Fosterstown 110kV/20MW Distribution Substation Planning & Environmental Considerations Report

Submission to: An Coimisiún Pleanála

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Change History of Report

	New Revision	Author	Summary of Change

Executive Summary

This Planning and Environmental Considerations Report (PECR) has been prepared by ESB Engineering and Major Projects (EMP) to accompany a planning application being made by the Electricity Supply Board (ESB) to An Coimisiún Pleanála (ACP).

The project for which planning consent has been sought is called the "Fosterstown 110kV/20MW Distribution Substation". The project objective is to add capacity and improve distribution security of supply for the Trim area, Co. Meath. This will be achieved by taking power from the existing 110 kV transmission line that traverses the site and transforming the voltage down to 20 kV so it can be used on the ESB Networks distribution network.

This non-statutory Planning and Environmental Considerations Report (PECR) has been prepared to ensure that appropriate planning requirements and potential environmental impacts of the proposed development on receiving environment are considered.

This PECR and associated assessments have concluded the following:

- The development is necessary to ensure the secure and effective supply of electricity to the greater Trim area. National policy outlines the need to invest in the distribution grid to support growing populations. The electrification of new sectors will also drive the increased demand for electricity.
- The characteristics of the proposed development are compatible with the stated objectives and policies of the Meath County Council Development Plans and present no conflicts in terms of surrounding land uses. The Meath County Development Plans also outline the Council's ambitions to work with service providers, such as ESB, to enhance the distribution grid in order to ensure adequate power capacity for the existing and future business and enterprise needs of the County.
- The development is considered to be compatible with all relevant policies and objectives including EU policy, national sectoral policy, national planning policy, regional planning policy and local planning policy.
- The likely significant impacts arising from the construction and operation of the proposed development were assessed against relevant environmental and planning criteria. Where necessary, mitigation measures have been recommended which will be fully implemented. These are detailed in this PECR and set out in a standalone outline Construction and Environmental Management Plan (oCEMP) under separate cover.
- An Appropriate Assessment (AA) Screening has also been prepared for the proposed development (under separate cover). The AA Screening has established that the proposed development has no potential for likely significant effects on any European site, with particular regard to their conservation objectives, either alone or in combination with other projects or plans. Therefore, it is the professional opinion that Stage 2 Appropriate Assessment is not required.

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Appendices

1 Introduction

This non-statutory Planning and Environmental Considerations Report (PECR) has been prepared by ESB Engineering and Major Projects (EMP) to accompany a planning application being made by ESB to An Coimisiún Pleanála (ACP) for a 110kV/20MV Distribution Substation.

The project for which planning consent has been sought is called the “Fosterstown Distribution Substation” (hereafter referred to as the “Proposed Development”). The project objective is to add capacity and improve distribution security of supply for the Trim area, Co Meath. This will be achieved by taking power from the existing Corduff-Mullingar 110 kV transmission line that traverses the site and transforming the voltage down to 20 kV so it can be used on the distribution network. This will relieve existing transformer capacity in the Trim substation which is urgently required.

This PECR and accompanying documentation has been prepared in support of this planning application to ensure that appropriate planning requirements and environmental effects are fully considered.

This report is structured as follows:

- Section 1 - Introduction
- Section 2 - The Planning Application
- Section 3 - The Proposed Development
- Section 4 - Environmental Assessment
- Section 5 - Planning Policy Context
- Section 6 - Planning Assessment
- Section 7 - Planning and Environmental Conclusions

An Appropriate Assessment Screening and outline Construction Environmental Management Plan (oCEMP) have also been prepared in support of this planning application (under separate covers).

2 The Planning Application

2.1 The Applicant

Permission is being sought by the Electricity Supply Board (ESB). The registered address of the ESB is; ESB Head Office, 27 Fitzwilliam Street Lower, Dublin 2, D02KT92, Ireland.

ESB was established in 1927 as a statutory corporation in the Republic of Ireland under the Electricity (Supply) Act 1927. With a holding of 95%, ESB is majority owned by the Irish Government with the remaining 5% held by the trustees of an Employee Share Ownership Plan.

ESB owns and operates assets across the electricity market: from generation, through transmission and distribution to supply. In addition, ESB provides associated services such as supplying gas, using its networks to carry fibre for telecommunications and developing electric vehicle public charging infrastructure.

ESB provides approximately 43% of electricity generation capacity in the Irish all-island market and supplies electricity to approximately 1.4 million customers. ESB Group employs approximately 7,000 people.

ESB's mission is to bring sustainable and competitively priced energy solutions to its customers and its vision is to be Ireland's foremost energy company competing successfully in the all-island market.

2.2 Site Location

The proposed development is located on lands located approximately 3 km southwest of Trim, Co Meath along a stretch of the R160 Trim -Longwood regional road (Figure 2-1). The proposed site is traversed by the Corduff-Mullingar 110 kV overhead transmission line. The proposed development will loop into this transmission line.

The planning application boundary encompasses c. 2.75 ha of agricultural grassland. The characteristics of the land are typical of other agricultural lands in the area, encompassing improved agricultural grassland, hedgerows, scrub and fence-lines. The site is relatively flat with a gentle slope west to east. The main land uses within the surrounding area are agricultural, low density residential.

A row of five residential properties is located fronting onto the eastern side of the R160, directly across the road to the proposed site and there are two golf courses located approximately 300m to the southwest and 300m to the northeast.

Access to the site will be via an existing access of the R160 regional road.

Figure 2-1 Site Location Map

Figure 2-2 Planning Application Boundary

2.3 Substation Development as Described in Public Notices

In accordance with Section 182A of the Planning and Development Act 2000, as amended, the Electricity Supply Board (ESB) gives notice of its intention to make an application for approval to An Coimisiún Pleanála in relation to the proposed development of a c. 27,513 sq.m site on the R160, Carberstown, Trim, Co. Meath, described below.

The proposed development will consist of the construction of a 110 kV / 20MV electrical substation and will include the following elements:

1) Demolition of an agricultural hay shed;
2) Construction of:
    i. a substation compound (c. 4,340sq.m.) with c.2.6 m high palisade perimeter fencing;
    ii. a seven bay 110 kV Gas Insulated Switchgear (GIS) building (c. 707sq.m.; c. 13m in height);
    iii. two 110 kV Double Circuit Overhead Line End Masts (c. 16 m in height) and associated outdoor electrical equipment to facilitate underground cable connections between the existing transmission circuit and the proposed GIS building;
    iv. two 110 kV transformers in transformer bays (c. 4.6 m in height) with associated electrical equipment;
    v. an internal access road (c. 6 m wide); and
3) All other associated and ancillary site development works including the provision of site services; fencing; gates; lighting; temporary construction compound and temporary overhead line tower to facilitate line diversion; upgraded access from the R160; drainage; and hedgerow removal.

2.4 Planning History

There has been no recent planning permission sought within the subject site. There are two historic applications that lie within the proposed site boundary, relating to the erection of a bungalow (MCC Ref. 90923) and erection of a single storey house and associated works (MCC Ref. 981221). There are no documents available to view for these applications on Meath's online planning portal. Both applications were refused planning permission. Directly across from the proposed site on the R160, there are a cluster of residential dwellings for which several applications have been made, only one of these applications (TA191337) has documents available to view.

Application reference	Applicant	Proposed Development	Proximity to proposed development	Decision	Decision date
90923 (no docs available)	M. Feely	Erection of bungalow and septic tank.	Within site	Refused	11/09/1990
981221 (no docs available)	R. Griffith	Replace existing house with a new single storey house and install a biocycle waste water treatment system with	Within site	Refused	28/08/1998

		irrigation area including demolishing existing outbuildings.			
TA20130 (no docs available)	B. Swan	1) alter and extend dwelling, 2) build domestic garage, 3) resite entrance	Directly across the road (R160), less than 50m	Approved (subject to 8 no. conditions)	04/06/2002
TA30311 (no docs available)	N. Slevin	Removal of septic tank and upgrade to proprietary domestic effluent treatment system.	Directly across the road (R160), less than 20m	Approved (subject to 4 no. conditions)	06/04/2004
TA50460 (no docs available)	B. McConnell & A. Tarpey	Revisions to planning ref. no TA/20130 (see above)	Directly across the road (R160), less than 50m	Refused	15/02/2006
TA191337	K&B Munnelly	Extension to dwelling and conversion of garage.	Directly across the road (R160), less than 20m	Approved (subject to 12 no. conditions)	18/06/2020

2.5 The Planning Application Process

2.5.1 Pre-Planning Consultation

Pre-planning consultations with ACP took place in September 2023 (Case No. 317654-23), the purpose of which was to outline details of the proposed development constitutes strategic infrastructure in accordance with the meaning provided by the Planning and Development Act (PDA) 2000, as amended. In October 2023, ABP decided that the proposed development falls within the scope of Section 182A of the PDA 2000 as amended, and that a planning application should be made directly to the Board – see **Appendix A.**

2.5.2 Statutory Consultation and Public Notices

In accordance with the requirements for public notices set out under the PDA 2000, ESB has notified the public of this application by means of the following:

- Site notices – 2 no. site notices have been erected on the relevant lands. The location of the notices is shown on the submitted planning application drawings. A copy of the notice is included in the application pack.
- Newspaper notices – a notice has been published in a national newspaper. A copy of the newspaper notice has been included in the application pack.
- A copy of this application has been circulated to the prescribed bodies, as advised by ABP during the pre-planning consultations.
- A stand-alone website has been established (www.esbfosterstownsubstation.ie). All planning application documentation can be viewed on this website.

2.5.3 Drawing Scales

This application has been prepared in accordance with the requirements set out under the PDA and its associated regulations, as amended. The list of drawings prepared in support of this planning application is tabulated below.

Table 2-1 Drawing submitted in support of planning application.

Drawing Title	Drawing Number	Size	Scale
Site Location	PE492-D282-016-001-002	A1	1:1000
Overall Construction and Operational Layout	PE492-D282-016-002-002	A1	1:500
Existing Site Layout	PE492-D282-016-003-002	A1	1:500
Proposed Site Layout	PE492-D282-016-004-002	A1	1:500
Proposed Drainage Layout	PE492-D282-016-005-001	A0	1:200
Proposed Plans & Section	PE492-D282-016-006-001	A0	1:100
Proposed Building Elevations	PE492-D282-016-007-000	A0	1:100
Proposed Transformer Bund Layout	PE492-D282-016-008-000	A1	1:50
Proposed Site Elevations	PE492-D282-016-009-001	A0	1:200
Proposed Palisade Fence Details	PE492-D282-016-010-001	A3	1:50
Proposed Substation Entrance Gate Details	PE492-D282-016-011-001	A3	1:50
Proposed Lighting Detail	PE492-D282-016-012-000	A3	1:25
Proposed Drainage Details	PE492-D282-016-013-000	A0	1:25
Proposed Road Details	PE492-D282-016-014-001	A3	1:25
Proposed NES Details	PE492-D282-016-015-001	A3	1:25
Proposed NER Details	PE492-D282-016-016-000	A3	1:25
Proposed Post & Rails Details	PE492-D282-016-017-001	A3	1:25
Proposed Site Clearance and Temporary Works	PE492-D282-016-018-001	A1	1:500
Proposed Sight lines Details	PE492-D282-007-001-000	A1	1:250 1:1000
Landscape Mitigation Plan	LD.FSTRSTWN-SBST 1.0	A1	1:500

2.5.4 Statement of Legal Interest in the Lands

A letter of consent was provided from the relevant landowners consenting to the making of this application.

3 The Proposed Development

3.1 Description of the Proposed Development

The description of the proposed development is included in Section 2 of this report. The existing and proposed site layouts are illustrated on drawings: PE492-D282-016-003 and PE492-D282-016-004.

3.2 Project Rationale

The existing 38kV substation at Trim is overloaded on normal feeding and experiencing numerous security of supply issues. There is no capacity for any demand load growth for new housing schemes in the area that will require connection over the next few years.

The objective of this project is to add capacity and improve distribution security of supply for the Trim area, co. Meath. This will be achieved by taking power from the existing Corduff-Mullingar 110 kV transmission line that traverses the site and transforming the voltage down to 20 kV so it can be used on the ESB Networks distribution network.

The overall strategy for the Trim area is as follows:

1. Install the new 110kV/20kV GIS station.
2. Transfer all 20kV feeders from Trim 38kV station to the new station.
3. Retain the existing Trim 38kV/10kV station for the medium term to ensure N-1 capability of the 10kV Trim urban networks.
4. All major new loads in the Trim and surrounding areas to be connected at 20kV to the new station.
5. Carry out further 20kV conversion of MV networks from 10kV to 20KV under the 20kV Conversion program.
6. Reduce the demand on Trim 38kV station and the 38kV network but retain the station in order to provide additional security of supply for the area and options for 38kV and 10kV source voltage in the area.

3.3 Construction Phase Activities

The commencement date for construction is subject to the date of grant of planning permission, pre-commencement obligations, and progression of the design to construction stage.

The construction work will take place in two broad phases:

- Civil Construction
- Electrical Installation

Details of each phase is outlined in sections 3.4.1 and 3.4.2 below.

3.3.1 Civil Construction

The exact programme of works will be proposed by the Contractor prior to mobilisation to site. The following is a non-exhaustive list of the works to be carried out:

- Site entrance modifications and creation of access road.

- Demarcation of construction works area, including site levelling to prepare the works area.
- Site establishment including welfare facilities, site office, etc.
- Construction of site drainage works.
- Enabling works and the formation of a construction route.
- Construction of underground 110 kV cable ducts.
- Installation of substation earth-grid.
- Construction of GIS building, including foundations works, structural steelwork erection, cladding and building finishing works.
- Construction of civils bases for transformer bunds, lightning monopoles, compound lighting columns, LV control cable surface block ducts etc.
- Permanent foul and surface water drainage works.
- Electrical and Mechanical fit out of building
- Compound stoning and paving,
- Finishing and Completion works.

All works will be carried out in accordance with the building regulations and up-to-date design codes at the time of mobilisation.

3.3.1.1 Site Access

The proposed access to the substation shall be via the existing entrance gate of the R160. If required, a wheel-wash will be installed within the site compound to wash dirt from the wheels of road trucks exiting the site. The access route shall be monitored to ensure no dirt accumulates on the public road due to the construction traffic and will be cleaned if required.

3.3.1.2 Site Preparation & Enabling Works

A programme of ground clearance and levelling will be undertaken across the proposed development site. Minor vegetation, topsoil removal and scrub clearance will be undertaken where required.

Prior to the preparation of the programme of clearance, a site investigation will be carried out. During the detailed design and engineering studies, further surveys of the proposed site may be undertaken to confirm the underlying ground conditions. The results of these surveys will be used to inform the final design and layout of the main plant / equipment items.

Topsoil will be stripped using excavators and stockpiled within the construction compound. The subsoil will be graded to align with the final ground levels as provided in the design. Stone for compound surfacing and access road will be delivered in a tipper truck and graded into place using an excavator. Once the stone base is in place, temporary perimeter fencing and gates will be erected, all within the boundary of the application site. Appropriate hoarding will be erected as required in order to shield neighbours from potential noise during construction works. Once fencing and gates are in place, installation of the site offices and construction compound, will commence.

3.3.1.3 Temporary Construction Area

An area has been identified for use as a construction compound. The area is currently agricultural land. The construction compound will facilitate temporary accommodation for the construction phase, and as a contractor laydown area for material storage for deliveries. This

area will also be used to accommodate temporary welfare facilities. Any discharges from the welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licensed facility. A temporary surface will be provided comprising granular stone material with passing bays provided. Storage of fuels and refuelling will be undertaken within a bunded hardstand area. Water will be tankered on to site as required. Foul waste will be disposed off-site using appropriate facilities. A suitably bunded generator may also be used for power.

3.3.1.4 Construction Plant & Machinery

The typical plant to be utilised during construction of the substation is presented in Table 3.3. It is estimated that traffic movements will peak at 20 HGV vehicles per day during the civil construction works.

The combined HGV vehicles importing site equipment, plant, materials, including stone & concrete during the civil works is expected to be approximately 700 - 800 HGV vehicle movements with the majority of HGV deliveries front loaded in the early stage of the works. Therefore, it is envisaged that there will be on average approximately —10 HGV vehicle movements entering the construction site per day and 10 exiting out per day. The above vehicle assumptions are for the estimated volume of imported materials only. Exporting of waste material offsite is not expected to be significant.

The estimated number of construction personal on site during peak times is expected to be 45. Assumed vehicle occupancy of 1.25 persons per vehicle. Therefore, up to 36 vehicles is expected per day during the civil construction works.

Table 3-1 Construction Plant & Machinery

Phase	Plant	BS 5228-1 Ref	Construction Noise Level (dB Laeq/1hr) at 10m distance BS5228-1 Ref)
Site Preparation	Track Excavator	C2.22	72
	Pneumatic Breaker	D2.11	87
	Dump Truck	C1.11	80
	Wheeled Loader Lorry	C2.26	79
	Dozer	C2.10	80
Foundations	Track Excavator	C2.22	72
	Pneumatic Breaker	D2.11	87
	Concrete Pump	C3.25	78
	Compressor	C3.19	75
	Poker Vibrator	C3.19	78
Steel Erection	Tower Crane	C4.48	76
	Articulated Lorry	C11.10	77
	Electric Impact Torque Wrench		78
General Construction	Hand Tools		81
	Pneumatic Circular Saw	D7.79	75

	Internal Fit Out		70
Landscaping	Dozer	C2.10	80
	Dump Truck	C1.11	80
	Surfacing	D8.25	68

3.3.2 Electrical Installation

Electrical installation includes the following:

- Electrical and Mechanical fit out of buildings.
- Delivery and installation of two 110 kV/MV transformers and associated equipment. These are large pieces of electrical plant and the deliveries will be managed in accordance with regulations governing the movement of large loads.
- Delivery and installation of all other outdoor HV equipment.
- Delivery and installation of all 110 kV GIS switchgear
- Pulling and termination of cables.
- LV cabling and wiring of 110 kV equipment and protection and control equipment.
- Installation of compound lighting and security systems.
- Commissioning of all newly installed equipment.

3.3.3 Construction Programme

The construction works will include site preparation, construction of the main building, structures, and site finishing works. It is envisaged that these works will take approximately 12 months to complete. Following this, electrical erection and commissioning will take place and it is envisaged that these works shall also take a further 18 months, subject to availability of required outages of the existing 110 kV overhead line from the electrical transmission system operator, Eirgrid and the time of year, weather conditions and the availability of specialised equipment.

Table 3-2 Outline Construction Schedule

Phase	Activity	pproximate Timeline	Total
Civil Construction	Site Preparation	8 Weeks	52 Weeks
	Civil Construction	44 Weeks	
Electrical Installation	Electrical Installation	52 Weeks	78 Weeks
	Electrical Commissioning	26 Weeks	

3.3.4 Working Hours

The proposed working hours for the construction phase of the project are tabulated below (Table 3-3). No construction works will take place outside these hours, unless such work:

- Is required under exceptional circumstances; or
- Is carried out with the prior written approval of the local authority.

Table 3-3 Normal Construction Working Hours

Day	Working Hours
Monday to Friday	07:00 – 19:00
Saturday	08:00 – 16:00
Sunday or Bank Holiday	N/A

3.3.5 Construction Personnel

A maximum daily workforce of approximately 30 people is expected during the peak period for construction works on site. However, typical daily workforce requirements will be less than this. Car parking for workers and visitors will generally be provided in the contractor's compound.

3.4 Operation Phase Activities

Once commissioned, the substation will be operating 24-hours per day, seven days per week. The plant will not have permanent staff but there will be periodic engineering checks and maintenance visits. Lighting of the compound area will only occur during these periods.

During this lifespan there will be on-going routine maintenance on the different primary plant units. The routine maintenance will be carried out within the substation compound and no environmental impacts are envisaged.

3.4.1 Engineering Services

An Engineering Services Report (ESR) has been prepared by ESB Engineering and Major Projects for the proposed development (**Appendix B).** A summary of the existing and proposed surface water, foul and water supply is provided below.

3.4.1.1 Surface Water

Existing Surface Water Drainage

A site visit was undertaken in June 2023. No drainage features were observed within the site boundary of the proposed development. There is no existing surface water infrastructure located along the R160 fronting the site.

There are two established drainage ditches located to the north and east of the site as shown in Figure 3-1. These drainage ditches converge from the west and east before continuing south as a single drainage ditch. This drainage ditch flows into the Moynasboy stream before then discharging to the Knightsbrook river.

Figure 3-1 Map Showing Existing Watercourses

Proposed Surface Water Drainage

The surface water drainage proposals for the proposed electrical substation have been developed to mimic the natural drainage patterns of the site and in accordance with Sustainable Drainage Systems (SuDS). The surface water proposals replicate greenfield drainage conditions where possible.

Preliminary investigations suggest the soil present is a silt loam or silty clay loam. A site investigation is to be undertaken prior to detailed design, which will include soakaway tests in accordance with BRE Digest 365. The soakaway design will be confirmed during detailed design.

Drainage from the proposed substation development will be collected on site in a dedicated drainage network and will discharge to a proposed soakaway. A soakaway tank with a storage to be confirmed during detailed design will be located in the northeast corner of the proposed development site. The soakaway system will manage flows during storm events and will incorporate an isolator row to enhance the removal of total suspended solids.

The two bunded transformers will be drained by new surface water sewers which will convey the runoff to the soakaway. The transformers will incorporate an Entexol SCS001 (or equivalent) oil sensitive bund dewatering system in addition to an Entexol SCS002 (or equivalent) integrated full retention oil separator.

The new access road within the site will be drained to the adjacent ground, before saturating the soil. This will then either infiltrate to ground or will evaporate as it would on a greenfield site.
All runoff will pass through a catchpit before flowing through the proposed soakaway system to catch any fines.

The remainder of the compound area of the substation will comprise a permeable surface consisting of 50 mm single sized clean compound stone. The permeable compound stone will provide a means of attenuating runoff in these areas and will allow rainwater to saturate the soil. This will then either infiltrate to ground or will evaporate as it would on a greenfield site.

The surface water drainage proposals are illustrated on drawing No. PE492-D282-016-005

3.4.1.2 Foul Water

Existing Foul Water Drainage

There are currently no foul water services within the boundary of the proposed site.

Proposed Foul Water Drainage

It is proposed to discharge foul water generated by the welfare facilities in the substation building to an underground foul water holding tank. A new foul sewer is proposed to convey wastewater to the underground holding tank which is proposed to be located to the north-east of the site.

The foul drainage proposals must cater for the wastewater generated in the welfare facilities of the proposed development. These welfare facilities include for one toilet (WC) and one wash hand basin (WHB) in the north eastern side of the GIS substation building, In addition there are to be two eye wash stations, one in the control room and one in the entrance lobby in the west of the building.

The proposed development will generate small quantities of foul waste. The facility will typically be unmanned. As such, the quantities of foul waste generated will therefore be low.

There will be visits to the site for scheduled and unscheduled inspections, maintenance and repairs as necessary. A two-person crew visiting site for three days a week would be the most that would be expected on the site. In such circumstances the operatives could be expected to use each of the facilities four times a day. A 2,500 gallon (11.36m3) round Carlow Concrete foul water holding tank (or equal approved) is proposed for the development. This will be emptied at 6-month intervals by a licensed waste contractor.

The calculated Population Equivalent (PE) for foul loading is estimated at 48 litres per day. This is consistent with the recommended wastewater loading for industrial sites without a canteen as per the EPA Wastewater Treatment Manual for Small Communities, Businesses, Leisure Centres and Hotels. This equates to 14,976 litres per annum. While such a consistently high visitation rate is unlikely, there is the possibility of increased numbers of staff being present on site for short durations of one to two weeks for the commissioning of electrical elements of the site from time to time. It is considered that these irregular occurrences would

balance with the ordinary operation of the unmanned site to produce a maximum of 14,976 litres of foul waste per annum.
It is common for much lower usage of the facilities on unmanned facilities and therefore a much lower foul loading. A common problem on such unmanned stations is odours in the toilet areas due to the water trap in the WC drying out through evaporation from the lack of use. For this reason, it is proposed to use self-flushing toilets in the station, which would flush automatically twice per week. The station will include one 6 litre flush WC so a minimum weekly foul flow of 12 litres can be expected from this. The self-flushing WC together will therefore contribute 624 litres per annum.

Combining the automatic flush and maximum user demand figures would result in a maximum annual generation of 15,600 litres of foul water. A 2,500 gallon (11.36m^3) round Carlow Concrete foul water holding tank (or equal approved) is proposed for the development. This will be emptied at 6-month intervals by a licensed waste contractor.

3.4.1.3 Water Supply

Existing Water Supply

There is currently no water supply within the site of the proposed development.

Proposed Water Supply Proposals

It is proposed to sink a well at the east section of the site which will provide the water supply for the development. This will provide water for toilet flushing, hand washing and for the eye wash stations in the east of the building.

Given the anticipated low use of the substation facilities following completion it is not considered that the water demand will be greater than the estimated foul water volumes.

3.4.2 Offload to MV Distribution Network

Once operational, the Fosterstown substation will offload to the Medium Voltage (MV) Distribution Network to provide capacity for demand growth and alleviate security of supply issues in the Trim region, Co. Meath whilst also reducing any overloading concerns of the nearby 38kV substation at Trim, Co. Meath.

3.5 Decommissioning Phase Activities

The expected lifespan of the proposed development is in the region of 50 to 60 years. In the event that part or all of the proposed infrastructure is to be decommissioned, all structures, equipment and material will be removed from site.

It is expected that the proximity of sensitive receptors may change over the operational lifetime of the Project. However, impacts during decommissioning are expected to be of a similar magnitude to those during construction but generally of shorter duration.

4 Environmental Assessment

This chapter provides details of the scope and approach to the environmental assessment, a summary of the assessment findings relative to each environmental topic considered and summary of mitigation and management measures identified during the assessment process.

4.1 Scope and Approach

4.1.1 Environmental Impact Assessment (EIA) Screening

The applicant has considered the provisions of Schedule 5 of the Planning and Development Regulations 2001 (as amended), and the governing European Directives.

The proposed development does not fall within any of the classes of development within Part 1 or Part 2 of Schedule 5.

The Proposed Development is not a type of development to which Schedule 5 applies and therefore the requirement for sub-threshold development does not apply (as that can only apply to a Schedule 5 development). As such it is considered that an EIA is not required for the Proposed Development.

This planning application is supported by a non-statutory Planning and Environmental Considerations Report to ensure that appropriate planning requirements and any potential environmental impacts to the receiving environment are considered.

4.1.2 Environmental Scoping

A preliminary environmental scoping exercise has been undertaken by ESB. The purpose of the scoping process was to establish aspects of the environment to be considered in this PECR, in particular those sensitive aspects requiring more in-depth study. The exercise has resulted in an iterative design process, such that the proposal and design has been modified to address the main environmental concerns (i.e. Flood Risk, Drainage Design, Landscaping, etc). Experience of similar developments also informed the process.

Following the preliminary scoping exercise, the following environmental topics have been comprehensively addressed within the PECR and supporting appendices.

- Biodiversity (Section 4.2.1)
- Flood Risk Assessment (Section 4.2.3)
- Noise Impact Assessment (Section 4.2.3)
- Traffic and Transport Assessment (Section 4.2.4)
- Cultural Heritage Appraisal (Section 4.2.4)
- Landscape & Visual Impact Assessment (Section 4.2.6)
- Waste and Resource Management (Section 4.2.7)

An Appropriate Assessment Screening has also been prepared in support of this planning application (under separate cover).

4.2 Environmental Assessment

4.2.1 Biodiversity

4.2.1.1 Introduction

This Ecological Impact Assessment (EcIA) for the proposed development (as described in Section 3.1) was carried out by David Daly (B.Sc., M.Sc.; Ecologist at ESB Engineering and Major Projects). The purpose of this assessment is to identify, describe and assess the likely significant effects of the proposed development on the existing ecological environment and where relevant provide mitigation measures to avoid significant residual effects.

A standalone Appropriate Assessment Screening has been produced, in accordance with the requirements of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as the 'Habitats Directive') and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), which considers the potential impacts of the proposed development on European sites (sites designated as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) within the Zone of Influence of the proposed development and should be read in conjunction with this report.

4.2.1.2 Approach and Methodology

Assessment Criteria

This EcIA has been prepared in line with the following established best practice guidance:

- Chartered Institute of Ecology and Environmental Management (2018 (Version 1.2, April 2022)) Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine
- EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports
- NRA (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes (formerly National Roads Authority (NRA), now Transport Infrastructure Ireland (TII))
- DHPLG (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment

The following legislation and policy documents have also been considered as part of this EcIA:

- European Communities (Birds and Natural Habitats) Regulations 2011 S.I. 477 of 2011 (as amended)
- The Habitats Directive (92/43/EEC) (as amended)
- The Birds Directive (2009/147/EC) (as amended)
- The Wildlife Act, 1976 (as amended)
- The Flora (Protection) Order 2015 [S.I. 356/2015]
- Meath County Development Plan 2021-2027 (Meath County Council, 2024)
- Ireland's 4th National Biodiversity Action Plan 2023-2030 (National Parks & Wildlife Service, 2023)

In accordance with the NRA/TII and CIEEM methodological guidance (outlined above), an evaluation of the value of ecological receptors at the proposed development site was carried out in order to characterise effects, to assess the significance of effects and establish the scale of any residual effects. Potential impacts to Key Ecological Receptors form a core aspect of this assessment; these are defined as features of sufficient value as to be material in the decision-making process for which potential impacts are likely.

Ecological receptors are valued as follows:

- International Importance;
- National Importance;
- County Importance;
- Local Importance (Higher Value)
- Local Importance (Lower Value)

Features of Local importance (Lower Value) are not considered to be Key Ecological Receptors.

Desktop Study

A desktop study was undertaken to establish the existing ecological conditions of the proposed development site and its surrounding environs and to identify the Zone of Influence of the proposed development. The following information was consulted as part of this study:

- Information on international and national designated sites for nature conservation (Special Areas of Conservation (SAC), Special Protection Areas (SPAs), Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)) and protected and rare species, held by National Parks and Wildlife Service (NPWS), viewed on the 31st July 2025 at https://www.npws.ie/
- Information on records of protected and rare species, held by the National Biodiversity Data Centre (NBDC), viewed on the 31st July 2025 at https://maps/biodiversity.ie/Map
- Information on surface, ground and coastal waterbodies, including the nomenclature of waterbodies and Water Framework Directive status, held by Environmental Protection Agency (EPA), viewed on the 31st July 2025 at https://gis.epa.ie/EPAMaps/
- Aerial photography of the proposed development site and the surrounding area as relevant to this assessment, held by Ordnance Survey Ireland, viewed on 31st July 2025 at https://geohive.ie/
- Information on planning applications within the environs of the proposed development site, viewed on the 31st July 2025, held by Meath Council at https://www.meath.ie/council/council-services/planning-and-building/planning-permission/view-or-search-planning-applications
- Information on the location and design of the proposed development provided by the design team.

Field Survey

The proposed development site was visited by ESB ecologist, David Daly on 03rd November 2023. The purpose of this survey was to identify all habitats within the proposed development site boundary and to assess their potential to support protected and/or rare species.

The approach to the field surveys is based on accepted standard practice and methods. Habitats within the study area were classified after 'A Guide to Habitats in Ireland' (Fossitt, 2000). The dominant plant species present in each habitat type were recorded during the field surveys and this is considered sufficient to allow accurate classification of the habitats present and assess their correspondence to habitats listed as Qualifying Interests, with reference to the Interpretation Manual of European Union Habitats (EC, 2013).

Limitations

The field survey was undertaken outside the optimal season for flowering plants. However, this is not considered to be a significant limitation on the findings of this assessment given that the proposed development site is dominated by improved agricultural grassland which is low in species diversity.

4.2.1.3 Receiving Environment

The proposed development site is a greenfield site located north-east of the Meath Golf Club and south-west of South Meath Gold Club, west of the regional road (R160) and south-west of Trim, Co. Meath.

Designated Sites for nature conservation

The proposed development site is not located within or immediately adjacent to any European or nationally designated site(s). The nearest site is the River Boyne and River Blackwater SAC [002299], which is located approximately 1.25 km west of the proposed development site. This is followed by the River Boyne and River Blackwater SPA [004232], which is located 1.3 km west of the proposed development site. The nearest Nationally designated site is Rathmoylan Esker pNHA [000557], which is located 4.1 km southeast of the proposed development site. The proposed development is hydrologically connected to the Trim pNHA [001357], which is designated for the same reasons and overlaps with the River Boyne and River Blackwater SAC.

The only potential impact pathway that exists between the proposed development and designated sites is via a tenuous hydrological connection – i.e. instream distance of 1 km of field drainage ditches, 0.8 km of Moynasboy stream, and 4.5 km the Knightsbrook River, before reaching the River Boyne (River Boyne and River Blackwater SAC and SPA and Trim pNHA). All other designated sites are considered to be beyond the ZoI of the proposed development. European sites are valued as being of international ecological importance, while pNHAs are valued as being of national ecological importance.

The assessment of potential impact on European sites arising from the proposed development is fully assessed and presented in the AA Screening report submitted as part of this planning application.

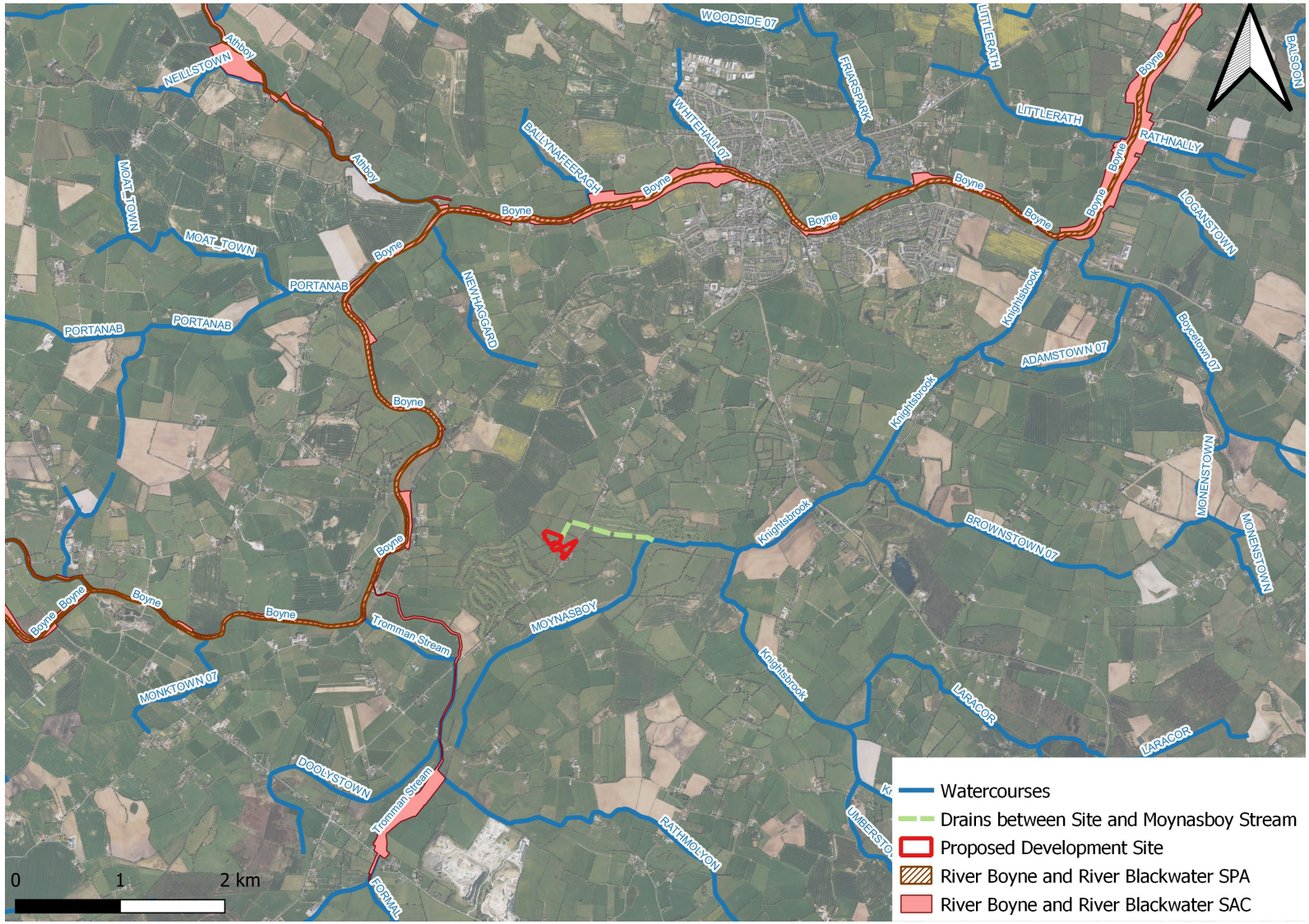


Figure 4-1 European sites located within the vicinity of the proposed development site

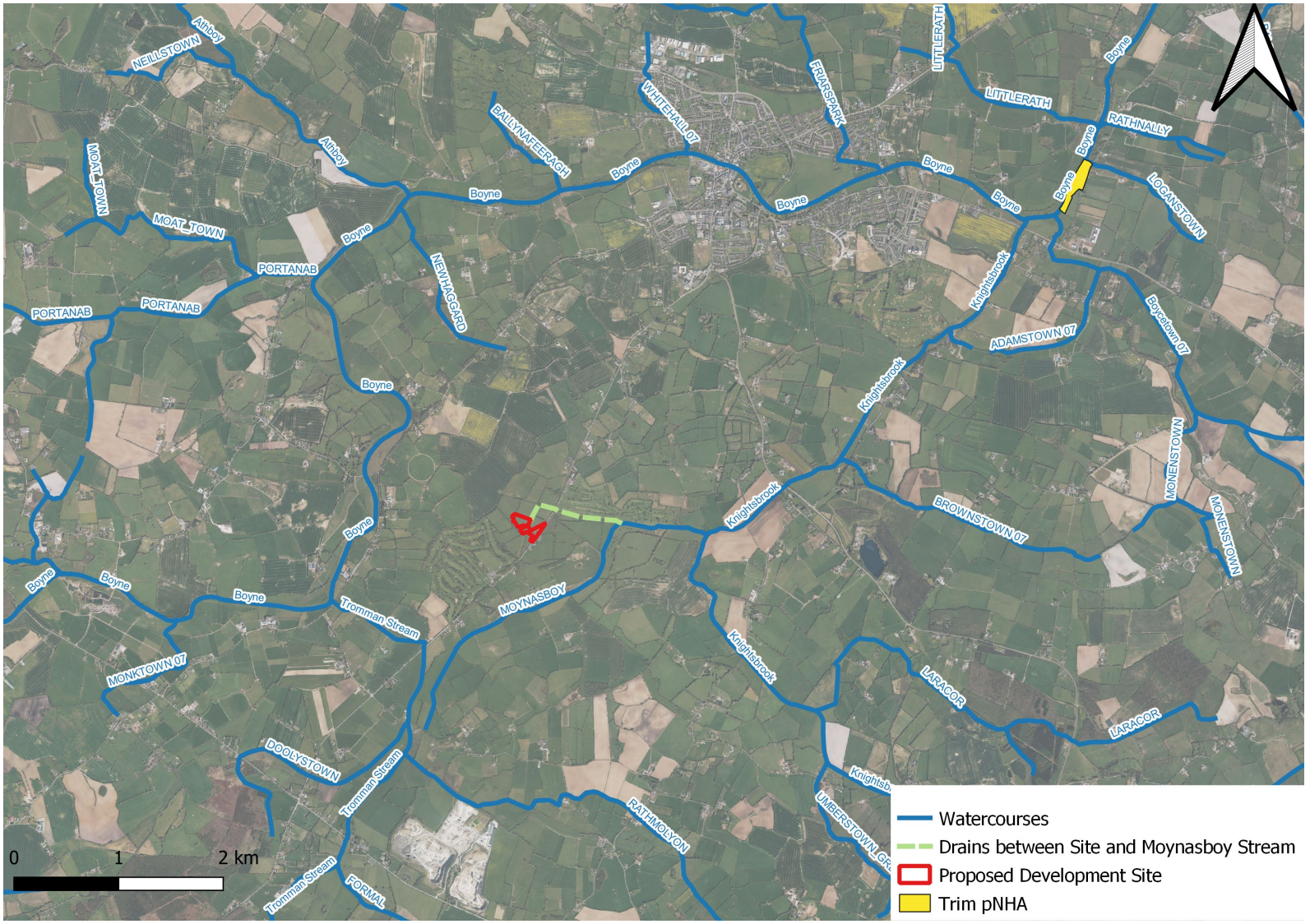


Figure 4-2 pNHA sites located within the vicinity of the proposed development site

Habitats and Protected/Rare Plant Species

According to NPWS Flora (Protection) Order 2022 map viewers and NBDC map viewer, there are no recent records (i.e. last 25 years) of protected and/ or rare plant species within the proposed development site. No protected and/ or rare plant species were recorded during the field survey.

The site comprises the following habitat types:

- Improved agricultural grassland (GA1) - the dominant habitat onsite, largely Perennial ryegrass (Lolium perenne) with other typical grasses (such as Poa annua) and a low diversity of herbaceous species i.e. Dock (Rumex obtusifolius), Clovers (Trifolium spp.), Meadow buttercup (Ranunculus acris). A high level of grazing was evident during the site visit; considered to be of negligible ecological importance.
- Improved wet grassland (iGS4) - corners of the grassland fields that are more water-logged. Soft rushes (Juncus effusus) are prevalent here; considered to be of local ecological importance (lower value).
- Scrub (WS1) - small areas of Bramble (Rubus fruticosus agg.); considered to be of local ecological importance (lower value).
- Buildings and artificial surfaces (BL3) - hardstand area around a derelict cottage and open hayshed; considered to be of negligible ecological importance.
- Hedgerows (WL1) - largely Hawthorn (Crataegus monogyna) hedgerows and strips of dense Bramble; considered to be of local ecological importance (higher value).
- Treelines (WL2) - Hawthorn hedge layer with Ivy-clad (Hedera helix) mature and semi-mature Ash (Fraxinus excelsior) trees; considered to be of local ecological importance (higher value).
- Drainage ditch (FW4) - straight field boundary ditches, associated with hedgerows/ treelines. Low flow and heavily vegetated with Watercress (Nasturtium officinale) in sections; considered to be of local ecological importance (lower value).

Photos of the habitats within the proposed development site are provided below (Plate 4.2.1 – Plate 4.2.5)

Figure 4-3 Habitats present within the proposed development site

Plate 4.2.1. Improved agricultural grassland (GA1) and treelines (WL2) under the existing overhead line – proposed location for new substation. Photograph taken facing a northerly direction.

Plate 4.2.2. Area of improved wet grassland (GS4) and drainage ditch (FW4) along the northern site boundary of the proposed development. Photograph taken facing a northerly direction.

Plate 4.2.3. Culverted drainage ditch (FW4) along existing farm track. Proposed access tracks to cross the drain at this location. Photograph taken facing a southerly direction.

Plate 4.2.4. Derelict cottage (BL3) along south-easterly boundary of the proposed development site. The cottage is to be retained. Photograph taken facing a westerly direction.

Plate 4.2.5. Hayshed (BL3) to be removed proposed for access roads. Scrub (WS1) and treelines (WL2) also present in background. Photograph taken facing a northerly direction.

Species

According to NBDC map viewer, the following protected fauna species were recorded within approximately 2 km of the proposed development site:

- One Red-listed bird species (as per Birds of Conservation Concern in Ireland 4: 2020-2026, Gilbert et al. 2020) - Swift
- Nine Amber-listed bird species (as per Birds of Conservation Concern in Ireland 4: 2020-2026, Gilbert et al. 2020) - Cormorant, House Martin, Kingfisher, Mallard, Mute Swan, Sand Martin, Sandpiper, Swallow, Teal.
- Two bat species – Daubenton's bat, Pipistrelle sp.
- Three other terrestrial mammals – Otter, Badger, Hedgehog

No protected fauna species were recorded during the field survey.

Birds

The proposed development site is dominated by agricultural fields (improved agricultural grassland and areas of wet grassland), which offers limited foraging habitat for birds.

The woody vegetation within the proposed development site, which comprises Bramble scrub, Hawthorn hedgerows and Ash trees, may provide some suitable nesting habitat for local common passerine species, which are of local importance (higher value).

Bats

The proposed development site is in an area of moderate habitat suitability for bats (Lunday *et al.* 2011). According to NBDC map viewer, the closest mapped bat roost is a Common Pipistrelle roost recorded in 1998 over 1.5 km east of the proposed development site.

The derelict cottage near the site entrance has moderate potential to be used by roosting bats, due to gaps in woodwork and the masonry work. The external roosting features were inspected for signs of roosting bats during the field visit, with no evidence recorded. Due to the derelict nature of the cottage, the internal area of the building was not fully inspected for health and safety reasons. However, the roof is made up of corrugated steel, and it is therefore unlikely that the internal roof space is suitable for roosting bats due to extreme fluctuations in temperature.

Mature ivy-clad trees in the surrounding hedgerows and treelines have low potential for roosting bats. These trees are outside the proposed development.

All bat species in the area are of national importance.

Non-volant mammals

The proposed development site is dominated by agricultural fields (improved agricultural grassland and wet grassland), which offers limited foraging habitat for mammal species such as badgers.

The woody vegetation within the proposed development site, which comprises Bramble scrub, hawthorn hedgerows and Ash trees, may provide suitable habitat foraging habitat for Badger (national importance). No evidence of badger was recorded during the field survey.

There is no suitable foraging or breeding habitat onsite for Otter, with no signs of Otter during the field survey.

Other taxa

While frogs have not previously been recorded within or adjacent to the site, the drainage ditches within the proposed development site have limited foraging and breeding habitat for frog.

4.2.1.4 Impacts of the Development

Construction Phase

Designated Sites for nature conservation

The assessment of potential impacts on European sites arising from the proposed development is fully assessed and presented in the AA Screening report submitted as part of this planning application.

The AA Screening concluded that there is no potential for likely significant effects on any European site (including River Boyne and River Blackwater SAC and SPA), with particular regard to their conservation objectives, either alone or in combination with other projects or plans.

The Trim pNHA overlaps with the River Boyne and River Blackwater SAC and SPA and is designated for the same Qualifying Interests. As such there is also no potential for a significant negative effect on this pNHA, or any other nationally designated site.

Habitats and Protected/Rare Plant Species

The habitats present within the proposed development site valued as being local importance (lower value) or of negligible ecological importance are not Key Ecological Receptors and are therefore not assessed further. Only those habitats of local importance (higher value) are assessed further below; i.e. hedgerows and treelines.

Approximately 75 m length of hedgerow/ treelines will be removed during the construction of the proposed development. In the absence of mitigation, there would be a significant effect to hedgerows/ treelines at a local scale

Species

Birds

Considering the suboptimal nature of the improved grassland habitats to support local common passerine species, and the availability of similar, and often more suitable, habitat in the wider area, no significant effects to birds are predicted due to the loss of improved agricultural grassland or the patches of wet grassland.

The proposed development will result in disturbance to nesting and foraging birds using. The hedgerows and treelines onsite. Given the small scale of suitable habitat onsite and the availability of suitable habitat in the wider area, disturbance to local passerines will not result in a significant effect on local bird populations at any geographical scale

The proposed development will result in the loss of some breeding bird habitat – hedgerows and treelines. In addition, the clearance of breeding bird habitat during the active season (i.e. March to August inclusive) could result in the increased risk of mortality and/or injury to common breeding passerine bird species that may be utilising the habitat. These hedgerows and treelines also provide foraging habitat for birds. Given the small scale of vegetation loss and the availability of suitable habitat in the wider area this loss will not result in a significant effect on local bird populations at any geographical scale. However, mitigation will still have to be provided due to the legal protection afforded to breeding birds.

Bats

The cottage near the site entrance will be retained. No trees with bat roosting potential will be trimmed/ felled as part of this development. Therefore, there will be no direct impact to roosting bats.

Proposed works in close proximity to the cottage are limited to vegetation clearance and the laying of the access road. The road will pass 10 m from the cottage at its closest point. The temporary site compound is located 79 m northwest of the cottage, and the proposed substation is 154 m north of the cottage, with intervening treelines between these locations and the cottage. However, the construction of the access road to the southeast of the site may lead to temporary increased levels of disturbance due to increased levels of light. Construction activity will be largely limited to after sunrise and before sunset during the peak bat activity months (April-September), see Table 3-3. Increased levels of light during construction on

hedgerows and treelines may reduce the suitable foraging and commuting habitat for bats in the surrounding area. In the absence of mitigation, there would be a significant effect to bats at a local scale.

Additionally, the removal of hedgerows and treelines could reduce the foraging and commuting habitat for bats in the surrounding environs. Approximately 75 m length of hedgerow/ treelines will be removed in total, which will consist of widening existing gaps in hedgerows slightly for access tracks and for trees to be trimmed back along the regional road to allow appropriate sightlines to accessing/ egressing vehicles. Considering the very limited sections of hedgerows and treelines to be removed – which will not create significant gaps in the commuting routes along hedgerows, and the availability of other suitable foraging/ commuting habitat in the wider area, no significant effects on commuting or foraging bats is considered at any geographical scale due to vegetation removal.

Badger

There were no signs of Badger recorded during the field visits. However, the site offers limited Badger foraging habitat. Given the availability of similar, and often more suitable, grassland habitat in the wider area, no significant effects to badger are predicted due to the loss of improved agricultural grassland or the patches of wet grassland. The proposed development will result in the loss of 75 m of hedgerows and treelines, which may provide suitable foraging habitat for Badger. Considering the very limited sections of hedgerows and treelines to be removed, and the availability of other suitable foraging habitat in the wider area, no significant effects on Badger is considered at any geographical scale during the construction phase.

Other Taxa

The site's drainage ditches may provide limited foraging and breeding habitat for Frog. There is only one proposed drain crossing for the access roads. This is at an existing culverted farm track. The existing culvert will be replaced with a slightly larger one for the proposed access road. This section of the drain is not considered suitable for breeding Frog, given its ephemeral nature and significant flow when wet.

Operational Phase

Designated Sites for nature conservation

As outlined in the AA Screening report, given the nature and scale of the proposed development site as well as the existing environment there is no potential for impacts on designated sites during the operation of the proposed development.

Habitats and Protected/Rare Plant Species

No further habitat loss is proposed during the operation of the proposed development, therefore there is no potential for significant effects on habitats or protected plant species at any geographical scale.

Species

Birds

Maintenance of hedgerows along access roads will be required during the operational phase. Any trimming of these hedgerows during the active season (i.e. March to August inclusive)

could result in the increased risk of mortality and/or injury to common breeding passerine bird species that may be utilising the habitat. In the absence of mitigation, there would be a significant effect to nesting birds at a local scale.

Bats

The plant will not have permanent staff, with only periodic engineering checks and maintenance visits, and security lighting of the compound area limited to these periods. However, increased levels of light during would lead to a significant effect to roosting, foraging or commuting bats at a local scale.

Badger

As the plant will not have permanent staff, with only periodic engineering checks and maintenance visits, and security lighting of the compound area limited to these periods. Therefore, there is no potential for impacts on Badger during the operational phase of the proposed development.

Other taxa

There are no potential impacts on Frogs or any other taxa envisioned during the operational phase of this development.

4.2.1.5 Mitigation Measures

Construction Phase

Designated Sites for nature conservation

There is no potential for impacts on designated sites during the construction of the proposed development and as such no mitigation measures are required.

Habitats and Protected/Rare Plant Species

It is proposed to plant a new hedgerow, total length of approximately 189 m, and bolster 359 m of existing hedgerows with native whips. The hedgerows will be planted up with native species: Hawthorn, Blackthorn, Holly, Willow, Gulder Rose, Dog-Rose and Honeysuckle, see Appendix H for locations of these features.

It is also proposed to plant 0.09 ha of native woodland around the site. Native species such as Oak and Scots Pine will be used. See Appendix H for full species list.

It is proposed to allow a total of approximately 0.8 ha to establish as areas of wildflower meadows. These areas will not be reseeded with intensive agricultural grasses, with local native wildflowers being encourages to established through the maintenance measures of these areas. Locally sourced Yellow Rattle is to be added to areas of grassland/ disturbed soil.

The maintenance measures of these hedgerows and wildflower areas are outlined in Section 4.2.1.5.

Species

Birds

The removal and trimming of scrub, hedgerows and treelines will be undertaken outside of the breeding bird season (March 01st to August 31st inclusive). Where this period cannot be

avoided, nesting bird surveys will be carried out by an experienced ecologist within 48 hours of any vegetation clearance. Where nests are recorded, a no works exclusion buffer will be implemented until after birds have fledged the nest.

Bats

Any construction lighting will be reviewed and agreed with an ecologist and will be positioned as to avoid light spill on to potential bat roosting, commuting or foraging sites – i.e. no light spill on to the derelict cottage or hedgerows and treelines. Luminaries should lack UV elements when manufactured, with LED luminaires used where possible. A warm white light source (2700 Kelvin or lower) will be used, with peak wavelengths higher than 550 nm. Column heights will be considered to minimise light spill. Only luminaires with negligible or zero Upward Light Ratio, and within good optical control will be considered.

Mammals

There is no potential for impacts on badger during the construction of the proposed development and as such no mitigation measures are required.

Other Taxa

There is no potential for impacts on frogs or any other taxa during the construction of the proposed development and as such no mitigation measures are required.

Operational Phase

Designated Sites for nature conservation

There is no potential for impacts on designated sites during the operation of the proposed development and as such no mitigation measures are required.

Habitats and Protected/Rare Plant Species

Hedgerows will be trimmed on a two- or three-years cycle in rotation. This will allow some sections to produce flowers each year. Trimming will only be required for safety and work access reasons.

The wildflower areas will be mown once a year in late autumn. Cuttings will be removed from the areas to maintain low fertility levels, thereby reducing grasses from outcompeting the herbaceous species. Any colonizing woody vegetation such as Gorse, Elder, and Bramble will be removed from these locations during annual mowing.

Species

Birds

Maintenance trimming of existing and proposed hedgerows during the operational phase will be undertaken outside of the breeding bird season (March 01st to August 31st inclusive). Trimming will only be necessary if required for safety and work access reasons.

Bats

Any external operational lighting will be reviewed and agreed with an ecologist and will be positioned as to avoid light spill on to potential bat roosting, commuting or foraging sites – i.e. no light spill on to the derelict cottage or hedgerows and treelines. Luminaries will lack UV elements when manufactured, with LED luminaires used where possible. A warm white light

source (2700 Kelvin or lower) will be used, with peak wavelengths higher than 550 nm. Column heights will be considered to minimise light spill. Only luminaires with negligible or zero Upward Light Ratio, and within good optical control will be considered.

Lighting will be limited to the compound area and will only occur during periodic engineering checks and maintenance visits. External security lighting will be set on motion-sensors for as short as possible, i.e. one or two minutes.

Badgers

There is no potential for impacts on Badger during the operation of the proposed development and as such no mitigation measures are required.

Other Taxa

There is no potential for impacts on Frogs or any other taxa during the operation of the proposed development and as such no mitigation measures are required.

4.2.1.6 Residual Impacts

Following the implementation of the prescribed mitigation measures, there will be no potential for residual impacts on any sensitive ecological receptors as a result of the proposed development.

4.2.1.7 Cumulative Impact

According to the Meath County Council planning application map viewer, there are a number of granted and undecided planning permissions proposed for lands located in the wider environs of the proposed development site, in particular towards the outskirts of Athboy town. These developments in the immediate environs are generally small scale in nature and involve:

- Demolition of existing structures and construction of new structures on existing built land (including associated site drainage).
- Construction of new single residential dwellings and/or extensions on existing residential sites.
- Various agricultural related activities, including the construction of slurry tanks, slabs and public entrances to farms and constructing cattle sheds.
- Retention for an existing 7 bay driving range building.

The construction of these developments and the proposed development during the same period of time could potentially act in cumulative effects on sensitive ecological receptors. However, considering the nature and scale of the proposed development, its potential impacts and that all identified potential impacts will be fully mitigated against, no cumulative effects are predicted. In addition, all projects within the boundaries of Meath County Council are subject to the overarching environmental protective policies and objectives contained within the Meath County Development Plan 2021-2027 (MCC, 2024), including those that related specifically to nature conservation.

4.2.2 Flood Risk Assessment

A Flood Risk Assessment (FRA) was carried out by ESB Engineering and Major Projects for the proposed development (**Appendix C**). A summary of the assessment is provided below.

- The FRA has been prepared in accordance with the Planning System and Flood Risk Management Guidelines to assess the flood risk associated with the proposed development.
- The site is located in Flood Zone C as defined by the 'The Planning System and Flood Risk Management Guidelines'. The proposed substation is classified as a highly vulnerable development which is permissible in Flood Zone C.
- Surface water proposals for the proposed works will be developed to mimic the natural drainage patterns of the site in accordance with the Best Management Practices of SuDS. The surface water proposals will replicate the greenfield drainage conditions of the site where possible.
- The proposed development will not increase the current flood risk in the catchment.

4.2.3 Noise Assessment

A Noise Impact Assessment has been prepared as supporting information for the application seeking full planning permission for a 110kV substation at Fosterstown, Co. Meath **(Appendix D).** The report has been prepared by Stephen Cleary (BA[Mod] MSc MIOA MIEMA CEnv) of Alive Environmental Ltd, who has over 20 years' experience in the area of Noise Impact Assessment.

The main conclusions of the study are summarised as follows:

- The assessment has been conducted on the basis of worst-case assumptions for construction and operational phase noise.
- The assessment has also been completed against a baseline noise dataset measured during weekday and weekend periods to determine existing ambient (LAeq) and background sound levels (LA90) in the study area.
- Subject to the appropriate mitigation measures being in place, the proposed development can be constructed and operated without generating any significant noise impact at the nearest sensitive properties.
- During the construction phase, a Construction Environmental Management Plan will be prepared in advance of the commencement of works and will detail all measures and monitoring to ensure that construction noise levels are maintained below the Category A BS5228 noise threshold limits.
- Operational phase noise levels from the proposed substation will be substantially below existing background sound levels at the nearest noise sensitive properties and will not generate any noise impact at these properties.

4.2.4 Traffic and Transport Assessment

A Traffic and Transport Assessment has been prepared by ORS to address the traffic and transport related issues that may arise in relation to the proposed New Distribution Substation development near Fosterstown, Co. Meath to the southwest of Trim **(Appendix E)**.

The main conclusions of the study are summarised as follows:

- This Traffic and Transport Assessment was conducted to accompany the planning application for a proposed new Distribution Substation near Fosterstown, Co. Meath.

- The development will consist of a control room, MV Switchgear room, HV Cable room and other ancillary facilities. Overall distribution centre will provide 1288 m2 of area, along with upgrading of site access and all associated site works and services.
- The proposed development will have no dedicated car parking spaces as the substation will be unmanned. During the construction, there will be temporary parking spaces provided.
- ORS liaised with the local authority to scope the requirements for the Traffic and Transport Assessment (TTA), and it was agreed that this report would focus on 3No. key-junctions: the R160/ Site access T-junction (JTC1), the 4-arm R160/ R158 junction to the south of the site (JTC2), and the R160/ R158/ Summerhill Road Roundabout to the north of the site (JTC3).
- The chosen junctions were subjected to capacity analysis to examine the potential traffic levels generated from the development to the existing road network.
- Automatic junction turning counts (JTCs) were undertaken by a third-party company named IDASO, on Wednesday the 8th of May, at the junctions mentioned above. The AM and PM traffic peak periods were identified along the junctions and occurs between 08:00 and 09:00 in the morning in Junction 1 and Junction 3 and between 07:45 and 08:45 in Junction 2. The PM peak occurs between 16:45 and 17:45 in Junction 1 and Junction 2 and between 16:30 and 17:30 in Junction 3. The peak flows indicated high traffic flow numbers for junctions JTC2 and JTC3 with especially high volumes of traffic to/from Trim.
- The Meath County Council planning website was consulted to obtain information about committed developments near the proposed site to be included in this traffic analysis. It was found that 1No. granted planning application will make use of the Junction 3, therefore, it was included in future scenarios of the junction's modelling.
- The traffic splits in the examined junctions could be calculated from the traffic counts and it is expected that the traffic from the proposed development will follow the same trend. The trip generation from the committed development was assessed from the TRICS database.
- The junctions analysed in this traffic assessment were assessed against the TII threshold and it was found that the development is anticipated to generate greater than 5% increase in traffic at the junction between the R160 and the development access road during the morning peak period; however, congestion is not expected to occur at this junction. Nevertheless, to demonstrate that the proposed development will not negatively affect the public roads, a junction modelling was conducted to evaluate the traffic impact generated by the proposed development across all future design years.
- The junctions were examined using Junctions 9 (PICADY and ARCADY) software for the AM and the PM peak conditions under conservative future projections and Central background Traffic Growth for the considered year of construction 2025, year of opening 2026, 5-years and 15-years after development conclusion.
- From a transportation planning perspective, the proposed substation is not anticipated to adversely impact the operation of the three junctions under analysis. The existing junctions JCT2 and JCT3 are currently operating below optimal efficiency and have capacity limitations. It is evident from the analysis that the introduction of additional traffic will result in minimal effects on the road network. However, it is important to acknowledge that the 4-arm R160/ R156 junction is currently experiencing heavy traffic

volumes. Forecasts indicate that this junction is likely to exceed its capacity limits, leading to queues and delays

4.2.5 Cultural Heritage Appraisal

A Cultural Heritage Appraisal Report was carried out by Byrne Mullins & Associates for the proposed development (**Appendix F)**. The report provides information with respect to previously identified baseline data and assesses the impact of the proposals on identified sites and areas of Cultural Heritage interest and/or potential. A summary of the main conclusions of the study are summarised as follows:

Local History (Construction Phase):

- There are no significant historical events associated with the subject development area which could be impacted upon by the construction of the proposed development. Consequently, it is considered that there are no predicted impacts with respect to Historical Heritage regarding the proposed construction phase of the development. The impact can be stated as Neutral with no significant effect.

Archaeological Heritage (Construction Phase):

- In terms of terrestrial and industrial archaeological heritage, there are there are no previously identified archaeological monuments or structures of industrial archaeological interest located within the subject development site; likewise, no features of archaeological potential were noted by a review of historic cartographic, aerial photographic and satellite imagery source material of by the subsequent field reconnaissance survey.
- There is one monument of terrestrial archaeological interest located within the defined Cultural Heritage Study Area (2.4 above); this is an Enclosure Site (SITE CH-1; SMR No: ME036-042; Carberrystown Td) which is included in the RMP. The closest extent of the monument to the subject site (road frontage/planning boundary) is approximately 64.6m; the extent of the established RMP Zone and SMR Zone of Notification is approximately 52m outside the planning application (red line) boundary. It is considered that his monument is of Medium Value/Significance.
- In terms of Marine/Underwater Archaeology, several wrecks are recorded in the general area of the subject site, none of which are located within the defined Cultural Study Area.
- No predicted direct impacts will occur with respect to the identified Archaeological Heritage Monument (CH-1) during the construction phase of the development. The effect can be stated as Neutral and of no significance.

Architectural Heritage (Construction Phase):

- There are no structures located within the subject site or wider study area listed in the Record of Protected Structures (RPS) of the Meath County Development Plan 2021-2027; likewise, there are no structures of architectural heritage interest, or historic gardens, listed by the National Inventory of Architectural Heritage (NIAH) within the overall defined study area.
- There are two structures (house – CH-2; hay barn) located within the site boundaries, both associated with a former residential farmyard adjacent the public road. The house (CH-2) is a partially ruinous gable-ended, entrance-lobby cottage, largely constructed

of cob with basal stone walls and covered with a rough render with replacement corrugated pitched roof and later rear lean-to extension; it is considered that this early nineteenth century structure, which is an undesignated cultural heritage asset of poor preservation is of Low Value/Significance and of local interest only; this will be retained in situ as part of the development proposals. The hay barn structure is of late twentieth century date and of no architectural or historical note; it will be removed as part of the overall development as it is positioned along a section of the access road.

- It is considered that no predicted direct impacts will occur with respect to Architectural Heritage during the construction phase of the development. The effect can be stated as Neutral and of no significance.

Operational/Post-Construction

There are no extant monuments or structures of historical, archaeological or architectural heritage interest located within the extent of the proposed planning application boundary; one monument (Site CH-1) is located to the east and to the rear of a row of residential plots along the eastern side of the public road and not readily visible from the subject site. Furthermore, there are no Protected Structures of NIAH-listed structure or landscape features located within the subject site or wider study area. The site contains an undesignated early nineteenth century ruinous cottage of poor preservation which will be retained as part of the overall proposals.

It is considered that the various proposed elements of the proposed development, will not cause any adverse visual impact to the setting or general views of or from any monuments, sites or features of archaeological interest or protected/designated structures and that no predicted visual impacts will occur with respect to historical, archaeological or architectural heritage relating to the operational/post-construction phase of the development. The impact can be stated as Neutral with no significant effect.

Consequently, given the above, the following mitigation measures, based on OPR Practice Note PN03: Planning Conditions (October 2022), are suggested:

1. The developer shall engage a suitably qualified archaeologist (licenced under the National Monuments Acts) to monitor all site clearance and topsoil stripping required of the development. The use of appropriate machinery to ensure the preservation and recording of any surviving subsurface archaeological remains shall be necessary. No subsurface work shall take place in the absence of the archaeologist without his/her express consent.
2. Prior to the commencement of any works in the vicinity of SITE CH-2, the structure should be protected from accidental damage by the installation of the temporary protective barriers around the southern, western and northern sides.
3. Should archaeological remains be identified during archaeological monitoring, all works in the area of archaeological interest shall be suspended, pending a decision of the Planning Authority, in consultation with the National Monuments Service, Department of Housing, Local Government and Heritage.
4. The developer shall facilitate the archaeologist in recording any remains identified. Any further archaeological mitigation measures specified by the Planning Authority,

following consultation with the National Monuments Service, shall be complied with by the developer.

5. Following the completion of all on-site archaeological interventions and any necessary post-excavation specialist analysis, the Planning Authority and the National Monuments Service shall be furnished with a final archaeological report describing the results of the monitoring and any other archaeological investigations/interventions that might subsequently have been required. All resulting and associated costs shall be borne by the developer.
6. The Construction Environmental Management Plan (CEMP) shall include the location of all archaeological and architectural heritage constraints relevant to the proposed development. The CEMP shall clearly describe all identified likely archaeological and architectural impacts, both direct and indirect (visual), and all mitigation measures to be employed to protect the archaeological/architectural heritage environment during all phases of site preparation and construction activities.

4.2.6 Landscape and Visual Impact Assessment

A Landscape and Visual Impact Assessment (LVIA) has been prepared by Macro Works in respect of a planning application for the proposed development (**Appendix G**). A summary of the assessment is provided in the sections below. The LVIA is supported by photomontages prepared in respect of the selected viewpoints (Under Separate Cover).

The proposed development is considered to have a relatively modest physical impact on the site as the substation is contained within the existing hedgerow network, and the proposed development will result in only very minor areas of permanent hedgerow removal to facilitate the site access road and the underground cable. Concerning landscape character, even though the proposed development will appear marginally incongruous in this landscape context, the proposed development is thematically linked to the existing development trends within the hinterland landscape of the study area. Indeed, it is likely to be perceived as an evolution of the existing electrical overhead line that passes through the study area. This is a productive rural landscape with associated landscape values, and whilst the proposed development may alter the 'landscape fabric' of the area, it does not markedly affect the prevailing landscape pattern or predominantly working rural landscape character of the area. This is considered an appropriately sited development in a robust landscape context. Consequently, the impact on landscape character (post-construction) will be of Moderate-slight significance and a Negative quality with a Permanent duration.

Visual impacts were assessed at four viewshed reference point locations, representing various viewing distances, angles and receptor types. The visual receptor sensitivity judgements ranged from High-medium to Medium-low. The overall significance of visual impacts was 'Slight' at the nearest viewshed reference point (VP4) significance, with a Negative quality with a Permanent duration. At all the other viewshed reference points, the impact was deemed to be 'Imperceptible' (VP1 to VP3). This is principally a consequence of the high degree of existing screening located within the intervening low-lying landscape, which heavily reduces the visual exposure of the proposed development.

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed development is not considered to give rise to any significant landscape and visual impacts.

Overall Significance of Impact: Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed Fosterstown Distribution Station development at Trim, County Meath is not considered to give rise to any significant landscape or visual impacts.

4.2.7 Waste and Resource Management

Waste management on site will be carried out in accordance with "*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*" produced by the Department of Environment, Community and Local Government. Regulations in relation to waste management will be adhered to.

A Resource & Waste Management Plan (R&WMP) will be prepared and implemented by the contractor to minimise waste generation. The key principles underlying the plan will be to minimise waste generation and to segregate waste at source.

The following general measures will be applied on site:

- Disposal of construction waste will be to licensed disposal facilities;
- On-site segregation of waste will be provided by the contractor using skips for timber, metal, general waste, and recyclables; &
- All waste will be removed from site by one or more waste haulage contractor(s) who hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

4.3 Summary of Mitigation Measures

This section of the report contains a summary of all mitigation measures and monitoring requirements proposed within this PECR and supporting appendices.

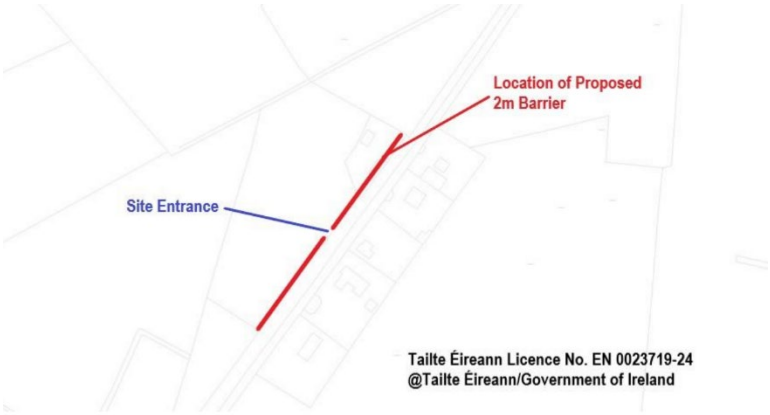
Early integration of the engineering design team with the planning and environmental team has enabled the implementation of "mitigation by design" causing many likely significant effects to be eliminated or reduced to an acceptable level during the preliminary design stage.

Following an examination, analysis and evaluation of the significant effects of the project in relation to the receiving environment, additional mitigation measures and monitoring programmes have been recommended which will be fully implemented during the construction and operation phase of the proposed development. Table 4-1 summarises the mitigation measures recommended within the PECR and supporting appendices.

Table 4-1 Mitigation measures recommended within the PECR

Potential Impact	Summary of Proposed Mitigation
General Mitigation during Construction	
Suspended Sediment (construction)	Sediment control in the construction stage is important to ensure that only high quality, treated runoff leaves the site. Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. Other erosion control measures include: Minimising the area of exposed ground and ensuring excavation will not proceed faster than the rate of construction. Monitoring of the weather forecast prior to planning excavation works. Providing impermeable mats (plastic sheeting) as covers to mounded excavated material and open excavations during periods of heavy rainfall.
Accidental release of contaminants (construction)	Concrete wash water will be retained on site and prevented from entering drains and refuelling will be undertaken using purpose designed equipment bunded to prevent leaks. Should any fuels or other liquids spill or leak from any vehicles these will be cleaned immediately, and any affected soils excavated and removed. Excavations for service runs will be managed using control measures such as bunding areas to prevent surface run-off and protecting drains. In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed. All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations. Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces. Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces or using mobile drip trays where it's not possible to provide an impermeable surface. All tanks and drums will be bunded in accordance with established best practice guidelines. Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works.

Biodiversity (Section 4.2.1)	
Designated Sites	
Habitats and protected / rare plant species	Construction Phase It is proposed to plant a new hedgerow, total length of approximately 189 m, and bolster 359 m of existing hedgerows with native whips. The hedgerows will be planted up with native species: Hawthorn, Blackthorn, Holly, Willow, Gulder Rose, Dog-Rose and Honeysuckle, see Appendix H for locations of these features. It is also proposed to plant 0.09 ha of native woodland around the site. Native species such as Oak and Scots Pine will be used. See Appendix H for full species list. It is proposed to allow a total of approximately 0.8 ha to establish as areas of wildflower meadows. These areas will not be reseeded with intensive agricultural grasses, with local native wildflowers being encourages to established through the maintenance measures of these areas. Locally sourced Yellow Rattle is to be added to areas of grassland/ disturbed soil. Operational Phase Hedgerows will be trimmed on a two- or three-years cycle in rotation. This will allow some sections to produce flowers each year. Trimming will only be necessary if required for safety and work access reasons. The wildflower areas will be mown once a year in late autumn. Cuttings will be removed from the areas to maintain low fertility levels, thereby reducing grasses from outcompeting the herbaceous species. Any colonizing wood vegetation such as gorse, elder, and bramble will be removed from these locations during annual mowing.
Fauna	Construction Phase Birds: The removal and trimming of scrub, hedgerows and treelines will be undertaken outside of the breeding bird season (March 01st to August 31st inclusive). Where this period cannot be avoided, nesting bird surveys will be carried out by an experienced ecologist within 48 hours of any vegetation clearance. Where nests are recorded, a no works buffer will be implemented until after birds have fledged the nest. Bats: Any construction lighting will be positioned as to avoid light spill on to potential bat roosting, commuting or foraging sites – i.e. no light spill on to the derelict cottage or hedgerows and treelines. Luminaries will lack UV elements when manufactured, with LED luminaires used where possible. A warm white light source (2700Kelvin or lower) will be used, with peak wavelengths higher than 550 nm. Column heights will be considered to minimise light spill. Only luminaires with negligible or zero Upward Light Ratio, and within good optical control should be considered. Operational Phase Birds: The trimming of existing and proposed hedgerows will be undertaken outside of the breeding bird season (March 01st to August 31st inclusive). Trimming will only be necessary if required for safety and work access reasons. Bats: Any operational lighting will be positioned as to avoid light spill on to potential bat roosting, commuting or foraging sites – i.e. no light spill on to the derelict cottage or hedgerows and treelines. Luminaries should lack UV elements when manufactured, with LED luminaires should be used where possible. A warm white light source (2700Kelvin or lower) should be used, with peak wavelengths higher than 550nm. Column heights should be considered to minimise light

	spill. Only luminaires with negligible or zero Upward Light Ratio, and within good optical control should be considered. Lighting will be limited to the compound area and will only occur during periodic engineering checks and maintenance visits. External security lighting will be set on motion-sensors for as short as possible, i.e. one or two minutes.
Flood Risk Assessment (Section 4.2.2)	
Surface Water Drainage	The Surface water drainage proposal for the site has been developed to mimic the natural drainage patterns of the site in accordance with the Best Management Practices of SuDS. The surface water proposals will replicate the greenfield drainage conditions of the site where possible.
Noise Assessment (Section 4.2.3)	
Construction (Working Hours)	Where construction activity takes place for a development in the vicinity of residential properties, it is standard practice that the activities would operate between the hours of 07:00 and 18:00 on Monday to Fridays, between 08:00 and 13:00 on Saturdays and there will be no activity on Sundays or Bank Holidays.
Construction (site hoarding)	It is proposed that a noise barrier in the form of site hoarding is erected at the site boundary with the R160 and directly across the road from the nearest noise sensitive properties. The location of this barrier is illustrated in Figure 7.1 pf Appendix D It is proposed that this is a minimum of 2m height with no gaps in it, which will provide noise attenuation of approximately 10dB(A) in the direction of the nearest noise sensitive properties. 
Construction Environmental Management Plan (CEMP)	A detailed Construction Environmental Management Plan (CEMP) will be prepared and will include a range of measures aimed at reducing the potential construction noise impacts on the nearest receptors to the proposed development site. This plan will address the mode and timing of construction activity in close proximity to the site boundary with the nearest receptors, aiming to reduce the noisiest activities in the vicinity of the boundary of the proposed site. This should also include measures to communicate and coordinate construction phase activities at the nearest boundary to the most affected receptors so as to reduce these noise impacts to the lowest possible levels. The detailed CEMP will include the noise threshold limits included BS5228:2009+A1:2014, which must be adhered to throughout the construction phase. On the basis of the noise monitoring survey completed, the lowest noise threshold limits

	included in this table (i.e. Category A) must be applied for all construction activities. British Standard BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites outlines a range of measures that can be used to reduce the impact of construction phase noise on the nearest noise sensitive receptors. These measures should be applied by the contractor where appropriate during the construction phase of the proposed development. Examples of some of the best practice measures included in BS5228 are listed below: • ensuring that mechanical plant and equipment used for the purpose of the works are fitted with effective exhaust silencers and are maintained in good working order; • careful selection of quiet plant and machinery to undertake the required work where available; • all major compressors should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use; • any ancillary pneumatic percussive tools should be fitted with mufflers or silencers of the type recommended by the manufacturers; • machines in intermittent use should be shut down in the intervening periods between work; • ancillary plant such as generators, compressors and pumps should be placed behind existing physical barriers, and the direction of noise emissions from plant including exhausts or engines should be placed away from sensitive locations, in order to cause minimum noise disturbance. Where possible, in potentially sensitive areas, acoustic barriers of enclosures should be utilised around noisy plant and equipment. • Handling of all materials should take place in a manner which minimises noise emissions; • Audible warning systems should be switched to the minimum setting required by the Health & Safety Executive; • A complaints procedure should be operated by the Contractor throughout the construction phase.
Operational phase	No specific mitigation measures and monitoring measures are proposed for operational noise impacts at off-site sensitive receptors.
Traffic and Transport Assessment (Section 4.2.4)	
It is considered that there are no predicted impacts with respect to Traffic and Transport regarding the proposed construction and post-construction/operational phases of the proposed development. Consequently, it is considered that no mitigation measures are required.	
Cultural Heritage Appraisal (Section 4.2.5)	
General mitigation measures, based on OPR Practice Note PN03: Planning Conditions (October 2022).	1. The developer will engage a suitably qualified archaeologist (licenced under the National Monuments Acts) to monitor all site clearance and excavations required of the development. The use of appropriate machinery to ensure the preservation and recording of any surviving subsurface archaeological remains will be necessary. No subsurface work will take place in the absence of the archaeologist without his/her express consent.

	2. Should archaeological remains be identified during archaeological monitoring, all works in the area of archaeological interest will be suspended, pending a decision of the Planning Authority, in consultation with the National Monuments Service, Department of Housing, Local Government and Heritage. 3. The developer will facilitate the archaeologist in recording any remains identified. Any further archaeological mitigation measures specified by the Planning Authority, following consultation with the National Monuments Service, will be complied with by the developer. 4. Following the completion of all on-site archaeological interventions and any necessary post-excavation specialist analysis, the Planning Authority and the National Monuments Service will be furnished with a final archaeological report describing the results of the monitoring and any other archaeological investigations/interventions that might subsequently have been required. All resulting and associated costs will be borne by the developer. 5. The Construction Environmental Management Plan (CEMP) shall include the location of all archaeological and architectural heritage constraints relevant to the proposed development. The CEMP shall clearly describe all identified likely archaeological and architectural impacts, both direct and indirect (visual), and all mitigation measures to be employed to protect the archaeological/architectural heritage environment during all phases of site preparation and construction activities.
Landscape and Visual Impact Assessment (Section 4.2.6)	
Mitigation by Design	The main mitigation measure employed is 'mitigation by avoidance'. The siting of the proposed Fosterstown Distribution Station is in a robust and well-contained rural area that also avails of both terrain and hedgerow screening such that the scheme will not be prominent within the surrounding landscape. Retention of existing hedgerow boundaries within and around the site also prevents a sense of ambivalence, aids visual screening, and maintains the existing field pattern. In this respect, the proposed Fosterstown Distribution Station is not perceived to impose itself on the existing landscape pattern.
New Hedgerow	In addition to retaining the existing hedgerows around the site, it is also proposed to bolster existing perimeter hedgerows with under-planting and inter-planting of whip transplants to ensure dense and consistent site screening in perpetuity. Whip species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance. A new hedgerow is proposed outside the palisade security fence that encloses the main substation. This planting will be allowed to mature up to a maintained height of 3-4m to further enhance and aid in screening the proposed development when viewed from nearby dwellings and roads. Some native trees are proposed across the site and a grassland/meadow management protocol is proposed in the undeveloped portions of the site. The mitigation measures are indicated on the Landscape Mitigation Plan (Appendix H).
Waste and Resource Management (Section 4.2.7)	

Construction Waste and Resource Management	Waste management on site will be carried out in accordance with "*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*" produced by the Department of Environment, Community and Local Government. Regulations in relation to waste management will be adhered to. A Resource & Waste Management Plan (R&WMP) will be produced and implemented by the contractor to minimise waste generation. The key principles underlying the plan will be to minimise waste generation and to segregate waste at source. The following general measures will be applied on site: Disposal of construction waste will be to licensed disposal facilities; On-site segregation of waste will be provided by the contractor using skips for timber, metal, general waste, and recyclables; & All waste will be removed from site by one or more waste haulage contractor(s) who hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

4.3.1 Implementation of Mitigation Measures

ESB intends to appoint a Contractor(s) to undertake each phase of the works. The mitigation measures set out in the PECR have been incorporated into an outline Construction Environmental Management Plan (oCEMP) for the proposed development (under Separate Cover).

The oCEMP sets out the minimum requirements which will be adhered to during the construction phase of the project. The oCEMP will form part of the Contract Documents for the construction stage to ensure that the Contractor undertakes the works required to implement the mitigation measures.

5 Planning Policy Context

5.1 National Planning Policy

5.1.1 National Planning Framework First Revision and the National Development Plan Review 2025

Project Ireland 2040 is the overarching policy guiding the sustainable development of Ireland. This policy is comprised of the National Planning Framework (NPF) First Revision, which sets out a vision for the social and economic growth of the nation to 2040, and the National Development Plan (NDP) Review 2025, which attributes funding to projects which achieve the goals of the NPF.

The development of Ireland's electricity grid is a key part of the NPF, coming under National Strategic Outcome (NSO) 8: *Transition to a Carbon Neutral and Climate Resilient Society*. It is recognised within this NSO that it will be imperative that the national grid is developed and upgraded to accommodate increasing levels of demand and supply, a key element reiterated under National Policy Objective 71:

> **National Policy Objective 71:** *Support the development and upgrading of the national electricity grid infrastructure, including supporting the delivery of renewable electricity generating development.*

The NDP sets out funding priorities for national, regional, and local projects based on the NSOs outlined in the NPF. Investment priorities for the Irish electricity grid are outlined in the NDP in Chapter 5.8. The NDP outlines that investment in grid infrastructure will enable ESB and EirGrid *"to significantly increase capital investment to expand electricity transmission and distribution network infrastructure".* The importance of infrastructure development in achieving the wider goals of the NDP and NPF is outlined in Chapter 8.5 of the NDP:

> *"...this infrastructure is required to underpin the development of all other economic and social infrastructure we need to function as a society. It is also vital to enable the development of the 300,000 homes we need to meet the Government's housing target, and to support our economy's competitiveness."*

5.2 National Sectoral Policies

5.2.1 Climate Action Plan 2025

Electricity has a challenge ahead to achieve a 75% reduction in emissions by 2030, based on a 2018 baseline and its success has knock-on implications for other sectors in reaching their target. Achieving the target heavily relies on the continued deployment of renewable energy generation and supporting electrical grid infrastructure enhancements. The plan outlines the importance of strengthening the grid connection to achieve the goals for the electricity sector:

> *"This represents an immense challenge as the sector not only has a requirement to reduce emissions, but also to meet the increasing electricity demand required*

> *for our economy, ensuring the energy security of the State, and supporting those sectors which are decarbonising through electrification."*

The proposed substation will strengthen the distribution system, providing greater security of electricity supply in the local area, and enabling future development in the Trim area in line with zoning objectives in the Development Plan.

5.3 Regional Guidelines

The proposed development is located in the Eastern and Midlands Regional Assembly (EMRA). Regional Assemblies guide the social and economic development of the region, by applying objectives set out by Project Ireland 2040 to the regional context. The EMRA has published the Regional Spatial and Economic Strategy (RSES) 2019-2031 to guide the region's development in line with its expected population growth. It aims to ensure that the services, including energy, within the region are developed to support social and economic growth, and funding is outlined within the document to allow this.

Aligning with the NPF and NDP, the RSES advocates for energy security in the context of increasing demand due to population growth and economic development (10.3 'Energy' pg. 224):

> *"A secure and resilient supply of energy is critical to a well-functioning region, being relied upon for heating, cooling, and to fuel transport, power industry, and generate electricity. With projected increases in population and economic growth, the demand for energy is set to increase in the coming years.*"

In the RSES, Section 10.3 outlines the policy approach for the development of energy infrastructure within the Region. It is acknowledged that there is a need to reinforce the electrical grid in the greater Dublin Region, noting that it is a major load centre on the Irish electricity transmission system. In this context it is stated within the RSES that:

> *"The main urban demand centres are composed of a mix of residential, commercial and industrial demand, which is expected to grow up to 2025 and beyond. Developing the grid in the Region will enable the transmission system to safely accommodate more diverse power flows from renewable generation and also to facilitate future growth in electricity demand. These developments will strengthen the grid for all electricity users, and in doing so will improve the security and quality of supply.*"

Relevant regional policy (RPO) objectives for this project relating to the reinforcement of the electrical grid are:

> ***RPO 10.20:*** *Support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the Region and facilitate new transmission infrastructure projects that might be brought forward in the lifetime of this Strategy. This Includes the delivery of the necessary integration of transmission network requirements to facilitate linkages of renewable energy proposals to the electricity and gas transmission grid in a*

sustainable and timely manner subject to appropriate environmental assessment and the planning process.

RPO 10.22: *Support the reinforcement and strengthening of the electricity transmission and distribution network to facilitate planned growth and transmission/distribution of a renewable energy focused generation across the major demand centres to support an island population of 8 million people, including:*

- *Facilitating interconnection to Europe, particularly the 'Celtic Interconnector' to France and further interconnection to Europe/the UK in the longer term*
- *Facilitating interconnection to Northern Ireland, particularly the 'North-South Interconnector and further co-operation with relevant departments in Northern Ireland to enhance interconnection across the island in the longer term.*
- *Facilitating transboundary networks into and through the Region and between all adjacent Regions to ensure the RSES can be delivered in a sustainable and timely manner and that capacity is available at local, regional and national scale to meet future needs.*
- *Facilitate the delivery of the necessary integration of transmission network requirements to allow linkages of renewable energy proposals to the electricity transmission grid in a sustainable and timely manner.*
- *Support the safeguarding of strategic energy corridors from encroachment by other developments that could compromise the delivery of energy networks.*

5.4 Local Policies and Objectives

5.4.1 Meath County Development Plan 2021-2027

The Meath County Development Plan 2021-2027 (MCDP) contains the relevant local policy for this proposal. The MCDP clearly supports the upgrading of electricity infrastructure in the county in order to keep up with growing local demand and to ensure security of supply.

Chapter 6 outlines the Infrastructure Strategy for the County and highlights that the Council, in conjunction with other agencies and authorities, needs to ensure that development of infrastructural services occurs in tandem with, and facilitates, physical development to ensure the continued economic growth of the County.

Section 5.15.4.1 outlines the importance of ensuring that the existing electricity networks can be upgraded and can provide enhanced capacity to provide for significant economic and supporting residential development within the Plan period. The MCDP states that this capacity is essential to facilitate the future development of the County in line with the Core and Settlement Strategies. The MCDP further highlights that the strengthening of the national grid is important for a number of reasons including improving security of supply for the domestic,

residential and enterprise market as well as attracting high-end enterprise which often require significant energy capacity and reliability.

There are several policies within the MCDP which are relevant to the proposed development;

INF POL 46: *To support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the County and to facilitate new transmission infrastructure projects that may be brought forward during the lifetime of the plan including the delivery and integration, including linkages of renewable energy proposals to the electricity transmission grid in a sustainable and timely manner.*

INF POL 47: *To co-operate and liaise with statutory and other energy providers in relation to power generation in order to ensure adequate power capacity for the existing and future business and enterprise needs of the County.*

INF POL 48: *To ensure that energy transmission infrastructure follows best practice with regard to siting, design and least environmental impact in the interest of landscape protection.*

INF OBJ 50*: To seek the delivery of the necessary integration of transmission network requirements to facilitate linkages of renewable energy proposals to the electricity transmission grid in a sustainable and timely manner.*

5.4.2 Other Local Policies and Objectives

5.4.2.1 Land Use Zoning and Development Management Standards

Chapter 11 of the MCDP which sets out the development standards and land use zoning objectives to be applied in the assessment of planning applications has been referred to in the design of the proposed development in order that the proposed development is in accordance with proper planning and sustainable development.

The subject site is located outside of the Trim Settlement Boundary within the MCDP and therefore, is not located on any identifiable zoned land.

The following policies and objectives of Chapter 11 have been considered in the preparation of the proposed development:

- **DM OBJ 11:** *Existing trees and hedgerows of biodiversity and/or amenity value shall be retained, where possible.*
- **DM POL 27:** *To encourage renewable development proposals which contribute positively to reducing energy consumption and carbon footprint.*
- **DM OBJ 76:** *In the assessment of individual energy development proposals, the Council will take the following criteria into account:*
    - *The proper planning and sustainable development of the area;*
    - *The environmental and social impacts of the proposed development;*
    - *Traffic impacts including details of haul routes;*
    - *Impact of the development on the landscape, (please refer to Appendix 5 Landscape Character Assessment);*
    - *Impact on protected Views and Prospects, (please refer to Appendix 10 Protected Views and Prospects);*

- *Impact on public rights of way and walking routes, (please refer to Appendix 12 Public Rights of Way);*
- *Connection to the National Grid (where applicable);*
- *Mitigation features, where impacts are inevitable;*
- *Protection of designated areas - NHAs, SPAs and SACs, areas of archaeological potential and scenic importance;*
- *proximity to structures that are listed for protection, national monuments, etc. (Please refer to Chapter 8 Cultural Heritage, Natural Heritage, Landscape and Green Infrastructure and Appendices 6-9 inclusive for further details);*
- *Cumulative Impact of proposal.*

6 Planning Assessment

6.1 Project Justification

This section of the report provides a justification and rationale for the project and all associated development. This submission builds on the stated need for the proposed development (see Section 3 above) and considers the project in the context of prevailing policy and the principles of sustainable development. The project is justified having regard to the following plans, policies, and objectives:

1. Compliance with and implantation of National energy policy;
2. Realising objectives set out in the Regional Spatial Economic Strategy;
3. Delivering on policies and objectives set out in Meath County Development Plan.

6.1.1 Implementing National Planning Policy

As noted in Section 5, the development of Ireland's distribution grid takes a key place in national, regional, and local energy policies. Reinforcing the grid will enable the achievement of objectives relating to ensuring a secure supply of energy to support population and economic growth.

The Climate Action Plan 2025 (CAP25) refers to a need for improvements to grid infrastructure which will enable a renewables-led system to radically reduce emissions in the electricity sector, protect our energy security, and ensure our economic competitiveness. CAP25 signifies support for the development of electricity grid enhancements, in order to allow greater capacity on the grid to support the transition to greater renewable generation capacity. The proposed development will be in line with CAP25.

The support for the construction of new and upgrades to existing electricity grid infrastructure outlined in the CAP25, is echoed in the revised NPF and NDP. In particular NSO 8: Transition to a Carbon Neutral and Climate Resilient Society within the NPF, recognises the requirement for the national grid to be upgraded to accommodate increasing levels of demand and supply. In particular, National Policy Objective 71 supports the development and upgrading of grid infrastructure, which the proposed development will align with. Similarly, the NDP outlines national support for investment to upgrade to the distribution network (i.e. specifically what is being proposed under the subject development) and outlines the importance of same to achieving the wider economic and social infrastructure goals within the NPF.

Ireland's national planning policies, aim to develop infrastructure in line with expected demand based on population and economic growth. With the economy of Dublin City and surrounding areas continuing to grow, the population is also expected to grow. This will create a need for an upgrade to the distribution grid within the Greater Dublin area, including Meath, to accommodate increased demand. The proposed development will contribute to the direction within the national planning policies to transition to a low carbon economy while supporting national social and economic development.

6.1.2 Realising Objectives set out in the Regional Spatial and Economic Strategy

The proposed development which will enhance the capacity of the greater Trim distribution system is supported by and in line with the EMRA RSES.

Section 10.3: Energy specifically recognises the need for upgrades to the electricity distribution network within the region in order to provide greater security of supply, particularly in areas with a current infrastructure deficit. A more secure distribution grid supports the social and economic growth of local areas within the region. This support is detailed on pg. 224:

> *"A secure and resilient supply of energy is critical to a well-functioning region, being relied upon for heating, cooling, and to fuel transport, power industry, and generate electricity. With projected increases in population and economic growth, the demand for energy is set to increase in the coming years".*

This project, which will bolster the distribution network in the Meath area, will facilitate increased electricity demand within the area. This will also reduce pressure on the existing distribution grid. Again, the importance of strengthening the grid is detailed on pg. 224:

> *"The main urban demand centres are composed of a mix of residential, commercial and industrial demand, which is expected to grow up to 2025 and beyond. Developing the grid in the Region will enable the transmission system to safely accommodate more diverse power flows from renewable generation and also to facilitate future growth in electricity demand. These developments will strengthen the grid for all electricity users, and in doing so will improve the security and quality of supply".*

The proposed development aligns with the wider RSES, and in particular RPOs 10.20 and 10.22 which support the strengthening of the electrical grid.

Meath is a major demand centre and the current distribution network is under pressure to meet local electricity demand. The project will support the increasing electricity needs of the area by providing increased capacity on the distribution network. Therefore, the proposed development contributes to achieving the objectives of the RSES.

6.1.3 Delivering on Policies and Objectives set out in Meath County Development Plan

The proposed development which will enhance the electricity distribution network in the greater Trim area to accommodate existing and growth in electricity demand, is supported by and in-line with the MCDP and in particular Chapter 6.

The Council's support for distribution grid enhancements, such as this project is demonstrated in Section 6.15.4, where the importance of ensuring that existing networks can be upgraded and can provide enhanced capacity for the region is highlighted.

The Council has additionally outlined their support for service providers, such as ESB, to provide the necessary enhancements of the distribution grid below under Policy Objective *INF POL 47: To co-operate and liaise with statutory and other energy providers in relation to power generation in order to ensure adequate power capacity for the existing and future business and enterprise needs of the County.*

The importance of upgrading the electricity network in Meath is acknowledged by the Council through Policy Objective *INF POL 46* and *INF OBJ 50.*

The proposed development aligns wholly with the MCDP energy infrastructure policies and objectives related to upgrading the distribution network, in order to support increased

population and employment to provide enhanced capacity. The proposed development will increase capacity within the County.

In line with the MCDP, sensitive design for new infrastructure development is important under Policy Objective *INF POL 48: To ensure that energy transmission infrastructure follows best practice with regard to siting, design and least environmental impact in the interest of landscape protection.* Landscape, visual, and associated amenity impacts have been robustly assessed during the preparation of this planning application. Overall, it is considered that this is an appropriately sited development, and consequently, the impact on landscape character (post-construction) will be of *Moderate-slight significance and a Negative quality*.

The proposed development is located outside of the Trim Settlement Boundary within the MCDP and therefore, is not located on any identifiable zoned land. However, under the 'RA Rural Areas' zoning objective within the MCDP, it is an objective to: *protect and promote in a balanced way, the development of agriculture, forestry and sustainable rural-related enterprise, community facilities, biodiversity, the rural landscape, and the built and cultural heritage.* Sustainable Energy Installations and Utility Structures are permissible uses under the 'RA' zoning objective.

Given the above it is considered that the proposed development complies with the wider MCDP policies and objectives, particularly those which support the upgrading of the electrical distribution network, and which relate to the sensitive location and design of utility installations.

7 Planning and Environmental Conclusions

The existing 38kV substation at Trim is overloaded on normal feeding and experiencing numerous security of supply issues. There is no capacity for any demand load growth for new housing schemes in the area that will require connection over the next few years.

The project for which planning consent has been sought is called the “Fosterstown 110kV/20MW Distribution Substation”. ESB is seeking permission to facilitate construction and commissioning of the new substation.

The project objective is to add capacity and improve distribution security of supply for the Trim area, co. Meath. This will be achieved by taking power from the existing Corduff-Mullingar 110 kV transmission line that traverse the site and transforming the voltage down to 20 kV and offload to the MV distribution network. This will relieve existing transformer capacity in the Trim substation which is urgently required.

Substation facilities and associated distribution equipment, such as that proposed, are located throughout Ireland’s rural landscape. This PECR and appended assessments have demonstrated that the proposed substation will not give rise to any significant planning or environmental effects.

The development is necessary to ensure the secure and effective supply of electricity to the greater Trim area. National policy outlines the need to invest in the distribution grid to support growing populations. The electrification of new sectors will also drive the increased demand for electricity. The RSES specifically references the importance of enhancing the grid in the Greater Dublin Region. The MCDP outlines the Council’s ambitions to work with service providers, such as ESB, to enhance the distribution grid in order to ensure adequate power capacity for the existing and future business and enterprise needs of the County.

The proposed development is not an EIA type set out in the planning and Development Act 2000 (as amended) or Planning and Development Regulations 2001 (as amended) and therefore no EIA is required. Nevertheless, this planning application is supported by a non-statutory Planning and Environmental Considerations Report (PECR) to ensure that appropriate planning requirements and any potential environmental impacts to the receiving environment are considered.

The following environmental topics have been comprehensively addressed within the PECR: Biodiversity; Flooding; Noise; Traffic and Landscape. The likely significant effects arising from the construction and operation of the proposed development were assessed against relevant environmental and planning criteria. Early integration of the engineering design team with the planning and environmental team has enabled the implementation of “mitigation by design” causing many likely significant effects to be eliminated or reduced to an acceptable level during the preliminary design stage. Where necessary, mitigation measures have been recommended which will be fully implemented. These are detailed in the PECR and set out in the outline Construction and Environmental Management Plan.

An Appropriate Assessment (AA) Screening has also been prepared for the proposed development (under separate cover). The AA Screening Report established that the proposed development has no potential for likely significant effects on any European site, with particular regard to their conservation objectives, either alone or in combination with other projects or

plans. Therefore, a Stage 2 Appropriate Assessment is not required for the proposed development.

The characteristics of the development are compatible with the stated objectives and policies of the MCDP and present no conflicts in terms of surrounding land uses.

Having regard to these considerations the proposed development is compatible with the principles of proper planning and sustainable development and should be favourably considered.

Appendix A – An Bord Pleanála SID Determination (October 2023)

Our Case Number: ABP-317654-23

An Bord Pleanála

The Electricity Supply Board (ESB)
c/o Brendan Allen, Planning Team Leader,
ESB Engineering and Major Projects (ESB EMP),
One Dublin Airport Central, Dublin Airport,
Cloghran,
Co. Dublin
K67 XF72

Date: 26 October 2023

Re: Proposed development of 110kV/MV distribution station.
Fosterstown, approximately 3 km south of Trim, County Meath.

Dear Sir / Madam,

Please be advised that following consultations under section 182E of the Planning and Development Act 2000, as amended, the Board hereby serves notice that it is of the opinion that the proposed development falls within the scope of section 182A of the Planning and Development Act 2000, as amended. Accordingly, the Board has decided that the proposed development would be strategic infrastructure within the meaning of section 182A of the Planning and Development Act 2000, as amended. Any application for approval for the proposed development must therefore be made directly to An Bord Pleanála under section 182A(1) of the Act.

Please also be informed that the Board considers that the pre-application consultation process in respect of this proposed development is now closed.

The following is a list of prescribed bodies to be notified of the application for the proposed development.

- Minister for Housing, Local Government and Heritage.
- Minister for Environment, Climate and Communications.
- Commission for Regulation of Utilities.
- Meath County Council

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• Transport Infrastructure Ireland

• The Heritage Council

• An Taisce

• Inland Fisheries Ireland

• Health and Safety Authority

Further notifications should also be made where deemed appropriate.

In accordance with section 146(5) of the Planning and Development Act 2000, as amended, the Board will make available for inspection and purchase at its offices the documents relating to the decision within 3 working days following its decision. This information is normally made available on the list of decided cases on the website on the Wednesday following the week in which the decision is made.

In accordance with the fees payable to the Board and where not more than one pre-application meeting is held in the determination of a case, a refund of €3,500 is payable to the person who submitted the pre-application consultation fee. As only one meeting was required in this case, a refund of 3,500 will be sent to you in due course.

The following contains information in relation to challenges to the validity of a decision of An Bord Pleanála under the provisions of the Planning and Development Act, 2000, as amended.

Judicial review of An Bord Pleanála decisions under the provisions of the Planning and Development Acts (as amended).

A person wishing to challenge the validity of a Board decision may do so by way of judicial review only. Sections 50, 50A and 50B of the Planning and Development Act 2000 (as substituted by section 13 of the Planning and Development (Strategic Infrastructure) Act 2006, as amended/substituted by sections 32 and 33 of the Planning and Development (Amendment) Act 2010 and as amended by sections 20 and 21 of the Environment (Miscellaneous Provisions) Act 2011) contain provisions in relation to challenges to the validity of a decision of the Board.

The validity of a decision taken by the Board may only be questioned by making an application for judicial review under Order 84 of The Rules of the Superior Courts (S.I. No. 15 of 1986). Sub-section 50(7) of the Planning and Development Act 2000 requires that subject to any extension to the time period which may be allowed by the High Court in accordance with subsection 50(8), any application for judicial review must be made within 8 weeks of the decision of the Board. It should be noted that any challenge taken under section 50 may question only the validity of the decision and the Courts do not adjudicate on the merits of the development from the perspectives of the proper planning and sustainable development of the area and/or effects on the environment. Section 50A states that leave for judicial review shall not be granted unless the Court is satisfied that there are substantial grounds for contending that the decision is invalid or ought to be quashed and that the applicant has a sufficient interest in the matter which is the subject of the application or in cases involving environmental impact assessment is a body complying with specified criteria.

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Section 50B contains provisions in relation to the cost of judicial review proceedings in the High Court relating to specified types of development (including proceedings relating to decisions or actions pursuant to a law of the state that gives effect to the public participation and access to justice provisions of Council Directive 85/337/EEC i.e. the EIA Directive and to the provisions of Directive 2001/12/EC i.e. Directive on the assessment of the effects on the environment of certain plans and programmes). The general provision contained in section 50B is that in such cases each party shall bear its own costs. The Court however may award costs against any party in specified circumstances. There is also provision for the Court to award the costs of proceedings or a portion of such costs to an applicant against a respondent or notice party where relief is obtained to the extent that the action or omission of the respondent or notice party contributed to the relief being obtained.

General information on judicial review procedures is contained on the following website, www.citizensinformation.ie.

Disclaimer: The above is intended for information purposes. It does not purport to be a legally binding interpretation of the relevant provisions and it would be advisable for persons contemplating legal action to seek legal advice.

If you have any queries in the meantime, please contact the undersigned officer of the Board or email sids@pleanala.ie quoting the above mentioned An Bord Pleanála reference number in any correspondence with the Board.

Yours faithfully,

PP EGM

Niamh Hickey
Executive Officer
Direct Line: 01-8737145

VC11A

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Appendix B - Engineering Services Report

Fosterstown 110 kV GIS Substation

ESB Networks

Engineering Services Report

Document No.: PE595-F2451-R451-005-000

Date: July 2025

Engineering and Major Projects, One Dublin Airport Central, Dublin Airport, Cloghran, Co. Dublin, K67 XF72, Ireland.

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File Reference:	PE595-F2451-R451-005-000	
Client / Recipient:	ESB Networks	
Project Title:	Fosterstown 110 kV Substation	
Report Title:	Engineering Services Report	
Report No.:	PE595-F2451-R451-005-000	
Revision No.:	000	
Prepared by:	Harry Griffin	Date: July 2025
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Title:	Senior Civil Engineer	
Approved by:	Sarah Donnelly	Date: July 2025
Title:	Project Manager	

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Template Used: T-020-017-Engineering and Major Projects Report Template

Change History of Report

Date	New Revision	Author	Summary of Change

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List Of Figures

1 Introduction

1.1 Project Background

In accordance with Section 182A of the Planning and Development Act 2000, as amended, the Electricity Supply Board (ESB) gives notice of its intention to make an application for approval to An Coimisiún Pleanála in relation to proposed development of c. 2.2 ha site on the R160, Carberstown, Trim, Co. Meath, described below.

The proposed development will consist of the construction of a 110 kV / 20MV electrical substation and will include the following elements:

1. Demolition of an agricultural hay shed;
2. Construction of:
   a) a substation compound (c. 4,340sq.m.) with c.2.6 m high palisade perimeter fencing;
   b) a seven bay 110 kV Gas Insulated Switchgear (GIS) building (c. 707sq.m.; c. 13m in height);
   c) two 110 kV Double Circuit Overhead Line End Masts (c. 16 m in height) and associated outdoor electrical equipment to facilitate underground cable connections between the existing transmission circuit and the proposed GIS building;
   d) two 110 kV transformers in transformer bays (c. 4.6 m in height) with associated electrical equipment;
   e) an internal access road (c. 6 m wide); and
   f) All other associated and ancillary site development works including the provision of site services; fencing; gates; lighting; temporary construction compound and temporary overhead line tower to facilitate line diversion; new access from the R160; drainage; and hedgerow removal.

The proposed development is illustrated on drawing No. PE492-D282-016-004-001 in Appendix A.

This Engineering Services Report (ESR) provides details on the foul and surface water drainage proposals in addition to the proposed water supply for the development.

1.2 Site of Proposed Development

1.2.1 Site Location

The Fosterstown 110 kV Substation is located in the Carberrystown area approx. 3 km southwest along the R160 from Trim, Co. Meath. The substation is accessed via an existing entrance gateway off a small laydown area, located adjacent to the R160.

The substation is immediately bound by rural agricultural land in every direction, five plots of private residential land lie opposite the site entrance to the southeast along the R160. The surrounding area is generally rural agricultural lands.

1.2.2 Site Topography

A topographical survey (see Appendix C: Topographic Survey) was undertaken in June 2023.

The site is relatively flat with a gentle slope west to east. The level at the centre of the site is approx. 61.81 mAOD (note all levels are to Ordnance Datum Malin Head. Site levels range from approx. 60.36 mAOD at the north-eastern boundary to 62.45 mAOD at the western side.

Figure 1-1: General Site Location

Figure 1-1: Proposed Site Boundary

2 Surface Water

2.1 Existing Surface Water Drainage

A site visit was undertaken in June 2023. The only drainage feature observed within the site boundary of the proposed development is 75 m to the southeast of the proposed compound boundary running perpendicular to the proposed access road. There is no existing surface water infrastructure located along the R160 fronting the site.

There are two established drainage ditches located to the north and east of the site as shown in Figure 2-1. These drainage ditches converge from the west and east before continuing south as a single drainage ditch. This drainage ditch flows into the Moynasboy stream before then discharging to the Knightsbrook river.

Figure 2-1: Map Showing Existing Watercourses

2.2 Proposed Surface Water Drainage

2.2.1 Surface Water Drainage Proposals

The surface water drainage proposals for the proposed electrical substation have been developed to mimic the natural drainage patterns of the site and in accordance with Sustainable Drainage Systems (SuDS). The surface water proposals replicate greenfield drainage conditions where possible.

In the absence of site investigations, desk study information from Geology Survey Ireland (GSI) suggests deep well drained mineral soil which is likely composed mainly of sand with silt and clay. A site investigation is to be undertaken prior to detailed design, which will include soakaway tests in accordance with BRE Digest 365. A soakaway is currently

proposed for the development. The use of a soakaway will be confirmed during detailed design following receipt of the site infiltration test results. Should the ground conditions be unsuitable for a soakaway, an alternative surface water drainage proposal will be developed. It is noted that there are existing ditches located to east and north of the main site boundary where the substation is proposed. These would provide a means for discharging surface water to greenfield conditions if a soakaway is not a feasible option.

Drainage from the proposed substation development will be collected on site in a dedicated drainage network and will discharge to the proposed soakaway. The soakaway will be located in the northeast corner of the proposed development site. The volume of the soakaway will be determined during detailed design upon completion of the site infiltration tests. The preliminary estimate of infiltration rate is $1x10^{-5}$ m/s assuming sandy soil with clay and silt. Rainfall data from Met Éireann has been supplemented by a 20% climate change allowance to provide preliminary sizing requirements for the soakaway.

The two bunded transformers will be drained by new surface water sewers which will convey the runoff to the soakaway. The transformer bunds will incorporate an Entexol SCS001 (or equivalent) oil sensitive bund dewatering system in addition to an Entexol SCS002 (or equivalent) integrated full retention oil separator.

The new access road within the site will drain to the adjacent compound stone. This will then either infiltrate to ground or will evaporate as it would on a greenfield site.

All runoff will pass through a catchpit before flowing through the proposed soakaway system to catch any fines and sediment.

The remainder of the compound area of the substation will comprise a permeable surface consisting of 50 mm single sized clean compound stone. The permeable compound stone will provide a means of attenuating runoff in these areas and will then either infiltrate to ground or will evaporate as it would on a greenfield site.

The surface water drainage proposals are illustrated on drawing No. PE492-D282-016-005-000 in Appendix B.

2.3 Water Quality

The quality of the surface water discharge from the site was considered during the development of the drainage proposals.

The Greater Dublin Regional Code of Practice V6, under the General Requirements for Bunding of Storage Tanks (Section 17.1.4) states that, "*Rainwater may only be removed from a bund by means of manual removal or a non-automatic pumping arrangement".* The proposed electrical transformers and oil tanks are oil filled equipment and as such are placed within impermeable bunds. In order to provide for treatment of surface water generated in the transformer bunds, it is proposed to install an Entexol SCS001 (or equal and approved) oil sensitive bund dewatering system. A 1 l/s low shear vortex pump with oil

separation detection will be fitted within each bund containing oil-filled equipment in accordance with the Greater Dublin Regional Code of Practice V6. This system will ensure only non-contaminated water enters the site drainage network.

The bund dewatering system will be fitted with a high oil level alarm and will be connected back to the station control panel which is connected to a manned control centre via the station's SCADA telecom relay system.

It should be noted that an oil leak from an electrical transformer is an extremely rare occurrence. Such a leak will result in an electrical fault which will be notified to the transmission system operator and attended to on site by trained operatives immediately.

3 Foul Water

3.1 Existing Foul Water Drainage

There are currently no foul water services within the boundary of the proposed site or in the adjacent public road.

3.2 Proposed Foul Water Drainage

It is proposed to discharge foul water generated by the welfare facilities in the substation building to an underground foul water holding tank. A new foul sewer is proposed to convey wastewater to the underground holding tank which is proposed to be located to the north-east of the site.

3.3 Foul Water Volumes

The foul drainage proposals must cater for the wastewater generated in the welfare facilities of the proposed development. These welfare facilities include for one toilet (WC) and one wash hand basin (WHB) in the north eastern side of the GIS substation building, In addition there are to be two eye wash stations, one in the control room and one in the entrance lobby in the west of the building.

The proposed development will generate small quantities of foul waste. The facility will typically be unmanned. As such, the quantities of foul waste generated will therefore be low.

There will be visits to the site for scheduled and unscheduled inspections, maintenance and repairs as necessary. A two-person crew visiting site for three days a week would be the most that would be expected on the site.

The calculated Population Equivalent (PE) for foul loading is estimated at 45 litres per day. This is consistent with the recommended wastewater loading for industrial sites that are part time, as per Uisce Éireann code of practice. This equates to 14,040 litres per annum. While such a consistently high visitation rate is unlikely, there is the possibility of increased numbers of staff being present on site for short durations of one to two weeks for the commissioning of electrical elements of the site from time to time. It is considered that these irregular occurrences would balance with the ordinary operation of the unmanned site to produce a maximum of 14,040 litres of foul waste per annum.

It is common for much lower usage of the facilities on unmanned facilities and therefore a much lower foul loading. A common problem on such unmanned stations is odours in the toilet areas due to the water trap in the WC drying out through evaporation from the lack of use. For this reason, it is proposed to use self-flushing toilets in the station, which would flush automatically twice per week. The station will include one 6 litre flush WC so a minimum weekly foul flow of 12 litres can be expected from this. The self-flushing WC together will therefore contribute 624 litres per annum.

Combining the automatic flush and maximum user demand figures would result in a maximum annual generation of 14,664 litres of foul water.

A 2,500-gallon (11.36 m^3) round Carlow Concrete foul water holding tank (or equal approved) is proposed for the development. This will be emptied at 6-month intervals by a licensed waste contractor. A high-level alarm shall be fitted to indicate when the tank is approaching capacity.

4 Water Supply

4.1 Existing Water Supply

There is currently no water supply within the site of the proposed development. There is a public water main in the main road to the southeast of the site.

4.2 Water Supply Proposals

The water supply servicing the WC will be provided via a rainwater harvesting storage tank system. Rainfall will be collected and brought to a storage holding tank. The system will include leaf filters, a pumped supply to the 110kV building as well as a water UV steriliser system before supplying the WC cisterns and wash hand basins.

The harvesting tank will be topped up using the rainfall collected from the 110kV building roof. A high-level inflow pipe to the 1000 l storage tank will be provided connecting to the storm water outfalls from the rainwater downpipes. The average annual rainfall for the area based on Met Eireann data is approximately 804 mm. Half the roof area of the 110kV building is 370 m^2. Allowing for a reduction of 20% due to water loss, this equates to a potential water supply of 370 x 0.804 x 0.8 x 1000 = 237,984 litres / year for the storage tank.

The estimated water demand will replicate the foul water volumes, i.e. 14,664 litres per year. Comparing this demand against the above calculated yield provides a potential supply of 16 times the demand for the buildings. However, as the system will not have any access to a mains water supply for top up, it is important that the system is oversized to ensure a supply is available all year round.

In the event of a drought period, the 1000 l storage tank will facilitate the conservatively estimated usage for a 3.5-week period (1000 l / 282l/wk). Note that just 3.4 mm rainfall across the roof space draining to the tank is all that would be required to replenish the tank when empty.

Appendix A: Proposed Development

- Drawing No. PE492-D282-016-004-(latest revision) Proposed Site Layout

Appendix B: Surface Water Drainage Proposals

- Drawing No. PE492-D282-016-005-(latest revision) Proposed Drainage Layout
- Drawing No. PE492-D282-016-013-(latest revision)Typical Drainage Details

Appendix C: Topographic Survey

Appendix C – Flood Risk Assessment

Energy for generations

Fosterstown 110 kV Substation

NETWORKS

Flood Risk Assessment

Document No.: PE595-F2451-R451-004-000

Date: July 2025

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File Reference:	PE595-F2304-R304	
Client / Recipient:	ESB Networks	
Project Title:	Fosterstown 110 kV Substation Flood Risk Assessment	
Report Title:	Flood Risk Assessment	
Report No.:	PE595-F2451-R451-005-000	
Revision No.:	000	
Prepared by:	Harry Griffin	Date: July 2025
Title:	Senior Team Lead, Water & Geospatial	
Verified by:	Deirdre Ryan	Date: July 2025
Title:	Senior Civil Engineer	
Approved by:	Sarah Donnelly	Date: July 2025
Title:	Project Manager	

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Template Used: T-020-017-Engineering and Major Projects Report Template

Contents

Table of Figures

1 Introduction

This Flood Risk Assessment has been prepared to address the proposed works to construct a 110 kV Substation. The substation is to be constructed on a greenfield site and will be an asset owned by ESB.

The proposed development will consist of the construction of a 110 kV / 20MV electrical substation and will include the following elements:

1. Demolition of an agricultural hay shed;
2. Construction of:
    a. a substation compound (c. 4,340 sq.m.) with c.2.6 m high palisade perimeter fencing;
    b. a seven bay 110 kV Gas Insulated Switchgear (GIS) building (c. 707 sq.m.; c. 13 m in height);
    c. two 110 kV Double Circuit Overhead Line End Masts (c. 16 m in height) and associated outdoor electrical equipment to facilitate underground cable connections between the existing transmission circuit and the proposed GIS building;
    d. two 110 kV transformers in transformer bays (c. 4.6 m in height) with associated electrical equipment;
    e. an internal access road (c. 6 m wide); and
3. All other associated and ancillary site development works including the provision of site services; fencing; gates; lighting; temporary construction compound and temporary overhead line tower to facilitate line diversion; new access from the R160; drainage; and hedgerow removal.

Please refer to Proposed Site Layout Drawing (No. PE492-D282-016-004-001) in Appendix A for details. Note all levels are to Ordnance Datum Malin Head.

The substation site will be surfaced with a clean single sized stone with the exception of the new access road which will be a concrete surface. The substation will be bounded by a palisade fence and an outer post and rail fence.

This Flood Risk Assessment was prepared in accordance with *'The Planning System and Flood Risk Management - Guidelines for Planning Authorities*' issued by the Department of Environment, Heritage and Local Government in November 2009. Flood risk from fluvial, coastal, surface water and groundwater sources has been assessed based on existing available information.

1.1 Scope of Assessment

The scope of this assessment includes the following:

- Review of Office of Public Works (OPW) Preliminary Flood Risk Assessment Mapping;
- Review of OPW National Hazard Flood Mapping;
- Review of any historic flood information for the site;
- Review any relevant Catchment Flood Risk Assessment and Management Studies (CFRAMS);
- Review of Irish Coastal Wave and Water Level Monitoring Study; and
- Identify risk of:
    - Fluvial;
    - Tidal;
    - Pluvial; and
    - Groundwater flooding.

2 Proposed Development Site

The Fosterstown 110 kV Substation is located in the Carberrystown area approx. 3 km southwest along the R160 road from Trim, Co. Meath. The substation is accessed via an existing entrance gateway off a small laydown area, located adjacent the R160.

The substation is immediately bound by rural agricultural land in every direction, five plots of private residential land lie opposite the site entrance to the southeast along the R160. The surrounding area is generally rural agricultural lands. The redline boundary can be seen in figure 2-1 below.

Figure 2-1 - Fosterstown 110 kV Substation Site location.

2.1 Site Topography

A topographical survey was undertaken in June 2023 and is included in Appendix B.

The site is relatively flat with a gentle slope west to east. The level at the centre of the site is approx. 61.81 mAOD. Site levels range from approx. 60.36 mAOD at the north-eastern boundary to 62.45 mAOD (± 0.05 m) at the western side.

3 The Planning System & Flood Risk Management

In November 2009, the Department of Environment, Heritage, and Local Government issued a guideline document to Planning Authorities in relation to Flood Risk Management titled *"The Planning System and Flood Risk Management Guidelines"*.

These guidelines are issued under Section 28 of the Planning and Development Act 2000 which requires Local Planning Authorities and An Coimisiún Pleanála to implement these guidelines when assessing planning applications under the Planning Acts.

The guidelines also set out the policy on development and flood risk in Ireland and provide a framework for the integration of flood risk assessment into the planning process. The objective is to ensure that flood risk is considered at all stages in the planning process.

The core objectives of the Flood Risk Management Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure the requirements of European Union and national law, in relation to the natural environment and nature conservation, are complied with at all stages of flood risk management.

These documents shall be referred to as the Guidelines throughout this report.

3.1 Definition of Flood Zones

Flood zones are defined in the Flood Risk Management Guidelines as *"geographical areas within which the likelihood of flooding is within a particular range".* There are three types of flood zones as noted below in Table 3-1.

Table 3-1 - Definition of Flood Zones

Flood Zone	Description
A	Probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).
B	Probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 and 0.5% or 1 in 200 for coastal flooding)
C	Probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

3.2 Definition of Vulnerability Classes

The Flood Risk Management Guidelines grade types of development in accordance with how vulnerable they would be to flooding. Table 3-2 below outlines the typical developments under the three vulnerability classes.

Table 3-2 - Definition of Vulnerability Class

Class	Description
Highly Vulnerable (including essential infrastructure)	Includes: Garda, ambulance, fire stations, hospitals, schools, residential dwellings and institutions, essential infrastructure such as primary transport and utilities distribution including **electricity generating power stations and sub-stations**, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less Vulnerable	Includes: buildings for retail, leisure, warehousing, commercial, industrial and non-residential institutions, land and buildings for holiday, agriculture or forestry, waste treatment, mineral working and processing, local transport infrastructure.
Water Compatible Development	Includes: flood control infrastructure, docks, marinas, wharves, navigation facilities, ship building, fish processing, water-based recreation and tourism (excluding accommodation), lifeguard and coastguard stations, amenity open space and outdoor sports and recreational facilities.

As the proposed development is an electrical utility distribution substation, it is considered Highly Vulnerable (Essential Infrastructure) as identified in Table 3-2.

3.3 Appropriate Development and the Justification Test

The Planning System and Flood Risk Management Guidelines outline the types of development that would be considered appropriate to each flood zone as per Table 3-3. A justification test is required in instances where development is proposed in areas of moderate or high flood risk. The test is designed to rigorously assess the appropriateness or otherwise of these developments which would be at risk of flooding.

The development types and land uses which are classed as “Highly Vulnerable” must be subjected to a justification test for Flood Zones A and B. Similarly, the development types and land uses which are classed as “Less Vulnerable” must be subjected to a justification test for Flood Zone A.

It can be seen from Table 3-3 overleaf that highly vulnerable development is appropriate in Flood Zone C.

Table 3-3 Matrix of Vulnerability versus Flood Zones.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development (including essential infrastructure)	Justification Test	Justification Test	**Appropriate**
Less Vulnerable	Justification Test	Appropriate	Appropriate
Water Compatible Development	Appropriate	Appropriate	Appropriate

3.4 Staged Approach

The Guidelines set out a staged approach for the consideration of flood risk in relation to developments. This staged approach is as follows;

Stage 1: Flood risk identification – to identify whether there may be any flooding or surface water management issues related to either the area of regional planning guidelines, development plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower-level plan or planning application levels.

Stage 2: Initial flood risk assessment – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped; and

Stage 3: Detailed flood risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

The level of FRA required is determined on a project specific basis with each stage building upon the previous stage.

4 Stage 1 – Flood Risk Identification

4.1 Available Information

The following sources of information were consulted in order to conduct this assessment as outlined in Table 4-1.

Table 4-1 Summary review of available information.

	Information Source	Coverage	Quality	Confidence	Identified Flood Risk(s)	Flood Risk Identified
Primary Data Sources & Modelled Data	OPW National Flood Hazard Mapping (www,floodinfo .ie)	National	High	High	Site is inland and is remote from any predicted flooding.	No
	Eastern CFRAM Study	Regional	High	High	Site is remote from any predicted flooding.	No
Secondary Data Sources	OPW Historic Flood Records	National	Varies	Varies	No historic flooding in the vicinity of the site.	No
	Site Walkover	Local	Moderate	Moderate	Substation is proposed in a greenfield site. No indication of any current flood issues	No

It can be seen from Table 4-1 that there are no immediate flood risks identified for the proposed site.

4.2 Historic information

A review of historic flooding was undertaken using the OPW website www.floodinfo.ie. The 'Past Flood Events' layer forms a record of all available flood records held by the OPW, all local authorities and other relevant state organisations such as the EPA and the Department of Communications, Climate Action and Environment. This website represents the current definitive database of historic flood information in Ireland.

There is one reported location of past flooding in the general locality of the Fosterstown site (see Figure 4-1). The location is 1.3 km west of the site at the Derrindaly bridge over the Boyne river. The OPW records two past fluvial flooding events at this location, in 1969 and 2002. Due to the distance to the site, these incidents are not considered to represent a risk to this project.

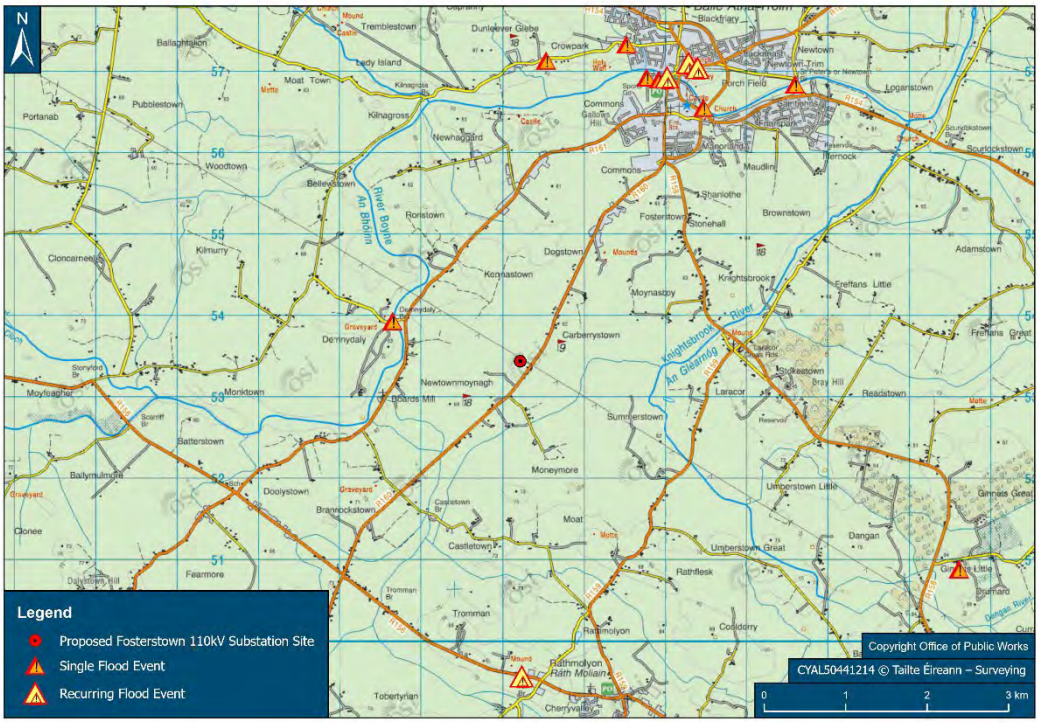


Figure 4-1 - Nearest Past flood event shown 1.3 km from Fosterstown 110 kV substation.

5 Flood Risk

5.1 Meath County Development Plan 2021-2027

A review of the Meath County Development Plan, Strategic Flood Risk Assessment (SFRA) for 2021-2027 which came into effect in November 2021 shows the Fosterstown ESB 110 kV substation outside flood zones A and B, and is therefore considered to be in Flood Zone C.

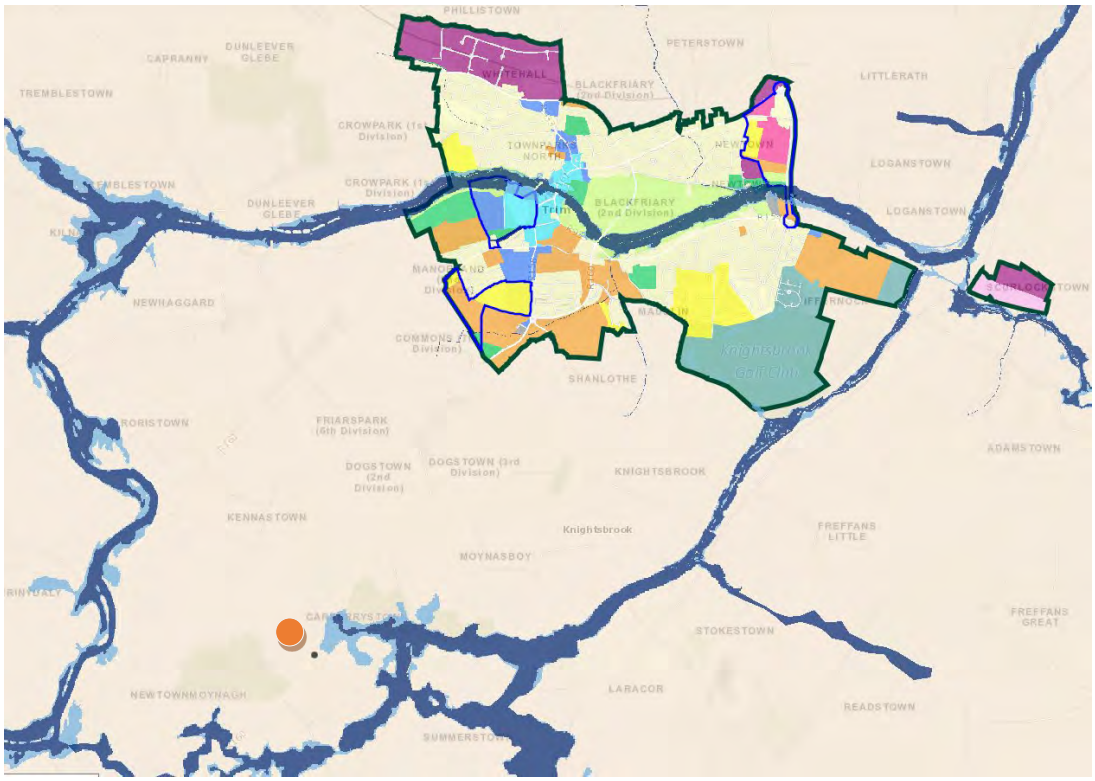


Figure 5-1 - Excerpt from Meath County Development plan 2021-2027 Strategic Flood Risk Assessment Online. Meath SFRA 2021-2027 Mapping - Accessed Feb 2024. Fosterstown 110 kV station location shown as red circle. Flood zones A & B shown in dark and light blue respectively

5.2 Fluvial Flood Risk

The Moynasboy, a small tributary of the Knightsbrook river, flows in a south to north direction as it passes the Fosterstown ESB 110 kV substation at is nearest point 0.7 km to the south-east.

The Boyne river flows south to north 1.35 km to the west of the subject site (see Figure 5-2).

Figure 5-2 - Watercourses Close to the Fosterstown 110 kV Substation.

5.2.1 Catchment Flood Risk Assessment Management Studies (CFRAMS)

As part of Ireland's obligations under the EU "Floods" Directive, the OPW is currently engaged in the generation of new mapping which will provide predictive estimates of the extent of floodplains as part of its CFRAMS. This programme is being undertaken on a River Basin District basis.

The Fosterstown ESB 110 kV substation is located within the Eastern CFRAM Study which was carried out between 2011 and 2016. The Eastern CFRAM Study covers approx. 6,300 km^2 of land and includes the Greater Dublin Area and its commuter belt. Fosterstown is located within the Unit of Management (UoM)/ Hydrometric Areas (HAs) area 07 (Boyne), commonly referenced as UoM/HA07-Boyne which covers an area of approx. 2,695 m^2. Finalised flood maps are available through floodinfo.ie.

5.2.1.1 CFRAMS Mapping

The CFRAMS maps present indicative extents of lands at risk of flooding, predicted flood depths and predicted water levels in watercourses. The mapping indicates the following in terms of Annual Exceedance Probability (AEP):

- Indicative extent of lands with 1-in-10 probability of flooding in any given year;
- Indicative extent of lands with 1-in-100 probability of flooding in any given year (generally corresponds with Flood Zone A as defined in Section 3 above); and
- Indicative extent of lands with 1-in-1000 probability of flooding in any given year (generally corresponds with Flood Zone B as defined in Section 3 above).

The Fosterstown 110 kV substation is located approximately 1.45 km from the 0.1% AEP flood event mapping extents (see Figure 5-4). This also places the site outside any current available CFRAMS flood risk mapping as shown in Figure 5-3. With relation to the CFRAM mapping, this site is classed as being located outside 0.1% AEP flood zone.

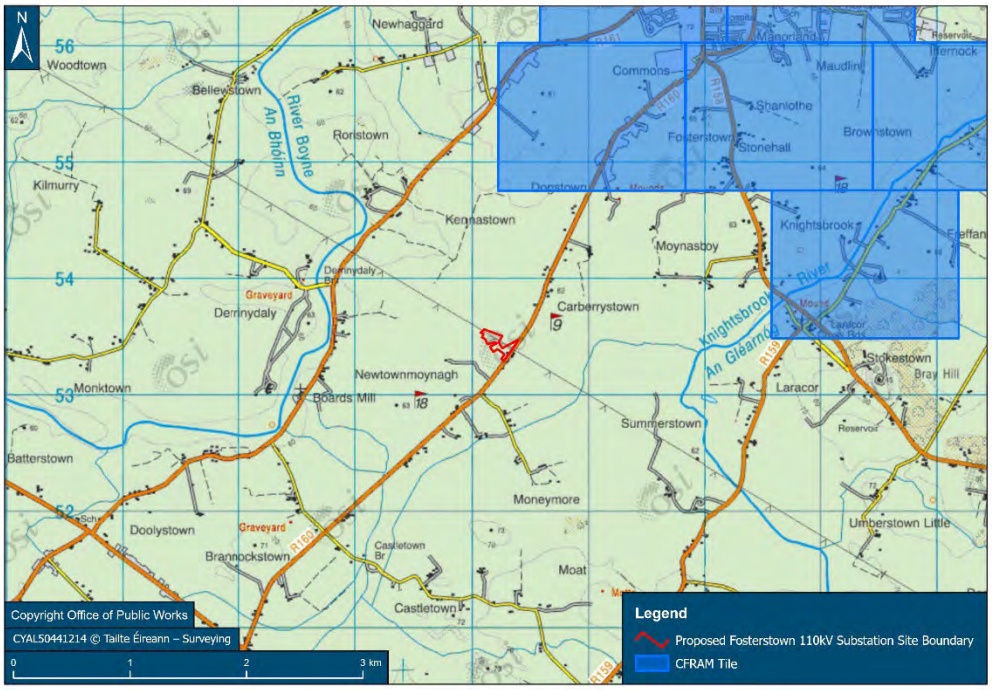


Figure 5-3 - Extents of CFRAM mapping with reference to the Fosterstown 110 kV substation.

Figure 5-4 - CFRAMS Present day fluvial flood risk

The lands adjacent to the eastern bank of the Boyne River is shown to have an elevation of 57 mAOD. The lowest point recorded at the Fosterstown 110 kV substation is 60.5 mAOD, which is 3.5 m above levels estimated in the lands adjacent the eastern bank of the Boyne River (source: Google Earth). This finding coupled with the distance to the Boyne river from the site (1.3 km) demonstrates, to an acceptable level of certainty, that the site is not at risk of fluvial flooding and that with respect to CFRAM mapping the site can be regarded as being outside the 0.1% AEP flood zone.

The www.floodinfo.ie maps 'National Indicative Fluvial Mapping' (NIFM) layer presents the modelled extents of fluvial flooding during a theoretical flood event with estimated probability occurrences of both 1.0% and 0.1% in contrast to information based on actual floods which have occurred historically.

This data has been produced for catchments greater than 5 km^2 in areas where CFRAM flood maps were not produced.

The Floodinfo.ie provides guidance notesfloodinfo.ie guidance notes (accessed 25/10/2023) on the use of NIFM to assess flood risk and states that,

"The maps only provide an indication of areas that may be prone to flooding. They are not necessarily locally accurate and should not be used as the sole basis for defining the Flood Zones nor for making decisions on planning applications."

When providing guidance on the accuracy of the NIFM, the floodinfo.ie guidance notes state that the NIFM is not as accurate as the CFRAMS mapping and should not be the only source of information for making planning decisions. However, this report does not solely refer to the NIFM and uses multiple sources of information.

The site is located approximately 0.605 km from NIFM present day 'low' flood risk associated the Moynasboy river. Due to the distance from the site this is not deemed a relevant flood risk for the site.

From considering the above guidance from Floodinfo.ie, reviewing the CFRAM mapping, assessing the NIFM mapping as referred to in Figure 5-5, reviewing climate change in section 5.6, we may assess the flood risk of the site.

Figure 5-5 - NIFM Present day fluvial flood risk

5.2.2 Arterial Drainage Scheme Benefited Lands

Arterial Drainage Schemes (ADS) were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. Rivers, lakes weirs and bridges were modified to enhance conveyance, embankments were built to control the movement of flood water and various other work was carried out under Part II of the Arterial Drainage Act, 1945.

The purpose of the schemes was to improve land for agriculture. To ensure that the 3 – year flood was retained in bank, this was achieved by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows. Flood protection in the benefiting lands was increased as a result of the Arterial Drainage Schemes. Under the Arterial Drainage Act, 1945, the OPW are required to maintain drainage works in proper repair and effective condition.

While drainage schemes were originally developed to provide drainage of agricultural land, they have significantly reduced the risk of flooding to the extent that many areas which historically had high risk of river flooding now have a low level of risk.

The Fosterstown 110 kV substation will be located within the Boyne ADS (C1) under the Eastern Region to which the works were completed between 1969 to 1986. The nearest OPW maintained arterial drainage network is located 150 m to the north of the station in the neighbouring field. Its branch reference number is: C1/25/2 (See Figure 5-6 for reference). There is no previous flood history associated with this drain as discussed in Section 4.2 previously. The proposed development will not have an impact on this drain.

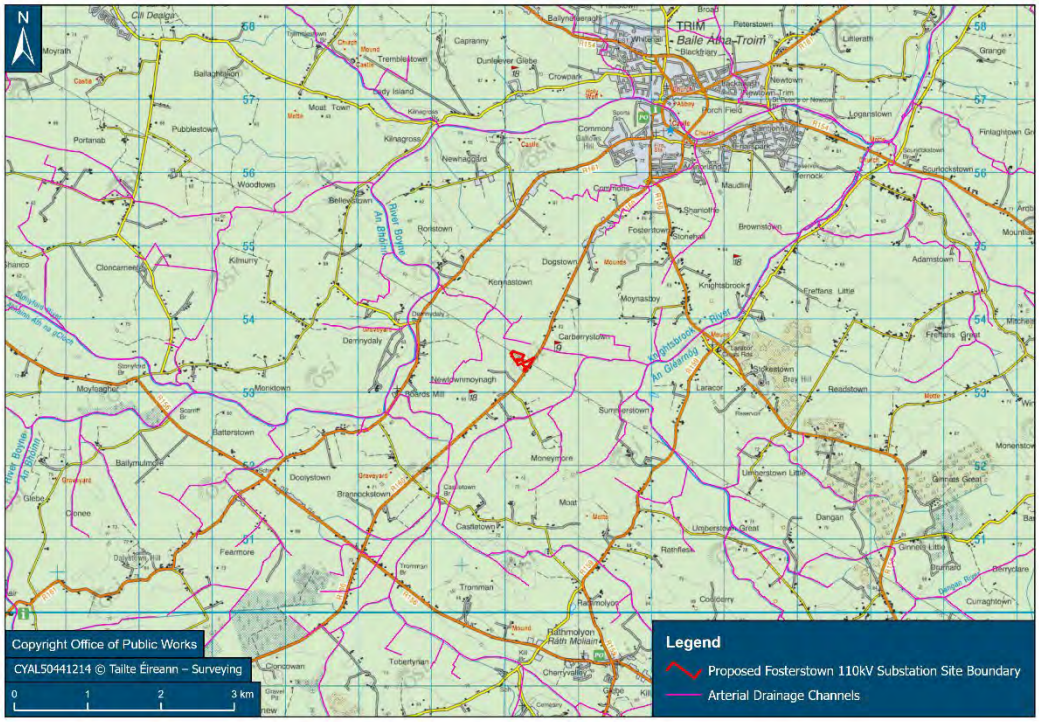


Figure 5-5 - Arterial Drainage Scheme

5.3 Coastal Flood Risk

The Fosterstown 110 kV Substation is located approximately 44 km inland. The nearest tidal estuary flows from the river Boyne to the Irish Sea at Drogheda 39 km away from the site to the east.

The predicted coastal flood extents for the 0.1% AEP are between Navan and Slane approximately 20 km away. The site is therefore not at risk to coastal flooding.

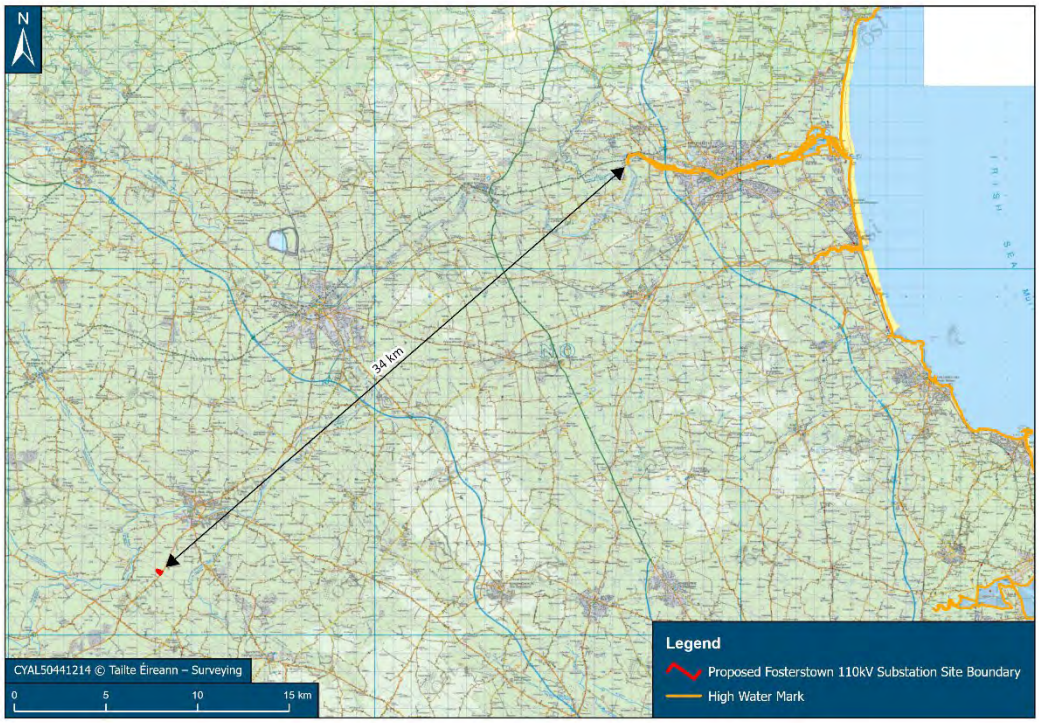


Figure 5-6 - Fosterstown 110 kV substation (marked with red '+')

5.4 Pluvial Flood Risk

The site of the proposed development is currently a greenfield site. The surface water proposals for the proposed works will be developed to mimic the natural drainage patterns of the site in accordance with the Best Management Practices (BMPs) of Sustainable Drainage Systems (SuDS). The surface water proposals will replicate the greenfield drainage conditions of the site where possible.

Storm water drainage systems, consistent with the criteria set out in the Greater Dublin Strategic Drainage Study (GDSDS) Code of Practice for Developers, will generally minimise the risk of flooding from pluvial sources and these measures are appropriately catered for by Meath County Council's design requirements under the planning application process. In view of this and given there are no known previous flood events at the site to suggest that the site is at risk to pluvial flooding, the site is not considered to be at risk to pluvial flooding.

5.5 Groundwater Flood Risk

The Geological Survey of Ireland (GSI) mapping indicates that the site is underlain by Lucan Formation. There are no karst features in the greater vicinity of the site, with the nearest being approx. 7 km away.

The Groundwater Flood Probability maps show less than 0.1% probability of ground water flooding, and there are no historic groundwater flood events in the locality.

It is therefore deemed that the proposed development is not at risk to groundwater flooding.

5.6 Climate Change

The OPW released a report on *"Implementing the National Flood Risk Policy*" in May 2018. The report summarises the measures put in place to manage Ireland's flood risk, provides a summary of the outputs of the national CFRAM Programme and outlines the arrangements for implementation of the proposed measures set out in the 29 No. Flood Risk Management Plans. The report states that climate change will impact the flood risk in Ireland, resulting in the rise of sea level, a projected increase in the number of heavy rainfall days per year and projected wetter winters.

The OPW recommends that a climate change factor of up to 20% be considered for river flows. The report states that *"While there is considerable uncertainty associated with most aspects of the potential impacts of climate change on flood risk (e.g., how fast sea levels will continue to rise into the future), the OPW considered that it was prudent to take the potential changes into account in the development of proposed measures in the Flood Risk Management Plans. Therefore, the OPW's appraisal of flood risk and the choice of the measures proposed for Flood Risk Management Plans considered the assessment of risk for two potential future scenarios, the:*

- *Mid-Range Future Scenario – increase in rainfall of 20% and sea level rise of 500mm (20 inches), and*
- *High-End Future Scenario – increase in rainfall of 30% and sea level rise of 1000mm (40 inches)".*

5.6.1 Meath SFRA

Each county council compiles their own strategic flood risk assessment based on the OPW's guidelines. Below are the provisions for future scenarios as set out in the Meath SFRA 2021-2027.

Table 5-1 - Allowances for Future Scenarios (100 Year Horizon)

Criteria	MRFS	HEFS
Extreme Rainfall Events	+20%	+30%
Flood Flows	+20%	+30%
Mean Sea Level Rise	+500 mm	+1000 mm

Figure 5-7 - Mid-Range Future Scenario Fluvial Flood Extents in relation to the Fosterstown 110 kV substation

Figure 5-8 - High-Range Future Scenario due to a 30% increase in annual rainfall in relation to the Fosterstown 110 kV substation

Figure 5-8 and Figure 5-9 illustrate the potential impact of climate change on the predicted fluvial flood extents under the Mid-Range Future Scenario (MRFS) and High-End Future Scenario (HEFS) respectively and illustrates that the site lies outside the predicted flood zone of flood extents of the Boyne river which is within the boundary of the nearest CFRAM mapping flood extents.

6 Impact of Development on Current Flood Regime in the Area

6.1 Impact of Site Surface Water Runoff

Surface water proposals for the proposed works will be developed to mimic the natural drainage patterns of the site in accordance with the BMPs of SuDS. The surface water proposals will replicate the greenfield drainage conditions of the site where possible.

Surface water storage up to the 1 in 100-year rainfall event will be provided on site for the proposed development as discussed in the Engineering Services Report included with the planning pack. Surface water will discharge to a soakaway located to the northeast of the site. Surface water runoff from the proposed development will be discharged at a controlled rate to replicate greenfield conditions.

It is therefore considered that the proposed development will not impact on the current flood regime in the area.

6.2 Loss of Floodplain

The proposed development will not result in loss of floodplain as the site is not near any areas which are vulnerable to fluvial flooding. Therefore, no compensatory floodplain storage is required to be provided as a result of the proposed development.

7 Application of Flood Risk Management Guidelines

7.1 Flood Zone & Vulnerability Class of the Site

As demonstrated in Sections 4 and 5 previously;

1. The development is classified as highly vulnerable development and is located within Flood Zone C;
2. The development is appropriate development in Flood Zone C and does not require a Justification Test to be carried out;
3. The site is not at risk from fluvial flooding;
4. The site is not at risk from coastal flooding;
5. The site is not considered at risk from pluvial flooding in its current state, or in the proposed scenario; and
6. The site is not considered to be at risk of groundwater flooding.

8 Conclusion

A flood risk assessment was carried out to establish if the proposed 110 kV GIS substation at Fosterstown, Co. Meath would be at risk to flooding.

Following the findings of this assessment, the construction of the Fosterstown 110 kV substation and associated works is not considered at risk to flooding.

The site is located in Flood Zone C as defined by the '*The Planning System and Flood Risk Management Guidelines*' summarised in Table 3-1 and found in Section 3.1. The proposed substation is classified as a highly vulnerable development which is permissible in Flood Zone C.

Surface water proposals for the proposed works will be developed to mimic the natural drainage patterns of the site in accordance with the Best Management Practices of SuDS. The surface water proposals will replicate the greenfield drainage conditions of the site where possible.

The proposed development will not increase the current flood risk in the catchment.

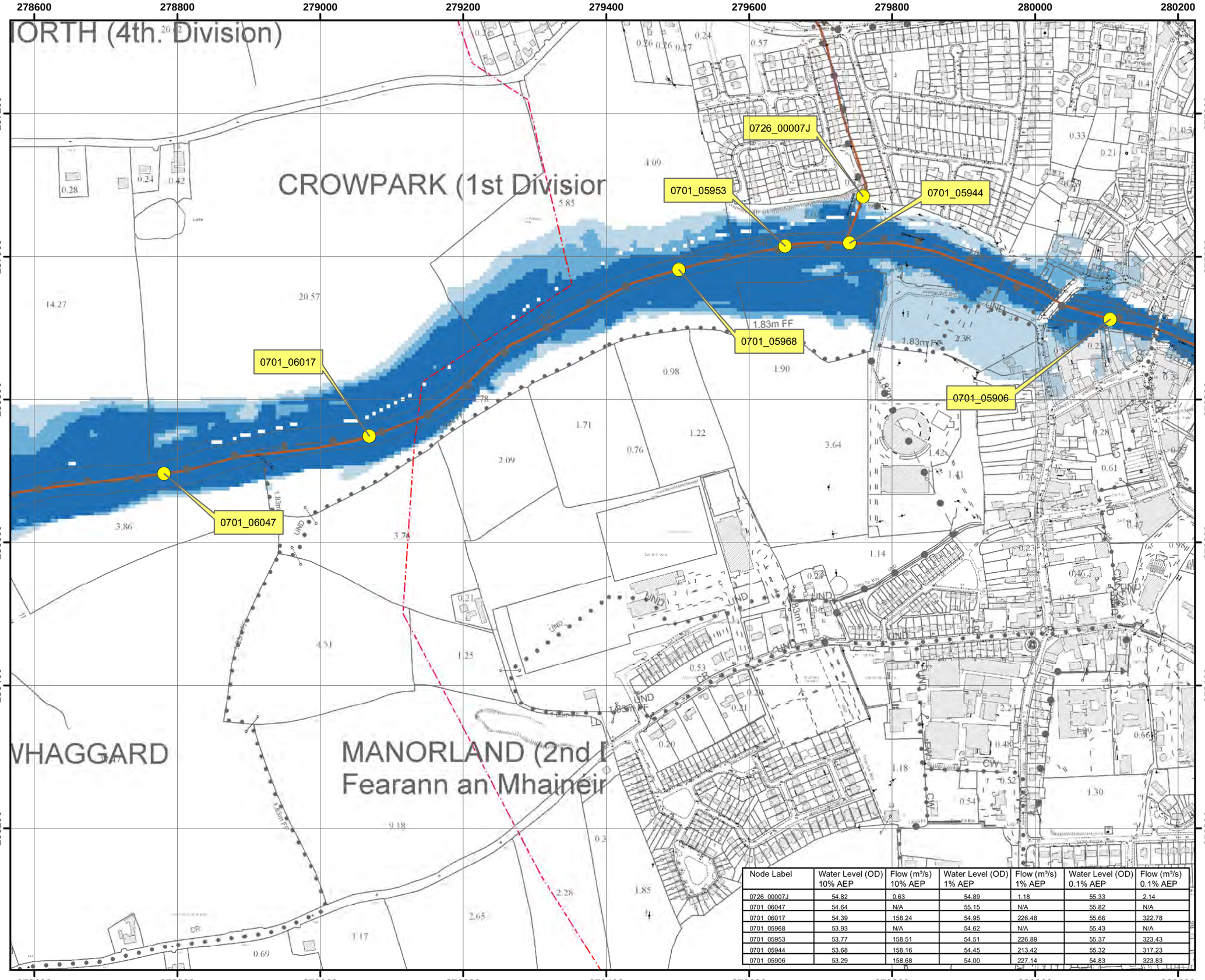
Appendix A – Proposed Layout

- Drawing No. PE492-D282-016-004-002– Proposed Substation Layout

Appendix B: Topographic Survey

Appendix C – Eastern CFRAMS Map

- Eastern CRFAM Study – Boyne Fluvial Flood Extents: E07TRI_EXFCD_F0_05



Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
0726_00007J	54.82	0.63	54.89	1.18	55.33	2.14
0701_06047	54.64	N/A	55.15	N/A	55.82	N/A
0701_06017	54.39	158.24	54.95	226.48	55.66	322.78
0701_05968	53.93	N/A	54.62	N/A	55.43	N/A
0701_05953	53.77	158.51	54.51	226.89	55.37	323.43
0701_05944	53.68	158.16	54.45	213.42	55.32	317.23
0701_05906	53.29	158.68	54.00	227.14	54.83	323.83

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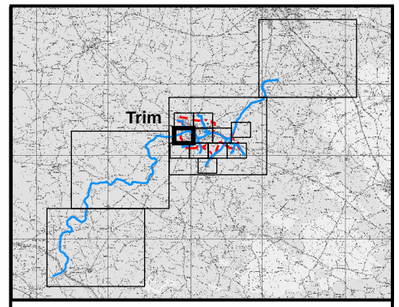

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW
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Map:
Trim Fluvial Flood Extents

Map Type: EXTENT
Source: FLUVIAL
Map Area: HPW
Scenario: CURRENT
Drawn By : F.M.C. **Date :** 15 July 2016
Checked By : M.N. **Date :** 15 July 2016
Approved By : S.P. **Date :** 15 July 2016
Drawing No. :
E07TRI_EXFCD_F0_05
Map Series : Page 5 of 15
Drawing Scale : 1:5,000 @ A3

Appendix D – Historic Flood Reports

- OPW Hydrometric Report November 1968 – January 1969
- Photos Flooding at Derrindaly Bridge Nov. 2002

Moy: Higher than average rainfall fell during December and January. In Ballina, 140 m.m. fell in December, much of it in the week before Christmas. In a 25 hour period on 10th/11th January 43 m.m. was recorded. There was no flooding in any part of the catchment where drainage has been carried out.

Inny: The rainfall during December and January was heavy but not exceptional. No major flooding was experienced in any part of the catchment.

Boyne: There was flooding in several areas, notably at Derrinadaly, near Trim and at Kilcarn, near Navan where public roads were flooded.

Deel: There was a lot of rain during December and January. There were particularly heavy falls about 11th-13th December (56 m.m.), 23-24th December (62 m.m), and 9th - 12th January (43 m.m.) On these three occasions there was flooding in the Deel Valley upstream of Enniskeane, at Deel Bridge, and on the latter two occasions, at Ballinlaha - Bunoke. The duration of flooding on all occasions was about 24 hours. Water levels are still high and the weather remains wet.

Feale: On 23-24th December 84 m.m. of rain was recorded at Listowel. No flooding was reported except minor flooding of back-drains.

Maine: There was slight flooding of back-drains.

Shannon Estuary: There was some flooding near Adare and minor flooding of back-drains.

Corrib: The rainfall was average for the time of year except for the 14th December, 24th December and 10th January on each occasion of which there was about 24 hours of continuous rain. The Corrib-Clare scheme performed well and there was no flooding except upstream of Tuam and at Culnacheeva Bridge where small areas were flooded for a day or so. There was no flooding of those areas on the Headford in which our works have been completed. There was some flooding near Belclare and Turloughcor Turloughs. Some roads were flooded at Oughterard where our works have not yet reached.

Killimor: There was prolonged heavy rain on 23rd-24th December which produced the highest recorded post drainage flows in both the Killimor and the Cappagh rivers. There was, however, no flooding except some minor flooding of back drains in the embanked area.

Carrigahorig: Heavy rainfall for 22nd-24th December was recorded at Birdhill (72 m.m.) Killaloe (79 m.m.) and Portumna 42 m.m. All the low lying lands in the Catchment are flooded but our works so far have relieved the annual flooding of the Carrigahorig - Portumna Road.

Nenagh: Rainfall there was similar. At Clarianna bridge, where the design flow is 1800 c.f.s. the discharge at peak was of the order of 3000 c.f.s., a considerable area of land was under water for about 24 hours. There was flooding also at Ballyartella where the road and a mill were flooded, at Islandbawn the Nenagh-Dublin road, a dwellinghouse and a shop were flooded for 12 hours. The flat land adjoining Nenagh was flooded for 24 hours. There was some flooding also in the embankment section where the capacity of the pumps was exceeded by the inflow.

Abbey & Duff: These schemes worked well.

Swilly: There was heavy rain (approximately 50 m.m. in 24 hours) in early November as a result of which a partly completed embankment on the Skeagh was breached and a large area of land flooded. At about the same time there was minor flooding of back-drains on the Blanket Nook. All the other Swilly schemes worked well and no flooding was reported.

Deale & Swillyburn: The scheme worked well. There was minor flooding near back-drains.

Brosna: There has been a lot of rain since mid-December, the heaviest fall being on the 24th when it rained continuously for about 18 hours particularly in the south of the catchment. The highest flow of the post-drainage period was recorded at Rahan on the Clodiagh River. There was some flooding of farmland upstream of Tullamore and at Pollagh and Ballycumber on the main channel. This flooding lasted only one day and, despite further heavy rain, it has not been repeated.

Clyde & Dee: The heaviest rain of the winter occurred towards the end of November. Continuous rainy weather since then has kept the River Clyde high but no flooding has been reported. There has been some flooding on the Dee downstream of Ardee on one or two occasions but it has not persisted more than a day or two.

Broadmeadow & Ward. Hatt: There has been a lot of rain since the beginning of December, the heaviest being on 24th. The flood which followed this was contained within the channels in all cases and no flooding has been reported.

7th February, 1969

Appendix D – Noise Impact Assessment

ALIVE ENVIRONMENTAL LTD

Noise Impact Assessment Report

Fosterstown 110kV Substation

Energy for generations

APRIL 2024

Contents

1. INTRODUCTION

This report has been prepared as supporting information for the application seeking full planning permission for a 110kV substation at Fosterstown, County Meath. This report has been prepared by Stephen Cleary (BA[Mod] MSc MIOA MIEMA CEnv) of Alive Environmental Ltd, who has over 20 years experience in the area of Noise Impact Assessment.

Section 2 of the report provides a description of the existing site and the proposed development to provide context of the site and its surroundings in the context of the proposed development. Section 3 provides a summary of existing noise guidance documents relevant to this report. A description of the methodology and results from the noise monitoring survey are provided in Section 4 of the report. Sections 5 and 6 contain a detailed impact assessment for the proposed development during construction and operational phases, while Section 7 includes an outline of relevant mitigation measures.

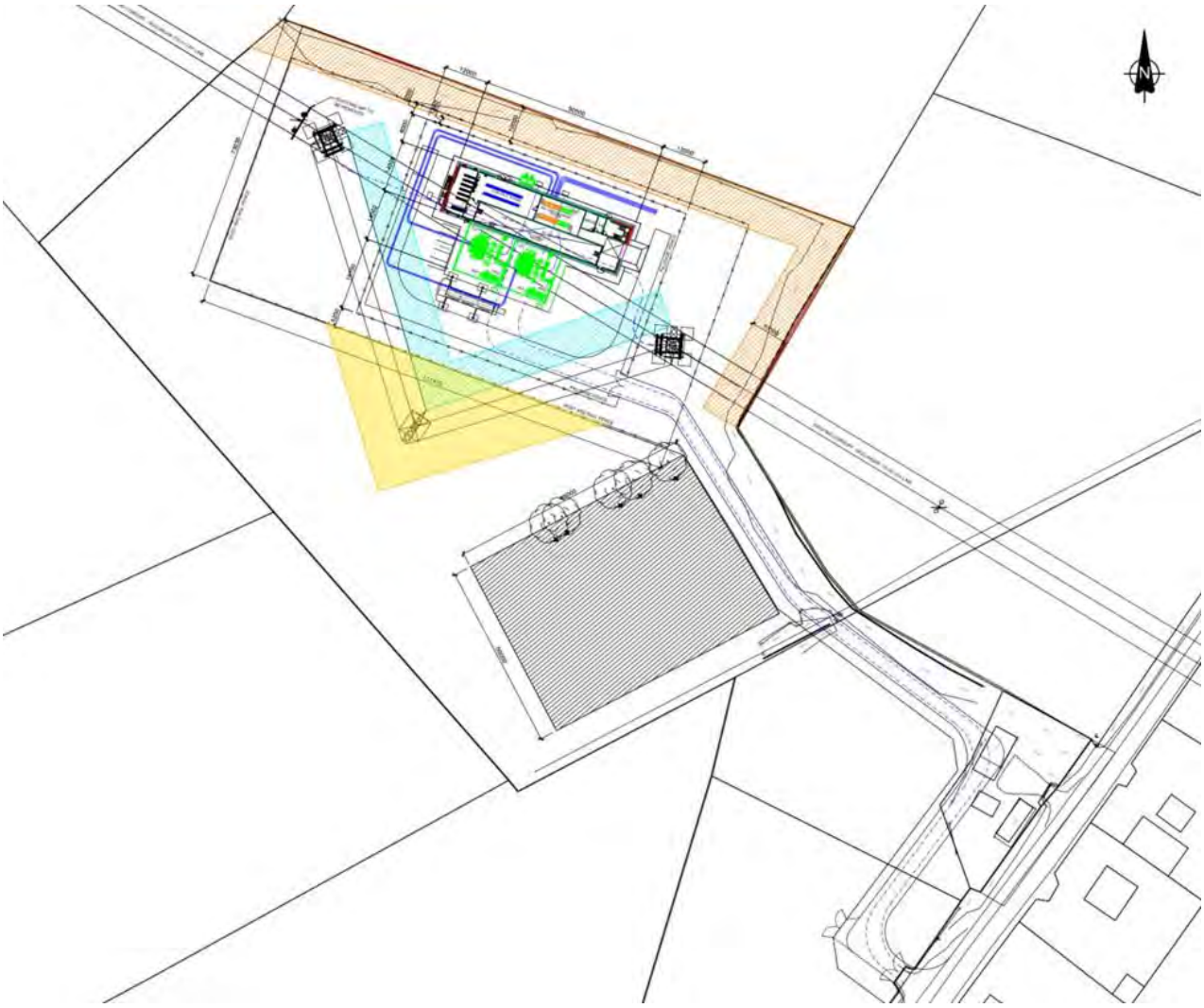
The report should be read in conjunction with Appendix 1 which includes calibration certificates for the noise monitoring equipment used during the survey.

2. SITE DESCRIPTION

The proposed site is located on lands adjacent to the R160 route, approximately 3km south-west of the town of Trim. The study area consists of agricultural lands, while two golf courses are present approximately 300m south-west and 300m north-east of the proposed site. A row of five residential properties is located off the R160 directly across the road to the proposed site.

Figure 2.1 illustrates the layout of the proposed 110kV substation.

Figure 2.1: Layout of Proposed 110kV Substation



3. RELEVANT NOISE GUIDANCE DOCUMENTS

3.1 Environmental Protection Agency (EPA) Office of Environmental Enforcement (OEE) - Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

This document relates primarily to noise surveys and assessments for EPA licensed facilities but in the absence of any other directly applicable guidance documents, it provides useful reference material for the purposes of completing the noise assessment for the proposed development.

The EPA published two earlier documents in relation to the survey, assessment and management of noise emissions from licensed facilities, namely the *Environmental Noise Survey Guidance Document* (commonly referred to as NG1) and *Guidance Note for Noise in Relation to Scheduled Activities - 2nd Edition* (commonly referred to as NG2). These two documents have been withdrawn with the publication of NG4.

NG4 provides detailed consideration of a range of noise related issues including basic background to noise issues, various noise assessment criteria and procedures, noise reduction measures, Best Available Techniques (BAT) and the detailed requirements for noise surveys. NG4 provides typical limit values for noise from licensed sites, namely:

- Daytime (07:00 - 19:00) - 55dB $L_{Ar,T}$;
- Evening (19:00 - 23:00) - 50dB $L_{Ar,T}$:
- Night-time (23:00 - 07:00) - 45dB $L_{Aeq,T}$.

In the description of the limits above, the $L_{Aeq,T}$ is the equivalent continuous sound level over the measurement period and $L_{Ar,T}$ is equal to the L_{Aeq} but includes an additional penalty of 5dB(A) to account for any tonal or impulsive characteristics to the noise source.

The threshold limits presented above are used in the general context of the noise impact assessment included in this report.

Other EPA guidelines such as *Guidelines on the Information to be Contained in Environmental Impact Statements [2022]* and *Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements) [2003]* have been considered also in the preparation of this Noise and Vibration Chapter.

3.2 World Health Organisation (WHO) Guidelines

In the World Health Organisation (WHO) Guidelines for Community Noise (1999), a LAeq threshold daytime noise limit of 55 dB is suggested for outdoor living areas to protect most people from being seriously annoyed. A second daytime limit of 50 dB is also given as a threshold limit for moderate annoyance.

The guidelines suggest that an internal LAeq not greater than 30 dB for continuous noise is needed to prevent negative effects on sleep. This is equivalent to a façade level of 45 dB LAeq, assuming open windows or a free-field level of about 42 dB LAeq. If the noise is not continuous, then the internal level required to prevent negative effects on sleep is a LAmax,fast of 45 dB. Therefore, for sleep disturbance, the continuous level as well as the number of noisy events should be considered.

The WHO Night Noise Guidelines for Europe was published in 2009 on the back of extensive research completed by a WHO working group. Considering the scientific evidence on the threshold of night noise exposure indicated by Lnight,outside as defined in the Environmental Noise Directive [2002/49/EC], a Lnight,outside of 40dB should be the target of the night noise guideline (NNG) to protect public, including the most vulnerable groups such as children, the chronically ill and the elderly. An interim target of 55dB is recommended where the NNG cannot be achieved. These guidelines are applicable to Member States of the European Region and may be considered as an extension to the previous WHO Guidelines for Community Noise (1999).

In 2011, the WHO published the Methodological Guidance for Estimating the Burden of Disease from Environmental Noise. This document outlines the principles of quantitative assessment of the burden of disease from environmental noise, describes the status in terms of the implementation of the European Noise Directive and reviews evidence on exposure-response relationships between noise and cardiovascular diseases.

In 2018, the WHO Regional Office for Europe has developed guidelines, based on the growing understanding of health impacts of exposure to environmental noise. The main purpose of these guidelines is to provide recommendations for protecting human health from exposure to environmental noise originating from various sources: transportation (road traffic, railway, and aircraft) noise, wind turbine noise and leisure noise. Leisure noise in this context refers to all noise sources that people are exposed to due to leisure activities, such as attending nightclubs, pubs, fitness classes, live sporting events, concerts or live music venues and listening to loud music through personal listening devices.

The 2018 guidelines are published by the WHO Regional Office for Europe. In terms of their health implications, the recommended exposure levels can be considered applicable in other regions and suitable for a global audience.

3.3 British Standard BS8233:2014 – Guidance on sound insulation and noise reduction for buildings

BS8233:2014 provides guidance values for a range of ambient noise levels within residential properties as shown in Table 3.1 below.

Table 3.1: Internal Ambient Noise Levels

Activity	**Location**	**07:00 – 23:00**	**23:00 – 07:00**
Resting	Living Room	35 dB $L_{Aeq16hr}$	
Dining	Dining Room/Area	40 dB $L_{Aeq16hr}$	
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq16hr}$	30 dB $L_{Aeq16hr}$

The standard allows for a further relaxation in standards of up to 5dB where "development is considered necessary or desirable". In relation to external amenity areas such as gardens and patios, the standard states that it is desirable that external noise does not exceed 50 dB LAeq,T with an upper guideline value of 55 dB LAeq,T.

3.4 British Standard BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures (BS, 7445-1)

BS 7445 provides the framework within which environmental noise should be quantified. Part 1 of the standard provides guidance to quantities and procedures in relation to environmental noise monitoring. Meteorological conditions are not prescribed but it is recommended that wind speed should not exceed 5 m /s at height of 3-11m above ground, any temperature inversions near ground, or heavy precipitation.

3.5 British Standard BS4142:2014+A1:2019 – Method for rating and assessing industrial and commercial sound

BS4142:2014 describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

BS 4142 also provides procedures in determining if the noise in question is likely to give rise to complaints from residents in the vicinity.

BS 4142 states that one should 'obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level and consider the following:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on the context.
d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The rating level is based upon the specific noise level of the noise source in question. A correction should be applied to the specific noise level to obtain an increased rating level if 'a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.

To summarise, BS4142 section 9.2 advises the following regarding corrections for acoustic characteristics:

- Tonality – for sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.
- Impulsivity – A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.
- Other sound characteristics – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.
- Intermittency – When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

3.6 British Standard BS5228:2009+A1:2014 Noise and Vibration Control on Construction and Open Sites

This British standard consists of two parts and covers the need for protection against noise and vibration of persons living and working in the vicinity of construction and open sites. The standard recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.

Part 1 of the standard provides a method of calculating noise from construction plant, including:

- Tables of source noise levels;
- Methods for summing up contributions from intermittently operating plant;
- A procedure for calculating noise propagation;
- A method for calculating noise screening effects; and
- A way of predicting noise from mobile plant, such as haul roads.

The standard also provides guidance on legislative background, community relations, training, nuisance, project supervision and control of noise and vibration.

The ABC method outlined in Section E3.2 has been used for the purposes of determining whether the predicted noise levels from the construction activities will result in any significant noise impact at the nearest noise sensitive properties.

Table 3.2 below outlines the applicable noise threshold limits that apply at the nearest noise sensitive receptors. The determination of what category to apply is dependent on the existing baseline ambient (LAeq) noise level (rounded to the nearest 5dB) at the nearest noise sensitive property. For daytime, if the ambient noise level is less than the Category A threshold limit, the Category A threshold limit (i.e. 65dB) applies. If the ambient noise level is the same as the Category A threshold limit, the Category B threshold limit (i.e. 70dB) applies. If the ambient noise level is more than the Category A threshold limit, the Category C threshold limit (i.e. 75dB) applies. The applicable limits that apply to each of the sensitive receptors are presented in Section 7 of this report.

Table 3.2: Noise Threshold Limits at Nearest Sensitive Receptors

	Threshold Limits [dB(A)]		
	Category A	**Category B**	**Category C**
Night-time (23:00 - 07:00)	45	50	55
Evening and Weekends (19:00 - 23:00 Weekdays, 13:00-23:00 Saturdays, 07:00-23:00 Sundays)	55	60	65
Weekday daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

3.7 Vibration Guidance Documents

Limits of transient vibration, above which cosmetic damage could occur, are given numerically in Table 3.3 (Ref: BS5228-2:2009+A1:2014). Minor damage is possible at vibration magnitudes which are greater than twice those given in Table 3.3, and major damage to a building structure can occur at values greater than four times the tabulated values (definitions of the damage categories are presented in BS7385-1:1990, 9.9).

Table 3.3: Transient Vibration Guide Values for Cosmetic Damage (Ref BS5228-2:2009+A1:2014)

Type of Building	Peak Particle Velocity (PPV) (mm/s) in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/S at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above.

4. NOISE SURVEY

4.1 Methodology

A baseline noise monitoring survey was completed between Thursday 15th and Monday 19th February 2024 at the proposed site. The survey period was chosen to include both weekday and weekend periods to characterise any difference between the weekday and weekend periods. The survey period was also selected to take place when there was no interference from weather conditions (i.e. no precipitation and no significant wind).

The following noise monitoring equipment was used (Calibration certificates for the equipment are contained in Appendix 1):

- Norsonic Nor140 Sound Level Meter (BS EN IEC 61672-1:2003 Class 1) [Serial No: 1402995]
- Norsonic Sound Calibrator 1251 [Serial No: 33739]

The microphone was placed at a height of 1.2 - 1.5m above ground level. The sound level meter was accurately calibrated before and after use with no drift observed.

The weather conditions during the noise monitoring survey were in accordance with the requirements of BS7445: Description and Measurement of Environmental Noise.

The following parameters were recorded during each monitoring period:

LAeq	The continuous equivalent A-weighted sound pressure level. This is an "average" of the sound pressure level.
LAmax	This is the maximum A-weighed sound level measured during the sample period.
LAmin	This is the minimum A-weighted sound level measured during the sample period.
LA10	This is the A-weighted sound level that is exceeded for noise for 10% of the sample period.
LA90	This is the A-weighted sound level that is exceeded for 90% of the sample period.

The noise monitoring location for the baseline survey is illustrated in Figure 4.1 and a view of the noise meter in-situ is included in Figures 4.2. The survey location was chosen so as to be approximately equidistant from the dominant noise source in the study area (i.e. road traffic noise from the R160) as the nearest noise sensitive properties.

Figure 4.1: Noise Monitoring Location for Baseline Survey

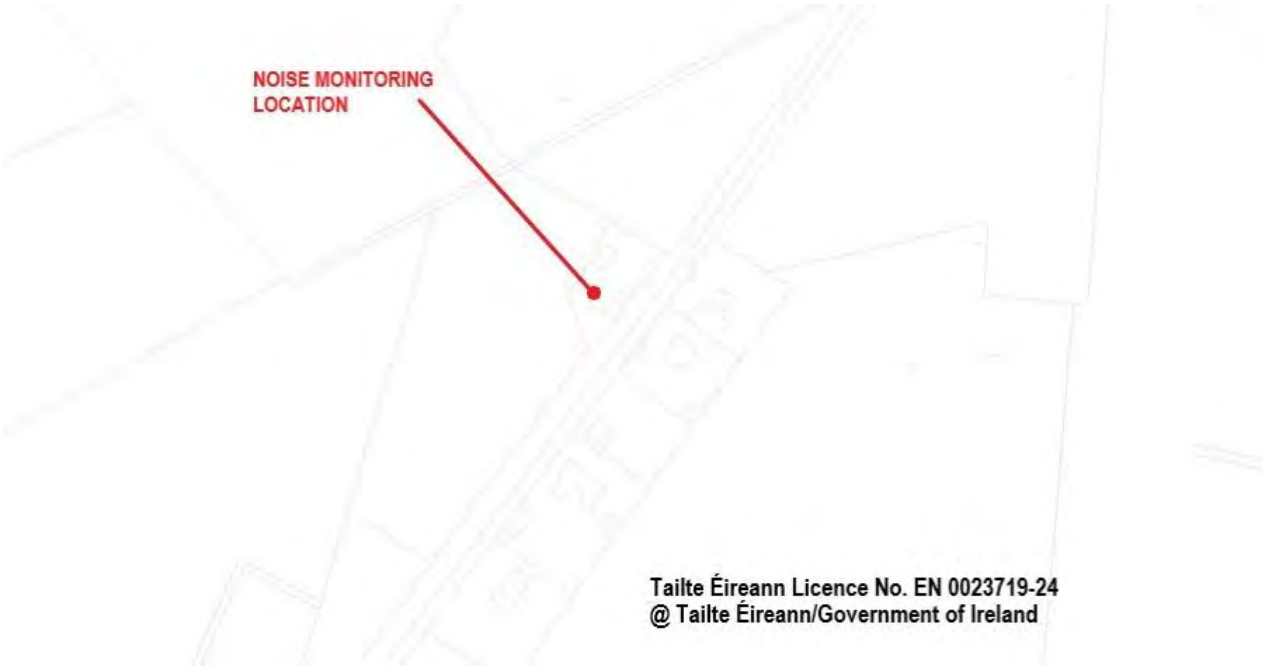
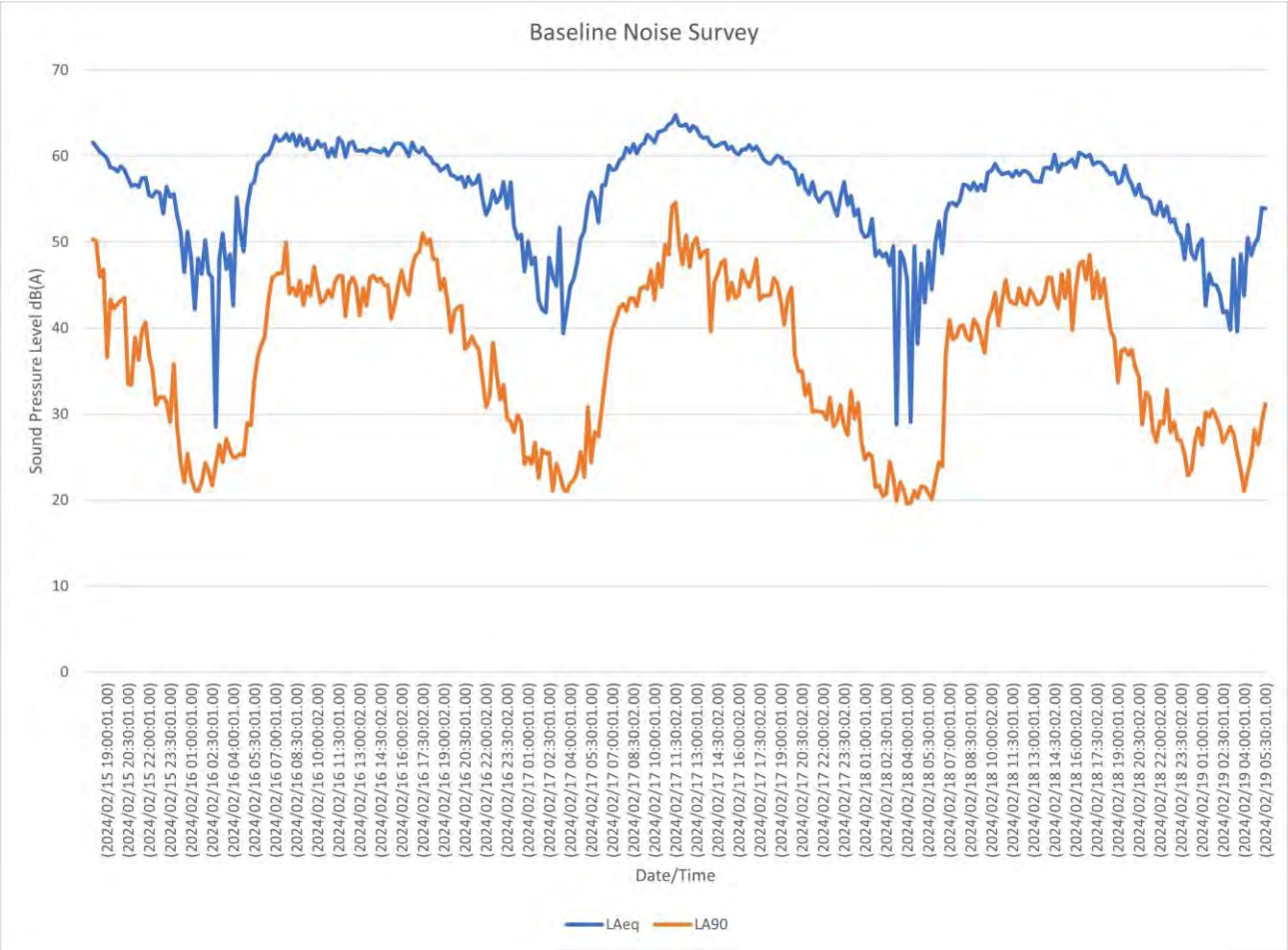


Figure 4.2: View of Noise Meter In-Situ During Baseline Survey

4.2 Noise Survey Results

Figure 4.3 illustrates the ambient noise level (L_{Aeq}) and background sound levels (L_{A90}) recorded during the noise monitoring survey. The noise monitoring data illustrates that there is a steady pattern for the ambient noise level (L_{Aeq}) and background sound levels (L_{A90}), with no significant difference between the weekday and weekend periods.

Figure 4.3: Noise Monitoring Survey Results



This assessment includes an assessment using the BS4142:2014 methodology as described in Section 3.5. The BS4142:2014 assessment methodology requires that appropriate and representative background sound levels (LA90) are determined for both day and night-time periods for the purposes of undertaking the BS4142 assessment. Under this methodology, the reference time period for daytime (07:00 – 23:00) is one hour, while the reference time period for night-time (23:00 – 07:00) is 15-minutes.

As detailed in Section 4.1, the baseline noise monitoring survey was completed over weekday and weekend periods and was completed during appropriate weather conditions so as to have no significant interference to measured noise levels from precipitation or wind.

Figures 4.4 and 4.5 present histograms illustrating the frequency distribution for daytime and night-time background sound levels (L_{A90}) at the noise monitoring location.

Figure 4.4: Frequency Distribution of Daytime Background Sound Levels (L_{A90})

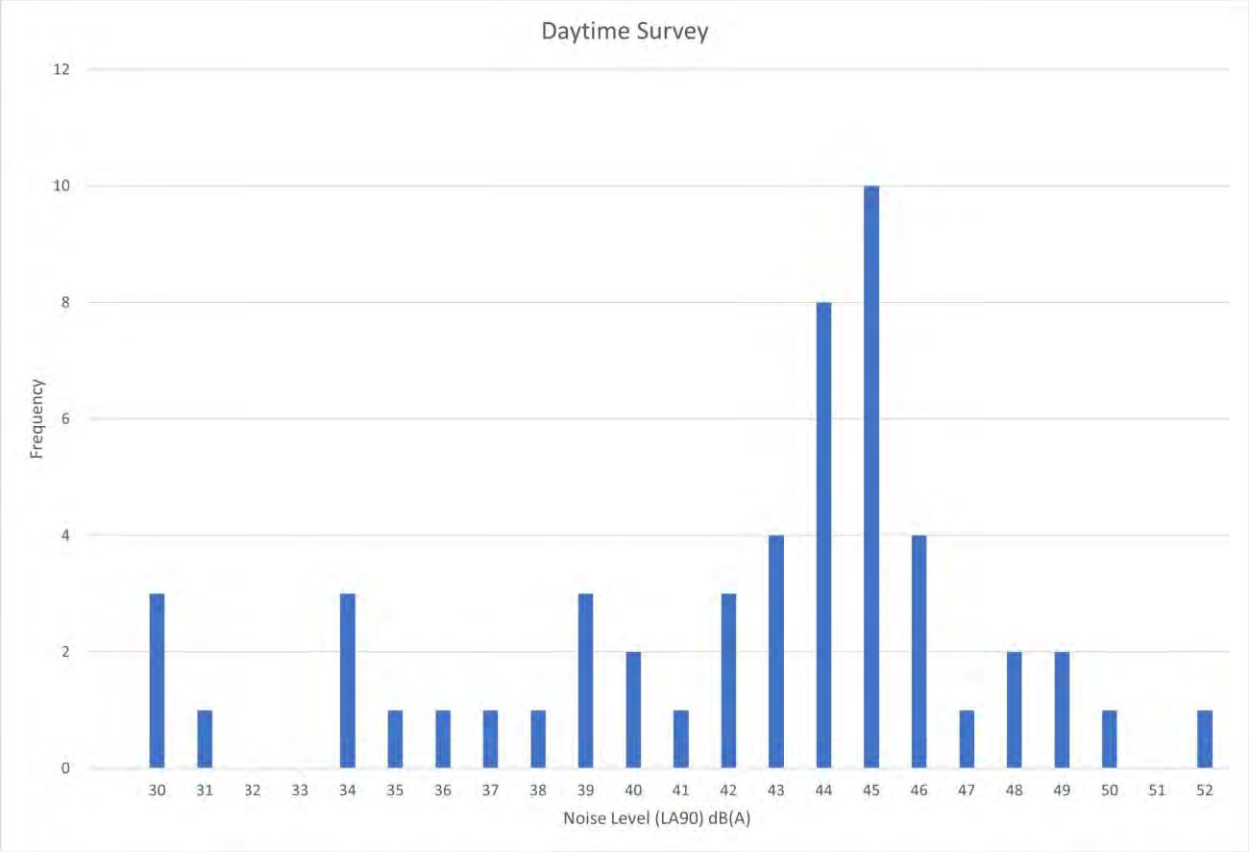
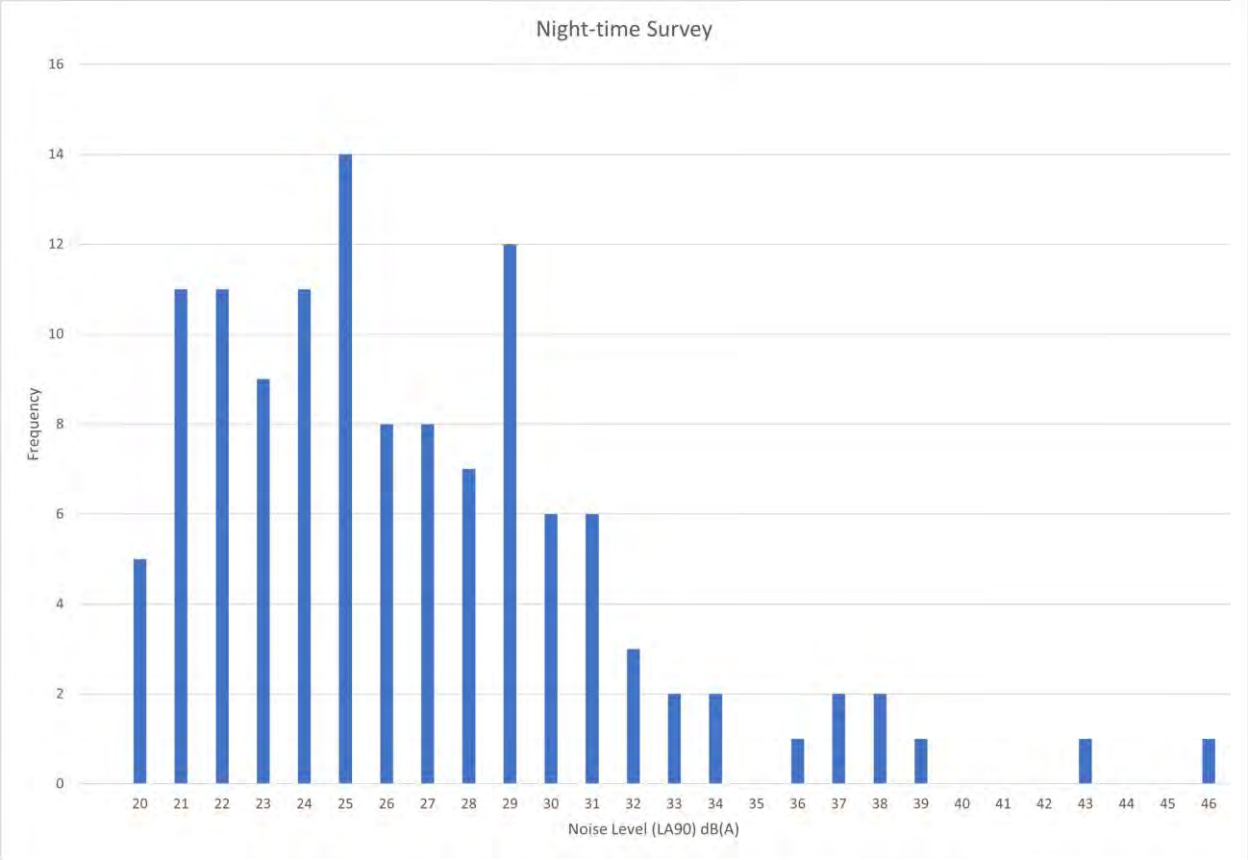


Figure 4.5: Frequency Distribution of Night-time Background Sound Levels (L_{A90})



On the basis of Figures 4.4 and 4.5, the typical background sound level (L_{A90}) for daytime and night-time periods is detailed below:

- Daytime – 45dB(A)
- Night-time – 25dB(A).

5. IMPACT ASSESSMENT – CONSTRUCTION PHASE

5.1 Description of Construction Process

Various aspects of the construction process for the proposed development are detailed in the bullet points below:

- Construction of site entrance;
- Construction of temporary site drainage works;
- Earthworks including levelling of site;
- Construction of entrance road;
- Construction of 110kV building, including foundation works and structural steelwork;
- Construction of transformer compounds;
- Construction of permanent foul and surface water drainage works;
- Construction of paving, fencing, landscaping and completion works.

Construction activities for the proposed development will take place on Monday to Fridays between 07:00 – 19:00 and on Saturdays between 08:00 – 13:00. It is not proposed that construction activities will take place outside of these hours.

Table 5.1 presents typical noise levels from various types of construction plant likely to be used during the construction process, while Table 5.2 shows typical combined construction noise levels for various construction phase activities at varying distances from the construction activities.

Table 5.1: Noise Levels for Construction Plant (Ref: BS 5228:2009+A1:2014)

Construction Phase	Plant (Reference from Annex C + D, BS5228:2009+A1:2014)	Reference from Annex C + D, BS5228	Plant Equivalent Continuous Sound Pressure Level L_{Aeq} at 10m (dB)
Site Preparation	Tracked excavator	C2.22	72
	Pneumatic breaker	D2.11	87
	Dump truck	C1.11	80
	Wheeled loader lorry	C2.26	79
	Dozer	C2.10	80
Foundations	Tracked excavator	C2.22	72
	Pneumatic breaker	D2.11	87
	Concrete pump	C3.25	78
	Compressor	C3.19	75
	Poker vibrator	C4.33	78
Steel Erection	Tower crane	C4.48	76
	Arcticulated lorry	C11.10	77
	Electric impact torque wrench		78
	Hand tools		81

General Construction	Pneumatic circular saw	D7.79	75
	Internal fit-out		70
Landscaping	Dozer	C2.10	80
	Dump truck	C1.11	80
	Surfacing	D8.25	68

Table 5.2: Typical Combined Construction Noise Levels

Activity	**L_{Aeq} @ 10 m**	**L_{Aeq} @ 40 m**	**L_{Aeq} @ 80 m**	**L_{Aeq} @ 160 m**	**L_{Aeq} @ 320 m**
Site Preparation	89	77	71	65	59
Foundations	88	76	68	62	56
Steel Erection	82	70	64	58	52
General Construction	82	70	64	58	52
Landscaping	83	71	65	59	53

5.2 Worst-Case Predicted Noise Impacts from Construction Process

Section 5.1 provides details on typical construction plant likely to be used during the construction process, while Table 5.2 provides typically combined noise levels from various plant operating simultaneously for different activities. A number of the items of plant included in Table 5.1 (e.g. tracked excavator, dump track) will be the same item of plant that will be used for different activities (e.g. dump truck used for site preparation and landscaping). The typical combined construction noise levels included in Table 5.2 are worst-case as they assume all items of plant acting simultaneously and continuously, however in reality plant activity will be more sporadic in nature with regular gaps in activity. Nevertheless, these typical combined construction noise levels are useful for the purposes of assessing the potential for worst-case construction noise impacts.

Section 3.6 includes a summary of the BS5228:2009+A1:2014 methodology, which includes relevant construction noise threshold limits based on the existing ambient noise levels at the nearest noise sensitive properties. On the basis of the existing ambient noise levels included in Figure 4.3 and the construction phase operating hours, the applicable BS5228 noise threshold limit at the nearest noise sensitive properties is the daytime Category A noise threshold limit of 65dB(A).

The majority of construction activities will take place in the area where the proposed 110kV substation building/plant and associated landscaping/paving/fencing will be located. These activities will take place at approximately 160-300m from the nearest noise sensitive properties. On the basis of the typical combined construction noise levels included in Table 5.2, worst-case construction noise levels from these activities will be in the mid-60s dB(A) or lower and within the relevant BS5228 noise threshold limit.

The site preparation and paving works associated with the entrance road from the site entrance to the 110kV substation will take place between 160-20m from the nearest noise sensitive properties. As these works come closer to the nearest noise sensitive properties and particularly at the closest point at the site entrance, there is potential for worst-case construction noise levels to increase to the high 70s / low 80s dB(A) under worst-case considerations.

It must be noted that these worst-case case construction noise predictions are an over-estimation of the likely construction noise levels that will actually be emitted from the proposed site as they assume every item of construction plant will be active simultaneously at the nearest portion of the proposed boundary to the respective sensitive receptor.

Nevertheless, these worst-case predicted noise levels serve as a useful tool in illustrating that there is potential for noise impacts during the construction phase from the activities nearest to R160. On the basis of the predicted worst-case construction noise levels from the proposed development, there will be a requirement for mitigation measures to be put in place in order to ensure that construction noise levels are reduced as much as practicable and do not significantly impact on the nearest noise sensitive receptors. Noise mitigation measures for construction activities are outlined in Section 7.

5.3 Vibration

Section 3.6 provides details on vibration threshold limits, whereby there is potential for damage to buildings. On account of the significant distance between the construction works for the proposed development and the nearest sensitive receptors, there is very limited opportunity for any significant vibration impact at these properties.

6. IMPACT ASSESSMENT – OPERATIONAL PHASE

This section contains a noise impact assessment of the operational phase of the proposed development. The primary noise source from the proposed development will be the external transformers located adjacent to the substation building.

6.1 Noise Source Data

Table 6.1 provides the primary noise source data used in the noise model. The only significant external noise source associated with the proposed substation will be two transformers. ESB have provided specification for the proposed transformers, taken from existing plant used by ESB on other sites. The station at Fosterstown is most likely to be a 110kV – 20kv Offload but this may be increased to a 110kv – 31.5 MVA. On this basis, the specification noise data for a 110kv – 31.5 MVA has been used for the purpose of completing a worst-case scenario.

Table 6.1: Noise Source Data (Transformer) Included in Noise Model

Transformer	Spectrum Data	Sound Power Level (dB) at Octave Band Centre Frequencies Z – Weighted (Hz)								Overall Sound Power (dBA)
		63	125	250	500	1k	2k	4k	8k	
31.5 MVA 110/20 kV DSO	Amplitudes Database	49	71	69	47	42	34	33	30	62

The data included in Table 6.1 was used for both transformers in the proposed development.

6.2 Predicted Noise Level from Proposed Substation

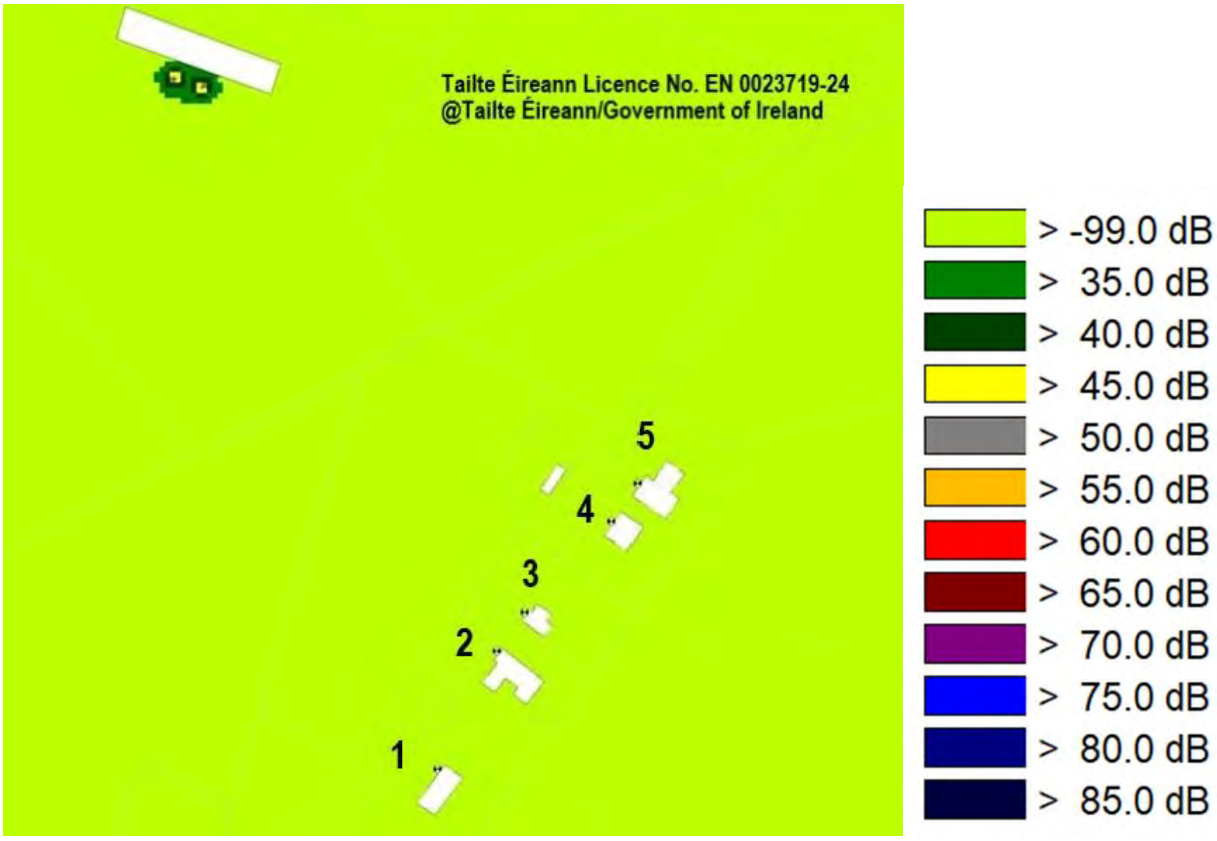
In order to predict plant noise levels from the proposed substation at the nearest noise sensitive properties, CadnaA noise modelling software was used to generate a detailed noise model of the hydrogen plant and its surrounding environment. The CadnaA noise modelling software package uses the ISO9613 prediction methodology along with a range of topographical and ordnance data collected on the surrounding area to build up a picture of the noise environment in the vicinity of sensitive receptors in the study area. The software was used to build a 3-dimensional model of all features which may affect the generation and propagation of noise in the study area.

Table 6.2 presents the predicted noise levels from the proposed Fosterstown 110kV Substation at the nearest noise sensitive properties. Figure 6.1 illustrated the noise contour map between the substation and these properties, including a reference number for each property included in Table 6.2. In Table 2, the properties have been modelled at ground floor (1.5m) for bungalows and at first floor (4m) for 2-storey properties.

Table 6.2: Predicted Noise Levels from Proposed Substation at Nearest Noise Sensitive Properties

Property Reference (See Figure 6.1)	Receptor Height	Predicted Noise Level dB(A)
1	1.5m	0.4
2	4m	3.5
3	1.5m	1.7
4	4m	2.9
5	1.5m	2.1

Figure 6.1: Noise Contour Drawing



6.3 BS4142:2014 Assessment

Sections 6.1 and 6.2 provide details on the noise modelling completed and the noise sources data included within the noise model. Noise level predictions were completed at the nearest noise sensitive properties to the proposed development. Figure 6.1 illustrates the nearest noise sensitive properties included within the noise model.

Table 6.1 presents the worst-case noise level predictions from the proposed development at the nearest noise sensitive properties. Properties have been modelled at ground floor level (1.5m) or first floor level (4m) depending on whether the property is a bungalow or two-storey property.

The predicted noise levels included in Table 6.2 have been used for the purposes of completing a BS4142 assessment. A worst-case tonal correction of +4dB has been added under the BS4142 assessment methodology on the basis of the distance between the noise sources and the relevant properties.

Tables 6.3 and 6.4 include a BS4142 assessment for day and night-time periods at the nearest noise sensitive properties to the proposed substation. Representative background sound levels derived for day and night-time periods as presented in Figures 4.4 and 4.5 have been used.

Table 6.3: Daytime BS4142 Assessment

Prop. Ref.	Predicted Noise Level dB(A)	Tonal Correction dB	Rating Level L_{AR}	Background Sound Level [L_{A90}] dB(A)	Excess of L_{AR} Above L_{A90}
1	0.4	+4	4.4	45	-41.6
2	3.5	+4	7.5	45	-37.5
3	1.7	+4	5.7	45	-39.3
4	2.9	+4	6.9	45	-38.1
5	2.1	+4	6.1	45	-38.9

Table 6.4: Night-time BS4142 Assessment

Prop. Ref.	Predicted Noise Level dB(A)	Tonal Correction dB	Rating Level L_{AR}	Background Sound Level [L_{A90}] dB(A)	Excess of L_{AR} Above L_{A90}
1	0.4	+4	4.4	25	-21.6
2	3.5	+4	7.5	25	-17.5
3	1.7	+4	5.7	25	-19.3
4	2.9	+4	6.9	25	-18.1
5	2.1	+4	6.1	25	-18.9

Table 6.2 indicates that all predicted noise levels with tonal correction are significantly below existing background sound levels at the nearest noise sensitive receptors for the daytime and night-time periods.

This assessment result would indicate that there is no likelihood of adverse noise impact during both the day and night-time periods.

Section 6.4 includes a further discussion on the predicted noise levels included in this section in the context of the surrounding site and other noise guidance documents.

6.4 Predicted Noise Levels and Other Noise Guidance Documents

As detailed in Section 3.1, the EPA NG4 guidance document relates primarily to noise surveys and assessments for EPA licensed facilities but provides useful reference material for the purposes of completing the noise assessment for the proposed development.

NG4 provides typical limit values for noise from licensed sites, namely:

- Daytime (07:00 - 19:00) - 55dB $L_{Ar,T}$;
- Evening (19:00 - 23:00) - 50dB $L_{Ar,T}$:
- Night-time (23:00 - 07:00) - 45dB $L_{Aeq,T}$.

The predicted noise levels from the proposed development are greater than 35dB below the worst-case night-time noise limit and will have no noise impact at these properties on the basis of the guidance provided in these documents.

As detailed in Section 3.2 and 3.3 of this report, both the WHO Guidelines and BS8233:2014 indicate a noise threshold limit of 30dB inside bedrooms for good sleeping conditions. This equates to an exterior façade noise level of 45dB(A), assuming an open window. The predicted noise levels included in Table 6.2 are greater than 35dB below the threshold for achieving good sleeping conditions in bedrooms, even assuming an open window.

As detailed in Sections 6.3 and 6.4, the predicted noise levels from the proposed substation are substantially below all relevant noise threshold limits presented in any relevant noise guidance documents. On this basis, there will be no requirement for mitigation measures during the operational phase.

7. NOISE MITIGATION

7.1 Construction Phase

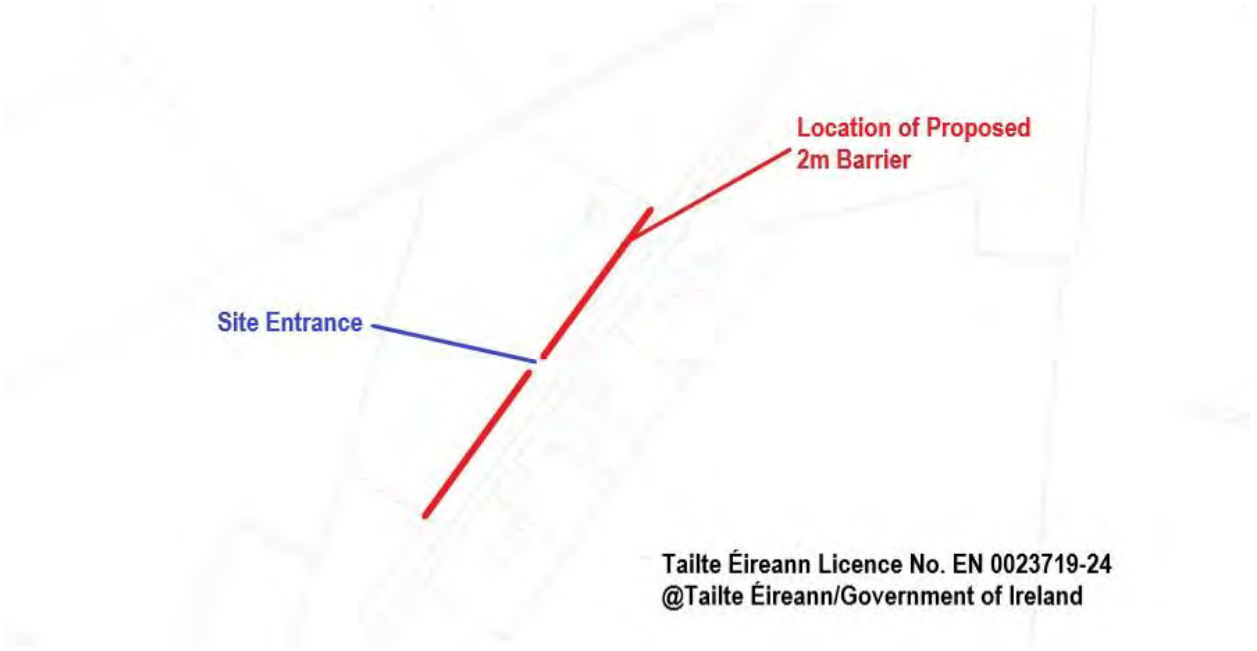
Where construction activity takes place for a development in the vicinity of residential properties, it is standard practice that the activities would operate between the hours of 07:00 and 18:00 on Monday to Fridays, between 08:00 and 13:00 on Saturdays and there will be no activity on Sundays or Bank Holidays.

As outlined in Section 5, there is potential for short-term noise impacts at the nearest noise sensitive properties if worst-case construction noise levels occur. Section 5.2 outlines worst-case predicted noise levels at the nearest noise sensitive properties and this indicates that there is potential for significant noise impacts at the nearest noise sensitive properties from the construction activities at the site entrance nearest to the nearest properties.

It must be noted that these worst-case predicted noise levels are very much an overestimation of the likely construction phase noise levels as they assume that all plant will be active simultaneously at the nearest portion of the site boundary to the proposed development. Nevertheless there is a clear need for appropriate mitigation measures to be in place during the construction phase.

It is proposed that a noise barrier in the form of site hoarding is erected at the site boundary with the R160 and directly across the road from the nearest noise sensitive properties. The location of this barrier is illustrated in Figure 7.1. It is proposed that this is a minimum of 2m height with no gaps in it, which will provide noise attenuation of approximately 10dB(A) in the direction of the nearest noise sensitive properties.

Figure 7.1: Proposed Construction Phase Noise Barrier



A detailed Construction Environmental Management Plan (CEMP) will be prepared and will include a range of measures aimed at reducing the potential construction noise impacts on the nearest receptors to the proposed development site. This plan will address the mode and timing of construction activity in close proximity to the site boundary with the nearest receptors, aiming to reduce the noisiest activities in the vicinity of the boundary of the proposed site. This should also include measures to communicate and coordinate construction phase activities at the nearest boundary to the most affected receptors so as to reduce these noise impacts to the lowest possible levels. The detailed CEMP will include the noise threshold limits included in Table 3.2 (BS5228:2009+A1:2014), which must be adhered to throughout the construction phase. On the basis of the noise monitoring survey completed, the lowest noise threshold limits included in this table (i.e. Category A) must be applied for all construction activities.

British Standard BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites outlines a range of measures that can be used to reduce the impact of construction phase noise on the nearest noise sensitive receptors. These measures should be applied by the contractor where appropriate during the construction phase of the proposed development. Examples of some of the best practice measures included in BS5228 are listed below:

- ensuring that mechanical plant and equipment used for the purpose of the works are fitted with effective exhaust silencers and are maintained in good working order;
- careful selection of quiet plant and machinery to undertake the required work where available;
- all major compressors should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use;
- any ancillary pneumatic percussive tools should be fitted with mufflers or silencers of the type recommended by the manufacturers;
- machines in intermittent use should be shut down in the intervening periods between work;
- ancillary plant such as generators, compressors and pumps should be placed behind existing physical barriers, and the direction of noise emissions from plant including exhausts or engines should be placed away from sensitive locations, in order to cause minimum noise disturbance. Where possible, in potentially sensitive areas, acoustic barriers of enclosures should be utilised around noisy plant and equipment.
- Handling of all materials should take place in a manner which minimises noise emissions;
- Audible warning systems should be switched to the minimum setting required by the Health & Safety Executive;

A complaints procedure should be operated by the Contractor throughout the construction phase.

7.2 Operational Phase

As detailed in Section 6.4, there is no requirement for mitigation measures during the operational phase.

8. CONCLUSION

This report contains a detailed assessment of construction and operational phase noise levels from the proposed Fosterstown substation. The assessment has been conducted on the basis of worst-case assumptions for construction and operational phase noise.

The assessment has also been completed against a baseline noise dataset measured during weekday and weekend periods to determine existing ambient (L_{Aeq}) and background sound levels (L_{A90}) in the study area.

Subject to the appropriate mitigation measures being in place, the proposed development can be constructed and operated without generating any significant noise impact at the nearest sensitive properties.

During the construction phase, a Construction Environmental Management Plan will be prepared in advance of the commencement of works and will detail all measures and monitoring to ensure that construction noise levels are maintained below the Category A BS5228 noise threshold limits.

Operational phase noise levels from the proposed substation will be substantially below existing background sound levels at the nearest noise sensitive properties and will not generate any noise impact at these properties.

APPENDIX 1 – CALIBRATION CERTIFICATES

Laboratory Location:
Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030

ilac-MRA UKAS 0789 CALIBRATION

Certificate of Calibration and Conformance

Certificate number: **U45454**

Test Object: **Sound Level Meter, BS EN IEC 61672-1:2003 Class 1**

Producer:	**Norsonic AS.**
Type:	**140**
Serial number:	**1402995**
Customer:	**Alive Environmental Ltd**
Address:	**52 Drumman Heights, Armagh, Northern Ireland. BT61 9SL.**
Contact Person:	**Stephen Cleary**
Order No:	**AEL/2023/EQ-02**

Introduction:
Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

Tested:	*Producer*	*Type*	*Serial No*	*Certificate No*
Microphone	Norsonic	1225	504184	45453
Calibrator*	Norsonic	1251	33739	U43087
Preamplifier	Norsonic	1209	12541	Included

* [illegible]

Additional items that have also been submitted for verification:

Wind shield	Norsonic	Nor1451 (ø 60mm)
Attenuator	N/A	
Extension cable	Norsonic	Nor1408A/5M

These items have been taken into account wherever appropriate.

Instruction Manual: im140_1Ed8R0En Firmware Version: v2.1.670 The test object is a single channel instrument.

Conditions	*Pressure kPa*	*Temperature °C*	*Humidity %RH*
Reference conditions	101.325	23	50
Measurement conditions	99.43 ±0.01	20.90 ±0.2	60.75 ±0.15

Calibration Dates:

Received date:	11/09/2023	Reviewed date:	22/09/2023
Calibration date:	22/09/2023	Issued date:	22/09/2023

Technicians: (Electronic certificate)

Calibrated by: *Palaniveł Manappan B.Eng (Hons), M.Sc*

Reviewed by: *Jenny Crawford*

[illegible]

Doc. ref: [illegible]

Laboratory Location
Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030

CALIBRATION

Certificate of Calibration

Certificate number: **45453**

Test Object: **Measurement Microphone**

Producer:	**Norsonic AS.**
Type:	**1225**
Serial number:	**504184**
Customer:	**Alive Environmental Ltd**
Address:	**52 Drumman Heights, Armagh, Northern Ireland. BT61 9SL.**
Contact Person:	**Stephen Cleary**
Order No:	**AEL/2023/EQ-02**

Measurement Results	Sensitivity (dB re 1V/Pa)	Sensitivity (mV/Pa)	Capacitance (pF)
Measurement 1	*-26.40*	*47.85*	*23.54*
Measurement 2	*-26.40*	*47.84*	*23.65*
Measurement 3	*-26.40*	*47.84*	*23.65*
Result (Average):	***-26.40***	***47.84***	***23.61***
Expanded Uncertainty:	0.10		2.00
Degree of Freedom:	>100		>100
Coverage Factor:	2		2

The stated sensitivity is the pressure sensitivity at 250Hz, S_{250}, and is valid at reference conditions. The following correction factors have been applied during the measurement:
Pressure:uncertainty dB/kPa Temperature:-0,005 dB/°C Humidity:0 dB/%RH

Conditions	*Pressure kPa*	*Temperature °C*	*Humidity %RH*
Reference conditions	101.325	23	50
Measurement conditions	99.39 ± 0.040	21.3 ± 0.1	59.5 ± 0.7

The calibration test report shown on the next page gives details of the response at other frequencies relative to the 250 Hz reference sensitivity. Results ≥100 Hz are obtained using an electrostatic actuator as described in BS EN 61094-6 and those below 100 Hz are obtained in a reference pressure chamber. Detailed results are available from the calibration laboratory upon request.

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a coverage probability of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level.

Calibration Dates:

Received date	11/09/2023	Reviewed date	22/09/2023
Calibration date	22/09/2023	Issued date	22/09/2023

Technicians: (Electronic certificate)

Calibrated by *Palaniswel Marappan B.Eng (Hons), M.Sc*
Reviewed by *Jenny Crawford*

This certificate is issued in accordance with the CA Quality Management System. It provides traceability of measurement to recognised national standards, and to the units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

[illegible]

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Laboratory Location

Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030

0789

CALIBRATION

Certificate of Calibration and Conformance

Certificate number: **U46490**

Test Object: **Sound Calibrator**

Producer: **Norsonic AS.**
Type: **1251**
Serial number: **33739**
Customer: **Alive Environmental Ltd**
Address: **52 Drumman Heights, Armagh. BT61 9SL.**
Contact Person: **Stephen Cleary.**
Order No: **AEL/2024/EQ/01**

Measurement Results	Level dB	Level Stability dB	Frequency Hz	Distortion %
Measurement 1	114.04	0.04	1000.80	0.35
Measurement 2	114.04	0.04	1000.80	0.36
Measurement 3	114.05	0.05	1000.80	0.36
Result (Average):	**114.04**	**0.04**	**1000.80**	**0.36**
Expanded Uncertainty:	0.1	0.02	1	0.25
Degree of Freedom:	>100	>100	>100	>100
Coverage Factor:	2	2	2	2

The stated level is relative to 20µPa. The level is traceable to National Standards. The stated level is valid at reference conditions. The following correction factors have been applied during the measurement
Pres:0.0005 dB/kPa Temp:0.003 dB/°C Humi:0 dB/%RH Load volume: 0.0003 dB/mm3

Conditions	*Pressure kPa*	*Temperature °C*	*Humidity %RH*
Reference conditions	101.325	23	50
Measurement conditions	99.919 ±0.041	21.7 ±0.2	40.1 ±1.3

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\Current Year\NOR1251_33739_M1.nmf

Preconditioning
The equipment was preconditioned for more than 4 hours in the specified calibration environment.

Method
Calibration has been performed as set out in the current version of CA Technical procedure TP01

Calibration Dates:

Received date:	17/01/2024	Reviewed date:	22/01/2024
Calibration date:	22/01/2024	Issued date:	22/01/2024

Technicians: (Electronic certificate)
Calibrated by: *Michael Tickner*
Reviewed by: *Jenny Crawford*

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Doc ref: Calb-Cert-Master-V3-06

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Appendix E - Traffic Impact Assessment

Contact us
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2024

Proposed Distribution Substation, Fosterstown, Co. Meath
Traffic and Transport Assessment

ENGINEERING A SUSTAINABLE FUTURE

Proposed Distribution Substation, Fosterstown, Co. Meath
Traffic and Transport Assessment

Document Control Sheet

Client:	**ESB Engineering**
Document No:	240284-ORS-XX-XX-RP-TR-13g-001

Revision	Status	Author:	Reviewed by:	Approved By:	Issue Date
P01	**DRAFT**	**AK/KM**	**AGK**	**AP**	**30/05/2024**

Table of Contents

Executive Summary

ORS has been commissioned by ESB Engineering to undertake a Traffic and Transport Assessment (TTA) of a new Distribution Substation near Fosterstown, Co. Meath to the southwest of Trim. It will consist of a control room, MV Switchgear room, HV Cable room and other ancillary facilities. Overall distribution centre will provide 1288 m^2 of area, along with upgrading of site access and all associated site works and services.

The report will examine existing and proposed traffic conditions and transport activity to determine the effects on the surrounding road network by the proposed development.

Following consultation via email in April 2024 with the Area Engineer of the Roads and Transportation Directorate of the Meath County Council, it was agreed that this traffic assessment would focus on 3No. junctions in the vicinity of the site location to assess existing and future traffic flow related to the proposed development. The junctions would cover the traffic in 4-arm R160/R156 junction to the southwest of the site, 3-arm Site Access/R160 junction at the frontage of the site and 4-arm R160/R1568/Summerhill Road Roundabout. These junctions cover all the traffic in and out of the major town Trim to the northeast of the application site and to/from the existing quarry which will be utilised sometimes by the construction HGVs from the site during construction phase. 4-arm R160/R156 junction to the southwest of the site also serves as an access for the traffic accessing the site via major towns like Mullingar. The traffic counts were undertaken on Wednesday, the 8th of May 2024 by a third-party company called IDASO.

The junctions analysed in this traffic assessment were assessed against the TII threshold and it was found that the development is anticipated to generate greater than 5% increase in traffic at the junction between the R160 and the development access road during the morning peak period; however, congestion is not expected to occur at this junction. To demonstrate that the proposed development will not negatively affect the public roads, a junction modelling was conducted to evaluate the traffic impact generated by the proposed development across all future design years.

The junctions were examined using *Junctions 9* (PICADY and ARCADY) software for the AM and the PM peak conditions under conservative future projections and Central background Traffic Growth for the considered year of construction 2025, year of opening 2026, 5-years and 15-years after development conclusion.

From a transportation planning perspective, the proposed substation is not anticipated to adversely impact the operation of the three junctions under analysis. The existing junction JCT2 currently has capacity limitations. It is evident from the analysis that the introduction of additional traffic will result in minimal effects on the road network.

1 Introduction

The purpose of this Traffic and Transport Assessment is to address the traffic and transport related issues that may arise in relation to the proposed New Distribution Substation development near Fosterstown, Co. Meath to the southwest of Trim. This report will form a part of a planning application to An Bord Pleanála.

This report, therefore, will follow the principles set out in the TII Publication PE-PDV-02045 'Traffic and Transport Assessment Guidelines', Meath County Development Plan 2021-2027 and will assess the impact the proposed development, and the associated traffic flows, will have on the public road network in the vicinity of the proposed development.

1.1 Objectives of this TTA

The objectives of this report are to assess the impact the Distribution Substation will have on the surrounding road network, with the assessment focusing primarily on the junctions between 4-arm R160/R1568/Summerhill Road Roundabout, Site Access/R160 junction at the frontage of the site and 4-arm R160/R156 junction to the southwest of the site in the vicinity of the proposed development.

Following consultation with the Roads and Transportation Department of the Meath County Council, the following 3No. junctions, shown in **Figure 1.1** below, were selected for inclusion in this assessment:

- Junction 1: 3-arm Site Access/R160 junction at the frontage of the site.
- Junction 2: 4-arm R160/R156 junction to the southwest of the site.
- Junction 3: 4-arm R160/R1568/Summerhill Road Roundabout to the northeast of the site.

Figure 1.1: Map indicating site location and JTC Locations (Source: Bing Maps)

In summary, the objectives of this report are to assess:

- The prevailing traffic conditions on the public road network in the vicinity of the proposed development;
- The potential effect on the surrounding road network due to the anticipated traffic generated by the proposed development;
- Review of the committed developments adjacent to the proposed development;
- The pedestrian, cyclist, and public transport connectivity in the vicinity of the site.

1.2 Methodology

The TII Publication PE-PDV-02045 sets out the methodology to be followed in any given TTA. The methodology that will be used in this assessment follows the guidelines set in this document and can be outlined as follows:

- 12-hour classified automatic junction turning counts (JTC) were undertaken by IDASO at the 3No. junctions on the 8th of May 2024.

- Traffic distribution splits on the public road network could be determined from the traffic counts and applied to the anticipated future generated traffic as a result of the proposed development.
- The traffic distribution splits on the public road network could be determined from the traffic counts, however, in order to provide a robust analysis, it was considered that all traffic to and from the site will make use of the 3No. junctions.
- The predicted traffic to be generated during the substation's operational stage is estimated to be negligible.
- The effect caused by the proposed distribution substation development in the neighbouring junctions could be calculated using the existing traffic flows obtained from the traffic counts and the proposed traffic generated by the development.
- The junctions were modelled using the Transport Research Laboratory (TRL) software *Junctions9* (ARCADY and PICADY) for future design years using Central Sensitivity Growth Factors for Co. Meath to obtain the existing and proposed traffic profiles at the junctions analysed for the year of construction, year of opening, 5 and 15 years after the implementation of the Distribution Substation.

2 The Proposed Development

2.1 Development Site Location

The proposed development is located to the southwest of Forsterstown in Carberrystown, Co. Meath. The vehicular/pedestrian access to the site is off regional road R160 which connects the site to the major closest town Trim to the northeast of the site and towns like Longwood to the southwest of the site which also provides access to many land uses along its way. As seen in **Figure 2.1** below, the site is bounded by R160 to the southeast and farmlands on all other three boundaries of the site.

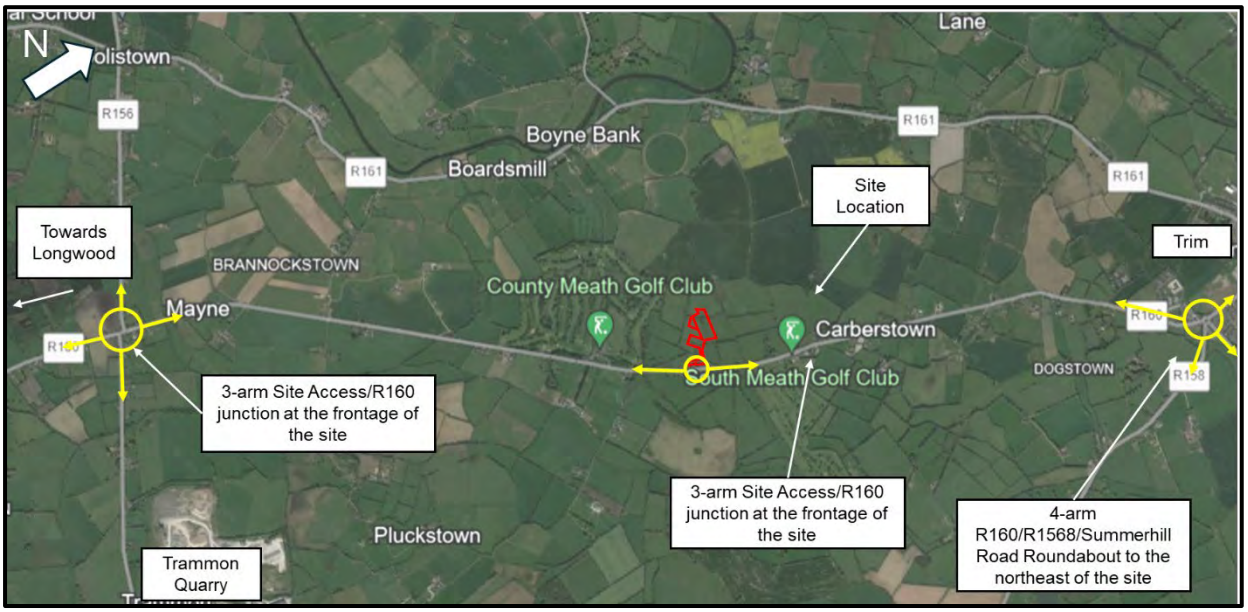

Figure 2.1: Site location map and surroundings (Source: Google Maps)

2.2 Existing Premises and Land use

The proposed development is located within a zoned land classified as 'RA - Rural Area' by the Meath County Development Plan 2021-2027. The land is also bounded by land classified as 'RA - Rural Area'. The nearest town, Trim is located ca. 3.6km to the northeast of the application site which has variety of land uses. The urban fabric of Trim is heavily influenced by the dominance of the motorised vehicle and the infrastructure that perpetuates this dominance, at the expense of other more sustainable modes of transport. Due to the rural nature of the site, pedestrian traffic to/from the site is expected to be minimal while the heavy vehicle traffic will be more frequent.

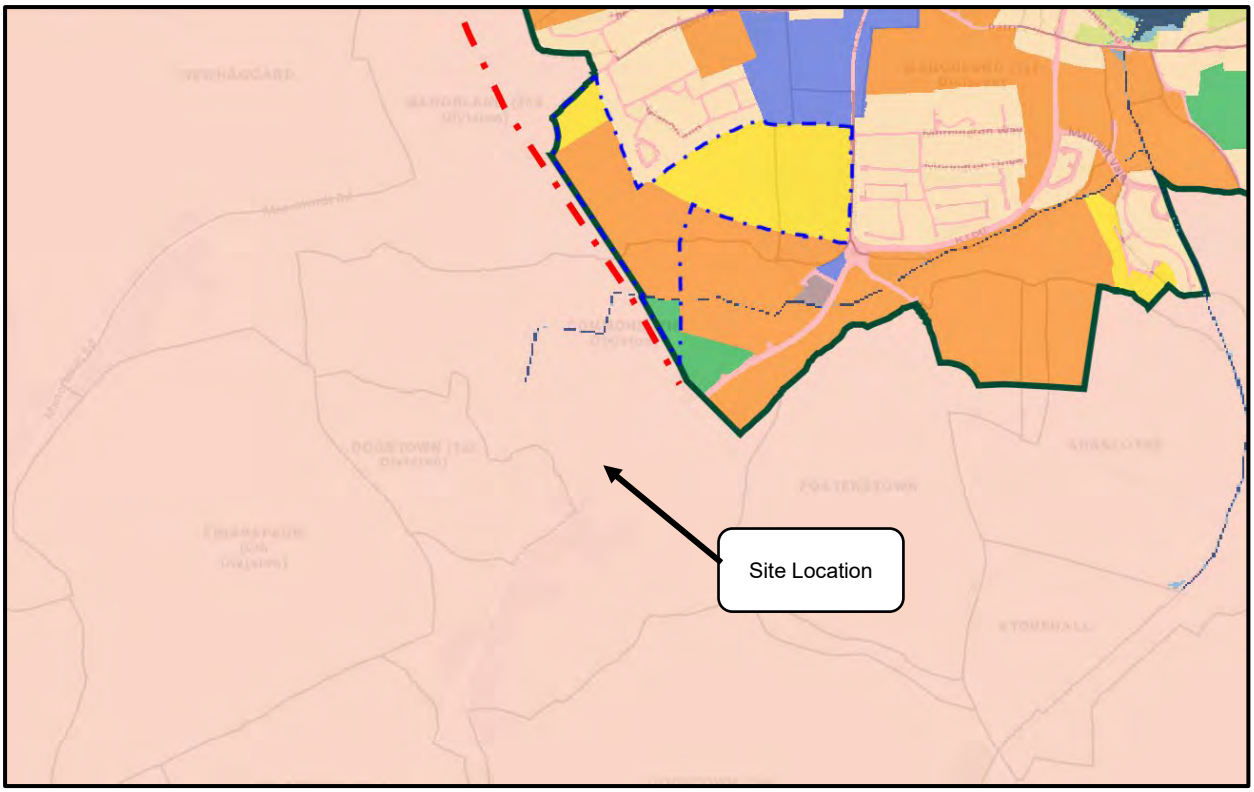

Figure 2.2: Land Use Zoning Objectives Map (Source: MCC Land Use Zoning Objectives)

2.3 Description of the Proposed Development

The project involves the construction of a Distribution Substation. This development includes a Control room, MV Switchgear room, HV Cable room, alongside other ancillary facilities. The distribution centre will encompass a total area of 1288 m^2, coupled with upgrades to site access and all associated site works and services.

Notably, there will be no formal car parking spaces as the substation will be unmanned (during routine inspections/maintenance there will only be one/two vans within the compound). During the construction, temporary parking will be provided onsite for the construction transport.

No cycle parking facilities have been incorporated on-site due to the absence of anticipated bicycle traffic.

Strategically positioned to the southwest of Forsterstown within the rural lands of Carberrystown, Co. Meath, the proposed development is bounded by R160 to the southeast and farmlands on the remaining site boundaries, all zoned as rural area. The sole proposed vehicular access/egress to the site is situated off R160 to the southeast of the application site.

The proposed layout is illustrated in **Figure 2.3** overleaf.

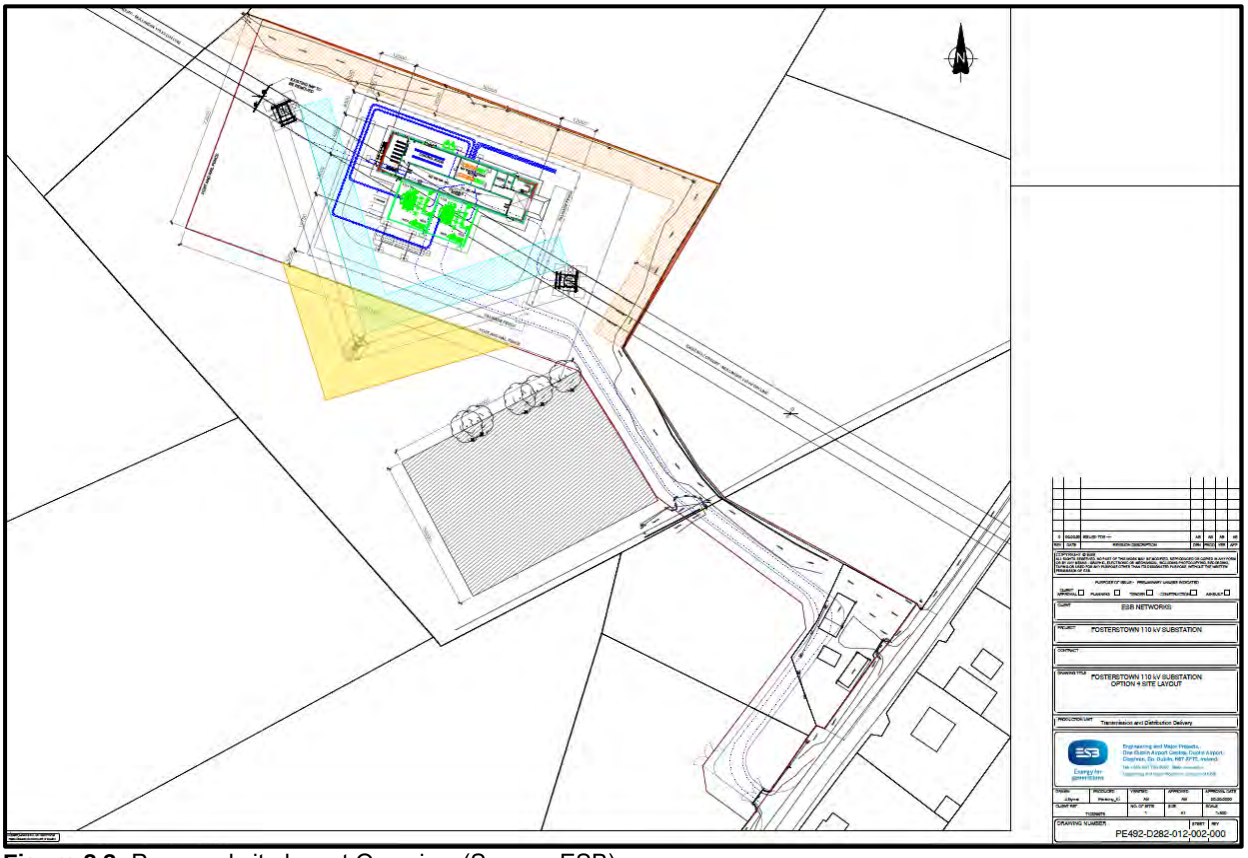

Figure 2.3: Proposed site layout Overview (Source: ESB)

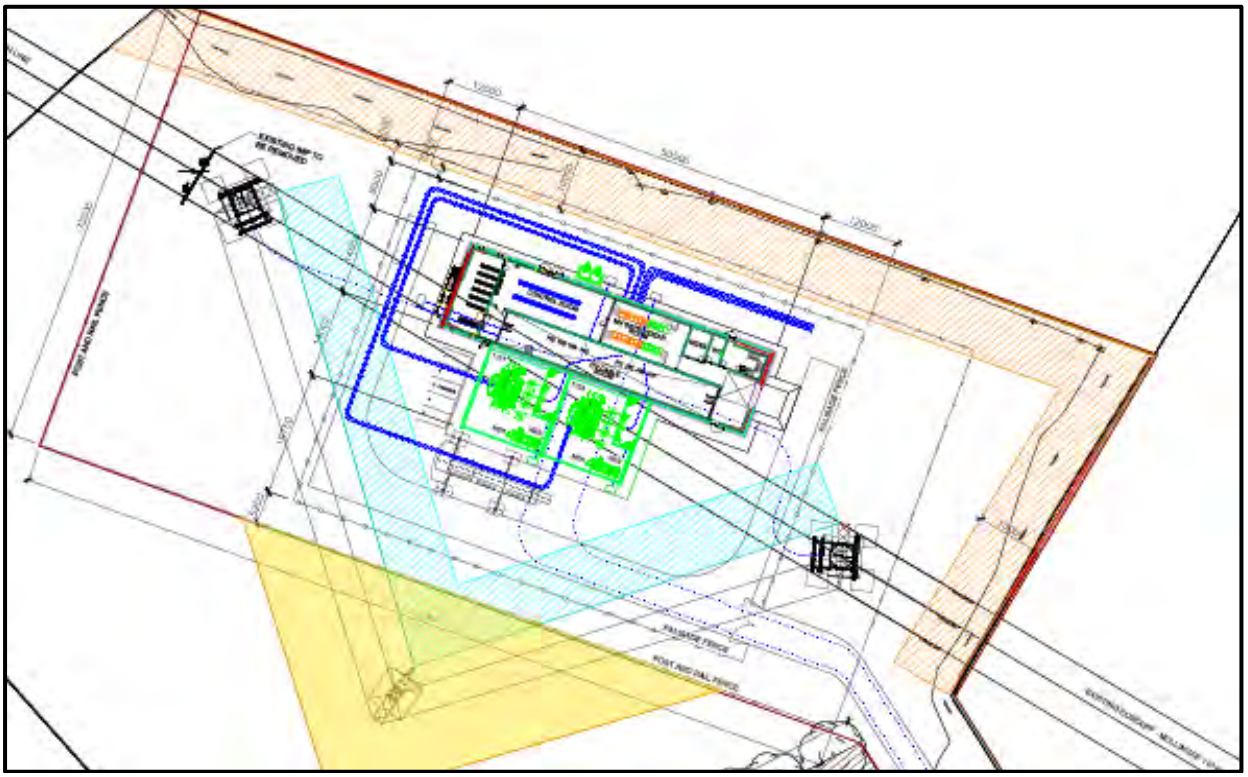

Figure 2.4: Proposed site layout (Source: ESB)

2.4 Accessibility, Parking and Pedestrian/Cyclist Connectivity

The proposed development is situated along the R160, approximately 2.6km from Trim, offering convenient connectivity to various locations and amenities within the town. The R160 provides access to the M3 motorway, located approximately 13km to the northeast, which in turn offers a direct link to Dublin City, southeast of the application site. Both vehicular and pedestrian access to the site is facilitated through a proposed priority T-junction off R160 to the southeast. However, it's worth noting that no footpaths or cycling tracks are present in the vicinity of the site, limiting accessibility by foot or bicycle. Additionally, no pedestrian or cycling facilities are provided within the site itself. No parking spaces are designated on-site as the substation will be unmanned.

Given the anticipated heavy vehicle traffic, sufficient space is allocated on-site for HGV vehicle reversing manoeuvres. The regional road R160 is a dual-lane single carriageway approximately 6.5m wide, lacking footpaths or cycle lanes. Pedestrians and cyclists must share the road with motorized users to access the development. The nearest footpath is approximately 1.2km northeast of the site on R160. However, due to the nature of the development, it is primarily expected to be accessed by private vehicles and lorries. Service vehicles will utilize an 8-meter-wide gate off R160 to the southeast for access/egress. The nearby 4-arm R160/R1568/Summerhill Road Roundabout to the northeast provides well-established pedestrian facilities connecting to Trim.

Meath County Development Plan 2021-2027 stated in item **MOV POL 17** the objective *'To identify and seek to implement a strategic, coherent and high-quality cycle and walking network across the County that is integrated with public transport and interconnected with cultural, recreational, retail, educational and employment destinations and attractions.'*

Meath County Development Plan 2021-2027 stated in item **MOV OBJ 28** the objective **'***To revise road junction layouts, where appropriate, to provide dedicated pedestrian and cycling crossings, reduce pedestrian crossing distances, provide more direct pedestrian routes, and reduce the speed of turning traffic.'*

The closest town, Trim, while lacking direct connectivity to a rail line, benefits from its proximity to the national road network. The current Development Plan outlines several distributor roads within the town, the implementation of which is expected to enhance the site's connectivity to the wider road network. Furthermore, public realm improvements within Trim as specified in Meath County Development Plan 2021-2027 are anticipated to bolster pedestrian infrastructure significantly. Although there are no specific proposals for pedestrian infrastructure in the immediate vicinity of the site, the anticipated increase in pedestrian activity within Trim town can serve to encourage multi-modal trips. Additionally, there may be future proposals for pedestrian infrastructure near the site to accommodate this shift towards pedestrian-friendly environments.

2.4.5 Vehicle Parking

As previously mentioned, the development will consist of 1 new distribution station with a total area of 1288 m^2. The Meath County Development Plan 2021-2027 was consulted in order to obtain the car parking standards for the proposed development. Table 11.2 summarises the standards required for developments such as the 'Distribution Station'. However, it's worth noting that the table does not specify the type of land use for distribution substations. Therefore, the Council will stipulate its requirements regarding car parking for such developments as stated in Meath County Development Plan 2021-2027.

The proposed layout, depicted in **Figure 2.4**, designates temporary parking spaces for the site. During the construction phase of the proposed development, it is anticipated that there will be construction traffic, involving approximately 24 work vehicles per day. In the case of HGV vehicles, 10 HGV vehicle movements in per day and 10 out per day are expected.
To accommodate this temporary increase in traffic, sufficient temporary parking spaces will be provided within the site throughout the construction phase, which is expected to last for a minimum of 12 months. Given the anticipation of heavy vehicle traffic, sufficient space is also allocated on-site for HGV vehicle reversing manoeuvres.

During routine inspections or maintenance after the construction completion, there will typically be only one or two vans within the compound. Considering the negligible traffic generation estimated at approximately 1 LGV/HGV visit per week, there is no need in providing designated car parking spaces for the development.

It is stated in the Meath County Development Plan 2021-2027 that *'Accessible car parking spaces shall be provided at a minimum rate of 5% of the total number of spaces, for developments requiring more than 10 car parking spaces, with the minimum provision being one space (unless the nature of the development requires otherwise).'* The proposed development is not expected to generate any vehicle requiring accessible parking. Therefore, no accessible parking space is provided at present. However, should the need arise in the future, provisions should be made to accommodate an accessible car parking space.

2.4.6 Cycle Storage

The Meath County Development Plan 2021-2027 outlines a policy objective aimed at ensuring the provision of cycle parking facilities as per the standards specified in Table 11.4 Cycle Parking Standards. However, the proposed development, namely the distribution substation, does not currently include provisions for cycle parking spaces due to the expectation of minimal to no cyclist traffic.

3 Existing Traffic Conditions

3.1 Existing Road network

The junctions and roads included in this assessment are existing roads already in active usage and are part of a wider area; as such, their condition and suitability for purpose are not subject to assessment as part of this report.

All vehicular traffic associated with the site will utilize the regional road R160, which runs along the southeast boundary of the application site. R160 is a single-carriageway regional road featuring one lane in each direction, with a width of approximately 6.2m. This road connects the 4-arm R160/Castle Street/R154 roundabout to the northeast of the site in Trim, extending to the R160/R148 junction to the south in Broadford. It intersects three junctions in the vicinity of the site, namely the 4-arm R160/R156 junction to the southwest, the 3-arm Site Access/R160 junction at the frontage of the site, and the 4-arm R160/R1568/Summerhill Road Roundabout.

It's notable that pedestrian and cycling facilities are lacking along this road section near the application site, as mentioned in **section 2.4** of this report. Pedestrians and cyclists must share the road with motorized users to access the development. The nearest footpath is approximately 1.2km northeast of the site along R160. Additionally, the presence of streetlights is inconsistent throughout the road's length. The speed limit on this road is 80km/h.

The 4-arm R160/R156 priority-controlled junction located southwest of the site is approximately 3.4km away and grants access to Keegan Quarries in Trammon which will be used during construction activities. This route will serve as a temporary route for construction traffic to and from the site. Equipped with road markings and stop signs, this junction lacks pedestrian and cycling facilities. However, the width of each carriageway arm is ample to accommodate construction and HGV vehicle turning. Despite the absence of streetlights, it's worth noting that construction activities are scheduled for daytime hours exclusively.

In contrast, the R160/R158/Summerhill Road roundabout to the northeast of the site, situated in Trim, serves as a gateway to and from Trim town. Although traffic to and from the site may occasionally utilize this roundabout during the construction phase, its usage post-operational phase remains uncertain. Pedestrian facilities are in place at R160/R158/Summerhill Road roundabout, as seen in **Figure 3.1** and **Figure 3.2.**

The 3No. junctions mentioned above and that are part of this assessment are displayed in **Figure 3.1, Figure 3.2, Figure 3.3, Figure 3.4** and **Figure 3.5** below.

Figure 3.1: R160/R158/Summerhill Road roundabout from R160 south (Source: Google Street View)

Figure 3.2: R160/R158/Summerhill Road roundabout from R158 (Source: Google Street View)

Figure 3.3: R160/Site Access Junction from R158 from R160 south (Source: Google Street View)

Figure 3.4: 4-arm R160/R156 junction from R160 south (Source: Google Street View)

Figure 3.5: 4-arm R160/R156 junction from R160 north (Source: Google Street View)

3.2 Pedestrian and Cyclist Connectivity

The proposed development is located approximately 3.6km to the southwest of Trim town in Co. Meath. At present, there are no footpaths or cycle tracks in the vicinity of the application site on R160. However, there are footpaths of varying width and condition approximately 1.2km northeast of the site along R160. However, there are no cycle tracks on R160 in the vicinity of the application site or in the wider environment in Trim town which discourages people from cycling.

As mentioned before, public realm improvement schemes are proposed in throughout Trim Town which shall further encourage pedestrian activities within Trim although not to/from the site. However, it is a policy objective MOV POL 3 *'To promote sustainable land use planning measures which facilitate transportation efficiency, economic returns on transport investment, minimisation of environmental impacts and a general shift towards the greater use of public transportation throughout the County.'*

Additionally, the proposed development of Masterplan 29 and Masterplan 30 in Trim town is expected to accommodate an increase in the local population. This growth can potentially support future road improvements in the wider network, including the R160 in the vicinity of the site. The Master Plan will incorporate proposals for the delivery of the RT 1 distributor and bridge, connecting the Dublin and Navan roads. These initiatives, along with other factors, have the potential to foster further sustainable transport growth in the broader road network, aligning with established policy objectives.

Figure 3.6: Lack of pedestrian/Cycling infrastructure in the vicinity of the site (Source: Google Street View)

3.3 Public Transport Provision

No bus services are provided in the vicinity of the application site. In addition to that, there are no train stations in the nearby towns like Trim. The nearest train station is in Enfield which is 19km away, or accessible in 18 mins by car.

The closest bus stop to the application site is approximately 3km northeast, situated within the Knightsbridge medical centre southwest of the R160/R158/Summerhill Road roundabout. This stop is serviced by route No. 189 operated by TFI Local Link Louth Meath Fingal, which operates five services per day, connecting Enfield to Navan while passing through Trim town. Additionally, Bus Éireann provides another bus route, No. 190, serving Trim-Navan-Drogheda, is available in Trim, roughly 3.8km northeast of the application site. This route runs at a frequency of every 30 minutes to an hour, providing further transportation options for commuters. The locations of these bus stops are illustrated in **Figure 3.6** overleaf.

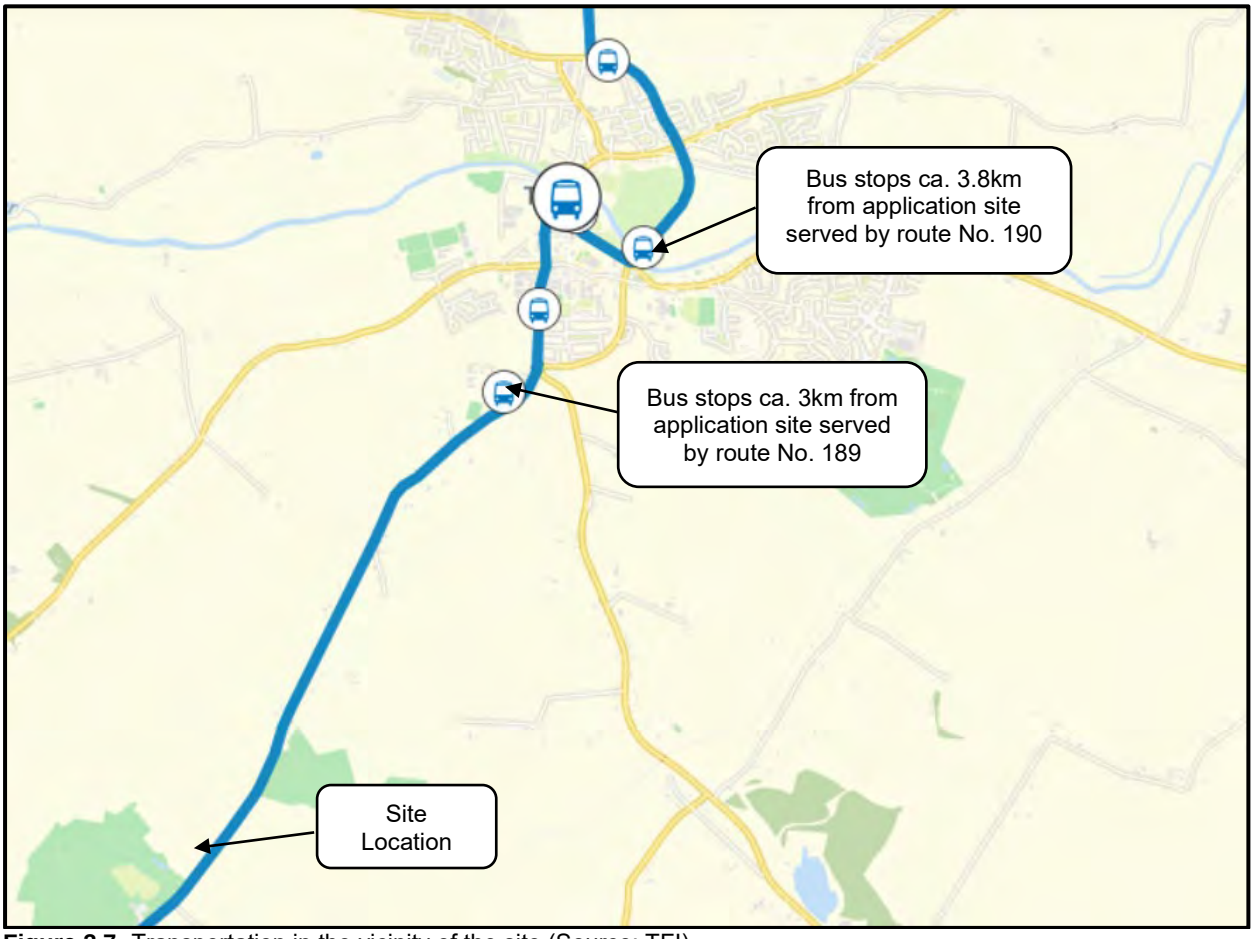

Figure 3.7: Transportation in the vicinity of the site (Source: TFI)

The initial strategic plan outlined by the National Transport Authority (NTA) for the Local Link Rural Transport Programme emphasizes two primary objectives: tackling rural social exclusion and integrating rural transport services with other public transportation networks. The mission statement of the Programme underscores its commitment to delivering a high-quality community-based public transport system across rural Ireland, tailored to meet local demands. Furthermore, this program may expect to facilitate the introduction of additional bus routes in the vicinity of the application site, thereby enhancing accessibility and connectivity.

Additionally, it is a policy objective RPO 8.13 to *'Support the Local Link Rural Transport Programme throughout rural areas of the Region.'*

3.4 Proposed Transport Infrastructure

There are a few proposals to facilitate and improve the transport within County Meath and more importantly within Trim which is a nearby town from the application site. However, no transport infrastructures are proposed in the vicinity of the site or along R160. These proposals are mentioned in the Meath County Development Plan 2021-2027 that are in different stages of design and implementation and are detailed below:

- Masterplans: Trim has three designated Master Plan areas for integrated land development. Master Plan 30 aims to repurpose the former Potterton cattle sales yard into a mixed-use residential and community development. Master Plan 29 focuses on creating

a balanced "live-work" community by combining employment opportunities with Executive-style housing and essential road infrastructure. Master Plan 31 involves developing mixed-use, residential, open space, high amenity, and town centre zoned lands, including the OPW site, to the west of the town centre, incorporating both greenfield lands and existing buildings and uses.

- Distributor road links: several local distributor road links are planned for construction, subject to Appropriate Assessment, consultation, and compliance with environmental regulations. RT 1 involves a road link from Dublin Road at Effernock to Navan Road at the Motor Park, including a new Boyne River bridge. RT 2 aims to connect the Athboy Road to the local distributor road west of the Town Centre Expansion area. RT 3 focuses on constructing a road link west of the mixed-use lands connecting to the Kinnegad Road, to be provided and funded alongside adjacent developments. RT 4 entails a road link between the Kinnegad Road and the Longwood Road, while RT 5 involves a link between the Longwood Road and the Summerhill Road, both to be coordinated with nearby industrial lands. The development of these projects' hinges on the outcome of the Appropriate Assessment process, ensuring compliance with European site integrity regulations and mitigation of adverse effects. These distributer link roads have proposed to improve active travel infrastructure in Trim.

- Public realm: It is a policy objective to enhance the public realm of Trim. Improvements are planned throughout the town, with a particular focus on Market Street and the Watergate Street junction. This initiative aims to revitalize urban spaces, promote pedestrian-friendly environments, and enhance the overall aesthetic appeal of these areas. By incorporating elements such as upgraded streetscapes, improved lighting, green spaces, and pedestrian amenities, the project seeks to create vibrant and inviting public spaces for residents and visitors alike.

The development of these masterplans, distributor road links and public realm improvements may increase traffic flow and population in Trim, potentially prompting additional pedestrian connectivity and active travel infrastructure in the broader road network, leading to proposed active travel improvements near the site.

3.5 Existing Traffic flows

Automated junction turning counts (JTC) have been undertaken at the junctions shown in **Figure 3.**, on Wednesday 8th May 2024 by a third-party company named IDASO. The traffic counts were carried out during a 12-hour period from 07:00 AM to 07:00 PM and encompass all movements at the junctions. The traffic counts cover movements of pedal cycles, cars, taxis, buses, LGVs and HGVs and the final number of traffic is presented in Passenger Car Unit (PCU). PCU is the impact that a mode of transport has on traffic compared to a single car, e.g., a private car represents 1 PCU whereas an HGV represents 2.3 PCUs.

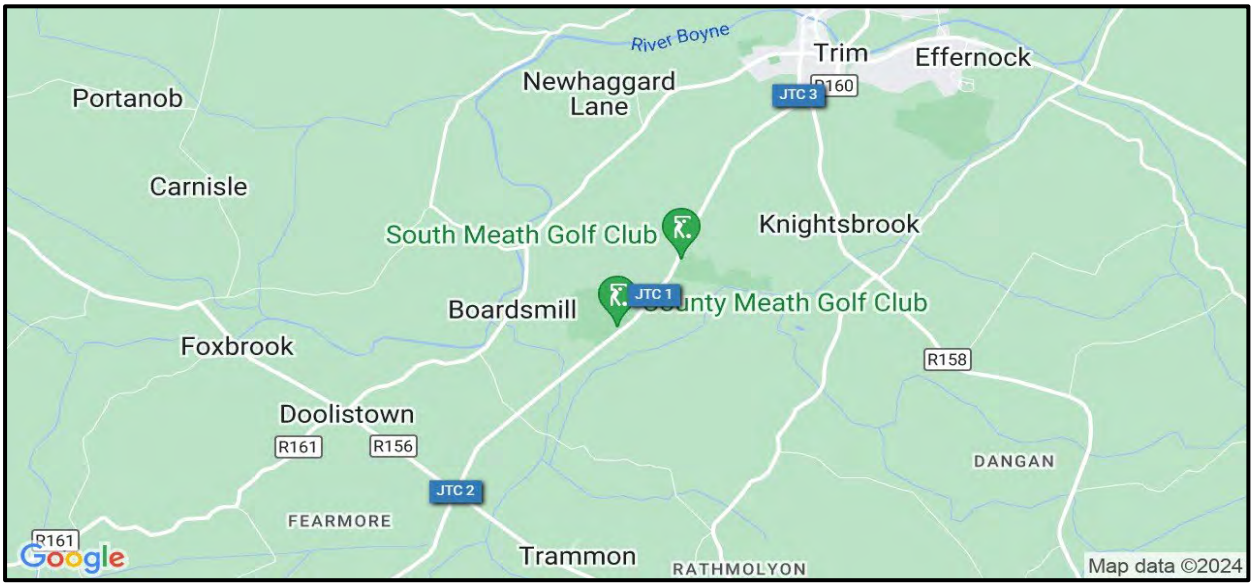

Figure 3.8: Junctions surveyed (Source: IDASO)

The AM and PM traffic peak periods were identified along the junctions and occurs between 08:00 and 09:00 in the morning in Junction 1 and Junction 3 and between 07:45 and 08:45 in Junction 2. The PM peak occurs between 16:45 and 17:45 in Junction 1 and Junction 2 and between 16:30 and 17:30 in Junction 3. **Table 3.2** summarises the traffic flows observed in the three junctions in the AM and PM periods. **Figure 3.9**, **Figure 3.10** and **Figure 3.11** display the traffic flows of all the vehicles observed in the junctions in the AM and PM periods, respectively.

Table 3.1 – Traffic Flows (PCU)

	Peak Time	
Junction	**AM**	**PM**
1 – Site Access/R160	587	664
2 – R160/R156	883	970
3 R160/R1568/Summerhill Road	1551	1711

From the traffic counts, it could be noted that the majority of traffic accessing the R160 from the Junction 3 is from Trim town via the Ring Road (R160): a total of 17% in the morning period and 19% in the evening period. For traffic exiting the R160 onto this roundabout, 19% of traffic in the morning and 16% in the evening travels towards the Trim town via the same road.

To the southwest of the site, similar pattern has been observed. 26% of the traffic accessing the R160 in the morning period and 17% in the evening arrive from the Longwood village via R160. For traffic exiting the R160 onto this roundabout, 16% of traffic in the morning and 23% in the evening travels towards Longwood via the same road.

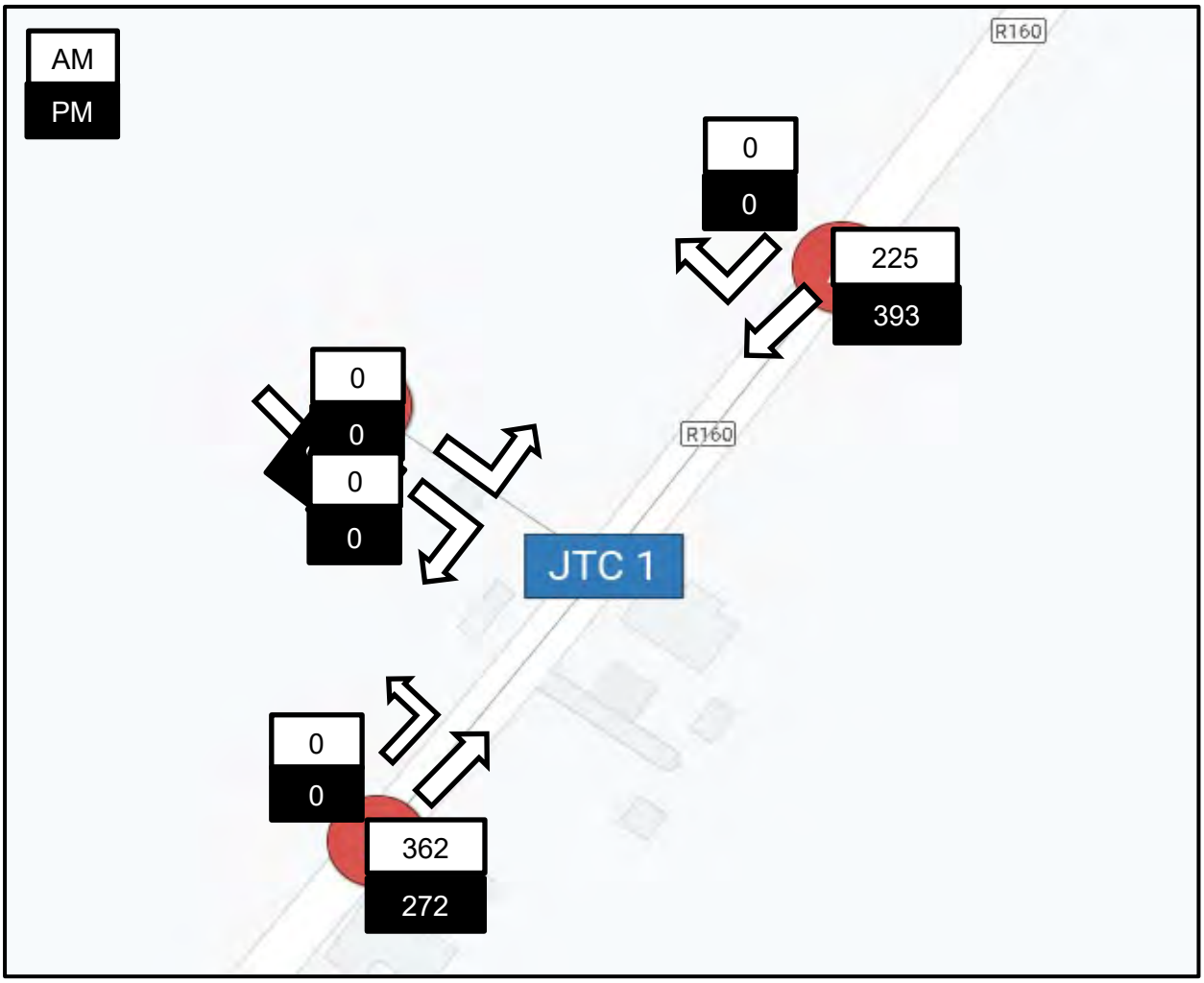

Figure 3.9: AM and PM Traffic Counts in JTC1 (Vehicles)

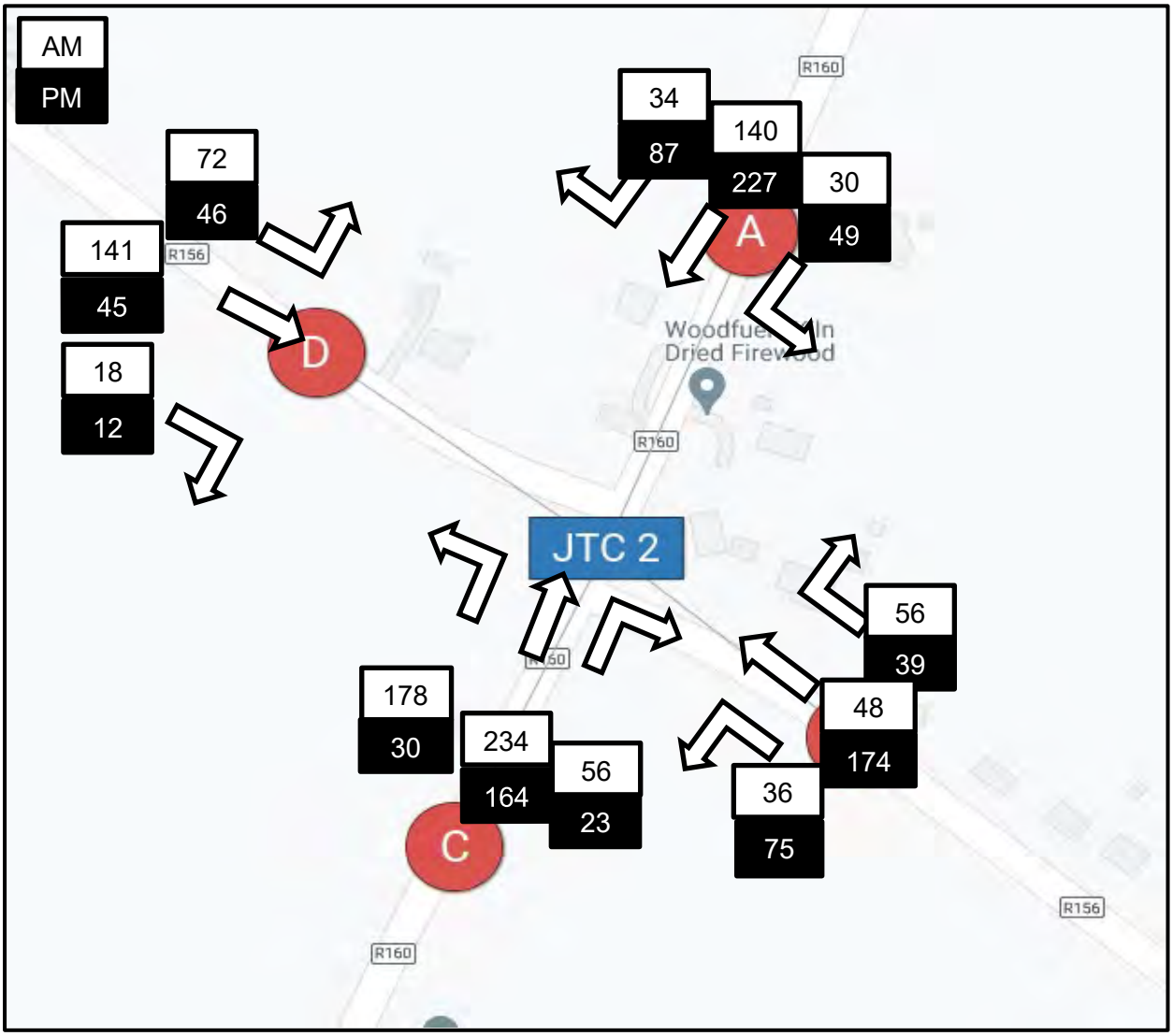

Figure 3.10: AM and PM Traffic Counts in JTC2 (Vehicles)

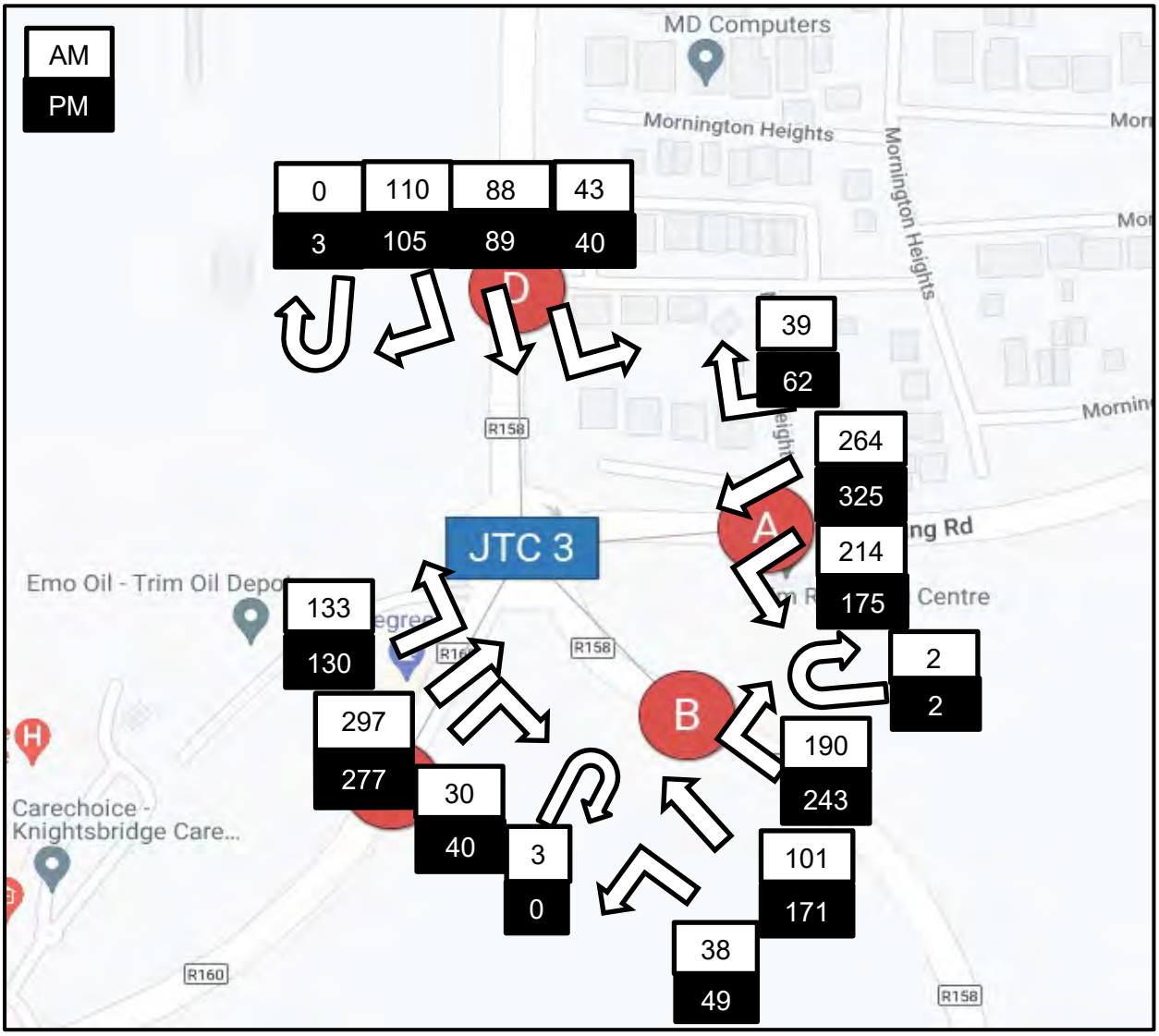

Figure 3.11: AM and PM Traffic Counts in JTC3 (Vehicles)

3.7 Traffic Collisions Data in the Vicinity of the Site

Traffic data on collisions in the vicinity of the site could not be obtained as the Road Safety Authority website is currently in process of reviewing its road traffic collision data. Therefore, this Traffic Assessment is unable to verify the safety along the road network in the vicinity of the site.

4 Trip Generation, Distribution and Impact on the Road Network

The traffic generation for the proposed development, once operational, will be negligible. As a substation, it will primarily have occasional visits from maintenance personnel and will not require daily staff presence. Conservatively, it can be assumed that there will be one trip arriving to the ESB station in the morning and one leaving in the afternoon.

The anticipated traffic flows for the development during construction, for the expected number of 30 workers at the site, will be 24No. vehicles arriving in the morning and 24No. vehicles leaving the site in the afternoon, assuming, in a conservative approach, a car occupancy of 1.25.

The most notable impact during the construction would be the movement of HGV to and from the proposed site, with a period of intensified HGV movement for the first 3 - 6 months of the project (assumed total construction duration is 12 months). The combined HGV deliveries during civil works is expected to be approximately 730 HGV vehicle movements with approx. 90% of HGV deliveries occurring in 65 working days. Therefore, it is envisaged that there will be on average 10No. HGV vehicle movements in and 10No. out per day.

Due to a lack of detailed information and to ensure a thorough analysis, it is presumed that the generated traffic will align with the peak network times for the evaluated junctions. Additionally, it was assumed that 50% of these trips would originate from or head northbound, towards the Trim town, and 50% southbound, towards Longwood.

Figure 4.1 shows the expected traffic generation profile during the construction.

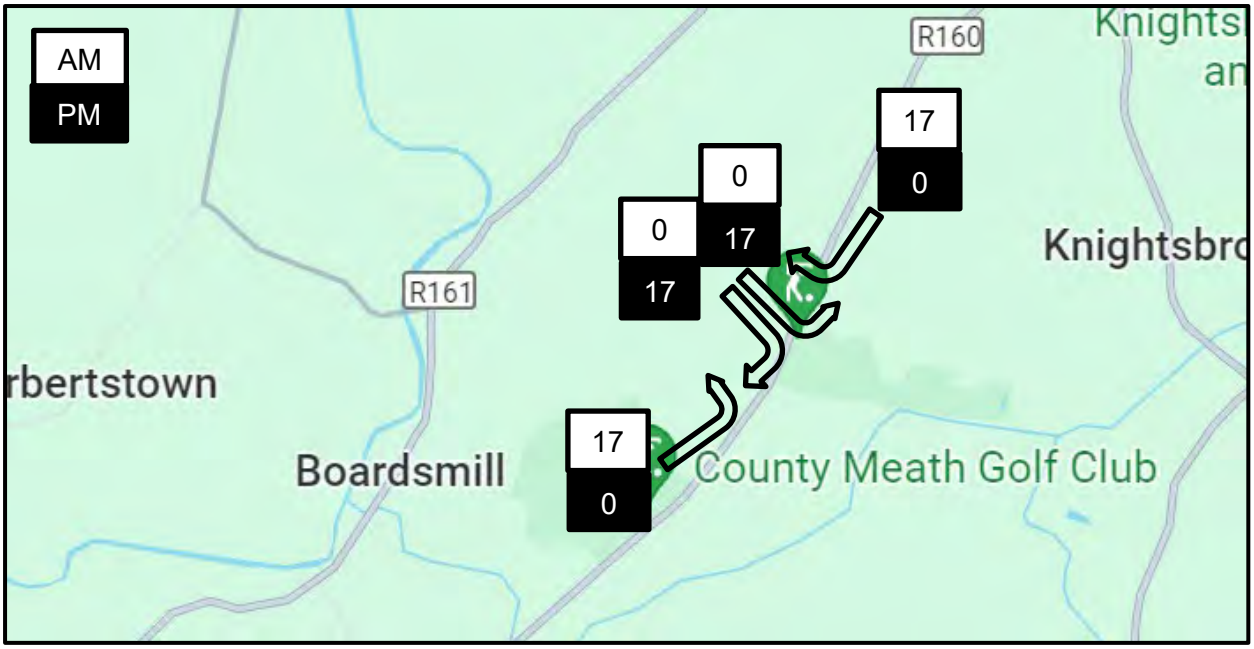

Figure 4.1: Expected Development (Construction Stage) Traffic in JTC1

4.2 Cumulative Impact

As part of this Traffic Assessment, to assess the existing and expected traffic along the road network in the vicinity of the proposed development, the Meath County Council Planning Application website was consulted to include all committed developments in the area. 1No. committed development was identified to the northeast of the site which would affect the Junction 3 analysed in the vicinity of the proposed development, as shown in **Figure 4.2** below.

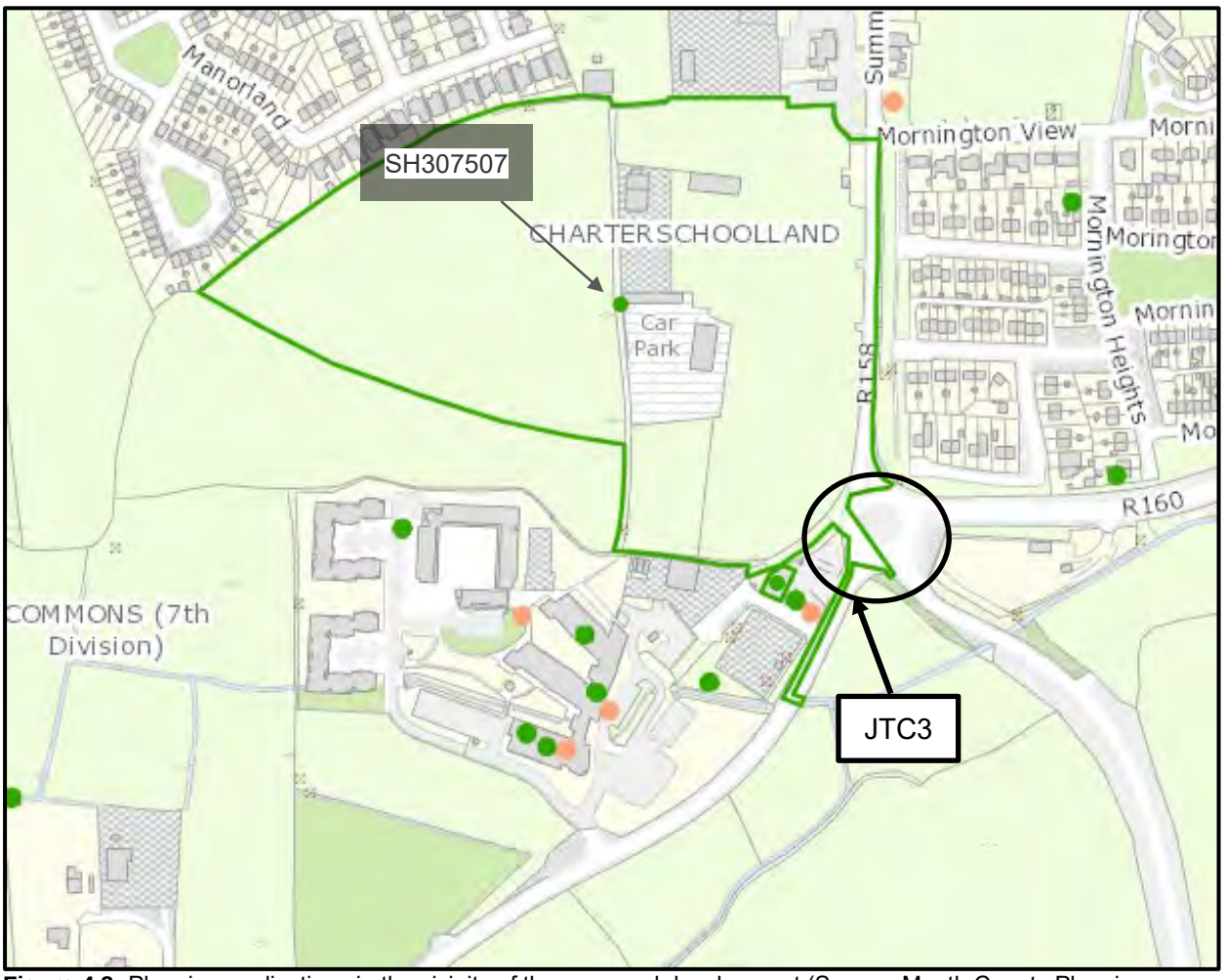

Figure 4.2: Planning applications in the vicinity of the proposed development (Source: Meath County Planning Website)

This development is presented in **Table 4.1** below.

Table 4.1 – Committed Development in the Vicinity of the Facility				
Planning Reference	**Decision Type**	**Description**	**Traffic generation**	
			AM	**PM**
SH307507	Conditional	Construction of: • 320 no. dwellings comprising: o 136No. houses o 120No. apartments within 4No. 3-5 storey blocks o 64No. duplex apartments within 8No. 3-storey blocks • A creche and community centre (total floor area c.739sqm). • 563No. car parking spaces, 188No. secure/covered bike parking areas and communal bin stores for apartments/duplexes. • Vehicular and pedestrian accesses from Summerhill Road (R158) with associated upgrades including new cycleways and footpaths. • All other site works, landscaping, boundary treatments, ESB substation/ switchrooms, plant and services provision required to facilitate the development.	205	207

The anticipated traffic flows for the proposed residential development were sourced from the TRICS database. The TRICS database contains traffic generation data for developments of a similar nature to the proposed development. TRICS was established in the UK and is a substantial source of validated empirical data which contains information on arrival and departure rates for a range of different types and sizes of development throughout Ireland.

The trip rate data for the proposed development has been summarised in **Table 4.2**, **Table 4.3** and **Table 4.4.**

Table 4.2 – TRICS output for Residential Developments						
TRICS 7.10.2						
Trip Rate Parameter: NUMBER OF DWELLINGS						
TRIP RATE for Land Use 03 – RESIDENTIAL / A - HOUSES PRIVATELY OWNED						
Calculation Factor: 1 DWELL						
Count Type: TOTAL VEHICLES						
TIME RANGE	ARRIVALS			DEPARTURE		
	No. Days	Ave. DWELL	Trip Rate	No. Days	Ave. DWELL	Trip Rate
07:00-08:00	43	333	0.071	43	333	0.283
08:00-09:00	43	333	**0.140**	43	333	**0.353**
09:00-10:00	43	333	0.122	43	333	0.151
10:00-11:00	43	333	0.11	43	333	0.127
11:00-12:00	43	333	0.117	43	333	0.124
12:00-13:00	43	333	0.133	43	333	0.133
13:00-14:00	43	333	0.137	43	333	0.13
14:00-15:00	43	333	0.148	43	333	0.162
15:00-16:00	43	333	0.229	43	333	0.154
16:00-17:00	43	333	0.255	43	333	0.147
17:00-18:00	43	333	**0.329**	43	333	**0.154**
18:00-19:00	43	333	0.258	43	333	0.144
19:00-20:00	1	231	0.091	1	231	0.091
20:00-21:00	1	231	0.108	1	231	0.065
Daily Trips Rates:	2.248			2.218		

Table 4.3 – TRICS Output for the Childcare Facility						
TRICS 7.10.4						
Trip Rate Parameter: Gross floor area						
TRIP RATE for Land Use 04 - EDUCATION/ D - NURSERY						
Calculation Factor: 100 sqm						
Count Type: TOTAL VEHICLES						
TIME RANGE	ARRIVALS			DEPARTURE		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
06:00-07:00	1	509	0	1	509	0
07:00-08:00	3	553	1.025	3	553	0.121
08:00-09:00	3	553	**3.677**	3	553	**2.773**
09:00-10:00	3	553	2.833	3	553	3.014
10:00-11:00	3	553	0.181	3	553	0.181
11:00-12:00	3	553	0.844	3	553	0.241
12:00-13:00	3	553	1.145	3	553	1.808
13:00-14:00	3	553	0.723	3	553	0.784
14:00-15:00	3	553	1.326	3	553	0.723
15:00-16:00	3	553	1.326	3	553	0.784
16:00-17:00	3	553	1.447	3	553	1.748
17:00-18:00	3	553	**2.833**	3	553	**4.219**
18:00-19:00	3	553	0	3	553	0.904
Daily Trips Rates:	17.36			17.30		

The TRICS output is presented in a trip rate per unit. The unit reference is dependent on the development in question, such as per person, per house or unit area. In this case, the multiplication factor to be applied to the unit rate is number of dwellings of the proposed residential development (320) and the gross floor area of the Childcare facility (739).

Table 4.4 – Expected Traffic from the Committed Development			
Time Range	**Arrivals**	**Departures**	**Total**
08:00-09:00	72	133	205
17:00-18:00	126	80	207

4.3 Future Year Traffic Growth

Transport Infrastructure Ireland (TII) issues a range of forecasts: low growth, central growth, and high growth. The implementation of policies relating to the National Sustainable Mobility Policy will act as a deterrent to high growth in car-based travel. Low growth factors are however likely to be equally unrealistic at present, therefore, this assessment has used central growth factors, which was extracted from the TII Publication PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, published in October 2021, outlined in **Table 4.5, Table 4.6** and **Table 4.7** below.

Table 4.5 – Development Location Information

Location of Development	Meath
Sensitivity Area	Central
Year of Traffic Counts	2024
Year of Assessment	2024
Year of Development Construction	2026

Table 4.6 – TII Annual Growth Rates (Central Growth) for Co. Meath

Year	LGV	HGV
2016 – 2030	1.0173	1.0365
2030 – 2040	1.0070	1.0186
2040 – 2050	1.0059	1.0207

Table 4.7 – Growth Factors for Future Design Years for Co. Meath

	Counts	Construction	Completion	Completion +5	Completion +15
	2024	2025	2026	2031	2041
LGV	1.000	1.017	1.035	1.116	1.195
HGV	1.000	1.037	1.074	1.263	1.522

4.4 Generated Traffic Splits Through Neighbouring Junctions

Based on the traffic counts obtained in May 2024 at the 3No. junctions mentioned above, the travel distribution could be established.

From the traffic counts obtained, the morning peak on both junctions occurs between 8:00-09:00 am and afternoon peak between 16:45-17:45 with a total of 3065 PCU associated with junction 1 during the AM peak and 2993 in the PM peak and 3418 PCU in the AM at junction 2 and 3441 PCU in the evening peak.

It has been assumed that all the peak flows to and from the proposed development will coincide with the peak traffic observed in the junctions, in order to obtain a more conservative analysis.

To obtain the worst-case scenario analysis, this traffic assessment considered that arrivals follow the same trend as the traffic counts. Therefore, all traffic leaving the site will be split at the 2No. 4-arm junctions following the same trend observed on the day of the traffic counts, as it gives the most robust analysis.

The projected 2026 traffic flows could be calculated using TII's Central Growth Factor for Co. Meath. Based on the traffic levels expected for 2026 based on the traffic counts and the predicted traffic to and from the proposed development, the impact in the junctions could be determined. **Figure 4.** below and **Figure 4.4** overleaf display the expected levels of the generated traffic on both 4-arm junctions affected in the vicinity of the site, projected for the proposed year of development conclusion in 2026.

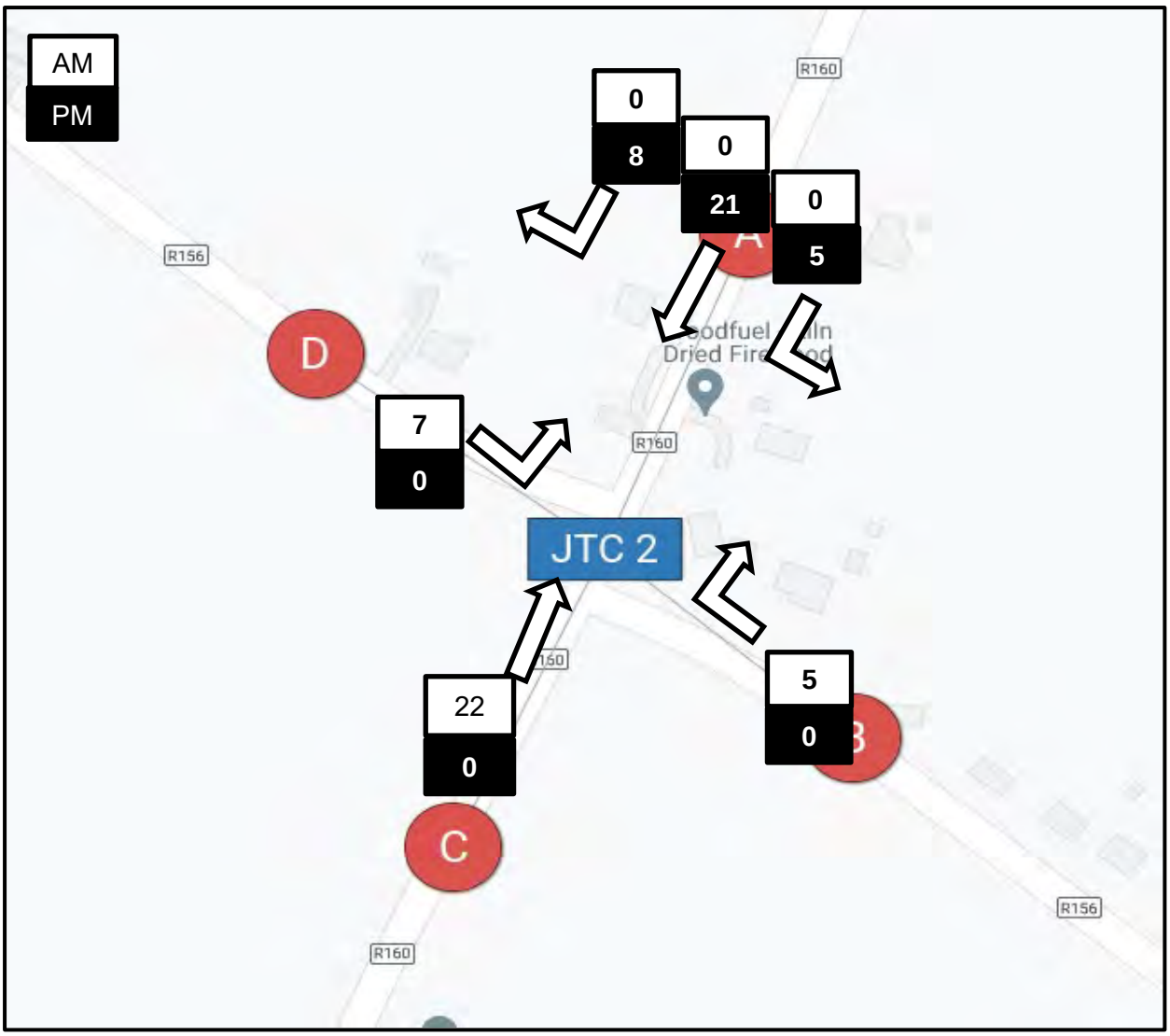

Figure 4.3: Development traffic in JTC2

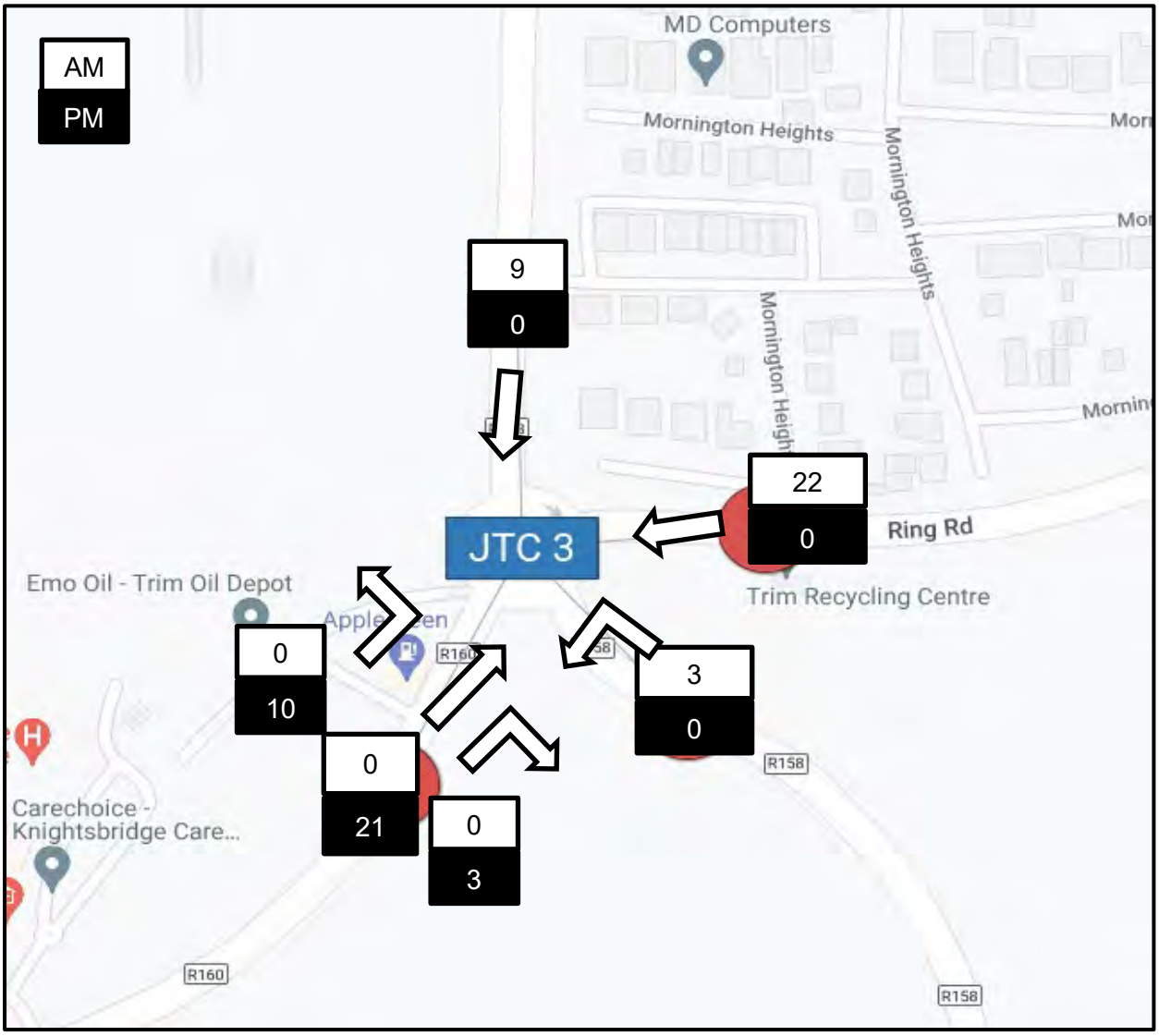

Figure 4.4: Development traffic in JTC3

4.5 Traffic and Transport Assessment Guidelines

The County Meath Development Plan 2021 – 2027, in Section 5 – Movement Strategy, requires a Traffic and Transport Assessment to be provided for proposed trip-intensive developments, "*to accompany planning applications for major developments with significant potential to generate traffic and or which could create a significant hazard or safety performance impact on a major road, particularly national roads*" (Section 11 - Development Management Standards and Land Use Zoning Objectives). It shall be in accordance with the Traffic and Transport Assessment Guidelines (TII 2014).

The TII Publication PE-PDV-02045 Traffic and Transport Assessment Guidelines, published in May 2014, recommends that junction modelling should be carried out where new traffic exceeds 5% of existing flows if congestion already exists and if traffic generated by the development exceeds 10% where no traffic congestion is present, as outlined in **Table 4.9** below. The impact on traffic for the assessed junctions is presented in **Table 4.**.

Table 4.8 – Traffic Impact on Neighbouring Junctions from the development

Junction	2026 Projected Traffic		Traffic from Development		Increase in Traffic		TII Threshold of 5%	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
JTC1	608	687	34	34	5.59%	4.95%	Above	Below
JTC2	914	1004	17	17	1.86%	1.69%	Below	Below
JTC2	1605	1771	17	17	1.06%	0.96%	Below	Below

As can be seen from **Table 4.7**, the anticipated traffic from the development is not expected to adversely affect the operational efficiency of the existing 4-arm junctions, with an increase of no more than 1.86% compared to the predicted traffic for 2026. Both 4-arm junctions already experience daily traffic. The rise in traffic due to the proposed development remains well below the Transport Infrastructure Ireland (TII) threshold of a 5% increase for junction modelling at the existing 4-arm junctions.

For the 3-arm Site Access/R160 junction at the frontage of the site (Junction 1), the rise in traffic due to the proposed development is slightly above the TII threshold, with an increase of 5.59% compared to the predicted traffic for 2026.

Table 4.9 – Traffic Management Guidelines Thresholds for Transport Assessments (TII)	
No	Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.
No	**Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive**
N/A	Residential development in excess of 200 dwellings
N/A	Retail and leisure development in excess of 100m^2
N/A	Office, education and hospital development in excess of 2,500m^2
N/A	Industrial development in excess of 5,000m^2
N/A	Distribution and warehousing in excess of 10,000m^2

When comparing the traffic to/from the development with the threshold requirements in **Table 4.8**, it is recommended by the TII that if any of the listed conditions apply to the development then a Traffic and Transport Assessment is required for the development. As can be seen in **Table 4.8**, none of these conditions applies in this case. The development is anticipated to generate greater than 5% increase in traffic at the junction between the R160 and the development access road during the morning peak period, which exceeds the minimum threshold of 5% for a TTA; however, congestion is not expected to occur at this junction.

Nevertheless, to demonstrate that the proposed development will not negatively affect the public roads, a junction modelling was conducted to evaluate the traffic impact generated by the proposed development across all future design years.

5 Capacity Analysis

5.1 Introduction

A capacity assessment was undertaken at 3No. junctions in the vicinity of the site, as previously noted. The performance of the junctions during the AM and PM peak hours was assessed using PICADY for priority junctions for the following design years:

- 2024, the base year
- 2025, the year of construction stage
- 2026, the opening year
- 2031, 5 years after development conclusion
- 2041, 15 years after development conclusion.

Figure 5.1 below shows the junctions in which a traffic simulation was undertaken in order to obtain the Ratio of Flow to Capacity (RFC) and the queue levels to determine if the junctions would cater for the predicted level of traffic by the development.

Figure 5.1: Location of junctions analysed (Source: Bing Maps)

The Ratio of Flow to Capacity (RFC) describes the capacity of each approach to the junction and determines if the junction will cater for the predicted level of traffic. An RFC below 0.85 (85%) implies that an approach road is operating satisfactorily well within capacity; between 0.85 to 1.0 RFC means the approach operates within capacity but at less optimal efficiency; and an RFC above 1.0 means that demand and capacity are equal and no further traffic can progress through the junction.

The queue levels are presented in Passenger Car Unit (PCU) and quantify the total number of vehicles queueing on each arm.

5.2 Traffic Impacts of the Proposed Development on the Local Road Network

As stated in above, traffic counts were undertaken at the 3No. junctions. The cumulative effect of adjacent developments described in **Section 4.2** was considered in the analysis. Central traffic growth rates for Co. Meath, specified in the TII's Publication PE-PAG-02017 of October 2021, were applied to existing background traffic only and were not applied to the development traffic, since it is limited by development size. The capacity assessment was modelled for three different scenarios:

- Base-year: 2026 traffic flows modelled according to traffic counts obtained in 2024, factored up using TII's Growth Factor.
- Do-nothing: modelled without the intervention of the proposed development. For this analysis, the traffic counts were factored up using TII's Growth Factor for the design years 2026, 2031 and 2041.
- Do-something: the impact of the traffic generated by the development was added to the design years 2026, 2031 and 2041. This analysis will enable the comparison with the 'Do-nothing' scenario.

5.2.1 Junction 1 – Site Access/R160

In the following analysis, the arms were labelled as follows:
- Arm A: R160 - Northeast
- Arm B: R160 - Southwest
- Arm C: Site Access

Figure 5.2 depicts the arm names as used in modelling with PICADY software.

Figure 5.2: JTC1 Arm Names (Source: Bing Maps)

Table 5.1 shows the results of the analysis of the junction modelled using PICADY transport modelling software for priority junctions for the assessment year (2024), the year of the construction stage (2025), the expected year of opening (2026), 5 years after the development completion (2031) and 15 years after the development completion (2041) for the 'Do-Nothing' and 'Do-Something' scenarios.

Table 5.1 – *PICADY* Results for JTC1 Analysis

		AM		PM	
Analysis	**Stream**	**Queue (PCU)**	**Rate Flow Capacity (RFC)**	**Queue (PCU)**	**Rate Flow Capacity (RFC)**
1 – 2024, base traffic	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
2 – 2025, do-nothing	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
3 – 2025, do-something	B-AC	0.0	0.0	0.1	0.1
	C-AB	0.1	0.05	0.0	0.0
4 – 2026, do-nothing	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
5 – 2026, do-something	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
6 – 2031, do-nothing	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
7 – 2031 do-something	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
8 – 2041, do-nothing	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0
9 – 2041, do-something	B-AC	0.0	0.0	0.0	0.0
	C-AB	0.0	0.0	0.0	0.0

In 2024, there is no junction present on the R160 road because the existing site access is closed. This is also the case for every Do-Nothing scenario.

Analysis 3 introduces the construction transport traffic from the proposed development in 2025, resulting in a non-significant increase of RFC of 5% (from non-existent to 0.05) in the AM period, and 10% (from non-existent to 0.1) in the PM period.

In the future years, up to 2041, there is no effect to the adjoining road anticipated from the proposed development when in operation. No congestion or queue formation are expected on R160 at the given location, with or without the proposed development.

5.2.2 Junction 2 – R160/ R156

In the following analysis, the junction was assessed for the AM and PM peak period and the arms were labelled as follows:

- Arm A: R160 North
- Arm B: R156 East
- Arm C: R160 South
- Arm D: R156 West

Figure 5.3 depicts the arm names as used in modelling with PICADY software.

Figure 5.3: JTC2 Arm Names (Source: Bing Maps)

Table 5.2 shows the results of the analysis of the junction modelled using PICADY transport modelling software for the assessment year (2024), the year of the construction stage (2025), the expected year of opening (2026), 5 years after the development completion (2031) and 15 years after the development completion (2041) for the 'Do-Nothing' and 'Do-Something' scenarios.

Table 5.2 – *PICADY* Results for JTC2 Analysis					
		AM		PM	
Analysis	**Arm**	**Queue (PCU)**	**Rate Flow Capacity (RFC)**	**Queue (PCU)**	**Rate Flow Capacity (RFC)**
1 – 2024, base traffic	B	0.9	0.42	4.7	0.85
	A	0.1	0.09	0.5	0.25
	D	2.2	0.68	0.4	0.30
	C	0.4	0.15	0.1	0.06
2 – 2025, do-nothing	B	0.9	0.43	5.2	0.86
	A	0.1	0.09	0.6	0.25
	D	2.4	0.70	0.4	0.31
	C	0.4	0.15	0.1	0.06
3 – 2025, do-something	B	1.0	0.45	6.6	0.9
	A	0.2	0.11	0.7	0.28
	D	2.8	0.74	0.5	0.34
	C	0.4	0.16	0.1	0.06
4 – 2026, do-nothing	B	0.9	0.43	5.1	0.86
	A	0.1	0.09	0.6	0.25
	D	2.3	0.70	0.4	0.31
	C	0.4	0.15	0.1	0.06
5 – 2026, do-something	B	0.9	0.43	5.1	0.86
	A	0.1	0.09	0.6	0.25
	D	2.3	0.70	0.4	0.31
	C	0.4	0.15	0.1	0.06
6 – 2031, do-nothing	B	1.1	0.48	11.1	0.97
	A	0.2	0.10	0.7	0.29
	D	3.6	0.79	0.5	0.35
	C	0.4	0.17	0.1	0.07
7 – 2031 do-something	B	1.1	0.48	11.1	0.97
	A	0.2	0.10	0.7	0.29
	D	3.6	0.79	0.5	0.35
	C	0.4	0.17	0.1	0.07
8 – 2041, do-nothing	B	1.3	0.53	21.1	1.06
	A	0.2	0.11	0.8	0.32
	D	5.5	0.86	0.6	0.39
	C	0.5	0.19	0.2	0.07
9 – 2041, do-something	B	1.3	0.53	21.1	1.07
	A	0.2	0.11	0.8	0.32
	D	5.5	0.87	0.6	0.39
	C	0.5	0.19	0.2	0.07

In 2024, traffic counts revealed the maximum capacity of 85% (0.85) at Arm B during the PM peak, while other arms operate efficiently with an RFC value lower than 0.85. The highest observed queueing formation in the morning period is 2.2 PCU's at Arm D (R156 west) and 4.7 PCU's in the evening period at Arm B (R156 east).

Analysis 2, considering committed development, experiences an increase in RFC to 0.86 (86%) in Arm B during the PM period, meaning that the approach operates within capacity but at less optimal efficiency. It is accompanied by a maximum queue of 5.2 PCU's (approximately 30m) at this arm during the PM peak.

In Analysis 8 and the Do-Nothing scenarios, which depict the anticipated traffic conditions in the study area for future 15 years without the proposed scheme in place, the maximum RFC value is 1.06 (106%) on the R156 (east) in the evening, meaning that no further traffic can progress through the junction. In the morning, the highest RFC observed is 0.86 (86%) on the R156 (west). Additionally, the highest observed queueing formation is on the R156: 5.5 PCU's (31m) heading eastbound in the morning, and 21.1 PCU (120m) heading westbound in the evening, in 2041.

Analysis 3 introduces the construction traffic from the proposed development, resulting in increase of RFC up to 4%: from 0.7 (70%) to 0.74 (74%) in the AM period at Arm D, and from 0.86 (86%) to 0.9 (90%) in the PM period at Arm B. Only Arm C in the evening period does not experience any increase in RFC; for all arms in both peak periods, the RFC value is getting higher by 1 – 3% comparing to the Do-Nothing scenario. The highest observed queueing formation is 6.6 PCU's in the evening period at Arm B (R156 east) which is approx. 38m.

In Analysis 5, the proposed unmanned development is presented in its operational stage. The RFC values are dropped by 1 – 4% comparing to the construction stage, e.g., from 74% to 70% at Arm D in the morning and from 90% to 86% at Arm B in the evening. There still is a congestion on R156: on the western side in the morning (2.3 PCU's or 13m) and on the eastern side in the evening (5.1 PCU's or 29m). However, there is absolutely no difference in RFC values or queuing formation between the Do-Nothing and Do-Something scenarios for the year 2026, in other words, the proposed development in its operational stage does not affect the analysed junction.

Looking forward to 2041, Analysis 9 which incorporates traffic from the proposed development, slightly increases the RFC by 0.01 (1%) in Arm B during the PM peak, with no increase in queue, comparing to the Do-Nothing scenario. During the morning peak Arm D is anticipated to operate at capacity with a maximum RFC value of 0.87 (87%) and a queue formation of 5.5 PCUs, equal to 31m.

However, it is important to acknowledge that road R160, on which the proposed development will be located, does not experience congestion in any scenario: the highest RFC value observed at the Arm A and Arm C is 0.32 (32%) in the evening peak in 2041, with or without the proposed substation.

5.2.3 Junction 3 – R160/ R158/ Summerhill Road Roundabout

The junction was assessed for the AM and PM peak and the arms were labelled as follows:

- Arm A: R160 (Ring Road)
- Arm B: R158

- Arm C: R160
- Arm D: R158 (Summerhill Road)

Figure 5.4 depicts the arm names as used in modelling with ARCADY software.

Figure 5.4: JTC3 Arm Names (Source: Bing Maps)

Table 5.3 shows the results of the analysis of the roundabout modelled using ARCADY transport modelling software for the assessment year (2024), the year of the construction stage (2025), the expected year of opening (2026), 5 years after the development completion (2031) and 15 years after the development completion (2041) for the 'Do-Nothing' and 'Do-Something' scenarios.

Table 5.3 – *ARCADY* Results for JTC3 Analysis					
		AM		PM	
Analysis	Arm	Queue (PCU)	Rate Flow Capacity (RFC)	Queue (PCU)	Rate Flow Capacity (RFC)
1 – 2024, base traffic	A	0.5	0.34	0.6	0.37
	B	0.5	0.33	0.9	0.45
	C	0.8	0.44	0.9	0.46
	D	0.2	0.19	0.2	0.19
2 – 2025, do-nothing	A	0.6	0.37	0.7	0.40
	B	0.6	0.38	1.3	0.57
	C	1.0	0.49	1.2	0.54
	D	0.4	0.30	0.4	0.26
3 – 2025, do-something	A	0.7	0.38	0.8	0.42
	B	0.6	0.39	1.4	0.59
	C	1.2	0.52	1.4	0.58
	D	0.5	0.32	0.4	0.27
4 – 2026, do-nothing	A	0.6	0.37	0.7	0.41
	B	0.6	0.38	1.4	0.58
	C	1.1	0.50	1.2	0.55
	D	0.5	0.31	0.4	0.27
5 – 2026, do-something	A	0.6	0.37	0.7	0.41
	B	0.6	0.38	1.4	0.58
	C	1.1	0.50	1.2	0.55
	D	0.5	0.31	0.4	0.27
6 – 2031, do-nothing	A	0.7	0.40	0.8	0.44
	B	0.7	0.42	1.8	0.64
	C	1.3	0.54	1.5	0.60
	D	0.5	0.33	0.4	0.29
7 – 2031 do-something	A	0.7	0.41	0.8	0.44
	B	0.7	0.42	1.8	0.64
	C	1.3	0.54	1.5	0.60
	D	0.5	0.33	0.4	0.29
8 – 2041, do-nothing	A	0.8	0.44	0.9	0.47
	B	0.9	0.46	2.3	0.70
	C	1.5	0.58	1.9	0.66
	D	0.6	0.36	0.5	0.32
9 – 2041, do-something	A	0.8	0.44	0.9	0.47
	B	0.9	0.46	2.3	0.70
	C	1.5	0.58	1.9	0.66
	D	0.6	0.36	0.5	0.32

In Analysis 1, which provides representations of the current year and the anticipated traffic conditions in the study area without the proposed and committed developments, RFC reaches the peak value of 0.44 (44%) in the morning and 0.46 (46%) in the evening for 2024, as indicated in the table above, in Arm C (R160). The highest observed queueing formation is 0.9 PCU's in the evening period at the same arm and arm B (R158).

In Analysis 8 and the Do-Nothing scenarios, which depict the anticipated traffic conditions in the study area for future years without the proposed scheme in place, the maximum RFC value is 0.58 (58%) on the R160 in the morning and 0.7 (70%) on the R158 in the evening for the year 2041. Additionally, the highest observed queueing formation is 2.3 PCU's (13m) on the R158 in the evening period for 2041.

In Analysis 3 and the Do-Something scenario for 2025, which represents the anticipated traffic conditions during the construction of the substation, there was an increase in RFC at all four arms during both the morning and evening periods. The maximum increase was by 3% (from 0.49 to 0.52) in the morning and by 4% (from 0.54 to 0.58) in the evening on the R160. This was accompanied by morning peak queueing formation of 1.2 PCU's, equivalent to 7m, on the R160, and evening peak queueing formation of 1.4 PCU's, equivalent to 8m, on both R158 and R160.

In Analysis 5 and the Do-Something scenario for 2026, which represents the anticipated traffic conditions with the proposed scheme implemented, there was no increase in RFC or queueing formation comparing to the Do-Nothing scenario (without the proposed development). If we compare the construction (2025) and post-construction (2026) traffic conditions, there is a decrease by 2% (from 52% to 50%) during the morning peak and by 3% (from 58% to 55%) during the evening period on the R160 Road, and by 1% at all other arms. The queue formation will also decrease at Arm A and Arm C, and remains at the same level at Arms B and Arm D.

Looking ahead to the design year 2041 in Analysis 9, the analysed junction did not see a rise in RFC or queueing formation, comparing to the Do-Nothing Scenario for the same year. The maximum RFC value is below 85% indicating that the roads are operating satisfactorily well within capacity. The highest expected queueing formation is 2.3 PCU, with or without the proposed development. Hence, the proposed development, after the construction is completed, is not expected to negatively affect the roundabout of interest.

6 Conclusions

The main conclusions of this study are summarised as follows:

- This Traffic and Transport Assessment was conducted to accompany the planning application for a proposed new Distribution Substation near Fosterstown, Co. Meath.
- The development will consist of a control room, MV Switchgear room, HV Cable room and other ancillary facilities. Overall distribution centre will provide 1288 m^2 of area, along with upgrading of site access and all associated site works and services.
- The proposed development will have no dedicated car parking spaces as the substation will be unmanned. During the construction, there will be temporary parking spaces provided.
- ORS liaised with the local authority to scope the requirements for the Traffic and Transport Assessment (TTA), and it was agreed that this report would focus on 3No. key-junctions: the R160/ Site access T-junction (JTC1), the 4-arm R160/ R158 junction to the south of the site (JTC2), and the R160/ R158/ Summerhill Road Roundabout to the north of the site (JTC3).
- The chosen junctions were subjected to capacity analysis to examine the potential traffic levels generated from the development to the existing road network.
- Automatic junction turning counts (JTCs) were undertaken by a third-party company named IDASO, on Wednesday the 8th of May, at the junctions mentioned above. The AM and PM traffic peak periods were identified along the junctions and occurs between 08:00 and 09:00 in the morning in Junction 1 and Junction 3 and between 07:45 and 08:45 in Junction 2. The PM peak occurs between 16:45 and 17:45 in Junction 1 and Junction 2 and between 16:30 and 17:30 in Junction 3. The peak flows indicated high traffic flow numbers for junctions JTC2 and JTC3 with especially high volumes of traffic to/from Trim.
- The Meath County Council planning website was consulted to obtain information about committed developments near the proposed site to be included in this traffic analysis. It was found that 1No. granted planning application will make use of the Junction 3, therefore, it was included in future scenarios of the junction's modelling.
- The traffic splits in the examined junctions could be calculated from the traffic counts and it is expected that the traffic from the proposed development will follow the same trend. The trip generation from the committed development was assessed from the TRICS database.
- The junctions analysed in this traffic assessment were assessed against the TII threshold and it was found that the development is anticipated to generate greater than 5% increase in traffic at the junction between the R160 and the development access road during the morning peak period; however, congestion is not expected to occur at this junction. Nevertheless, to demonstrate that the proposed development will not negatively affect the public roads, a junction modelling was conducted to evaluate the traffic impact generated by the proposed development across all future design years.
- The junctions were examined using *Junctions 9* (PICADY and ARCADY) software for the AM and the PM peak conditions under conservative future projections and Central background Traffic Growth for the considered year of construction 2025, year of opening 2026, 5-years and 15-years after development conclusion.
- From a transportation planning perspective, the proposed substation is not anticipated to adversely impact the operation of the three junctions under analysis. The existing junctions JCT2 and JCT3 are currently operating below optimal efficiency and have capacity limitations. It is evident from the analysis that the introduction of additional traffic will result in minimal effects on the road network. However, it is important to acknowledge that the 4-arm R160/ R156 junction is currently experiencing heavy traffic volumes. Forecasts indicate that this junction is likely to exceed its capacity limits, leading to queues and delays.

Appendix A – Traffic Data

Traffic data available upon request.

Appendix B – TRICS Data

TRICS data available upon request.

Appendix C – Junctions9 Modelling Data

Junctions9 Modelling data available upon request.

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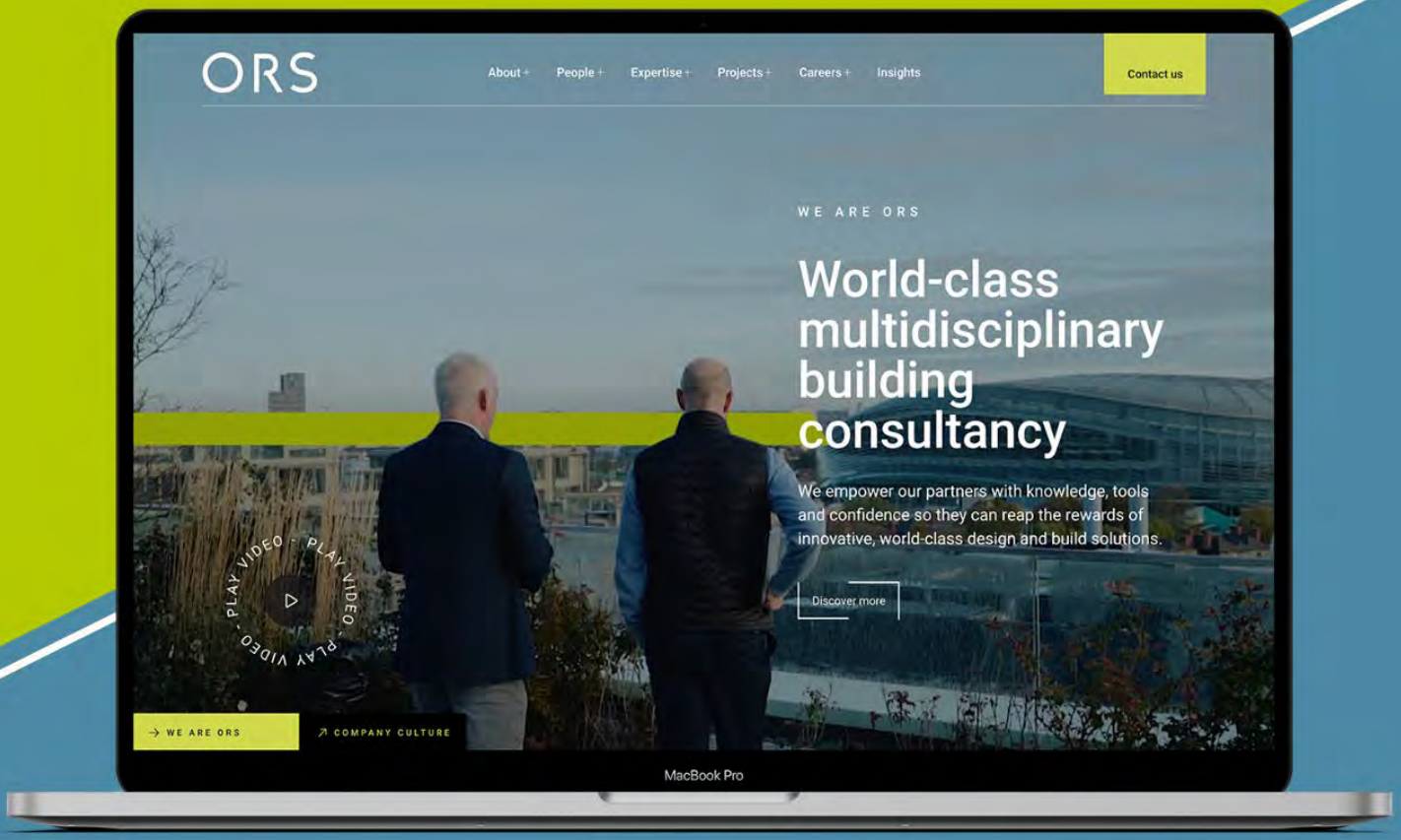

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Appendix F – Cultural Heritage Appraisal

FOSTERSTOWN 110kV/20MW DISTRIBUTION SUBSTATION
CARBERRYSTOWN
TRIM
Co. MEATH

CULTURAL HERITAGE APPRAISAL REPORT

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Report Commissioned by
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JULY 2025

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FOSTERSTOWN 110kV/20MW DISTRIBUTION SUBSTATION CARBERRYSTOWN, TRIM, Co. MEATH

CULTURAL HERITAGE APPRAISAL REPORT

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1. INTRODUCTION

Cultural Heritage has been defined by UNESCO as "the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations" (Tangible Cultural Heritage, UNESCO http://www.unesco.org/new/en/cairo/culture/tangible-cultural-heritage). Cultural Heritage is assumed to include all humanly created features on the landscape, including portable artefacts, which might reflect the prehistoric, historic, architectural, engineering and/or social history of the area. Where appropriate, it also includes for non-physical aspects of heritage, such as history, linguistics, folklore, etc.

The Heritage Act (1995) contains a list of various aspects of heritage, including archaeological monuments and objects, architectural heritage, fauna, flora, geology, heritage gardens and parks, heritage objects, inland waterways, landscapes, monuments, seascapes, wildlife habitats, and wrecks.

The Cultural Heritage of the area of the proposed development was examined through an Archaeological, Architectural, and Historical study. The Archaeological and Architectural studies involved a documentary/cartographic search and focussed field inspection of the area, while the Historical study involved a documentary search.

The chapter discusses the receiving environment from a Cultural Heritage perspective. It provides information with respect to previously identified baseline data and assesses the impact of the proposals on identified sites and areas of Cultural Heritage interest and/or potential.

2. ASSESSMENT METHODOLOGY

The Cultural Heritage components of the study comprise the results of a survey and evaluation of sites of archaeological, architectural and historical potential within, and in the immediate environs of, the proposed development area. The work consists of the results of the paper survey and the field inspection.

2.1 Paper Survey

The Paper Survey comprised documentary, cartographic and aerial photographic research using the following principal sources:

- Record of Monuments and Places – Co. Meath (RMP)
- Sites and Monuments Record (SMR); National Monuments Register, Register of Historic Monuments (RHM) & Lists of Monuments subject to Preservation Orders (PO) – www.archaeology.ie
- Topographical Files of the National Museum of Ireland
- Annual Archaeological Excavations Bulletin – www.excavations.ie

- Cartographic and Aerial Photographic Archive of the Ordnance Survey of Ireland – www.osi.ie
- Satellite Imagery on Google (www.google.ie/maps) and Bing (www.bing.com/maps)
- National Inventory of Architectural Heritage (NIAH) – www.buildingsofireland.ie
- Documentary and cartographic source (see Appendix 1)
- Meath County Development Plan 2021-2027 (MCDP)
- Placenames Database – www.logainm.ie
- Heritage Council Data – www.heritagemaps.ie

2.2 Field Inspection

From the preceding paper survey, a list of cultural heritage sites/sites of cultural heritage potential was compiled for inspection. A field survey of the subject lands and environs was subsequently undertaken in late June 2024; this included a surface reconnaissance survey of the subject development site and visual inspection of the immediate surrounds. It also included examination of soil edges to the drain and soil surfaces to the fields, where exposed.

2.3 Difficulties Encountered

No difficulties were encountered with respect to undertaking of the Paper Survey or subsequent Field Inspection.

2.4 Definition of Study Area

The subject development lands (red-line boundary) and an area of 500km surrounding such lands were determined to be the Study Area for Cultural Heritage. The extent of the Cultural Heritage Study Area was chosen to reflect an appropriate context for the development, beyond which it was considered that a development of this nature would have no direct/indirect impacts.

3. SITE LOCATION & DESCRIPTION

The subject proposed development site is located on lands located approximately 3 km southwest of Trim, Co Meath and on the western side of the R160 Trim -Longwood road (**Figure 1**) and is traversed by the Corduff-Mullingar 110kV overhead transmission line.

The planning application boundary encompasses a *c.* 2.07 ha area of agricultural grassland, comprising parts of two separate fields, both under grass and with an open drain routed along the southern boundary of the northern field; a former residential farmyard (see Sections 4 and 6) located along part of the road frontage boundary, each accessed by separate entrance gates from the road.

The characteristics of the land are typical of other agricultural lands in the area, encompassing improved agricultural grassland, hedgerows, scrub and fence-lines (Plate 1). The level at the centre of the site is approx. 61.81 mAOD Malin Head; site levels range from approx. 60.36 mAOD at the north-eastern boundary to 62.45 mAOD (± 0.05 m) at the western side (Figure 2).

A row of five residential properties is located fronting onto the eastern side of the R160, directly across the road to the proposed site and there are two golf courses located approximately 300m to the southwest and 300m to the northeast. The main land uses within the surrounding area are agricultural, and low density residential.

Figure 1 Site Location

Plate 1 Aerial View of Site and Environs

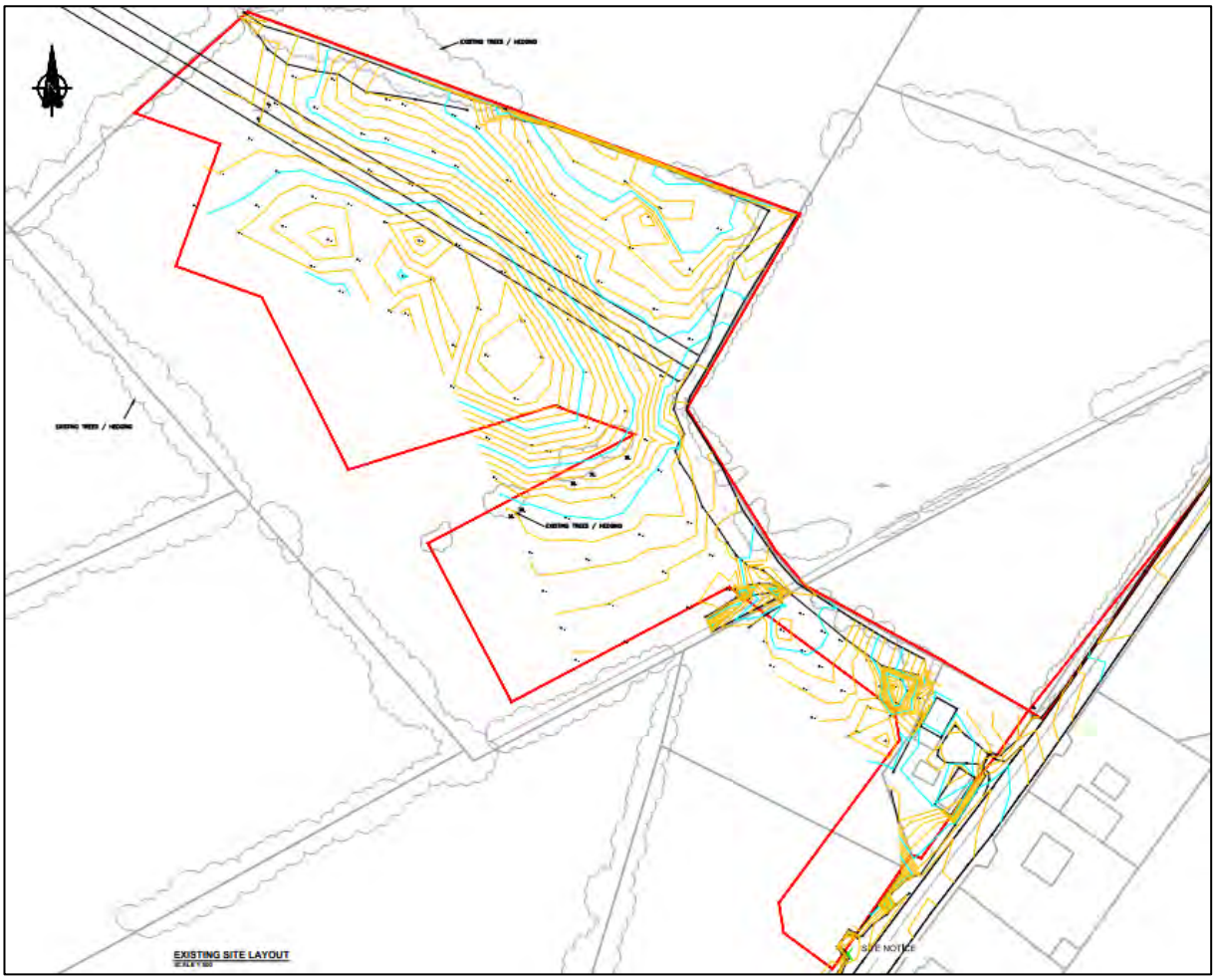


Figure 2 Existing Topographical Layout

Plate 2 General View of Southern Field – from northern corner looking east

Plate 3 Northern Field – from eastern corner looking northwest

4. LOCAL HISTORY

The subject proposed development lands form part of the townland of Carberrystown, in the civil parish of Trim and barony of Moyfenrath Lower; the Placenames Database (www.logainm.ie) considers the townland name to be of English origin.

Evidence for prehistoric activity is relatively sparce in the immediate region of the subject site; ring ditches have been identified at Blackfriary, Trim (SMR No: ME036-097) and Laracor (SMR No: ME036-043002) and a Fulacht Fia at Friarspark (SMR No: ME036-102).

Meath is traditionally said to have been created in the early historic period by *Túathal Techtmar* and the *Uí Enechglaiss* was an early dynasty of the region. Along with the *Uí Failge* and *Uí Bairrche*, they belonged to the *Laigin*. During the early sixth century, they were driven away from their original homeland in Kildare and over the Wicklow Mountains by the *Uí Néill*, whose sept, the *Clann Cholmáin*, took their place. Historically, the region became known as the 'kingdom of Mide' and included all the present counties of Meath, Westmeath and Fingal, as well as parts of counties Cavan, Longford, Louth, Offaly and Kildare. Evidence for activity relating to this period is plentiful, with several ringforts and enclosures dispersed across the landscape, including an enclosure at Carberrystown (SMR No: ME036-042), to the east of the subject site (see Section 5 below). In terms of ecclesiastical history, a monastery was founded at Trim by St. Loman, and is associated, at least from the ninth century, with St. Patrick. Abbots and bishops are recorded from the mid-eighth century; in addition, a house for the Augustinian canons appears to have been founded at Trim before the coming of the Normans and it has been suggested that St. Malachy was the founder (Gwynn & Hadcock, 1970, 195).

Meath is also considered to have been one of five Provinces (Irish: *cúige* meaning "fifths") of Ireland, along with the four current provinces of Connacht, Leinster, Munster and Ulster. The Diocese of Meath established by the Synod of Ráth Breasail in 1111 had boundaries like those of the kingdom. County Meath is known as the Royal County as it was once the territory of the High Kings of Ireland, who resided at Tara.

Following the Anglo-Norman invasions, Henry II granted the ancient 'kingdom of Mide 'to Hugh de Lacy. Under the feudal system, de Lacy divided his 'Liberty of Meath' among his closest allies, his barons, and these land divisions became known as baronies. De Lacy retained control over the barony of Moyfenrath for himself, making Trim the centre of his new lordship; a castle was in existence by 1174, when it was destroyed by the high-king and soon afterwards de Lacy began to build the present stone castle (SMR No: ME036-048004), the oldest and largest surviving castle in Ireland. A substantial town (SMR No: ME036-048) was also established, straddling the River Boyne north and west of the castle; this was later enclosed by a circuit of stone walls with at least five gates, possibly erected by the end of the thirteenth century, following a grant of murage in the 1290s. Dominican, Franciscan and Augustinian friaries were founded in the thirteenth century. In the fifteenth century, it was an important place of pilgrimage because of a famous wooden statue of Our Lady, burnt in 1538 after the Reformation (Cogan, 1887, 392).

The original de Lacy lordship included the townland of Carberrystown and passed through several major English families, including the Mortimers in the fourteenth/early-fifteenth centuries and Richard, Duke of York.

Mac Niocaill (1992, 108) notes that Edmund Lawless and Donald O'Toole occupied lands at "Carbreston" around 1540.

The Civil Survey (aka Down Survey) of 1656-8 notes, with respect to Moyfenrath that "… the soyle of this Barony is generally good arable meadow and pasture but very little or no wood in it. There is store of turf for fireing in most places, no timber, some small quantity of shrubby and underwood…". The Survey notes that 'Carbarberstown' (**Figure 3**) contained 233 plantation acres of 'profitable' lands, with 12 acres described as 'unprofitable'; the landowner in 1641 and 1670 was Robert Dillon.

The *'Abstracts of the conveyances from the trustees of the Forfeited Estates and Interests in Ireland'* for 1703 contains the following with respect to 'Carburystowne'

'47. BRINSLEY BUTLER of Dublin, esq , 7th June 1703; consideration…The town and lands of Forterstowne and Carburystowne, 316 a.; bar. Moyfenrath…the estate of Richard Earl of Tyreconnell, attainted, subject to a lease allowed to Mr. John Percevall, on his claim, for the lives of himself, John and Mary Hawkshaw…'

Figure 3 'Carbarberstown' as indicated in the Civil Survey Map of 1656-8

Very little is known about the immediate area in the eighteenth century. Although a few house/structures are indicated on the Grand Jury Map of 1812 (**Figure 4**) as being located at Carberrystown, it is unclear if any are associated with the subject site.

Figure 4 Extract from Grand Jury Map (William Larkin) of 1812 – Meath Sheet 6

The Ordnance Survey 6-inch map of 1836 (**Figure 5**) indicates the layout of the subject site and environs at that time. The existing northern field was formed by two fields and the southern field formed part of a

much smaller field than that exists at present; this latter field incorporates a rectangular plot along part of the road frontage which includes a house. In addition, the road is narrower than that which exists today.

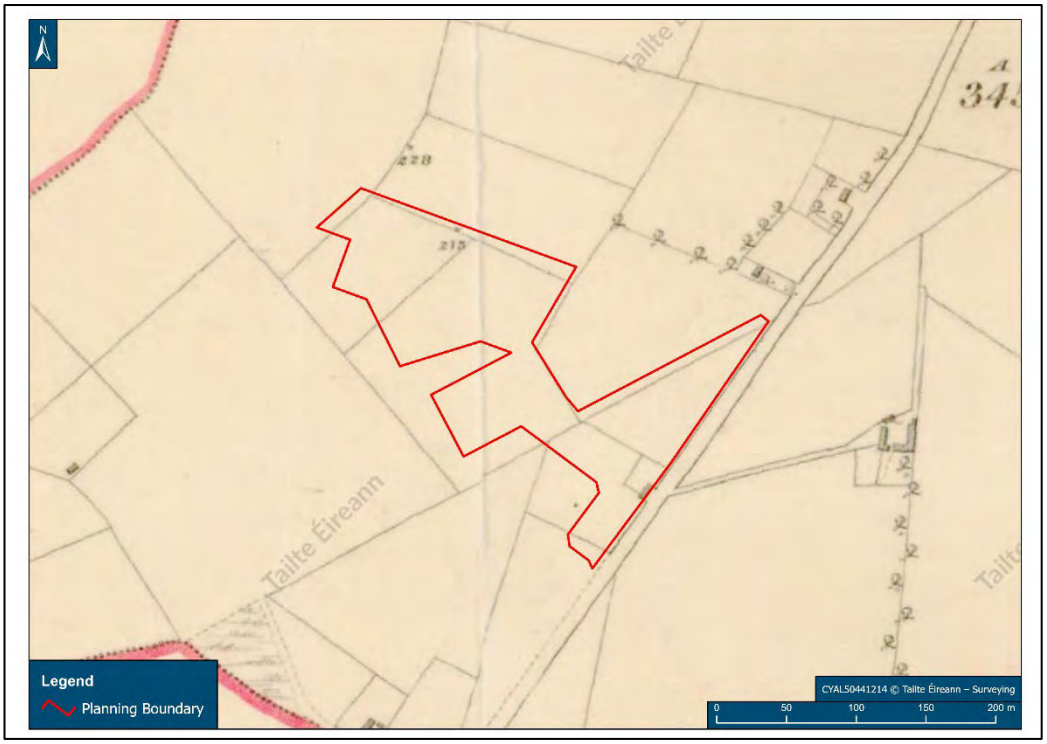


Figure 5 Extract from Ordnance Survey Map of 1836

Lewis (1837, II, 643-45) notes that the parish of Trim had a population of 5926 at that time, of which 3282 resided in the town of Trim; he states that it comprised 12,650¾ statute acres, of which 11,880 were applotted under the tithe act and describes the land as "principally in tillage and of good quality" affording abundant crops with system of agriculture that had "lately improved"; in addition, only a small portion of the land comprised bog.

Griffith's Valuation (*Primary Valuation of Ireland 1848-64*) of 1855 notes that the subject lands formed part of a large landholding owned by Michael Sweetman; the subject lands were occupied by John Cummins who leased had an area of 11 acres, 1 perch, 22 roods and contained a house and office [outbuilding].

Very little changes to the subject lands and environs are evidence on the Ordnance Survey 25-inch map of 1909 (**Figure 6**). The boundary between the northern and southern fields is indicated as a drain/stream, with culvert/bridge providing access between the two. The residential/farmyard plot has been extended to the southwest; a rear extension to the house is indicated, which most likely for agricultural use; in addition, two detached outbuildings are also indicated.

The Ordnance Survey 6-inch map of 1959 (**Figure 7**) indicates that the former field boundary in the centre of the northern area had been removed for form a larger, single field; it also indicates that the 110kV overhead line (OHL) had been established by then. Additional outbuildings are indicated within the residential farmyard plot, including one at the location of the existing open-sided hayshed structure. Some structures are also indicated across the road from the site.

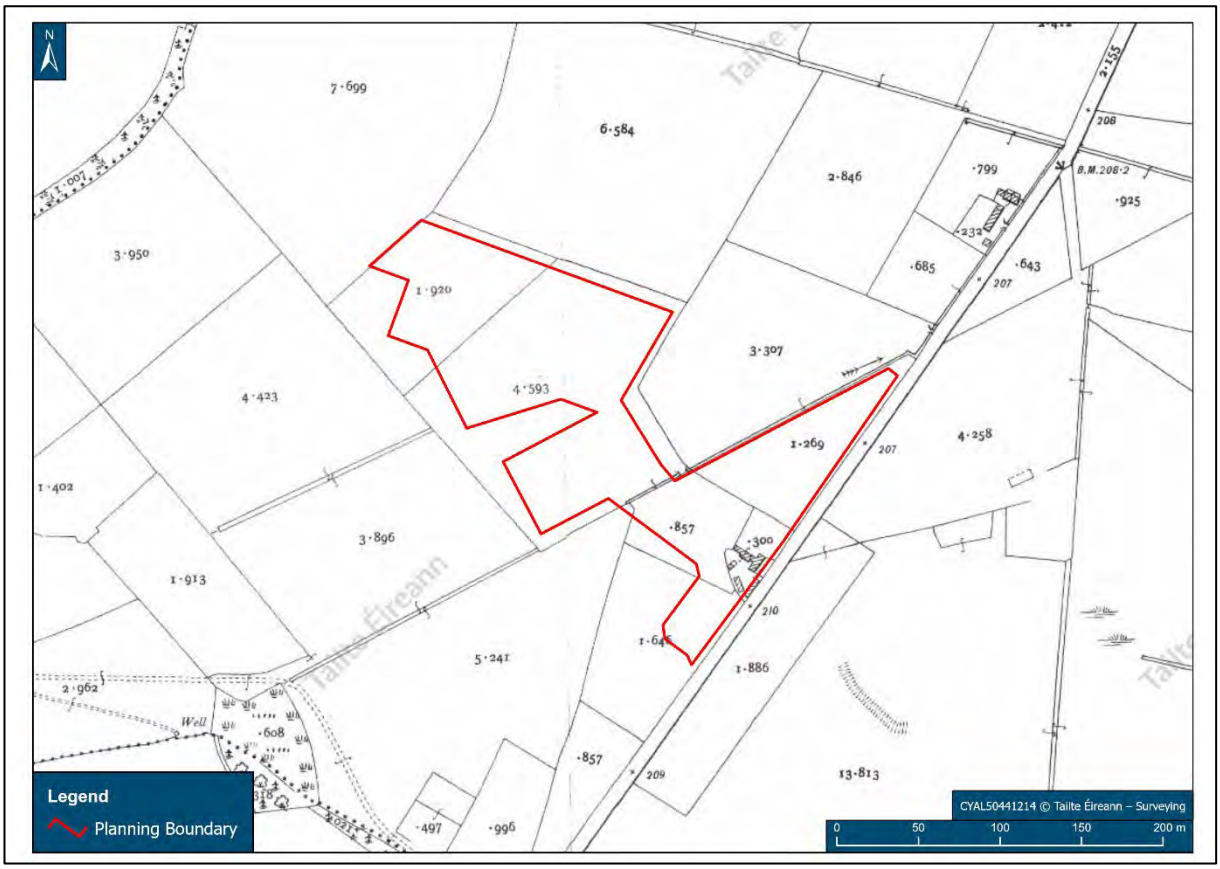


Figure 6 Extract from Ordnance Survey Map of 1909

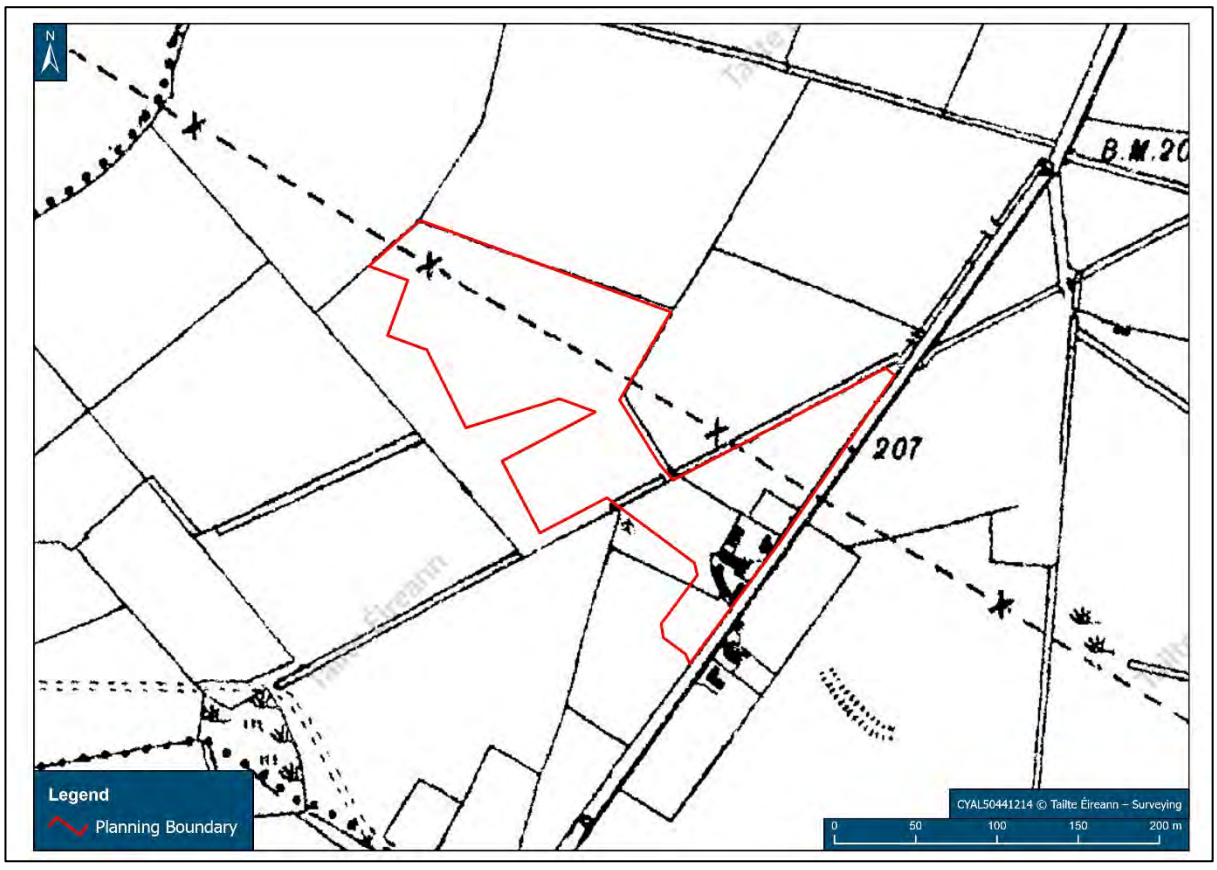


Figure 7 Extract from Ordnance Survey Map of 1959

In more recent years, additional houses have been constructed across the road from the subject site and the road has been widened. A boundary in the southern field was removed to form a larger field. The residential farmyard plot was abandoned and many of the former outbuildings were removed; some additional site clearance works are indicated on an aerial photograph of *c.* 2010 (**Plate 4**), with the associated spoil deposited to the rear of the hay barn structure.

Plate 4 Aerial View of Residential Farmyard – *c.* 2010

5. ARCHAEOLOGICAL HERITAGE

5.1 Introduction

Archaeology is the study of past societies through their material remains and the landscapes they lived in. 'Archaeological Heritage consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence' (DAHGI, 1999, 9).

Archaeological heritage comprises all material remains of past societies, with the potential to enhance our understanding of such societies. It includes the remains of features such as settlements, burials, ships and boats and portable objects of all kinds, from the everyday to the very special. It also includes evidence of the environment in which those societies lived. The terms "site" or "monument" are used generally to refer to fixed structures or areas of activity, as opposed to particular moveable objects. Historic wrecks are also part of the archaeological heritage (DHLG&H, 2021, 3).

5.2 Statutory Protections

The statutory and administrative framework of development control in zones of archaeological potential or in proximity to recorded monuments has two main elements:

(a) Archaeological preservation and licensing under the National Monuments Acts; and

(b) Development plans and planning applications under the Planning Acts.

5.2.1 National Monuments Acts 1930-2014

Section 12 (1) of the National Monuments (Amendment) Act, 1994 provides that the Minister for the Environment, Heritage and Local Government shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect to each county of the State. This is referred to as the 'Record of Monuments and Places' (RMP), and monuments entered into it are referred to as 'Recorded Monuments.'

Section 12(3) of the National Monuments (Amendment) Act 1994 provides for the protection of monuments and places in the record, stating that

"When the owner or occupier (not being the Minister) of a monument or place which has been recorded under subsection (1) of this section or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Minister and shall not, except in the case of urgent necessity and with the consent of the Minister, commence work for a period of two months after having given the notice.

5.2.2 Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023

This Act (October 2023) repeals the National Monuments Acts 1930 to 2014 and replaces those Acts with provisions for the protection of historic heritage, provisions for the protection of archaeological heritage,

provisions for the regulation of certain activities in the interests of such protection and provisions enabling the State to ratify or accede to certain international conventions which relate to such protection or regulation; to give effect to the EIA Directive and the Habitats Directive in relation to the carrying out of works at, on, in, under, to, or within the immediate surroundings of monuments; to give further effect to the Valletta Convention; to consequentially repeal or amend certain other enactments; and to provide for related matters.

The Act contains a range of provisions that seek to streamline and simplify existing systems and processes, including the automatic legal protection for finds of archaeological sites, a system of civil enforcement to be used as an alternative to, or to supplement criminal proceedings, and an appeal process for license applications.

In terms of monument protections, the key change will be the creation of a single Register of Monuments to replace the statutory Record of Monuments and Places (RMP) and the non-statutory Sites and Monuments Record (SMR); two levels of protection are provided, Special and General, and automatic protection will be afforded newly discovered monuments.
Although the Act has been signed into law, it will be enabled on a phased basis and the provisions of the National Monuments Acts 1930 – 2014 are still in force.

5.2.3 Meath County Development Plan 2021-2027

The following relevant Archaeological Heritage Policies are set out in Chapter 8.6 of the Plan:

HER POL 1 To protect sites, monuments, places, areas or objects of the following categories:

- Sites and monuments included in the Sites and Monuments Record as maintained by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht;
- Monuments and places included in the Record of Monuments and Places as established under the National Monuments Acts;
- Historic monuments and archaeological areas included in the Register of Historic Monuments as established under the National Monuments Acts;
- National monuments subject to Preservation Orders under the National Monuments Acts and national monuments which are in the ownership or guardianship of the Minister for Culture, Heritage and the Gaeltacht or a local authority;
- Archaeological objects within the meaning of the National Monuments Acts; and Wrecks protected under the National Monuments Acts or otherwise included in the Shipwreck Inventory maintained by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

HER POL 2 To protect all sites and features of archaeological interest discovered subsequent to the publication of the Record of Monument and Places, in situ (or at a minimum preservation by record) having regard to the advice and recommendations of the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht and The Framework and Principles for the Protection of the Archaeological Heritage (1999).

HER POL 3 To require, as part of the development management process, archaeological impact assessments, geophysical survey, test excavations or monitoring as appropriate, for development in the vicinity of monuments or in areas of archaeological potential. Where there are upstanding remains, a visual impact assessment may be required.

HER POL 4 To require, as part of the development management process, archaeological impact assessments, geophysical survey, test excavations or monitoring as appropriate, where development proposals involve ground clearance of more than half a hectare or for linear developments over one kilometre in length; or developments in proximity to areas with a density of known archaeological monuments and history of discovery as identified by a suitably qualified archaeologist.

5.3 Archaeological Inventory

The Archaeological Survey of Ireland (ASI) inventory database is known as the Sites and Monuments Record (SMR). The SMR contains details of all monuments and places (sites) where it is believed there is a monument known to the ASI pre-dating AD 1700 and includes a selection of monuments from the post-AD 1700 period. The RMP (Section 5.1.1 above) is a subset of the SMR; monuments included in the RMP are legally protected and are generally referred to as "Recorded Monuments". The SMR also includes monuments subject to Preservation Orders, including National Monuments. The addition of a monument to the ASI SMR database does not, of itself, confer legal protection. The reclassification of a monument does not affect its legal status in any way.

In terms of the present proposals, there are no previously identified archaeological monuments or structures of industrial archaeological interest located within the subject development site; likewise, no features of archaeological potential were noted by a review of historic cartographic and aerial photographic source material of by the subsequent field reconnaissance survey.

5.3.1 Terrestrial/Industrial Archaeology

There is one monument of terrestrial archaeological interest located within the defined Cultural Heritage Study Area (2.4 above); this is an Enclosure Site (SITE CH-1; SMR No: ME036-042; Carberrystown Td) which is included in the RMP (**Figure 8**); as indicated, the subject planning boundary is outside the RMP Zone.

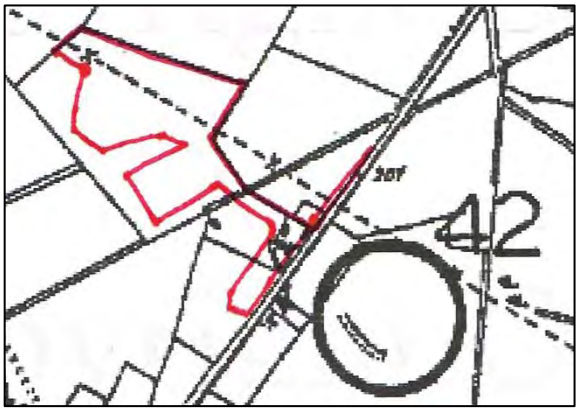


Figure 8 Extract from RMP – Meath Sheet 36

The monument (**SITE CH-**1; ITM (centre-point): 678340 753310) is located to the rear of the residential plots across the road and to the east of the subject site and situated on a locally prominent hillock in a fairly level landscape. A linear fosse (length: *c.* 50m) aligned northwest-southeast is depicted on the 1909 and 1959 Ordnance Survey maps (**Figures 6 & 7** above). The fosse (at south: width of top: 8m; internal depth: 2.7m; external depth: 0.7m) is curving around the base of the hill from southeast – west but it cannot be traced elsewhere. It may have been an outer defence for the rectangular mound (dimensions of base: 23m north-south; *c.* 14m east-west; height: 1.7m) at the hilltop, into which an electrical supply pole has been inserted (Plates X & Y). The closest extent of the monument to the subject site (road frontage/planning boundary) is approximately 64.6m; the extent of the established RMP Zone (**Figure 8**) and SMR Zone of Notification (**Figure 10**) is approximately 52m outside the planning application (red line) boundary.

Plate 5 SITE CH-1 (SMR No: ME036-042) from northwest

Plate 6 Aerial View of SITE CH-1 (SMR No: ME036-042)

5.3.2 Watercourse Related/Underwater Archaeology

There are no previously recorded watercourse related/underwater archaeological sites or features located within the extent of the subject site or wider defined study area

5.4 Results from Previous Documented Archaeological Investigations

A search undertaken of the annual Archaeological Excavations Bulletin (www.excavations.ie) indicates that no licensed archaeological investigations are recorded from within the defined Cultural Heritage Study Area.

5.5 Reported Archaeological Artefacts

A search of the Topographical Files of the National Museum of Ireland determined that no objects have been reported from within the overall defined study area.

6. ARCHITECTURAL HERITAGE

6.1 Introduction

Architectural heritage has several definitions and meanings for people. A useful rule of thumb (which is the legal situation) is set out in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 which provides the following definition:

a) Structures and buildings together with their settings and attendant grounds, fixtures and fittings,

b) Groups of such structures and buildings, and

c) Sites, which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

6.2 Protected Structures

Section 51 of the Planning and Development Act, 2000 (as amended) requires the Development Plan to include a record of structures. These structures form part of the architectural heritage of the County and are to be protected. Meath County Council has drawn up this list, referred to as the Record of Protected Structures (RPS), in which each structure is given a reference number and is a constituent part of the County Development Plan.

There are no structures listed in the Record of Protected Structures (RPS) of the Meath County Development Plan 2021-2027 as being located within the subject study area associated with the project.

6.3 National Inventory of Architectural Heritage (NIAH)

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of Culture, Heritage and the Gaeltacht. It was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage; it also included an Historic Gardens listing. It is intended that the NIAH will provide the basis for the recommendations of the relevant Minister to the planning authorities.

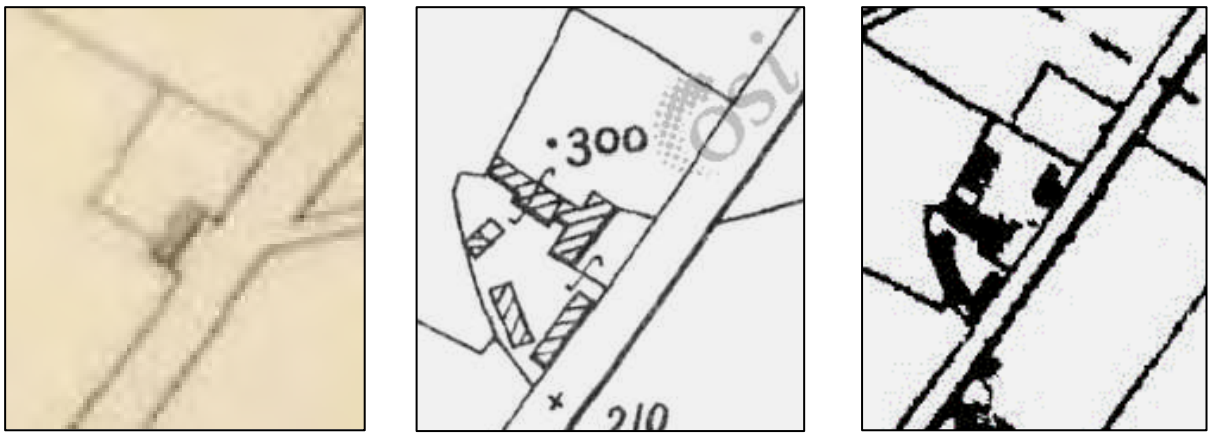
There are no structures of Architectural Heritage interest, or Historic Gardens, listed by the non-statutory NIAH as being located within the subject study area.

6.4 Miscellaneous Structures Within Extent of Planning Boundary

As noted above in Section 4, a house (**SITE CH-2**) is indicated on the 1836 Ordnance Survey map (**Figure 5** above; **Figure 9(a)** below); it is stepped back slightly from, and appears to have an open boundary to, the public road; in addition, it is positioned within a small rectangular plot. Griffith's Valuation of 1855 notes that an associated outbuilding had been constructed by that time.

The 1909 Ordnance Survey map (**Figure 6** above; **Figure 9(b)** below) indicates that the road frontage boundary to the house structure had been established by this time and that s small rear extension to the house had been erected; an outbuilding was erected to the rear of the house and appears to be attached to the rear house extension. Three additional detached outbuildings had been constructed in the southern area of the residential/farmyard plot, one of which was aligned along the road frontage; furthermore, the farmyard plot had been extended to the south/southeast to accommodate these developments.

The 1959 Ordnance Survey map (**Figure 7** above; **Figure 9(c)** below) indicates two additional detached structures had been erected in the northern area of the plot, with some possible extensions to those in the southern/southeastern area.



(a) 1836 **(b) 1909** **(c) 1959**

Figure 9 SITE CH-2: O.S. Map Depictions

All the structures within the farmyard plot were subsequently demolished, apart from the house and a hay barn structure (e.g. **Figure 2** and **Plate 4** above; **Figure 10** below). In addition, the road frontage boundary was subsequently removed and replaced with a concrete post-and-rail fence, the line of which was moved westwards and closer to the façade of the house structure; the existing access gates to the subject lands were established at the time of the road improvement works.

The house (**SITE CH-2**) comprises a partially ruinous gable-ended, structure, with small rear off-centre extension at the northern end; it is rectangular in plan and roughly aligned north-south, with the long sides almost parallel with the road-frontage boundary. The roof is pitched and composed of corrugated iron sheeting, a replacement for the original thatch; it incorporates a slightly off-centre chimney to the south, composed of brick with rough render (**Plate 7**). The external walls incorporate a rough mortared render, which has peeled off in many areas to reveal a cob (earth and stone) structural material, with the basal

areas formed by stone coursing, with some evidence for brick repairs at the southwestern corner (**Plate 8**). There are square window opes in the gables; the one to the south incorporates a timber one-over-one sash window with missing sill (**Plate 9**), with the one to the north largely removed, comprising of only part of the frame and a stone sill (**Plate 10**). The upper areas of the gables are faced with timber panelling (e.g. **Plate 10**). A small lean-to extension to the rear is very overgrown and partially ruinous; there is no evidence for a roof, and the walls appear to be of a cementitious mortar; cartographic evidence indicates that this is of later nineteenth or early twentieth century date.

Plate 7 CH-2: View from east showing roof detail

Plate 8 CH-2: Rear south-western corner

Plate 9 CH-2: South Gable with widow detail

Plate 10 CH-2: Northern Gable – note overgrown rear extension to right

The façade is extremely overgrown, and no features are visible (**Plate 7** above). However, a street-view image from google maps (**Plate 11**) indicates that it appears to incorporate a central lobby entrance with pairs of rectangular window opes to sides; the opes contain one-over-one timber sash windows with stone sills.

Plate 11 CH-2: Façade View from east (*c.* 2020; www.google.ie/maps)

An open-sided hay barn with steel upright and vaulted corrugated roof (**Plate 12**) is located to the northwest of the house

Plate 12 Hay Barn

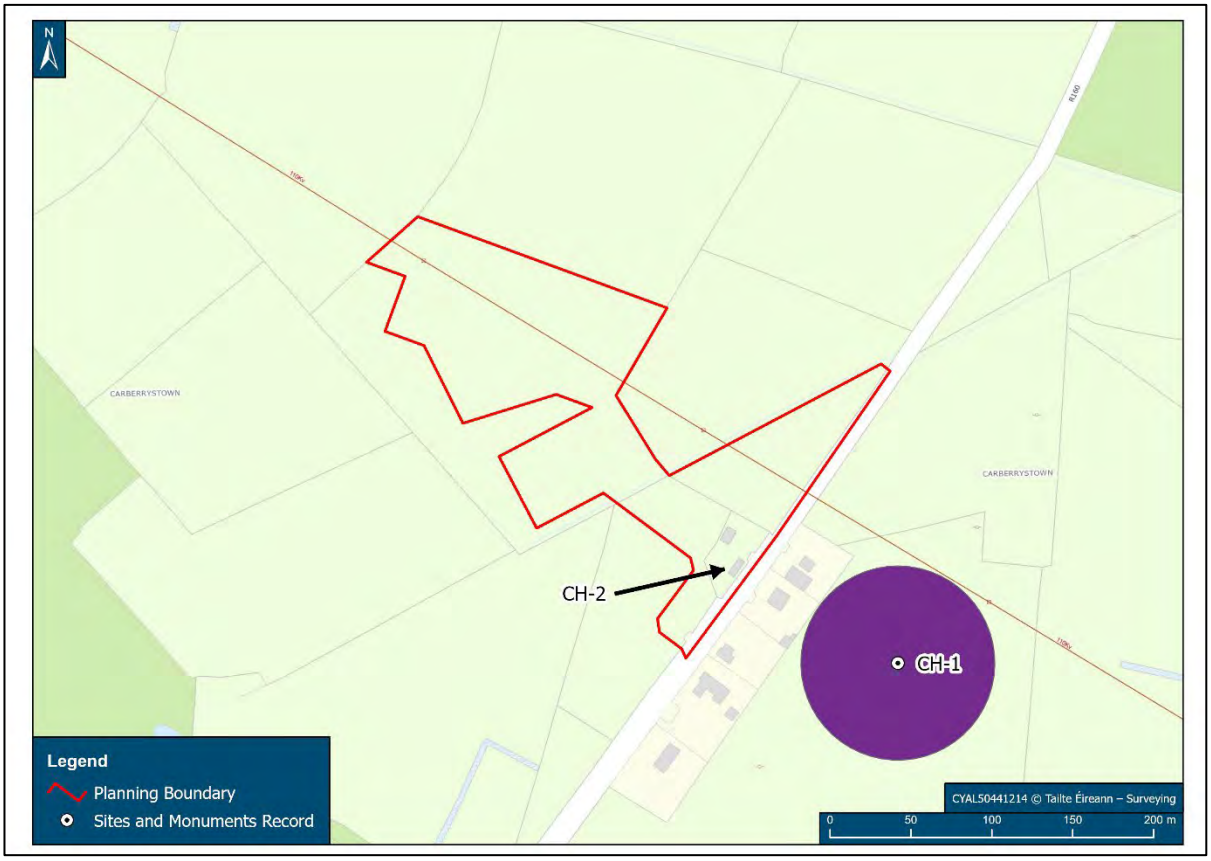


Figure 11 Locations of Cultural Heritage Monuments & Structures within defined study area - Planning Application Boundary outlined in red

7. DESCRIPTION OF DEVELOPMENT

The development will consist of the construction of a new 110 kV Gas Insulated Switchgear (GIS) building located entirely within the site of the red line boundary as indicated (see **Figure 12**) to provide a secure energy supply at this critical location into the future.

The proposed development will include:

- A new indoor GIS building measuring 50.5m x 14.0m x 12.0m
- Installation of new 110 kV electrical transformer equipment.
- All associated construction site works.

The proposed GIS building will measure circa 700 sq.m, with a height of 12 meters. It will also include an element of cladding to the external elevation planes.

The proposed site is traversed by the Corduff-Mullingar 110 kV overhead transmission line and it is intended to loop the proposed substation into this line.

A layout plan of the development, as proposed, is illustrated in **Figure 12**.

Further details of the development, as proposed, are included in Section 3 of the main body of the PECR.

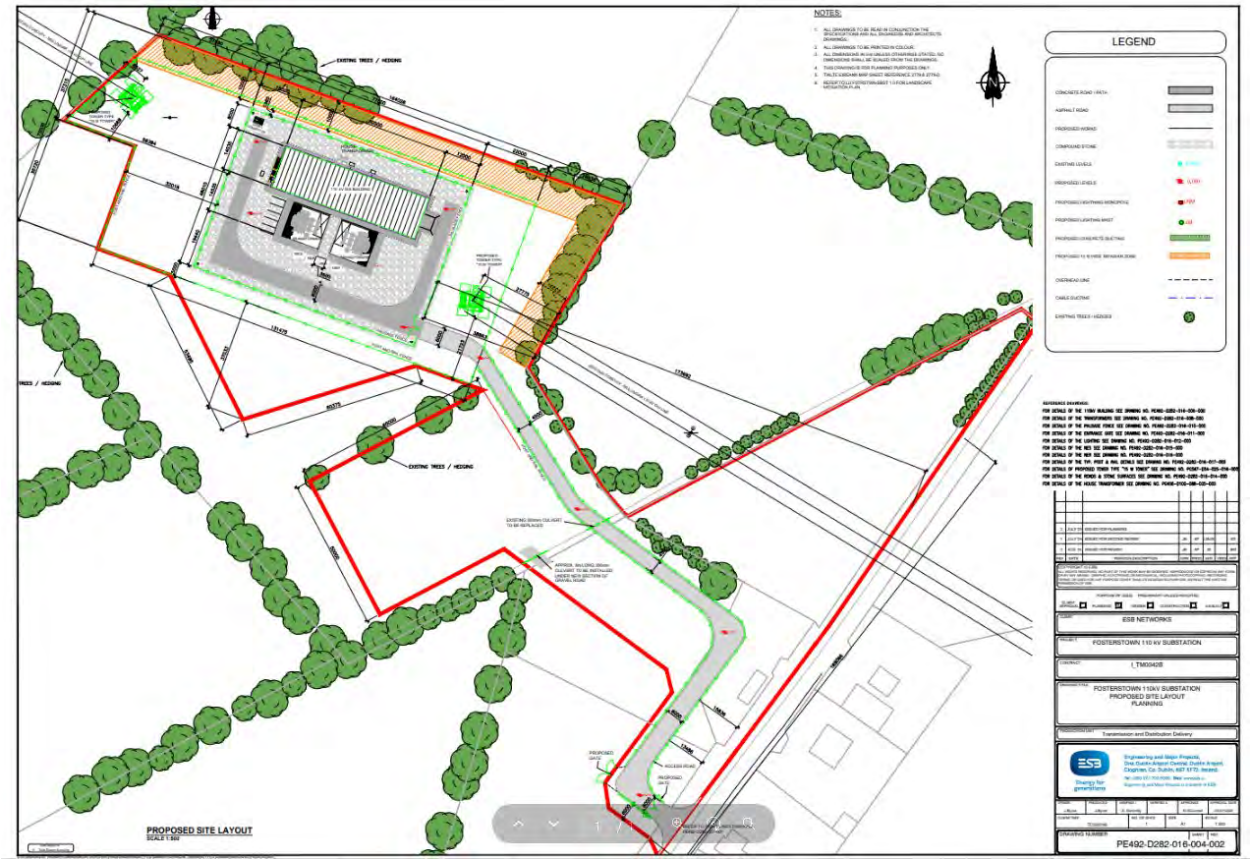


Figure 12 Proposed Layout Plan

8. IMPACTS OF DEVELOPMENT

8.1 Impact Criteria

The methodology used for this assessment is based on EPA (2015) *Advice Notes for Preparing Environmental Impact Statements* and EPA (2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, in accordance with Environmental Impact Assessment (EIA) requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

The following summation of the criteria applied to determine the nature of effects is provided to clearly and concisely outline the methodology specifically applied to the cultural heritage resource. Assessment was achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

Duration of Effect

The duration of effects is assessed based on the following criteria:

• Momentary (seconds to minutes)

• Brief < 1 day • Temporary 60 years.

• Reversible: Effects that can be undone, for example through remediation or restoration Quality of Effect The quality of an effect on the cultural heritage resource can be positive, neutral or negative.

• Positive – a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a site in terms of managed access, signage, presentation etc. or high-quality conservation/restoration and re-use of an otherwise vulnerable derelict structure).

• Neutral – no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment.

• Negative – a change which reduces the quality of the cultural heritage resource (e.g. visual intrusion on the setting of an asset, physical intrusion on features/setting of a site etc.)

The type of effect on the cultural heritage resource can be direct, indirect or no predicted effect.

• Direct – where a cultural heritage site is physically located within the footprint of the development, which will result in its complete or partial removal.

• Indirect – where a cultural heritage site, or its setting, is near the footprint of the development.

• No predicted effect – where the development will not adversely or positively affect a cultural heritage site.

Significance of the Effect

This is based on an assessment of the Magnitude of the Impact (graded from High to Negligible, based on a consideration of character, duration, probability and consequences) and the Value (graded from High to Negligible, based on a consideration of significance/sensitivity) of the heritage asset.

The Magnitude of Impact is based on the degree of change, incorporating any mitigation measures, which can be negative or positive, and is ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible.

The evaluation of the Value/Significance of a cultural heritage asset is based on its significance criteria, which is not to be considered definitive but rather an indicator that contributes to a wider judgment based on the individual circumstances of each asset. Generally, the more criteria that are evident for a given asset, the higher in scale its respective Value is adjudged. Criteria considered in addition to any legal designations include the condition/preservation; documentary/historical significance; group value; rarity; visibility in the landscape; fragility/vulnerability and amenity value.

The Value/Significance of all known or potential assets that may be affected by a development are ranked according to the following scale: High; Medium; Low and Negligible.

The criteria outlined in Table 3 have been informed by the International Council on Monuments and Sites Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011, 14-17).

Value	Asset Type
Very High	• World Heritage Sites (including Tentative List properties) • Assets of acknowledged international importance, including buildings. • Assets that can contribute significantly to acknowledged international. • research objectives
High	• Designated National Monuments (archaeological) • Assets of significant quality and importance, including designated RMP sites • Assets that can contribute significantly to acknowledged national research objectives. • Protected Structures/National Grade NIAH Buildings • Conservation Areas containing significant buildings of national importance, including group value. • Archaeological Landscapes with significant inter-group value
Medium	• Assets of good quality and importance, including designated RMP sites • Assets that can contribute significantly to acknowledged regional research objectives.

	• Regional Grade NIAH Buildings • Other undesignated buildings that can be shown to have exceptional qualities in their fabric or historical associations. • Undesignated structures of potential national importance (archaeological, potential 'new sites') • Conservation Areas containing buildings that contribute significantly to a region's historic character. • Historic townscapes or built-up areas with important historic integrity in their buildings, or built settings (e.g., including street furniture and other structures)
Low	• Designated and undesignated assets of local importance, including buildings. • Assets compromised by poor preservation and/or poor survival of contextual associations. • Assets of limited value, but with potential to contribute to local research objectives. • Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g., including street furniture and other structures)
Negligible	• Assets with very little or no surviving archaeological interest • Buildings of no architectural or historical note; buildings of an intrusive character
Unknown	• The nature of the resource has yet to be fully ascertained, e.g. sites or areas of specific archaeological potential, greenfield areas or riverine / stream / coastal environs with inherent archaeological potential. • Structures with potential historic significance (possibly hidden or inaccessible).

Table 3 Definition of criteria terms relating to the Value of the Cultural Heritage Asset

The significance of the effect upon Cultural Heritage is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The following Table 10.4 from EPA, 2022, Table 3.4) provides the baseline criteria used to describe the impacts (effects) that the proposed development will have on Cultural Heritage Sites, Structures and Features.

Significance	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very	An effect which, by its character, magnitude, duration or intensity significantly alters

Significant	most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics

Table 4 Significance of Effects

Magnitude of Impact	**High**	Not Significant/ Slight	Moderate/ Significant	Significant/ Very Significant	Very Significant/ Profound
	Medium	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	Low	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	Negligible	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		Negligible	**Low**	**Medium**	**High**
		Value/Sensitivity of the Asset			

Table 5 Assessment of Significance of Effects Matrix (after EPA 2017)

8.2 Construction Phase

8.2.1 Local History: The general historical background to development area is discussed above in Section 4. In summary, there are no significant historical events associated with the subject development area which could be impacted upon by the construction of the proposed development. Consequently, it is considered that there are no predicted impacts with respect to Historical Heritage regarding the proposed construction phase of the development. The impact can be stated as **Neutral with no significant effect.**

8.2.2 Archaeological Heritage: The general archaeological background to the subject development area in discussed above in Section 5.

In terms of terrestrial and industrial archaeological heritage, there are there are no previously identified archaeological monuments or structures of industrial archaeological interest located within the subject development site; likewise, no features of archaeological potential were noted by a review of historic cartographic, aerial photographic and satellite imagery source material of by the subsequent field reconnaissance survey.

There is one monument of terrestrial archaeological interest located within the defined Cultural Heritage Study Area (2.4 above); this is an Enclosure Site (SITE CH-1; SMR No: ME036-042; Carberrystown Td) which is included in the RMP. The closest extent of the monument to the subject site (road frontage/planning boundary) is approximately 64.6m; the extent of the established RMP Zone and SMR Zone of Notification is approximately 52m outside the planning application (red line) boundary. It is considered that his monument is of Medium Value/Significance.

In terms of Marine/Underwater Archaeology, several wrecks are recorded in the general area of the subject site, none of which are located within the defined Cultural Study Area.

No predicted direct impacts will occur with respect to the identified Archaeological Heritage Monument (CH-1) during the construction phase of the development. The effect can be stated as **Neutral with no significance**.

8.2.3 Architectural Heritage: The architectural heritage background to the subject development area is discussed above in Section 6. As noted, there are no structures located within the subject site or wider study area listed in the Record of Protected Structures (RPS) of the Meath County Development Plan 2021-2027; likewise, there are no structures of architectural heritage interest, or historic gardens, listed by the National Inventory of Architectural Heritage (NIAH) within the overall defined study area.

There are two structures (house – CH-2; hay barn) located within the site boundaries, both associated with a former residential farmyard adjacent the public road. The house (CH-2) is a partially ruinous gable-ended, entrance-lobby cottage, largely constructed of cob with basal stone walls and covered with a rough render with replacement corrugated pitched roof and later rear lean-to extension; it is considered that this early nineteenth century structure, which is an undesignated cultural heritage asset of poor preservation is of Low Value/Significance and of local interest only; this will be retained *in situ* as part of the development proposals. The hay barn structure is of late twentieth century date and of no architectural or historical note; it will be removed as part of the overall development as it is positioned along a section of the access road.

Given the above, it is considered that no predicted direct impacts will occur with respect to Architectural Heritage during the construction phase of the development. The effect can stated as **Neutral and of no significance.**

8.3 Operational/Post-Construction Phase

There are no extant monuments or structures of historical, archaeological or architectural heritage interest located within the extent of the proposed planning application boundary; one monument (Site CH-1) is located to the east and to the rear of a row of residential plots along the eastern side of the public road and not readily visible from the subject site. Furthermore, there are no Protected Structures of NIAH-listed structure or landscape features located within the subject site or wider study area. The site contains an undesignated early nineteenth century ruinous cottage of poor preservation which will be retained as part of the overall proposals.

Given the above, it is considered that the various proposed elements of the proposed development, will not cause any adverse visual impact to the setting or general views of or from any monuments, sites or features of archaeological interest or protected/designated structures and that no predicted visual impacts will occur with respect to historical, archaeological or architectural heritage relating to the operational/post-construction phase of the development. The impact can be stated as **Neutral with no significant effect.**

8.4 Do-Nothing Scenario Impact

The “do nothing” scenario is the outcome that would be achieved if the proposed development were not constructed. In terms of Cultural Heritage, no impacts (direct or visual) will occur.

9. MITIGATION

As noted above in Sections 8.2.1 and 8.3, it is considered that there are no predicted impacts with respect to Historical Heritage regarding the proposed construction and post-construction/operational phases of the proposed development. Consequently, it is considered that no mitigation measures are required.

IN terns of Archaeological Heritage, it is considered, as noted above in Sections 8.2.2 and 8.3, that there are no predicted impacts with respect to previously identified archaeological monuments, sites or features of archaeological interest by the proposed construction and post-construction/operational phases of the developments. In general, ground reductions associated with a development of this kind, in areas of previous generally undisturbed ground, can uncover and disturb hitherto unrecorded subsurface features,

deposits, structures and finds of archaeological interest and potential, although it is considered that this site is of low archaeological potential. Without the adoption and implementation of a suitable mitigation strategy, any subsurface archaeological features or artefacts that might be located within the site during the construction phase of the development might not be identified and recorded.

Likewise, as noted above in Sections 8.2.3 and 8.3, no direct or indirect (visual) impacts will occur to any structures or features of Architectural Heritage interest designated as 'Protected' in the County Development Plan or listed by the NIAH

Consequently, given the above, the following mitigation measures, based on OPR Practice Note PN03: Planning Conditions (October 2022), are suggested:

1. The developer shall engage a suitably qualified archaeologist (licenced under the National Monuments Acts) to monitor all site clearance and topsoil stripping required of the development. The use of appropriate machinery to ensure the preservation and recording of any surviving subsurface archaeological remains shall be necessary. No subsurface work shall take place in the absence of the archaeologist without his/her express consent.
2. Prior to the commencement of any works in the vicinity of SITE CH-2, the structure should be protected from accidental damage by the installation of the temporary protective barriers around the southern, western and northern sides.
3. Should archaeological remains be identified during archaeological monitoring, all works in the area of archaeological interest shall be suspended, pending a decision of the Planning Authority, in consultation with the National Monuments Service, Department of Housing, Local Government and Heritage.
4. The developer shall facilitate the archaeologist in recording any remains identified. Any further archaeological mitigation measures specified by the Planning Authority, following consultation with the National Monuments Service, shall be complied with by the developer.
5. Following the completion of all on-site archaeological interventions and any necessary post-excavation specialist analysis, the Planning Authority and the National Monuments Service shall be furnished with a final archaeological report describing the results of the monitoring and any other archaeological investigations/interventions that might subsequently have been required. All resulting and associated costs shall be borne by the developer.
6. The Construction Environmental Management Plan (CEMP) shall include the location of all archaeological and architectural heritage constraints relevant to the proposed development. The CEMP shall clearly describe all identified likely archaeological and architectural impacts, both direct and indirect (visual), and all mitigation measures to be employed to protect the archaeological/architectural heritage environment during all phases of site preparation and construction activities.

10. RESIDUAL IMPACT

It is not envisaged that any negative residual effects will occur with respect to Cultural Heritage because of the project proceeding as proposed.

11. CUMULATIVE IMPACT

The cumulative impact of the proposed development and other existing and/or approved developments in the area was assessed by considering the existing baseline environment and the predicted impacts of this and other approved developments in the area.

It is not envisaged that any negative cumulative effects will occur with respect to Cultural Heritage because of the project proceeding as proposed.

APPENDIX 1

LIST OF CONSULTED DOCUMENTARY SOURCES

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Appendix G – Landscape and Visual Impact Assessment

LVIA

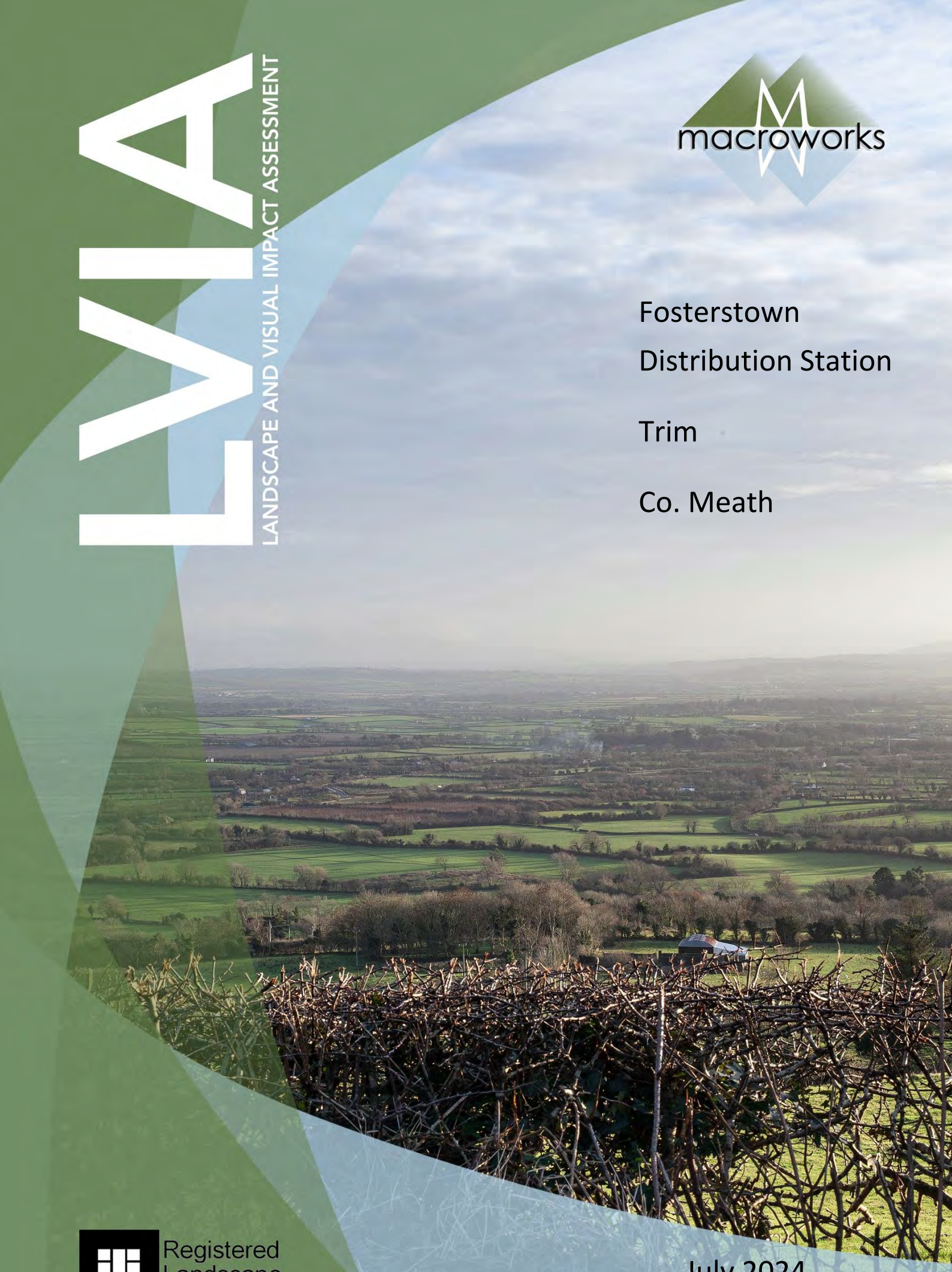
LANDSCAPE AND VISUAL IMPACT ASSESSMENT

macroworks

Fosterstown
Distribution Station

Trim

Co. Meath



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LANDSCAPE AND VISUAL ASSESSMENT

1 INTRODUCTION

This Landscape and Visual Assessment (LVIA) has been prepared in respect of a planning application for a electrical distribution station near Trim, Co. Meath. The LVIA report describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of the proposed development on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

This LVIA uses methodology as prescribed in the following guidance documents:

- 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)', EPA, 2003;
- 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports', EPA, May 2022;
- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition, Landscape Institute and Institute of Environmental Management and Assessment (IEMA); 2013; and
- Landscape Institute Technical Guidance Note TGN 06/19 Visual Representation of development proposals (Landscape Institute and the Institute of Environmental Management and Assessment, 2019).

1.1 STATEMENT OF AUTHORITY

This LVIA was prepared by Macro Works Ltd. Relevant experience includes landscape and visual assessments for a range of industrial, commercial and infrastructural developments. Experience extends to the assessment of over 150 wind energy developments, 120 solar energy developments and includes numerous Strategic Infrastructure Development (SID) projects.

1.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The application site is located in County Meath at lands located approximately 4km southwest of the centre of Trim. The development will consist of permission for a Distribution Station on lands to the northwest of the R160 regional road.

The development will consist of the construction of a 110 kV Gas Insulated Substation (GIS) building, transformers enclosed within a transformer bund wall, lightning monopoles and associated electrical equipment surrounded by a palisade fence set within existing field boundaries. It will also include removal of one poleset from the existing Corduff – Mullingar 110 kV Overhead line, two new Line Interface Masts and a site access track to the R160 regional road.

1.3 ASSESSMENT METHODOLOGY

Production of this Landscape and Visual Impact Assessment involved;

- A desktop study to establish an appropriate study area, relevant landscape and visual designations in the Meath County Development Plan as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposed development;
- Fieldwork to establish the landscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage;
- Assessment of the significance of the landscape impact of the proposed development as a function of landscape sensitivity weighed against the magnitude of the landscape impact; and
- Assessment of the significance of the visual impact of the proposed development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This aspect of the assessment is supported by photomontages prepared in respect of the selected viewshed reference points (VRP).
- Incorporation of mitigation measures to reduce potential impacts and estimation of residual impacts once mitigation has become established.

1.3.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape effects

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area (LCA) or feature) can accommodate changes or new elements without

unacceptable detrimental effects to its essential characteristics. Landscape value and sensitivity are classified using the following criteria set out in **Table 1**.

Table 1 Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the application site boundary that may have an effect on the landscape character of the area. **Table 2** refers.

Table 2 Magnitude of Landscape Impacts

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in **Table 3**.

Table 3 Impact significance matrix

	Sensitivity of Receptor				
Scale/Magnitude	*Very High*	*High*	*Medium*	*Low*	*Negligible*
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: Judgements deemed 'substantial' and above are considered to be 'significant impacts' in EIA terms.

1.3.2 Visual Impact Assessment Criteria

As with the landscape impact, the visual impact of the proposed development will be assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

1.3.3 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below and used in **Table 6** below to establish visual receptor sensitivity at each VRP:

1. **Susceptibility of Receptors** - In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are;
    - "*Residents at home;*
    - *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
    - *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*

- *Communities where views contribute to the landscape setting enjoyed by residents in the area; and*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened*".

Visual receptors that are less susceptible to changes in views and visual amenity include;

- "*People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life*".

2. **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;

3. **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated within the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;

4. **Primary views from dwellings**. A proposed development might be seen from anywhere within a particular residential property with varying degrees of sensitivity. Therefore, this category is reserved for those instances in which the design of dwellings or housing estates, has been influenced by the desire to take in a particular view. This might involve the use of a slope or the specific orientation of a house and/or its internal social rooms and exterior spaces;

5. **Intensity of use, popularity**. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;

6. **Connection with the landscape**. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it;

7. **Provision of elevated panoramic views**. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;

8. **Sense of remoteness and/or tranquillity.** Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;

9. **Degree of perceived naturalness**. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;

10. **Presence of striking or noteworthy features.** A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;

11. **Historical, cultural and / or spiritual significance.** Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;

12. **Rarity or uniqueness of the view**. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;

13. **Integrity of the landscape character**. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;

14. **Sense of place**. This considers whether there is special sense of wholeness and harmony at the viewing location; and

15. **Sense of awe**. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations deemed to satisfy many of the above criteria will likely be of higher sensitivity. (No relative importance is inferred by the order of listing in **Table 5**.) Overall sensitivity may result from a number of these factors or a strong association with one or two in particular.

1.3.4 Visual Impact Magnitude

The magnitude of visual effects is determined by two factors: the proposal's visual presence (relative visual dominance) and its effect on visual amenity. The magnitude of visual impacts is classified in **Table 4**.

Table 4 Magnitude of Visual Impact

Criteria	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene.
High	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene.
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity.
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene.
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.

1.3.5 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and the visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used earlier regarding landscape impacts (**Table 3** refers).

1.3.6 Quality and Timescale of Effects

EPA Guidance for EIAs recommends assessing the significance of landscape and visual effects and determining their quality. This could be negative/adverse, neutral, or positive/beneficial. Landscape and Visual effects are also categorised according to their duration:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years; and
- Permanent – Lasting over sixty years.

1.4 EXTENT OF STUDY AREA

From similar studies it is anticipated that the proposed development is likely to be difficult to discern beyond approximately 1km and is not likely to give rise to significant landscape or visual impacts beyond approximately 2km. In the interests of a comprehensive appraisal, a 3km radius study area was selected in this instance (**Figure 1** refers).

Figure 1: Study area map

1.5 LANDSCAPE AND VISUAL POLICY CONTEXT AND DESIGNATIONS

1.5.1 Meath County Development Plan 2021-2027

A landscape character assessment was carried out in 2007 and has been included within Appendix A.05 Landscape Character Assessment[1] of the current Meath County Development Plan 2021-2027[2], in which the county is divided into four main landscape character types. These are subdivided into 20 geographically distinct Landscape Character Areas (LCAs). The proposed development is located within a '*Lowland Area*' Landscape Character Type (Type 2) (**Figure 2** refers). However, in terms of more-localised scale LCAs, the site is situated within '*LCA 6 – Central lowlands*'. LCA 6 is identified as having; '*High*' Landscape Value; '*Moderate*' Landscape Sensitivity (**Figure 2** and **Figure 3** refer), and; '*Regional*' Landscape Importance. Map 4 of the Landscape Character Assessment (**Figure 4** refers) indicates potential capacity for various development types. LCA 6, in which the site is located, has been identified as having a 'high' capacity for 'visitor facilities', a 'low-medium' capacity for wind turbines and a 'medium' capacity for all types of development. These classifications provide the sense of reasonable robustness for this LCA to accommodate various forms of development, including alterations to existing industrial and extractive facilities.

The landscape description for this Landscape Character Type includes:

> *'The Lowland LCT covers the largest proportion of Meath and, due to the high quality of the land, is primarily agricultural. In the south of the County there is an abundance of 18th Century demesnes with extensive areas of mixed woodland and parkland bounded by original stonewalls, creating an attractive landscape setting for the numerous estate houses. The Lowland LCT have been developed more extensively than other LCT's…'*

There are eight general recommendations for this Landscape Character Type, but none relate to the proposed development.

The landscape description for this Landscape Character Area includes:

> *'Large lowland landscape area composed of rolling drumlins interspersed with numerous large estates and associated parkland. Thick wooded hedgerows, with some conifer plantations, and shelterbelts of ash and larch, separate medium to large fields. Deep roadside drainage ditches and banked hedgerows are a common feature of the landscape in the enclosed rural road corridors. The main transport routes are those radiating from Trim…'*

[1] https://consult.meath.ie/en/consultation/meath-adopted-county-development-plan/chapter/a05-landscape-character-assessment
[2] https://consult.meath.ie/en/consultation/meath-adopted-county-development-plan

There are seven general recommendations for this Landscape Character Area. In terms of relevant recommendations, the Co. Meath landscape character assessment states that:

- *"This LCA is in good condition so the existing methods of managing the rural landscape should be maintained.*
- *Future expansion of settlements should take place in accordance with design guidelines to inform layout, scale, detailing, use of materials and location. Also to ensure that the existing strong interfaces between urban and rural areas are maintained.*
- *Maintain the visual quality of the landscape by avoiding development that would adversely affect short range views between drumlins."*

Four general objectives are provided concerning landscape in 'Section 8.17 Landscape[3]' of the Meath County Development Plan 2021-2027, but none are directly relevant to the proposed development:

- *HER OBJ 48 - To support the aims and objectives of the European Landscape Convention by implementing the relevant objectives and actions of the National Landscape Strategy 2015-2025 and any revisions thereof.*
- *HER OBJ 49 - To ensure that the management of development will have regard to the value of the landscape, its character, importance, sensitivity and capacity to absorb change as outlined in Appendix 5 Meath Landscape Character Assessment and its recommendations.*
- *HER OBJ 50 - To require landscape and visual impact assessments prepared by suitably qualified professionals be submitted with planning applications for development which may have significant impact on landscape character areas of medium or high sensitivity.*
- *HER OBJ 51 - To review and update (if required), in the context of a regional approach to landscape assessment, the County Landscape Character Assessment following publication of statutory guidelines for Planning Authorities on local Landscape Character Assessments, as outlined in the National Landscape Strategy 2015-2025.*

Furthermore, there are two policies relating to landscape, one of which relates to the management of existing hedgerows, which is of particular relevance to this proposed development as it has been designed to avoid impacting existing hedgerows:

- *HER POL 52 - To protect and enhance the quality, character, and distinctiveness of the landscapes of the County in accordance with national policy and guidelines and the recommendations of the Meath Landscape Character Assessment (2007) in Appendix 5, to ensure that new development meets high standards of siting and design.*
- *HER POL 53 - To discourage proposals necessitating the removal of extensive amount of trees, hedgerows and historic walls or other distinctive boundary treatments.*

[3] https://consult.meath.ie/en/consultation/meath-adopted-county-development-plan/chapter/08-cultural-and-natural-heritage-strategy

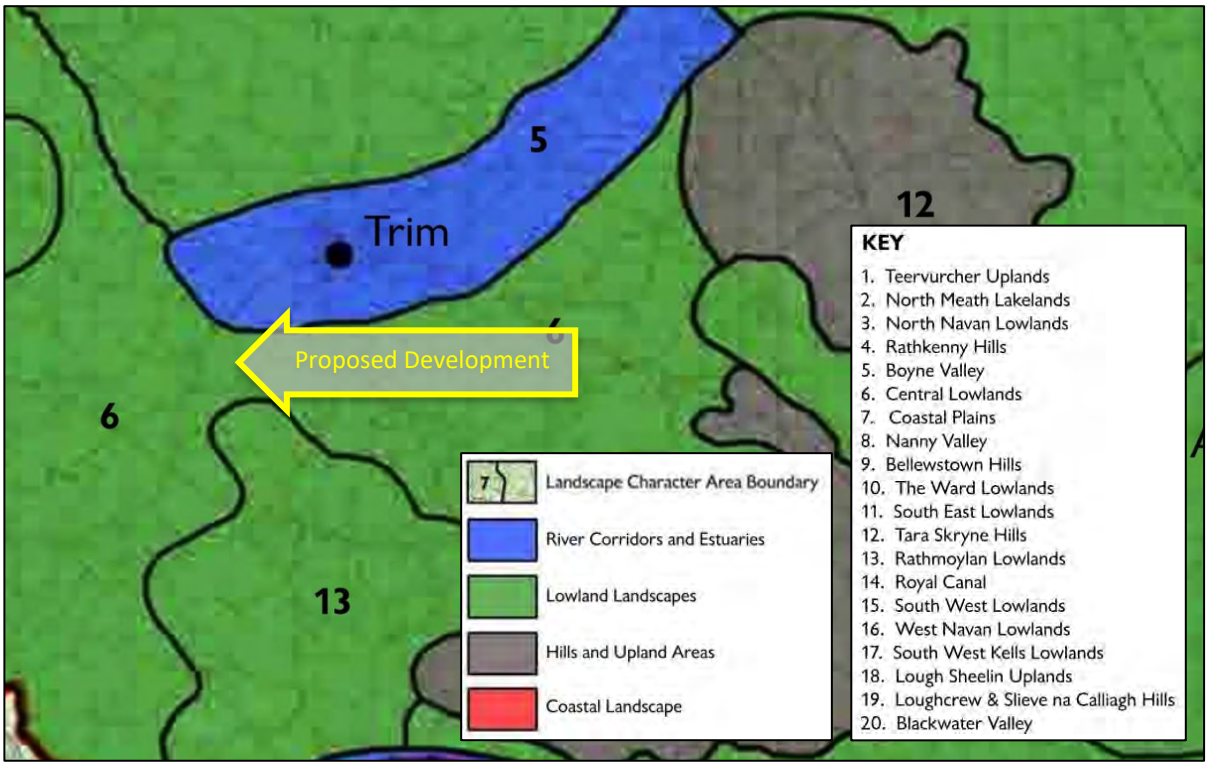

Figure 2: Excerpt from Meath Landscape Character Assessment, map 1.0 showing the approximate location of proposed development in relation to designated landscape character types and landscape character areas.

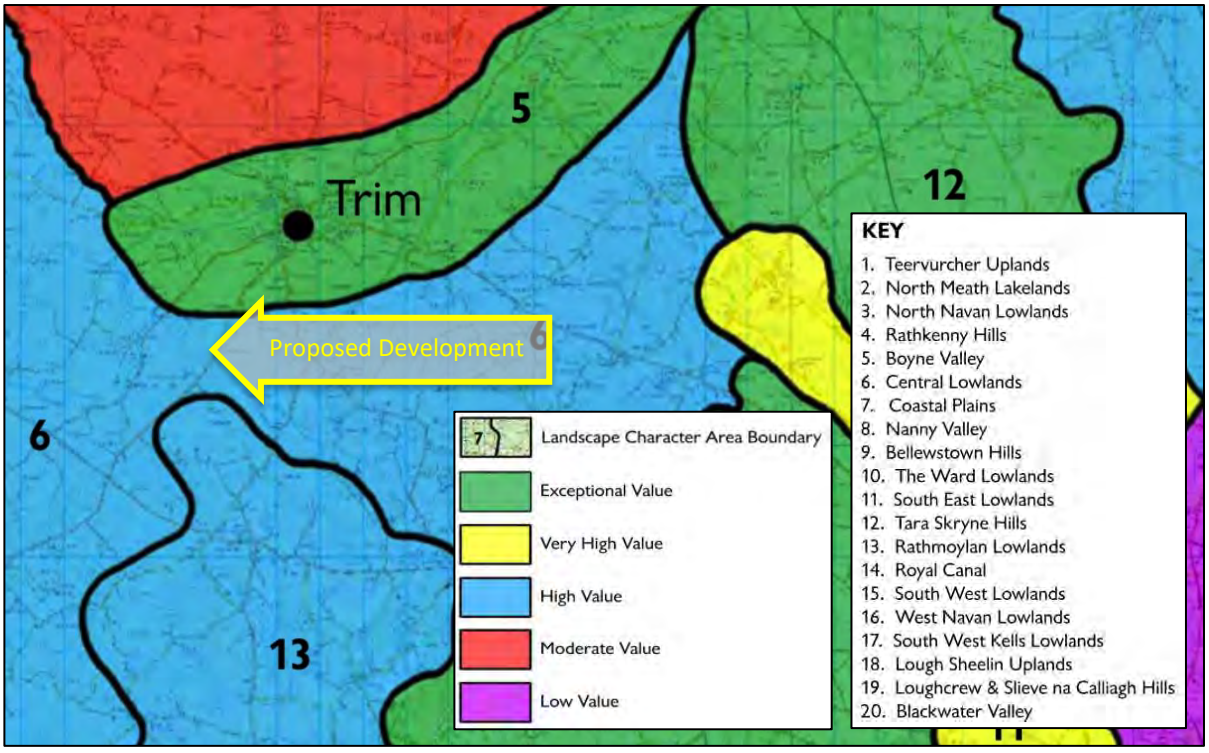

Figure 3: Excerpt from Meath Landscape Character Assessment, map 2.0 showing the approximate location of the proposed development in relation to landscape character areas and associated Value ratings.

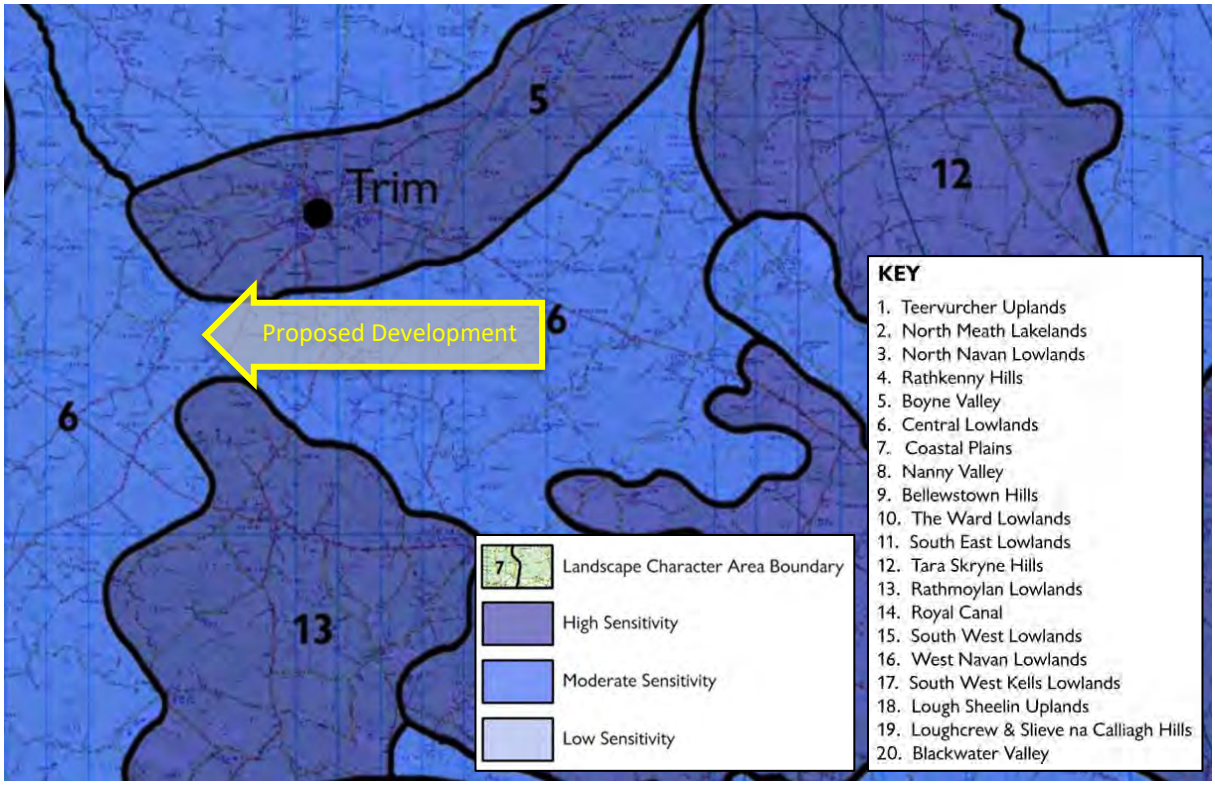

Figure 4: Excerpt from Meath Landscape Character Assessment, map 3.0 showing the approximate location of the proposed development in relation to areas of sensitivity.

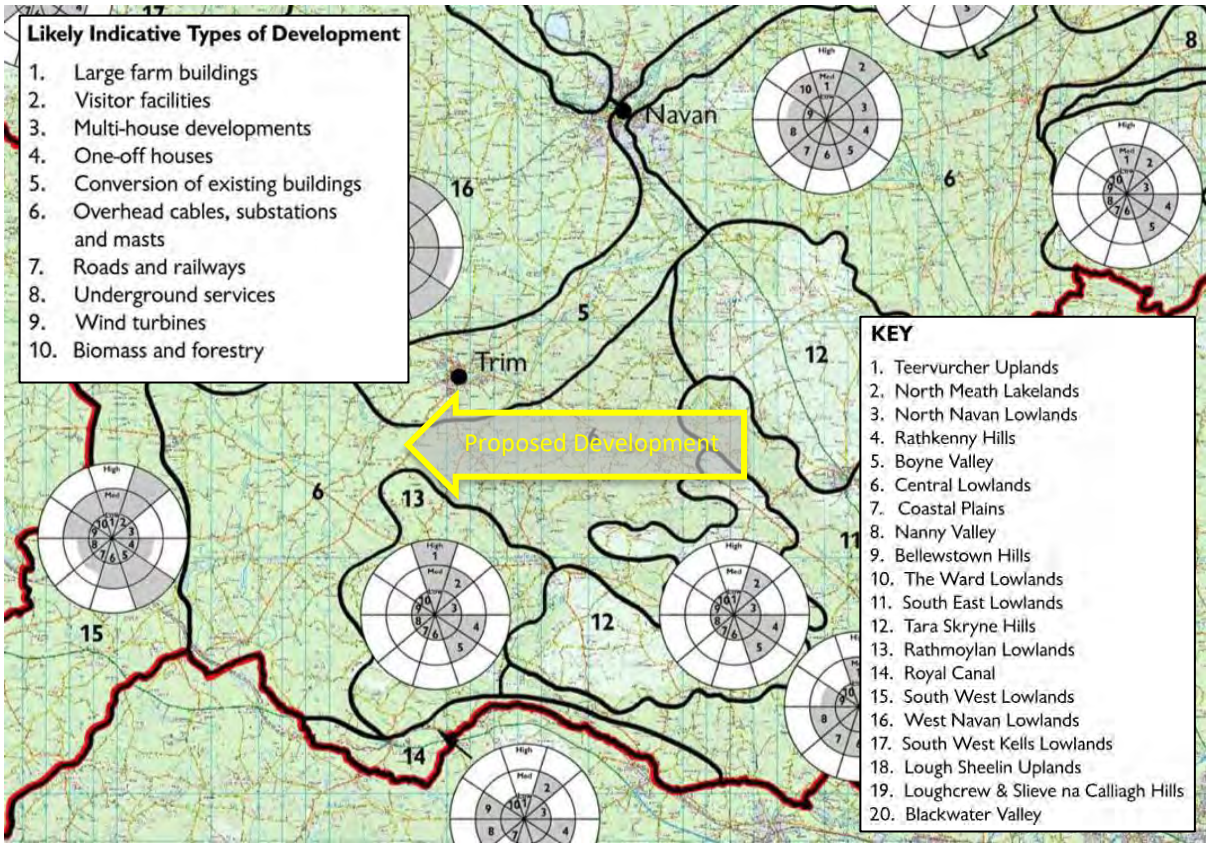

Figure 5: Excerpt from Meath Landscape Character Assessment, map 4.0 showing the potential capacity for development within certain landscape character areas.

1.5.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within the current and draft Development Plans in the context of scenic views/route designations, but they might also be indicated on touring maps, guidebooks, roadside rest stops, or postcards that represent the area.

1.5.2.1 County Meath

Designated scenic Views and Prospects within County Meath are listed in Appendix 10, in Volume 2 and on Map 8.6 of the Meath County Development Plan. There are two designated scenic viewpoints within the study area (**Figure 6** refers).

The two designated scenic viewpoints in the study area are View ID no. 78 and View ID no. 51. View ID no. 51 is described in the Meath CDP as: '*R158 between Trim and Laracor*' and the direction of view is to the north, but because this view is not orientated towards the proposed development, it will not have any potential to be impacted. View ID no. 78 is described in the Meath CDP as: '*Boyne Valley from Derrindaly Bridge*', and the direction of view is to the north and south but the proposed development is situated to the east. (This designated scenic viewpoint has been selected as a viewshed reference point, VP1 – see Section 4.)

Figure 6: Excerpt from Meath Landscape Character Assessment, map 8.6 showing designated Views and Prospects.

2 EXISTING ENVIRONMENT

2.1 LANDSCAPE BASELINE

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed development will be assessed.

A description of the landscape context of the proposed development and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities and the site context. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors, i.e. places and transport routes from which viewers may potentially see the proposed development. The visual resource will be described in greater detail in **Section 2.2**.

2.1.1 Landform and Drainage

In the overall study area context, this is a gently undulating lowland landscape. The River Boyne runs through the study area, first from west to north, before veering in an easterly direction to pass through the settlement of Trim, just beyond the study area. The Knightsbrook River forms another valley to the southeast of the site. It follows a generally northerly course, passing approximately 1.7km to the southeast before converging with the River Boyne further to the northeast.

2.1.2 Vegetation and Land Use

This is a hinterland landscape with a varied mix of land uses (**Figure 7** refers). The predominant land use is pastoral farmland, comprising small to medium-sized geometric fields defined by a complex network of dense, mature tree-lined hedgerows. The settlement of Trim accounts for the principal urban land cover, which includes some significant built-up areas. There is a quarry at Trammon in the southern extent of the study area.

2.1.3 Centres of Population and Houses

The most significant population centre within the study area is Trim, located approximately 2.7km northeast of the site. No other notable population centres exist, but a substantial, dispersed rural population exists within the study area. These tend to be in the form of linear clusters of dwellings along local and regional roads. One such group of dwellings is situated along the R160 regional road a short distance to the south of the site (approximately 190m). These are the nearest residents.

2.1.4 Transport Routes

A handful of regional roads are located within the bounds of the study area, the nearest of which is the R160, which passes to the south of the site and is oriented in a southwest-northeast direction. The R161 diverges from the R160 just south of Trim, heading in a southerly direction approximately 1.5km

to the north of the site. Also running parallel to the R160, the R159 makes its way through the southwestern extents of the study area.

2.1.5 Tourism, Heritage and Recreational Amenities

The study area's most important tourism and heritage feature is the River Boyne, which is also well known among anglers for its salmon fishing. Two golf courses are also located within the study area, including the extensive recreational areas encompassed by the County Meath Golf Club and the South Meath Golf Club golf courses, which are located adjacent to the southwest and northeast of the site. Otherwise, recreational opportunities are limited to sports grounds near Trim and walking or cycling on the public road network.

2.1.6 Conservation Interests

Boyne River is a Special Area Conservation SAC and a proposed Natural Heritage Area (pNHA). No other ecological designations were identified.

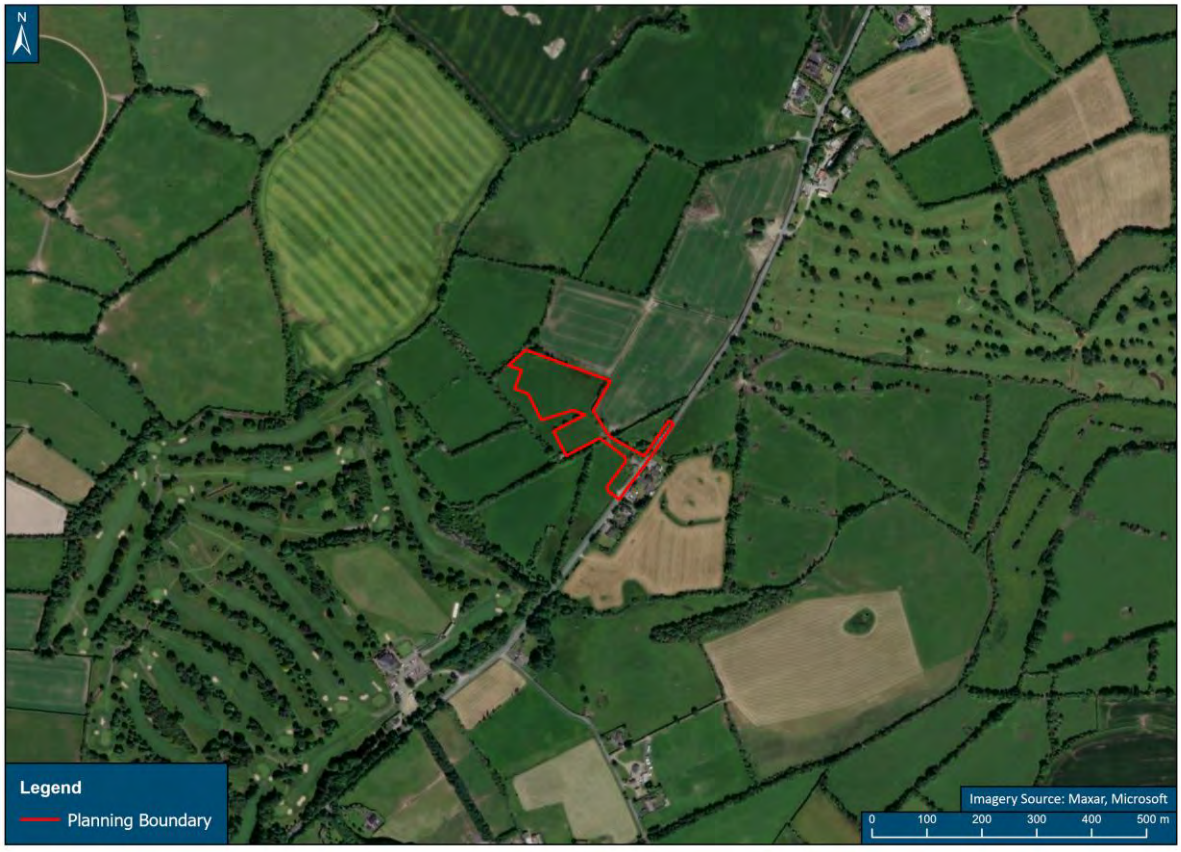

Figure 7: Aerial view showing the application site boundary (red line) and the immediate landscape context (Google Earth Pro).

2.2 VISUAL BASELINE

Only those parts of the receiving environment that potentially afford views of the proposed development are of concern to this section of the assessment. A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the proposed development is potentially visible. The ZTV map is based solely on terrain data (bare ground visibility) and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the proposed development will not be visible due to terrain screening within the 3km study area. It allows further focused investigation of the areas from which the proposed development may potentially be visible and determines the actual extent of visibility which is available in reality. It is the proposed PV panel array only that is the subject of this ZTV analysis.

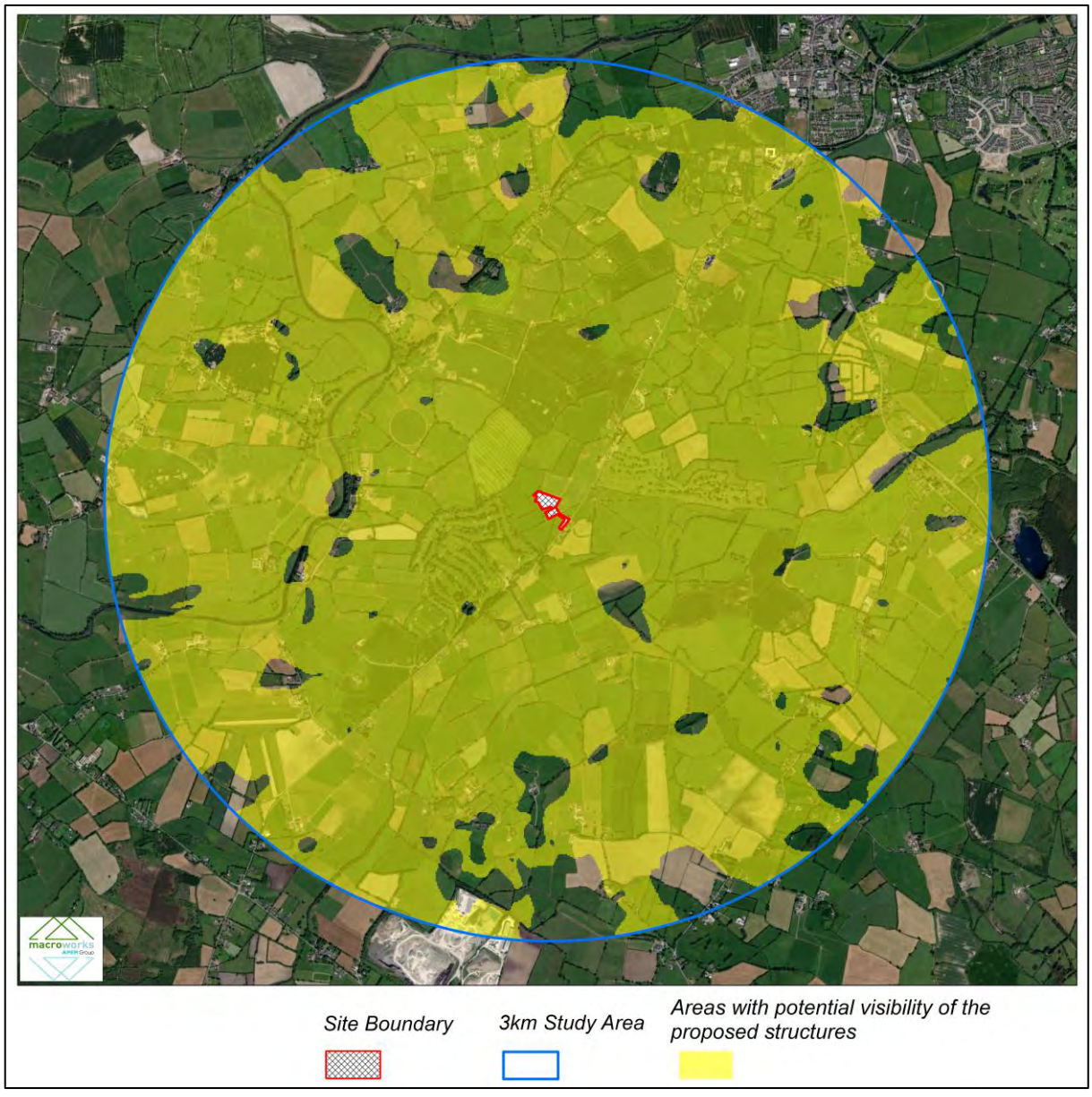

Figure 8: Standard (bare-ground) ZTV map (excluding all existing vegetation and man-made features).

The proposed towers will be the highest structure of the development, at 16.25 m above the underlying terrain. The most important point regarding this 'bare-ground' ZTV map is that it is theoretical.

The following key points are illustrated by the 'bare-ground' ZTV map (see **Figure 8** above):

- The low-lying terrain within the application site and study area means there is theoretical potential for views of the proposed development from many areas within the study area, which is indicated by the yellow-coloured ZTV pattern that occurs throughout the study area.

- There is no potential for visibility of the proposed development from the locations where the yellow-coloured ZTV pattern is absent. Such low lying hollows are dotted sporadically across the study area.

3 MITIGATION AND RESTORATION MEASURES

In this instance, the main mitigation measure employed is 'mitigation by avoidance'. The siting of the proposed Fosterstown Distribution Station is in a robust and well-contained rural area that also avails of both terrain and hedgerow screening such that the scheme will not be prominent within the surrounding landscape. Retention of existing hedgerow boundaries within and around the site also prevents a sense of ambivalence, aids visual screening, and maintains the existing field pattern. In this respect, the proposed Fosterstown Distribution Station is not perceived to impose itself on the existing landscape pattern.

In addition to retaining the existing hedgerows around the site, it is also proposed to bolster existing perimeter hedgerows with under-planting and inter-planting of whip transplants to ensure dense and consistent site screening in perpetuity (**Figure 9** refers). Whip species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance. A new hedgerow is proposed outside the palisade security fence that encloses the main substation. This planting will be allowed to mature up to a maintained height of 3-4m to further enhance and aid in screening the proposed development when viewed from nearby dwellings and roads. Some native trees are proposed across the site and a grassland/meadow management protocol is proposed in the undeveloped portions of the site. The mitigation measures are indicated on the Landscape Mitigation Plan (Appendix H).

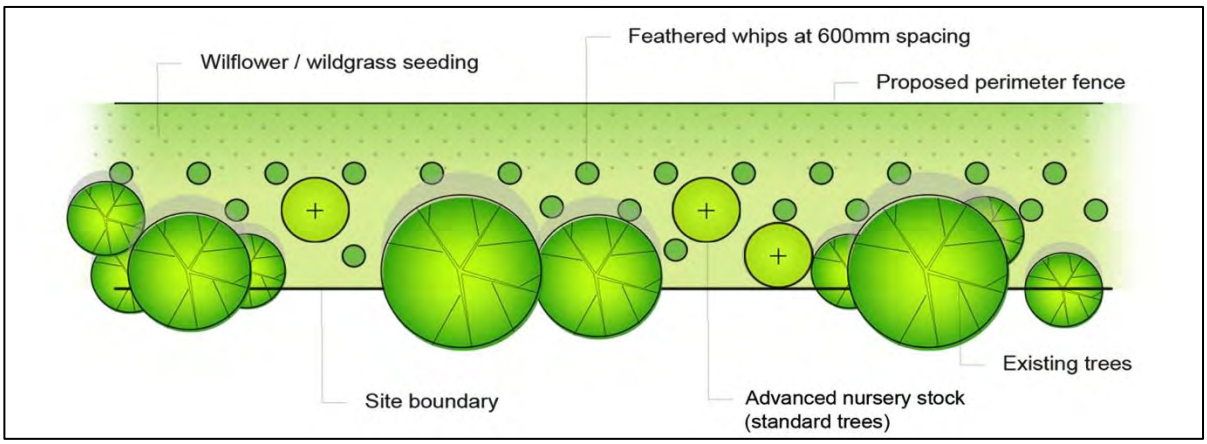

Figure 9: Indicative boundary planting detail showing the approach to inter-planting and under-plating of existing hedgerows TYPE 1 (where indicated).

A native hedgerow will be planted ('Type 2,' as per below) to enclose the main substation.

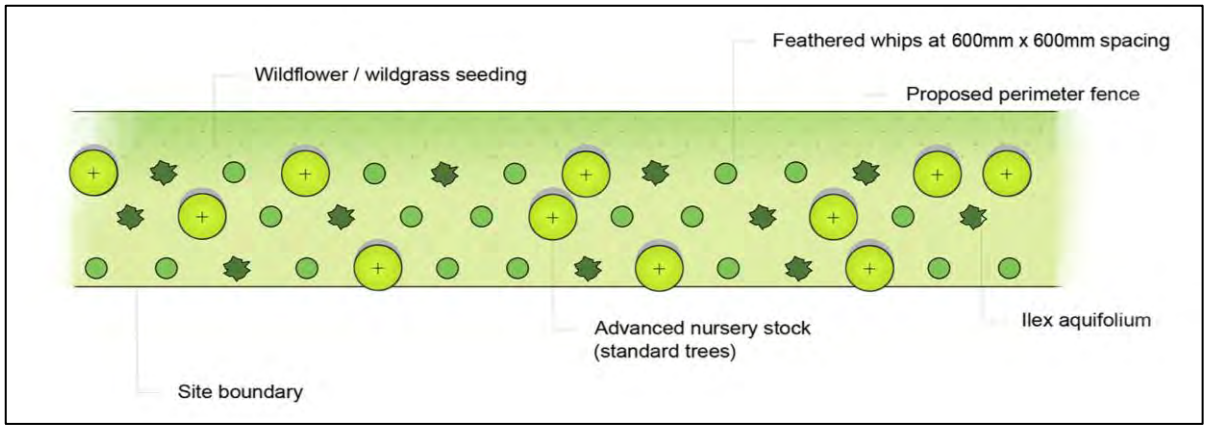

Figure 10: Indicative boundary planting ('Type 2' in the Landscape Mitigation Plans) showing the approach for new sections of hedgerow.

4 IDENTIFICATION OF VIEWSHED REFERENCE POINTS AS A BASIS FOR ASSESSMENT

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a proposal in detail. It is not warranted to include each and every location that provides a view of development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect various receptor types, distances and angles. The visual impact of a proposed development is assessed by Macro Works using up to six categories of receptor type as listed below:

- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and
- Amenity and heritage features.

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal.

The Viewshed Reference Points selected in this instance are set out in the **Table 5** and **Figure 11** below.

Table 5 Outline Description of Selected Viewshed Reference Points (VRPs)

VRP No.	***Location***	***Direction of View***
VP1	Local road, Derryinydaly	SE
VP2	R161 regional road, Newtownmoynagh	SE
VP3	R160 regional road, Kennastown	SW
VP4	R160 regional road, Carberrystown	NE

Figure 11: Viewpoint location map.

5 IMPACT ASSESSMENT

5.1 LANDSCAPE IMPACT

5.1.1 Landscape Value and Sensitivity

Landscape value and sensitivity are considered with the several factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the application site and study area.

This area of gently undulating terrain between the Boyne and Knightsbrook River valleys. Whilst the landscape character of the site and its immediate environs is predominantly rural, in the broader context, this is a hinterland landscape consisting of various land uses and supporting a reasonably dense rural population. The southern outskirts of Trim consist of industrial and residential estates and golf courses, with major routes that converge on the settlement. Whilst the golf courses and urban fringe housing developments borrow rural amenity from the neighbouring landscape context, this is principally a working landscape, where values are generally associated with rural productivity and subsistence of the farming lifestyle.

The settlement of Trim and its immediate environs have a strong sense of heritage, with the Boyne Valley and Trim Castle adding to the sense of place and association with other heritage assets within this iconic river corridor. However, it is important to note that the proposed development site lies outside the Boyne River valley. It occurs in an area categorised as LCA 6 ‘Central lowlands’ in the Landscape Character Assessment of County Meath. LCA 6 has been given a ‘moderate’ landscape sensitivity in the Landscape Character Assessment.

Based on the reasons outlined above, the study area encompasses a robust landscape context that is already influenced by the settlement of Trim. The Landscape Character Assessment of County Meath identifies LCA 6 as being of ‘regional’ landscape importance but the receiving landscape of the proposed development is not considered highly rare or distinctive on a local, regional, or national level.

Whilst it is acknowledged that the Boyne River Valley has a greater level of sensitivity, the site’s landscape context is considered to be that of a more typical rural hinterland. Therefore, on the balance of these factors and following the criteria outlined in Table 1.1, the landscape sensitivity is deemed to be **Medium**.

5.1.2 Magnitude of Landscape Effects

Site activity will be much higher during the proposed development's construction and decommissioning phases than during the operational phase. Both are assessed.

5.1.2.1 Construction Stage

Access to the site will be via the R160 regional road, requiring the removal of up to 50 meters of roadside vegetation on the north side of the road to facilitate the full extent of the proposed site entrance and its associated sightlines. Trenches will be excavated to install conductors below ground from the R160 to the main substation. The physical impact of the trench on the landscape will be modest. Impacts on land cover for this off-road portion of underground cable will be limited to a narrow swathe where some grassland and hedgerow vegetation must be removed. These impacts will not materially affect the study area's landscape fabric or character. While construction activity may temporarily alter the landscape character locally, these changes will be transitory. Open-cut trenching will remove localised vegetation, but the route has been selected to keep this to a necessary minimum and healthy mature trees will be preserved wherever possible. Trenches will be backfilled and will form the route of the site access track, resulting in a permanent but localised change.

During the Construction Phase, physical landscape impacts will occur at the site of the proposed 110kV Substation. These impacts will result from the disturbance of landform and land cover due to the erection of various structures, buildings, and access roads. The construction activities at the main substation will commence with temporary site perimeter fencing. Subsoil excavation will be necessary for the foundations of buildings within the proposed substation site. Given that this is a gently undulating site, significant modification or redistribution of subsoil material is not anticipated to accommodate access road gradients or building ground levels. The earthworks have been designed to balance excavated materials, optimising the use of topsoil and minimising the physical impact.

In addition to the permanent physical disturbance, there will be temporary effects on the landscape character of the site and its immediate surroundings during construction. This will be due to the intensity of construction activities, including the movement of heavy vehicles. A temporary construction compound will house site welfare facilities, vehicle parking, and storage areas for excavated earth and building materials. Tower cranes and partially completed structures will be more visible than surface-level construction activities and characteristic of this phase. These activities represent a notable increase in baseline activity levels for this rural site.

The construction activities will be relatively modest in scale and 'temporary' in duration. While there will be a noticeable increase in activity from workers and construction machinery, few visual receptors will be located near the works. Nevertheless, the construction phase may temporarily impact landscape character due to heavy machinery movement, excavation and stockpiling of soil, and the temporary storage of construction materials.

Based on the above reasons, the magnitude of construction stage landscape effects is deemed **Medium** within the site's immediate surrounds. However, this quickly reduces to Low and Negligible in the study area's wider surroundings where construction activity's visibility is likely to be very limited.

5.1.3 Significance of Construction Phase Landscape Effect

With a Medium magnitude of impact combined with the Medium landscape sensitivity judgement outlined above, the significance of construction stage impacts is deemed to be **Moderate** within the site's immediate surroundings (refer to Table 3). However, this quickly reduces to Moderate-slight and Imperceptible within the wider study area, where construction activities will not be discernible. The quality of the construction stage effects will be **Negative**.

The construction phase is likely to take less than 52 weeks to complete. Construction-related effects are brief in nature and will only result in '**Temporary**' landscape and visual impacts.

5.1.3.1 Operational Stage

There will be permanent physical changes to the land cover within the site, which will not be easily reversible. These changes relate to the excavation required for the foundations of the proposed 110kV substation compound. The proposed towers will reach a maximum height of approximately 19.25 meters, and the proposed 110 kV GIS will be 12 meters high. The development will result in the loss of productive agricultural farmland, replaced by electrical infrastructure.

Due to its relative height and bulk compared to other surface-level features within the site, the proposed 110kV substation compound has the potential to impact the landscape character. The primary effect will be an increased sense of industrialisation within the predominantly rural setting. The development involves adding electrical infrastructure and a new and unfamiliar land use. Once fully constructed, the development will notably increase the intensity of electrical infrastructure in the immediate surroundings. Still, given the context of the receiving landscape, it will not appear inappropriate or incongruous. From a landscape character perspective, the proposed 110kV Substation compound will increase the degree of industrialisation within the landscape but only to a limited extent. It will not significantly alter the wider landscape setting, which is already marked by various productive land uses and infrastructure.

The proposed underground cable will occur within the proposed site access track to minimise physical impacts on the landscape. Because it will not materially rise above the existing terrain, it will not have the potential to result in any notable adverse impacts on the physical landscape or landscape character within the receiving landscape. The new section of the internal site access track above the underground cable will resemble other farm tracks commonly found in this rural area. These features will not result in any material impact on the landscape.

Based on the factors discussed above, the operational phase magnitude of landscape impact is considered **Medium-low** within the immediate vicinity of the site (being those lands contained within approximately 1km). Thereafter, the magnitude of landscape impact is deemed to reduce as it becomes a progressively smaller component of the overall landscape fabric. It is considered that the impact will be **Negative**.

5.1.4 Significance of Operational Phase Landscape Effect

With reference to the significance graph (**Table 3** refers) above, the Medium landscape sensitivity judgement attributed to the study area, coupled with a Medium-low magnitude of operational stage landscape impact, is considered to result in an overall significance of no greater than **Moderate-slight**. Operational-related effects will result in '**Permanent**' landscape and visual impacts.

5.2 VISUAL IMPACT ASSESSMENT

5.2.1 Sensitivity of Visual Receptors

Views of the agricultural landscape are generally pleasant because of its 'green', settled working character. The network of hedgerows and vegetation throughout it contributes to a sense of naturalness. Combined with its gently undulating topography, it generates a high degree of containment in many locations.

However, while the agricultural context forms the primary landscape and visual experience, the site's local landscape is interrupted by existing electrical infrastructure traversing the landscape. Indeed, all parts of this landscape, including those areas in agricultural use, demonstrate longstanding human intervention in the landscape.

VP1 and VP2 are located in the Boyne Valley, and VP1 is located at a designated scenic viewpoint associated with the Derrinydaly Bridge over the River Boyne. The Boyne Valley is a sensitive landscape area, and the scenic designation recognises the scenic quality in that portion of the western extents of the study area. Otherwise, the integrity and quality of landscape features are not considered to contribute to or generate any specific scenic value in most of the study area. Consequently, other views towards the site are not considered unique or form a core part of any key views.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and the distance at which views are obtained. Static residential receptors are generally more susceptible to changes in views than those where views are experienced transiently by those travelling through the landscape. Likewise, receptors located in closer proximity to the site are considered more susceptible to changes in views than those where views are experienced at a distance.

In the context of this site, visual receptors are generally considered to be Medium-low sensitivity (e.g. VP3 and VP4), but this increases to Medium and High-medium upon approach to the River Boyne from the site (VP2 and VP1, respectively).

Table 6 shows the sensitivity at each of the selected viewshed reference points using the criteria set out in Section 1.3.3.

5.2.2 Magnitude of Visual Effects

Photomontages of the proposed development aid the assessment of visual impacts at each of the selected viewpoints. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced;

1. Existing view;
2. Outline view (yellow outline showing the extent of the above-ground elements of the proposed development overlaid on the photography);
3. Montage view; and
4. Mitigated view (where visible).

Table 6 Visual Impact Assessment

VRP No.	Title and description of existing view	Receptor Sensitivity	Description and Magnitude of Visual impact	Pre-mitigation Significance/ Quality/ Duration of Visual Impact	Residual Significance/ Quality/ Duration of Visual Impact
VP1	**Local road, Derryinydaly** This VRP is representative of View ID no. 78, as identified in the Meath CDP. It is a local road bounded by low drystone walls that merge into the parapet of the Derrindaly Bridge, which spans the Boyne River in the middle ground. The view to the west is foreshortened by mature intervening vegetation.	**High-medium**	The proposed development will be fully screened by existing vegetation and landform from this location, consequently the magnitude of impact is deemed **Negligible**.	**Imperceptible/ Neutral/ Long term**	**Imperceptible/ Neutral/ Long term**
VP2	**R161 regional road, Newtownmoynagh** This is an enclosed view from a field gate onto a regional road within the sensitive Boyne Valley Landscape Character Area. It represents a fleeting glimpse to the west for road users along an otherwise well-screened section of the road. A	**Medium**	The proposed development will be fully screened by existing vegetation and landform from this location, consequently the magnitude of impact is deemed **Negligible**.	**Imperceptible/ Neutral/ Long term**	**Imperceptible/ Neutral/ Long term**

	mature treeline forms a skyline in the middle distance.				
VP3	**R160 regional road, Kennastown** This is a broad view from a regional road to the northeast of the proposed development. This VRP represents a small cluster of residential properties. There is a degree of complexity to the view. In the foreground, the road pavement is adjoined by a residential property. A low-trimmed hedgerow lines the opposite side of the road.	**Medium-low**	The proposed development will be fully screened by existing vegetation and landform from this location, consequently the magnitude of impact is deemed **Negligible**.	**Imperceptible/ Neutral/ Long term**	**Imperceptible/ Neutral/ Long term**
VP4	**R160 regional road, Carberrystown** This is a point on a regional road southeast of the application site where a layby, concrete post, and rail fence have replaced roadside hedgerows. This viewshed reference point represents several residential properties to the southeast of the regional road. A small pasture is enclosed by a mature hedgerow in the middle ground, which foreshortens the view to the northwest.	**Medium-low**	Access to the proposed development will be via the layby at this location. The main substation is located approximately 180m to the northwest. The upper portions of one of the proposed towers, the proposed 110 kV GIS, and a proposed lightning monopole will be visible above and beyond the mature hedgerow in the middle ground. The existing vegetation would screen the remainder of the proposed development.	**Slight/ Negative/ Long term**	**Slight/ Negative/ Long term**

			The scale of the structures is masked by the screening provided by the existing vegetation, and the material used has muted tones; thus, the development is deemed to have a sub-dominant visual presence. There is a degree of contextual ambiguity here concerning the actual context of the main substation relative to the foreground setting, but the new access road and the existing pole sets and overhead conductors will provide a visual link, thus helping the proposed development to integrate with the other elements within the view. However, there will be a visual change that will detract from the visual amenity; consequently, the magnitude of impact is deemed **Low**.		

6 CONCLUSION

Regarding landscape impacts, the proposed development is considered to have a relatively modest physical impact on the site as the substation is contained within the existing hedgerow network, and the proposed development will result in only very minor areas of permanent hedgerow removal to facilitate the site access road and the underground cable. Concerning landscape character, even though the proposed development will appear marginally incongruous in this landscape context, the proposed development is thematically linked to the existing development trends within the hinterland landscape of the study area. Indeed, it is likely to be perceived as an evolution of the existing electrical overhead line that passes through the study area. This is a productive rural landscape with associated landscape values, and whilst the proposed development may alter the 'landscape fabric' of the area, it does not markedly affect the prevailing landscape pattern or predominantly working rural landscape character of the area. This is considered an appropriately sited development in a robust landscape context. Consequently, the impact on landscape character (post-construction) will be of **Moderate-slight** significance and a **Negative** quality with a **Permanent** duration.

Visual impacts were assessed at four viewshed reference point locations, representing various viewing distances, angles and receptor types. The visual receptor sensitivity judgements ranged from High-medium to Medium-low. The overall significance of visual impacts was '**Slight**' at the nearest viewshed reference point (VP4) significance, with a **Negative** quality with a **Permanent** duration. At all the other viewshed reference points, the impact was deemed to be 'Imperceptible' (VP1 to VP3). This is principally a consequence of the high degree of existing screening located within the intervening low-lying landscape, which heavily reduces the visual exposure of the proposed development.

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed development is not considered to give rise to any significant landscape and visual impacts.

6.1 OVERALL SIGNIFICANCE OF IMPACT

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed Fosterstown Distribution Station development at Trim, County Meath is not considered to give rise to any significant landscape or visual impacts.

Appendix H – Landscape Mitigation Plan