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Mooretown 220 kV Substation

Architectural Design Statement

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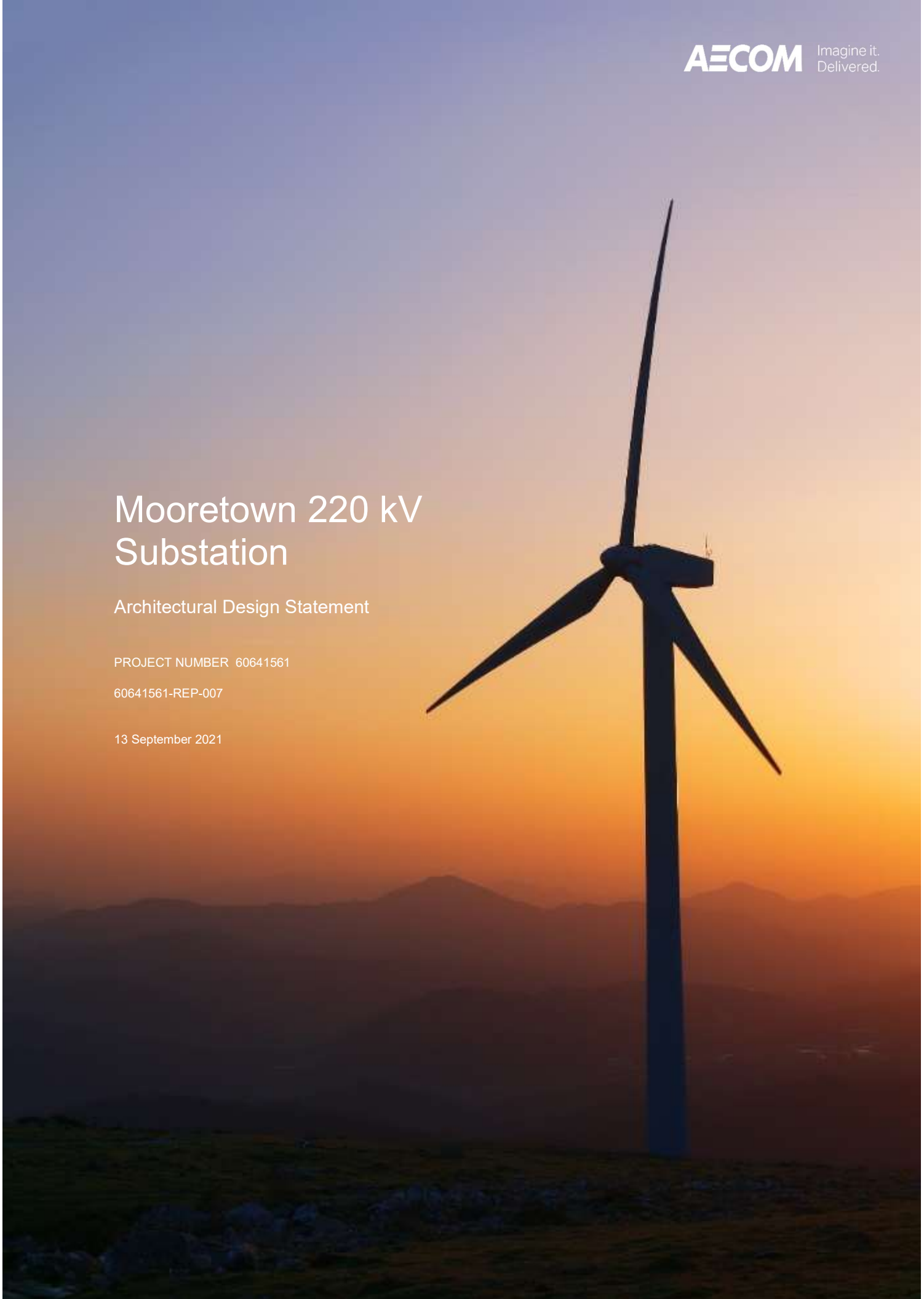

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	25 June 2021	Rev 0	Draft	Pat Barry	Associate Director
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1. Introduction

The proposed development comprises of the construction of a 220 kV Gas Insulated Switchgear (GIS) substation and associated facilities at a site located in Huntstown, North Road (R135), Dublin 11.

The subject lands are located approximately 1.5 km north of the Dublin M50 ring road at the N2 junction, just west of Dublin Airport.

The Planning Application comprises the 220 kV electrical substation which will serve an adjacent data centre facility. A separate Planning Application has been lodged for the data centre facility, comprising two separate data centre buildings and associated ancillary structures to be constructed over an estimated 10-year period. An additional Planning Application has also been submitted for underground re-routing of existing overhead transmission lines.

The purpose of this document is to provide an overview of the context and design rationale of this development. It should be read in conjunction with the balance of drawings and documents submitted with the Planning Application for the 220 kV Substation.

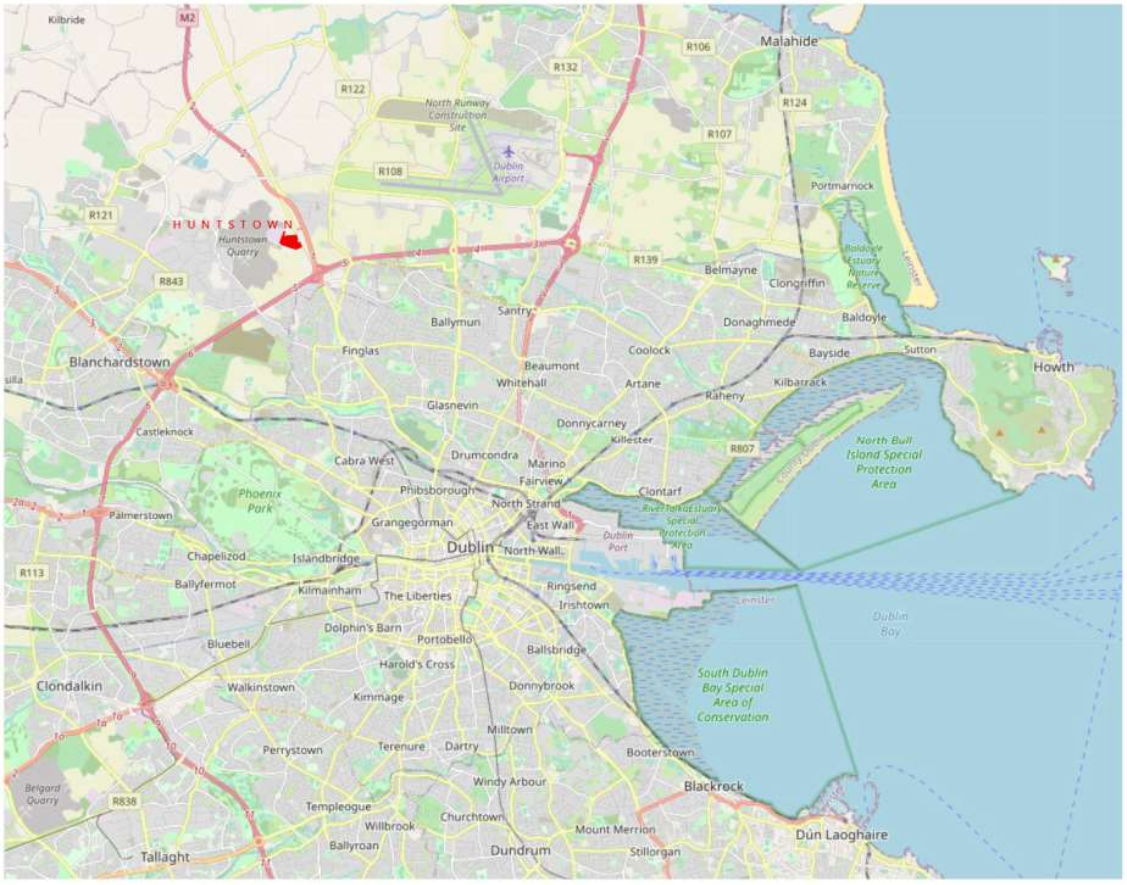

Figure 1 - General Location Map

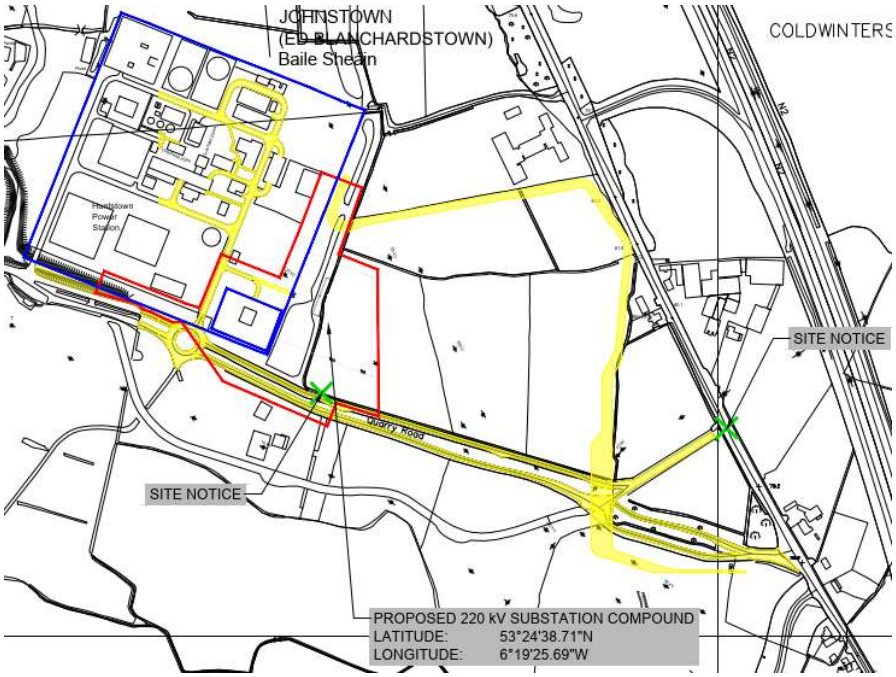

Figure 2 - OS Map

2. Brief

The development will consist of the following new works:

- A two-storey gas insulated switchgear (GIS) building located to the east side of the site, oriented north-south and with a gross floor area of 2,068 sqm. The parapet height of the GIS building is 17.0 m above finished ground level. 3.0m high lightning finials will be mounted on top of the parapet.
- The GIS building will include a 220 kV switchgear room, control room, battery room, emergency generator room, workshop, mess and WC.
- 4 no. outdoor 220 kV/20 kV transformers, fire walls and associated electrical equipment
- 1 no. outdoor 220 kV series coil, fire walls and associated electrical equipment
- 4 no. Medium Voltage Switchgear Houses and 1 no. Medium Voltage Control House
- 2 no. lightning masts, each 20.0 m high
- A fenced substation compound subdivided into two areas
- Vehicular and pedestrian entrance with associated security installations, roadways and limited vehicle parking. The development will be accessed via the Huntstown Power Plant. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry Road and Huntstown temporary access for construction works.
- Perimeter fencing, landscaping, storm water treatment and sundry ancillary works. The development will be enclosed with landscaping to southern frontage including perimeter berming The landscape design integrates ecology and surface water attenuation strategies for the site. An Environmental Impact Assessment Report (EIAR) is being submitted with this application.

3. Site Context

3.1 General Description of the Site

The overall site extends to over 10.7 acres (4.33 ha.) of mainly greenfield (agricultural) lands, zoned HI (Heavy Industry) under the Fingal Development Plan 2017-2023.

The site is bounded by the Huntstown Power Station to the west and the Roadstone Huntstown Quarry and Huntstown Power Station private access road to the south. The site is presently bounded by greenfield (agricultural) lands to the north and east, which are subject to a concurrent Planning Application for the Data Centre facility.

Site features include a drainage ditch running north-south and also along the southern boundary, and a limited number of additional ditches and hedgerows associated with historic field arrangements and farms.

An existing ESB transmission line cross the site at the north. A proposal for underground re-routing of this line is subject to a separate Planning Application.

The site elevation varies from approximately 78.0m AOD to 82.0m AOD.

Existing ESB underground 220 kV cables to Corduff and to Finglas substation which are presently located along the Roadstone Huntstown Quarry road will be diverted from the existing ESB substation in Huntstown Power Plant into the proposed new 220 kV Substation. This will have minimal impact and disturbance to existing and proposed services and roads.

Figure 3 - Site Plan (existing)

3.2 Archaeology

An archaeo-geophysical survey followed by a preliminary programme of archaeological testing has been undertaken for the site. These studies identified a potential bivallate enclosure (Early Christian farmstead enclosure) as well as a number of other possibly related remains.

A further phase of pre-development archaeological testing and the subsequent excavation of features, deposits or structures identified (under license to the National Monuments Service of the Department

of Culture, Heritage and the Gaeltacht) is currently being procured to fully assess the potential for archaeological remains across the development site.

3.3 Environment and Ecology

It is an element of the proposal to maintain and enhance the ecological value of the site through a green belt at the northern and southern boundaries and the integration of landscaping and planting to provide a wild life corridor and a soft transition to neighbouring sites (such as the proposed adjacent Data Centre facility) and the public realm.

Habitats found on site (tree lines, hedgerows and recolonising bare ground) have potential to support commuting, foraging and roosting for bats as well as breeding and foraging habitat for a variety of breeding and wintering bird species. Mitigation measures accounting for seasonal limitations are being put in place.

Environmental modelling to assess noise generation and air quality has been carried out to ensure adherence with statutory requirements.

Further detail is provided with the Environmental Impact Assessment Report (EIAR) submitted with this application.

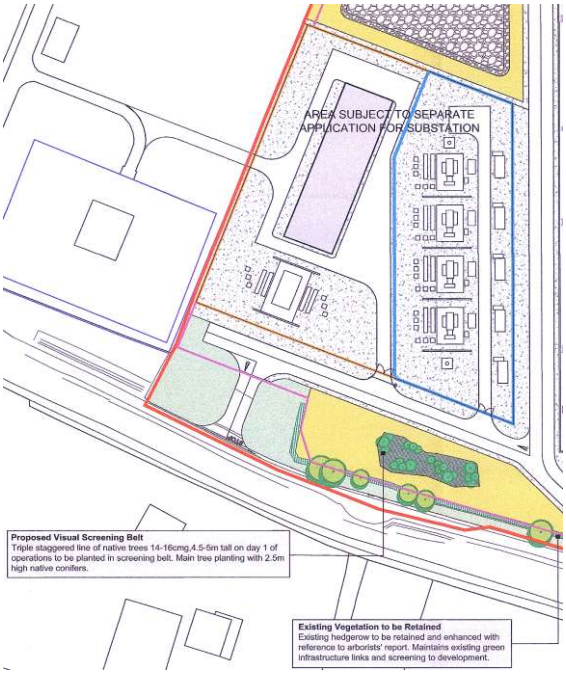

Figure 4 - Greenbelt approach

4. Development Proposal

4.1 Town Planning

The site proposed for development is zoned under Zoning Objective “HI” Heavy Industry under the Fingal County Development Plan 2017-2023.

> Objective: Provide for heavy industry.
>
> Vision: Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts.

The development accords with the ‘Heavy Industry’ designation and provides an appropriate transition from neighbouring residential uses to heavy industry.

The scale and intensity of use, as well as the readily available power supply, make this an ideal site for a 220 kV Substation needed to support a data centre facility.

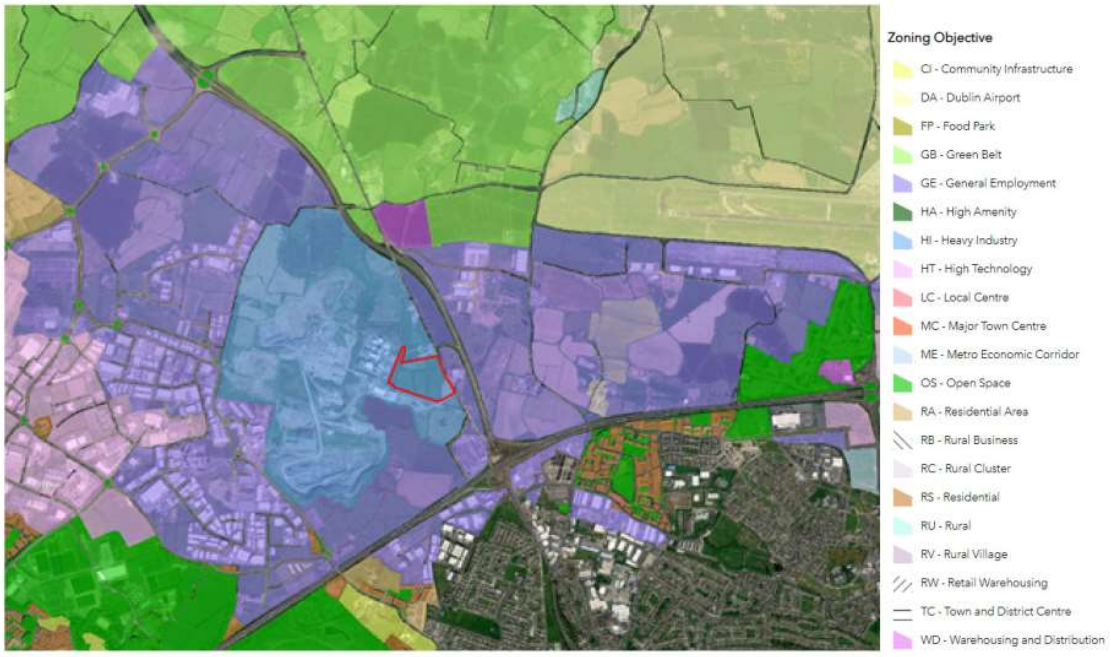

Figure 5 - Development Plan Zoning Objectives map

4.2 Site Response

The primary objective of the site strategy is to construct the substation per technical requirements and in a timely manner while providing mitigation to visual impact, noise and emissions and protecting and enhancing the ecological value of the land.

Buildings and outdoor high voltage plant installations are tightly contained centrally, in so far as electric safety and maintenance clearances allow, to maximise landscaping mitigation around the southern and northern perimeters of the site in the form of a landscaping provisions, softening transition areas and screening installations visible from site boundaries.

The main site entrance will be located at the east of the site, via the Huntstown Power Station.

The proposed ground levels for each side of the substation compound at 78.00m AOD and 78.80m AOD are defined to take account of projected flood levels and to minimise excavation and earthmoving. Levels are subject to confirmation during detailed design. Please refer to the Engineering Report included with the Planning Application documentation.

4.3 Landscape Design Approach

The proposed landscape design aims to enhance the existing ecological and wildlife assets, to contribute to visual impact mitigation and to provide a visual amenity to the public realm.

The main landscaping features are an undulating berm, indigenous vegetation including riparian planting along water features and tree rows and clusters to provide primary screening. Fully grown mature trees will be planted. All tree and plant species proposed are native.

Figure 6 - Aerial View from the south east

4.4 Building Design Approach

The primary building on the substation site will be the two storey GIS building containing the 220 kV gas insulated switchgear room. The building will also contain critical support functions such as control room, battery room, emergency generator room, workshop as well as welfare facilities for maintenance and operations staff. The building size and layout will be in accordance with EirGrid standard requirements.

The GIS building construction technology will be a bespoke structural steel frame on reinforced concrete foundations with an insulated roof and proprietary insulated metal wall cladding. The main parapet will be at ca. 17.00m from floor ground level, which is lower height than the proposed Data Centre buildings. The wall cladding exterior colour will match the darker colour of the lower façade of the proposed adjacent data centre facility.

Secondary buildings containing Medium Voltage Switchgear and Medium Voltage control equipment will comprise materials to ensure continuity of finishes throughout the facility.

Boundary treatment will consist of fencing and landscaping which will provide screening to ancillary equipment.

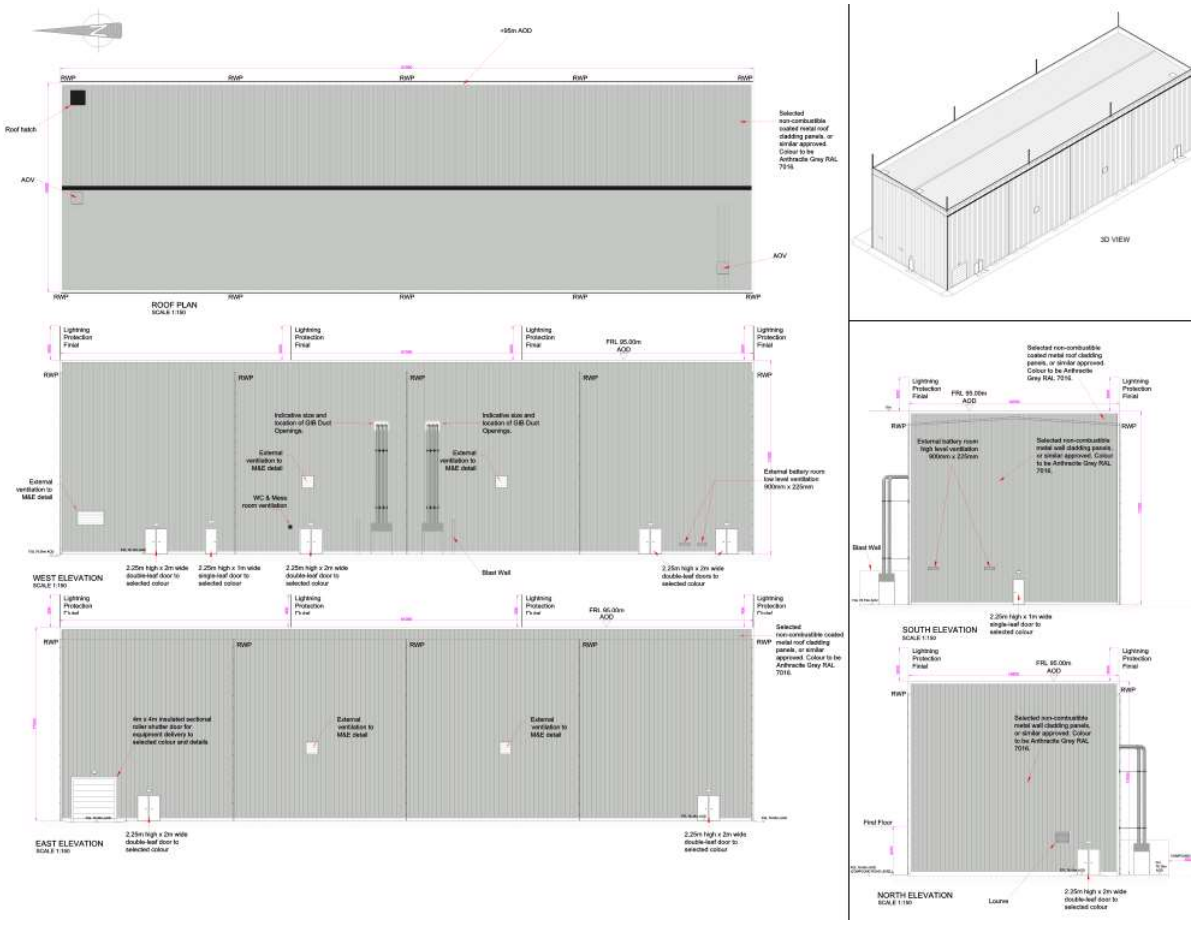

Figure 7 - 220 kV GIS Building Elevations

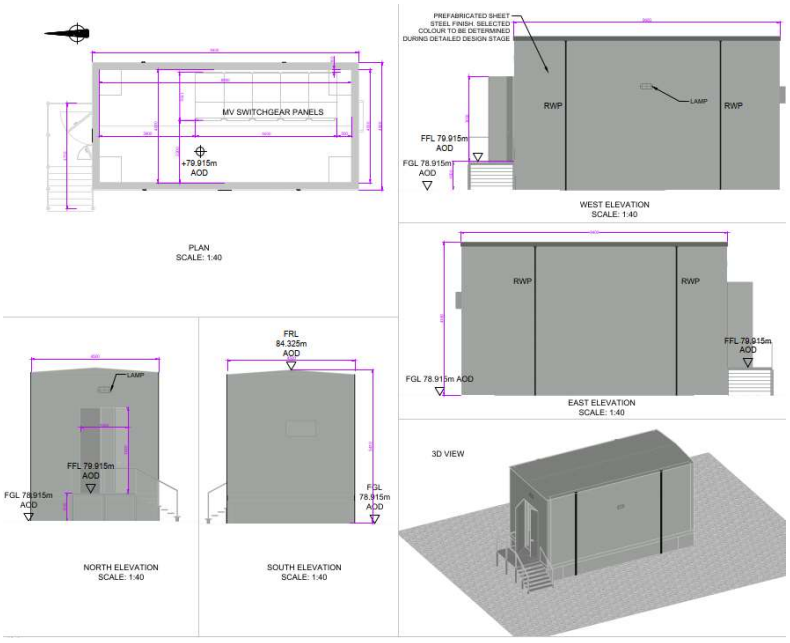

Figure 8 - MV Switchgear Rooms Elevation

4.5 Sustainability

The GIS Building will be designed and constructed to meet the requirements of the Irish Building Regulations and current Technical Guidance Documents (TGD's).

Waste management for both construction and post occupation will actively control the generation, recycling and disposal of waste material.

Please refer to the EIAR for further information.

4.6 Access and Parking Provision

The main vehicular entrance to the substation campus will be via the Huntstown Power Plant.

A secondary entrance at the south of the site will provide emergency access for the site via the Roadstone Huntstown Quarry Road. It will also be possible to access the substation site via the proposed Data Centre facility internal access road network.

Car parking provision, to cater for maintenance and operations staff, will be 5 spaces for the EirGrid side of the substation compound and 4 spaces for the Customer side of the substation compound. Disabled parking spaces and electric car charging points are not proposed due to occupancy and usage of the substation.

4.7 Universal Design and Accessibility

The substation buildings will be used solely for inspection, repair and maintenance purposes of high voltage equipment, and hence will only be accessed by highly trained personal who need to be able bodied to carry out any inspection, maintenance or emergency repair work. Hence disability access provisions are not proposed for the substation and a Disability Access Certificate (DAC) under the Building Regulations will not be required.

4.8 Fire Safety

The development will comply with Part B of the Building Regulations (Fire Safety). An application for a Fire Safety Certificate will be prepared and lodged with Fingal County Council for the GIS substation building proposed.

4.9 Building Services

The engineering, fabrication, construction, installation, inspection, testing and commissioning of building services installations shall be carried out in accordance with current Irish and European regulations, codes, standards and any relevant manufacturers' instructions and guidelines.

4.10 Design References, Standards and Guidelines

The project will be carried out in compliance with the 1997-2019 Building Regulations and the 1997-2020 Building Control Regulations, Irish and European Standards, Codes of Practice and manufacturers' instructions and guidelines and EirGrid Functional specifications.

The project will be carried out in strict compliance with the Planning and Development Acts 2000-2020, the Planning and Development Regulations 2001-2020 and with the detail contained in permissions, approvals or consents issued by the Planning Authority (An Bord Pleanala).

Project teams will be required to manage and conduct all design and construction activities so as to comply with the Safety, Health and Welfare at Work Act 2005 and with the Safety, Health and Welfare at Work (Construction) Regulations 2013-2020, and in particular to apply the General Principles of Prevention.

The design shall fully comply with all applicable safety, health, welfare and labour legislation.