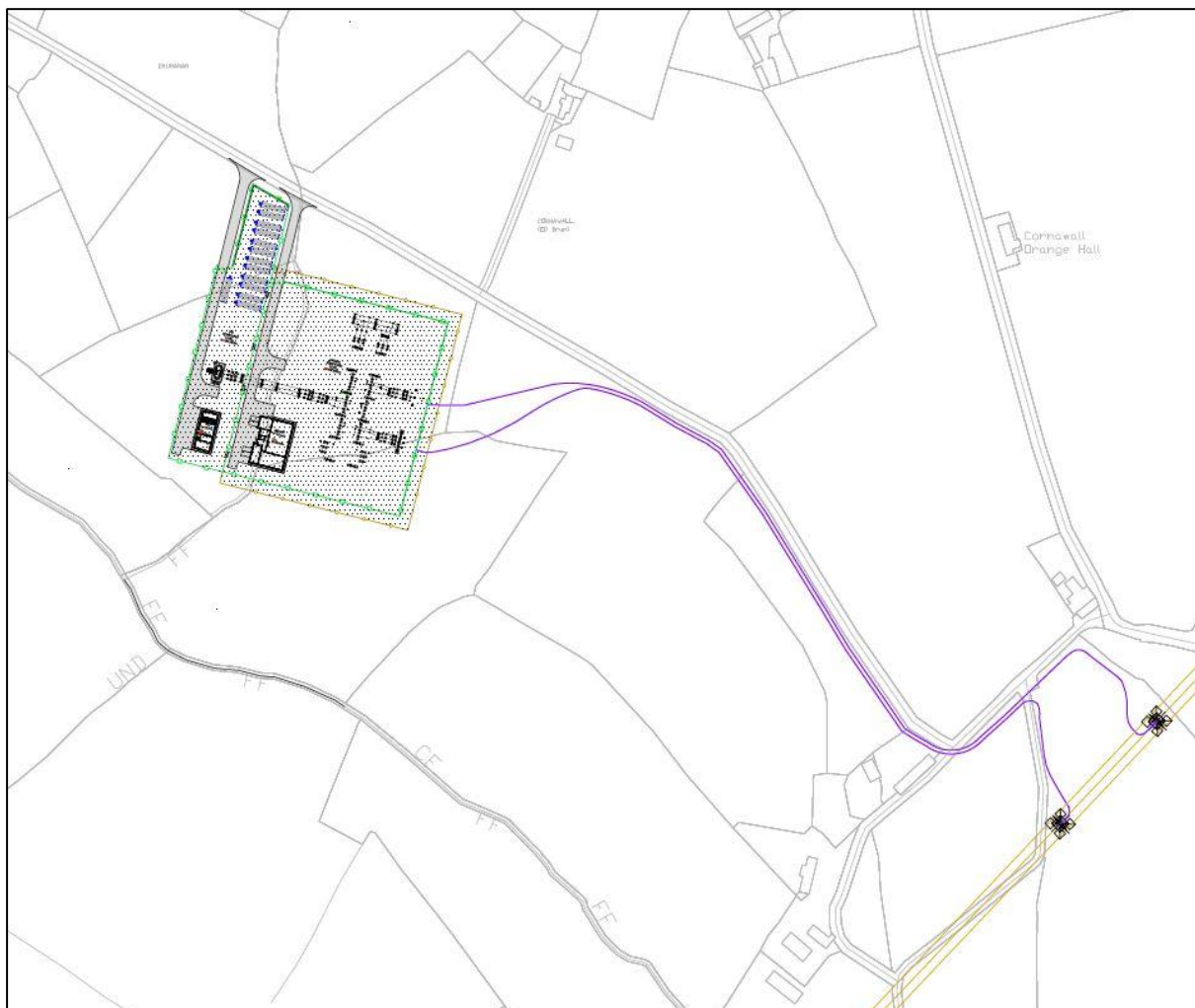
The proposed development will comprise a 110kV electricity substation, including all associated development works to accommodate its construction, operation, maintenance and the export of electrical power generated by the permitted Drumlins Park Wind Farm to the national grid via the existing Lisdrum-Shankill overhead electricity transmission line. This will include:-

- A 110 kilovolt (kV) 'loop-in/loop-out' Air-Insulated Switchgear (AIS) electrical substation, including 2 no. single-storey control buildings (with a Gross Floor Area of 623 square metres); 1 no. transformer bay; 2 no. line bays; and all associated electrical equipment, services and lighting within an up to 2.95 metre high fenced compound (with a total footprint of 12,765 square metres);
- An Electricity Storage System (ESS) comprising containerised energy storage modules; transformer and inverter modules; heating, ventilation and air condition units; and associated underground electricity cabling;
- Approximately 300m of on-site access tracks with associated site entrances from local public road (LT62013);
- Approximately 700m of 110kV underground electricity lines and communication cabling and all associated infrastructure;
- Replacement of 1 no. existing wooden pole-set with 2 no. lattice-type end masts, to a maximum height of up to 16m, to facilitate connection of the proposed 110kV underground electricity lines to the existing Lisdrum-Shankill 110kV overhead electricity transmission line; and

- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including upgrade works to the LT62013 and the provision of site drainage infrastructure and surface water protection measures.

The site of the proposed development has a total area of c. 7 hectares. The proposed development will facilitate the export of renewable electricity generated at the permitted Drumlins Park Wind Farm (Monaghan County Council Planning Register Reference 19/486) to the national electricity grid.

The layout of the overall proposed development is illustrated at **Figure 3.3**, below, and replicated at **Annex 3.1 (Volume II)**.



**Figure 3.3: Proposed Development Layout**

Each element of the proposed development is discussed in turn below and all relevant technical plans, drawings and other particulars are included in the accompanying planning application plans and particulars.

#### 3.4.1 Substation

As set out at **Chapter 2**; following consultations with Eirgrid and a comprehensive assessment of available alternative substation design technologies, it has been determined that the proposed development will comprise a 110kV 'loop-in/loop-out' air-insulated switchroom (AIS). The footprint of the substation (overall compound



area) will measure approximately 12,765m<sup>2</sup> and will be surrounded by a palisade fence, with associated gates, of up to 2.95m in height for safety and security reasons. The proposed substation will contain 2 no. control buildings and all necessary electrical equipment and apparatus to facilitate the export of electricity to the national grid. Ancillary infrastructure located within the footprint of the compound will include electrical apparatus, light posts and lightning masts.

The layout of the proposed substation is illustrated at **Annex 3.2 (Volume II)**. It is important to note that this layout has been designed fully in accordance with current Eirgrid specifications; however, the Applicant may be instructed by Eirgrid to immaterially alter the precise siting and/or specification of control buildings and/or electrical equipment within the overall substation. Any such immaterial alterations or deviations have been fully assessed and provided for within this EIAR.

The proposed substation site is gently sloping, to the southwest, with approximate ground elevations ranging from 105m AOD in the northwest of the site to 99m AOD in the southwest corner. There will be a requirement to undertake minor modifications to ground levels in order to achieve the required levels for the buildings, structures and electrical substation equipment. In order to provide a level compound footing, aggregates will be imported to the site to make up levels while, at increased elevations, topsoil and subsoil will be excavated to provide a level footing.

The substation compound will be surfaced with free-draining crushed stone such that rainwater can percolate to ground. Site investigations undertaken to date do not indicate the presence of rock within the proposed development site and, therefore, it is likely that all aggregate material will be imported to the proposed development site from local quarries (see **Chapter 13**).

The boundaries of the proposed substation will be landscaped with native species to reduce any visual effects on the landscape. Further details of landscaping proposals are provided at **Section 3.4.6**.

The proposed substation will be connected to the Drumlins Park Wind Farm via underground electrical cabling permitted pursuant to Monaghan County Council Planning Register Reference 19/486.

A typical 110kV AIS substation is illustrated at **Figure 3.4**.



**Figure 3.4: Example of a typical 110kV AIS Substation**

The footprint of the proposed substation traverses 2 no. existing open agricultural drains. These drains are located along existing field boundaries and drain the field catchments but do not typically contain free-flowing water. Low-level flow rates are only assessed as likely to be present following periods of intense or prolonged rainfall.

It is proposed to divert the existing drains around the substation footprint. Eirgrid specification does not allow for the piping and infilling of existing drainage features within the footprint of electricity substations and, given the topography of the site, diversions can be provided without any effect on the hydrological regime of the site. A north-south running drain will be diverted to the west and south of the substation before rejoining its original alignment. An east-west running drain, which discharged into the aforementioned north-south running drain, will be diverted around the south eastern corner of the substation footprint. The proposed diversions are illustrated on the accompanying drawings.

#### 3.4.1.1 Control Buildings

The proposed substation will contain 2 no. control buildings; one of which, the Independent Power Provider (IPP) building, will be operated and maintained by the Applicant while the Transmission System Operator (TSO) building will be operated and maintained by Eirgrid.

The IPP building will measure approximately 20.1m x 8.6m (gross floor area of c. 173m<sup>2</sup>) and will have an overall height of 5.5m to ridge height. The building shall be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The IPP building will house switchgear and associated equipment such as incoming and outgoing circuit breakers, earth fault, protection devices, metering equipment, computers and servers while also providing welfare

facilities for wind farm staff and maintenance personnel. The building will not require a dedicated water source due to infrequent use and the low volumes that will be required (toilet facilities and hand washing). Accordingly, the building design will incorporate a rainwater harvesting system. Wastewater arising will be stored in a sealed foul holding-tank and will be tankered off-site as required by a local licensed waste collector. Potable water will, as required, be delivered to site by an approved local provider. Water supply and waste water management proposals of this nature are common practice for developments of this type located in remote/rural areas with infrequent usage.

The TSO building will measure approximately 25m x 18m (gross floor area of c. 450m) and will have an overall height of approximately 6.9m (to ridge height). This building shall also be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The TSO building will contain a control room to allow operatives monitor and manage the operation of the electrical apparatus and will also include storage and welfare facilities. Similar to the IPP building, a rainwater harvesting system will be implemented and wastewater will be stored in a sealed foul holding-tank and removed from site by a local licensed waste collector.

Layout and elevation drawings of both the IPP and TSO buildings are provided at **Annex 3.3 (Volume II)**. The precise internal layout of both buildings may be subject to further immaterial alterations to reflect any future revisions to Eirgrid specifications. As set out above, any immaterial deviations from the precise layout and elevations illustrated at **Annex 3.3** are fully provided for within this EIAR.

#### 3.4.1.2 Electrical Apparatus

Electrical equipment; including, but not limited to, busbars, line bays and a transformer bay; will be located outside the control buildings (within the palisade fence) and will increase the low voltage of the electricity generated by the adjacent Drumlins Park Wind Farm to high-voltage before being transmitted to the national grid. Electrical equipment may also include underground cabling, as necessary, located within the substation compound.

The positioning of electrical equipment within the substation compound is provided on the accompanying planning application drawings and accords with current Eirgrid specifications. Immaterial deviations to the precise siting of this internal equipment may be necessary at the time of construction in line with any future revisions to Eirgrid specifications. To reiterate, any such deviations are fully provided for and assessed within this EIAR.

#### Energy Storage System

The proposed electrical apparatus will also incorporate an Energy Storage System (ESS) which will store electricity generated by the Drumlins Park Wind Farm which cannot immediately be exported to the national electricity grid. Such a scenario may arise, for example, during times of maintenance of the proposed electricity substation or during times when electricity generated by the wind farm exceeds demand on the electricity grid.

The ESS will comprise up to 14 no. energy storage modules containing battery modules; ancillary heating, ventilation and air conditioning units and corresponding power conversion systems and transformers; and will be connected to the proposed IPP building by underground electricity cables. The proposed energy storage

modules, which contain the battery storage infrastructure/technology measure c. 3.7m in height (inclusive of heating, ventilation and air conditioning unit and concrete plinth foundation), c. 12.6m in length and c. 2.5m wide. Each module will have an external ventilation module/unit for the ventilation/heating system and will be placed on concrete plinths, approximately 0.9m above finished ground level.

It should be noted that the precise dimensions, specifications and positioning of the energy storage modules (and ancillary equipment including ventilation units, doors and access stairs) are indicative and precise details, comprising any immaterial deviations, will be confirmed as part of the detailed design process completed prior to the commencement of development.

#### 3.4.1.3 Site Entrances & Access Tracks

Access to the proposed substation will be provided by 2 no. new site entrances from the LT62013 local-tertiary public road. The proposed site entrances will not be required to accommodate any abnormal sized loads but have been designed to ensure ease of access and egress for standard HGVs which will deliver construction materials and electrical apparatus to the site. The site entrances will be constructed in accordance with the requirements of the Local Authority, particularly regarding the provision of appropriate site visibility splays to ensure traffic safety<sup>1</sup>.

Following the completion of construction, the site entrances will be appropriately fenced off and gated to prevent unauthorised access. The reinstatement of the site entrances will also incorporate the replanting of hedgerows with native species. Hedgerows will be appropriately sited to allow for future growth while ensuring, at all times, that visibility splays are maintained during the operational phase.

Existing field entrances will be utilised to access the route of the proposed underground electricity line and proposed end mast locations.

A total of approximately 300m (including c. 200m located within the substation compound area) of on-site access tracks will be required for construction purposes and for site access during the operational phase. Access tracks will be unsealed and constructed of crushed stone material to allow for permeability. Initial site investigations have not indicated the presence of suitable material which can be reused in the construction of the access tracks and substation compound and, therefore, it is likely that the majority of material will be imported to the proposed development site from local quarries (see **Chapter 13**).

A cut/fill approach will also be implemented in the construction of the proposed access tracks to ensure that horizontal and vertical alignments are suitable to accommodate HGV loads accessing the proposed substation site and to implement drainage infrastructure.

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<sup>1</sup> Visibility splays will be provided in accordance with Table 15.5 of the Monaghan County Development Plan 2019-2025



**Figure 3.5: Typical Access Track**

### 3.4.2 Underground Electricity Line

The proposed electricity substation is located c. 380m (in a straight line) northwest of the existing Lisdrum-Shankill overhead electricity transmission line. In order to connect the respective developments, and provide the 'loop in/loop out' infrastructure, it is proposed to install c. 700m of underground 110kV electricity transmission line. The underground line (UGL) will be located within private lands with c. 685m located within agricultural lands and across an access track to a private dwelling (i.e. 'open country' works) and c. 15m located within private lands immediately adjoining the LT62013.



**Figure 3.6: Typical Trench Construction**

The UGL will be installed within ducting in excavated trenches of approximately 1.3m deep and 0.6m wide. Cables will be pulled through the ducting in a single length thus eliminating the requirement for joint bays. Ground levels will then be made up using appropriate material and finished as required by the landowner.

#### 3.4.2.1 'Open Country' Works

The proposed UGL will be located within 'open country' for approximately 685m. The UGL route will be located within agricultural grassland, with 1 no. crossing of a private dwelling access.

All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials (topsoil and subsoil) will be stored

separately for use during the reinstatement of the trench or disposed of at the designated spoil deposition area.

The trench will then be reinstated to its pre-existing condition by reseeding using native species, allowed to revegetate naturally; replacing of excavated grass turves; or reinstated with aggregates where appropriate.

A typical trench elevation is illustrated at **Figure 3.7<sup>2</sup>** (reproduced at **Annex 3.4**).

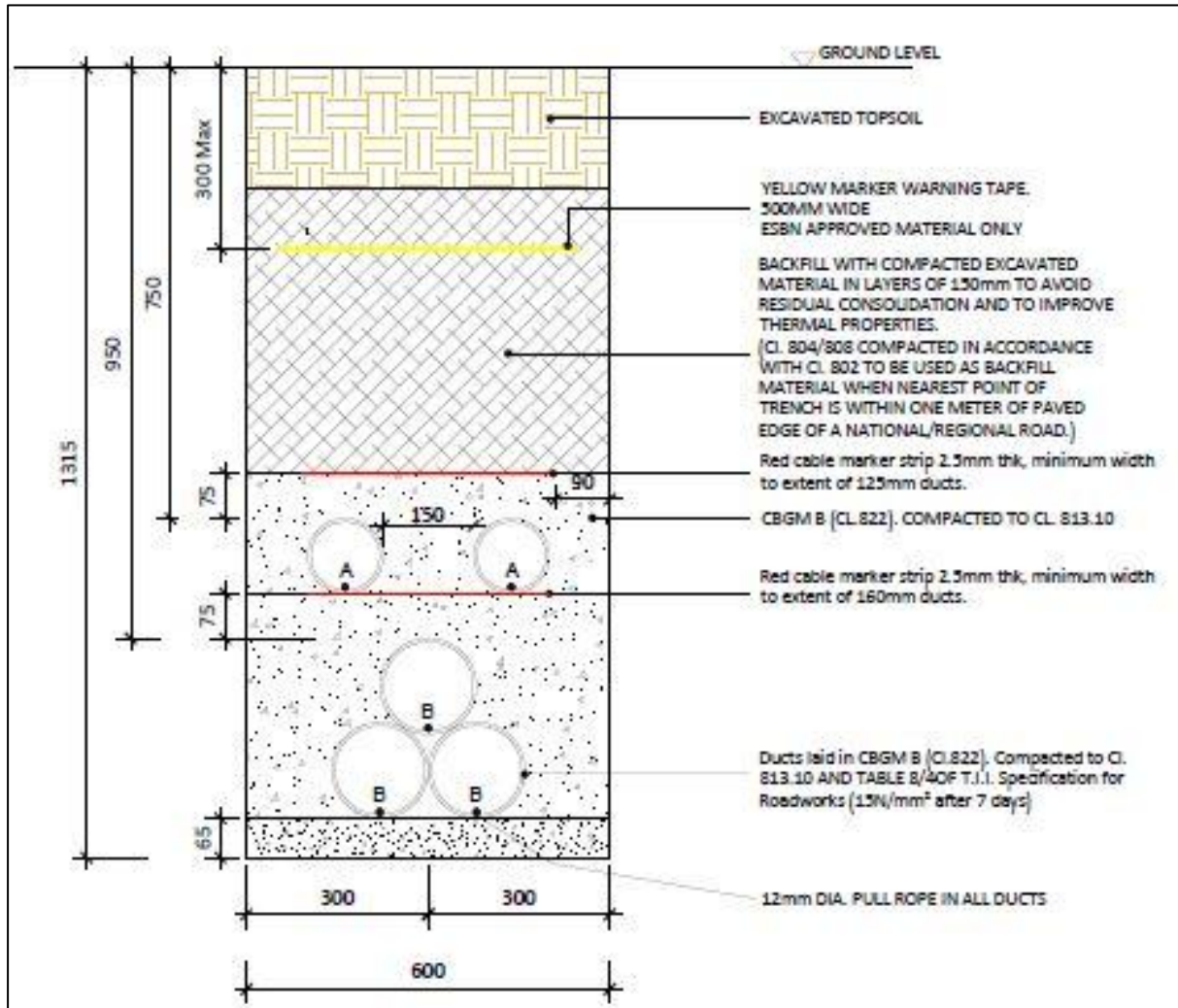
The proposed UGL will also cross an agricultural drain as it exits the proposed substation compound. The drain is assessed to be generally dry, containing only limited flow following periods of intense or prolonged rainfall. The proposed UGL will be installed below the bed to the drain to ensure that the hydraulic capacity of the drain is unaffected. Construction works will only be undertaken during dry periods to avoid the requirement for any flow rate control infrastructure/technology. Temporary silt/sediment control measures will be installed, down gradient, prior to the commencement of crossing works. Following the completion of UGL installation works at this location, the drain and its surrounds will be reinstated to its original condition. The temporary silt/sediment control measures will remain *in situ* until such time as vegetation becomes established.

Short lengths of hedgerow will be removed at each location where the proposed UGL passes through a hedgerow; however, the extent of removal is unlikely to exceed 4m at each location and 30m overall.

A detailed method statement will be prepared by the contractor outlining the precise methodology to be put in place during the trenching/ducting/reinstatement phase. This method statement will be reviewed by the Environmental Manager (EM; to be appointed by the contractor) to ensure that all environmental protective measures to be implemented are suitable and to the required standard.

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<sup>2</sup> It should be noted that **Figures 3.7** and **3.8** illustrate a trench with a single UGL circuit. Along part of the proposed UGL route, where the 2 no. circuits are to be located immediately adjacent to each other, it is likely that a slightly wider trench will be excavated to accommodate both circuits (i.e. similar to **Figure 3.6**)



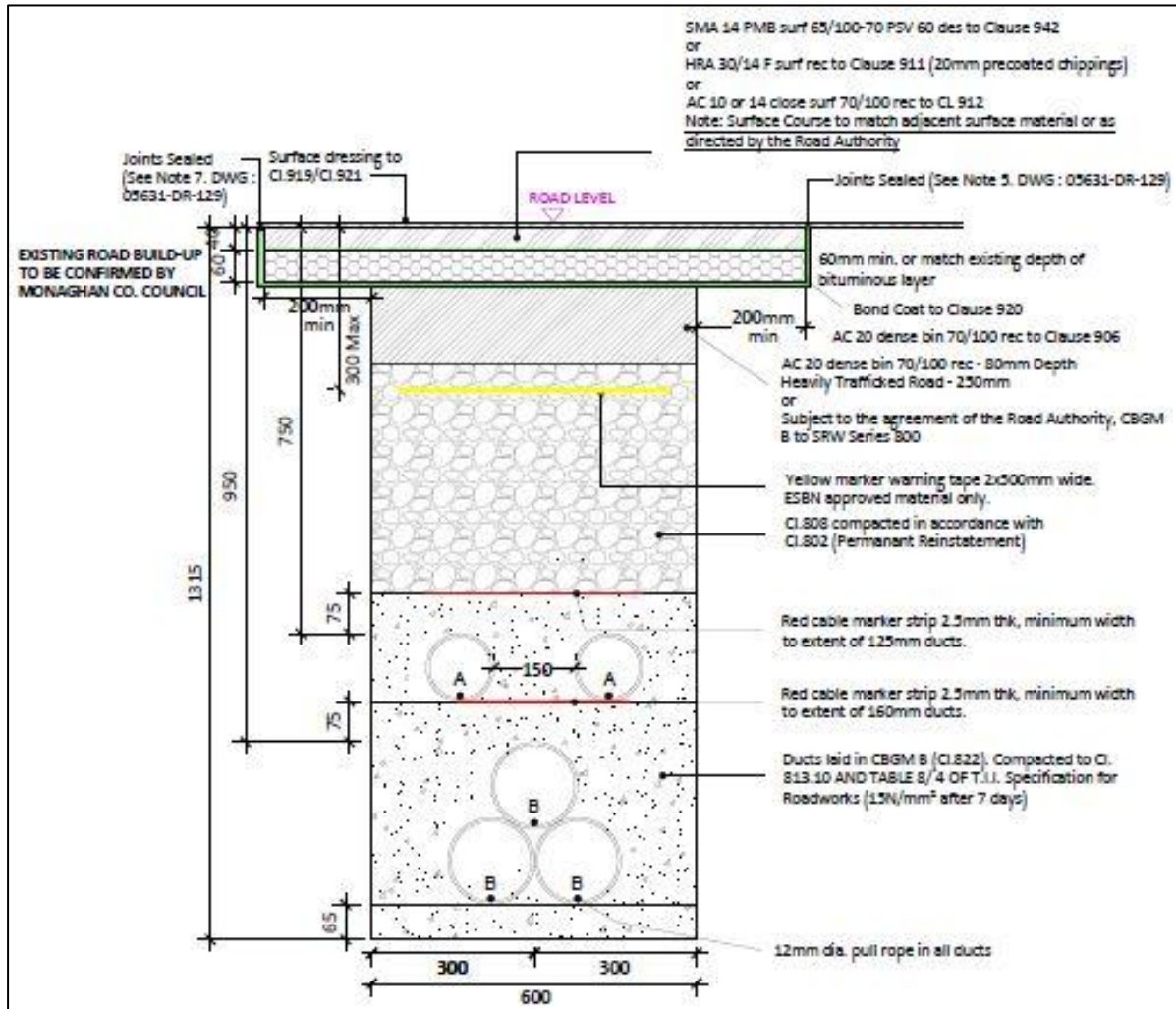
**Figure 3.7: Typical Trench Specification ('Open Country' Works)**

### 3.4.2.2 Works adjoining the LT62013

Approximately 15m of UGL is proposed to be installed across the entrance to a private dwelling adjoining the LT62013. Reinstatement materials (see **Figure 3.8** below and **Annex 3.4**) and methodologies will be agreed with the landowner and, given the interface with the public road network, Monaghan County Council prior to the commencement of development.

A detailed method statement will be prepared by the contractor outlining the precise methodology to be put in place during the trenching/ducting/reinstatement phase. This method statement will be reviewed by the EM to ensure that all environmental protective measures to be implemented are appropriate and to the required standard.





**Figure 3.8: Typical Trench Specification (Works Adjoining the LT62013)**

### 3.4.3 Lattice-type End Masts

The end masts will be lattice-type towers and will be located immediately beneath the Lisdrum-Shankill overhead electricity transmission line. The masts will have a maximum height of up to 16m and a permanent above-ground footprint of c. 76m<sup>2</sup> (total; c. 38m<sup>2</sup> per mast) with concrete foundations below ground to a depth of 3m. However, it should again be noted that the precise specifications of the proposed end masts may be immaterially altered to ensure compliance with any future revised Eirgrid specifications.

One of the end masts is proposed to replace an existing wooden pole-set associated with the existing Lisdrum-Shankill overhead F electricity transmission line. The proposed end mast will replace this existing pole-set. The wooden poles and electricity line suspension equipment will be decommissioned and removed from site for re-use or recycling where possible or disposal at a licensed waste handling facility.

At the location of the proposed end masts, the Lisdrum-Shankill overhead electricity transmission line will be broken and will be connected to the proposed UGL (**Section 3.4.2**). Once constructed, electricity being transmitted along the Lisdrum-Shankill electricity transmission line will be diverted along the proposed UGL and through the proposed substation, allowing electricity generated by the Drumlins Park Wind Farm

to be exported to the national grid, before returning to the Lisdrum-Shankill electricity transmission line; hence the 'loop-in/loop-out' nature of the proposed substation.



**Figure 3.9: Typical End Mast**

#### 3.4.4 Earthworks

No borrow pits will be developed as part of the proposed development and no blasting of any rock will take place on-site to generate material for construction works. All materials for the construction of the access tracks and compound footing will be sourced from approved local quarries.

The site of the proposed substation is gently sloping towards the southwest and, as a result, extensive earthworks are not required. As set out above, in order to provide a level substation compound area and to ensure appropriate levels are available for the construction of transformer plinths and control building foundations, it is proposed to adopt a cut/fill approach whereby topsoil and subsoil will be removed (at higher elevations) while suitable aggregates will be imported to increase the

levels at lower elevations. However, it should be noted that substantial excavations (or importation of material) will not be required.

The level of earthworks associated with the proposed UGL is set out at **Section 3.4.2** above. Excavations will also be undertaken at the location of the proposed end masts to facilitate the installation of mast foundations.

Due to the generally shallow nature of the proposed excavations, substantial levels of spoil are not predicted to be generated. It is proposed that excavated material (topsoil and subsoil) will, where possible, be utilised in the reinstatement (e.g. at the substation site, UGL trenches and end mast foundations) and in the landscaping (e.g. substation) of the proposed development.

As part of the design process, significant consideration has been given to the level of excavations required to construct the proposed development in order to minimise the generation of spoil and, subsequently, to the management of excavated material. **Table 3.1**, below, provides a breakdown of the spoil volumes predicted to be generated and proposals regarding the re-use or disposal of this material.

Where excess topsoil or subsoil material is generated which cannot be utilised for reinstatement or landscaping purposes, it is proposed to develop a dedicated spoil deposition area to the south of the proposed substation footprint where excess soil and subsoil will be stored permanently. It is estimated that c. 5,055m<sup>3</sup> of excess material (topsoil and subsoil material) will be generated and will be stored in the deposition area. The location of the deposition area was selected due to the general absence of environmental constraints, available separation distances to watercourses, generally flat or gently sloping gradient and close proximity thus avoiding traffic movements on the public road network. Spoil will be transported to the deposition area where it will be placed in layers in accordance with best-practice methods. Appropriate drainage management measures will be implemented to ensure that the deposited spoil does not become waterlogged. Following the completion of construction, the deposition area will be graded to match the profile of surrounding land, covered with topsoil and reseeded. Works at the spoil deposition area will be monitored, on a weekly basis during the construction phase and monthly for a six month period thereafter, by an appropriately qualified engineer.

It should be noted that tarmac cuttings arising from trenching works adjoining the LT62013 (estimated to be c. 3m<sup>3</sup>), or upgrade works to the LT62013, will not be re-used or stored on site due to the possibility of soil contamination but will be removed and disposed of at a licensed waste handling facility.

Proposed Development Element	Volume of Material to be Excavated (m <sup>3</sup> )	Volume of Material to be utilised for reinstatement/ landscaping (m <sup>3</sup> )	Volume of Material to be disposed of in deposition area (m <sup>3</sup> )	Volume to be disposed of off-site (m <sup>3</sup> )
Substation	4,740	210	4,530	0
Underground Electricity Line	796	424	369	3
End Masts	624	468	156	0

**Table 3.1: Spoil Generation & Management**

A preliminary Spoil Management Plan (enclosed at **Annex 3.5, Volume II**) was prepared in respect of the Drumlins Park Wind Farm and incorporated proposals regarding the appropriate management of material which may arise from the construction of the proposed substation. Prior to the commencement of development at the site, a detailed Spoil Management Plan will be prepared following the post-consent detailed design process and will address the re-use, reinstatement, storage and restoration of all material excavated during the construction phase including detailed methodologies regarding the establishment and management of the spoil deposition area for the entire project, including the proposed development.

### 3.4.5 Construction Drainage Management & Disposal

Construction works will be carried out in accordance with the 'Land & Soil' and 'Water' assessments and mitigation measures included in this EIAR in order to prevent any likely significant effects on nearby watercourses by debris, silt and hydrocarbons (see **Chapters 6 & 7**). These measures have also been implemented in the Natura Impact Statement (NIS) which accompanies the planning application.

Sources for likely significant effects on the hydrological environment during construction include increased volumes of surface water runoff; the generation of silt laden surface water runoff from excavations (including from the diversion of 2 no. existing drains within the site [see **Section 3.4.1**] and the crossing of an agricultural drain by the proposed UGL) and the storage of stockpiled materials; contamination due to the leakage of oils/fuel from site vehicles; spillage during refuelling operations; and leakage from chemical, waste and fuel storage areas.

Specific mitigation measures are presented in the relevant chapters of this EIAR in relation to each of these issues. The precise implementation and siting of these measures will be determined, subject to planning permission being granted, following the further post-consent detailed design process and will be included within the Construction Environmental Management Plan (CEMP) to be agreed with the Planning Authority prior to the commencement of construction.

All surface water runoff from stockpiles (including the spoil deposition area), excavations or from dewatering operations will be passed through an appropriate attenuation train, including silt fences (also known as silt curtains) and silt traps (also known as silt/settlement/sediment/stilling ponds)<sup>3</sup>. Other surface water protection measures which may be implemented, as appropriate, include straw bales, silt bags and siltbusters.

Surface water control measures will be implemented as construction progresses through the site; however, prior to the commencement of earthworks, temporary silt/sediment control infrastructure (e.g. straw bales) will be placed in agricultural drains around the site until the full range of construction phase measures are installed.

The installation of surface water runoff measures will avoid any discharge of silt or sediment laden waters directly to any surface water feature prior to being fully treated. At the point of discharge, buffered outfalls (or level spreaders) will be installed to ensure that erosion or scouring does not occur. Further details of the proposed surface water protection measures are enclosed at **Chapter 7**.

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<sup>3</sup> Please note that the titles of surface water protection infrastructure are used interchangeably within this EIAR and accompanying documentation.

A preliminary Surface Water Management Plan (SWMP) was prepared in respect of the Drumlins Park Wind Farm (enclosed at **Annex 3.5, Volume II**). This SWMP will be further developed prior to the commencement of development, following a further post-consent detailed design process, and will incorporate the precise implementation and siting of surface water management infrastructure.

Following the completion of construction, surface water treatment infrastructure will be decommissioned and removed from site. Due to the permeable nature of the access tracks and substation footing, the vast majority of surface water will percolate to ground. Stormwater drainage infrastructure will be installed around the control buildings and transformer plinth to capture any runoff from concrete areas, will be passed through an oil interceptor before being discharged to an agricultural drain. Discharge rates will be designed to mimic Greenfield runoff rates thus avoiding any long term alteration to the hydrological regime of the proposed development site.

### 3.4.6 Landscaping

The footprint of the proposed substation (including access tracks) is located within 5 no. individual agricultural fields, each of which is separated by existing hedgerows, trees and associated drainage ditches. Further details of the habitat composition and ecological significance of these hedgerows, trees and drainage ditches are provided at **Chapter 5**. It will be necessary to remove approximately 215m of existing field boundaries, including trees, to facilitate the construction of the proposed site entrances, and associated sight visibility splays, access tracks and electricity substation. Detailed landscaping proposals have been incorporated into the design of the proposed development and comprise the following:-

- Bolstering/reinforcing of existing hedgerows;
- Planting of new hedgerows around the proposed substation; and
- Planting of trees at locations which are not proposed to accommodate infrastructure associated with the electricity substation.

The landscaping proposals have been incorporated into the design of the proposed development predominately to ensure that there is no net loss of hedgerow habitat or trees as a result of the proposed development; however, the proposals will also assist in screening the proposed development within the local landscape and will, in particular, reduce the prominence of the substation from the LT62013.

While the construction of the proposed development will require the removal of c. 215m of hedgerow; it is proposed to plant c. 360m of new hedgerow around the boundary of the proposed substation while c. 220m of existing hedgerow will be bolstered to improve its current condition (including the replacement of hedgerow removed to facilitate sight visibility splays). It is also proposed to plant c. 0.16 hectares of trees. Hedgerow and tree species to be planted are discussed further at **Chapters 5** and **9** but it can be confirmed that the species mix will be native Irish species and will be selected to complement those current found within the local landscape. The proposed planting locations have been carefully selected to ensure sufficient separation distances to electrical equipment and only species which do not grow in excess of 10m in height will be selected.

### 3.4.7 Micro-siting

The immaterial micro-siting of the proposed substation; including control buildings and electrical equipment, access tracks and other elements of the proposed

development; following further post-consent site investigations and geotechnical analyses, also forms part of the proposed development.

It is proposed that infrastructure may be micro-sited within the planning application boundary subject to compliance with the mitigation measures included in this EIAR. These immaterial micro-siting deviations have been incorporated, and fully assessed, throughout this EIAR, and will have no material effect on the substantive conclusions of this EIAR.

### 3.5 Off-Site & Secondary Developments

#### 3.5.1 Aggregates Sources & Construction Materials Haul Route

Due to the absence of rock material within the proposed development site, construction materials and aggregates will be sourced from local quarries/suppliers. Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used. These aggregates are slated for extraction in the normal course of the relevant quarry's business and therefore will have no additional likely significant environmental effects above and beyond those normally entailed in the operation of the quarry.

The estimated volume of aggregates required for the construction of the proposed development has been estimated based on the characteristics of the proposed development site and proposed development and are presented at **Tables 3.2, 3.3, 3.4** and **3.5** below. Other miscellaneous materials; including drainage infrastructure, concrete blocks, fencing, ducting and underground cabling, and end mast components; will also be required, however, the material volumes are substantially less than those presented below and the traffic movements associated with these materials are quantified at **Chapter 13**.

Proposed Development Element	Total Volume of Aggregates to be Imported (m <sup>3</sup> )	Volume of Clause 804 (CL804) to be Imported (m <sup>3</sup> )	Volume of 6F1 (stone) to be Imported (m <sup>3</sup> )	Other (sub-formation) Fill Material (m <sup>3</sup> )
Substation	10,750	2,670	580	7,500

**Table 3.2: Estimated Substation Aggregate Requirements**

Proposed Development Element	Volume of Concrete to be Imported (m <sup>3</sup> )
Substation	970

**Table 3.3: Estimated Substation Concrete Requirements**

Proposed Development Element	Total Volume of Aggregates (CL808) to be Imported (m <sup>3</sup> )	Volume of Aggregates (CL804/CL808) to be Imported (m <sup>3</sup> )	Volume of Concrete (CBGM B) to be Imported (m <sup>3</sup> )
Underground Electricity Line	8	3	303

**Table 3.4: Estimated UGL Aggregate & Concrete Requirements**

Proposed Development Element	Total Volume of Aggregates (CL804/808) to be Imported (m <sup>3</sup> )	Volume of Concrete to be Imported (m <sup>3</sup> )
End Masts	10	139

### Table 3.5: Estimated End Masts Aggregate & Concrete Requirements

Detailed consideration has been given to a number of construction material sources and haul route options to the site as part of the EIAR process (see **Chapter 13**). Candidate quarries, which may be selected to supply materials following a competitive tendering process, are identified at **Annex 13.1 (Volume II)**.

While the final selection of a precise construction material haul route to the site will be dependent on the chosen material supplier(s), all suppliers will be instructed to utilise the extensive regional road networks in counties Monaghan and Cavan (as relevant) and to avoid local roads insofar as possible. Regardless of the supplier ultimately selected, all construction deliveries will be required to access the site via a specific route from the R189. From the R189, deliveries will utilise site entrances and site access tracks permitted as part of the Drumlins Park Wind Farm to the LT62013. From here, construction traffic will proceed along the L62013 in a south easterly direction to the proposed electricity substation site entrances or to the location of the proposed end masts, as necessary.

It is proposed to increase the carriageway width of the LT62013 (in relevant part) from its current running width of 2.5m to a running width of c. 4m. Along the majority of the route, carriageway widening can be accommodated within roadside verges; however, at a number of locations, hedgerows will also be trimmed back to facilitate road widening works. A detailed assessment of the LT62013 has been completed and it is not proposed to remove any hedgerows.

It is also proposed to remove a number of overhanging tree branches along the LT62013 to ensure that sufficient headroom is available during the delivery of electrical equipment. The tallest loads to be brought to site will be 5m in height and, therefore, all overhanging branches below 5.5m are proposed to be removed.

Prior to the commencement of construction, a structural assessment of the LT62013 will be undertaken to ensure that it is capable of accommodating construction traffic. If, during this survey, some pre-construction works are found to be required to ensure the integrity of the road throughout the construction phase, remedial works will be completed as necessary. Following the completion of construction, a further condition and structural survey will be undertaken and any deterioration of the road structure will be put right. Finally, and regardless of whether any post-construction structural remediation is required, the carriageway of the LT62013 (relevant part) will be reinstated to the required standard and to the satisfaction of the Planning Authority.

The LT62013 is not a heavily utilised road and currently experiences extremely low levels of vehicular traffic with 2-4 no. movements per day. Therefore, significant disruption to local residents and landowners is not predicted. A number of local alternative routes and diversions are available and appropriate traffic management measures will be implemented throughout construction.

### 3.6 Construction Phase

The construction phase is predicted to last for approximately 15-18 months from commencement of detailed site investigations through to the commissioning of the substation and ending with progressive site reinstatement and landscaping. Construction activities will be completed concurrently with the permitted Drumlins Park Wind Farm.

The construction phase of the development will comprise a 6 no. day week with normal working hours from 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. It may be necessary to undertake occasional works outside of these hours to avail of favourable weather conditions or in the event of any emergency. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

No construction works are envisaged during the operational phase. Works during this phase will typically involve the routine maintenance and servicing of the electrical equipment and the site, as necessary

Further details of the construction phase and specific mitigation measures to be implemented are provided in each chapter of this EIAR as they relate to each environmental topic.

### 3.6.1 Construction Method

The construction method will consist of the following general sequence:-

- Traffic management measures to be implemented in advance of commencement of haul route upgrade works. Works to be completed to ensure unimpeded access during the construction of the proposed electricity substation and grid connection;
- Surface water protection measures to be installed;
- The construction of the site entrances, ensuring that requisite traffic visibility splays are provided;
- Site preparatory and groundworks associated with the substation compound footprint including control building and including the diversion of existing agricultural drains;
- Establishment and continued management of spoil deposition areas;
- Construction of the control buildings;
- Construction of bases or plinths for electrical apparatus;
- Erection of palisade fencing around substation;
- Installation of internal and external electrical apparatus in control buildings and within compound area;
- Site preparatory and groundworks associated with the strain tower foundations,
- Erection of end masts;
- Installation of UGL between substation location and end masts;
- Commissioning and testing of electrical apparatus;
- Connection of UGL to the 110kV Lisdrum-Shankill electricity transmission line;
- Final commissioning of all electrical equipment and apparatus; and
- Progressive site reinstatement, restoration, landscaping and planting proposals including the installation of stockproof fencing and the erection of gates.

A preliminary Construction & Environmental Management Plan (CEMP) was prepared in respect of the entire Drumlins Park Wind Farm (including the proposed electricity substation) as part of its planning application and is enclosed at **Annex 3.5 (Volume II)**. The methods and measures set out in the CEMP, regarding construction activities, will be implemented as relevant to the subject proposed development. A detailed CEMP, addressing the overall development (i.e. permitted wind farm and proposed development) will be prepared in advance of all construction activities and will incorporate all mitigation measures proposed in this EIAR and targeted Construction Method Statements (CMSs) prepared by the appointed Contractor in respect of each element of the proposed development. The preparation,



application and documentation of this CEMP will enable all parties – including contractors, designers and competent authorities – to learn from the systematic implementation and assessment of best practice, particularly through the recording of summary information on performance outcomes.

The construction phase will be supervised by a range of environmental and engineering specialist personnel including, but not limited to, a Project Supervisor for the Construction Stage (PSCS), Geotechnical Clerk of Works (GCoW) and Archaeological Clerk of Works (ACoW) who will liaise closely with the appointed Contractor's on-site Environmental Manager (EM) to monitor and to ensure that all applicable measures are implemented. The detailed CEMP, which will incorporate further technical information following the undertaking of further post-consent detailed design, will be submitted to the Planning Authority for approval prior to any works commencing on the proposed development site. The CEMP shall also provide additional details of intended construction practices including:-

- A detailed Traffic Management Plan for the timing and routing of construction traffic to and from the construction site and associated directional signage, to include, in particular, proposals to facilitate and manage the delivery of loads and alternative arrangements to be put in place for pedestrians and vehicles during the course of site development works;
- Implementation stage details of the proposed construction methods (i.e. CMSs);
- Specific measures to prevent the spillage or deposit of clay, rubble or other debris on the public road network;
- Details of appropriate measures for construction stage noise, dust and vibration, and any monitoring of such levels;
- Storage and containment of all construction related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained. All such bunds shall be roofed to exclude rainwater;
- Appropriate provision for re-fuelling of vehicles;
- Off-site disposal of construction/demolition waste and construction-stage details regarding the management of spoil;
- Final drainage design specifications to ensure that surface water run-off is controlled such that no silt or other pollutants enter watercourses in full compliance with the measures outlined in this EIAR; and
- Further details of the intended hours of construction.

The CEMP will also take full cognisance of and will incorporate the measures outlined within any specific environmental management plans proposed as part of this EIAR and will also incorporate any specific requirements set out in conditions of consent, subject to a grant of planning permission.

### 3.6.2 Site Entrances & Access Tracks

The site entrances and on-site access tracks will generally be constructed as follows:-

- Temporary construction phase drainage and surface water protection measures will be installed;
- Existing hedgerow will be removed to accommodate the site entrances and provide sufficient visibility splays;
- Works associated with the diversion of the north-south running drain will be completed;

- Topsoil and subsoil will be removed, side cast and stored in separate mounds in appropriate areas adjacent to the site entrances and access tracks for use in the reinstatement process as appropriate of removal from site;
- Crushed stone will be laid on a geo-textile mat (where required) and compacted in layers to an appropriate depth; and
- The site entrances and access tracks will be retained during the operational phase to facilitate access for maintenance.

The proposed methodology for this section of UGL will be generally similar to that implemented for the 'open country' works, except for minor modifications owing to different reinstatement requirements.

### 3.6.3 Underground Electricity Line

The proposed sequence of works is typically as follows:-

- Excavate the trench to the required dimensions, approximately 1.3m deep and 0.6m wide;
- Place a blinding layer at the base of the trench;
- Place and joint the cable trefoil HDPE power ducts using cable ties at c. 3m intervals;
- Lay in and compact a layer of leanmix concrete around and above ducts; and place a red marker strip above;
- Install a single HDPE communications cable ducts;
- Lay in and compact an additional layer of leanmix concrete, and place another red marker strip above;
- Final backfill layer (excavated material if suitable) to include yellow warning tape; and
- Appropriate reinstatement as discussed above.

### 3.6.4 Temporary Construction Compound

A dedicated temporary construction compound is not required for the proposed development. Construction materials, fuels and chemicals will be stored; and waste management facilities, site offices, parking facilities and welfare facilities provided; at the permitted Drumlins Park Wind Farm temporary construction compound; however, following the completion of groundworks associated with the substation, certain non-polluting construction materials and electrical apparatus may be stored at the proposed development site prior to use/installation.

### 3.6.5 Chemical Storage and Refuelling

Storage areas for oils, chemicals and fuels will comprise bunded areas of sufficient capacity within the Drumlins Park Wind Farm temporary construction compound. Bunds will have a watertight roof structure and will be supplied by a licensed manufacturer to enable adequate safe storage for the quantities of material required. An adequate supply of spill kits will be readily available in order to clean up any minor spillages should they occur. A hydrocarbon interceptor will be installed within the surface water drainage system during the construction phase to trap any hydrocarbons that may be present. A 50m buffer will be observed around all surface water features and no fuel/chemicals shall be handled or stored within this zone.

From the construction compound, fuel will be transported to the works area by a 4x4 in a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. The bowser/4x4 will be fully stocked with spill kits and

absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for its carrying capacity.

### 3.6.6 Construction Waste Management

Waste will be generated during the construction phase and the main items of anticipated construction waste are as follows:-

- Hardcore, stone, gravel, concrete, plaster, topsoil, subsoil, timber, concrete blocks and miscellaneous building materials;
- Waste from chemical portaloos (at Drumlins Park Wind Farm temporary compound);
- Packaging and plastics; and
- Oils and chemicals.

Waste disposal measures proposed include:-

- On-site segregation of all waste materials into appropriate categories including, for example, topsoil, bedrock, concrete, bricks, tiles, oils /diesels, metals, dry recyclables e.g. cardboard, plastic, timber;
- All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound;
- Wherever possible, left over materials (e.g. timber off-cuts) shall be re-used on-site;
- Uncontaminated excavated material (topsoil, subsoil, etc.) will be re-used on-site in preference to importation of clean inert fill;
- All waste leaving the site will be transported by approved and licensed contractors and taken to suitably licensed facilities and will be recycled, recovered or reused, where possible; and
- All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.

### 3.6.7 Construction Employment

It is estimated that approximately 100 no. people will be employed during the 15-18 month construction phase. The actual number of personnel present at a given time will depend on the activities being undertaken and will vary throughout the course of the construction programme. Employment will be the responsibility of the construction contractor but it is likely that the workforce will include labour from the local area.

### 3.6.8 Construction Traffic

Vehicular traffic required for the construction phase is likely to include:-

- Articulated trucks (HGVs) to bring initial equipment onto site and later to bring electrical equipment and apparatus;
- Tipper trucks and excavation plant involved in site development and groundworks; and
- Miscellaneous vehicles and handling equipment, including light commercial vehicles associated with the construction workforce.

Likely effects from construction traffic could include temporarily increased local traffic levels and traffic noise. Construction traffic on the local road network will be managed in accordance with a Traffic Management Plan and the requirements of the Local Authority. This may include the installation of temporary road signage and

traffic lights, as appropriate. Noise arising from construction traffic will be localised, temporary and of a short term duration.

Traffic mitigation measures will be implemented during the construction phase, as follows:-

- Signage at the proposed site entrances giving access information;
- Temporary traffic restrictions kept to minimum duration and extent;
- Diversions put in place to facilitate continued use of roads;
- Strictly enforced speed limits; and
- Provision of a designated person to manage access arrangements and act as a point of contact to the public.

### **3.7 Operational Phase**

During the operational phase, other than routine maintenance and monitoring, there will be no other activities associated with the proposed development. On average, the site will be visited 1-2 times per week by a light commercial vehicle for maintenance purposes. In exceptional circumstances there may be a requirement to replace an electrical component which may require more substantive works on site; however, large scale construction works would not be required.

Waste will be generated during the operational phase including, for example, cooling oils, lubricating oils and packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with best-practice and all regulations in a licensed facility.

Further details on the operational phase and specific mitigation measures are provided in each chapter of this EIAR as they relate to each environmental topic.

### **3.8 Decommissioning Phase**

While the primary function of the proposed development is to facilitate the connection of the Drumlins Park Wind Farm to the national electricity grid; the development will, once operational, be largely operated and maintained by Eirgrid as a node on the national electricity network. As a result, it is highly likely that the proposed substation and ancillary infrastructure will continue to operate following the decommissioning of the Drumlins Park Wind Farm (i.e. after its 30-year operational period) and, therefore, decommissioning of the electricity substation is not proposed.

