Fieldstown 110kV Substation & Grid Connection

Environmental Considerations Report

Energia Solar Holdings Ltd

Project number: 60657534
Document reference: 60657534_ACM_RP_EN_FT_006_1

1 December 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
AECOM Various	Bernice Cahill Associate Director	Various Michael McMullan Director	Bernice Cahill Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	17 October 2023	Draft	Y	Bernice Cahill	Associate Director
1	1 December 2023	Final	Y	Bernice Cahill	Associate Director

Distribution List

# Hard Copies	PDF Required	Association/Company Name
0	1	Energia Solar Holdings Ltd

Prepared for:

Energia Solar Holdings Ltd

Prepared by:

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin A96 T927
Ireland

T: +353 1 696 6220
aecom.com

Table of Contents

Figures

Tables

1. Introduction

This Environmental Considerations Report (ECR) has been prepared by AECOM Ireland Limited (AECOM) on behalf of Energia Solar Holdings Limited (herein referred to as the 'Applicant'). Energia Solar Holdings Ltd are a subsidiary of the Energia Group, who are a major all-Ireland energy provider and infrastructure investor across renewable technologies.

The applicant is seeking planning permission for a 110 kilo Volt (kV) Air Insulated Switchgear (AIS) substation, named Fieldstown 110kV Substation (hereafter referred to as the 'Proposed Substation Development') and associated 13.3 kilometres (km) underground cable (herafter referred to as the "Proposed Grid Connection") to Finglas Substation (hereafter referred to collectively as the 'Proposed Development'). The Proposed Development is located within the administrative area of Fingal County Council (FCC). The planning application is being submitted to An Bord Pleanála (ABP) as Strategic Infrastructure Development (SID).

The purpose of this ECR is to assess the potential environmental impacts associated with the Proposed Development and associated works and determine appropriate mitigation measures to reduce those impacts.

This ECR identifies the potential significant environmental effects (if any) arising from the construction and operational phases of the Proposed Development. Where potential significant environmental effects have been identified, mitigation and monitoring measures have been proposed to avoid, prevent, reduce or offset the effects. In addition, cumulative environmental impacts have been assessed, where appropriate.

1.1 Scope of the ECR

The ECR has been prepared in conjunction with an Environmental Impact Assessment (EIA) Screening Report[1] and each topic includes a baseline assessment, impact prediction and evaluation, and determining appropriate mitigation measures, including monitoring and reinstatement where appropriate. The structure of the ECR is outlined in Table 1-1.

Table 1-1 Structure of ECR

Chapter	Chapter Title
1	Introduction
2	Description of Proposed Development
3	Consultation
4	Alternative Options Considered
5	Population and Human Health
6	Biodiversity
7	Land and Soils
8	Water
9	Air Quality
10	Climate
11	Noise and Vibration
12	Material Assets
13	Cultural Heritage
14	Landscape and Visual Impact
15	Traffic and Transport
16	Conclusion
17	References

[1] AECOM (2023), Fieldstown 110KV Substation and Grid Connection environmental Impact Assessment Screening Report

1.2 Need for the Proposed Development

The need for the Proposed Development, is to provide the necessary infrastructure to support the development, as well as secure and transport the supply of electricity from the three nearby Energia solar energy projects, Fieldstown County Dublin (c. 75 MW), Ballaghaweary County Meath (c. 18MW) and Gerradstown County Dublin (c. 55MW).

The National Development Plan 2021 to 2030[2] is committed to the decarbonisation of electricity supply and to increase the share of renewable electricity up to 80% by 2030. The Proposed Development will help Ireland to reach this target, reducing our reliance on fossil fuels and increasing security of energy supply.

1.3 Planning, Policy and Development Context

Details of the relevant policies and planning and development context are provided in the Planning Statement[3] accompanying this planning application.

1.4 Planning History Context

A review was initially carried out to identify other existing and/or approved projects (including approved projects that have been appealed and a decision is pending), taking into account any existing environmental impacts relating to areas of particular importance likely to be affected or the use of natural resources. A review was carried out of the planning files from the following databases:

- FCC.
- Meath County Council (MCC).
- ABP.
- Department of Housing, Planning and Local Government (DHPLG) Environmental Impact Assessment (EIA) Portal.

An overview of the planning history search is included in Appendix A.

This assessment considers whether any of these existing/approved projects will likely have significant cumulative effects in combination with the Proposed Development. The assessment also considers whether all of the existing/approved projects taken together as a whole will likely have significant cumulative effects in combination with the Proposed Development. There are many projects listed on the planning databases considered, however, the focus for this assessment was on the proximity, scale and nature of those projects in relation to the Proposed Development and on those which could potentially exacerbate environmental effects and thus be of significance to the cumulative effects assessment. Particular attention was given to those projects which were designated as Strategic Infrastructure Developments (SID) in proximity to the proposed development given the larger scale and nature of these developments. Those projects where an Environmental Impact Assessment Report (EIAR) or Natura Impact Statement (NIS) accompanies the planning applications were also given due regard at review stage. Live or Proposed Developments which have not yet been permitted were not considered in this assessment.

Arising from this review, a number of existing and/or approved projects (as listed in Appendix A) were identified which have been considered for the potential for likely significant cumulative effects.

Table 1-2 List of Planned Projects Identified as Having a Potential Cumulative Effect of the Proposed Development

Planning Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
ABP Ref: 317480	Kilshane Road, Kilshane, Finglas, Dublin 11	Demolition of buildings, road improvement works and construction of gas turbine power generation station with all associated site works. EIAR has been prepared. EPA licence is required.	Proposed Decision Date Unavailable	c.2km west
FCC Ref: FW22A/0201	Irishtown, Spricklestown, Ward Lower, Dublin	Permission for development at a site of c. 61.1 hectares (ha). The development will consist of a 10-year permission for the construction of a Solar Photovoltaic (PV) panel on ground mounted frames/support.	25/07/2023	c.2.4km west
FCC Ref: FW22A/0204	Kilshane Road, Kilshane, Finglas, Dublin 11.	The construction of a new Gas Turbine Power Generation Station with an output of up to 293 Megawatts. The proposed station will consist of 1 Gas Turbine and 1 28m high Exhaust	23/06/2023	c.1.6km west

[2] Department of Public Expenditure, NDP Delivery and Reform (2021), National Development Plan 2021-2030
[3] AECOM (2023), Fieldstown 110kV Substation and Grid Route Planning Statement

Planning Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
		Stack partially enclosed by a 12m high acoustic wall. 1 single storey Admin Building and Warehouse (c. 926m²), 1 single storey Packaged Electronic/Electrical Control Compartment (PEECC) (c. 72m²), 1 single storey Continuous Emission Monitoring System (CEMS) Shelter (c. 14.8m²), 1 16.2m high x 024.4m Fuel Oil Tank, 1 15.3m high x 09.2m Raw/Fire Water Tank, 1 16.2m high x 018.3m Demin Water Tank, and miscellaneous plant equipment. The demolition of a detached residential dwelling (c. 142 m² GFA) and associated farm buildings (c. 427m² GFA) located in the northwest corner of the subject site to facilitate the proposed development. Road improvement works to 493.34m Kilshane Road (L3120), including the realignment of a portion of the road (293.86m) within the subject site boundary and the provision of new footpaths, off-road cycle ways, together with the construction of a new roundabout linking the proposed realignment of Kilshane Road back to the existing road network to the northeast of the subject site and to the proposed internal road network to serve the proposed development. The construction of entrance gates, low wall and railings fronting the realigned Kilshane Road and a private internal road network providing for vehicular, cyclist and pedestrian access to serve the development. Construction of 3m high security fencing within development. Total provision of 26 car parking spaces including 1 disabled persons parking space and 2 EV electrical charging points. Provision of security lighting columns to serve the development and the installation of Closed-Circuit Television System (CCTV) for surveillance and security purposes. Provision of 20 sheltered bicycle parking spaces. Provision of hard and soft landscaping works, tree planting and boundary treatments including 3m high security fence along Kilshane Road and the perimeter of the subject site boundary. Provision of new onsite foul sewer pumping station to serve the development. Provision of underground surface water attenuation areas to serve the development. All associated site development and excavation works, above and below ground, necessary to facilitate the development. An Environmental Impact Assessment Report has been prepared in respect of the proposed development. This application relates to a development that will require an Industrial Emissions Directive licence from the Environmental Protection Agency. A subsequent application will be submitted for an Above Ground Installation (AGI) compound, underground gas supply installation and a subsequent Strategic Infrastructure Development (SID) Application will also be submitted for a Gas-Insulated Switchgear Substation (GIS), Air Insulated Switchgear Substation (AIS) and Proposed Grid Connection to serve the development.		
FCC Ref: FW23A/0111	Lands at Huntstown Townland and Coldwinters Townland, County Dublin	We Rathdrinagh Land Unlimited Company (Trading as Irish Recycling LTD) intend to apply to the aforementioned Planning Authority for permission for development on lands at Huntstown Townland and Coldwinters Townland, Co. Dublin. The development will consist of the construction of a Materials Recovery Facility along with a Food Container Cleaning Plant. The development is phase one of the Huntstown Circular Economy Hub and will include for the following works: 1. The development will consist of the erection 2separate buildings and associated site area for use as a Circular Economy Hub. 2. The processes to be carried out within the Materials Recovery Facility building include for the sorting of range of wastes into recoverable and recyclable streams. Recoverable wastes to processed will include for potential recyclables. This building will include for an external odour control plant with associated flue. 3. The processes to be carried out in the Food Container Cleaning Plant building will provide a centralised washing/sterilisation facility for large food retailers in the area to facilitate re-use of containers. 4. The 2buildings to be constructed will incorporate ancillary office and staff facilities	12/06/2023	c.0.9km west

Planning Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
		along with solar PV panels and signage. 5. The development of associated access roads, turning/loading areas, footways, parking areas, electric vehicle charge points, landscaping, lighting, fencing, bicycle and bin storage facilities and associated site works. 6. The provision of an ESB substation. 7. The provision of ancillary external storage areas. 8. The reprofiling of existing ground levels within the Site and associated works to include for infilling and reprofiling of lands within the overall site area. 9. The provision of a new site entrance with associated works to facilitate vehicular and pedestrian access along with associated upgrade works to the adjacent public road to include for provision of footpaths and cycle paths. 10. The provision of a weighbridge and associated staff building at the entrance. 11 The provision of perimeter fencing and security gates. 12. The provision of all associated hard and soft landscaping works. 13. Provision of attenuation tanks and associated infrastructure as part of the surface water system along with installation of a bypass petrol interceptor. 14. All ancillary site development, landscaping and construction works to facilitate foul. water and service networks. The Materials Recovery Facility will require an EPA Industrial Emissions Licence. An Environmental Impact Assessment Report (EIAR) has been prepared and accompanies this application.		
FCC Ref: F21A/0607	Kilsallaghan, County Dublin	Revised solar PV panel arrangement resulting in a decrease to the overall panel footprint extent. a reconfigured internal access route network resulting in a decrease to the overall network length. revised inverter/transformer types and arrangements. revised CCTV arrangement relocation of a permitted communications cabin. omission of 2 permitted substations. provision of a 1 spare parts container and 3 weather station poles.	08/06/2022	c.2.1km south
MCC Ref: 211436	Ballaghaweary & Greenogue, Kilsallaghan, Co. Meath	Solar PV Energy Development with a total site area of 34.4ha. to include solar panels mounted on steel support structures, associated cabling and ducting, 7 MV Power Stations, 1 Client Substation, 1 No Temporary Construction Compound, access tracks, hardstanding area, boundary security fencing and security gates, CCTV, landscaping and ancillary works.	31/01/2022	c.2.5km southwest
FCC Ref: F21A/0042	Lands including Whitestown and Fieldstown, Kilsallaghan, County Dublin	Permission for a Solar PV Energy Development with a total site area of c 105ha, to include solar panels mounted on steel supports, associated cabling and ducting, 1 client substation, 33 MV Power Stations, 8 Battery Storage Containers, 1 Temporary Construction Compound, access tracks, boundary security fencing and security gates, CCTV, landscaping and ancillary site works.	16/09/2021	c.2.2km northwest
FCC Ref: FW20A/0040	Claremount Filling Station, Coolquay, County Dublin.	Provision and construction of an ESB substation.	05/08/2020	c.4.6km southwest
ABP Ref: PL17.301151	Harlockstown, Ashbourne, Co. Meath.	10-year permission for construction of a solar farm and all ancillary and associate site works.	11/12/2018	c.5km northwest
ABP Ref: PL06F.300230	Kilsallaghan, County Dublin	10-year permission for the construction of Solar PV energy development and all ancillary works.	30/10/2018	c.2km south
FCC Ref: F17A/0650	Townland of Rathbeale, Swords, County Dublin.	1 cable interface mast c. 20.75m high with a square base c. 6m x 6m to facilitate the undergrounding of the existing Finglas-Glasmore 110kV overhead power line.	22/08/2018	c.4.2km southeast
FCC Ref: F17A/0718	Palmerstown, Oldtown, North County Dublin	Planning Permission for a 2.1659MW Solar Photovoltaic (PV) array to cover 13396.74m² of the roofs.	26/06/2018	c.4.4km northwest
MCC Ref: AA160553	Bullstown, Donaghmore, Ashbourne, Co. Meath.	Solar Photovoltaic (PV) development consisting of solar PV arrays with a surface area of approximately 58,000m², a grid control building, 5 inverter/transformer cabins, 2 battery enclosures, site entrance, access tracks, hardstanding area,	21/02/2017	c.3.4km west

Planning Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
		boundary security fence, CCTV, landscaping and ancillary works.		

2. Description of Proposed Development

The Applicant is proposing a 110kV AIS substation and grid connection to Finglas Substation (hereafter referred to collectively as the 'Proposed Development') with a total area of 17.9 hectares (ha).

The AIS substation (the Proposed Substation Development) will facilitate the connection of three nearby Energia solar developments to the local electricity network via a 13.3km underground cable (the Proposed Grid Connection).

It is intended that three solar energy projects will connect to the Proposed Substation Development via underground cables with a maximum voltage of 33kV which are considered to be exempted development under Class 26 of the Planning and Development Regulations 2001, as amended. The 110kV AIS substation is required to support, the supply of electricity from these renewable energy projects. Details of the three solar energy projects which will connect to the proposed substation are included below:

- Fieldstown at Whitestown and Fieldstown, Kilsallaghan County Dublin. Permission for a Solar Photovoltaic (PV) Energy Development with a total site area of 105ha, to include solar panels mounted on steel supports, associated cabling and ducting, one client substation, 33 medium voltage (MV) power stations, eight battery storage containers, a temporary construction compound, access tracks, boundary security fencing and security gates, closed circuit television (CCTV) security, landscaping and ancillary site works. A planning application was submitted to FCC in July 2021 and granted planning consent in September 2021 (Planning Ref: F21A/0042).
- Ballaghaweary near Greenogue in County Meath. Permission for a Solar PV Energy Development with a total site area of 34.4ha, to include solar panels mounted on steel support structures, associated cabling and ducting, seven MV power stations, one client substation, a temporary construction compound, access tracks, hardstanding area, boundary security fencing and security gates, CCTV, landscaping and ancillary works. A planning application was submitted to Meath County Council in July 2021 and was granted planning consent in December 2021 (Planning Ref: 21/1436).
- Gerrardstown, near Ballyboughal in County Dublin. Permission sought for a Solar PV Energy Development with a total site area of 84.35ha, to include solar panels mounted on steel support structures, associated cabling and ducting, two client substations, 25 MV power stations, two permanent storage containers, two temporary construction compounds, access tracks, hardstanding area, boundary security fencing and security gates, CCTV, landscaping all associated ancillary works. A planning application was submitted to FCC in July 2021 and granted planning consent in October 2023 (Planning Ref: F23A/0130).

The Proposed Development includes:

Proposed Substation Development:

- A 110kV AIS tail-fed substation compound comprising:
  - A single storey 110kV AIS substation building [total floor area comprising circa 450m², height approximately 6.3m).
  - MV switchgear container and switchboard total floor area comprising circa 60m².
  - 110kV grid transformer and two-house transformers within bunded enclosures (height approximately 6m).
  - Diversion of existing 38kV overhead line (OHL).
  - 160MV transformer positioned within bunded enclosures (height approximately 6m).
  - A shunt filter.
  - Diesel generator & diesel tank.
  - Twelve lightning protection masts (height approximately 20m).
  - Two service/maintenance carparking facilities.
- Internal access roads and car parking.
- New site entrance from the R122 regional road.
- Drainage infrastructure.
- 420m of 2.6m high perimeter palisade fencing and post and rail (1.4m high) fencing.
- 200m of internal separation fencing (2.6m high).

- All associated and ancillary site development works including localised alterations to the landscape.

Proposed Grid Connection:

- A 13.3km underground 110kV cable connection to Finglas Substation to facilitate connection to national grid.
- Approximately 20 joint bays primarily within public roadways.
- Trenchless installation in the form of horizontal directional drilling (HDD) will be used at the following locations:
  - Broadmeadow River Bridge before the junction of the R122 and the R125 regional
  - roads. Ward River Bridge on the R122 regional road.
  - Under the N2 prior to entering Finglas Substation.

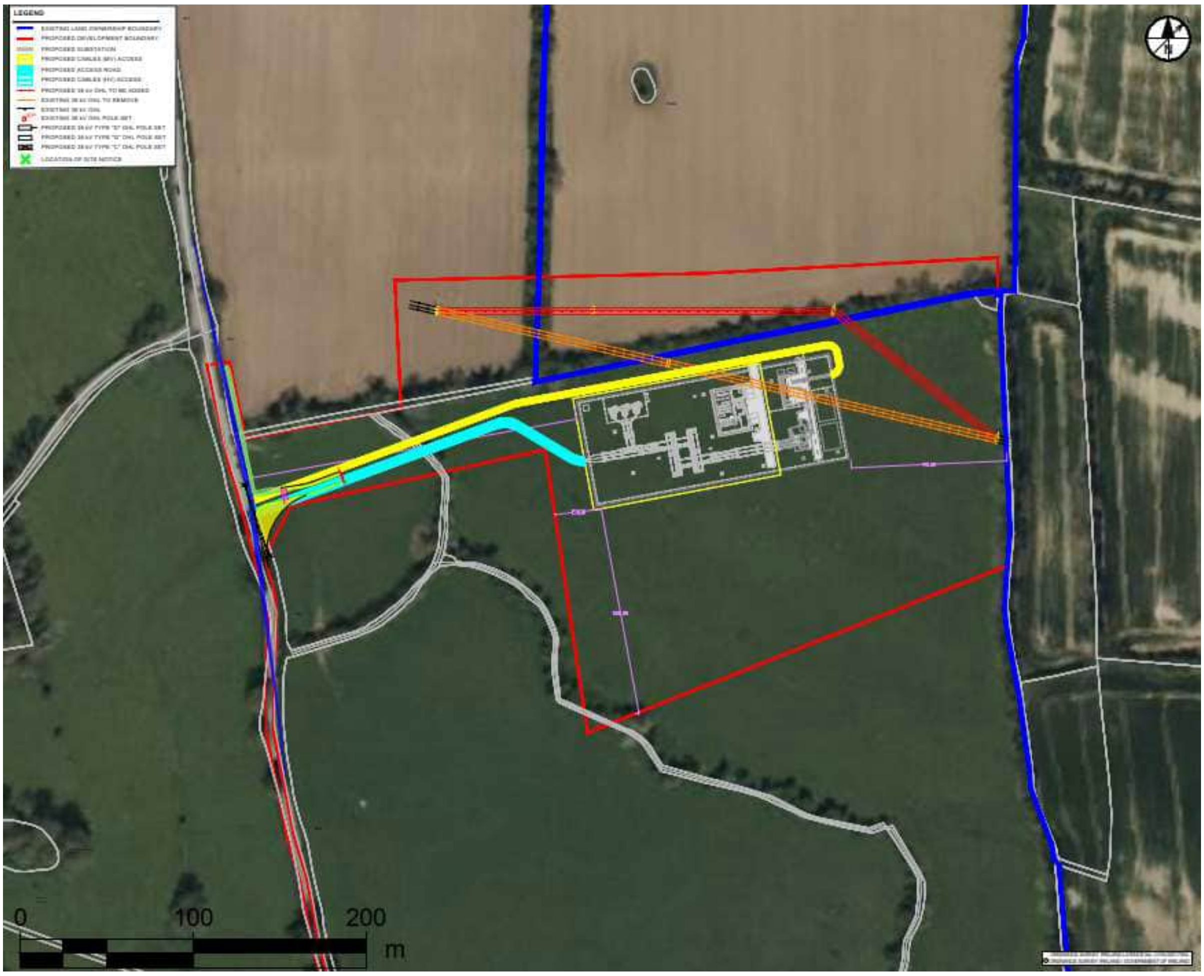
2.1 Site Location

2.1.1 Proposed Substation Development

The Proposed Substation Development is located within an area of agricultural grassland on lands at Fieldstown East, County Dublin (Irish Transverse Mercator (ITM) coordinates: 711952, 750625). The Proposed Substation Development is bounded by the R122 regional road immediately west and agricultural lands to the east, north and south as shown in Figure 2-1.

The largest nearby towns are Ashbourne, approximately 4.5km east, and Swords, approximately 9.5km to the southeast. Oldtown is located approximately 2.5km directly north, Ballyboghill is approximately 4.5km east, and Rolestown is situated within 1km southeast of the Site. There are dispersed one-off housing units located in proximity to the Proposed Substation Development, with the nearest property located approximately 300m west.

Figure 2-1 Location of Proposed Substation Development and Associated Infrastructure

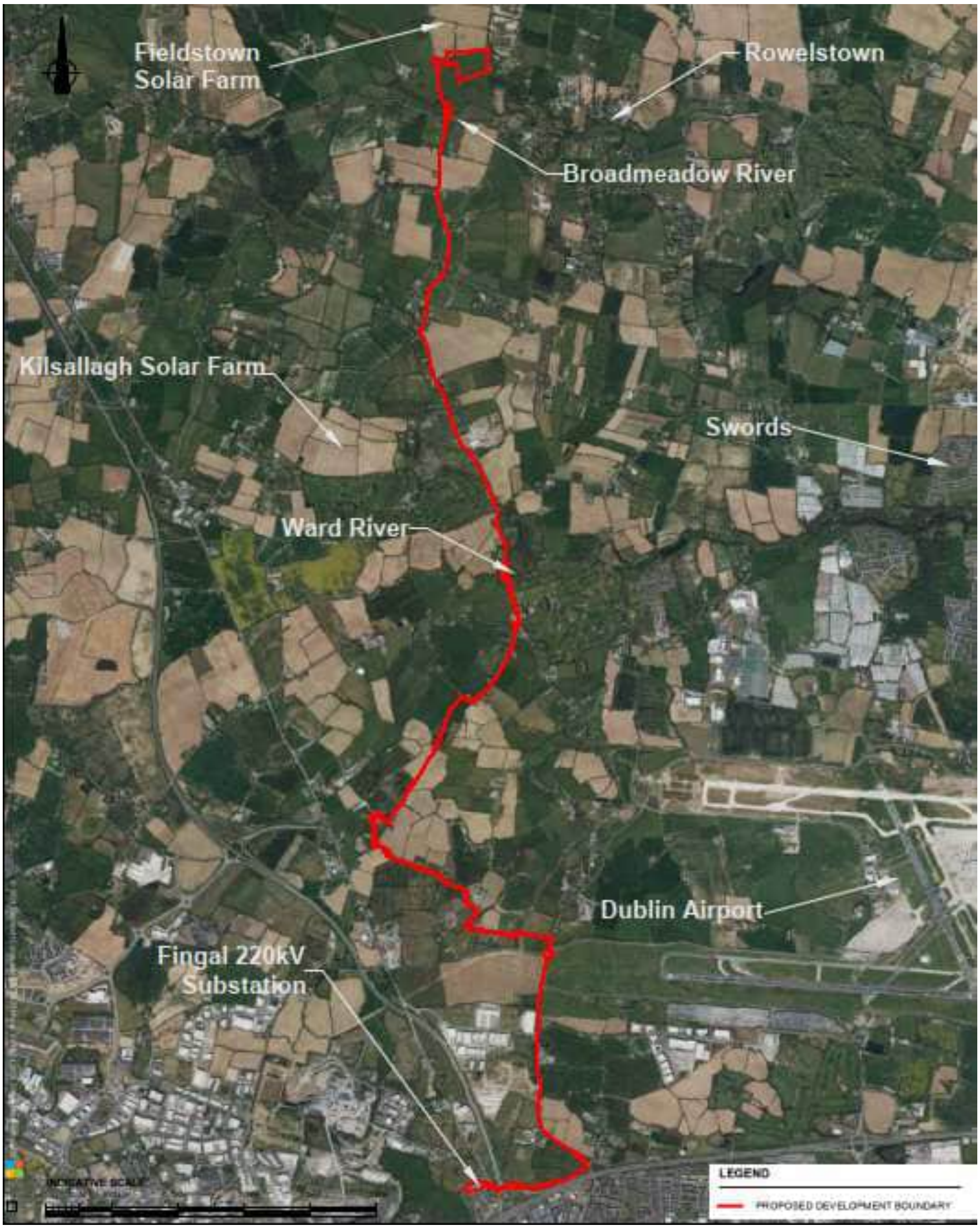


The proposed onsite electrical substation will be served by an access road from the R122 regional road which will allow access for maintenance of the substation by ESB/EirGrid.

2.1.2 Proposed Grid Connection

In order to connect the substation to the transmission network, it is proposed to connect the 110kV substation to the Finglas substation by means of a 110kV underground cable. The Proposed Grid Connection is approximately 13.3km in length. This cable run will exit the Proposed Substation Development compound travelling west before heading south and entering the R122 regional road. The proposed cable connection will follow the path of the R122 regional road to the L7325 and L7231 local roads before returning to the R122, before heading west adjacent to the M50 (motorway), under the N2 to the boundary of Finglas Substation as shown in Figure 2-2.

Figure 2-2 Proposed Grid Connection



The majority of the Proposed Grid Connection is located within the public road with dispersed residential and commercial properties adjacent to the route. The planned tie in for the Proposed Grid Connection to Finglas substation is located to the north of Junction 5 of the M50 and to the west of Junction 1 of the N2.

2.2 Construction Phase

The exact programme of works is yet to be finalised, but it is expected that:

- Application is made for Planning Permission in quarter Q4 of 2023.
- Commence site enabling and construction works in Q4 of 2024 (subject to grant of planning permission).
- Completion of construction and commissioning in Q4 of 2026.

Construction activities will include the following elements as shown in Table 2-1.

Table 2-1 Main Construction Elements and Associated Activities

Element	Description of activities
Site Preparation and Enabling Works	Site establishment. Site clearance works. Construction of temporary site drainage. Bulk earthworks including excavation and removal of topsoil/soil. Infilling of material for internal access road, site compound and laydown area. Landscaping/reinstatement.
Underground Cables	Trenching and installation of underground cables, cable joint bays and pulling pits. Installation of the associated above ground infrastructure (cable marker posts, communication boxes and access points). HDD of water and road crossings.
OHL Diversion	The site preparation required for OHL diversion will be limited with minimal site clearance required. Excavation.
Substation Construction	Pouring of concrete foundations (potentially piling works if required). Erection of steel frame and cladding walls and roofs for any required buildings. Permanent foul and surface water drainage works. Installation of above ground and underground cabling. Electrical installation, commissioning and operation. Other miscellaneous civil works including erection of fencing, provision of site entrance, paving etc.

Construction activities will gradually phase out from pre-construction followed by commissioning and testing of the substation and equipment. It is expected that the number of construction workers required throughout the duration of the construction phase will peak at approximately 50 persons (peak during construction). It is anticipated that the construction of the Proposed Development will be completed during normal construction hours, i.e., 07.00 and 19.00 Monday to Friday and 08.00 to 13.00 on Saturday.

The proposed programme for the construction works will be approximately 24 months from initial enablement works through to commissioning. It is expected that the civil works will take approximately 5 to 6 months, with a further 6 months estimated for cable installation, jointing and testing and reinstatement.

Consideration should be given at the detailed design stage to ensure coordination between the construction phasing and equipment delivery schedules.

2.2.1 Proposed Substation Development Access

Access to the Proposed Substation Development site is currently provided via an existing gated entrance from the R122 regional road. It is proposed to move the existing site entrance approximately 20m south to achieve required safety sightlines. The creation of the new site entrance will require the removal of existing hedgerow but no mature trees in this area. The entrance will be suitably splayed. A 4m wide compacted access track will extend from the entrance to the substation compound. The track will include a geotextile base and filter membrane and 200mm of Clause 804 sub-base.

2.2.2 Haulage Route and Construction Traffic

Construction materials will be brought to site by road along the R122 and the R125 regional roads from the wider environs. Construction materials will be transported in clean vehicles and lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent escape of material along the public roadway. Materials will be sourced locally where possible to minimise transportation distances and will be scheduled to avoid queues/increased traffic on local routes.

Construction of the Site is anticipated to take 24 months and additional traffic movements are expected to peak at 80 vehicles per day, with 30 of those movements being Heavy Goods Vehicle (HGV).

A Construction Traffic Management Plan (CTMP) will be implemented by the appointed Contractor, prior to the commencement of construction.

2.2.3 Site Preparation and Enabling Works

The preparation phase for the Proposed Development will involve site clearance, excavations and levelling of the Proposed Substation Site to the necessary base level for construction, surveying and setting out for structures and any rerouting of services/connections to services. A combination of bulldozer, excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

A construction compound of approximately 2,500m² will be located adjacent to the Proposed Development boundary. The compound may include:

- Welfare facilities (compliant with appropriate regulations such as Safety, Health and Welfare at Work (Construction) Regulations 2013 -Part 14 Construction Site Welfare Facilities (Construction Site Welfare Facilities).
- Bunded fuel storage area.
- Potable water supply.
- Contractor lock-up facility.
- Water tanker.
- Diesel generator.
- First aid facilities.

A layer of granular material will be spread and lightly compacted within the compound to provide hardstanding for site offices and storage containers. Areas of the compound may be used as vehicle hardstanding. The compound will be built using a similar technique to the access roads. The temporary construction compound will be removed on completion of the construction phase.

Temporary access roads will be constructed by stripping surface soils, placing geotextile reinforcement at subgrade level followed by a layer of granular material in accordance with the specification to form a working surface for vehicle. Roadside drains within the temporary works area will be culverted and check dams made from stone or sandbags covered with terram will be inserted upstream and downstream of these culverts to intercept any solids generated during the works.

2.2.4 Levelling/Cut and Fill

The Site preparation phase for the Proposed Substation Development will involve site clearance, excavations and levelling of the Site to the necessary base level for construction, surveying and setting out for structures and any rerouting of services/connections to services. A combination of bulldozer, excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

Approximately 10,000m³ (circa 18,000 tonnes) of clean backfill would be brought to Proposed Substation Development from licensed quarries. All material will undergo validation sampling to confirm suitability from a geotechnical and environmental perspective. In so far as possible, contractors will be required to utilise quarries local to the Site.

The Proposed Grid Connection is anticipated to require excavation works for the underground cabling. For the purpose of this assessment, the volume of earthworks is estimated to be in the order of 10,000m³, however, excavated spoil will be reused for trench reinstatement purposes, reducing the volume of offsite import and/or disposal.

Any excess spoil not suitable and/or required for reuse on site will be removed offsite for appropriate reuse, recovery and/or disposal as reused.

2.2.5 Foundations and Building Structure

Following completion of the enabling works and site clearance, all structures will require foundations. Building structures will comprise standard structural steel frames, and it is anticipated that foundations will require moderate scale excavations.

2.2.6 Substation

The footprint of the proposed onsite electrical substation will include an EirGrid control building, MV switchgear building and the electrical substation components necessary to consolidate the electrical energy generated by the associated solar energy projects and export the electricity to the national grid. The layouts of the proposed substation and its compound are shown in Drawing 60657534-ACM-DWG-FT-601 accompanying this planning application. The construction and exact layout of electrical equipment in the onsite electrical substation will be to EirGrid/ESB Network specifications.

The substation will be surrounded by a steel palisade fence 2.6m in height and approximately xxm in length and internal fences will also segregate different areas within the main substation compound.

The onsite electrical substation buildings will include staff welfare facilities. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the Proposed Development, there will be a very small water requirement for occasional toilet flushing and hand washing and therefore the water requirement of the Proposed Development will be limited. The Applicant has consulted with Uisce Éireann and proposes to connect to the exisiting water network, subject to a valid connection agreement being put in place prior to project execution.

It is not proposed to treat wastewater on site. Wastewater from the staff welfare facilities in the control buildings will be managed by means of a sealed storage tank. All wastewater will be removed from site by permitted waste collector to wastewater treatment plants. This is an accepted industry approach and has been adopted as a response to the specific site characteristics.

2.2.7 Proposed Grid Connection

The Proposed Grid Connection will comprise a single circuit connection with three 160mm diameter High Density Polyethylene (HDPE) power cable ducts and two 125mm diameter communication ducts installed in an excavated trench, typically 600mm wide by 1,250mm deep primarily within public roadways. Existing utility services of varying diameters and depths are located along the route of the proposed grid connection and some will be required to be crossed. Where existing utilities/services are found, the works will be diverted around the service/utility or below them.

Before the junction of the R122 and R125 regional roads, the Proposed Grid Connection will cross under the Broadmeadow River, before the junction of the R122 and R125 regional roads it will cross under the Ward River and will also cross under the N2/M50 prior to entering Finglas Substation. The cables will be installed by HDD at these three locations via entrance and exit pits on either side of the crossings. The underground cabling will cross existing culverts using undercrossing or overcrossing method.

HDD crossings will be installed using specialist equipment along a predetermined route. Two temporary pits (entry and exit) are excavated at each side of the HDD route, locations are selected based on drilling requirements including angle, depth, diameter, curvature, vertical clearance underneath water courses and structures, etc.

Access to the entry and exit pits will be via a newly constructed temporary access or existing access road/track. Works area will be a minimum of 15m back from watercourses and will be levelled where required in accordance with the specification to form access roads and temporary work platform. The depth of the drill below the riverbed will be determined from site investigations. Once the route has been drilled, the ducts will be towed into the bore.

Upon completion, temporary platforms at entry and exit pits will be removed and area reseeded where required.

All works will be carried out in accordance with international best practice and full compliance with health and safety requirements.

2.2.8 Materials and Storage

Key materials will include steel, concrete, composite cladding, piping, electrical cabling, process equipment and finishes. Exact quantities are currently unknown and will be identified at the detailed design stage. Aggregate materials such as sands and gravels will be loaded directly to vehicles for use within the Site of the Proposed Development as appropriate, e.g., as fill material. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – British Standard (BS) EN 1992-3:2006) to prevent spillage.

2.2.9 Reinstatement

Once all construction works are complete, the work areas will be reinstated with excavated soil and either seeded out with native species, allowed to vegetate naturally, or reinstated with excavated grass turves and will be restored to their original condition.

Landscaping consists of native meadow planting surrounding the compound with native hedgerow planting to the north and woodland planting within the visual screening mitigation planting (refer to Drawing 60657534-ACM-DWG-FT-620 submitted as part of this planning application).

2.2.10 Waste Management

All waste products (general waste, plastic, timber, etc.) arising during the construction phase will be managed and disposed of in accordance with the provisions of the Waste Management Act 1996 and associated amendments and regulations, and a Waste Management Plan (WMP) will be prepared by the appointed Contractor prior to the commencement of construction. All waste material will be disposed of at a fully licensed facility.

2.2.11 Outline Construction Environmental Plan

An Outline Construction Environmental Management Plan (oCEMP)[4] is included as part of this planning application. The oCEMP will be developed into a detailed CEMP by the appointed Contractor and implemented by the appointed Contractor during the construction phase of the Proposed Development. All environmental protection measures contained within this ECR will be incorporated into the detailed CEMP by the appointed Contractor. Prior to commencement of construction works, the contractor will draw up detailed Method Statements which will be informed by the oCEMP, environmental protection measures included within the planning application, and the guidance documents and best practice measures to be implemented in full during the construction phase.

2.3 Operational Phases

During the operational phase, the Proposed Development will be operated, maintained and managed by EirGrid/ESBN personnel.

Operational lighting will be directed onto required areas and light spill will be minimised by the use of beam deflectors. Lighting will not be used such that there is light spill on to surrounding habitat which could be used by important species.

2.4 Community Benefit Fund

The Proposed Development has the potential to provide significant additional investment in community initiatives which will benefit local residents and businesses through an annual community benefit fund.

[4] AECOM (2023), Outline Construction Environmental Management Plan

3. Consultation

3.1 Pre-Application Consultation Meeting with An Bord Pleanála

Pre-application meetings were held with An Bord Pleanála on the 22 November 2021 and 31 May 2022. The objective of the meetings was to outline the proposal and to discuss any concerns or comments that An Bord Pleanála may have in relation to the proposal. Confirmation that the project was SID was a part of the pre application process.

3.2 Consultation with Statutory and Non-Statutory Bodies

Letters and project descriptions were sent out to a list of statutory and non-statutory bodies that may have had an interest in the Proposed Development.

3.3 Information Drop to Local Residents

To inform local residents about the Proposed Development, the Applicant distributed information and contact details to households within a radius of just over 1km of the Proposed Substation Development. The information distributed to each household consisted of an information brochure con the Proposed Development. Local residents were also given a letter inviting them to a public information drop-in event which was held on 30November 2022.

In advance of the public information event, the Applicant also visited local residents to provide further information on 15 and 16 November 2022.

Residents and businesses were also visited on 3 and 27 October 2023 along the local road section (L7231 and L7235) of the proposed underground cable route to the Proposed Substation Development. Residents and businesses were provided with a letter and further information on request. Follow up discussions with a number of interested parties regarding local access during construction are ongoing.

3.4 Public Information Event

The Applicant held a public information drop-in event in Oldtown Community Hall on 10 November 2022. Information Brochures and mapping were available for attendees to take home. There were additional documents available to view, including photomontages and engineering drawings. The Energia project team were on hand to answer questions included electrical engineers, planning officers, project managers and community liaison officers. A copy of the consultation report is included in Appendix B.

3.5 Project Website

Energia Renewables launched a stand-alone project website for the Fieldstown 110kV Substation www.fieldstownsubstation.ie to keep members of the public informed about the Proposed Development.

4. Alternative Options Considered

A transmission network connection is required to export the power from the three solar energy projects that will connect into Fieldstown 110kV Station. Therefore, the alternative site locations considered for this development were based on the feasibility of connecting to the transmission system.

The closest transmission station for a tailed connection is Glasmore 110kV Station in Swords, County Dublin. A grid connection to this station was considered but ultimately ruled out as Glasmore 110kV Station does not have a spare bay for a generation connection and is also unlikely to be extendable for same due to proximity constraints from existing housing developments and road infrastructure.

A “loop-in” to the Finglas – Stephenstown 110kV OHL was also considered within design development, but a suitable location for Line Cable Interface Masts (LCIM) could not be identified in the context of land use zoning (green belt designation), its associated sensitivities and other environmental factors given the proximity of the Ward River.

A spare bay was identified in Finglas 110kV gas insulated substation (GIS) that would facilitate a technically viable Proposed Grid Connection. Once the point of connection to the transmission system was confirmed, a number of Proposed Grid Connections from the Fieldstown 110kV Station site to Finglas 110kV GIS Station were then considered. Several options were assessed for the grid connection. An alternative route heading west along the R125 regional road and then south along R135 regional road (formerly the old N2) was ruled out due to the presence of underground services as the route approaches Finglas. Similarly, a further alternative route down the new N2 was ruled out due to engineering constraints. EirGrid stipulations have also influenced the selection of the proposed route and the final route which heads south along the R122 and enters the Finglas 110/220kV Substation compound from the east was chosen following verification of constructability after a detailed site investigation programme.

This is the basis on which the Proposed Development was identified from several connection alternatives.

5. Population and Human Health

5.1 Introduction

This chapter presents an assessment of the impacts of the Proposed Development on population and human health. It defines the study area, the methodology used for developing the baseline and impact assessment, provides a description of the baseline environment in relation to population and human health and presents the findings of the impact assessment.

Impacts of the Proposed Development on population and human health have potential to arise from various aspects including:

- Land-use and accessibility.
- Community severance.
- Employment.
- Human health.

Many of the potential population and human health effects of the Proposed Development arise from air quality, noise and vibration, visual and traffic effects. Therefore, the human health impact assessment relies on the assessments and draws on the findings of those sections in this report as necessary to assess the impacts on human health.

5.2 Legislation, Policy and Guidance

This chapter has been prepared with reference to the following:

- EIA Directive 2014/52/EU.
- Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports[5].
- National Health Service (NHS) Healthy Urban Development Unit (HUDU) Planning for Health Rapid Health Impact Assessment Tool[6].
- Guidelines on the Treatment of Tourism in an Environmental Impact Statement[7].
- FCC, Fingal Development Plan (FDP) 2023 to 2029[8].
- Institute of Public Health (2021). Health Impact Assessment Guidance A Manual.
- Institute of Environmental Management and Assessment (IEMA) (2017) Health in Environmental Impact Assessment.
- International Association for Impact Assessment (IAIA) (2019) Addressing Human Health in Environmental Impact Assessment as per EU directive 2011/92/EU amended by 2014/52/EU.
- European Public Health Association (EUPHA) (2019). Addressing Human Health in Environmental Impact Assessment.

5.3 Methodology

5.3.1 Study Area

The Site is located on lands at Fieldstown, County Dublin (see Figure 2-1 and Figure 2-2). The Proposed Substation Development is bounded by the R122 regional road immediately west and the R130 regional road to the west and agricultural lands to the north, south and west. The Proposed Grid Connection is located primarily with public roads and follows the route of the R122 regional road before heading west adjacent to the M50 to the boundary of Finglas Substation.

The study area for the population and human health assessment has considered the area of land that encompasses the likely impacts of the Proposed Development. The study area therefore includes the construction footprint/project boundary (including compounds and temporary land take). The area used for the baseline analysis consists of the electoral division (ED) of Kilsallaghan.

[5] EPA (2022), Guidelines on the information to be contained in Environmental Impact Assessment Reports
[6] NHS (2019), HUDU Planning for Health – Rapid Health Assessment Tool
[7] Failte Ireland (2011), Guidelines on the Treatment of Tourism in an Environmental Impact Statement
[8] FCC (2023), Fingal Development Plan

However, there is potential for effects to occur on receptors outside of this area. For example, it is not always possible to determine the catchment area for community facilities as residents of an area may utilise facilities located within different districts, counties, or regions without regard for statutory boundaries.

5.3.2 Determination of the Baseline Environment

The types of effects considered in the assessment of population and human health covers land-use and accessibility, community severance, employment and human health. In order to assess the associated potential effects of the Proposed Development, it is necessary to determine the environmental or baseline conditions, resources and receptors that currently exist on site and in the surrounding area. The identification of the baseline conditions therefore involves predicting changes that are likely to happen in the intervening period, for reasons unrelated to the Proposed Development.

The methodology for determining the baseline environment for the population and human health assessment involved desktop review of publicly available information and details provided by the Applicant. The baseline includes a description of local communities within the study and a profile of the people which reside within these communities. This profile includes an analysis of population and population growth, age, demographics, and health determinants. The presence of any vulnerable groups which could be disproportionately affected by the impacts of the Proposed Development are also identified in the baseline.

The baseline also includes a description of land uses in the local area, including the presence of:

- Private residential buildings and commercial properties.
- Community land (e.g., common land, village greens, open green space, allotments, sports pitches etc).
- Community facilities (e.g., village halls, healthcare facilities, education facilities, religious facilities etc).
- The location of land allocated for employment and residential development by local authorities.

A planning search of granted and pending planning applications made within the vicinity of the Proposed Development within the last five years was also completed within the baseline (refer to Appendix A). This was used to determine how the area may change between now and the time when the Proposed Development is constructed.

5.3.3 Determination of Sensitive Receptors

The sensitivity of the existing environment identifies the ability of the receptor to respond to potential effects. Receptors in the population and human health assessment are members of the local and wider community which have potential to be impacted by any of the effects described. The following section identifies the methodology for defining the sensitivity of receptors for each type of potential effect identified. Terminology used to describe the sensitivity of the receptor are as per the EPA Guidelines[5]. The assessment of human health is assessed using HUDU Tool[6].

5.3.3.1 Land Use and Accessibility

The value and typical descriptors which have been applied to determine sensitivity to the impacts as a result of the Proposed Development have been based on professional judgement. Examples of the sensitivities typically assigned to different land uses are identified in Table 5-1. It is important to note, however, that other criteria are also used to inform the sensitivity of a resource to potential change. This includes how often the resource is used, how many users the resources have and whether the resource is maintained.

Table 5-1 Examples of Sensitivities Assigned to Different Land Uses

Sensitivity	Description
High	• Private residential buildings, or land allocated for development of housing. • Buildings used for employment use, and land allocated for development of employment uses. • Regularly used community buildings which have only limited alternatives available nearby. • National or regional walking, cycling and horse-riding routes, and other routes regularly used by vulnerable travellers such as the elderly. • Designated public open spaces, or open spaces which attract users nationally e.g., national parks. • Religious sites and cemeteries. • Regularly used agricultural land where the enterprise is dependent on the spatial relationship of the land to key agricultural infrastructure.
Medium	• Land associated with private residential buildings e.g., gardens.

Sensitivity	Description
	• Community buildings which are regularly used or where there are only limited alternatives available in the local area. • Open spaces which span over a regional area and attract visitors from a regional catchment e.g., country parks, forests. • Public rights of way and other routes close to communities which are used for recreational or utility purposes, but for which alternative routes can be taken. • Agricultural land holdings which are used semi-regularly and where the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure.
Low	• Community buildings which are infrequently used or where there are many alternatives available in the local area. • Open spaces which are used for informal recreation (e.g., dog walking), and where there are alternative open spaces available. • Locally used community land e.g., local parks and playing fields. • Walking, cycling and horse-riding routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes. • Agricultural land which is used semi-regularly but where the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure.
Negligible	• Derelict or unoccupied buildings. • Agricultural land which is infrequently used on a non-commercial basis.

5.3.3.2 Community Severance

The receptors which have potential to experience severance effects are residents of the local community which use the roads and walking/cycling routes to travel in and around the study area to commercial properties, community facilities, places of work and educational facilities. No sensitivity values are assigned to receptors with potential to experience severance effects.

5.3.3.3 Employment

The receptor which has potential to experience employment effects is the workforce in the surrounding area. This includes the construction industry and the local supply chain. Receptors within the construction workforce/local supply chain are likely to have different sensitivities to change due to the range of circumstances which may apply. Therefore, no single sensitivity value is assigned in the employment effects assessment.

5.3.3.4 Human Health

The assessment of human health is assessed using guidance set out in the HUDU Tool[6]. Sensitivities are not defined for receptors.

5.3.4 Describing Potential Effects

The assessment of significance is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary. As such, it would be neither representative of the population, nor a fair representation of the range of sensitivities in a population, were an overall sensitivity classification assigned to the population in question.

5.3.4.1 Land Use

This assessment includes all direct and indirect effects on community resources and private assets in the study area. Direct effects include land-take and/or impacts on access, i.e., properties and/or facilities being cut off or split.

Indirect effects include significant impacts on the amenity of residents of properties and/or users of community resources in the study area.

5.3.4.2 Severance

Severance is defined as the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows. The Proposed Development has the potential to severance effects by changing levels of traffic congestion on existing roads and/or introducing traffic management measures. This may lead to separation of residents from facilities and services which they use. The magnitudes for effects on severance have been identified based on a three-point scale: high, medium and low.

Table 5-2 outlines the criteria used to determine the magnitude of effect on severance.

Table 5-2: Magnitude of Effect Criteria Used to Assess Severance

Magnitude of Effect	Description
High	People are likely to be deterred from making trips to an extent enough to induce reorganisation of their habits. Considerable hindrance would be caused to people trying to make their existing journeys for a prolonged period.
Medium	Some people are likely to be dissuaded from making trips. Other trips would be made longer or less attractive.
Low	In general, the current journey pattern is likely to be maintained, but there would probably be some hindrance to movement for limited amount of time.

5.3.4.3 Employment

This assessment includes all potential direct, indirect and induced effects on the workforce in the study area and the surrounding area. There is no consolidated methodology or practice for assessing the impact on employment in EPA guidance. The impacts of the Proposed Development on employment have therefore been assessed qualitatively based on the number of jobs which the Proposed Development will create.

5.3.4.4 Human Health

Constraints on human health consider the health of residents of properties and users of community resources in the study area, and will include accounting for effects on air quality, noise and vibration, visual and traffic effects. An initial scoping exercise was undertaken to determine the criteria within the HUDU guidance (NHS, 2019) which is relevant to this assessment. The criteria which will be assessed as part of this chapter are listed below. Other criteria in HUDU guidance (NHS, 2019) but not in the list below, have been scoped out for this assessment:

- Air quality, noise and neighbourhood amenity.
- Access to work and training.
- Climate change.

5.3.4.5 Magnitude of Impact

The assessment of human health is a qualitative rather than quantitative assessment, due to the diverse nature of health determinants and health outcomes which are assessed. Although the assessment of human health effects describes the likely qualitative health outcomes, it is not possible to quantify the severity or extent of the effects which give rise to these impacts.

As such, the potential health impacts are described as outlined in Table 5-3, based on broad categories for the qualitative effects identified. Where an effect has been identified, actions have been recommended to mitigate negative impact on health, or opportunities to enhance health benefits. It should be noted that in many cases, embedded controls to reduce these effects or measures to enhance certain benefits already form part of the Proposed Development and the assessment has considered these impacts as such.

Table 5-3 Human Health Impact Categories

Impact Category	Impact Symbol	Description
Positive	+	A beneficial impact is identified
Neutral	0	No discernible health impact is identified
Negative	-	An adverse impact is identified
Uncertain	?	Where uncertainty as to the overall impact

5.4 Baseline Environment

5.4.1 Population

Table 5-4 presents the population change from 2006 to 2022 for Ireland, the FCC area and the study area using available census data. These results indicate that the population within the study area increased by 6.3% between 2016 and 2022.

The Proposed Substation Development is located within a rural area therefore no urban area or dense residential settlements are present. The rural settlements that do exist within the study area are not located within the vicinity of the Proposed Substation Development. The Proposed Grid Connection runs through Kilsallaghan and St Margaret's.

Table 5-4 Population and Population Growth in the Study Area and its Comparator Areas

Area	2022	2016	2011	2006	Change Between 2016-2022 (%)
Study Area	2,406	2,263	2,205	2,081	6.3
Fingal	330,506	296,020	273,991	239,992	11.6
Ireland	5,123,536	4,761, 865	4,588,252	4,239, 848	7.6

Table 5-5 presents the total population for the study area and its comparator areas by age band. In 2022, 57.4% of the residents in the study area were aged between 20 and 64 years. In addition, Kilsallaghan ED had a slightly lower proportion of residents aged 19 years or under (23.7%) in comparison to Fingal (29.3%) but slightly higher than Ireland (23.2%). Similarly, the proportion of residents aged 65 years or older in Kilsallaghan ED (19%) was significantly higher than the average for Fingal (11.1%) and Ireland (13.9%).

Table 5-5 Percentage of Total Population in Each Age Band for the Study Area and its Comparator Areas

Area	% of Total Population by Age Band						
	0 to 4	5 to 14	15 to 19	20 to 24	25 to 44	45 to 64	65+
Study Area	4.3	12.8	6.6	7.2	23.3	26.9	19
Fingal	6.4	16	6.9	5.8	29.6	24.3	11.1
Ireland	5.1	12.4	5.7	4.8	20	21.7	13.9

5.4.2 Education and Skills

Fingal's population has similar levels of education compared to the rest of the country. Table 5-6 shows that within the study area, the number of residents qualified to Ordinary bachelor's degree/professional qualification or higher is 25.3% which is lower than Fingal (39.2%) and the national average (33.7%).

Table 5-6 Percentage of Population - Education and Skills

Indicator	Study Area	Fingal	Ireland
No formal education	1.9%	1.7%	2.4%
Primary	9.1%	4.7%	7.4%
Lower secondary	15.6%	10.3%	13.2%
Upper secondary	19.0%	18.8%	18.1%
Technical/vocational	7.6%	7.6%	7.5%
Advanced certificate/completed apprenticeship	5.8%	5.3%	5.6%
Higher certificate	4.6%	5.8%	5.5%
Ordinary bachelor's degree/professional qualification or both	6.6%	9.2%	8.1%
Honours bachelor's degree/professional qualification or both	9.9%	15.3%	13.3%
Postgraduate diploma or degree	8.0%	13.4%	11.2%
Doctorate (Ph.D.)	0.8%	1.2%	1.1%
Not stated	11.0%	6.8%	6.5%

5.4.3 Employment

As shown in Table 5-7, the labour force participation rate within the study area is below both Fingal (65.6%) and the national average (61.2%).

Table 5-7 Labour Force Participation Rate

Employment Rate	Study Area	Fingal	Ireland
Labour Force Participation Rate	54.2%	65.6%	61.2%

5.4.4 Social Class

The census provides a breakdown of the total population by 'social class'. These groupings are based on the level of skill and education attainment of their occupation. For the population which does not work, the social class of the person which they are deemed to depend on is attributed to them (as per guidance issued by the CSO). The data shows that the population of the study area is relatively better educated with a higher percentage of people in occupations which require greater skill levels than its comparator areas.

Table 5-8 shows the percentage of population by social class for the study area and its comparator areas. In 2016, the relative proportion of population in the 'Semi-Skilled' (10.0%) and 'Unskilled' (2.8%) social classes in the study area was similar to the average for Fingal (8.5% and 2.8%) and the average for Ireland (10.5% and 3.6%). The study area had a similar proportion of population in the 'Skilled' social class (14.4%) in comparison to Ireland (14.1%) but slightly higher than Fingal (12.9%).

At the time of Census 2022, the study area had a slightly lower proportion of population in the 'Professional' social class (7.4%) in comparison to Fingal and the national average (9.7% and 9.3%). Similarly, the study area had lower proportion of population in the 'Managerial/Technical' social class (28.4%) in comparison to the national average (30.7%) but lower than in Fingal (34.7%).

Table 5-8 Percentage of Total Population in Each Social Class for Study Area and Comparator Areas

Area	% of Total Population by Social Class						
	Professional	Managerial/ Technical	Non-Manual	Skilled Manual	Semi-Skilled	Un-skilled	Other
Study Area	7.4	28.4	17.2	12.8	9.5	3.2	21.5
Fingal	9.7	34.7	17.4	11.7	9.4	2.7	14.4
Ireland	9.3	30.7	16.2	12.9	11.2	3.1	16.6

5.4.5 Human Health

Information on general health is represented in Table 5-9. The health conditions in the study area are poorer than the averages for Fingal and Ireland. In 2022, 77.1% of the population in the study area considered themselves to be in very good or good health, which is lower than the rate for Fingal (84.2%) and the overall rate for Ireland (82.9%).

At the time of Census 2022, 1.9% of residents in the study area considered themselves to be in bad or very bad health, which is broadly in line with the rate for Fingal (1.5%) and Ireland (1.7%).

Table 5-9 Proportion of the Population by General Health for the Study Area and its Comparators

Area	Proportion of Population by General Health (%)					
	Very Good	Good	Fair	Bad	Very Bad	Not Stated
Study Area	48.1	29	8.5	1.4	0.5	12.5
Fingal	55.4	28.8	7.2	1.2	0.3	7.2
Ireland	53.2	29.7	8.7	1.4	0.3	6.7

5.4.5.1 Disabilities

Table 5-10 shows the proportion of the population with a disability in the study area and its comparator areas. In the Census 2022, a disability has been defined as a long-lasting condition or difficulty and may be physical or mental. In 2022, 23.2% of residents in the study area stated that they had a disability. This is higher than the rate recorded in both Fingal (18.6%) and Ireland (21.7%) as a whole.

Table 5-10 Proportion of the Population with a Disability

Area	Proportion of Population with a Disability (%)
Study Area	23.2
Fingal	18.6
Ireland	21.7

5.4.6 Travel Patterns and the Existing Transport Network

Travel time to work, school or college is a useful tool indicating the travel patterns within an area as well as the standard of existing transport networks. This can provide information when considering potential impacts associated with traffic and noise. Table 5-11 presents travel time as a percentage of population under average time frames within a given area. The results show that residents in the study area travel similar distances to work, school or college compared to residents in Fingal but longer distances than Ireland as a whole. Approximately 51.1% of respondents from the study area reported spending 29 minutes or less travelling to these destinations, compared to 49.1% in Fingal and 57.5% in Ireland.

Table 5-11 Travel Time to Work, School or College

Area	% of Total Population by Travel Time to Work, School or College						
	Under 15 mins	15-29 mins	30-44 mins	45-60 mins	1-1.5 hours	>1.5 hours	Not Stated
Study Area	21.7	29.4	18.3	5.3	6.3	2.4	16.5
Fingal	23.7	25.4	19.4	8.1	9.2	2.8	11.3
Ireland	29.4	28.1	17.3	5.9	6.1	2.5	10.7

Table 5-12 shows the modes of transport most commonly used to travel to work, school, and college for residents of the study area and its comparator areas in 2022. The results show that residents in the study area rely primarily on private vehicles. Approximately 41.7% of residents in the study area travel to their respective destinations by driving or as a passenger in a private vehicle. This is higher than the percentage of residents who travel by private vehicle in Fingal (33.9%) and Ireland (39.1%). Conversely, only 7.4% of residents travel by foot or cycle, which is significantly lower than for Fingal (18.1%) and Ireland (15.3%). This is due to the rural location of the study area. Residents are required to travel elsewhere for school and college. Employment opportunities in the area are also limited.

Table 5-12 Travel Mode to Work, School or College

Area	Foot (%)	Bicycle (%)	Bus or Coach (%)	Train (%)	Personal Vehicle[9] (%)	Car Passenger (%)	Other (%)	Work from Home	Not Stated (%)
Study Area	6.4	1	9.6	0.3	41.7	20.2	0.8	7.9	12.2
Fingal	15	3.1	11.2	6.2	33.9	14.7	0.2	8	7.7
Ireland	12.6	2.7	9	2.4	39.1	34.7	0.4	7.4	7.4

5.4.7 Land Use

The Irish national Coordination of Information on the Environment (CORINE) 2018 dataset[10] has identified the area within the Proposed Substation Development as an area described as an ‘Agricultural Area’ of ‘Pastures’. The majority of the Proposed Grid Connection is in areas described as “Artificial Surfaces”.

5.4.7.1 Local Community Facilities

The Proposed Substation Development is located approximately 1km west of Rolestown, a small village along the R125 regional road. In Rolestown, there are a number of community facilities which include the following:

- Rolestown National School, a state-of-the-art school under the patronage of the Catholic Church which is currently providing for 280 children and employs 14 teachers and 5 additional staff members[11].

[9] Motorcycle, Scooter, Car or Van
[10] EPA (2018), Corine Lancover 2018
[11] Rolestown National School - https://rolestownns.ie/about-us/

- Rolestown Parish Church, a catholic church serving the local community.
- Rolestown Cemetery.

The Proposed Grid Connection runs alongside a number of community facilities including:

- Little Moo Moos Playschool.
- St Margaret's National School.
- St Margaret's Church.
- St Margaret's Cemetery.
- Chapelmidway Cemetery.
- St Margaret's GAA Club.
- St Margaret's Golf and Country Club.

5.4.7.2 Open Spaces/Amenity Areas

There are no open spaces or amenities within the vicinity of the Proposed Development site. St Margaret's GAA Club and St Margaret's Golf and Country Club provide amenity facilities within 1km of the Proposed Grid Connection.

5.5 Potential Impacts

5.5.1 Construction Phase

5.5.1.1 Land use and Accessibility

There are no receptors that would experience land use or severance effects in the vicinity of the Proposed Development during construction.

5.5.1.2 Community Severance

Construction of the Proposed Development is anticipated to generate additional traffic movements on the local road network, with vehicles accessing the construction site via the R122 and R125 regional roads. Traffic and transport effects are included in the Traffic and Transport Assessment (TTA) included in Appendix I.

5.5.1.3 Employment

The impact on direct employment has been identified by the number of workers required onsite. The main construction activities associated with the Proposed Development are expected to last 24 months. During this period, the number of construction workers will vary considerably though the maximum required onsite during working hours is expected to be 30 persons. Given the size, nature, and duration of the Proposed Development, it has potential to create some temporary employment in Kilsallaghan and the surrounding area. The Proposed Development is assessed to have a minor beneficial impact on employment owing to the slight increase as a result of the construction work force and the additional indirect and induced employment effects supported within the supply chain and ancillary services in the study area.

5.5.1.4 Air Quality, Noise and Neighbourhood Amenity

Given its nature, the Proposed Development will not result in any significant change to the local air quality environment, the local noise environment, or the existing road network (see Chapter 9: Air Quality and Chapter 11: Noise and Vibration).

Therefore, the impact of the Proposed Development on air quality, noise, and neighbourhood amenity as a determinant of human health and well-being is assessed to be neutral (0).

5.5.1.5 Access to Work and Training

The Proposed Development has the potential to create new jobs during the construction phase. Therefore, the impacts of the Proposed Development on access to work and training as a determinant of human health is assessed to be positive (+).

5.5.1.6 Climate Change

Given its nature, the Proposed Development is not expected to result in changes to the climate of the study area (see Chapter 9: Air Quality and Chapter 10: Climate).

Therefore, the impact of the Proposed Development on climate change as a determinant of human health and well-being is assessed to be neutral (0).

5.5.2 Operational Phase

No likely significant impacts are anticipated to human health during the operational phase of the Proposed Development.

No direct impacts on employment are expected as a result of the operation of the Proposed Development

5.6 Mitigation Measures

5.6.1 Construction Phase

An oCEMP[4] is included as part of this planning application. The oCEMP will be developed into a detailed CEMP and implemented by the appointed Contractor during the construction phase, which will ensure best practice methods are used throughout the construction phase and that potential noise and traffic disturbances are minimised. It is assumed that as part of the oCEMP, traffic management measures will be put in place to ensure that access is maintained along the R122 regional road and the M50 during construction of the Proposed Grid Connection to avoid severance to land use receptors. The Proposed Development will facilitate employment. This impact is positive; therefore, no mitigation measures are proposed.

5.6.2 Operational Phase

No impacts to population and human health are expected during the operational phase of the Proposed Development and therefore no mitigation measures are proposed.

5.7 Residual Effects

Following the inclusion of the mitigation measures described in Section 5.6, no residual significant effects on population and human health are anticipated from the Proposed Development.

5.8 Cumulative Effects

Should the construction of the listed projects in Table 1-2 and the Proposed Development occur concurrently, there is potential for temporary indirect cumulative effects on population and human health due to increased construction traffic and nuisances associated with site activities (dust, noise). However, given the scale of the of the project, it is unlikely there will be a significant direct or indirect cumulative effect on population during construction. No significant direct or indirect cumulative effects on population or human health are predicted during the operation of the planned and Proposed Development.

5.9 Summary

The potential human health and populations impact arising from the Proposed Development have been considered with regards to the construction and operational phases.

Based on a review of available information, potential impacts to the human health and population from the construction and operation of the Proposed Development are not considered to be significant.

No cumulative effects from other developments are expected.

6. Biodiversity

An Ecological Impact Assessment (EcIA) has been undertaken and is included in Appendix C.

7. Land and Soils

7.1 Introduction

This chapter examines the baseline environment in terms of land and soils in relation to the Proposed Development and assesses the potential impact of the Proposed Development. Mitigation and monitoring measures are also proposed to address the likely impacts to land and soils.

7.2 Legislation, Policy and Guidance

This chapter has been informed by relevant guidance documents, including the following:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports[5].
- Environmental Impact Assessment of Projects, Guidance on the preparation of Environmental Impact Assessment Reports' (Directive 2011/92/EU as amended by 2014/52/EU)[12].
- Planning and Development Environmental Impact Assessment Regulations[13].
- Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements[14].

7.3 Methodology

7.3.1 Study Area

The study area for the geology and soils assessment is focused on land within the Proposed Development boundary and outward to 2km. This area is considered appropriate for the consideration of impacts on geology and land use.

7.3.2 Determination of the Baseline Environment

The baseline assessment has been reviewed to identify sensitive receptors. The following is a list of sources of information that have been consulted for use in the baseline assessment:

- Ordnance Survey Ireland (OSI) online historical maps and aerial photographs.
- Geological Survey of Ireland (GSI) online maps.
- EPA online maps.

7.3.3 Describing Potential Effects

A qualitative approach was used to determine the significance of impact as per the EPA's Guidance[5] determination figure. It should be noted the control measures, as outlined in Chapter 2: Description of Proposed Development, have been considered embedded in the project design and their application has been assumed in determining the significance of the impact. Mitigation measures will be devised for potential complete pollutant linkages (comprising a source, pathway, and receptor), potential impacts to geology and potential impacts to land.

7.4 Baseline Environment

7.4.1 Existing Data

7.4.1.1 Geology[15]

Quaternary Sediments

According to GSI mapping, the Proposed Substation Development is underlain by till derived from limestone.

According to GSI mapping, the Proposed Grid Connection is underlain by till derived from limestone, alluvium and limestone gravel, however, give the Proposed Grid Connection is primarily located in public roadways, quaternary sediments are anticipated to comprise predominantly of made ground.

---

[12] European Commission (EC) (2017), Environmental Impact Assessment of Projects, Guidance on the Preparation of Environmental Impact Assessment Reports (as amended).
[13] European Union (EU) (2018), Planning and Development Environmental Impact Assessment Regulations 2018 (Statutory Instrument) S.I. 296)
[14] Institution of Geologists of Ireland (IGI) (2013), Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements.
[15] Hydrogeological regime beneath the site is described in Chapter 8

Bedrock Geology

According to GSI mapping, the bedrock beneath the Proposed Substation Development is Lucan Formation, which comprises dark limestone and shale.

The bedrock beneath the Proposed Grid Connection is limestone and shale of the Lucan Formation to the north, limestone and shale of the Rush Conglomerate Formation, Tober Colleen Formation, Malahide formation and Waulsortian Limestones to the south.

Geological Features

Geological faults are recorded approximately 300m to the east and 500m to the southeast of the Proposed Substation Development.

Several northwest/southeast trending faults are recorded along the route of the Proposed Grid Connection.

Geological Heritage Sites

There are no recorded geological heritage sites within 2km of the Proposed Substation Development.

Huntstown Quarry (Site Code DF022) which is designated as a County Geological Sites (CGS) which may be recommended for Geological national heritage area is located approximately 800m west of the southern extent of the Proposed Grid Connection. The quarry illustrates the base of the Tober Colleen formation directly overlying the Waulsortian limestone.

7.4.1.2 Land Use

Current

The Proposed Substation Development and surrounding land are currently in agricultural use.

The Proposed Grid Connection is primarily with public roadways. Lands surrounding the Proposed Grid Connection are primarily agricultural and residential with occasional commercial premises.

Historical

Based on a review of publicly available historical mapping, the Proposed Substation Development has been in agricultural use since the first maps available in the 1830s. Nineteenth century mapping indicates a gravel pit was present offsite immediately to the southwest.

Available historic mapping of the Proposed Grid Connection indicates it has been in use as a public road since the earliest mapping.

Designated Sites

There are no recorded Special Areas of conservation (SACs), Special Protection Areas (SPAs) or Natural Heritage Areas (NHAs) within a 2km radius of the Proposed Development site.

7.4.2 Site Investigation

There are no publicly available borehole logs within 2km of the of the Proposed Substation Development. A trial pit log from a site 800m to the east of the Proposed Substation Development is available on the GSI website and indicates shallow soils to comprise topsoil over sandy gravelly clay, with occasional cobbles and boulders.

The GSI website notes a number of geotechnical investigations appear to have been carried out in the vicinity of the southern extent of the Proposed Grid Connection that indicate ground conditions comprise primarily of stiff clays overlying gravel and bedrock.

7.5 Potential Impacts

7.5.1 Construction Phase

Full details of the description of the project are set out in Chapter 2: Description of Proposed Development. The potential impacts on land and soils from these construction activities include:

- Excavation and stockpiling of soils, which could lead to soil erosion.
- Potential accidental spills/release of fuels, chemicals, concrete, drilling fluids and lime to ground.
- Soil compaction due to traffic and storage or excessively high stockpiles of soil, and silt laden run off in heavy rain or wheel-washing activities.
- Depletion of natural resources, through use of quarried material as fill.

- Potential for overburden collapse at the proposed HDD locations crossings.

7.5.2 Operational Phase

There is the potential for oils to be present within transformers and for fuels to be used in back-up generators and maintenance activities at the Proposed Substation Development, but any such materials would be contained above sealed hardstanding, and in bunds where necessary.

There is the potential for spills/leaks of fuel/oil from parked vehicles to impact soils in the absence of mitigation measures.

The Proposed Substation Development would also remove land from agricultural use. However, given the scale of the Site and the availability of agricultural land in the wider area, this is not considered to be a significant impact.

7.6 Mitigation Measures

7.6.1 Construction Phase

7.6.1.1 Management of Excavated Materials

Temporary storage of soil will be carefully managed in such a way as to prevent potential negative impact on the receiving environment and the soil material will be stored away from any surface water drains. It will be necessary to designate areas within the Site where stockpiles will be established in order to facilitate the efficient transfer of material within the Site. In order to minimise the potential environmental impact from excavations and stockpiles, it will be necessary to adopt the following mitigation measures:

- Store excavated topsoil for reuse in stockpiles less than 2m high to prevent damage to the soil structure. Other excavated materials of lower engineering quality can be stored in higher stockpiles.
- Segregate different grades of soil where they arise.
- Excavations in made ground will be monitored by an appropriately qualified person to ensure that any contaminated material is identified, segregated and disposed of appropriately. Any material from identified localised areas of contamination shall be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage.
- Minimise movements of materials within the stockpiles in order to reduce the degradation of the soil structure.
- On completion of the works, the ground surface disturbed during the Site preparation works and at the entry and exit pits for HDD will be carefully reinstated and reseeded at the soonest opportunity to prevent soil erosion.

In order to minimise the impact of the Proposed Development on local geology, where possible, excavated material will be reused on site and imported material including fill and hard standing will be obtained from local sources.

7.6.1.2 Fuel and Chemical Handling/Accidental Release

The following mitigation measures will be implemented to reduce the potential for accidental spills and leaks during the construction phase:

- Designate a bunded storage area at the contractor’s compound(s) and away from open ground and surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total capacity of all the tanks within the bund, whichever is the greater.
- Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the Site plot, a suitably sized spill pallet will be used for containing any spillages during transit.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains.
- Where mobile fuel bowsers are used on the Site, in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and/or booms) shall be held onsite in order to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles.

- Any bentonite (or similar HDD drilling head lubrication material) will be handled and removed by the drilling contractor.
- The drilling fluid/bentonite will be non-toxic and naturally biodegradable.
- HDD will be a closed system, with drilling fluid recirculated, the drill cuttings recovered, and drilling fluid reused. Pneumatic leak testing shall be carried out to confirm the integrity of the return line.
- Spent drilling fluids including separated drill materials shall be contained in secure bunded areas for offsite disposal at a licensed disposal facility.

7.6.1.3 Control of Concrete and Lime

All ready-mixed concrete will be brought to site by truck. Wash down and washout of concrete transporting vehicles will take place at an appropriate designated area and direct discharge of wash water to ground or surface waters will be strictly prohibited.

7.6.2 Earthworks Haulage

The following mitigation measures will be implemented to reduce the soil compaction during the construction phase:

- Earthworks haulage will be along predetermined routes within the proposed development and any deliveries to site will be along existing national, regional and local routes for importation and exportation of materials.
- Haulage with the Proposed Substation Development will be along internal haul roads/access tracks, where practicable.
- Where compaction occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to its original condition. Where practicable, compaction of any soil or subsoil which is to remain in situ along the Sites will be avoided.

7.6.2.1 Sources of Aggregates and Clean Fill for the Project

The source of aggregate and fill material will be carefully selected and vetted in order to ensure that it is of a reputable origin and that it is 'clean' (i.e., will not contaminate the environment). The project contract and procurement procedures will be developed to ensure that aggregates are sourced from reputable sources. All potential suppliers will be vetted for the following criteria:

- Environmental management status.
- Regulatory and legal compliance status.

Only suppliers that comply with the planning requirements will be considered for inclusion in the project. Likewise, 'clean' fill material will only be sourced from suppliers who comply with the above requirements.

The use of quarried material would lead to the depletion of a non-renewable natural resource. However, quantities of fill material required to be imported to site are likely to be extremely small, when compared to the national demand for aggregates.

7.6.2.2 Overburden Collapse (HDD)

The following mitigation measures will be implemented to reduce the potential for overburden collapse during the construction phase:

- Detailed subsurface investigations will be carried out at the proposed HDD locations prior to construction.
- Limits will be placed on drilling fluid pressures in the annular space of the bore to prevent inadvertent drilling fluid returns to the ground surface and maintain bore stability.
- A minimum soil cover depth of 3m will be maintained under existing roads and watercourses.
- Ground settlement, horizontal movement and vibration monitoring will be implemented during construction activities to ensure that the construction does not exceed the design limitations.

7.6.3 Construction Environmental Management Plan

An oCEMP[4] is included as part of this planning application. The oCEMP will be developed into a detailed CEMP and implemented by the appointed Contractor during the construction phase of the Proposed Development. This will set out relevant environmental avoidance or mitigation measures to reduce potential environmental impact. It will also include details of proposed environmental monitoring for the duration of the construction works, be this good practice or as a planning condition requirement.

7.6.4 Operational Phase

During the operational phase, maintenance checks will be undertaken to ensure any oils, fuels or chemicals stored onsite are done so in line with guidance, and within bunded areas where necessary.

A sealed drainage system will be present, which would capture any potential leaks/spills from parked vehicles.

7.7 Residual Effects

There are no likely significant impacts on the land and soils environment associated with the Proposed Development, assuming the mitigation measures outlined above are implemented during the construction and operational phases.

7.8 Cumulative Effects

Should the construction of the listed projects in Table 1-2 and the Proposed Development occur concurrently, there is potential for temporary indirect cumulative effects on land and soils. Potential emissions to soil and groundwater associated with the Proposed Development can be mitigated to the extent that the impact will not be significant. It is not unreasonable to assume that the listed projects in Table 1-2, will also implement standard and best practice mitigation measures to the extent that impacts are not significant. When the predicted effects of the Proposed Development are considered cumulatively with each planned project and cumulatively with all planned projects as a whole, it is concluded that there are no significant negative cumulative effects predicted on soils, geology or hydrogeology.

7.9 Summary

The potential land and soils impact arising from the Proposed Development have been considered with regards to the construction and operational phases.

Based on a review of available information, potential impacts to the land and soils environment from the construction and operation of the Proposed Development are not considered to be significant.

No cumulative effects from other developments are expected.

8. Water

8.1 Introduction

This Chapter examines the baseline environment in terms of surface water and groundwater in relation to the Proposed Development and assesses the potential impact of the Proposed Development. Mitigation and monitoring measures are also proposed to address the likely impacts to water.

8.2 Legislation, Policy and Guidance

This chapter has been prepared with reference to the following:

- EU Water Framework Directive (WFD)[16]
- European Communities Water Policy Regulations[17].
- European Communities Environmental Objectives (Surface Water) Regulations[18].
- European Communities Environmental Objectives (Groundwater) Regulations[19].
- European Communities, Environmental Impact Assessment of Projects– Guidance on Scoping[20].
- EU Floods Directive[21].
- European Communities Assessment and Management of Flood Risks Regulations[22].
- River Basin Management Plan 2018-2021[23].
- EPA's Guidelines on the Information to be Contained in Environmental Impact Assessment Reports[5].
- IGI Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements[14].

8.3 Methodology

8.3.1 Study Area

The study area includes the Proposed Development, as well as groundwater and surface waters within a 2km radius.

8.3.2 Determination of the Baseline Environment

The baseline environment has been determined through review of the following sources:

- OSI historic mapping.
- OPW flood maps.
- GSI online mapping for groundwater wells and springs.
- The FRA which has been prepared for the Proposed Development site and is included as Appendix D. The baseline assessment has been used to identify sensitive receptors with respect to the Proposed Development.

8.3.3 Describing Potential Effects

A qualitative approach was used to determine the significance of impact as per the EPA's guidance[5] determination figure. It should be noted the control measures, as outlined in Chapter 2; Description of Proposed Development, have been considered embedded in the project design and their application has been assumed in determining the significance of the impact. Mitigation measures will be devised to address potential impacts.

[16] EU (2000), EU Water Framework Directive
[17] European Communities (2003) Water Policy Regulations
[18] European Communities (2009) Environmental Objectives (Surface Water) Regulations (as amended)
[19] European Communities (2010) Environmental Objectives (Groundwater) Regulations (as amended)
[20] European Communities (2011), Environmental Impact Assessment of Projects – Guidance on Scoping (as amended)
[21] EU (2007), EU Floods Directive
[22] European Communities (2010), Assessment and Management of Flood Risks Regulations
[23] DHPLG (2018), River Basin Management Plan 2018-2021.

8.4 Baseline Environment

8.4.1 Topography

A topographic survey of the Proposed Substation Development was undertaken by Apex Surveys in May 2021, and Civils three-dimensional (3D) surface of Proposed Substation Development was created to inform a description of levels. The 3D surface indicates the northern part of the Proposed Substation Development comprised of elevations up to 49m above ordnance datum (AOD), and the substation would be constructed on land comprising of elevations between 39m AOD and 44m AOD.

The topographic survey also revealed the presence of a ditch to the south of the Proposed Substation Development. The ditch comprises of levels between 29m AOD and 34m AOD and is the topographical low point within the development boundary. It is assumed the ditch forms part of the natural drainage system for the development, and the levels indicate flow in the ditch is conveyed southwards where the ditch discharges to the Broadmeadow River.

As the Proposed Substation Development will be located approximately 10m higher than the ditch, and flow in the ditch is conveyed southwards towards the Broadmeadow River, the substation is not considered to be at fluvial risk from flows in the ditch.

The topography of the Proposed Grid Connection ranges from approximately 40m AOD to the north to 80m AOD in the south.

8.4.2 Hydrology

8.4.2.1 Surface Water Features

Proposed Substation Development

The closest surface water feature recorded on EPA mapping is the Broadmeadow River, which flows from west to east, immediately to the south of the of the Proposed Development site. This enters the Irish Sea approximately 8km to the east of the Site. A minor ditch is present on the south of the Site, which flows into the Broadmeadow River.

The Proposed Substation Development lies within the Broadmeadow_030 River Sub Basin of the Broadmeadow_SC_010 sub catchment, as defined under the WFD.

Proposed Grid Connection

The Proposed Grid Connection traverses the following surface water features:

- Broadmeadow River (river water body code IE_EA_08B020700, segment code 08_0442).
- Rowlestown West (river water body code IE_EA_08B020700, segment code 08_631).
- Ward River (river water body code IE_EA_08W010300, segment code 08_644).
- Dunsoghly (river waterbody code IE_EA_08W010300, segment code 08_673).
- Huntstown 08 (river waterbody code IE_EA_08W010300, segment code 08_645).

The Broadmeadow River (IE_EA_08B020700) and Ward River (IE_EA_08W010300) are classified as having a 'Moderate' river waterbody WFD status (2016-2021) and is considered 'at risk' under the WFD.

The Proposed Grid Connection lies within the following sub catchments as defined by the WFD:

- Broadmeadow_010 River Sub Basin of the Broadmeadow_SC_030.
- Broadmeadow_010 River Sub Basin of the Ward_SC_030.
- Mayne_SC_010 River Sub Basin of the Santry_SC_010.
- Tolka_SC_020 River Sub Basin of the Tolka_SC_050.

8.4.3 Hydrogeology

8.4.3.1 Aquifer Classification

Proposed Substation Development

The Proposed Substation Development is underlain by a 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones', according to GSI mapping.

Proposed Grid Connection

The aquifer underlying the majority of the Proposed Grid Connection is classified as a ‘Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones’ with a “Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones” mapped within the central section of the Proposed Grid Connection.

8.4.3.2 Groundwater Vulnerability

Proposed Substation Development

Groundwater vulnerability beneath both the Proposed Substation Development ranges from low in the north to high in the south.

Proposed Grid Connection

Groundwater vulnerability along the Proposed Grid Connection ranges from low to extreme.

8.4.3.3 Groundwater Wells and Springs

Proposed Substation Development

A well is recorded approximately 700m northeast of the Proposed Substation Development. The use of well is unknown and the yield class is defined by the GSI as moderate.

Proposed Grid Connection

A number of wells are mapped within a 2km radius of the Proposed Grid Connection, these wells are summarised in Table 8-1.

Table 8-1 Groundwater Wells and Springs Within 2km of Proposed Grid Connection

Reference	Location	Use	Yield
2923NEW032	750m west	Unknown	Good (174.5m³/day)
2923NEW014	500m west	Agri & domestic use	Good (130.9m³/day)
2923NEW024	250m west	Unknown	Low
2923NEW023	250m west	Unknown	Low
2923NEW017	250m west	Unknown	Good (164m³/day)
2923NEW035	800m east	Unknown	Moderate (48.5m³/day)
2923NEW030	Within Proposed Grid Connection	Unknown	Unknown
2923NEW025 to 2923NEW031	50m west	Unknown	Moderate (83.8m³/day)

Source: GSI Spatial Resources (2023)

8.4.4 Flooding

A Stage 2 FRA was undertaken for the Proposed Development and concluded the following based on a review of available data:

- Flood zone mapping indicates the Proposed Development lies in Flood Zone C.
- The pluvial flood risk to the Proposed Development is considered to be low.
- The groundwater flood risk to the Proposed Development is considered to be low.
- The ground levels at the Proposed Substation Development are approximately 7m higher than the ordinary watercourse and flow is conveyed southwards towards the Broadmeadow River (away from the Site), consequently the Proposed Substation Development is not considered to be at fluvial risk from flows in the ditch. Therefore, the fluvial flood risk to the Proposed Substation Development is considered to be low.
- A Stage 3 Detailed FRA is not required.

8.5 Potential Impacts

8.5.1 Construction Phase

The main potential impacts associated with the construction of the Proposed Development include:

- Vegetation removal, site stripping and bulk earthworks as part of the construction would leave deposits exposed to erosion by wind or rain and this could potentially lead to increases in sediment loading of the surface water network.

- Contamination of surface water from suspended sediments may also be caused by runoff from material stockpiles, excavation dewatering and dirt from vehicles.
- Potential accidental spills/release of fuels, chemicals, concrete, drilling fluids and lime to ground.
- Excavation and removal of contaminated made ground has the potential to release contaminants via runoff to surface water bodies.
- Migration of pollutants associated with the HDD to enter the surface water environment as a result of a frack out.

8.5.2 Operational Phase

The potential adverse impacts during the operational phase, in the absence of adequate management and mitigation measures are as follows:

- Uncontained spillage of polluting materials stored on site, e.g., oil and lubricants for maintenance.
- Fuel/oil leaks from parked vehicles.
- Potential changes to groundwater recharge rates due to the introduction of hardstanding cover over previously unsealed ground.

8.6 Mitigation Measures

8.6.1 Construction Phase

8.6.1.1 Sedimentation (Suspended Solids)

The following mitigation measures would be implemented to reduce the potential for sedimentation during the construction phase:

- Instream works are not required at any watercourse crossing along the Proposed Grid Connection. There will be no tracking of machinery within watercourses.
- There will be no storage of material/equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse.
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary.
- Drainage channels and streams will be clearly identified on site and shown on method statements and site plans.
- During the construction activities there will be a requirement for diverting rainwater away from the construction areas, into nearby drainage channels and streams.
- Visual inspections of roads and wheel washing at site entry/exit points will be undertaken to prevent the accumulation of dirt.
- Excavations will only remain open for limited time periods to reduce groundwater and surface water ingress and water containing silt will be passed through a settlement tank or adequate filtration system prior to discharge. A discharge consent will be obtained as necessary for disposal of dewatering water and groundwater arising from pumping (if any) or such water may be disposed of as construction site run off where appropriate.
- Dewatering, where required, will incorporate the use of filter media. there will be no direct discharges into the watercourses.
- Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from drainage systems and retained drainage channels, away from areas subject to flooding.
- Runoff from spoil heaps will be prevented from entering watercourses by diverting it through onsite settlement ponds and removing material as soon as possible to designated storage areas.
- Silt traps will be placed across the works boundary in any areas adjacent to watercourses to avoid siltation of watercourses. These will be maintained and cleaned regularly throughout the construction phase. Attention will also be paid to preventing the build-up of dirt on road surfaces, caused by trucks and other plant entering and exiting the Proposed Development site.

8.6.1.2 Fuel and Chemical Handling/Accidental Release

The following mitigation measures would be implemented to reduce the potential for accidental spills and leaks during the construction phase:

- There will be no tracking of machinery within watercourses.
- There will be no storage of material/equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse.
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary.
- Designate a bunded storage area at the contractor’s compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total capacity of all the tanks within the bund, whichever is the greater.
- Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the Site plot, a suitably sized spill pallet will be used for containing any spillages during transit.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains.
- There will be no refuelling allowed within 100m of watercourse crossings.
- Where mobile fuel bowsers are used on the Site, in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and/or booms) shall be held onsite in order to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles.
- Any bentonite (or similar HDD drilling head lubrication material) will be handled and removed by the drilling contractor. Typically, bentonite is used, which comprises 95% water and 5% bentonite clay which is a non-toxic, natural substance. HDD will be a closed system, with drilling fluid recirculated, the drill cuttings recovered, and drilling fluid reused. Pneumatic leak testing shall be carried out to confirm the integrity of the return line.
- Spent drilling fluids including separated drill materials shall be contained in secure bunded areas for offsite disposal at a licensed disposal facility.

8.6.1.3 Control of Concrete and Lime

All ready-mixed concrete will be brought to site by truck. Wash down and washout of concrete transporting vehicles will take place at an appropriate designated area and direct discharge of wash water to surface waters will be strictly prohibited.

8.6.1.4 Management of Excavated Materials

Temporary storage of soil will be carefully managed in such a way as to prevent potential negative impact on the receiving environment and the soil material will be stored away from any surface water drains. It will be necessary to designate areas within the Site where stockpiles will be established in order to facilitate the efficient transfer of material within the Site. In order to minimise the potential environmental impact from stockpiles, it will be necessary to adopt the following mitigation measures:

- Store excavated topsoil for reuse in stockpiles less than 2m high to prevent damage to the soil structure. Other excavated materials of lower engineering quality can be stored in higher stockpiles.
- Segregate different grades of soil where they arise.
- Excavations in made ground will be monitored by an appropriately qualified person to ensure that any contaminated material is identified, segregated and disposed of appropriately. Any material from identified localised areas of contamination shall be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage.
- Minimise movements of materials within the stockpiles in order to reduce the degradation of the soil structure.

8.6.1.5 Migration of Drilling Fluids

The following mitigation measures would be implemented to reduce the potential for HDD drilling fluid migration during the construction phase:

- Detailed subsurface investigations will be carried out at the proposed HDD locations prior construction.
- The drilling fluid/bentonite will be non-toxic and naturally biodegradable.

- Limits will be placed on drilling fluid pressures in the annular space of the bore to prevent inadvertent drilling fluid returns to the ground surface and maintain bore stability.
- A minimum soil cover depth of 2m will be maintained under existing roads and watercourses.
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages.
- Drilling fluid returns will be contained within a sealed system to prevent migration from the works area.
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken offsite.

8.6.1.6 Construction Environmental Management Plan

An oCEMP[4] is included as part of this planning application. The oCEMP will be developed into a detailed CEMP and implemented by the appointed Contractor during the construction phase of the Proposed Development. This will set out relevant environmental avoidance or mitigation measures to reduce potential environmental impact. It will also include details of proposed environmental monitoring for the duration of the construction works, be this good practice or as a planning condition requirement.

8.6.2 Operational Phase

8.6.2.1 Accidental Spillage and Leaks

Owing to the proposed embedded mitigation (as outlined in Chapter 2), there will be no requirement for additional mitigation measures during the operational phase.

However, routine maintenance will be carried out in accordance with the maintenance procedures provided by the contractor and manufacturer. The Proposed Development will be required to undertake an annual inspection, as per the manufacturer's requirements.

High-risk areas requiring specialised containment such as the transformers and concrete aprons will be constructed to provide bunding, oil separation and flow controls to ensure the oil is contained and the downstream drainage does not become contaminated.

Interceptors will be present in the surface water drainage system, to protect surface waters from potential pollution from oil spills/leaks from parked cars and storage.

8.7 Residual Effects

There are no likely significant impacts on the water environment associated with the Proposed Development, assuming the mitigation measures outlined above are implemented during the construction and operational phases.

8.8 Cumulative Effects

Should the construction of the listed projects in Table 1-2 and the Proposed Development occur concurrently, there is potential for temporary indirect cumulative effects on hydrology and water quality. Potential emissions to soil and groundwater associated with the Proposed Development can be mitigated to the extent that the impact will not be significant. It is not unreasonable to assume that the listed projects in Table 1-2, will also implement standard and best practice mitigation measures to the extent that impacts are not significant. When the predicted effects of the Proposed Development are considered cumulatively with each planned project and cumulatively with all planned projects as a whole, it is concluded that there are no significant negative cumulative effects predicted on hydrology and water quality.

8.9 Summary

The potential water impacts arising from the Proposed Development have been considered with regards to the construction and operational phases.

Based on a review of available information, potential impacts to the groundwater and surface water environment from the construction and operational phases of the Proposed Development are not considered to be significant.

No cumulative effects from other developments are expected.

9. Air Quality

9.1 Introduction

This chapter assesses the potential air quality impacts associated with the Proposed Development.

The potential air quality impacts arising from the Proposed Development have been considered under the following scenarios:

- Construction phase dust impact.
- Construction phase road traffic impacts.

No significant sources of emissions to air are expected during the operational phase of the Proposed Development, with emissions limited to those associated with the maintenance vehicles. Therefore, operational air quality impacts have been scoped out of the assessment.

9.2 Legislation, Policy and Guidance

9.2.1 European and National Legislation

The Air Quality Standard Regulations 2011 implement the European Union Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (CAFE) and designate the EPA as the competent authority responsible for assessing ambient air quality in the territory of the State. They also establish Limit Values (LVs) and alert thresholds for concentrations of certain pollutants in ambient air, to prevent or reduce harmful effects on human health and the environment. LVs were published for seven pollutants, with alert thresholds for an additional five pollutants.

These LVs are legally binding and of the seven pollutants for which LVs have been set, national assessments have demonstrated that there is no risk of carbon monoxide (CO), 1,3-butadiene, benzene, lead and sulphur dioxide (SO_2) concentrations exceeding the limits due to emissions from traffic anywhere in Ireland and therefore not considered in this assessment. Volatile organic compounds (VOCs) as a group are similarly scoped out. There are no EULVs for volatile organic compounds (VOCs) as a group, and as discussed above, benzene and 1,3-butadiene, which are types of VOCs, are not at risk of exceedance.

The EULVs for the remaining pollutants are displayed in Table 9-1. These are nitrogen dioxide (NO_2) and particulate matter in the fractions of <10 µm (PM_{10}) and <2.5 µm ($PM^2{}_{.5}$) and are the pollutant most commonly associated with combustion emissions from vehicles and energy plant. Limit values are expressed in one of two ways: as annual mean concentrations which are not to be exceeded without exception, due to their chronic effects. or as shorter term (24-hour or one-hour) mean concentrations for which only a specified number of exceedances are permitted within a specified time frame, due to their acute effects.

Table 9-1 National Air Quality Standards

Pollutant	Averaging Period	Concentration (µg/m^3)	Permitted Exceedances
NO_2	Annual mean	40	None
	1-hour mean	200	Not to be exceeded more than 18 times a year
PM_{10}	Annual mean	40	None
	24-hour mean	50	Not to be exceeded more than 35 times a year
$PM^2{}_{.5}$	Annual Mean	25	None

Source: The Air Quality Standards Regulations 2011

An annual mean LV for nitrogen oxides (NOx) of 30µg/m^3 is set for the protection of vegetation. In addition, critical loads (CL) for nitrogen and acid deposition have been determined which represent (according to current knowledge) the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem. The purpose of these LVs and CLs is to protect habitats at designated sites for nature conservation. Upon review of maps available on the National Parks and Wildlife Service website[24], no such designated sites are

[24] https://www.npws.ie/protected-sites

located in the vicinity of the Proposed Development, and as such, no air quality impacts are possible. The impact of emission to air on designated nature conservation sites is not considered any further in this assessment.

There are no national or EU limits for dust deposition. however, the Technical Instructions on Air Quality Control (Technische Anleitung zur Reinhaltung der Luft (BMU))[25] provide a guideline for the rate of dust deposition of 350mg/m²/day averaged over one year. The EPA concurs that this guideline may be applied, although applied as a 30-day average[26].

9.2.2 National Planning Policy

Project Ireland 2040[27] is the Government's long-term overarching strategy for future development and infrastructure in Ireland. It consists of several documents, including the NPF, which is the Government's high-level strategic Plan for shaping the future growth and development of Ireland up to 2040.

The Framework includes the following overarching aim that is relevant to this assessment:

> *"Creating a Clean Environment for a Healthy Society:*
>
> *Promoting Cleaner Air: Addressing air quality problems in urban and rural areas through better planning and design."*

The Framework includes NPO 64, which stresses the importance of improving ambient air quality:

> *"National Policy Objective 64: Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions."*

9.2.3 Local Planning Policy

The Fingal Development Plan (FDP) 2023-2029[28] sets out FCC's proposed policies and objectives for development in the County over the Plan period. It includes the following objectives that relate to local air quality:

- Policy DAP7 – Align with Local Area Plan Objectives: Ensure that all development within the Dublin Airport Local Area Plan lands will comply with the following Objectives of the Dublin Airport Local Area Plan, 2020, or any subsequent plan or extension of same. These include. … Air Quality Objectives…"
- Policy IUP41 to "Continue to work proactively with the EPA to monitor and improve air quality in Fingal".
- Objective IUO59 to "Monitor, pro-actively manage and improve air quality in the County through integrated land use and spatial planning measures to avoid, mitigate and minimise unacceptable levels of air pollution in accordance with national and EU policy Directives on air quality and, where appropriate, promote compliance with established targets".
- Objective IUO59 to "Continue to work with the Dublin Local Authorities and relevant agencies in the collection of local air quality data through the EPA's air quality monitoring network, to maintain good air quality in the County".
- Objective IUO60, to "Implement the recommendations of the Dublin Regional Air Quality Management Plan (and any subsequent Plan) and to implement the relevant spatial planning recommendations and actions of the Dublin Agglomeration Environmental Noise Action Plan 2018–2023 or any superseding action plan".

9.2.4 Transport Infrastructure Ireland Guidance

Transport Infrastructure Ireland (TII – formerly the National Roads Authority) published guidance relating to the assessment of local air quality impacts for National Roads Proposed Developments in 2011[29]. Whilst not wholly relevant to the Proposed Development, it is the only guidance in Ireland to provide an approach to assessing air quality impacts not relating to environmental licencing. The TII Guidance, when published, incorporated

---

[25] Erste Allgemeine Verwaltungsvorschrift zum Bundes–Immissionsschutzgesetz (Technische Anleitung zur Reinhaltung der Luft – TA Luft) Vom 24. Juli 2002. https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Luft/taluft.pdf
[26] EPA (2006), Environmental Management in the Extraction Industry (non-scheduled minerals)
[27] Government of Ireland (2018), Project Ireland 2040 National Planning Framework. https://www.gov.ie/en/campaigns/09022006-project-ireland-2040/
[28] FCC (2023), Fingal Development Plan 2023-209
[29] TII (formerly the NRA) (2011), Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. https://www.tii.ie/technical-services/environment/planning/Guidelines-for-the-Treatment-of-Air-Quality-during-the-Planning-and-Construction-of-National-Road-Schemes.pdf

contemporary guidance from other organisations, including that published by Highways England (HE) and Environmental Protection UK (EPUK).

9.2.5 Institute of Air Quality Management Guidance

The Institute of Air Quality Management (IAQM) published guidance on the assessment of dust from demolition and construction in 2014[30]. The guidance provides a means by which the risk of dust impacts from construction activities can be estimated to determine the level of mitigation required.

9.3 Methodology

9.3.1 Construction Dust

During the construction phase, there is the potential for works to generate dust and finer particle emissions caused by the disturbance of soil, the handling and storage of soil and construction materials, abrasive construction activities and the movement of construction vehicles on and off site. There is also the potential for site plant (including non-road mobile machinery) and construction vehicle movements to increase emissions of pollutants associated with diesel fuel combustion (namely, oxides of nitrogen, including nitrogen dioxide, and particulate matter (PM_{10} and $PM^{2}{}_{.5}$)).

Due the scale of the construction works proposed, the number of site plant and construction-related vehicles, and associated emissions, is considered to be too low to contribute to a potential significant effect. Emissions associated with these sources will be delt with in the assessment in a qualitative manner.

The occurrence and significance of dust and finer particulates generated by construction activities on site depositing beyond the Site boundary is difficult to estimate and depends upon the weather conditions, ground conditions and location of the work relative to receptors, the timing and the nature of the actual activity being carried out. Dust emissions and subsequent deposition and soiling at sensitive locations have the potential to harm the amenity of the users of that sensitive land use and or harm vegetation by affecting the rate of photosynthesis. Particulate emissions at sensitive locations are associated with increased risk of harm to human health.

The IAQM provides guidance for good practice qualitative assessment of risk of dust emissions from construction and demolition activities. The guidance considers the risk of dust emissions from unmitigated activities to cause human health (PM_{10}) impacts, dust soiling impacts, and ecological impacts. The appraisal of risk is based on the scale and nature of activities and on the sensitivity of receptors, and the outcome of the appraisal is used to determine the level of good practice mitigation required for adequate control of dust.

The steps the IAQM construction dust methodology are set out below:

- Identify receptors within the IAQM screening distance of the construction site boundary.
- Identify the magnitude of impact through consideration of the scale, duration and location of activities being carried out (including demolition (if any), earthworks, construction and trackout – where construction vehicles carry mud from site onto the public highway).
- Establish the sensitivity of the area through determination of the individual sensitivity and number of receptors and their distance from construction activities.
- Determine the risk of significant impacts on receptors occurring as a result of the magnitude of impact and the sensitivity of the area, assuming no additional mitigation (beyond the identified development design and impact avoidance measures) is applied.
- Determine the level of additional best practice mitigation required based on the level of risk, to reduce potential impacts at receptors to not significant or negligible.
- Summarise the potential residual effects of the mitigated works.

A detailed description of the IAQM construction dust assessment methodology is provided in Appendix E.

For amenity effects from dust and particulates associated with construction activities, the aim of the guidance document referred to is to bring forward a Proposed Development, including additional mitigation measures where necessary, that would control impacts so that they give rise to negligible or minor effects (at worst) at the closest sensitive receptors. Determination of whether an effect is likely to be significant or not is based on professional judgement (from experience of similar projects), taking account of whether effects are permanent or temporary, direct or indirect, constant or intermittent and whether any secondary effects are caused (in this instance,

[30] Holman *et al*. (2014), IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf.

secondary effects refer to dust that is generated and deposited (primary impact) and then re-suspended and deposited again by further activity).

The classification of amenity impacts (from dust soiling) and health effects on receptors exposed to impacts has been assessed using the relationship between the magnitudes of effects identified, in combination with receptor sensitivity and other related factors where appropriate (as described in the relevant guidance[31]), which results in a classification of effects as defined in Table 9-2.

Table 9-2 Selected Sensitive Receptors

Magnitude of Effect1	Change in dust deposition and short term PM10 Concentrations	Significance of Effects
High	Dust impact is likely to be intolerable for any more than a very brief period of time and is very likely to cause complaints from local people. Increase in PM_{10} concentrations at a location where concentrations are already elevated and to the extent that the short term PM_{10} air quality objective is likely to be exceeded.	Significant to Profound: A significant Impact that is likely to be a material consideration in its own right.
Medium	Dust impact is likely to cause annoyance and might cause complaints but can be tolerated if prior warning and explanation has been given. Increase in PM_{10} concentrations at a location where concentrations are already elevated and to the extent that the short term PM_{10} air quality objective is at risk of being exceeded.	Moderate: A significant effect that may be a material consideration in combination with other significant impacts but is unlikely to be a material consideration in its own right.
Low	Dust impact may be perceptible, but of a magnitude or frequency that is unlikely to cause annoyance to a reasonable person or to cause complaints. Limited increase in PM_{10} concentrations.	Not significant to Slight: An impact that is not significant but that may be of local concern.
Negligible	Dust impact is unlikely to be noticed by and/or have an effect on sensitive receptors. Negligible increase in PM_{10} concentrations.	Imperceptible: An impact that is not significant.

In terms of the significance of the effects (consequences) of any adverse impacts, an effect is reported as being either significant or not. If the overall effect of the Proposed Development on local air quality or on amenity is found to be 'Moderate' (where a large proportion of sensitive receptors are affected and/or there is risk of air quality standards and environmental assessment levels being exceeded) or 'Significant' to 'Profound', this is deemed to be significant for assessment purposes. Effects found to be 'Moderate' (where limited sensitive receptors are affected and there is no risk of exceedance of an air quality standard or environmental assessment level) to 'Imperceptible' are not considered to be significant.

9.3.2 Construction Traffic

The incomplete combustion of fuel in vehicle engines results in the presence of a variety of pollutants including hydrocarbons, such as benzene, 1,3-butadiene, SO_2 and carbon monoxide (CO) in the exhaust emissions. However, it is the emission of NO_X, mainly in the form of nitric oxide (NO), which is then converted to NO_2 in the atmosphere, and particulate matter (PM_{10} and $PM^2{}_{.5}$) in exhaust emissions, which are the main pollutants of concern, due to their association with adverse effects on human health. Although SO_2, CO, benzene and 1,3-butadiene are present in motor vehicle exhaust emissions, detailed consideration of the associated impacts on local air quality is not considered relevant in the context of the Proposed Development. This is because the concentrations of release and the number of vehicles involved are not likely to give rise to significant effects. In particular, no areas within the vicinity of the study area are considered to be at risk of exceeding the relevant objectives for these species (pollutants), and the risks to achievement of the relevant air quality objectives from the Proposed Development considered negligible.

Construction of the Proposed Development is anticipated to generate additional traffic movements on the local road network, with vehicles accessing the stie via the R122, R125, L7231 and L7325 which are regional and local roads linking small towns and villages.

Construction of the Site is anticipated to take 24 months and during that time, additional traffic movements are expected to peak at 80 vehicles per day, with 30 of those movements being HGV.

TII guidance states that an assessment of construction phase traffic emissions impacts is required on roads where construction traffic generates a 10% change in 24-hour Annual Average Daily Traffic (AADT) flow from future baseline flows. The TII guidance was published to consider air quality impacts associated with major infrastructure Proposed Developments where base traffic flows are likely to be in the tens-of-thousands, and construction traffic of 10% or more has the potential to cause a significant impact. It is not intended to consider such impacts on roads where base traffic flows are likely to be considerably less than that.

Alternative guidance, published by the IAQM[31], suggests that a detailed assessment of air quality emissions impacts from traffic is only likely required where 24-hour AADT increases by 100 HGV movements or more. Where traffic is not anticipated increase to that extent, a detailed assessment is not required.

In this instance, due to the nature of the roads in the study area and the low baseline flows anticipated, the likely good standard of air quality and the number of additional HGV movements being less than 100 per day, it is considered that a detailed assessment of air quality impacts is not required and the impact of the Proposed Development not significant.

9.3.3 Study Area

The study area for construction dust assessment impacts is defined within the IAQM guidance[31] referred to in the assessment and includes all dust sensitive receptors (such as residential properties, commercial properties, areas of amenity and designated ecological sites) within 350m of the Proposed Development (Proposed Substation Development and Proposed Grid Connection) and those located within 50m of the construction site boundary and/or within 50m of a public road used by construction traffic that is within 500m of the Site entrance.

9.3.4 Determination of the Baseline Environment

To inform the air quality assessment background information has been obtained from the following sources:

- EPA Air Quality in Ireland Report[32].
- EPA air quality monitoring data[33].

The state of the baseline environment has been determined through the gathering of data from secondary sources. Secondary sources include a review of pollutant monitoring data undertaken by the EPA, under the requirements of the Air Quality Standards Regulations.

9.3.5 Determination of Sensitive Receptors

For impacts associated with harm to amenity, including those associated with dust deposition and soiling, the type and sensitivity of receptors is determined by the level of amenity associated with the land use and the typical duration of exposure. For impacts associated with harm to health, such as an increase in exposure to PM_{10}, the sensitivity of receptors has already been determined through the implementation of the air quality standards, which have been set below the level of concentration in which the most vulnerable members of society are likely to be affected. The sensitive receptors considered in this assessment are summarised in Table 9-3.

Table 9-3 Sensitive Receptors

Receptor ID	X	Y	Description	Distance and Orientation from the Site
R1	312392	250638	Residential properties off Céide Bhaile an Rólaigh	230m E
R2	312501	250259	Residential properties at Farm off the R125	250m SE
R3	311478	250482	Residential property at Farm off R122	250m W
R4	n/a	n/a	Agricultural land	<5m all directions
R5	n/a	n/a	Residential properties along the Proposed Grid Connection	<10m all directions

9.3.6 Describing Potential Effects

The description of potential effects associated with dust and particulate emissions has been undertaken in line with the IAQM guidance[31] on assessing the impact of dust from construction and demolition (Holman *et al.*, 2014). As the duration of the Proposed Development covers multiple years and because the nature of the project requires large scale earthworks and a large frequency of HGV movements, the assessment has also referred to sections of the guidance on assessing the impact of dust from mineral sites.

According to the IAQM, the main effects (referred to in the guidance as “impacts”) that may arise due activities like those carried out for the Proposed Development are:

[31] IAQM (2023), Guidance on the Assessment of Dust From Demolition and Construction
[32] EPA (2020), Air Quality in Ireland 2019.
[33] https://airquality.ie/

- Dust deposition, resulting in the soiling of surfaces.
- Visible dust plumes, which are evidence of dust emissions.
- Elevated PM_{10} concentrations resultant of dust generating activities onsite.

Activities carried out onsite for the Proposed Development are classified into the following categories for the purpose of assessment:

- Earthworks.
- Onsite vehicle movements.
- Offsite vehicle movements.

Onsite plant emissions, such as those associated with combustion from generators and Non-Road Mobile Machinery (NRMM), have the potential to increase public exposure to airborne concentrations of NO_2, PM_{10} and $PM^{2}_{.5}$, at locations close to onsite emission sources. However, the guidance states that:

> *"Experience of assessing the exhaust emissions from onsite plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed".*

Emissions from site plant for energy generation purposes will be limited. The Site will maintain and utilise the existing high and low voltage power supply that currently exists.

Emissions from site plant and NRMM associated with the Proposed Development will be controlled via the application of the NRMM standards and through best practice mitigation measures presented in the oCEMP[4] for the Proposed Development. The number of site plant in operation at any one time will be limited, due to the phased nature of the works. However, there could be a number of NRMM operating in unison at any one time. The effect from such emission would also be restricted by the limited number of sensitive receptors in close proximity to the actual working areas, as well as the fact that such emissions will be temporary and intermittent in nature. NRMM will operate on an as and when required basis, at times during the proposed working hours.

In light of this, it is considered unlikely that emissions from site plant and NRMM could contribute to a significant impact on local air quality.

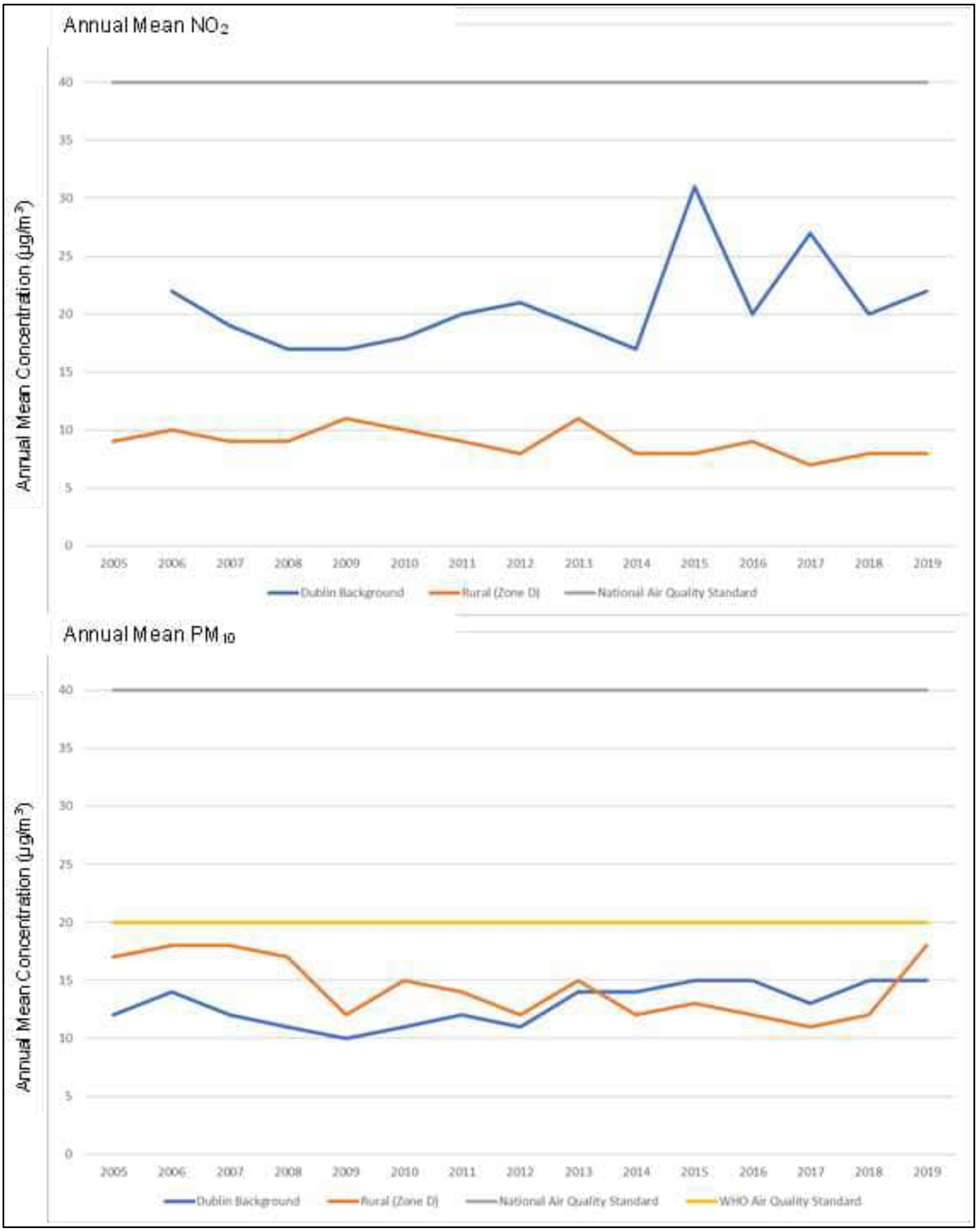
9.4 Baseline Environment

Due to the rural nature of the study area, there is limited air quality monitoring data in the vicinity of the Proposed Development. In the absence of local data, a review of representative data has been undertaken with reference to monitoring data gathered by the EPA at background locations in the Dublin area and rural locations across Ireland. Actual background concentrations at the Proposed Development site are likely to be between the two sets of data provided, with the Site being in a rural location within the Greater Dublin Area. Figure 9-1 provides a summary of background pollutant data gathered in these areas over a number of years up to 2019. Reference to monitoring data beyond 2019 is not provided due to the effect of the Covid-19 pandemic on air quality levels.

Figure 9-1 suggests that background annual mean NO_2 concentrations in the area are likely to be around 15µg/m^3 and background annual mean PM_{10} concentrations are likely to be around 17µg/m^3.

There is no dust deposition data to report for the study area or the wider region. Baseline dust deposition is likely to be typical of much of rural Ireland, with short-term episodes associated with farming activity on nearby farmland.

Figure 9-1 Background Air Quality Data



9.5 Potential Impacts

9.5.1 Construction Phase

As described in Section 9.3, the construction dust and particulate matter assessment follows the step-by-step approach.

9.5.1.1 Identify Receptors within the Screening Distance of the Site Boundary

Step 1 of the IAQM construction dust guidance is to screen the requirement for a more detailed assessment. According to the guidance, no further assessment is required if there are no receptors within a certain distance of the works. The screening distances set by the IAQM guidance are:

- Receptors sensitive to amenity and human health impacts within 350m of the construction site boundary and/or within 50m of a public road used by construction traffic that is within 500m of the Site entrance.
- Nature conservation receptors located within 50m of the construction site boundary and/or within 50m of a public road used by construction traffic that is within 500m of the Site entrance.

There are a limited number of high sensitivity amenity and human health sensitive receptors within 350m of the Proposed Substation Development site boundary which include the residential dwellings 300m west, 300m east, 400m north and 500m south of the Proposed Substation Development. There is low sensitivity farmland adjacent to the Site in all directions. There are no designated sites for nature conservation within the area covered by the screening distances.

The majority of the Proposed Grid Connection is located within the public road with dispersed residential and commercial properties within 350m of the Proposed Grid Connection increasing in density to the south of the connection.

Due to the presence of the high sensitivity amenity and human health sensitive receptors within the screening distances set by the guidance, the more detailed assessment is required and is set out below.

9.5.1.2 Identify the Magnitude of Effects

Step 2A requires the determination of the dust emission magnitude, which the guidance states is based on the scale of the anticipated works with the following activities: demolition. earthworks. construction (i.e., the building and erection of structures) trackout (the deposition of dust and particulate matter onto public roads by construction vehicles), and should be classified as Small, Medium, or Large. In this instance, the construction works will only be concerned with earthworks. construction and trackout. No demolition work is proposed. A description of the construction works is provided in Section 2.2.

Earthworks

The Proposed Substation Development is anticipated to require earthworks associated with soil-stripping, ground levelling and excavation works. For the purpose of this assessment, the area of earthworks is estimated to be in the order of 10,000m² and will require the handling of a large mass of materials and multiple earth-moving vehicles. of material. As such, the dust emissions magnitude of effect for earthworks is Large.

The Proposed Grid Connection is anticipated to require earthworks associated excavation works for the underground cabling. For the purpose of this assessment, the area of earthworks is also estimated to be in the order of 10,000m². As such, the dust emissions magnitude of effect for earthworks is Large.

Construction

Potentially dusty materials that may be in use during construction works are concrete (if delivered dry), sand and hard core, which will be stored and handled at the Site throughout construction. Other construction materials are likely to be prefabricated with little dust emissions potential. For the purpose of this assessment, the volume of construction work is considered to be between 50,000 m^3 and 100,000m^3 and require the storage and handling of potentially dusty material. As such, the dust emissions magnitude of effect for construction is Medium.

Trackout

Construction of the site is anticipated to take 24 months additional traffic movements are expected to peak at 80 vehicles per day, with 30 of those movements being HGV. There is also anticipated to be periods when onsite haul routes are not surfaced, particularly during the earlier phases of construction. As such, the dust emissions magnitude of effect for trackout is Medium.

9.5.1.3 Establish the Sensitivity of the Area

Step 2B of the IAQM construction dust guidance requires the determination of the sensitivity of the area to construction dust impacts. According to the guidance, this is based on the sensitivity of individual receptors, the proximity and number of those receptors, background PM_{10} concentrations and site-specific factors, such as local terrain, meteorology and natural and existing windbreaks.

In this instance, there are a number of High sensitivity amenity and human health receptors between 100m and 350m of both the Proposed Substation Development and the Proposed Grid Connection, there is also a large area of Low sensitivity within 20m of the Proposed Development boundary. This equates to an area of Low sensitivity for dust soiling amenity impacts. Background PM_{10} concentrations are estimated to be around 17μg/m^3 and this, coupled with the limited number of receptors and their proximity to the construction site, means that the sensitivity of the area to health impacts is also Low.

9.5.1.4 Determine the Risk of Significant Effects

Step 2C of the IAQM construction guidance then concerns the determination of the risk of dust impacts, which is informed by the dust emission magnitude identified in Step 2A and the sensitivity of the area identified in Step 2B.

For dust soiling amenity and human health impacts, the large dust emission magnitude identified for earthworks and trackout equate to a low risk of dust impacts during those activities. The Medium dust emission magnitude identified for construction works also equates to a low risk of dust impacts.

9.5.2 Operational Phase

No significant sources of emissions to air are expected during the operational phase of the Proposed Development, with emissions limited to those associated with the maintenance vehicles. Therefore, operational air quality impacts have been scoped out of the assessment.

9.6 Mitigation Measures

9.6.1 Construction Phase

9.6.1.1 Site Specific Mitigation

Step 3 of the IAQM construction dust guidance[31] then uses the risk of dust impacts identified in Step 2C to compile an appropriate list of dust mitigation to offset that risk and ensure that a significant effect does not occur. The guidance relevant to the construction dust assessment lists measures that should be applied, if practical, relative to the risk identified.

In this instance, a Low risk of dust impacts was identified due the potential dust emission magnitude and the sensitivity of the area. Therefore, the list of IAQM recommended mitigation measures provided below is proportionate to the risk identified.

An oCEMP[4] is included as part of this planning application. The oCEMP will be developed into a detailed CEMP and the mitigation measures will be implemented by the appointed Contractor during the construction phase of the Proposed Development.

IAQM recommended dust (and particulate matter) mitigation measures for Low-risk sites are as follows:

- Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP).
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either onsite or offsite, and the action taken to resolve the situation in the logbook.
- Undertake daily onsite and offsite inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues onsite when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens/barriers or enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period.
- Fully enclose site or specific operations where there is a high potential for dust production and the Site is actives for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.

- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used onsite cover as described below.
- Cover, seed or fence long-term stockpiles to prevent wind whipping.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost maximum-speed-limits on surfaced and unsurfaced haul roads and work areas.
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression technique.
- Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment if it is fitted.
- Ensure equipment is readily available onsite to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Avoid bonfires and burning of waste materials.
- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable). Ensuring that there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever site size and layout permits.

9.6.2 Operational Phase

Whilst operational air quality impacts have been scoped out of the assessment, it is considered good practice to reduce emissions to air as far as reasonably practical. Where practicality allows, operational emissions could potential be reduced by typical Green Travel Plan mitigation measures, including the use of high emission standard vehicles and incentives to reduce single car occupancy use.

9.7 Residual Effects

Step 4 of the IAQM construction dust guidance[31] is to determine whether not the effects after the application of the identified level of mitigation are significant or not. The guidance states that:

> *"For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'".*

Therefore, providing a sufficient level of dust mitigation is implemented on site throughout the works, with reference to those recommended by the IAQM, which are considered standard practice on all well managed construction sites, it Is considered that the residual effects from the Proposed Development are not significant.

9.8 Cumulative Effects

Should the construction of the listed projects in Table 1-2 and the Proposed Development occur concurrently, there is potential for cumulative dust emissions during construction. Cumulative air quality impacts associated with the listed projects are not envisaged due to the low volume of construction required and the use of materials with a low dust generation potential. No significant sources of emissions to air are expected during the operational phase of the Proposed Development, with emissions limited to those associated with the maintenance vehicles. Thus, there is no potential for any significant negative direct nor indirect cumulative impacts to arise from the Proposed Development in combination with the listed projects.

9.9 Summary

The assessment has considered the potential for impacts associated with the following sources:

- Construction phase dust emissions.
- Construction phase road traffic emissions.
- Construction phase NRMM and site plant emissions.

No significant sources of emissions to air are expected during the operational phase of the Proposed Development, with emissions limited to those associated with the maintenance vehicles. Therefore, operational air quality impacts have been scoped out of the assessment.

Due to the limited number of emissions sources and good standard of existing air quality, emissions to air associated with road traffic emissions during construction and operation, and NRMM and site plant emissions during construction, have been screened out of detailed assessment and the impact of those emissions is not significant.

A detailed assessment of construction phase dust impacts has been undertaken and has identified the risk of dust impacts occurring, based on the potential for dust emissions magnitude of construction activities and the sensitivity of the study area to dust impacts. In line with industry standard guidance, the assessment has identified the level of mitigation required to ensure that any impact is not significant. Providing that the mitigation measures are implemented throughout the construction works, which are standard practice on all well managed construction sites, the impact of the Proposed Development is not considered to be significant.

No cumulative effects from other developments are expected.

10. Climate

10.1 Introduction

This chapter assesses the potential climate impacts associated with the Proposed Development.

The following potential climate impacts arising from the Proposed Development have been considered:

- Lifecycle greenhouse gas (GHG) impact assessment – an assessment of the likely effect of GHG emissions arising from the Proposed Development on the climate during the lifecycle stages.
- Climate change resilience (CCR) review – the resilience of the Proposed Development to projected climate change impacts.

A transformational shift toward climate resilient and sustainable developments is required by United nations (UN) Agenda 2030[34] and the Paris Agreement[35]. The Irish government has made commitments to tackle climate change and supports the adoption of a net zero target by 2050 at EU level. The Climate Action and Low Carbon Development (Amendment) Bill[36] puts in place plans to transition to a climate resilient and climate neutral economy by no later than the end of the year 2050. The management of impacts on climate and the effects of climate change on projects offers an opportunity to improve the resilience of a Proposed Development to future climate conditions and reduce the potential impacts of a Proposed Development on climate by minimising GHG emissions as far as possible.

10.2 Legislation, Policy and Guidance

This section describes the legislation, policy, and guidance of relevance to the assessment of potential climate impacts associated with the Proposed Development, considered on an international, national, and local level.

10.2.1 International Legislation

Kyoto Protocol[37]: An international agreement which commits its Parties by setting internationally binding emission reduction targets. Ireland is a Party to the Kyoto Protocol and its emission reductions targets are now binding. Under Article 4 of the Kyoto Protocol, the EU created an Effort Sharing Regulation that requires the setting of individual binding GHG emission reduction targets for each of its Member States. The current Effort Sharing Decision (ESD) commits Ireland to a 39% reduction in GHG emissions for the period 2021 to 2030 (Department of Communications, Climate Action & Environment, 2019).

UN Paris Agreement[35]: A legally binding agreement within the UN framework convention on climate change which requires all signatories to strengthen their climate change mitigation efforts to keep global warming to below 2°C this century.

10.2.2 National Policy

Climate Action and Low Carbon Development (Amendment) Bill[36]. The Irish Government published the 'Climate Action and Low Carbon Development National Policy Position' in April 2014, committing Ireland to an 80% reduction in carbon emissions in the energy sector compared to 1990 levels by 2050. However, a more ambitious target has now been committed to in law which establishes a 2050 net zero emissions target, compared to 1990 levels, and introduces a system of successive 5-year carbon budgets starting in 2021.

National Energy and Climate Plan 2021-2030[38] sets out Ireland's objectives regarding the five EU energy dimensions together with planned policies and measures to ensure that these objectives are achieved (Government of Ireland, 2020).

Climate Action Plan 2023[39] sets out Irelands intention to meet a 51% reduction in its GHG emissions by 2030 and to achieve net-zero emissions no later than 2050.

[34] UN Department of Economic and Social Affairs (2015), Transforming Our World: The 2030 Agenda for Sustainable Development
[35] UN Framework Convention on Climate Change (2016), The Paris Agreement
[36] Government of Ireland (2021), Climate Action and Low Carbon Development (Amendment) Bill
[37] UN Framework Convention on Climate Change (1997), Kyoto Protocol
[38] Government of Ireland (2020), Ireland's National Energy and Climate Plan 2021-2030
[39] Government of Ireland (2022), Climate Action Plan 2023

Project Ireland 2040: National Planning Framework (NPF)[40] The NPF highlights the importance of reducing GHG emissions to accelerate action on climate change, adopting principles of the circular economy and managing waste in a more sustainable manner.

10.2.3 Local Guidance

Regional Planning Guidelines for the Greater Dublin Area 2010-2022[41] aim to create an integrated policy approach in order to enable the creation of sustainable regions with the capability to be resilient to future climate change.

Fingal County Climate Action Plan 2019-2024[42] details actions to support Fingal adapt to and mitigate against climate change. Targets include reducing CO2 emissions by at least 40% by 2030 and ensuring that the county can continue to run effectively during more extreme weather.

10.2.4 Assessment Guidance

PAS 2080 Carbon Management in Infrastructure[43] is a global standard for managing infrastructure carbon.

The **Greenhouse Gas Protocol**[44] provides standards and guidance for companies and other types of organisations in preparing a GHG inventory.

The **International Organization for Standardization** (ISO) 14064-1:2019 and 14064-2:2019[45] provides specifications for organisational-level and project-level guidance for the quantification and reporting of GHG emissions and removals.

The Inventory of Carbon and Energy (ICE) Database[46] is the world's leading source of embodied energy and carbon data. This database has been used to source appropriate carbon factors to estimate the embodied carbon of materials used for demolition and remediation works of the Proposed Development.

GHG Reporting Conversion Factors[47]: UK government annually publish 'GHG Conversion Factors for Company Reporting'. These will be used as a proxy where Sustainable Energy Authority of Ireland (SEAI) emissions factors are not available, to quantify GHG emissions to convert the activity data into emissions.

Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance[50]. While we are not undertaking an EIA, this is the most appropriate guidance for this assessment. It provides a framework for the consideration of GHG emissions in the EIA process, in line with the EIA Directive. The guidance sets out how to:[50]

- Identify the GHG emissions baseline in terms of GHG current and future emissions.
- Identify key contributing GHG sources and establish the scope and methodology of the assessment.
- Assess the impact of potential GHG emissions and evaluate their significance.
- Consider mitigation in accordance with the hierarchy for managing project related GHG emissions (avoid, reduce, substitute, and compensate)

IEMA Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation[48]: provides a framework for effective consideration of CCR and adaptation in the EIA process.

Guidance for the Calculation of Land Carbon Stocks[49]: These Guidelines provide a calculation methodology for calculating carbon stocks from land use.

[40] Government of Ireland (2019), Project Ireland 2040, National Planning Framework
[41] Eastern and Midlands Regional Assembly (2010), Regional Planning Guidelines for the Greater Dublin Area 2010-2022
[42] FCC (2019), Climate Change Action Plan (2019-2024)
[43] Carbon Trust (2016), PAS 2080 Carbon Management in Infrastructure
[44] World Resources Institute (2004), Greenhouse Gas Protocol
[45] ISO (2019), GHG Emissions Verification
[46] Bath University (2019), The Inventory of Carbon and Energy (ICE) Database (Version 3) and the Cement, Mortar and Concrete Model (Version 1)
[47] UK Government (2022), Greenhouse Gas Reporting: Conversion Factors 2022
[48] IEMA (2020), Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation
[49] EC (2010) Guidance for the Calculations of Land Carbon Stocks

10.3 Methodology

10.3.1 Lifecycle GHG Impact Assessment

10.3.1.1 Determining the GHG Baseline Environment

The GHG assessment study area considers direct GHG emissions arising from activities within the Proposed Development site boundary and indirect emissions from activities outside the Proposed Development site boundary (for example, the transportation of materials to the Proposed Development site and embodied carbon within construction materials). The baseline is a Do Minimum scenario whereby the Proposed Development does not go ahead, using forecast GHG emissions and GHG reduction targets for Ireland.

10.3.1.2 Determining Sensitive Receptors

The IEMA guidance states that all GHG emissions contribute to global climate change. The identified receptor for GHG emissions is the global climate. As the effects of GHGs are not geographically constrained, all GHG emissions have the potential to result in a cumulative impact in the atmosphere.

10.3.1.3 Determining Potential Effects

The lifecycle approach considers emissions from different lifecycle stages of the Proposed Development as a whole including land clearance, construction products and fuel use, worker transport, waste transportation and disposal, operational energy use, and maintenance.

Where activity data have allowed, expected GHG emissions arising from activities, and embodied carbon in materials of the Proposed Development, have been quantified using a calculation-based methodology as per the following equation:

Activity data x GHG emissions factor = GHG emissions value

In line with the GHG Protocol, when defining potential impacts (or 'hot spots'), the seven Kyoto Protocol GHGs have been considered, specifically:

- Carbon dioxide (CO_2).
- Methane (CH_4).
- Nitrous oxide (N_2O).
- Sulphur hexafluoride (SF_6).
- Hydrofluorocarbons (HFCs).
- Perfluorocarbons (PFCs).
- Nitrogen trifluoride (NF_3).

These GHGs are broadly referred to in this chapter under an encompassing definition of 'GHG emissions', with the unit of tCO_2e (tonnes CO_2 equivalent).

SEAI emission factors will be used to calculate emissions where available. Where SEAI emissions factors are not available, UK Government 2021 emissions factors will be used. Land use change has been calculated according to the methodology and factors set out in the EU Commission's guidelines for the calculation of land carbon stocks. Where data is not available, a mix of assumptions, industry benchmarks and a qualitative approach to addressing GHG impacts will be followed, in line with IEMA guidance.

Table 10-1 summarises the key anticipated GHG emissions sources associated with the Proposed Development.

Table 10-1 GHG-emitting Activities

Lifecycle stage	Activity	Primary emission sources
Construction stage	Land clearance.	Loss of carbon sink.
	Materials	Embodied GHG emissions.
	Onsite construction activity. Transport of construction workers.	Energy (electricity, fuel, etc.) consumption from plant, vehicles and generators on site. GHG emissions from fuel consumption for transportation of construction workers.
	Disposal and transportation of construction waste.	GHG emissions from energy use and from fuel consumption for transportation of waste.

Lifecycle stage	Activity	Primary emission sources
	Provision and treatment of water.	GHG emissions from the supply of potable water, and the disposal and treatment of wastewater.
Operational stage (operational use)	Operational energy consumption	GHG emissions from electricity consumption e.g., power for lighting.
	Worker transportation	GHG emissions from fuel consumption for transportation of workers.
	Maintenance	Embodied carbon associated with replacement materials and any maintenance equipment.

10.3.1.4 Significance of Effect

All GHG emissions are classed as being capable of being significant on the basis that all emissions contribute to climate change[50]. The global climate has been identified as the receptor for the purposes of the GHG assessment. The sensitivity of the climate to GHG emissions is considered to be 'high'. The rationale supporting this includes:

- GHG emission impacts could compromise the Ireland's ability to reduce its GHG emissions, in line with international and national future carbon targets.
- The need to reduce GHG emissions to reduce the risks and impacts of climate change, as broadly identified by the climate science community and by the Paris Agreement which aims to keep global temperature rise this century below two degrees above pre-industrial levels. Additionally, the Intergovernmental Panel on Climate Change[51] highlight the importance of limiting global warming below 1.5°C.
- A disruption to global climate is already having diverse and wide-ranging impacts to the environment, society, economic and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.
- The IEMA guidance states that all GHG emissions have the potential to be significant and as such there is no defined threshold or significance criteria published. Therefore, it is considered good practice to contextualise emissions against pre-determined carbon budgets to understand the magnitude of the impact. In the absence of relevant Irish carbon budgets, the national GHG Inventory and carbon reduction targets can be used to contextualise the level of significance.

PAS 2050 Specification[52] allows emissions sources of <1% contribution to be excluded from emission inventories, and these inventories to still be considered complete for verification purposes. This exclusion of emission sources that are <1% of a given emissions inventory is on the basis of a '*de minimis*' (relatively minimal) contribution. On this basis, where GHG emissions from the Proposed Development are equal to or more than 1% of the most recent Irish GHG inventory, the impact of the Proposed Development on the climate is considered to be of major adverse significance. This is summarised in Table 10-2. As published by the EPA, the total Irish emissions in 2019 have been estimated to be 59,777.6 kt CO_2e (59.8 Mt CO_2e).

Table 10-2 Magnitude Criteria for GHG Emissions

Magnitude of the Effects	Magnitude Criteria Description	Sensitivity of Receptor
High	Estimated GHG emissions equate to equal to or more than 1% of the estimated Irish GHG Inventory in the year which they arise	Major adverse significance
Low	Estimated GHG emissions equates to less than 1% of the estimated Irish GHG Inventory in the year that they arise	Minor adverse significance

10.3.2 Climate Change Resilience Review

10.3.2.1 Determining the CCR Baseline Environment

The 'current baseline' for the CCR assessment is the historic climate in the location of the Proposed Development. Historic climate data from Met Eireann recorded at Dublin Airport Meteorological Station (the closest station to the

[50] IEMA (2017), Assessing Greenhouse Gas Emissions and Evaluating their Significance.
[51] Intergovernmental Panel on Climate Change (2018)
[52] Carbon Trust (2011), PAS 2050 – Specification for the Assessment of the Lifecycle Greenhouse Gas Emissions of Goods and Services

Proposed Development for which sufficient historic data is available, approximately 8.5km southeast from the Site) for the period of 1981-2000 has been used to determine the 'current baseline', in line with the baseline period for the climate change projections used for the 'future baseline' scenario.

An EPA report[53] on the regional climate model projections for Ireland, presenting climate change projections for mid-century (2041-2060) against a baseline period of 1981-2000, has been used to determine the 'future baseline' scenario. These climate change projections have been used to identify chronic and acute climate hazards that may affect the location of the Proposed Development, such as increased temperature and increases in winter rainfall. The resilience of the Proposed Development to climate change has been reviewed in the context of these climate projections.

10.3.2.2 Determining Sensitive Receptors

The receptor for the CCR review is the Proposed Development itself and associated users (including residents, workers and visitors).

10.3.2.3 Determining Potential Effects

The review covers resilience against both gradual climate change, and the risks associated with an increased frequency of extreme weather events. It considers the strategic aims and objectives encompassed within local and national planning strategies and policies, which have the overarching aim of minimising the adverse impacts of climate change, whilst requiring new developments to take climate change considerations into account within design.

Potential climate change impacts have been identified using relevant projections and conclusions from the EPA[53] and considers the potential consequences to receptors and likelihood of occurrence, taking into account any measures incorporated into the design of the Proposed Development. Receptors may include the Proposed Development's assets and its operation and maintenance (i.e., structures, earthworks and drainage, technology assets, etc.). end-users (i.e., staff and commercial operators etc).

Measures to adapt the Proposed Development are identified where potential climate change consequences are identified as being significant and are reported in this ECR.

10.3.2.4 Significance of Effect

The identification and assessment of CCR within ECR is an area of emerging practice. There is no single prescribed format for undertaking such assessments. therefore, the approach adopted to undertaking and reporting the assessment has drawn on good practice from other similar developments and studies and is aligned with existing guidance such as that of IEMA.

This assessment of CCR is undertaken for the Proposed Development to identify potential climate change impacts, and to consider their potential consequence and likelihood of occurrence, taking account of the measures incorporated into the design of the Proposed Development. The CCR review identifies potential climate change impacts using climate change projections, available from the EPA, and considers their likelihood of occurrence and consequence to the infrastructure and assets of the Proposed Development.

As is usual with projects of this nature, a detailed design of the enabling works and construction activities has not been undertaken for this stage of design, the GHG emissions calculations are based on the following conditions using a mixture of data from similar projects, industry benchmarks and professional judgement. The following assumptions, inclusions, and exclusions, made on a precautionary basis, have been used in this calculation:

- The embodied carbon within materials and transportation of materials has the potential to contribute to GHG emissions. GHG emissions for construction of the Proposed Development have been calculated based on estimated material quantities in inverters, transformers, switchgear, li-on batteries from similar projects. Material quantities for the Proposed Development have been estimated using published Lifecycle Assessments as benchmarks. Harrison *et al.*[54] was used to estimate material quantities within transformers assuming that, by weight, 52% of each transformer is steel, 14% is copper, 22% is oil, and 12% is 'other' (plastic, aluminium, glass, iron, paint and rubber).
- Based on similar studies, it is assumed that many of the materials will have a long-distance transportation due to components being sourced from abroad (China or South Korea) and as such emissions from transportation of materials are relatively high in comparison to other Proposed Developments. The Defra 2021 emissions

[53] EPA (2015). Ensemble of Regional Climate Model Projections for Ireland
[54] Harrison et al (2010), Projected Material Requirements for The Global Electricity Infrastructure – Generation, Transmission And Storage

factors for 'Rigid HGV – 7.5-17t' for 100% laden HGV transport, and 'Products tanker – Average' for sea freight have been applied, including WTT emissions.

- At this stage, the construction worker distance travelled is unknown. Professional judgement and conservative estimates have been used to calculate GHG emissions associated with worker transportation to site. An average distance of 20km has been assumed for workers to travel to site, using the UK Government emissions factor for an 'Average Car' including well-to-tank (WTT) emissions. It is assumed that there will be 20 workers travelling to site each day. Also based on similar studies, the GHG calculations have assumed an 18-month construction period with a 5-day working week.
- It has been assumed that 15% of construction waste would be sent to landfill and 85% would be recovered, in line with standard permit requirements for an 85% recovery rate for construction and demolition wastes.

10.4 Baseline Environment

10.4.1 Lifecycle GHG Impact Assessment

The baseline condition for the GHG impact assessment is a Do Minimum scenario where calculations mainly consist of the carbon stock that will be lost assuming the Proposed Development does not go ahead. The land within the boundary of the Proposed Development currently consists of agricultural land.

10.4.2 Climate Change Resilience Review

The current baseline for the CCR assessment is the current climate in the location of the Proposed Development. Historic climate data obtained from Met Eireann recorded at Dublin Airport Meteorological Station (the closest station to the Site for which sufficient historic data was available, approximately 8.5km southeast from the Site) for the 20-year period of 1981-2000, is summarised in Table 10-3.

Table 10-3 Historic Climate - Current Baseline

Climatic Factor	Month	Value
Average annual maximum daily temperature (°C)	-	13.1
Warmest month on average (°C)	July	19.5
Coldest month on average (°C)	February	2.6
Mean annual rainfall levels (mm)	-	747
Wettest month on average (mm)	December	77
Driest month on average (mm)	July	47

The future baseline will be used to determine the resilience of the Proposed Development to climate change and to identify where potential climate adaption measures are required. EPA[53] regional climate model projections for Ireland present the following projections for mid-century (2041-2060), against a baseline period of 1981-2000:

- Temperature projections suggest an increase in mean annual temperatures of 1.2-1.6°C, with the largest increases expected in the east of the country.
- Average annual rainfall is projected to decrease.
- Rainfall projections indicate a significant decrease in average precipitation levels for summer. "Likely"[55] reductions in summer rainfall of 3% to 20% are anticipated.
- Projections for average winter precipitation are less certain.
- "Likely" increases in the number of 'wet days' and 'very wet days' for winter of 24% and 30%, respectively.
- The number of extended dry periods (defined as at least 5 consecutive days for which the daily precipitation is less than 1 mm) is also expected to increase over the year, particularly in summer and autumn, with "likely" values ranging from a 12% to 40% increase.
- Storms affecting Ireland are anticipated to decrease in frequency, but increase in severity, increasing the risk of damage to infrastructure.
- Wind energy is projected to decrease in spring summer and autumn, while projected increases in wind energy in the winter were found to be statistically insignificant.

[55] where over 66% off the ensembles agree

Recent climate hazards experienced by the County include extreme rainfall and strong winds, flooding, heatwaves, and droughts. Climate change-induced changes to these variables are summarised in Table 10-4.

Table 10-4 Summary of Future Climatic Projections

Climate Variable	Projected Change in Likelihood
Temperature	
Average annual temperature	↑
Average summer temperature	↑
Average winter temperature	↑
Rainfall	
Annual rainfall	↓
Average summer rainfall	↓
Average winter rainfall	↑
Extreme Events	
Heat waves	↑
Droughts	↑
Storms- frequency	↓
Storms- intensity	↑

10.5 Assessment of Potential Impacts

10.5.1 Lifecycle GHG Impact Assessment

10.5.1.1 Construction Phase

The total GHG emissions from construction are estimated to be 5,088 tCO_2e. The primary GHG emissions sources and the breakdown of the calculated GHG emissions are shown in Table 10-5. The greatest contribution to construction emissions is the transport of materials, accounting for 27% of construction emissions.

Table 10-5 Construction GHG Emissions

Project Activity/Emissions source	Total GHG Emissions (tCO_2e)	Percentage of Construction Emissions
Loss of carbon sink (land use change)	291	5.7%
Construction materials/embodied carbon in products	610	12%
Water use	0.03	0.0%
Fuel use	297	5.8%
Transport of materials	1383	27.2%
Worker travel	1350	26.5%
Waste disposal	1,158	22.8%
Total tCO_2e construction stage emissions	**5,088**	-
Annual tCO_2e from construction stage – assumed a 1.5-year construction period	**2,544**	-

To contextualise the magnitude of impact, these emissions have been compared to the current Irish national GHG inventory[56]. Emissions from the construction phase of the Proposed Development would not contribute to more than 0.009% of the latest Irish GHG inventory. The magnitude of effect during construction would therefore be considered **low** and the significance of effects would be minor adverse.

[56] EPA (2021), Ireland's National Inventory Report 2021

10.5.1.2 Operational Phase

The total GHG emissions from operation of the Proposed Development are estimated to be **15,493** tCO_2e. The primary GHG emissions sources and the breakdown of the calculated GHG emissions are shown in Table 10-6**.** The operational GHG footprint is considered to reflect a robust worst-case as the calculations have been carried out using current emissions factors. Embodied carbon and emissions associated with energy and fuel use are anticipated to be lower in the future as a result of grid decarbonisation and machinery and vehicle electrification in line with Ireland's net zero carbon emissions target for 2050.

Table 10-6 Operation GHG Emissions

Project activity/Emissions source	Total GHG Emissions (tCO_2e)	Percentage of Annual Operational Emissions
Operational energy use[57]	227	59%
Worker transportation	12	3%
Maintenance	148	38%
Annual tCO2e (1st year of operation)	**387**	-
Total tCO2e of design life occupied (40 years)	**15,493**	-

If passed, the Climate Action and Low Carbon Development (Amendment) Bill 2021 will set a binding target of cutting GHGs in Ireland by 51% by 2030 based on a 2018 baseline, with the aim of reaching carbon neutrality by 2050. Ireland's GHG emissions in 2018 were 60,935 $ktCO_2e$, and a 51% reduction would see 2030 emissions being 29,858 $ktCO_2e$ (SEAI).

Emissions from the operational phase of the Proposed Development would not contribute to more than 0.03% of the 2030 reduction target levels. The magnitude of effect during operation would therefore be considered **low** and the significance of effects would be **minor adverse**. The operational GHG footprint is considered to reflect a worst-case as the calculations have been carried out using current emissions factors. Embodied carbon and emissions associated with energy and fuel use are anticipated to be lower in the future as a result of grid decarbonisation and machinery and vehicle electrification in line with Ireland's net zero carbon emissions target for 2050.

10.5.2 Climate Change Resilience Review

During the construction process, receptors may be vulnerable to a range of climate risks. These could include:

- Inaccessible construction site due to severe weather event (flooding, snow and ice, storms) restricting working hours and delaying construction.
- Health and safety risks to the workforce during severe weather events.
- Unsuitable conditions (due to very hot weather or very wet weather, for example) for certain construction activities.
- Damage to construction materials, plant and equipment, including damage to temporary facilities/assets within the Site boundary, such as offices, compounds, material storage areas and worksites, for example from stormy weather.

During the operational phase, the Proposed Development may be vulnerable to a range of climate risks. These could include:

- Increased frequency and severity of extreme weather events (such as heavy and/or prolonged precipitation, storm events and heatwaves) leading to:
  - Damage to utilities due to stormy periods and intense rainfall.
  - Flooding from drainage systems during intense or prolonged rainfall leading to loss or inability of the substation to function.
- Increased winter precipitation leading to surface water flooding, standing waters, and pluvial flooding from the Broadmeadow River.
- Surface infrastructure foundations affected by summer drought and consequent ground movement, leading to mechanical damage.

[57] This is for energy consumed during the night. It is assumed that energy consumed during the day is from the solar PV park rather than the grid.

- Increased summer and winter temperatures leading to increased heat stress on infrastructure (e.g., switchgear affected by temperature rise, reducing rating)

10.6 Mitigation Measures

- It is recommended that the following GHG mitigation measures are implemented:
- An oCEMP[4] is included as part of this planning application. The oCEMP will be developed into a detailed CEMP and implemented by the contractor during the construction phase of the Proposed Development. The CEMP sets out various measures required by contractors to reduce GHG emissions, including:
  - Specification of locally sourced materials with lower embodied carbon content where feasible, in line with circular economy principles.
  - Turning off machinery engines when not in use.
  - Ensuring regular maintenance of construction machinery.
  - Handling materials efficiently on site to minimise the waiting time for loading and unloading, thereby reducing potential emissions.
  - A requirement for the Contractor to implement an Energy Management System for the duration of the works.

A Stage 2 FRA (Appendix D) was undertaken for the Proposed Development and concluded the following based on a review of available data and while it was noted that a Stage 3 Detailed FRA is not required, however it is recommended that the following CCR mitigation measures are implemented:

- Substation to be constructed at a level above any potential flooding.
- A flow control device will be included within the Proposed Substation Development to limit surface water discharge.
- Have a policy in place for flood defence which is reviewed on a regular basis. For example, portable flood defence equipment deployed at strategic locations (e.g., aqua sack, barriers, high speed pumps).
- Substation equipment (e.g., cables) to be specified for use in higher temperatures projected in the future.
- Maximise the use of natural ventilation to keep internal temperatures within plant and equipment operating within their optimum parameters.

10.7 Residual Impacts

As per EPA, the effects from the impacts that remain after all assessment and mitigation are referred to as ‘Residual Effects’. There would be unavoidable GHG emissions resulting from both the construction phase and the operational phase of the Proposed Development as materials, energy use, fuel use, and transport would be required. Table 10-7 provides a summary of residual effects on climate, following the implementation of mitigation and monitoring measures.

Table 10-7 Climate Summary of Potential Effects

Description of Impact	Sensitivity of Receptor	Nature of Effect/Geographic Scale	Magnitude of Effect	Initial Classification of Effect (with embedded mitigation)	Additional Mitigation	Residual Effect Significance
Construction						
GHG emissions	High	Long term/ Global	Low	Minor	None	Minor (Low significance)
Operation						
GHG emissions	High	Long term/ Global	Low	Minor	None	Minor (Low significance)

10.8 Cumulative Effects

Significant impacts to climate are not predicted as a result of the listed projects in Table 1-2 as there are no direct emissions to atmosphere during operation. Construction vehicles and machinery may give rise to some GHG emissions during construction, however, due to the small scale of the development and the predicted low volume of machinery required GHG emissions are not considered to be significant. The cumulative impact to climate is overall imperceptible and therefore there is no potential for any significant negative direct nor indirect cumulative impacts to arise from the Proposed Development in combination with the listed projects in Table 1-2.

10.9 Summary

10.9.1 Lifecycle GHG Impact Assessment

- The construction phase has been quantitatively assessed in terms of expected GHG emissions arising from onsite construction activities, loss of carbon sink through land use change, embodied carbon in the construction materials, transportation of construction materials and workers, and waste disposal.
- In relation to Ireland's national GHG inventory, the impact of GHG emissions during the construction phase of the Proposed Development have been found to be minor (low significance).
- The operational phase has been quantitatively assessed in terms of expected GHG emissions arising from operational energy use.
- In relation to Ireland's national GHG inventory, the impact of GHG emissions during the operation of the Proposed Development have been found to be minor (low significance).
- There would be unavoidable GHG emissions resulting from both the construction phase and the operational phase of the Proposed Development. An oCEMP[4] has been prepared and will be further refined and expanded by the appointed Contractor, into a Contractor's CEMP.

10.9.2 Climate Change Resilience Review

- During the construction process, receptors may be vulnerable to a range of climate risks. These could include:
  - Inaccessible construction site due to severe weather event (flooding, snow and ice, storms) restricting working hours and delaying construction.
  - Health and safety risks to the workforce during severe weather events.
  - Unsuitable conditions (due to very hot weather or very wet weather, for example) for certain construction activities.
  - Damage to construction materials, plant and equipment, including damage to temporary buildings/facilities within the Site boundary, such as offices, compounds, material storage areas and worksites, for example from stormy weather.
- During the operational phase, the Proposed Development may be vulnerable to a range of climate risks. These could include:
  - Increased frequency and severity of extreme weather events (such as heavy and/or prolonged precipitation, storm events and heatwaves) leading to:
    - Damage to utilities due to stormy periods and intense rainfall.
    - Damage to drainage systems due to flooding from intense rainfall.
    - Flooding from drainage systems during intense or prolonged rainfall.
- Increased winter precipitation leading to surface water flooding and standing waters.
- Increased summer and winter temperatures leading to increased heat stress on infrastructure and assets.
- It is recommended that CCR measures are built into the design of the Proposed Development which considered to be appropriate in the context of the climate change projections, as outlined in Section 10.6.

11. Noise and Vibration

11.1 Introduction

This chapter assesses the potential noise impacts associated with the Proposed Development.

The potential noise impacts arising from the Proposed Development have been considered under the following scenarios:

- Short term noise impacts arising during the construction and commissioning phase.
- Long term noise impacts arising during the operational phase.
- Vibration generating activities.

11.2 Legislation, Policy and Guidance

11.2.1 National Policy Objective 65

NPO 65 identified in the Government of Ireland document '*Project Ireland 2040 National Planning Framework*'[58] states the following aim:

> *"Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans."*

11.2.2 FDP 2023 to 2029

The FDP 2023-2029[28] sets out the Council's proposed policies and objectives for development in the County over the Plan period. It includes the following objectives that relate to noise and vibration:

- Policy IUP39 to "Support the pro-active management of noise in the County and to continue to work with the Dublin Local Authorities and relevant statutory agencies, through the implementation of measures to avoid, mitigate and minimise noise in accordance with the Noise Action Plan for the County of Fingal 2018–2023 and the Dublin Agglomeration Environmental Noise Action Plan 2018–2023 (and any subsequent plans)".
- Policy IUP40 to "Continue to work alongside relevant stakeholders including the NTA, TII and the EPA to promote and improve safer noise protection infrastructure in line with population growth and traffic increases along all our national roads".
- Objective IUO60 to "Implement the relevant spatial planning recommendations and actions of the Dublin Agglomeration Environmental Noise Action Plan 2018–2023 and the Noise Action Plan for Dublin Airport 2019–2023 (or any subsequent plan), working in conjunction with relevant statutory agencies".
- Objective IUO61 to "Consider the location, design and construction of noise sensitive developments, to ensure they are protected from major noise sources, where practical, and to support and facilitate the monitoring and enforcement by Fingal's Environmental Health Department of noise reduction measures in areas experiencing excess noise".
- Objective IUO62 to "Developments for noise sensitive uses shall have regard to the noise exposure maps contained within the Fingal Noise Action Plan 2018 – 2023 or any supplementary mapping prepared by FCC, and developers shall be required to produce a noise impact assessment and mitigation plans, where necessary, for any new noise sensitive development within these areas.

11.2.3 Guidelines

Transport Infrastructure Ireland (TII), formerly the national Roads Authority (NRA) is the only government body in Ireland to publish construction noise limits, which are presented in the document 'Guidelines for the Treatment of Noise and Vibration in National Road Proposed Developments'[59].

It is acknowledged the limits presented relate to construction works for road Proposed Developments, however it is assumed that noise sensitive receptors are likely to be equally sensitive to construction noise from other project types.

The criteria presented in this Guideline are given in Table 11-1.

[58] Government of Ireland (2018) *Project Ireland 2040 National Planning Framework*
[59] National Roads Authority (2004) *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*

Table 11-1 Maximum permissible noise levels at the façade of dwellings during construction

Period	$L_{Aeq,1hr}$dB	$L_{p(max)\ slow}$dB
Monday to Friday – 07:00 to 19:00	70	80
Monday to Friday – 19:00 to 22:00	60[1]	65[1]
Saturday – 08:00 to 16:30	65	75
Sundays and Bank Holidays – 08:00 to 16:30	60[1]	65[1]

[1] Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority

11.2.4 BS 5228

The potential noise and vibration impacts arising from construction site activities can also be assessed accordance with the methods and guidance in BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'[60].

The 'ABC' method (detailed in BS 5228 Section E.3.2) has been used to develop criteria for use in this assessment. Using this method, the construction noise limit for the Proposed Development can be determined by rounding the ambient noise level at receptor positions to the nearest 5dB and then comparing this level to the Category A, B and C values given in BS 5228, detailed in Table 11-2.

Table 11-2 BS 5228 Construction Noise Criteria

Assessment category and threshold value period	Threshold Value L_{Aeq}, TdB		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

NOTE 1: A potential significant effect is indicated if the L_{Aeq}, T noise level arising from the Site exceeds the threshold level for the category appropriate to the ambient noise level.
NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e., the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total L_{Aeq}, T noise level for the period increases by more than 3dB due to site noise.
NOTE 3: Applies to residential receptors only.

(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.
(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.
(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.

Source: BS 5228

11.2.5 NG4

Guidance on permissible noise emission limits for industrial facilities such as the Proposed Development is contained in the document Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)[61].

NG4 provides criteria for use in noise assessments which vary depending on whether the location of the development is in a 'Quiet Area' or an 'Area of Low Background Noise'.

A 'Quiet Area' is defined as a location that meets the following criteria:

- At least 3km from urban areas with a population >1,000 people.
- At least 10km from any urban areas with a population >5,000 people.
- At least 15km from any urban areas with a population >10,000 people.
- At least 3km from any local industry.

[60] BSI Group (2014) BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites*
[61] Environment Protection Agency (2016) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*

- At least 10km from any major industry centre.
- At least 5km from any National Primary Route.
- At least 7.5km from any Motorway or Dual Carriageway.

An 'Area of Low Background Noise' is a location that meets the following criteria:

- Average Daytime Background Noise Level ≤40dB LAF90.
- Average Evening Background Noise Level ≤35dB LAF90.
- Average Night-time Background Noise Level ≤30dB LAF90.

The resulting criteria presented in NG4 are detailed in Table 11-3.

Table 11-3 Recommended Noise Limit Criteria

Scenario	Daytime Noise Criterion dB $L_{ar,\,T}$ (07:00 to 19:00 hours)	Evening Noise Criterion dB $L_{ar,\,T}$ (19:00 to 23:00 hours)	Night-time Noise Criterion dB $L_{ar,\,T}$ (23:00 to 07:00 hours)
Quiet Area	Noise from the licenced site to be at least 10dB below the average daytime background noise level measured during the baseline survey	Noise from the licenced site to be at least 10dB below the average evening background noise level measured during the baseline survey	Noise from the licenced site to be at least 10dB below the average night-time background noise level measured during the baseline survey
Areas of Low Background Noise	45dB	40dB	35dB
All other Areas	55dB	50dB	45dB

Source: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (EPA, 2016)

The criteria are given in terms of a Rated Noise Level ($L_{ar,\,T}$) which is defined in NG4 as:

> *The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.*

The method for applying adjustments for tonal and/or impulsive characteristics are described in NG4 and have been considered in this assessment.

11.2.6 Design Manual for Roads and Bridges LA111 Noise and Vibration – Version 2 (LA111)

No specific Irish guidance containing criteria for noise and vibration impacts from construction traffic has been published.

The impact of construction phase traffic has therefore been considered in accordance with the criteria provided in HE's Design Manual for Roads and Bridges[62] (DMRB) LA111 Noise and Vibration (LA111). These criteria are given in terms of change in noise level and are presented in Table 11-4.

Table 11-4 Magnitude of impact at noise sensitive receptors from construction traffic

Change in Sound Level ($L_{A10,18hr}$dB)	Magnitude of Impact (Short Term)
0	No Change
0.1 to 0.9	Negligible
1.0 to 2.9	Minor
3.0 to 4.9	Moderate
5+	Major

11.2.7 Calculation of Road Traffic Noise (CRTN)

Noise levels arising from road traffic can be calculated using the methodology described in the Calculation of Road Traffic Noise (CRTN)[63]. LA111 and the TII Guidelines refer to the CRTN methodology for determining the potential increase in noise levels resulting from changes to road traffic flows.

Noise from a stream of traffic is not constant, but to assess the noise impact a single figure estimate of the overall noise level is necessary. The index adopted in CRTN to assess traffic noise is $L_{A10,18h}$. This value is determined by

[62] HE, Design Manual for Roads and Bridges
[63] Department of Transport, Welsh Office (1988) Calculation of Road Traffic Noise (CRTN). HMSO, London

taking the highest 10% of noise readings in each of the 18 one-hour periods between 06:00 and 00:00, and then calculating the arithmetic mean. As noted in LA111, a reasonably good correlation has been shown to exist between this index and the perception of traffic noise by residents over a wide range of noise exposures.

11.2.8 Construction Vibration

BS 5228[60] provides comprehensive guidance on the assessment of vibration due to construction activity. It considers levels of vibration from construction in terms of peak particle velocity (ppv) defined as the instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position and is expressed in millimetres per second (mm/s).

BS 52282[60] provides guidance on the levels of vibration associated with human perception and disturbance and the onset of potential structural damage to different types of buildings.

Vibration due to construction activities has the potential to result in adverse impacts at nearby sensitive receptors. The transmission of ground-borne vibration is highly dependent on the nature of the intervening ground between the source and receiver and the activities being undertaken. BS 5228-2: 2009[60] provides data on measured levels of vibration for various works. Effects are considered for both damage to buildings and annoyance to occupiers.

With regards to annoyance, the magnitude of the effect of vibration from piling is classified with the descriptors in Table 11-5, taken from Table B.1 in BS 5228-2: 2009.

Table 11-5 Magnitude of Construction Vibration Impacts

Vibration Level Peak Particle Velocity (ppv) mms^{-1}	Effect		Magnitude
10	Vibration is likely to be intolerable for any more than a brief exposure at this level	Intolerable	High
1	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.	Complaints likely	Medium
0.3	Vibration might just be perceptible in residential environments	Just perceptible	Low
0.14	Vibration may be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration	Complaints unlikely	Negligible

With regards to building damage, the threshold values for demolition/remediation vibration are classified within Table B.2 in BS 5228-2[60]. These threshold values are given in Table 11-6.

Table 11-6 Transient Vibration Guide Values for Cosmetic Damage

Building type	Peak Component Particle Velocity 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 mms^{-1} at 4 Hz and above	50 mms^{-1} at 4 Hz and above
Unreinforced or light framed structure Residential or light commercial buildings	15 mms^{-1} at 4 Hz increasing to 20 mms^{-1} at 15 Hz	20 mms^{-1} at 15 Hz increasing to 50 mms^{-1} at 40 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50 mms^{-1} at 4 Hz and above	50 mms^{-1} at 4 Hz and above

Note 1: Values referred to are at the base of the building.

Note 2: For unreinforced or light framed structures and residential or light commercial buildings, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

These levels were derived following an extensive review of data (which yielded very few cases of vibration-induced damage) and include the results of experimental investigations carried out in other countries into vibration-induced damage thresholds. Note the standard uses peak component particle velocity for guidance purposes. The levels suggested are judged to give a minimal risk of vibration induced damage.

The estimated ppv values due to construction works are compared to the target limits specified above to determine the significance of the vibration effect in terms of cosmetic building damage.

These values are for vibration that is classified as intermittent. If the vibration is of sufficient duration that it can give rise to amplification within a building structure due to resonance, these limit values should be halved.

The guidance presented in BS 7385 (BSI, 1993) states that for intermittent vibration the probability of cosmetic damage occurring tends to zero at a level of 12.5 mms^{-1} ppv.

11.3 Methodology

11.3.1 Study Area

The study area for onsite construction and operational noise and vibration is defined as the area extending from the Proposed Substation Development which includes the nearest sensitive receptor (NSR) locations.

The study area for onsite construction and operational noise and vibration focuses on the closest sensitive receptors within 300m of the Proposed Grid Connection.

If compliant levels are noise and vibration are predicted at the location of the nearest NSR locations, it follows that compliant levels will be achieved at all other locations.

11.3.2 Determination of the Baseline Environment

A baseline survey has not been carried out at the Site of the Proposed Development. Instead, assumptions have been made based on a desk top assessment and professional judgement. This is discussed further below.

11.3.3 Determination of Sensitive Receptors

The closest sensitive receptors to the Proposed Substation Development are 440m west and 320m east of, as shown in Figure 11-1.

The closest sensitive receptors to the Proposed Grid Connection are within 300m of the Proposed Grid Connection boundary.

11.3.4 Describing Potential Effects

The EPA's Guidelines[5] are written with to facilitate EU Directive 2014/52/EU in Ireland. This document covers the assessment and description of environmental impacts.

Effects are described under various headings, including Quality, Significance, Extent and Context, Probability, Duration and Frequency. Of particular relevance are the definitions of significance and duration, which have been reproduced in Table 11-7 and Table 11-8.

Table 11-7 Description of the Significance of Effects

Aspect	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 Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment
Very Significant Effects	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment
Profound Effects	An effect which obliterates sensitive characteristics

Table 11-8 Description of the Duration and Frequency of Effects

Aspect	Description
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-Term Effects	Effects lasting from one to seven years
Medium-Term Effects	Effects lasting from seven to 15 years
Long Term Effects	Effects lasting from 15 to 60 years
Permanent Effects	Effects lasting over 60 years
Reversible Effects	Effects that can be undone, e.g., through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly, or hourly, daily, weekly, monthly, annually)

11.4 Baseline Environment

The Proposed Substation Development site is set in a rural area with agricultural land, farm buildings and a few residential properties nearby. The baseline acoustic environment is expected to comprise low levels of road traffic sound and agricultural sources (birdsong, animal sounds etc.).

The Proposed Grid Connection is located within the public road with dispersed residential and commercial properties adjacent to the route.

11.5 Potential Impacts

Noise and vibration from the Proposed Development will potentially occur during the construction and operational phases of the project. Construction activities will include the elements as described in Section 2.2.

Construction activities, and associated noise emissions, will gradually phase out from pre-construction followed by commissioning and testing of the substation and equipment. The highest noise levels are expected to occur during the early stages of site preparation and enabling works, mainly due to earthwork processes. Increases in road traffic on the existing road network may also give rise to noise impacts, again principally due to vehicle movements associated with earthworks (i.e., transportation of material).

Once constructed, the Proposed Development will incorporate some sound generating elements, in particular a 110MV transformer. Potential noise impacts associated with these sources are discussed further below. Due to the nature of the proposed development, once constructed, no significant increase in road traffic is expected on the existing road network. Therefore, no assessment of operational phase road traffic noise has been carried out.

11.5.1 Construction Phase

11.5.1.1 Construction Noise

Noise limits for construction works are provided by the NRA Guidelines and BS 5228 and described in Section 11.2. The NRA Guidelines provide fixed limits, whereas BS 5228 provides limits which vary depending on the ambient sound levels at the receptors.

As the ambient sound levels at the receptors are unknown at the time of this assessment the lowest noise limit provided by the 'ABC' method in BS 5228 (Category A threshold values) should be used. Where the NRA guidelines and BS 5228 differ, the most stringent criteria will be used.

Category A threshold values from BS 5228 and the maximum permissible sound levels from the NRA guideline have been compared and the most stringent criteria chosen. For different times of day these are outlined below in Table 11-9.

Table 11-9 Construction Noise Limit at Receptors

Period	Noise limit $L_{Aeq,\,T}$
Weekday Daytime (07:00 to 19:00)	65
Weekday Evening (19:00 to 23:00)	55

Period	Noise limit $L_{Aeq, T}$
Saturday Mornings (07:00 to 13:00)	65
Saturday Afternoons and Evenings (13:00 to 23:00)	55
Sundays and Bank Holidays Daytime (08:00 to 16:30)	55
Night-time (23:00 to 07:00)	45

Section 2.2 describes the stages of construction and the activities that will be involved. At the time of writing, the construction programme for the Proposed Development is at a relatively early stage, therefore, the details required to complete a quantitative assessment of construction noise were not available. Instead, a qualitative assessment has been carried out based on the best practice recommendations presented in BS5228.

For the construction of the Proposed Substation Development the distances between the construction site and nearby sensitive receptors are relatively large (320m or greater, depending on the receptor). Therefore, it is expected to be relatively straightforward to achieve the limits detailed in Table 11-9 through the adoption appropriate noise mitigation and site management measures. These are discussed further in Section 11.6.

The construction of the Proposed Grid Connection follows the R122 regional road where there are properties on both sides of the road at quite small distances (some at less than 5 meters). Due to the small distances involved it is likely that the limits detailed in Table 14-7 are exceeded at the receptors during the construction. However, the length of time the noise limit is exceeded at each receptor is not anticipated to be long as the construction moves along the route of the Proposed Grid Connection.

11.5.1.2 Construction Road Traffic Noise

Construction of the site is anticipated to take 24 months additional traffic movements are expected to peak at 80 vehicles per day, with 30 of those movements being HGV.

Baseline traffic flows are not known at this time. however, this is a relatively small number of additional vehicles and therefore is not expected to result in a sufficient increase in traffic levels to result in a significant adverse impact.

11.5.1.3 Construction Vibration

Construction activities associated with duct and trenching that are expected to generate groundborne vibration during the construction phase of the Proposed Development include earthworks and HDD.

During the excavation and backfill for the Proposed Grid Connection a number of residential receptors have been identified within 10m of the Proposed Development boundary vibration may be perceptible for short periods of time and cause a negative effect, for instance during compaction of backfilled material. However, these works are likely to last for short periods at close distances and are unlikely to cause a significant effect.

For HDD drilling at the Broadmeadow River, Ward River and Under the N2, the receptors are as follows:

- Broadmeadow River HDD Crossing – Residential receptor 100m south.
- Ward River HDD Crossing – Residential receptor 90m north.
- N2 HDD Crossing – Commercial industrial receptor 60m east.

HDD works are considered vibration intensive. Reference has been made to vibrations due to HDD in Lucan Formation and Dublin Boulder Clay[64] which outlines vibration measurements conducted during directional drilling for a 110kV line in Drimnagh, Dublin. Measurements were taken near rail tracks at approximately 9m from the line of directional drilling with measured vibration levels of less than 1mm/s recorded. The minimum distance between the HDD works receptors is 60m, therefore, the predicted vibration impacts arising from HDD works is assessed as not significant.

With regards to building damage from vibration, all predicted levels fall well below the 15 mms^{-1} level at which cosmetic damage could occur in residential or light commercial buildings. The magnitude of effect is negligible and assessed as not significant.

11.5.2 Operational Phase

Once operational, the Proposed Grid Connection will not produce any significant noise and vibration levels, therefore, the operational noise impact assessment has been scoped out of this assessment.

[64] Reilly, et al (2020), Vibrations Due to Horizontal Directional Drilling in Lucan Formation Rock and Dublin Boulder Clay

The Proposed Substation Development is approximately 4km northeast of the M2 and 7km west of the M1, therefore it does not meet the criteria set out in NG4 for a 'Quiet Area'.

No site survey has been carried out to date, therefore it is not known whether the noise sensitive receptors in the vicinity of the Proposed Substation Development are subject to the 'Area of Low Background Noise' criteria or the 'All Other Areas' criteria, as set out in NG4.

To ensure the robustness of the assessment, it has been assumed that existing sound levels at the relevant NSR locations are sufficiently low to be considered an 'Area of Low Background Noise' as this results in the most stringent criteria for operational noise.

If it becomes apparent the 'Area of Low Background Noise' criteria are onerous or difficult to achieve technically, a survey can carried out at the Site to determine if different criteria (i.e., the 'all other area' criteria) are appropriate to adopt. If it becomes apparent that the 'All other Areas' criteria are more appropriate, the design limits can be relaxed accordingly. For completeness, the design limits for both sets of criteria are presented below.

A 3D sound model was constructed using CadnaA 2020 acoustic modelling software. Details of the sound modelling methodology is given in Appendix F.

The inputs to the model are as follows:

- Site location and layout drawing produced by AECOM.
- Google earth satellite imagery.

The sound source at the Proposed Development is understood to be a 160MV transformer and a shunt filter. No other significant sound sources are proposed. At the time of writing no sound data was available for either source. Therefore, limits for each sound source have been calculated to be adopted at the detailed design stage to comply with the noise limits specified in Section 11.2.5. The results of these calculations are presented in Table 11-10. It has been assumed there is no acoustic enclosure of barrier surrounding the transformer for a worst-case assessment. Figure 11.1 in Appendix F shows the noise contours associated with the noise modelling for noise sources meeting the design criteria for an 'Area of Low Background Noise'.

Table 11-10 Sound Limits – Design Criteria based on 'Area of Low Background Noise' Assessment Criteria

Sound Source	Sound Power Level Limit (dB L_{wA})
Transformer	91
Shunt Filter (Single Unit)	89

If a further survey was carried out which demonstrated that the 'All Other Areas' criteria are more suitable. The design criteria given in Table 11-11 would need to be achieved.

Table 11-11 Sound Limits – Design Criteria based on 'All Other Areas' Assessment Criteria

Sound Source	Sound Power Level Limit (dB L_{wA})
Transformer	101
Shunt Filter (Single Unit)	99

Having determined the design criteria to be adopted to ensure compliant sound levels are achieved, an investigation was carried out to determine the feasibility of sourcing equipment that would comply with these criteria.

A study from the US Department of Energy[65] describes an empirical relationship between the sound levels of transformers at a distance of 100 feet (L_{100}) based on the total maximum rating in MVA (R):

$$L_{100} = 40 + 8.5\,log(R)$$

It is understood from the applicant the transformer will have a rating of 160MV, which gives a predicted sound power level of 97dB which is 6dB above the level required to achieve the 'Area of Low Background Noise' criterion and below the sound power level required to achieve the 'All other Areas' criterion.

A reduction of 6dB is expected to be readily achievable though careful transformer specification, or mitigation measures (e.g., acoustic barriers or enclosures).

[65] Keast and Gordon (1980) *Assessment of the Need for Noise Control Research on Electric Power Transformers and Reactors* Available: https://www.osti.gov/servlets/purl/5082211/ Accessed: 10/08/2021.

Based on specifications for similar developments, it is understood that shunt filters typically generate 65 dB LAeq, T at 2m, giving a sound power of approximately 79 dB LwA. Based on this, it is expected the limit of 89 dB LwA presented is achievable.

On this basis, provided appropriate mitigation measures are implemented for the transformer at the detailed design phase, no adverse impact is predicted with regards operational phase sound emissions.

11.6 Mitigation Measures

11.6.1 Construction Phase

All plant items used during the construction phase of the Proposed Development should comply with standards outlined in Construction Plant and Equipment Permissible Noise Levels Regulations[66].

Reference is made to BS 5228[60], which offers detailed guidance on the control of noise from construction activities.

The following various practices should be adopted during construction, including:

- Limiting the hours during which noisy site activities occur to 07.00 – 19.00.
- Appointing a site representative responsible for matters relating to noise.
- Establishing channels of communication between the appointed Contractor/applicant, FCC and residents.

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These include:

- Selection of construction plant with low inherent potential for generation of noise and/or vibration.
- Erection of temporary barriers around items such as construction generators or high duty compressors. For maximum effectiveness, the barrier will be positioned as close as possible to either the noise source or receiver. The barrier will be constructed of material with a mass of >7kg/m² and have no gaps or joints in the barrier material. As a rough guide, the length of a barrier will be five times greater than its height. A shorter barrier would be bent around the noise source, so no part of the noise source is visible from the receiving location.
- Siting of noisy construction plant as far away from sensitive properties as permitted by site constraints.

With the above mitigation in place, there should be no impacts due to construction noise or vibration.

11.6.2 Operational Phase

To achieve compliant sound levels during the operational phase, the criteria set out in Section 11.5.2 will need to be achieved.

Depending on the details of the plant installed, no mitigation may be required. However, calculations indicate that, potentially, a reduction of approximately 6dB in sound emissions from the transformer will be required.

A reduction of 6dB is expected to be readily achievable though careful transformer specification, or mitigation measures (e.g., acoustic barriers or enclosures).

11.7 Residual Effects

Following the inclusion of the mitigation measures described in Section 11.6, no residual significant effects from noise and vibration are anticipated from the Proposed Development at the nearby receptors.

11.8 Cumulative Effects

Should the construction of the listed projects in Table 1-2 and the Proposed Development occur concurrently, there is potential for cumulative noise emissions during construction. Cumulative noise impacts associated with the listed projects are not envisaged due to the low volume of construction required and the use of materials with a low dust generation potential. No significant sources of emissions to noise are expected during the operational phase of the Proposed Development. Thus, there is no potential for any significant negative direct nor indirect cumulative impacts to arise from the Proposed Development in combination with the listed projects.

[66] European Communities (1998), Construction Plant and Equipment) (Permissible Noise Levels) Regulations

11.9 Summary

The potential noise and vibration impacts arising from the Proposed Development have been considered with regards short term noise impacts arising during the construction and commissioning phase and long-term noise impacts arising during the operational phase.

No significant vibration generating activities are expected during the construction or operational phases. Therefore, vibration impacts have been scoped out of the assessment. Furthermore, due to the nature of the Proposed Development, no significant increase in road traffic is expected on the existing road network during the operational phase. Therefore, no assessment of operational phase road traffic noise has been carried out.

A qualitative assessment of construction phase noise emissions was carried out. Provided the measures detailed in Section 11.6 are adopted, no significant adverse impact is expected arising from noise during the construction phase.

Noise limits for operational phase sound sources associated with the Proposed Development have been calculated. These limits have been investigated and are expected to be readily achievable through careful plant selection and/or the adoption of suitable noise mitigation measures during the detailed design phase. Provided these limits are adopted in the design, no significant adverse impact is expected arising from noise during the operational phase.

No cumulative effects from other developments are expected.

12. Material Assets

12.1 Introduction

This chapter examines the baseline environment in terms of material assets in relation to the Proposed Development and assesses the potential impact of the Proposed Development. Mitigation and monitoring measures are also proposed to address the likely impacts to material assets.

12.2 Legislation, Policy and Guidance

This section evaluates the impacts, if any, which the Proposed Development may have on Material Assets as defined in Directive 2014/52/EU, the EPA Guidelines[5].

12.3 Methodology

The EPA's Guidelines[5] describes material assets to be taken to mean 'built services' (i.e., utilities networks including electricity, telecommunications, gas, water supply and sewerage), 'waste management' and 'infrastructure' (e.g., roads and buildings).

The following chapter provides an assessment of impacts on:

- Infrastructure: Land Use and property (non-agricultural). an assessment of impacts on private properties and commercial properties, including full or partial acquisitions, demolition and/or severance, or other changes likely to alter the character and use of the surroundings and therefore effect viability of property/land use.
- Utilities networks including:
  - Electricity network.
  - Telecommunications (including phone and broadband).
  - Gas distribution networks.
  - Water supply networks.
  - Drainage network (including stormwater and sewerage effluent).

12.3.1 Study Area

This chapter assesses ownership and access (including buildings and other structures), built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in terms of the following:

- Power and electricity supply.
- Telecommunications.
- Surface water infrastructure.
- Foul drainage infrastructure.
- Water supply.

12.3.2 Determination of the Baseline Environment

A desktop assessment of client provided, and publicly available information was undertaken to determine the baseline utility arrangements within the study area. The information reviewed included the Proposed Development site utility plans and preliminary design information.

12.3.3 Determination of Sensitive Receptors

The sensitivity of the existing environment identifies the ability of the receptor to respond to potential effects and can be determined by describing changes to the environment that could limit the access to, or use of, the material asset. For the purpose of this assessment, the sensitive receptors are regarded as land use and the existing utilities network within the study area.

12.3.4 Describing Potential Effects

Terminology used to describe the sensitivity of the receptor are as per the EPA Guidelines[4]. As descriptors for sensitivity are not outlined within Irish guidance, the descriptors are based on professional judgement.

The methodology used for evaluating impact levels and the terminology for describing the quality, significance, extent, probability and duration of effects on existing land use, properties and utilities network is in line with the EPA Guidelines. In summary, it involves combining a sensitivity of a receptor with a description of an impact on that receptor (its quality, type, frequency, duration, probability and magnitude) to determine a significance of an effect.

Specific assessment criteria are outlined in the following sections. As specific criteria are not outlined within Irish guidance, the criteria are based upon professional judgement.

12.3.4.1 Land Use and Property

Impacts from a road development on existing land use and properties can include:

- Acquisition of land.
- Changes to accessibility and severance.
- Demolition of residential and commercial properties.
- Revaluation of or change in the development potential of adjoining lands/properties.

12.3.4.2 Utilities

A development could impact existing utilities networks if it involves any of the following:

- Demolition of a utility.
- Diversion of a utility.
- Modification of a utility.
- Connection works to existing utilities infrastructure.
- Additional demand on existing supply (during construction and operation).

12.4 Baseline Environment

12.4.1 Land use

The study area is characterised by presence of open greenfield area with hedgerows delineating field boundaries and some wooded areas on the southern edges. The Irish national CORINE 2018 dataset[10] has identified the study area as an 'Agricultural Area' of 'Pastures'.

The R122, which exists in the wider vicinity, is lined by residential properties with several community facilities at the Rowlestown junction including:

- Rowlestown National School.
- Rowlestown Parish Church.
- Texaco Rolestown Service Station.

12.4.2 Public Utilities

Information regarding utility infrastructure is described in Chapter 2: Description of Proposed Substation Development.

Service records were obtained from relevant utility providers and considered within the Proposed Grid Connection. Where existing utilities/services are found, the works will be diverted around the service/utility or below them depending on the degree of complexity found.

12.4.2.1 Proposed Substation Development

Electricity Network

The availability of power is a key consideration in site selection for the Proposed Development. Power demand for the Proposed Development will be provided by a connection through an existing 110kV busbar in the existing Finglas 220kV Substation via the Proposed Grid Connection.

In addition, low voltage cable installation will provide a house power supply to the Proposed Substation Development.

Water Supply

The water demand for the Proposed Development will be minimal. The Applicant has consulted with Uisce Éireann and proposed to connect to the existing water network. It is proposed to take a 100mm connection from an external watermain to the west of the Site to provide adequate water services for the Proposed Substation Development, subject to agreement and connection with Uisce Éireann.

The Proposed Grid Connection is not anticipated to require water.

Sewerage Effluent

Proposed Development will temporarily store foul waste on the site during both the construction and operational phases which will be removed by tanker to a licensed disposal facility at regular intervals.

Telecommunications

The connection into the wider telecommunications network will be undertaken by a statutory telecommunications operator.

Gas Distribution Network

There are no gas utilities within the Proposed Substation Development boundary and no requirement for gas during operations.

12.4.2.2 Proposed Grid Connection

There are several utilities in place along and crossing the Proposed Grid Connection, the majority of which are buried within and along the roadways. These utilities include:

- ESB electricity lines (high, medium, and low voltage) and associated infrastructure.
- Gas Networks Ireland gas mains (high, medium, and low pressure) and associated infrastructure.
- Uisce Éireann potable water mains and associated infrastructure.
- Uisce Éireann sewer lines (foul and combined sewers) and associated infrastructure.
- Local Authority surface water drainage network and associated infrastructure.
- Eir, Enet and Virgin Media telecommunications lines and associated infrastructure.
- Local Authority traffic signal ducting.

12.5 Potential Impacts

12.5.1 Construction Phase

12.5.1.1 Utility Services

All reasonable measures will be taken to avoid unplanned disruptions to any services during the proposed works (including OHL diversion). This will include thorough investigations to identify and reconfirm the location of all utility infrastructure within the works areas.

Service disruptions impacting the surrounding residential, social and commercial properties will be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions will be given to all impacted properties. This will include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties will be undertaken prior to any proposed disruptions.

There is potential for disruption to services during construction works. Impacts will be localised and temporary in duration, however, the measures detailed above will ensure that this will not result in significant impacts in the receiving environment. The effects are likely to be temporary and imperceptible – slight.

12.5.1.2 Utility Use

During the construction phase temporary construction compounds will be required for the Proposed Development. Welfare facilities will be provided at these locations and any discharges will be connected to a sealed holding tank to be emptied and disposed of offsite by a licenced contractor to an approved licenced facility. Water will be tankered onto site as required. Consequently, significant adverse effects on utility services during the construction phase are not likely.

12.5.2 Operational Phase

While operational impacts are not anticipated, should maintenance measures necessitate it, service disruptions impacting the surrounding residential, social and commercial properties will be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions will be given to all impacted properties. This will include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties will be undertaken prior to any proposed disruptions.

12.6 Mitigation Measures

12.6.1 Construction Phase

The excavation of trenches within the vicinity of existing utilities will be carried out in consultation with ESB Networks, Gas Networks Ireland, Uisce Eireann, local authorities and other relevant entities to ensure that there is no impact on existing users.

As the connection works required by the Proposed Development are entirely within site boundaries, there will be no potential offsite impact. There are no potential impacts associated with telecommunications for the Proposed Development for the construction phase.

No remedial or mitigation measures are required in relation to foul drainage infrastructure and water supply.

12.6.2 Operational Phase

There are no potential impacts associated with utility supply for the Proposed Development for the operational phase. No remedial or mitigation measures are required in relation to material assets during the operational phase.

12.7 Residual Effects

The implementation of mitigation measures will ensure that the predicted impacts on the material assets assessed in this section will be short-term, neutral, and imperceptible for the construction phase.

The predicted impacts on power and electrical supply, telecommunications, surface water infrastructure, foul drainage infrastructure and water supply will be long-term, neutral, and imperceptible for the operation phase.

12.8 Cumulative Effects

The Proposed Development will have a negligible demand on power. Based on this, it is predicted that the cumulative impact of the Proposed Development with other permitted and planned developments is considered to be imperceptible during the construction and operational phases.

The Proposed Development entails minimal use of material assets (i.e., power and electrical supply, telecommunications, surface water infrastructure, foul drainage infrastructure and water supply) during construction with no impact once operational. The overall predicted cumulative impact of the Proposed Development with other permitted developments can be classed as long-term and not significant with respect to material assets during the construction and operational phases.

12.9 Summary

The potential impacts to material assets (built services) from the Proposed Development have been considered. During construction, there is potential for disruption to services, however, impacts will be localised and temporary in duration and are assessed as imperceptible-slight. No significant impacts are expected during the operational phases and no cumulative effects from other developments are expected.

13. Cultural Heritage

13.1 Introduction

This section of the assessment is concerned with the cultural heritage resource. This comprises archaeological assets, architectural heritage and designed landscapes such as gardens and demesnes. This baseline also considers the setting of these heritage assets, which can be described as the surroundings in which the heritage assets are experienced and appreciated.

The main objectives of the Archaeological desk-based assessment are:

- To identify cultural heritage assets within the Site and study area.
- To assess the baseline information and offer an analysis of the potential for currently unrecorded archaeological assets within the Site.
- To assess the importance of the cultural heritage assets.
- To assess the potential impact of the Proposed Development on cultural heritage assets and their setting within the Site and study area.

13.2 Legislation and Guidance

This assessment has been undertaken in accordance with all relevant legislation, policies and guidelines. The documents utilised in the preparation of this study include:

- National Monuments Acts[67].
- The Heritage Act[68].
- Heritage Ireland 2030[69].
- Planning and Development Acts[70].
- FDP 2023-2029[8].

13.2.1 Local and National Policy Framework - FDP 2023-2029

Local Cultural Heritage policy for Fingal is contained within Chapter 10 of the FDP 2023-2029. The primary aim of the archaeology and cultural heritage policies within this plan is to protect and conserve the heritage of the county through good management, sensitive interventions and sympathetic development. For archaeological sites, there are a number of objectives in place to safeguard this finite resource. The policies directly relevant to this study are:

- Policy HCAP2 – Importance of Archaeological Resource. Recognise the importance of our archaeological resource and provide appropriate objectives to ensure its appropriate retention and recording.
- Policy HCAP3 – Record of Monuments and Places/ Sites and Monuments Record. Safeguard archaeological sites, monuments, objects and their settings listed in the Record of Monuments and Places (RMP), Sites and Monuments Record (SMR) and any additional newly discovered archaeological remains.
- Policy HCAP4 – Preservation-in-situ. Favour the preservation in-situ (or at a minimum preservation by record) of all sites and features of historical and archaeological interest.
- Objective HCAO1 – Preservation-in-situ. Favour the preservation in situ or at a minimum preservation by record, of archaeological sites, monuments, features or objects in their settings. In securing such preservation the Council will have regard to the advice and recommendations of the National Monuments Service of the Department of the Housing, Local Government and Heritage.
- Objective HCAO2 – Protection of RMPs/SMRs. Protect all archaeological sites and monuments, underwater archaeology, and archaeological objects, which are listed in the Record of Monuments and Places and all sites and features of archaeological and historic interest discovered subsequent to the publication of the Record of Monuments and Places, and to seek their preservation in situ (or at a minimum, preservation by record) through the planning process.

[67] Government of Ireland (1930-2004), National Monuments Act (as amended)
[68] Government of Ireland (2018), Heritage Act (as amended)
[69] Government of Ireland (2019), Heritage Ireland 2030
[70] Government of Ireland (2000), Planning and Development Act (as amended)

- Policy HCAP5 – Development Design. Incorporate heritage features into infrastructure design at an early stage in the development planning and management process to protect and promote the cultural heritage resource and create awareness and interpretation.
- Objective HCAO7 – Archaeology and Development Design. Ensure archaeological remains are identified and fully considered at the very earliest stages of the development process, that Proposed Developments are designed to avoid impacting on the archaeological heritage.
- Objective HCAO8 – Archaeological Impact Assessment. Require that proposals for linear development over one kilometre in length. proposals for development involving ground clearance of more than half a hectare. or developments in proximity to areas with a density of known archaeological monuments and history of discovery. to include an Archaeological Impact Assessment and refer such applications to the relevant Prescribed Bodies.
- Objective HCAO10 – Context of Archaeological Monuments. Ensure that development within the vicinity of a Recorded Monument or Zone of Archaeological Notification does not seriously detract from the setting of the feature and is sited and designed appropriately.
- Objective HCAO11 – Impacts of large-scale development. Ensure that proposals for large scale developments and infrastructure projects consider the impacts on the archaeological heritage and seek to avoid them.
- Objective HCAO13 – Findings of Archaeological Activity. Encourage reference to or incorporation of significant archaeological finds into development Proposed Developments, where appropriate and sensitively designed, through layout, in situ and virtual presentation of archaeological finds and by using historic place names and the Irish language where appropriate.
- Objective HCAO15 – Best Practice. Promote best practice for archaeological excavation by ensuring that they are undertaken according to best practice as outlined by the National Monuments Service, Department of Housing, Local Government and Heritage, The National Museum of Ireland and the Institute of Archaeologists of Ireland.
- Policies and objectives on the architectural heritage directly relevant to this project are:
- Policy HCAP8 – Protection of Architectural Heritage. Ensure the conservation, management, protection and enhancement of the architectural heritage of Fingal through the designation of Protected Structures and Architectural Conservation Areas, the safeguarding of designed landscapes and historic gardens, and the recognition of structures and elements with no specific statutory designation that contribute positively to the vernacular, industrial, maritime or 20th century heritage of the County.
- Policy HCAP10 – Retention. Continue to support and encourage the sympathetic and appropriate reuse, rehabilitation and retention of protected structures and historic buildings ensuring the special interest, character and setting of the building or structure is preserved.

Policies and objectives on planned landscapes directly relevant to this project are:

- Policy HCAP18 – Designed Landscape Features, Settings and View. Protect the setting, significant views, and built features of historic designed landscapes and promote the conservation of their essential character, both built and natural.
- Policy HCAP19 – Development and Historic Demesnes. Resist proposals or developments that would lead to the loss or, or cause harm to the character, principal components or setting of historic designed landscapes and demesnes of significance in the County.
- Objective HCAO31 – Protection of Designed Landscapes. Identify the historic designed landscapes of significance in the County and determine the appropriate mechanism to ensure their future protection. Several of the most significant are already designated, as Architectural Conservation Areas.
- Objective HCAO32 – Designed Landscape Appraisal. Require that proposals for development within historic designed landscapes include a Designed Landscape Appraisal (including an ecological assessment) as part of the planning documentation to fully consider the potential impacts of the proposal. The appraisal should be carried out prior to the initial design of any development, in order that this evaluation to inform the design which must be sensitive to and respect the built heritage elements and green space values of the Site.

13.2.2 Sources

The preparation of the baseline was informed by material gathered and collated from various online sources, including:

- National Monuments Service (NMS) and Archaeological Survey of Ireland (ASI).
- National Inventory of Architectural Heritage (NIAH).

- FDP 2023-2029, Record of Protected Structures.

13.3 Methodology

13.3.1 Determination of Baseline Environment and Study Area

A study area of 1km from the Proposed Substation Development boundary and 200m from the Proposed Grid Connection has been used to identify all known and potential cultural heritage (archaeological, architectural heritage and designed landscapes) assets. These study areas are illustrated on Figures 13-1 to 13-4 and has been utilised to produce figures illustrating the surrounding cultural heritage assets. Heritage data from all sources has been identified within this 1km and 200m buffer. The size of this study area enabled a detailed examination of the heritage assets surrounding the Site, in order to provide sufficient archaeological and historical contextual information and allow an assessment of the archaeological potential of the Site to be made.

13.3.2 Assessing the Importance of Heritage Assets

A heritage asset is defined as a *monument, building, group of buildings and sites, which are the combined works of nature and man constituting the historic or built environment* (UNESCO 1972). A heritage asset's value is not solely expressed through any designated status but can also be exhibited through a series of values or special interests. These include architectural, historical, artistic, archaeological, cultural, scientific, social or technical interests. In order to assess the potential effects of a development upon a heritage asset, it must first be assigned a level of importance. This can be done in accordance with a three-point scale (Table.1). This table has been derived from the following guidance, with reference to relevant legislation and policy, and using professional judgement:

- NIAH Handbook[71].
- EPA Guidelines on Information to be Contained in Environmental Impact Assessment Reports[5].
- Code of Practice for Archaeology[72].
- TII Guidelines for the Assessment of Archaeological Heritage Impacts[73].

Table 13-1 Factors Determining the Importance of Heritage Assets

Importance	Criteria
National/High	National Monuments. Recorded Monuments deemed to be of high importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement. Protected Structures deemed to be of high importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Structures recorded by the NIAH Building Survey with a National Rating or deemed to be of high importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Designed landscapes recorded by the NIAH Garden survey with main features substantially present and deemed to be of high importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Architectural Conservation Areas containing structures and/or designed landscapes of predominantly national importance. Undesignated archaeological remains which are rare or complex in nature, and deemed to be of high importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement.
Regional /Medium	Recorded Monuments deemed to be of medium importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement. Protected Structures deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Structures recorded by the NIAH Building Survey with a Regional Rating or deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Designed landscapes recorded by the NIAH garden survey with main features substantially present and deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Architectural Conservation Areas containing structures and/or designed landscapes of predominantly regional importance. Undesignated architectural heritage assets which are deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement.

[71] Department of Arts, Heritage and the Gaeltacht (2013), NIAH Handbook
[72] Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs and TII (2017), Code of Practice for Archaeology.
[73] TII (formerly NRA) (2005), Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes

Importance	Criteria
	Undesignated archaeological remains which are neither particularly common nor uncommon, and/or of moderate complexity, and deemed to be of medium importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement.
Local/Low	Structures recorded by the NIAH Building Survey with a Local or Record Only Rating or deemed to be of low importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Designed landscapes recorded by the NIAH garden survey with only peripheral features surviving, and deemed to be of low importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Townland Boundary Features. Undesignated architectural heritage assets which are deemed to be of low importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. Undesignated archaeological features which are particularly common or in poor condition, and deemed to be of low importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement. Parks/Gardens/Demesnes recorded by the NIAH Garden Survey which have poor historic legibility.

The assessment is based upon currently available online information at the time of writing. No archaeological fieldwork has been undertaken to inform this assessment.

13.4 Baseline Environment

13.4.1 Geology and Topography

13.4.1.1 Proposed Substation Development

The underlying bedrock geology of the Site comprises Carboniferous-period Lucan Formation Dark Limestone and Shale (also known as Calp). This is overlain by limestone till comprising grey-brown Podzols in the north of the Site changing to gravels derived from limestone closer to the Broadmeadow River (Geological Survey of Ireland). Refer to Section 7.4.1.1 for further information.

13.4.1.2 Proposed Grid Connection

The underlying bedrock geology of the Proposed Grid Connection from Baleskin to Kilsallaghan comprises of a mixture of Tober Colleen formation (Calcareous shale, limestone conglomerate) and Malahide formation (argillaceous bioclastic limestone and shale). The bedrock formation throughout Kilsallaghan is a Rush Conglomerate Formation (conglomerate, shale and limestone). Around Fieldstown the underlying bedrock geology of the Site comprises of Carboniferous-period Lucan Formation Dark Limestone and Shale (also known as Calp). Refer to Section 7.4.1.1 for further information.

The southern Proposed Grid Connection lies on an elevation of 82m. Overall this fluctuates throughout the route, the maximum elevation is approximately 76m (by Kilsallaghan solar farm). In Fieldstown, the elevation is approximately 38m (Geological Survey Ireland Spatial Resources (arcgis.com)).

13.4.2 National Monuments

There are no sites or monuments under Preservation Order and no National Monuments in state care or ownership and guardianship of the Minister for Housing, Local Government and Heritage, within the Proposed Development site boundaries.

Additionally, there are no sites or monuments under Preservation Order and no National Monuments in state care or ownership and guardianship of the Minister for Housing, Local Government and Heritage within the 1km study area around the Proposed Development site.

One National Monument is recorded within the 200m study area extending from the Proposed Grid Connection. Dunsoghly Castle (NM 230) was associated with the Plunkett Family and is located within a farmyard 151 west of the Proposed Grid Connection at Dunsoghly. Dunsoghly Castle is a 15th century tower house consisting of four storeys with four large corner towers built with coursed limestone blocks with dressed stone quoins and a base batter. It is recorded as DU014-005001 on the Record of Monuments and Places.

A chapel (DU014-005002) is connected to the southwest corner of the tower house. This consists of an oblong, single storey building of randomly coursed masonry with roughly dressed limestone quoins. The entrance is in the west end of the north wall. It consists of a round arched doorway which contains punch dressed jambs with double roll moulding and a hood moulding that terminates in a rosette and fleur-de-lis. Above the door is a limestone tablet (DU014-005005-) inscribed with the date 1573.

The interior is lit by a double light window with semi-elliptical arches in the west gable. A blocked up rectangular window is set in the south wall alongside a pointed arch single light window with cusps and punch-dressed jambs.

A bawn wall extends from the northwest end of the tower house. The remains of a dwelling (DU014-005006) are attached to this bawn wall 173m to the west to the Proposed Grid Connection. These remains consist of the west wall and north gable with a Tudor style chimney which have been incorporated into farm outbuildings References in the Civil Survey (1654-6) mention a 'dwelling house' within the castle at Dunsoghly likely refer to this dwelling.

Two square trenched areas are visible on an aerial photograph to the east of the tower house and 123m to the west of the Proposed Grid Connection. These have been interpreted as possible house sites (DU014-005004) and have been partially built on since the aerial photographs were taken with the general area disturbed. The house sites are not covered by the National Monument designation. Further evidence of activity in the form of former field systems and ridge and furrow cultivation were detected by geophysical survey carried out as part of a Conservation Plan in 2010.

One further archaeological site associated with the National Monument is located on a natural rise 118m to the southwest of the tower house and outside the 200m study area around the Proposed Grid Connection. This is a former motte and bailey castle (DU014-005003) which is marked on the 1837 OS map as Connaberry Moat. The Site comprises a raised area, which is roughly oval in plan (measuring 80m northeast-southwest by 65m southeast-northwest and standing 3m high). Traces of an outer bank are visible on aerial photography. The rise is currently occupied by a farm and tree cover. The motte and bailey are not included in the National Monument Designation but is recorded as (RPS 623) on the Fingal County Record of Protected Structures 2023-2029.

13.4.3 Record of Monuments and Places

13.4.3.1 Proposed Substation Development

A review of the RMP dataset identified ten sites within 1km of the Proposed Substation Development. None of these are located within the boundaries of the Proposed Substation Development. The earliest of these comprises a mound (DU011-004) which is also recorded as a Protected Structure (RPS 0329) on the FDP 2023-2029.

The mound (DU011-004) is located on a north-facing slope 548m to the southwest of the Proposed Substation Development. It was originally a circular mound measuring 16m in diameter by 2.5m high with a lone bush on its summit. A cross was erected on the mound in modern times although this has since been removed with an electricity pole erected on the summit. The mound has been quarried at its northeast extent and terracing has taken place on its eastern and southern extents where some stones are visible. The exact nature of the mound is unknown but it most likely dates to the prehistoric period.

The Early Medieval period is represented by two assets within the 1km study area. The closer of these to the Proposed Substation Development is a Holy Well (DU011-002004) which is located 241m to the southwest in the grounds of Fieldstown House. This asset is also recorded as a Protected Structure (RPS 0329) on the FDP 2023-2029. It is set in the western face of a field bank in a hollow under trees. It is known locally as a holy well associated with St. Catherine but O'Danachair (1958) notes it is no longer venerated.

The second asset dating to the Early Medieval period is a ringfort (DU011-001) which is also recorded as a Protected Structure (RPS 0328) on the FDP 2023-2029. The RMP defines a ringfort as the general term given to circular enclosures surrounded by one, two or three banks of earth of stone, with or without, enclosing ditches constituting the defended farmhouse or dwelling site of the Early Medieval period in Ireland. The ringfort (DU011-001) is situated 663m to the southwest of the Proposed Substation Development on higher ground in a field of rich pasture which falls away to the south towards the R125 regional road and the Broadmeadow River.

It comprises a circular earthen platform measuring 70m in diameter which is enclosed by an outer earthen bank which measures 3m wide by 1.2m high. A ditch is evident around the ringfort except at the south, while the area immediately to the southeast has been extensively quarried. The perimeter of the ringfort has been extensively planted with trees, possibly to create a landscape feature for Newbarn House to the south. Several of these trees have since been removed leaving large holes and rotting tree stumps.

The medieval period is represented by three assets comprising two churches and a field system. The closest of these to the Proposed Substation Development is the field system (DU011-002003) which is located 265m to the southwest within the grounds of Fieldstown House between the Holy Well (DU011-002004) and St Catherine's Church (DU011-002001). The field system (DU011-002003) is evident as a hollow way running north-northwest to south-southeast linking the Holy Well and the church. The hollow way is 3m side and is defined by a drop to the east from level ground while there is evidence for drainage ditches on either side. The surrounding ground surface undulates implying the remains of a deserted settlement.

The remains of St Catherine's Church (DU011-002001) are located to the immediate north-northwest of the field system (DU011-002003) and 255m to the southwest of the Proposed Substation Development. This asset is also recorded as a Protected Structure (RPS 0326) on the FDP 2023-2029. The remains comprise a raised oval area measuring 45m east to west and defined by a bank with an external ditch which is best defined at the north. The foundations of a church exist as a grassed over mound measuring 18.8m long, 6m wide and 0.6m high. The church was first surveyed in 1992 and the RMP notes that the location has since been subject to intense planting and overgrowth. Donnelly (1905) notes that the chapel of St Catherine was place of pilgrimage until 1555 when the devotions ceased due to pilgrims being 'vexed' and 'molested' during their visits. The church appears to have fallen into disrepair after this and was ruinous by 1615 (Donnelly, 1905).

A graveyard (DU011-002002) associated with the church is located immediately adjacent. The remains of this are visible as two stone grave markers while the landowner has recovered an iron cross which is now chained to a nearby tree. The graveyard was used as a Killeen for the burial of unbaptised children although is no longer used for burials. It is recorded as part of the Protected Structure (RPS 0326) on the FDP 2023-2029.

Further activity during the medieval period is indicated by remains of the parish church of Killossery (DU011-005001) which is located on an elevated position above the Broadmeadow River 691m to the southeast of the Proposed Substation Development. The church is also recorded as a Protected Structure (RPS 0335) on the FDP 2023-2029. It is located with a surrounding walled graveyard (DU011-005002) and comprises a plain rectangular building measuring 13m long by 5.9m wide. The north wall survives to a height between 0.5m and 1m with the remains of a doorway at its west end. Walsh (1888) noted that this had a round arch during the 19th century although this has since been removed. The east and west gable end survive to window height with a plain, widely splayed window in the east gable. There are only slight traces of the south wall. A font was associated with the church although this has since been removed to the Roman Catholic church in Swords. The Civil Survey (1654-6) described the church as ruinous by the middle of the 17th century (Simington, 1945).

The remains of the enclosing walled graveyard (DU011-005002) are also recorded as a Protected Structure (RPS 0335) on the FDP 2023-2029, and it is also recorded on the National Inventory of Architectural Heritage (NIAH 11327005). It is noted that the graveyard appears to be artificially raised 2m above the surrounding ground level. This may indicate that the graveyard and church may be built on an earlier monument. Walsh (1888) states that the Site was originally a rath or ringfort which suggests that the medieval church was constructed upon an Early Medieval or earlier enclosure site.

This theory is possibly corroborated by the dimensions of the graveyard which is 30m in diameter and consistent with the size of a ringfort. There is a steep drop down to the north where there may originally have been an enclosing bank although this area is now tree lined and obscured. The ground beyond the trees to the north drops steeply to the Broadmeadow River. The adjacent R125 also curves noticeably from the north to southwest at the location of the graveyard although the curve in the road is much larger than the archaeological monument and does not appear to specifically respect it. The gravestones within the graveyard are predominantly 19th century in date although there are a concentration of older grave markers dating from 1725 located to the east of the church.

The post-medieval period is represented by the RMP sites within the study area including a corn mill site (DU011-05701) located 633m to the southeast of the Proposed Substation Development at Killossery. This asset is also recorded as a Protected Structure (RPS 0334) on the FDP 2023-2029. A mill belonging to Philip of Kilsallaghan is mentioned at Killossery in the Civil Survey (1654-6) and the mill complex is currently located between the hillslope and the Broadmeadow River. The mill building (DU011-057002) stands to the west of the yard with a dwelling that runs at right angles to it with some later out-buildings off to the north.

The mill building (DU011-057002) is orientated north to south measuring 16.4m long by 6.6m wide. It changes from a two-storey building to a one storey building as it ascends the hillslope. The building has stone foundations with mud walls and hipped gables. The thatched roof is covered in galvanised iron. The mill machinery is still present in the north end of the building while a corn kiln is located in the south end.

13.4.3.2 Proposed Grid Connection

A review of the RMP dataset identified 40 archaeological sites within 200m of the Proposed Grid Connection study area. Four of these have already been discussed in association with the National Monument Dunsoghley Castle (NM.230) comprising the towerhouse (DU014-005001), chapel (DU014-005002), houses (DU014-005004 &006) and plaque (DU014-005005), There are 39 sites that are scheduled for inclusion in the next revision of the RMP and 12 zones of archaeological potential associated with the recorded sites intersecting the Proposed Grid Connection. Listed below are the most significant RMP sites with zones of archaeological potential that are directly impacted by the route.

A group of four ring ditches are located towards the northern section of a field boundary in the surrounding area of the Proposed Grid Connection in the townland of Balseskin. Two of these assets have zones of archaeological potential intersecting the Proposed Development. The nearest ring ditch (DU014-130) is located approximately 15m southwest of the Proposed Grid Connection's boundary. This ring ditch is the easternmost of the group and has a circular plan. The second circular plan ring ditch (DU014-132) is located approximately 23m southwest of the Proposed Grid Connection's boundary. It should be noted that a third ring ditch (DU014-131) is located on the border of the Proposed Development but has no associated Zone of Notification.

Further along the R122 is an Inn (DU014-047) with its zone of archaeological potential extending into the Proposed Grid Connection. The inn, itself, is located within overgrown pasture, approximately 10m north of the Proposed Grid Connection, although there are no visible remains. Further to the north is a curvilinear earthwork (DU014-017) with a zone of archaeological potential intersecting the Proposed Grid Connection. The enclosure is situated in a low-lying area, located approximately 15m east of the Proposed Grid Connection.

A farmhouse (DU011-067) is shown on the Down Survey map (1655-6) at Shallon and a small vernacular building, of a hearth type, currently occupies the location which is by the roadside on a right-angle bend in a low-lying situation. The associated Zone of Notification extends across the bend in the road with the Proposed Grid Connection passing through it for a distance of 92m.

A Zone of Notification in Common covers both a ringfort (DU011-023001) and a graveyard (DU011-023002). The Zone of Notification fully extends over the Proposed Grid Connection. The ringfort (DU011-023001) is located approximately 35m west of the Proposed Grid Connection. The oval enclosure is shown on the 1837 OS 6-inch map and was interpreted as a ringfort. However, an archaeological investigation in 1999 recovered nothing of archaeological significance from the feature. The graveyard (DU011-023002) which is presented as a small field is located approximately 30m west of the Proposed Grid Connection. In the local area, tradition suggests that the Site was either an 'old fort' or a 'burying place' (Healy 1975, 23).

In the townland of Corrstown, the Zone of Notification covering a church (DU011-022001) and a graveyard (DU011-022002) intersects the Proposed Grid Connection. The church, which is enclosed by the walled graveyard, is located approximately 45m west of the route. Originally, the church was a subsidiary chapel to Kilsallaghan (Joyce, 1890, 40). The only surviving feature of the church is the chapel midway which lies at the base of the western tower. The ground floor is entered through an arched opening on the eastern wall which then follows to a vaulted chamber. Towards the north section of the western wall there is a mural chamber. As well as the church containing a spiral staircase towards the southwestern projection. The remains of the church are traced over an area of c.8m east of the tower.

The walled graveyard (DU011-022002) which surrounds the church (DU011-022001) is located approximately 35m west of the Proposed Grid Connection. The graveyard is located amongst tilled fields. Within the graveyard there is a mixture of 18th, 19th and 20th century headstones as well as the base of the west tower referenced above.

The 'base of a stone cross' (DU011-010), which has a Zone of Notification extending over the road, lies on the boundary of the Proposed Grid Connection. An OS map dating to 1840 lists that the base of the stone cross was located at the southern end of a Fair Green at the junction between three roads. The cross was described by Austin Cooper as 'the pedestal of a market cross' (ed. Price, 1942, 42). There are no visible surface traces of the base of a stone cross at this location currently.

One large Zone of Notification covers the central townland of Castlefarm including the Proposed Grid Connection, this includes multiple assets such as a church (DU011-011001), graveyard [DU011-011002) and ecclesiastical enclosure (DU011-011003) in one area. Followed by a battlefield (DU011-100), castle- tower house (DU011-011004) and an earthwork (DUO11-011006) and field system (DU011-011005) in the wider area.

Towards the northwest section of the church (DU011-011001) is a flat wide embankment, this is likely the remains of an ecclesiastical enclosure (DU011-011003). The potential pre-Norman Ecclesiastical enclosure is located approximately 55m east of the Proposed Grid Connection. Further investigation by Swan (1971) has revealed a double enclosure that extends from the southwest to the northeast near the road. Aerial photography has identified a low curving bank enclosing the north and eastern area of the churchyard.

Just within the ecclesiastical enclosure (DU011-011003), surrounding the church (DU011-011001) is a sub-rectangular graveyard [DU011-011002]. The graveyard is located approximately 15m east of the Proposed Grid Connection. The graveyard is currently still in use and contains 18th/19th century headstones.

The Saint David's Church of Ireland lies centrally in the graveyard, approximately 22m east of the Proposed Grid Connection RLB. The church (DU011-011001) is recorded as a Protected Structure (RPS 0653) on the FDP 2023-2029, and it is also recorded on the NIAH (NIAH 11333001). Originally, the Site was a medieval chapel which was gifted in 1197 to St Thomas's Abbey in Dublin. However, the Site is now occupied by a 'board of first fruits structure' (1812). By the 18th century, the original church gable was still standing.

Also in the Zone of Notification is the Site of the Battle of Kilsallaghan (DU011-100), this is located approximately 45m east of the Proposed Grid Connection. The battle took place in 1642 around Kilsallaghan castle and included approximately 2,800 government forces under the Early of Ormond and between c. 2,000-3000 insurgents led by Colonel Hugh Byrne.

The castle (DU011-011004) is also surrounded by its Zone of Notification and is recorded as a Protected Structure (RPS 0654) on the FDP 2023-2029. The remains of the medieval stone tower house (DU011-011004) are located approximately 50m east of the Proposed Grid Connection. The only surviving features of the castle are the southwest turret, northwest stair turret with slit opes and part of the ground floor. Alongside the tower house is an associated field system (DU011-011005) which includes drains and banks. Additionally, a flat-topped earthwork (DU011-011006) is located approximately 90m east of the Proposed Grid Connection.

Towards the northern section of the Proposed Grid Connection in the townland of Fieldstown, there is a Zone of Notification partially covering the route The Zone is associated with four recorded monuments, these are listed as a holy well (DU011-002004), field system (DU011-002003], graveyard (DU011-002002) and a church (DU011-002001). The Holy Well (DU011-002004) is located approximately 75m west of the Proposed Grid Connection. This asset is also recorded as a Protected Structure (RPS 0329) on the FDP 2023-2029. It is set in the western face of a field bank in a hollow under trees. It is known locally as a holy well associated with St. Catherine but O'Danachair (1958) notes it is no longer venerated.

The field system (DU011-002003) is located approximately 120m west of the Proposed Grid Connections. The field system (DU011-002003) is evident as a hollow way running north-northwest to south-southeast linking the Holy Well and the church. The hollow way is 3m to the side and is defined by a drop to the east from level ground while there is evidence for drainage ditches on either side. The surrounding ground surface undulates implying the remains of a deserted settlement.

The remains of St Catherine's Church (DU011-002001) are located to the immediate north-northwest of the field system (DU011-002003) and approximately 165m to the southwest of the Proposed Development site. This asset is also recorded as a Protected Structure (RPS 0326) on the Fingal Development Plan 2023-2029. The remains comprise a raised oval area measuring 45m east to west and defined by a bank with an external ditch which is best defined at the north. The foundations of a church exist as a grassed over mound measuring 18.8m long, 6m wide and 0.6m high. The church was first surveyed in 1992 and the RMP notes that the location has since been subject to intense planting and overgrowth. Donnelly (1905) notes that the chapel of St Catherine was place of pilgrimage until 1555 when the devotions ceased due to pilgrims being 'vexed' and 'molested' during their visits. The church appears to have fallen into disrepair after this and was ruinous by 1615 (Donnelly, 1905).

A graveyard (DU011-002002) associated with the church is located immediately adjacent. The remains of this are visible as two stone grave markers while the landowner has recovered an iron cross which is now chained to a nearby tree. The graveyard was used as a Killeen for the burial of unbaptised children although is no longer used for burials. It is recorded as part of the Protected Structure (RPS 0326) on the FDP 2023-2029.

13.4.4 Designated Architectural Heritage Sites

13.4.4.1 Proposed Substation Development

There are 11 assets recorded as protected structures on the FDP within the Study Area around the Proposed Substation Development. None of these are located within the Proposed Substation Development site. Six of these protected structures are also assets recorded on the RMP and have been discussed in Section 13.4.3.

The remaining protected structures are buildings and structures that represent the development of the area from the post-medieval period onwards. Two of the protected structures are houses dating to the 18th century which are set within their respective Planned Landscapes. The closer of these is Fieldstown House (RPS 0325) is located 278m to the southwest of the Proposed Substation Development. This is an 18th century country house with a walled garden and stone outbuildings set within an associated Historic Garden (NIAH 2171). This Historic Garden extends east to the R122 regional road, 22m from the Proposed Substation Development. Fieldstown House is clearly labelled on the 1st edition OS map (1836) with the walled garden a prominent feature. The church of St Catherine (RPS 0326) is clearly labelled within the Historic Garden. The Holy Well (RPS 0327) is not identified although a pathway leads to its location. Fieldstown House is clearly identified on the subsequent 2nd edition OS map (1909) although the surrounding Historic Garden is denuded with the walled garden no longer a prominent feature. The church of St Catherine (RPS 0326) is clearly labelled although the Holy Well (RPS 0327) is still not shown. The path is no longer shown. The boundary of the Historic Garden is still discernible on current mapping although Fieldstown House (RPS 0325) appears as an unremarkable fam complex.

Rowlestown House (RPS 0330), which is also recorded as NIAH 11327007, is located 300m to the east of the Proposed Substation Development, this is a detached five bay, two-storey over basement house which dates to 1760. There is a single-bay, three-storey return to rear and a two-storey extension to the west. Other buildings on the Site consist of detached farm buildings. Rowlestown House (RPS 0330) is set within the surrounding Historic Garden (NIAH 2174). The Historic Garden is contemporary with the house and is shown on the 1st edition OS map (1836). The perimeter of the Historic Garden is tree-lined and clearly discernible with Rowlestown House (RPS 0330) set within the centre and accessed via a laneway which leads northeast from the road. Outbuildings are marked to the immediate north of the house and these are accessed via a separate lane which leads directly north from the main road. Orchards are marked to the east and south of Rowlestown House (RPS 0330) while dense bands of planting are evident to the west and east. These dense bands of planting most likely form shelter belts to protect against the wind. The Historic Garden does not incorporate the area of the Proposed Substation Development.

The Historic Garden (NIAH 2174) is clearly visible on the subsequent 2nd edition OS map (1909) with Rowlestown House (RPS 0330) clearly labelled within its centre. The outbuildings to the north have expanded while the orchards to the east are no longer shown. Similarly, the shelter belt to the west is no longer shown. The boundaries of the Historic Garden are still discernible on current mapping with the house in the centre. However, the Historic Garden is greatly denuded with the orchards and shelter belts no longer visible. The laneway, which formerly led to the house, is no longer shown with access now via the laneway to the outbuildings.

There are three further protected structures located within the Study Area. The closest of these to the Proposed Substation Development is Rowlestown West (RPS 0331), also recorded as NIAH 11327006, which is located 517m to the southeast. It is a detached three-bay, two-storey house dating to 1890 with a projecting entrance porch flanked by bow windows and a single storey extension to the rear dating to 1970. The stable yard dates to 1900 while a detached three-bay single-storey former thatched cottage and detached four-bay single-storey farm building date to 1800. The bridge is marked on the OS mapping from 1836 onwards.

The last Protected Structure within the Study Area is the Church of Our Lady Queen of Peace (RPS 0332) which is located 757m to the southeast of the Proposed Substation Development. Also recorded as NIAH11327001, this detached Roman Catholic church dates to 1860 consisting of a five-bay side elevation to nave with single-storey chancel, having adjoining sacristy. A gable-fronted projecting entrance porch is located to street elevation while a gable-fronted projecting entrance porch to the rear elevation dates to 2000.

13.4.4.2 Proposed Grid Connection

One other asset is recorded as a protected structure on the FDP 2023-2029 within the 200m study area. This is Freedagh Mound (RPS.0644) which is located 180m to the west of the Proposed Grid Connection at Corrstown. This asset comprises an earthwork, which has been incorporated into a field boundary on a steep east facing slope, at the highest point of a ridge within a golf course. There are no signs of a ditch or bailey associated with this earthwork which is believed to be a motte. It is also recorded on the RMP as DU011-020.

13.5 Undesignated Architectural Heritage Sites

13.5.1 National Inventory of Architectural Heritage- Buildings

13.5.1.1 Proposed Substation Development

There are three buildings recorded on the NIAH within the study area around the Proposed Substation Development. All are also recorded as Protected Structures on the FDP 2023-2029 and have been discussed under this designation.

13.5.1.2 Proposed Grid Connection

There are two buildings recorded on the NIAH (11333001, 11348001) within the study area around the Proposed Grid Connection. All are also recorded as Protected Structures on the Fingal Development Plan 2023-2029 and have been discussed under this higher designation.

In addition to this, Chapelmidway triple-arch rubble stone Bridge (c.1820) is located along the Proposed Grid Connection at Laurestown and is recorded on the National Inventory of Architecture (11342007). This bridge dates to 1820 and carries the road over a local stream.

13.5.2 National Inventory of Architectural Heritage (NIAH) Garden Survey

13.5.2.1 Proposed Substation Development

Three Historic Gardens are located within the study area. Two of these, Fieldstown House (NIAH 2171) and Rowlestown House (NIAH 2174) are associated with Protected Structures and have been discussed in relation to these assets.

The third historic garden within the study area is Newbarn House (NIAH 2296), which is located 800m to the southwest of Proposed Development site. The Newbarn House Historic Garden is shown on the 1st edition OS map (1836) with Newbarn House clearly labelled with parkland, and a formal garden and outbuildings clearly marked. The Historic Garden is shown as denuded on the 2nd edition OS map (1909) with the house still labelled although the surrounding features are not apparent. The Site footprint is still visible on modern mapping with the parkland and formal garden still intact.

13.5.2.2 Proposed Grid Connection

There are four historic gardens located within the study area around the Proposed Grid Connection, these are Newbarn house (NIAH 2296), Fieldstown House (NIAH 2171), Corrstown House (NIAH 2301) and Kilcoskan House (NIAH 2302).

Newbarn house gardens (NIAH 2296), is located directly west of the Proposed Grid Connection. This house has been discussed previously in section 5.5.4. Fieldstown House associated historic gardens (NIAH 2171) is located directly west of the Proposed Grid Connection. This is an 18th century country house with a walled garden and stone outbuildings set within an associated Historic Garden (NIAH 2171). The gardens are present on the 1st (1836), 2nd (1909) and revised edition OS map. Corrstown House (NIAH 2301) and associated gardens is located approximately 100m west of the Proposed Grid Connection. Lastly, Kilcoskan House (NIAH 2302) and associated historic gardens is located 190m west of the Proposed Grid Connection.

13.5.3 Townland Boundaries

13.5.3.1 Proposed Substation Development

Townlands are the lowest level, officially defined geographical area in Ireland and date to before the Anglo-Norman period (12th century). The boundaries of townlands boundaries are often visible in the landscape as walls, tree-lined ditches and embankments or natural features such as streams. They provide visible physical evidence of historical territory or political boundaries and are regarded as being of local importance as historic, cultural heritage features.

The eastern boundary of the Proposed Substation Development is formed by a north to south orientated field boundary comprised of mature vegetation. The field boundary forms the boundary between the townlands of Fieldstown and Rowlestown. The Proposed Development site is completely located within the townland of Fieldstown.

13.5.3.2 Proposed Grid Connection

A total of 21 townland boundaries are intersected by the Proposed Grid Connection. The Proposed Grid Connection runs directly though the townlands of Baleskin, Dubber, Coldwinters, Newtown, Dunsohly, Broghan, Shallon, Shanganhill, St Margaret's, Millhead, Kingstown, Ballystrahan, Common, Skephubble, Laurestown, Surgalstown, Kilcoskan, Ballyhack, Castlefarm, Kilsallaghan and Fieldstown. The Proposed Grid Connection is located within active roadways and there are no physical traces of these townland boundaries where the Proposed Grid Connection crosses over them.

13.5.4 Previous Archaeological Investigations

13.5.4.1 Proposed Substation Development

Examination of *Excavations.ie, the database of Irish excavations* reports, reveals two archaeological investigations which have taken place within the study area. The closer of these to the Proposed Development site took place in Killossery, Rowlestown 600m to the southeast. This investigation took the form of trenches excavated in five fields in 2016 (Shanarc, 2016). Nothing of archaeological significance was uncovered within four of the five fields.

The fifth field was located close to the mill (DU011-057) and uncovered features associated with the industrial site including cobbled and metalled surfaces, drainage and an overflow for the mill race. Investigations also revealed that the buildings were built directly onto the ground surface. The mill race was also partially uncovered.

The second investigation took place in 2006 in advance of the construction of a single dwelling to the northeast of Newbarn House. Nothing of archaeological interest was uncovered during the investigation (Sweetman, 2006).

13.5.4.2 Proposed Grid Connection

Archaeological testing by Irish Archaeological Consultancy Ltd (2010:280) took place approximately 260m southwest of the Proposed Grid Connection. Geophysical surveying was undertaken prior to test trenching, this was to determine areas of archaeological potential. The archaeological testing was undertaken at a proposed Kildonan Stop and Kildonan Parks and Ride. A total of three trenches were mechanically excavated. The archaeological investigation recovered an enclosure with two post-holes, this could have been associated with a palisade. There were also two kilns identified towards the southern end of the enclosure.

In 1988, archaeological investigations for the Phase 2 Northeast Gas Pipeline revealed an area of occupation debris. These were situated on a slight north facing incline 190m to the east of the Proposed Grid Connection in the townland of Broghan. This occupation debris consisted of multi-period artefacts including three iron objects. The occupation debris is believed to represent a settlement and is recorded on the RMP as a settlement site (DU014-094).

Three separate archaeological investigations took place near the route, these were undertaken by Archaeological Consultancy Services Ltd (2006:568). The archaeological assessments took place prior to a planned M50 Upgrade Scheme, these were in areas 4, 5 and 6. The nearest archaeological assessment was area 5, this was located approximately 90m south of the route. The investigation contained a total of 15 test trenches throughout three fields. Overall, there were no features of archaeological significance identified. Both areas 4 and 6 were outside of the Proposed Grid Connection study area.

Ellen O’ Carroll, The Archaeology Company, undertook an archaeological excavation (05E0236) as part of a planning application for warehousing units on the border of the Proposed Grid Connection on R122. Aerial photography identified sites with potential archaeology. The Site showed characteristics of an early medieval multivallate ringfort. Within the feature there was a singular prehistoric pottery sherd recovered.

An archaeological impact assessment (18E0722) was conducted by Gill McLoughlin, Courtney Deery Heritage Consultancy, approximately 20m west of the route. The assessment was carried out prior to no.3 of a grant of planning permission from Fingal County Council (Planning ref. F18A/0307). In the northern section of the proposed development was the possible site of a ringfort (DU011-023001) and a graveyard (DU011-023002). Five trenches were excavated on the 5 December 2018; however, no features or deposits of archaeological significance were identified.

The possible ringfort and graveyard were also investigated by Malachy Conway, Archaeological Consultancy Services Ltd (1999:172). The assessment was carried out prior to the development of proposed dwellings. The excavation involved the mechanical excavation of three test trenches on the 30 November 1999. Overall, the investigation did not reveal anything of archaeological significance.

Test trenching (2011:219) was undertaken prior to development by Rosanne Meenan at two adjoining sites in Kilsallaghan. One site included the excavation of 17 test trenches (F10A/0472), this was located approximately 40m west of the route. The test trenches recovered a spread of stone exposed at 0.55m below the surface, a band of charcoal clay and 17th-19th century pottery.

The adjoining proposed horticultural nursery site was tested by means of seven test trenches (F10A/0342), this was located approximately 110m west of the route. Overall, there was a circular area of clay embedded with charcoal flecks and a stone spread which was identified as a field fence. Both sites investigated have low archaeological significance, but mitigation measures were recommended.

Archaeological monitoring works (2021:237), relating to the upgrading of the water-mains infrastructure between Ballycoolen and Kingstown townlands, in north County Dublin, was carried out between 19 April 19 and 15 June 2021. The works were situated within the townland of Newtown in proximity to the Proposed Grid Connection. A single small pit was identified which contained one fill, a compact dark brown and mid-greyish orange mottled silty clay. It contained frequent charcoal flecks, occasional burnt bone, possibly human in origin, and occasional small angular stones. The pit measured 0.88m east-west by 0.43m and was 0.08m deep.

Three archaeological investigations have taken place within the townland of Dunsoghly with the earliest taking place in 1994 (1994:091). This was at the National Monument Dunsoghly Castle (NM.230) which featured as a set on the film Braveheart. Minor excavation was carried out in four areas where mock houses were to be erected and a mock moat placed. Artefacts recovered comprised clay pipes, sherds of black glazed earthen ware and an iron hook. A stone wall or drain was also disturbed. The other two investigations took place on the Kilshane Road in 2022 (2022:018) and 2023 (2023:036). Nothing of archaeological significance was uncovered during these works.

Another archaeological investigation (2009:296) took place in Kilsallaghan prior to development, this was located approximately 130m east of the Proposed Grid Connection Boundary. The archaeological research was conducted due to a series of monuments including a nucleated medieval deserted settlement which lay west of the development. The main feature recovered from this investigation was a stone drain recovered in both trench 6 and trench 8. Other than this, nothing of substantial archaeological significance recovered relating to medieval activity.

A geophysical survey (16R0066) was conducted by Archaeological Consultancy Services Unit prior to development approximately 185m east of the route in Kilsallaghan. The results of the geophysical survey were compared with the earlier test trenching referenced above (2009:296)**.** Overall, the results illustrated a linear anomaly which is likely to reflect a ditch with a stone drain. In addition to this, the geophysical survey also shows a circular anomaly and linear ploughing trends, likely relating to field system and features relating to the monuments.

Archaeological testing undertaken by ADS Ltd (07E0326 ext.) took place along the main road through Kilsallaghan. Testing uncovered remains of a burnt mound which had been intersected by drains. The complete area of the mound uncovered by the trenches measured 6.2m east and 11.2m west.

Another archaeological testing (07E0326) was undertaken prior to a new access road linking the N2 to the new development at Kilsallaghan. From the 126 trenches excavated there were 32 field drains, seven furrows, modern agricultural activity, three intercutting ditches and a pit uncovered.

13.5.5 Cartographic Research

13.5.5.1 Proposed Substation Development

Historic cartographic sources were examined using the NMS's Historic Environment Viewer (https://maps.archaeology.ie/HistoricEnvironment/). The 1st edition OS map (1836) shows the area of the Proposed Substation Development during the first half of the 19th century (map not reproduced). The location of the Proposed Substation Development is shown as agricultural land similar to the current layout. It includes parts of three fields which are separated by tree-lined boundaries. The eastern boundary is identified as the townland boundary between Fieldstown and Rowlestown. The Broadmeadow River is situated to the south of the location of the Proposed Substation Development and is also identified as the townland boundary between Fieldstown and Newbarn.

The curving field boundary located within the Proposed Substation Development is extant at this period and is shown curving southwest from a linear feature to join the southern field boundary. The linear feature extends southeast from a semi-circular feature located within the northwestern corner of the larger field. The linear feature is not straight with several sharp bends along its length which suggests that it may be a stream. A similar linear feature curves from north to southeast within the northern half of the Proposed Substation Development and this may also represent a stream. An old gravel pit is located to the southwest of the location of the Proposed Substation Development close to the river. This gravel pit is the only indication of activity within the area close to the Proposed Substation Development.

The wider area is occupied by the Historic Gardens associated with the houses at Fieldstown, Rowlestown and Newbarn. All three are well established at this time. The archaeological sites within the study area are all marked with the exception of the Holy Well (DU011-002004). The mound (DU011-004) is identified as a gravel pit.

The 2nd edition OS map (1909) shows the area of the Proposed Substation Development at the start of the 20th century (map not reproduced). The location of the Proposed Substation Development is unchanged from the previous map edition although the linear features are clearly identified as streams and the old gravel pit is no longer shown. The surrounding Historic Gardens are still apparent although these are denuded with the buildings appearing as farm complexes while the wider area appears rural in nature. Archaeological sites are still marked within the wider area although the mound (DU011-004) is no longer marked.

13.5.5.2 Proposed Grid Connection

The 1st edition OS map (1836) shows the conditions within the line of the Proposed Grid Connection and the immediate vicinity during the first half of the 19th century. At the southwest of the route, the cable accesses a green field area with vast open fields. The route, then, enters the road (now R122) and follows along it to the northwest passing The Old Red Lion Inn (DU014-047). The Proposed Grid Connection continues along the road until it reaches a road junction labelled *Pass if you can*. Here, the Proposed Grid Connection turns west to follow the road towards Dunsoghly Towerhouse (NM.230). Disturbance is shown in the form of a large quarry to the immediate south of the road at this juncture. Dunsoghly Castle (NM.230) is clearly marked as a bastioned structure with adjoining walls, while the chapel (DU-014-005002) is labelled to the immediate south. The Proposed Grid Connection continues along the road which has some notable curves and sharp bends along it, although these do not appear to correspond to possible upstanding archaeological remains. The Proposed Grid Connection turns northeast at Broghan and follows the road. The road passes the location of a house (DU011-067) where a building is shown. The Proposed Grid Connection rejoins the road, later named the R122, at Commons where the ringfort and graveyard (DU011-023) are located. There are no indications of these heritage assets within their location which is depicted as a sub-rectangular field.

The Proposed Grid Connection remains within the previously depicted roads. The cable follows the road until Chapelway Bridge (NIAH 11342007), where directional drilling will take place immediately to the west of the bridge. The OS map depicts a gravel pit within the field directly west of the bridge. The Proposed Grid Connection remains within the road through Kilsallaghan. Along the route is the 'Base of Stone Cross' (DU011-010) next to Fair Green at the junction of the three roads. This is said to be the pedestal of a market cross which tallies with the asset being located adjacent to the Fair Green. The medieval complex of the church (DU011-011001), enclosure (DU011-011003) and castle (DU011-011004) are clearly marked to the north of the Fair Green. Kilsallaghan is shown to be relatively undeveloped with only a few buildings forming the village. Towards the north end of the Proposed Grid Connection in Fieldstown is an open field with little development depicted.

The second edition 25-inch map (1909) and the third edition Cassini six-inch map (1900-1924) show the rural area of the route to be relatively unchanged with the roads also showing no change or modifications.

13.5.6 Aerial and Satellite Imagery

13.5.6.1 Proposed Substation Development

Aerial photographic evidence has been examined using the NMS's Historic Environment Viewer (https://maps.archaeology.ie/HistoricEnvironment/). Aerial and satellite imagery shows that the Proposed Development site consists of parts of three fields divided by a curving field boundary/stream. The stream largely follows the line shown in the historic cartographic evidence although the easternmost section to the eastern field boundary no longer exists. Similarly, the curving stream formerly shown within the northern half of the Proposed Development site is no longer apparent. To the south, the River Broadmeadow has been realigned and straightened.

The fields forming the Proposed Development site are under pasture and there are no visible signs of cropmarks which could indicate the presence of subsurface archaeological features. There are no visible signs of the former gravel pit either despite this being a large feature within the immediate vicinity of the Proposed Development site on the 1st edition OS map (1836).

13.5.6.2 Proposed Grid Connection

Aerial photographic evidence has been examined using the NMS's Historic Environment Viewer (https://maps.archaeology.ie/HistoricEnvironment/). Aerial photography dating to 1995 shows the partially constructed M50 motorway to the immediate south of the Proposed Grid Connection. Other than this, there are no major differences between the previous OS maps and the aerial photography. None of the archaeological sites identified through aerial photography are evident on these aerial photographs.

Modern satellite imagery (2013-2018) shows the full construction of the completed M50 northern cross route, alongside the addition of the R108 through St Margaret's. In addition to this, there are small developments within each small settlement along the Proposed Grid Connection, this includes residential dwellings and agricultural buildings.

13.6 Potential Impacts

13.6.1 Direct Impacts During the Construction Phase

13.6.1.1 Proposed Substation Development

The Proposed Substation Development site occupies parts of three fields which are currently under pasture. The boundaries between the fields are formed by hedges which have been extant since the early 19th century while historic cartographic sources show the southwest extent of the Proposed Substation Development crossed by a stream which has since been removed. This is the only improvements evident with the Proposed Substation Development which is shown as agricultural ground for the last 200 years.

There are no recorded heritage assets within the Proposed Substation Development, though the eastern and southern boundaries comprise historic townland boundaries and separate the townlands of Fieldstown and Rowlestown, and Fieldstown and Newbarn respectively. Under the criteria outlined in Section 13.3.2, these are considered heritage assets of local interest and low importance. The Proposed Substation Development will be fully contained within the fields and these boundaries will not be impacted.

While there are no recorded heritage assets within the Proposed Substation Development, the known heritage assets within the 1km study area represent activity within the area dating from the Prehistoric period through the Early Medieval, Medieval and Post-Medieval periods. In particular, the closest archaeological assets to the Proposed Development include a Holy Well (DU011-002004), St. Catherine's Church (DU011-002001) and possible settlement activity (DU011-002002). These assets represent Early Medieval and medieval activity while their surrounding landscape is a Historic Garden (NIAH 2171) associated with the 18th century Fieldstown House (RPS 0325).

The majority of the archaeological sites within the Study Area are all recorded as Protected Structures on the FDP 2023-2029. While this designates these as assets of regional interest and medium importance, most have been greatly disturbed and have been designated Protected Structures in order to protect them from further disturbance. The majority of the assets, especially the Holy Well (DU011-002004), mound (DU011-004) and ringfort (DU011-001), would normally be considered of local interest and low importance.

There is the possibility that the Proposed Substation Development may have been utilised in the past for settlement or other activities before becoming agricultural land. Evidence of such activity would exist, as yet previously undiscovered archaeological sites and features. Any such sites and features would likely be of local interest and low importance although the archaeological interest and importance of as yet unrecorded assets can only be confirmed upon identification.

The potential impacts upon such archaeological sites and features would consist of the destruction of sites, features or deposits during construction and impacts upon sites, features or deposits to gain site access. The severity of these impacts can be reduced with appropriate mitigation.

13.6.1.2 Proposed Grid Connection

The proposed scheme involves constructing a Proposed Grid Connection which is 13.3km long from substation to Finglas. The baseline study has revealed that there are two recorded heritage assets within the Proposed Grid Connection, these are listed as Chapelmidway Bridge (11342007) and the base of a stone cross in Kilsallaghan (DU011-010).

The construction relating to the Proposed Grid Connection is unlikely to physically impact the base of a stone cross (DU011-010) in Kilsallaghan. This is due to the unknown location of the stone cross foundation which has been removed from its former location at the junction of three roads. The risk increases to the north due to the medieval setting of Kilsallaghan with its tower house (DU011-011004) and ecclesiastical enclosure (DU011-011003) located directly adjacent to the road and Proposed Grid Connection. Overall, the potential for unknown remains from this period to be encountered within the Site's boundary is considered high.

Chapelmidway Bridge (NIAH 11342007) is near the construction. However, it is unlikely that the work will impact the bridge as the cable will be installed using directional drilling to the west of the asset.

The closest heritage assets to the Proposed Grid Connection comprise a ring ditch (DU014-130), an Inn (DU014-047), curvilinear earthwork (DU014-017), a house (DU011-067) and a sub-rectangular graveyard (DU011-011002). There is the possibility that the Proposed Development site may have been utilised in the past for settlement or other activities. Evidence of such activity would exist in the form of previously undiscovered archaeological sites and features. Any such sites and features would likely be of local interest and low importance although the archaeological interest and importance of as-yet unrecorded assets can only be confirmed upon identification.

The potential impacts upon such archaeological sites and features would consist of the destruction of sites, features or deposits during construction and impacts upon sites, features or deposits to gain site access. The severity of these impacts can be reduced with appropriate mitigation.

Overall, much of the Proposed Grid Connection footprint runs along existing roads where the existing ground has been disturbed by road construction and the laying of services. This activity would have severely impacted or destroyed any archaeological features which may have existed. However, if unexpected remains are found during construction, advice from an archaeological specialist should be sought.

In addition to this, whilst there will be no direct impacts to the monuments, associated Zones of Notification extend within the Proposed Grid Connection. Such zones do not define the exact extent of the associated monument but are intended to identify them for purposes of notification under Section 12 of the National Monuments Act (1930-2004), whereby a notification of proposed works must be submitted to the National Monument Service at least two months in advance of works commencing. The footprint of the scheme will extend into 12 of these Zones of

Notification. It is essential that a notification of proposed works within the Zones of Notification must be submitted to the National Monuments Service at least two months prior to the Site works entering any of these zones.

13.6.2 Impacts to Setting During Construction Phase

13.6.2.1 Proposed Substation Development

There are a number of Protected Structures within the Study Area around the Proposed Substation Development. The majority of the archaeological sites have been physically disturbed and have been designated Protected Structures for their protection. The physical presence of the Proposed Substation Development will not create an impact upon the setting of these assets.

Other Protected Structures within the Study Area are upstanding buildings including Fieldstown House (RPS 0325) Rowlestown House (RPS 0331) and Rowlestown West (RPS 0321). These buildings were all associated with farm complexes and are considered assets of regional interest and medium importance. They are located over 300m away and, given this distance, the physical presence of Proposed Substation Development will not create an impact upon the setting of these assets.

Fieldstown House (RPS 0325) and Rowlestown House (RPS 0331) are set within their associated Historic Gardens (NIAH 2171 and 2174 respectively). Both Historic Gardens are greatly denuded with prominent features removed or degraded. As such, they are considered of local interest and low value. The physical presence of Proposed Substation Development will not create an impact upon the agricultural setting of these assets. The third Historic Garden, Newbarn House (NIAH 2296), is substantially intact with many of its features still present. It is considered of regional interest and medium importance. Newbarn House (NIAH 2296) is located 1km from the Proposed Substation Development and the physical presence of Proposed Substation Development will not create an impact upon the setting of these asset given the intervening distance.

The construction of the Scheme will also introduce additional traffic and noise to the areas of the Protected Structures and assets recorded on the NIAH. While these have the potential to impact upon the settings of these assets, this will be a temporary impact limited to the construction phase and will not extend to the operational phase once the scheme is in use.

13.6.2.2 Proposed Grid Connection

There would be slight temporary changes to the setting of archaeological assets, located adjacent to the Proposed Grid Connection and also to the setting of Chapelmidway Bridge (NIAH 11342007). However, the temporary construction works and the physical presence and operation of the Proposed Development site will not result in significant adverse impacts upon the setting of these assets.

The construction of the Proposed Grid Connection will also introduce additional traffic and noise to the areas of the Protected Structures and assets recorded on the NIAH. While these have the potential to impact upon the settings of these assets, this will be a temporary impact limited to the construction phase and will not extend to the operational phase once the scheme is in use.

13.6.3 Impacts During Operational Phase

All predicted impacts associated with the Proposed Development will occur during the construction phase and there will be no additional impacts during the operational phase.

13.7 Proposed Mitigation

13.7.1 Proposed Substation Development

13.7.1.1 Archaeological Works

Archaeological testing will be carried out at the pre-construction phase where the Proposed Development has the potential to impact upon archaeological remains All archaeological works (which will be agreed by the Archaeological Consultant and the NMS) will be carried out in compliance with the National Monuments Acts[67] and Policy and Guidelines on Archaeological Excavation[74].

A suitably qualified and licensed Archaeological contractor will be appointed to carry out the archaeological fieldwork. Relevant licenses will be acquired from the DHLGH and the National Museum of Ireland (NMI) for all archaeological works, which will be carried out in accordance with an Overarching Method Statement for

[74] Department of Arts, Heritage Gaeltacht and the Islands (1999), Policy and Guidelines on Archaeological Excavation

Archaeological Works prepared by the Archaeological Consultant and agreed with the NMS. It is anticipated that all archaeological works will be completed pre-construction.

The programme of pre-development archaeological testing would likely consist of the mechanical excavation of test trenches down to sterile glacial tills and bedrock by means of a smooth toothless bucket at specified locations within the Proposed Development site but in particular within areas where construction will require sub-surface excavation works. The appointed archaeologist will undertake full-time monitoring of the excavation of the test trenches and where appropriate, carry out archaeological investigation.

Should archaeological material/features be encountered during the archaeological testing, the use of machinery shall cease, and further archaeological investigation (by hand) shall be carried out to determine the nature and extent of archaeological remains. Archaeological deposits shall not be removed as part of the assessment process.

The testing should be undertaken in advance of construction to allow adequate time to evaluate, record and where necessary mitigate any archaeological features that may be revealed. In the event that any archaeological features are uncovered the NMS will be consulted to determine the appropriate mitigation measures which may include preservation *in situ*, preservation in record through systematic archaeological excavation and/or monitoring of specific construction activities during the construction phase.

13.7.1.2 Construction

Archaeological issues will be resolved where possible, at the pre-construction stage of the development. If unexpected archaeological remains or artefacts are discovered during construction work, work in that area will cease and the area will be protected. An unexpected finds procedure will be included in the Overarching Method Statement for Archaeological Works. The Archaeological Consultant and NMS will be notified, and the unexpected find protocol will be implemented.

13.7.1.3 Operational Phase

No additional mitigation measures are required for the operational phase of the Proposed Development.

13.7.2 Proposed Grid Connection

13.7.2.1 Construction Works

The Contractor will submit a notification of proposed works within the Zones of Notification around the recorded monuments to the National Monuments Service at least two months prior to commencement of construction works. The appointed Archaeologist will undertake constant archaeological monitoring of cable laying works within the Greenfield sections of the Proposed Development and the sections of road encompassed by the Zones of Notification associated with the recorded monuments. During this watching brief, the Archaeologist will be delegated authority by the Contractor’s engineer to:

- Halt trenching work by the appointed Contractor in a specified area where it is necessary to examine any potential archaeological material encountered.
- Undertake any archaeological procedure necessary for the recording and removal of archaeological objects or features before work by the Contractor can resume within a specified area.
- Instruct the appointed Contractor as to the measures required to be taken to protect archaeological remains to be left in situ, should circumstance arise.

The appointed Contractor will agree with the Engineer and the Archaeologist:

- A programme to ensure that excavation of deposits that are of archaeological interest, is carried out under the supervision of the Archaeologist.
- A method statement describing how trenching will be excavated and what excavation machinery will be used in the stripping and removal of the topsoil and underlying deposits.
- Arrangements to allow the Archaeologist sufficient time to examine, record and remove, if necessary, the revealed and discovered archaeological remains.
- Arrangements to protect archaeological remains to be left in-situ.

Any recommendations contained in this report are subject to the ratification of the National Monuments Section, Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media.

14. Landscape and Visual

14.1 Introduction

This chapter identifies and assesses the potential effects of the Proposed Development on the landscape and visual resource of the study area to the northwest of County Dublin and a small section to the east of County Meath. It identifies mitigation and compensation measures that will be implemented to prevent, reduce, or offset potential adverse landscape and visual effects or enhance potential beneficial effects.

The assessment considers how:

- Landscape effects associated with a development relate to changes to the fabric, character and quality of the landscape resource and how it is experienced.
- Visual effects relate closely to landscape effects, but also concern changes in views as visual assessment is also concerned with people's perception and response to changes in visual amenity.

The assessment acknowledges that landscape and visual effects change over time as the existing landscape internal and external to the Proposed Development evolves. The assessment therefore reports on potential effects during both construction/operation and completion of the Proposed Development. The prominence of the Proposed Development in the landscape or view will vary according to the existing screening effects of local topography, intervening existing vegetation and building structures.

The Landscape and Visual Impact Assessment (LVIA) chapter is supported by the photomontages which are enclosed in Appendix H and Drawings 60657534-ACM-DWG-FT-620 and 60657534-ACM-DWG-FT-621 submitted as part of this application.

14.2 Legislation and Guidance

14.2.1 European Landscape Convention

The European Landscape Convention[75] provides guidelines for managing landscapes/landscapes. The Convention is not an EU Directive. Countries that sign and ratify the Convention make a commitment to upholding the principles it contains within the context of their own domestic legal and policy frameworks. The convention was ratified by Ireland in March 2002 and came into effects in Ireland in 2004. The European Landscape Convention requires "landscape to be integrated into regional and town planning policies and in cultural, environmental, agricultural, social and economic policies, as well as any other policies with possible direct or indirect impacts on Landscape".

14.2.2 National Landscape Strategy

The National Landscape Strategy (NLS) for Ireland 2015-2025[76] was launched in May 2015 and is to be implemented by the Government in the future. The NLS promotes the sustainable protection, management and planning for the landscape. The NLS states that the "*National Landscape Strategy will be used to ensure compliance with the European Landscape Convention and to establish principles for protecting and enhancing the landscape while positively managing its change. It will provide a high-level policy framework to achieve balance between the protection, management and planning of the landscape by way of supporting actions*." It also states that *"the Strategy sets out Ireland's high-level objectives and actions with regard to landscape. It also positions landscape in the context of existing Irish and European strategies, policies and objectives, and outlines methods of ensuring co-operation at a sectoral and at a European level by the State.*"

14.2.3 Fingal Development Plan 2023-2029[8]

This is the main strategic planning policy document guiding the future renewal and development within the jurisdiction of FCC to 2023 and beyond. The Proposed Development is located in FCC's jurisdiction. Relevant details on planning policies are described in the Planning Statement[77] included in the planning application. .

The FDP incorporates a landscape character assessment for Fingal as part of Chapter 9 – Green Infrastructure and Natural Heritage, which identifies a range of six landscape character types. Each landscape type is assigned a 'value' through the consideration of such elements as aesthetics, ecology, historical, cultural, religious or mythological. Value categories range from low to exceptional. Following the assessment of value, the sensitivity of

[75] Council of Europe (200), The European Landscape Convention
[76] Department of Arts, Heritage and the Gaeltacht (2015), National Landscape Strategy for Ireland
[77] AECOM (2023), Fieldstown 110kV Substation and Grid Connection Planning Statement

each character type is defined. This is considered to be the landscapes overall ability to sustain its character in the face of change. Sensitivity is evaluated using criteria ranging from high to low.

Objectives and policies relating to the landscape are also outlined in section 9.6.14 of the county development plan. Some relevant are included below:

- Policy GINHP21 – Protection of Trees and Hedgerows. Protect existing woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character and ensure that proper provision is made for their protection and management in line with the adopted Forest of Fingal-A Tree Strategy for Fingal.
- Policy GINHP22 – Tree Planting. Provide for appropriate protection of trees and hedgerows, recognising their value to our natural heritage, biodiversity and climate action and encourage tree planting in appropriate locations.
- Objective GINHO46 – Tree Removal Ensure adequate justification for tree removal in new developments and open space management and require documentation and recording of the reasons where tree felling is proposed and avoid removal of trees without justification.
- Policy GINHP25 - Ensure the preservation of the uniqueness of a landscape character type by having regard to the character, value and sensitivity of a landscape when determining a planning application.
- Objective GINHO57 - Ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types, including the retention of important features or characteristics, taking into account the various elements which contribute to their distinctiveness such as geology and landform, habitats, scenic quality, settlement pattern, historic heritage, local vernacular heritage, land-use and tranquillity.
- Objective GINHO58 - Resist development such as houses, forestry, masts, extractive operations, landfills, caravan parks and large agricultural/horticulture units which would interfere with the character of highly sensitive areas or with a view or prospect of special amenity value, which it is necessary to preserve.
- Objective GINHO59 - Ensure that new development does not impinge in any significant way on the character, integrity and distinctiveness of highly sensitive areas and does not detract from the scenic value of the area. New development in highly sensitive areas shall not be permitted if it:
- Causes unacceptable visual harm.
- Introduces incongruous landscape elements.
- Cause disturbance of loss of (i) landscape elements that contribute to local distinctiveness, (ii) historic elements that contribute significantly to landscape character and quality such as field or road patterns, (iii) vegetation which is a characteristic of that landscape type and (iv) the visual condition of landscape elements.
- Objective GINHO55 - Protect skylines and ridgelines from development.
- Objective GINHO56 - Require any necessary assessments, including visual impact assessments, to be prepared prior to approving development in highly sensitive areas.
-

14.2.4 Meath County Development Plan 2021-2027[78]

The Meath County Development Plan (MCDP) 2021-2027 is the main strategic planning policy document guiding the future renewal and development of County Meath to 2021 and beyond. The study boundary traverses an eastern section of MCDP jurisdiction. Relevant details on planning policies are described in the Planning Policy Context report included in the planning submission package. MCDP identifies and describes LCAs, as identified in the Landscape Character Assessment of County Meath, which is included within the MCDP. The landscape character assessment for County Meath "*sets out guidance and recommendations to assist the development of related planning policies, development of strategies, and development management within the County*".

14.2.5 Sources

The following sources and guidelines were used in the assessment:

- EPA, Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022[5].

[78] Meath County Council (2021), Meath County Development Plan 2021-2027

- Landscape Institute & IEMA, Guidelines for Landscape and Visual Impact Assessment' (GLVIA3), 2013[79].
- Landscape Institute, Photography and Photomontage in Landscape and Visual Impact Assessment, 2011[80].
- Landscape Institute, Visual Representation of Development Proposals, 2019[81].
- Fingal County Development Plan 2023-2029.
- Meath County Development Plan 2021-2027.
- Irishtrails, https://www.sportireland.ie/outdoors/find-your-trails.
- OSI, 1:50,000 Discovery Mapping.

14.2.6 Interaction with Other Environmental Factors

The LVIA is focused on the physical and visual appearance as well as the character of the landscape as it is experienced today.

Landscape is also a consideration under other environmental aspects and assessments, e.g., the natural landscape, the cultural/historical landscape (refer to Chapter 13: Cultural Heritage), the human landscape (refer to Chapter 5: Population and Human Health).

While it is evident that an interaction of effects exists between the landscape and visual environment and these other related landscape environments/environmental factors – not least in terms of potential for interactions of effects – assessments under these areas are generally addressed separately by other competent specialists in the relevant chapters of this ECR.

14.3 Methodology

14.3.1 Landscape and Visual Impact Assessment Criteria

This chapter has been prepared in accordance with the EPA's guidance[5] and good practice guidance, such as the GLVIA3 which provide specific guidelines for LVIA. Therefore, a combination of the EPA guidelines, the Landscape Institute guidelines and professional experience has informed the methodology for the assessment herein. The Landscape Institute guidelines require the assessment to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessment is based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. For clarity, and in accordance with best practice, the assessment of potential effects on landscape character and visual amenity, although closely related, are undertaken separately.

The assessment acknowledges that landscape and visual effects change over time as the existing landscape external to the Proposed Development evolves and proposed planting establishes and matures.

The significance of an effect or impact is determined by two distinct considerations:

The **Nature** of the receptor likely to be affected, namely:

- The value of the receptor.
- The susceptibility of the receptor to the type of change arising from the Proposed Developments.
- The sensitivity to change is related to the value attached to the receptor.

The **Magnitude** of the effect likely to occur, namely:

- The size and scale of the landscape and visual effect (for example, whether there is a complete or minor loss of a particular landscape element).
- The geographical extent of the areas that will be affected.
- The duration of the effect and its reversibility.
- The quality of the effect – whether it is neutral, positive, or negative.

Table 14-1 provides the definition of the duration of both landscape and visual effects.

[79] Landscape Institute (UK) and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition
[80] Landscape Institute (2011), Photography and Photomontage in Landscape and Visual Impact Assessment
[81] Landscape Institute (2019), Visual Representation of Development Proposals

Table 14-1 Definition of Duration of Effects

Duration	Description
Temporary	Effects lasting one year or less
Short Term	Effects lasting one to seven years
Medium Term	Effects lasting seven to fifteen years
Long Term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years

The quality of both landscape and visual effects is defined in Table 14-2.

Table 14-2 Definition of Quality of Effects

Quality of Effects	Description
Neutral	This will neither enhance nor detract from the landscape character or view
Positive (Beneficial)	This will improve or enhance the landscape character or view
Negative (Adverse)	This will reduce the quality of the existing landscape character or view

14.3.2 Assessment Process

The assessment is undertaken based on the following key tasks and structure:

- Establishment of the Baseline or receiving environment.
- Appreciation of the Proposed Development.
- Assessment of effects.

14.3.3 Establishment of the Receiving Environment

A baseline study has been undertaken through desk-based research in order to establish the existing conditions of the landscape and visual resources of the study area. Desk based research has involved a review of mapping and aerial photography, relevant planning and policy documents, the relevant Landscape Character Assessments and other relevant documents and publications.

14.3.4 Appreciation of the Proposed Development

In order to be able to accurately assess the full extent of likely effects on landscape character and visual amenity it is essential to develop a thorough and detailed knowledge of the Proposed Development. This includes a comprehensive understanding of its location, nature and scale and is achieved through a review of detailed descriptions of the Proposed Development and drawings (see Planning Application Drawings accompanying the application) and an onsite appraisal.

14.3.5 Assessment of Effects

The LVIA seeks to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor.

The assessment acknowledges that landscape and visual effects change over time as the existing landscape evolves and proposed planting establishes and matures. The assessment therefore reports on potential effects during both construction/operation and completion of the proposed development. The prominence of the proposed development in the landscape or view will vary according to the existing screening effects of local topography, structures and buildings, intervening existing vegetation and type and height of the proposed structures.

14.3.6 Scope

14.3.6.1 Study Area

A study area radius of 1.5km has been determined from the boundary of the Proposed Substation Development for the assessment of landscape and visual effects. The extent of the study area is based on initial findings of the desktop study.

In terms of visual considerations for the Proposed Grid Connection, the development is only likely to involve new visual intrusions predominantly during the construction phase, rather than creating new, permanent visual intrusion or obstruction. Considering the underground nature of the project and similar studies, it is anticipated that the proposed works relating to the development of three new underground cables are likely to be difficult to discern beyond approximately 500m and are not likely to give rise to significant landscape or visual impacts beyond this distance. For these reasons a 500m radius study area was selected (Figure 14.1). This study area will focus the assessment within the area where impacts may actually occur.

It is acknowledged that the Proposed Development may be visible from locations beyond the study area, and as such it is important to note that the study area defines the area within which potential effects could be significant, rather than defining the extent of visibility.

14.3.6.2 Effects Scoped Out

The Proposed Development will become a permanent feature in the landscape following the completion and the implementation of landscape mitigation measures. The assessment takes account of this in the determination of residual landscape and visual effects.

14.3.7 Landscape Effects

Visual effects and Landscape effects describe the impact on the fabric or structure of a landscape or landscape character.

The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as landscape receptors and comprise the following:

- Individual landscape elements or features.
- Specific aesthetic or perceptual aspects.
- Landscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another.

The assessment will identify the interaction between these components and the Proposed Development during construction and operational phases. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

14.3.7.1 Landscape Value

Landscape value is frequently addressed by reference to international, national, regional, and local designations, determined by statutory and planning agencies. However, absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition are also considered in the determination of the value of a landscape. The evaluation of landscape value is undertaken with reference to the definitions stated in Table 14-3.

Table 14-3 Landscape Value

Landscape Value	Classification Criteria
High	Nationally designated or iconic, unspoilt landscape with few, if any, degrading elements.
Medium	Regionally or locally designated landscape, or an undesignated landscape with locally important landmark features and some detracting elements.
Low	Undesignated landscape with few if any distinct features or with several degrading elements.

14.3.7.2 Landscape Susceptibility

Landscape susceptibility relates to the ability of a particular landscape to accommodate the Proposed Development. Landscape susceptibility is appraised through consideration of the baseline characteristics of the landscape, and in particular the scale or complexity of a given landscape.

The evaluation of landscape susceptibility is undertaken with reference to a three-point scale, as outlined in Table 14-4.

Table 14-4 Landscape Susceptibility Criteria

Landscape Susceptibility	Classification Criteria
High	Small scale, intimate or complex landscape considered to be intolerant of even minor change.
Medium	Medium scale, more open or less complex landscape considered tolerant to some degree of change.
Low	Large scale, simple landscape considered tolerant of a large degree of change.

Landscape Sensitivity

Landscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified landscape value, quality and susceptibility and is defined with reference to the scale outlined in Table 14-5.

Table 14-5 Landscape Sensitivity to Change Criteria

Landscape Sensitivity	Classification Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements.
Medium-High	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent or a landscape with highly valued features locally. Good example in the area of a well-cared for landscape or set of features that combine to give a clearly defined sense of place.
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character. Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space. An example of a landscape or a set of features which is relatively coherent, with a good but not exceptional sense of place - occasional buildings and spaces may lack quality and cohesion.
Medium-Low	Landscape characteristics or features which are reasonably tolerant of change without determent to their present character. No designation present or of little local value. An example of an un-stimulating landscape or set of features. with some areas lacking a sense of place and identity.
Low	Landscape characteristics or features which are tolerant of change without determent to their present character. An area with a weak sense of place and/or poorly defined character /identity. No designation present or of low local value or in poor condition. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape.
- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones.
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character.
- The geographic area over which the landscape effects will be felt (within the Project Development site itself. the immediate setting of the Project Development site. at the scale of the landscape type or character area. on a larger scale influencing several landscape types or character areas).

- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to landscape characteristics can be both direct and indirect. **Direct change** occurs where the Proposed Development will result in a physical change to the landscape within or adjacent to the Project Development site. **Indirect changes** are a consequence of the direct changes resulting from the Proposed Development. They can often occur away from the Proposed Development site (for example, offsite construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems, e.g., littering). They may be separated by distance or in time from the source of the effects. The magnitude of change affecting the baseline landscape resource is based on an interpretation of a combination of the criteria set out in Table 14-6.

Table 14-6 Magnitude of Landscape Change Criteria (Landscape Effects)

Magnitude of Landscape Change	Classification Criteria
None	No change.
Negligible	Little perceptible change.
Low	Minor change, affecting some characteristics and the experience of the landscape to an extent. Introduction of elements that is not uncharacteristic.
Medium	Noticeable change, affecting some key characteristics and the experience of the landscape. Introduction of some uncharacteristic elements.
High	Noticeable change, affecting many key characteristics and the experience of the landscape. Introduction of many incongruous developments
Very High	Highly noticeable change, affecting most key characteristics and dominating the experience of the landscape. Introduction of highly incongruous development.

14.3.8 Visual Effects

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e., how a development is seen within the landscape). for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point.

Negative visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

14.3.8.1 Receptors

For there to be a visual impact, there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e., people, will be affected by changes as a result of the Proposed Development depends on a number of factors, including:

- Receptor activities, such as taking part in leisure, recreational and sporting activities, travelling or working.
- Whether receptors are likely to be stationary or moving and how long they will be exposed to the change at any one time.
- The importance of the location, as reflected by designations, inclusion in guidebooks or other travel literature, or the facilities provided for visitors.
- The extent of the route or area over which the changes will be visible.
- Whether receptors will be exposed to the change daily, frequently, occasionally or rarely.
- The orientation of receptors in relation to the Proposed Development and whether views are open or intermittent.
- Proportion of the developments that will be visible (full, sections or none).
- Viewing direction, distance (i.e., short distance, medium distance and long-distance views) and elevation.

- Nature of the viewing experience (for example, static views, views from settlements and views from sequential points along routes).
- Accessibility of viewpoint (public or private, ease of access).
- Nature of changes (for example, changes in the existing skyline profile, creation of a new visual focus in the view, introduction of new man-made objects, changes in visual simplicity or complexity, alteration of visual scale, landform and change to the degree of visual enclosure).
- Nature of visual receptors (type, potential number and sensitivity of viewers who may be affected).

14.3.8.2 Value of the View

Value of the view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey of tourist maps and in guidebooks, literature or art. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view is also an indicator. The value of the view is determined with reference to the definitions outlined in Table 14-7.

Table 14-7 Value of the View

Value	Classification Criteria
High	Nationally recognised view of the landscape, with no detracting elements.
Medium	Regionally or locally recognised view, or unrecognised but pleasing and well composed view, with few detracting elements.
Low	Typical or poorly composed view often with numerous detracting elements.

14.3.8.3 Visual Susceptibility

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location.
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport, where views are not important, or at their place of work, are often considered less susceptible to change. Visual susceptibility is determined with reference to the three-point scale and criteria outlined in Table 14-8.

Table 14-8 Visual Susceptibility

Susceptibility	Classification Criteria
High	Receptors for which the view is of primary importance and are likely to notice even minor change.
Medium	Receptors for which the view is important but not the primary focus and are tolerant of some change.
Low	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change

14.3.8.4 Visual Sensitivity

Sensitivity to change considers the nature of the receptor. for example, a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view.

- A judgement is also made on the value attached to the views experienced. This takes account of:
- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations.
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art.
- Possible local value. it is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in Table 14-9.

Table 14-9 Sensitivity to Change Criteria

Visual sensitivity	Classification Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in nationally designated landscapes. Residential buildings.
Medium-High	Users of outdoor recreational facilities, in highly valued landscapes or locally designated landscapes or on local recreational routes that are well publicised in guidebooks. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of outdoor recreational facilities including public open space in moderately valued landscapes. Users of primary transport road network, orientated towards the Proposed Development, likely to be travelling for other purposes than just the view.
Medium-Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Primary transport road network and rail users likely to be travelling to work with oblique views of the project or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Proposed Development.

14.3.8.5 Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the Proposed Development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development.
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, skylining, back-grounding, visual clues, focal points, colour and texture.
- The nature of the view of the Proposed Development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses.
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible.
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effect resulting from the development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in Table 14-10.

Table 14-10 Magnitude of Visual Change Criteria (Visual effects)

Magnitude	Classification Criteria
None	No change in the existing view.
Negligible	The development will cause a barely discernible change in the existing view.
Low	The development will cause very minor changes to the view over a wide area or minor changes over a limited area.
Medium	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area.
High	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area.
Very High	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area.

14.3.9 Duration and Quality of Effects

Table 14-11provides the definition of the duration of landscape and visual effects:

Table 14-11 Definition of Duration of Effects

Duration	Description
Temporary	Effects lasting one year or less.
Short Term	Effects lasting one to seven years.
Medium Term	Effects lasting seven to fifteen years.
Long Term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.

The quality of both, landscape and visual effects, can be Beneficial (Positive), Adverse (Negative) or Neutral according to the definitions set out in Table 14-12.

Table 14-12 Definition of Quality of Effects

Quality of Effects	Description
Neutral	This will neither enhance nor detract from the landscape character or view
Positive (Beneficial)	This will improve or enhance the landscape character or view
Negative (Adverse)	This will reduce the quality of the existing landscape character or view

14.3.10 Significance Criteria

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the Proposed Development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and the change over time.

The significance of effects is assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions. In order to provide a level of consistency and transparency to the assessment and allow comparisons to be made between the various landscape and visual receptors subject to assessment, the assessment of significance is informed by pre-defined criteria as outlined in the table below. When assessing significance, individual effects may fall across several different categories of significance and professional judgement is therefore used to determine which category of significance best fits the overall effect to a landscape or visual receptor.

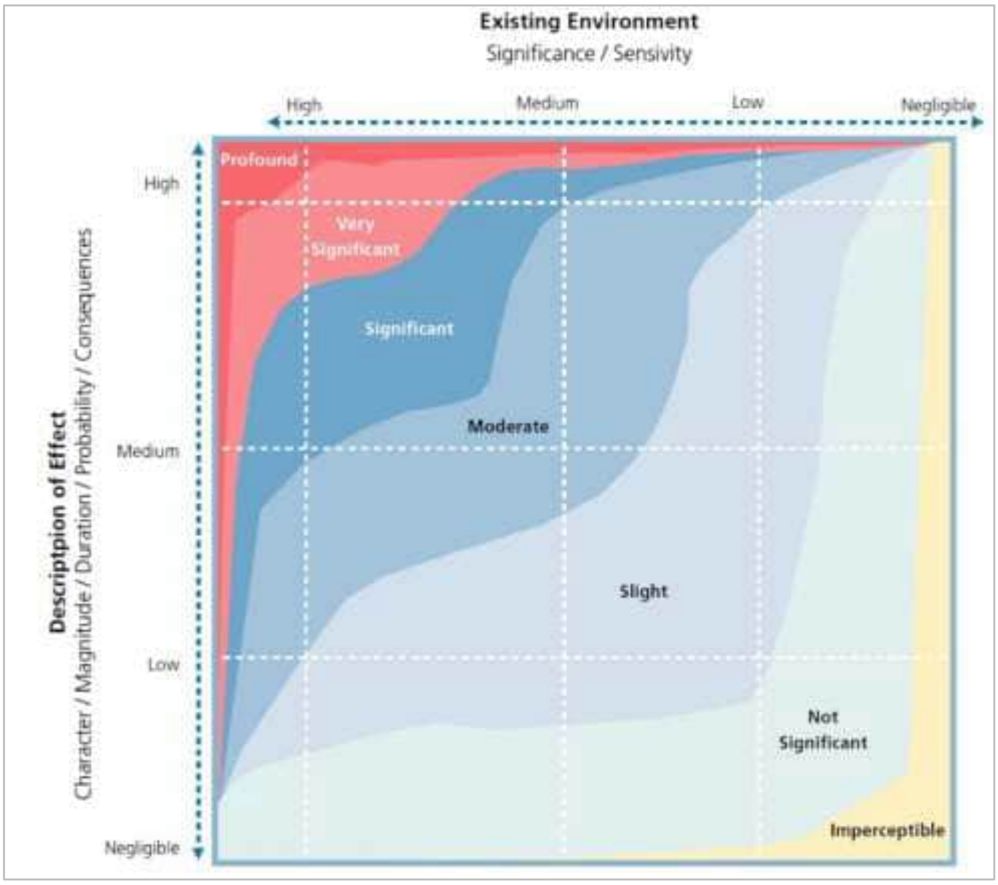
The significance of the effects can be adverse (negative) or beneficial (positive) according to the definitions set out in Table 14-13.

Table 14-13 Categories of Significance of Landscape and Visual Effects

Significance Category	Description of Effect
Profound	An effect that obliterates sensitive characteristics within the landscape and/or visual environment.
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the landscape and/or visual environment.
Significant	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the landscape and/or visual environment.
Moderate	An effect that alters the landscape in a manner that is consistent with existing and emerging baseline trends.
Slight	An effect which causes noticeable changes in the landscape and/or visual environment without affecting its sensitivities.
Not Significant	An effect which causes noticeable changes in the landscape and/or visual environment but without significant landscape and/or visual consequences.
Imperceptible	An effect capable of measurement but without significant landscape and/or visual consequences.

The significance of the effect is determined by considering the magnitude of the effect and the quality of the baseline environment affected by the Proposed Development. The basis for consideration of the significance of effects is included overleaf.

Figure 14-1 Basis for Consideration of Significance of Effects[5]



Effects will be assessed for all phases of the Proposed Development. Construction effects are considered to be temporary, short-term effects which occur during the construction/decommission phase only. Operational/residual effects are those long-term effects, which will occur as a result of the presence or operation of the development.

The quality of each effect is based on the ability of the landscape character or visual receptor to accommodate the Proposed Development, and the impact of the development within the receiving context. Once this is done, the quality of the effect is then assessed as being neutral, beneficial or adverse. A change to the landscape or visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.

14.3.11 Cumulative Effects

The approach used to determine cumulative effects has drawn on guidance on cumulative impact assessment published by the GLVIA[79]. Cumulative landscape and visual effects may result from additional changes to the baseline landscape or views as a result of the Proposed Development in conjunction with other developments of a similar type and scale.

The cumulative assessment includes developments that are consented but not constructed, that are the subject of undetermined applications, or are currently at scoping which are similar in type and scale to the Proposed Development.

14.3.11.1 Magnitude of Cumulative Effects

The principle of magnitude of cumulative effects makes it possible for the Proposed Development to have major effects on a particular receptor, while having only minor cumulative effects in conjunction with other existing developments.

The magnitude of cumulative effects arising from the Proposed Development is assessed as **Very High, High, Medium, Low or Negligible, with intermediate categories**, based on interpretation of the following parameters:

The additional extent, direction and distribution of existing and other developments in combination with the Proposed Development.

The distance between the viewpoint, the Proposed Development and the cumulative developments.

The landscape setting, context and degree of visual coalescence of existing and Proposed Development and cumulative developments.

14.3.11.2 Significance of Cumulative Effects

As for the assessment of landscape and visual effects, the significance of any cumulative effects follows a same classification as illustrated in Image 1 - Basis for consideration of significance of effects and will be assessed as **Profound, Very Significant, Moderate, Slight, Not Significant, Imperceptible**.

The cumulative assessment focuses on potential cumulative effects relating to the main permanent structure of each cumulative development. This is due to the uncertainty of the timing of construction activities for each of the identified developments. As a result, temporary structures and activity relating to construction have not been considered within the cumulative assessment.

14.4 Characteristics of the Proposed Development

14.5 Baseline Environment

14.5.1 Site Context

The Proposed Substation Development is located within an area of agricultural grassland on lands at Fieldstown East, County Dublin (ITM coordinates: 711952, 750625). The Proposed Substation Development is bounded by the R122 regional road immediately west and agricultural lands to the east, north and south as shown in Figure 2-1.

The majority of the Proposed Grid Connection is located within the public road and measures approximately 13.3km in total. This cable run will exit the substation compound travelling west before heading south and entering the R122 regional road. The proposed cable connection will follow the path of the R122 before heading west adjacent to the M50 to the boundary of Finglas Substation as shown in Figure 2-2.

14.5.2 Existing Environment

14.5.2.1 Landscape Context

Proposed Substation Development

The Proposed Substation Development and surrounding area has a gently undulating topography that is slightly more elevated to the north. Watercourses in the area generally drain in a southerly direction to The Broadmeadow River (300m south of the Proposed Substation Development).

The Proposed Substation Development and surrounding area is characterised by presence of open greenfield area with hedgerows delineating field boundaries and some wooded areas on the southern edges. The Irish national CORINE 2018 dataset[10] has identified the study area as an 'Agricultural Area' of 'Pastures'. The Proposed Substation Development is within the confines of an arable field with boundaries consisting of bands of mature hedgerows and semi-mature or mature trees. The hedgerow pattern varies throughout the study area with some areas of low well-kept hedgerows and some unmanaged hedgerows with gaps and bands of trees of varying maturity.

The largest nearby towns are Ashbourne, approximately 4.5km east, and Swords, approximately 9.5km to the southeast. Oldtown is located approximately 2.5km directly north, Ballyboghill is approximately 4.5km east, and Rolestown is situated within 1km southeast of the Site. There are dispersed one-off housing units located in proximity to the Proposed Substation Development, with the nearest property located approximately 300m to the southeast.

The R122 regional road runs in a north south direction adjacent to the Proposed Substation Development.

There are no notable landscape related tourism or heritage amenities within the study area surrounding the Proposed Substation Development.

Proposed Grid Connection

The Proposed Grid Connection is located primarily on public roads (R122-Fieldstown, L7325, L7231, R122-Coldwinters, adjacent to the M50 and under the N2).

The study area has a gently undulating topography that is slightly more elevated to the west.

A large proportion of the study area associated with the northern section of the Proposed Grid Connection is occupied by agricultural fields and one-off housing. Field patterns are generally composed of small to medium sized fields demarcated by mature hedgerows. The southern section of the study area is predominantly urban landuse, in the form of built-up residential and industrial and commercial premises including several business and industrial parks surrounding Dublin Airport, namely, Dublin Airport Logistics Park, Williamsville Industrial Estate and Finglas Substation.

The greatest population densities in the area are in the settlements of Kilsallaghan and St Margarets, however, there are also one-off houses throughout the study area, dispersed along the local roads.

The M1 and M50 (motorways) are the most significant transport routes within the study area surrounding the Proposed Grid Connection. Several regional and local routes also fall within the study area including the R121, R122, R125, L7325 and L7231.

There are several public amenities, in the form of golf clubs and other sports recreation areas. St Margarets Golf and Country Club, St Margarets Gaelic Athletic Association (GAA) Club and Corrstown Golf Course are located along the R122 to the north of Dublin Airport.

14.5.2.2 Architectural Conservation Areas

There are two Architectural Conservation Areas (ACAs) in the wider vicinity of the Site. The Rowlestown ACA lies approximately 1km east of the Proposed Substation Development. The Oldtown ACA is located approximately 3km north of the Proposed Substation Development. The Proposed Grid Connection does not traverse an ACA.

14.5.2.3 Protected Structures

There are 11 assets recorded as Protected Structures on the FDP 2023-2029 within the Study Area around the Proposed Development, none of which are located within the Proposed Development boundary. A summary of which is included in Appendix G.2.

14.5.2.4 Open Space, Vegetation and Green Infrastructure

A desktop survey was also undertaken by the National Inventory of Architectural Heritage (Gardens), which is a review of the designed landscapes of Ireland. The survey states that *"… the statement of condition is not an indication of the heritage value of the Site and should not be used to justify statements about the importance or merit of the Site. A field survey is required to confirm the survival of a site and to evaluate the heritage value of the Site".*

There are five historic gardens or designed landscapes recorded on the National Inventory of Architectural Heritage Gardens Survey within the Proposed Development study area. none of which are located within the Proposed Development boundary. A summary of which is included in Appendix G.3.

14.5.2.5 Protected Views and Prospects

The protected views (R108 (St Margaret's to Naul Road) and R125 (Swords to Ashbourne Road) are located approximately 2.75km southeast of the Proposed Substation Development (approximately 3km east of the Proposed Grid Connection).

14.5.2.6 Walking and Cycling Routes

There is an indicative greenway mapped adjacent to the Broadmeadow River approximately 300m south of the Proposed Substation Development.

The Proposed Grid Connection traverses the indicative greenway noted above and a planned regional cycle route at the intersection of the R122 and L7245.

14.5.3 Landscape Character Assessment

14.5.3.1 Fingal Development Plan 2023-2029 (FDP)

The Site is zoned RU – Rural with a Vision to "*Protect and promote the value of the rural area of the County. This rural value is based on: Agricultural and rural economic resources, Visual remoteness from significant and distinctive urban influences, A high level of natural features. Agriculture and rural related resources will be employed for the benefit of the local and wider population. <u>Building upon the rural value will require a balanced approach involving the protection and promotion of rural biodiversity, promotion of the integrity of the landscape,</u> and enhancement of the built and cultural heritage"* – FDP (Emphasis added)

The FDP defines six overarching Landscape Character Types (LCTs), two of which are relevant to the Proposed Development.

The LCTs are:

- Rolling Hills with Tree Belts Character Type.
- Low Lying Agricultural Character Type.

The Proposed Development is located within the 'Rolling Hills' LCT. This LCT is categorised as having a Modest Landscape Value and a Medium Landscape Sensitivity - described within the FDP as:

> *"is made up principally of agricultural land and is of value due to the Ward and Broadmeadow River and the ecological and visual attributes they bring. The protected views (R108 (St Margaret's to Naul road) and R125 (Swords to Ashbourne Road), tree belts and undulating lands also add value to the area. An important quality is the archaeological heritage in Swords".*

The 'Low-Lying' LCT is located to the north and south of the Proposed Development. This LCT is categorised as having a Modest Landscape Value with a Low Landscape Sensitivity and is described within the FDP as:

> *"has an open character combined with large field patterns, few tree belts and low roadside hedges. The main settlements located within the area include Oldtown, Ballyboghill and Lusk and parts of Malahide and Donabate. Dublin Airport is located in this area. This low-lying area is dominated by agriculture and a number of settlements. The area is categorised as having a modest value. It contains pockets of important value areas requiring particular attention such as important archaeological monuments and demesnes and also the Feltrim Hill and Santry Demesne proposed Natural Heritage Areas".*

14.5.3.2 Meath County Development Plan 2021-2027

The Proposed Substation Development study area encroaches the Meath/Dublin county boundary, consequently, the MCDP has also been considered as part of the landscape character assessment carried out. The MCDP defines four overarching LCTs as follows:

- Hills and Uplands Areas.
- Lowland Areas.
- River Corridors and Estuaries.
- Coastal Areas.

The western study boundary of 1.5km traverses a section of a 'Lowlands' LCT. The 'Lowlands' LCT comprises of high-quality agricultural land and has been described within the MCDP as have been developed more extensively than other LCT's, particularly in the southeast where there is development pressure from the Dublin metropolitan area.

The four LCTs are further sub-divided into 20 geographically specific Landscape Character Areas (LCAs). The study boundary for the Proposed Development traverses a small section of 'The Ward' LCA and is described as follows.

LCA 8 – The Ward Lowlands

Landscape Value: Low

Landscape Sensitivity: High

Landscape Importance: Regional

This LCA is part of LCT 'Lowlands'.

The MCDP states that this area is of low landscape value, high landscape sensitivity and regional landscape importance. The landscape contains large areas of pasture and arable farmland. Views within this LCA are often limited by roadside vegetation consisting of mature hedgerows and bands of trees. Gaps or stretches with low hedgerows open up views across a rural landscape with often large fields.

The Meath Landscape Character Assessment describes this LCA as follows:

> "*Medium potential capacity to accommodate new road development because busy transport corridors are part of the existing character. However, the design of transport corridors (both new and upgrading of existing roads) should be carefully planned to minimise and mitigate against adverse impacts on the landscape and avoid further loss of landscape structure. Where possible, road corridors should be replanted to minimise their impacts in the long term and increase their value and green corridors through this LCA. Low potential capacity to accommodate underground services as the landscape is highly sensitive and as such would be susceptible to change such as further loss of hedgerows and degradation of farmland".*

This LCA is under significant development pressure due to the proximity of the Dublin metropolitan area, which has already led to a landscape of degraded quality along the urban fringe due to a lack of management. The study boundary of 1.5km traverses this LCA briefly within the western section of the study area.

14.5.3.3 Dublin City Development Plan 2022 – 2028

The Proposed Grid Connection corridor accesses the Fingal Substation approximately 700m north of the Dublin City Council administrative boundary. There will be no significant impact on the landscape character or visual amenity due to the nature of the cable installation, the intervening M50 motorway infrastructure, existing screening vegetation and the built environment.

14.6 Potential Impacts

The following potential visual effects, direct and indirect landscape effects, as well as the duration and nature of effects arising from the Proposed Development, have been identified.

14.6.1 Construction Phase

14.6.1.1 Proposed Substation Development

Areas experiencing landscape and visual effects during the construction stage will be experienced locally from the adjacent local road network. The sensitivity of views on residential receptors is considered high, particularly for the residents located along the local road to the west of the Proposed Substation Development boundary, however the vegetation present within the field boundaries and roadside will be a mitigating factor given the level of vegetation within the immediate context. It is considered that there will be some available views of construction works from within the wider area due to the nature of the development, containing many vertical elements.

Construction effects will result in:

- Potential effects to landscape character or visual amenity within the locality or the wider study area as a result of the visibility of construction activities such as ground works and associated construction machinery.
- Effects of temporary site infrastructure such as site traffic and construction compounds especially those located in areas adjacent to sensitive landscape and visual receptors.
- Potential physical effects arising from construction of the development and in particular on the landscape resource within the Site area.

Landscape and visual effects and their significance during construction works will be temporary. They will be highest within the immediate vicinity of the Site. however, the vegetation within the immediate field boundaries will screen the majority of the construction works. The majority of significant views of construction works will likely be experienced within a radius of approximately 200m to either side of the construction site and can range up to 600m radius, particularly for properties located east and south of the Proposed Substation Development. The nearest property is located approximately 300m to the west of the Proposed Substation Development boundary. Given the vegetation providing screening, especially along the ‘Broadmeadow River’ corridor, the potential for views of construction works from this route is reduced significantly. The magnitude of visual effects is considered Moderate to High in available close distance views. Their significance is considered Moderate-Significant Adverse.

The visibility of construction works within the wider study area will be related to vehicular construction traffic along ‘Rolestown Drive’ to the east of the Site and along the R122 to the east and R125 south of the Site. The landscape and visual effects and their significance at construction stage will be temporary, adverse and range from Low/Negligible in the wider study area (approximately 200m to 600m and beyond) to Medium/High (within approximately 200m of the Site boundary). The significance will range from Slight/Not Significant Neutral in the wider study area to Moderate/Significant Adverse within approximately 200m radius from the boundary of the Proposed Substation Development.

14.6.1.2 Proposed Grid Connection

At Construction phase the proposed Grid Connection route will comprise of trench excavation to place the cables underground. The proposed route is largely located within the existing hard surface road network and some stretches through private farmland (at the Broadmeadow River, Ward River and adjacent to the intersection of the N2 and M50). Open cut trenching will be required to lay the cables during the construction phase generating temporary and transient effects. Stream crossings will be achieved using HDD. Construction plant, including earth moving equipment and lifting machinery and typical construction features such as fencing, will be introduced, with focussed activity across a series of construction compounds. Sensitive features such as field boundaries and hedgerows will be protected in locations where they are to be retained. Vehicles and machinery entering the Proposed Grid Connection corridor will increase the level of activity across the study area along roads connecting to the Site. Road traffic controls to regulate the flow of traffic will be visible along the route and will cause localised temporary disruption.

Negative effects to landscape vegetation and habitat will occur where the grid cable trenches cause the removal of hedgerow vegetation or interfere with root systems, this will include:

- Likely loss of some existing vegetation and habitat.
- Extended soil stripping, earthworks, grading, etc.
- Effects of temporary to short-term site infrastructure such as site traffic, construction compounds, soil storage areas etc. especially those located in areas adjacent to visual receptors.
- Physical effects arising from construction of the Proposed Grid Connection will be largely confined to approximately 200m to either side of the construction route.

The majority of significant views of construction works will likely be experienced within a radius of approximately 200m to either side of the construction site and can range up to 600m radius. The magnitude of visual effects is considered Moderate to High in available close distance views. Their significance/quality is considered Moderate-Significant/Adverse.

It is anticipated that Proposed Grid Connection will not alter the landscape character along the approximately 13.3km corridor. The landscape and visual effects and their significance at construction stage will be temporary, adverse and range from Low/Negligible in the wider study area (approximately 200m to 600m and beyond) to Medium/High (within approximately 200m of the Site boundary). The significance/quality will range from Slight - Not Significant/Neutral in the wider study area to Moderate – Significant/Adverse within approximately 200m radius from the boundary of the Proposed Development.

The change resulting from construction will be temporary to short term and largely reversible.

14.6.2 Operational Phase

The introduction of the Proposed Development will alter the landscape character locally from agricultural to light industrial. However, the change is contained to the immediate surrounds and is in keeping with prevailing development emerging within this region.

Operational effects will result in:

- Potential effects of the development on landscape resources and landscape character, including the perceptual qualities of the landscape, and upon designated landscapes where the primary focus of designations or sensitive landscapes is altered.
- Potential effects of the development on views and visual amenity such as the potential for the development to alter (beneficial or adverse) the composition of the view from a viewpoint.
- Potential cumulative effects of the Proposed Development in combination with other planned or permitted developments of similar type, nature and scale upon the landscape and visual resource of the study area.

Some of the key landscape and visual operational effects may relate to:

- The important opportunity to improve views from within the local landscape.
- The extent to which the development may intrude into existing views or improve views experienced by residents and day to day users of the area.
- The extent to which users of the landscape such as tourists and visitors may be subject to effects (beneficial or adverse) arising from the Proposed Development.

14.6.2.1 Landscape Effects

Proposed Substation Development at Operation

The following potential direct and indirect landscape effects arising from the Proposed Substation Development have been identified, along with their duration and quality.

Direct or indirect effects on the fabric of the landscape and its receptors are closely related to the nature and extent of visibility. The Proposed Development is located in LCT ‘Agriculture Rolling Hills’. The Site has also been designated as ‘Moderate Landscape Value’ and of ‘Moderate Sensitivity’. The adjacent site context is of agricultural land. The introduction of the Proposed Development will modify the landscape character locally and introduce an infrastructural character to the area.

The Proposed Substation Development will result in a local change in the overall rural landscape character with the introduction of a light industrial development. However, the Proposed Substation Development is confined to one field boundary with existing hedgerows and mature tree lines confining this change in landscape character to the Proposed Substation Development's immediate surrounds without significantly extending arising landscape effects into the wider study area and beyond, this is due to significant existing intervening screening vegetation and distance from receptors.

Direct and long-term change or modification will occur locally where the Proposed Substation Development will be physically located. The Proposed Development will cause a change in character where the Site is. The magnitude of landscape change is considered High and the resulting significance is Moderate Adverse. Indirect change will occur outside of the Proposed Development site boundary, where the visibility of the Proposed Substation Development influences the perception of the character of the landscape. The indirect change in landscape character is greatest in its immediate and nearby surroundings within approximately 200m from the Proposed Substation Development boundary, where infrastructure associated with Proposed Substation Development, may be seen. The magnitude of change in these areas is considered Low. When seen, the majority of the Site will continue to be screened by field boundary comprising of intervening, existing and proposed vegetation resulting in largely partial views and obscured views. The significance/quality of landscape effects on the landscape character in these areas is therefore considered to be Slight/Adverse to Moderate/Adverse at operation.

Indirect change and the significance of landscape effects will reduce quickly beyond approximately 200-300m distance from the Site boundary due to intervening topography and vegetation. Landscape effects range between Negligible – Low with a resulting significance/quality of Slight/Adverse and Not-Significant/Neutral with increasing distance from the Proposed Development in the remaining study area.

Changes to the landscape character will be discernible when travelling along the R122 located to the west of the Proposed Development, however, changes will be only seen briefly where there are gaps in vegetation or when crossing the Broadmeadow River. Changes to the landscape character in views from Rolestown Drive to the east of the Proposed Development will be barely discernible given the distance between the Proposed Substation Development and the receptors along this route.

There will be a recognisable modification in the landscape character on the field and along the immediate adjacent local roads. In middle distance and long distance views at approximately 600m to1km and beyond or along the R125 to the south are limited and glimpsed views of the development through intervening and proposed vegetation and some built structures. The Proposed Substation Development is located Meath CDP Landscape character area LCA 8 – The Ward Lowlands where landscape value is considered Low and landscape sensitivity is considered High. The Development will have a negligible effect on this LCA. The landscape change at these middle or long distances will range from Very Low to Negligible. The significance/quality is considered Not-Significant/Neutral as the development site will integrate in the overall pattern of the surrounding landscape.

14.6.2.2 Proposed Grid Connection at Operation

Direct and long-term change will occur locally where the Proposed Grid Connection will be physically located. This change will include 13.3km of trench excavation and the installation joint bays and associated features, requiring localised changes to landform.

The landscape impacts of underground cables involve surface disturbance, possible hedgerow and hedgerow tree removal causing habitat fragmentation, soil compaction, erosion, watercourse crossings, and the risk of spills or leaks. During the installation of underground cables within the road carriageway, excavation and construction activities will cause visible surface disturbances and repairs. Trenching activities will likely have an impact on the roadside vegetation root zones and the root protection zones of trees located along the boundary and adjacent properties.

Adverse effects to landscape and hedgerow vegetation will occur along the cable route and will include:

- Loss of some existing peripheral vegetation and habitat.
- Trenching earth works associated with installation of cables will scar the landscape.

It is anticipated that the development will not alter the landscape character but visual disturbance will be experienced within approximately 200m of the Grid Connection corridor for a short term, this will decrease over time where any ruderal vegetation can become established. No Change to the landscape character will be experienced.

The magnitude of landscape change during Operation is considered Low and the resulting significance/quality is Slight/Adverse.

No landscape mitigation measures have been considered at this stage.

A summary of landscape effects has been provided in Table 14-14.

Table 14-14 Summary of Landscape Effects

Receptor	Sensitivity	Magnitude of Landscape Change (at operation)	Quality of Landscape Effects	Significance of Landscape Effects
LCA – Rolling Hills (within the development site)	Medium	High	Adverse	Significant
LCA - Rolling Hills (in close proximity of the development site, up to approx. 100-200m radius)	Medium	Medium	Adverse	Moderate
LCA - Rolling Hills (within the wider area, beyond approx. 200m radius)	Moderate	Low-Negligible	Adverse	Slight
LCA – Lowland Landscape Co, Meath (within the wider area, beyond approx. 1km radius)	High	Negligible	Neutral	Not Significant
LCA – 'The Ward' (within the wider area, beyond approx. 1km radius)	High	Negligible	Neutral	Not Significant

14.6.2.3 Visual Effects

Proposed Substation Development

The Proposed Substation Development with lightning masts becoming the most visible element associated with this type of development. The Proposed Substation Development is confined within the boundary of a large agricultural field. The nearest visual receptor is likely to be associated with a residential property located just beyond 300m west of the Proposed Substation Development boundary. The majority of the Proposed Development's immediate site is currently visually screened by a network of hedgerows and mature tree lines existing along field boundaries. The Site has also designated as *'Modest Landscape Value'* and of *'Medium Sensitivity'* according to landscape character assessment contained in FDP 2023-2029.

The majority of visual effects will be localised and confined to locations in close proximity, within approximately 200m to either side of the Proposed Substation Development. There are no visual receptors located within 200m of the Proposed Development boundary, with the exception of landowners and/or farmers checking on livestock within the neighbouring fields. The visual change will be high due to the introduction of a Proposed Substation Development within a previously arable field in a rural setting. The highest visual effects will be experienced within the immediate surrounds. The Proposed Substation Development will therefore result in a change in visual character from rural to light industrial at the proposed development site. The magnitude of change is considered High. Considering the moderate sensitivity of the visual receptor within the immediate surrounds of the Site, the significance/quality of change is considered Moderate/Adverse.

Sections of the Proposed Substation Development will become visible in the middle distance, 500m to 750m away. Visual effects at that distance are considered Low-Medium and their significance/quality will be Slight-Moderate/Adverse. While visible, the Proposed Substation Development will be seen with other landscape elements including built structures. It will not substantially alter the visual amenity in views at that distance.

The majority of the visual receptors are located beyond 500m from the main elements of the Proposed Substation Development. A number of residential dwellings are set back from the local road and are at distance of just over 400m from the Proposed Development boundary. Views of the Proposed Substation Development beyond 600m are becoming rare due to intervening vegetation and built structures screening partially or fully the proposed development resulting in Negligible or No visual effects and a significance/quality ranging between Not Significant to Imperceptible/Neutral.

As the Proposed Grid Connection will comprise an underground cable it is not included in the photomontage pack.

Table 14-15 Summary of Visual Effects

Receptor	Main Receptor Group	Sensitivity	Magnitude of Visual Change (at operation)	Quality of Visual Effects	Significance of Visual Effects
Close-distance views at the proposed development or within approximately 200m from the centre of the Proposed Development	Residential Farmers/Landowners Local road Vehicle Traffic,	Moderate	High	Adverse	Significant
Medium-distance views within approximately 500-750m from the centre of the Proposed Development	Residents, Local road Vehicle Traffic, Pedestrians	High	Low-Medium	Adverse	Slight - Moderate
Long-distance views beyond approximately 750m from the centre of the Proposed Development	Residents, Vehicle Traffic, Pedestrians,	High	Low-None	Neutral	Imperceptible

A total of 10 photomontages from representative viewpoint locations have been prepared illustrating the nature of visibility of the proposal at various distances and contexts. The Photomontages are included in Appendix H.

Considering the nature of the Proposed Substation Development, the magnitude of visual change is considered long-term. A description of effects on visual receptors for Photomontages 1 to 10 is provided in Table 14-16.

Figure 14-2 Map and Direction of Viewpoint Locations

Table 14-16 Photomontage Locations Summary

Photomontage	Baseline View/Permitted View	Sensitivity/Susceptibility to Visual Change	Proposed Change	Magnitude of Visual Change	Significance/Quality of Visual Effects
Photomontage 1 View southeast from R122 Distance: 540m	Baseline View This view is taken from the R122 – northwest of the Proposed Substation Development. Receptors: Vehicular traffic, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/Low	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location. The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.	Low	Not Significant/Neutral
Photomontage 2 View east from R122 Distance: 130m	Baseline View This view is taken from the R122, north of the Proposed Substation Development. The gate entrance provides a vista across the landscape towards the substation site. The existing electricity 110kV pylons are visible across the Site in a north–south alignment. This stretch of road is sparsely populated although a low hedgerow permits views across the landscape towards the Site, however, the intervening field boundary vegetation screens much of the mid distance. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location. The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.	Low	Not Significant/Neutral
Photomontage 3 View northeast from R122 and R125 Distance: 470m	Baseline View This view is taken from the intersection of the R122 and R125 to the south of the Proposed Substation Development. The existing electricity 110kV pylons are visible across the Site in a north–south alignment. This stretch of road is sparsely populated although a low hedgerow permits views across the landscape towards the Site, however, the intervening field boundary vegetation screens much of the mid distance. A small number of residential properties are located along road. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location. The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.	Low	Not Significant/Neutral
Photomontage 4 View west from from of Rowlestown West	Baseline View This view is taken from Rowlestown West southeast of the Proposed Substation Development. The gate entrance provides a vista across the landscape towards the Site. This local road has a number of individual residential properties located along both sides.	High/High	The Proposed Development is not visible from this location.	None	None

Photomontage	Baseline View/Permitted View	Sensitivity/Susceptibility to Visual Change	Proposed Change	Magnitude of Visual Change	Significance/Quality of Visual Effects
Distance: 690m	Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).				
Photomontage 5 View northwest from the R125 Distance: 590m	Baseline View This view is taken from R125 southeast of the Proposed Substation Development. The fence provides a vista across the landscape towards the Site. The view captures the gently undulating land and irregular shaped field patterns with hedgerows in various conditions. A number of residential properties are located along road. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location. The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.	Low	Not Significant/Neutral
Photomontage 6 View southeast from R122 Distance: 780m	Baseline View This view is taken from the R122, south of the Proposed Substation Development. The gate entrance provides a vista across the landscape towards the substation site. The existing electricity 110kV pylons are visible across the Site in a north–south alignment. This stretch of road is sparsely populated although a low hedgerow permits views across the landscape towards the Site, however, the intervening field boundary vegetation screens much of the mid distance. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location. The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.	Low	Not Significant/Neutral
Photomontage 7 View northeast from Newbarn Distance: 1640m	Baseline View This view is taken from Newbarn which is a local road. This local road has a number of individual residential properties located along both sides. This stretch of road is sparsely populated although a low hedgerow permits views across the landscape towards the Site, however, the intervening field boundary vegetation screens much of the mid distance. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location. The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.	Low	Not Significant/Neutral
Photomontage 8a and 8b View south from Augherskea,	Baseline View This view is taken from Rowlestown East to the east of the Proposed Substation Development. This local road has a number of individual residential properties located along both sides.	High/High	The proposed electricity substation is visible from this location and will introduce an industrial element to the landscape in the mid-distance. The vertical elements of the proposal (lighting masts) protrude above the skyline from this location.	Low	Not Significant/Neutral

Photomontage	Baseline View/Permitted View	Sensitivity/Susceptibility to Visual Change	Proposed Change	Magnitude of Visual Change	Significance/Quality of Visual Effects
local Road off the R154 Distance: 500m	The existing electricity 110kV pylons are visible across the Site in a north–south alignment. This stretch of road is sparsely populated although a low hedgerow permits views across the landscape towards the Site, however, the intervening field boundary vegetation screens much of the mid distance. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).		The view was taken in winter when the field boundary vegetation is leafless, this photomontage provides a worst-case scenario.		
Photomontage 9 View southeast from Hill of Tara Distance: 20km	Baseline View This view is taken from the Hill of Tara west of the Proposed Substation Development. The view captures the gently undulating land and irregular shaped field patterns with hedgerows in various conditions. Receptors: Vehicular traffic, pedestrians, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The Proposed Development is not visible from this location.	None	None
Photomontage 10 View southeast from R122 Distance: 0m	Baseline View This view is taken from the R122 on the western boundary of the Proposed Substation Development. Receptors: Vehicular traffic, residents. The sensitivity and susceptibility of these receptors is considered Low (Vehicular), Medium (Pedestrians) and High (Residents).	High/High	The proposed site entrance with gate and fencing will be prominently visible in the foreground. The substation will become visible in the background and introduce a light industrial element to this view. The vertical elements of the proposal (gate and lighting masts) protrude partially above the skyline when seen from this location.	Moderate	Significant/Adverse

Proposed Grid Connection

The visual effects of the Proposed Grid Connection are not considered to be uncharacteristic due to the existing road use and are considered to have a low magnitude of visual change therefore it was deemed unnecessary to prepare photomontages for the Proposed Grid Connection. Given the sensitivity of the immediate surrounds, the significance/quality of change is considered Negligible/Neutral.

14.7 Mitigation

The embedded landscape mitigation measures at the substation site will maximise the retention of existing vegetation, where possible, particularly along the proposed access road to the Proposed Substation Development. The landscape master plan for the Proposed Substation Development site includes planting with a mix of native shrubs and woodland, native hedgerow and wildflower planting (refer Drawings 60657534-ACM-DWG-FT-620 and 60657534-ACM-DWG-FT-621), the planting will increase screening from external areas. The selection of planting will require a Planting Maintenance Plan to provide ongoing clearance of overhead transmission lines. The retention of existing vegetation, as well as the additional woodland and understory planting will bolster the existing screening from the east and west and increase screening effects in views from the north and south of the Site.

As there will be no material alteration to the landscape associated with the Proposed Grid Connection, no additional mitigation is proposed, however a Tree Protection Strategy & Method Statement be prepared and applied to the proposed retained trees, particularly to existing trees and hedgerows located at the border of the redline boundary. This is to ensure protection the RPZ's of the remaining trees and nearby tree root systems located on the Proposed Development Site and adjacent properties are adequately protected during the construction phase.

Removal of tree vegetation will need to comply with Section 40 of the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 and the Heritage Act 2018.

14.8 Residual Effects

14.8.1 Landscape Effects

The Proposed Substation Development will increase of light industrial landscape character within the study area. However, the Proposed Development is confined to one field boundary with existing hedgerows and mature tree lines confining this change in landscape character to the Proposed Substation Development's immediate surrounds without significantly extending landscape effects into the wider study area and beyond due to the significant intervening vegetation providing screening and significant distance from receptors.

The light industrial character of the Proposed Development will remain where the Site is located. The landscape character will remain similar as in Year 1 after the completion of construction works in its immediate and nearby surroundings within approximately 200m to 300m from the Proposed Development boundary.

The establishment of the proposed mitigation planting at the substation site will increase biodiversity and support habitat on site and have a beneficial effect locally as it will help to integrate the Proposed Development better into its setting.

Landscape effects will reduce quickly beyond approximately 300m distance from the Site boundary due to intervening vegetation. Landscape effects reduce to not significant with increasing distance from the Proposed Development in the remaining study area.

Overall, the effects on the landscape character will reduce slightly over time but remain similar as in Year 1 after the completion of construction works.

Table 14-17 Summary of Residual Landscape Effects

Receptor	Sensitivity	Magnitude of Landscape Change (at operation)	Quality of Landscape Effects	Significance of Landscape Effects
LCA – Rolling Hills (within the development site)	Medium	High	Adverse	Significant
LCA - Rolling Hills (in close proximity of the development site, up to approx. 100-200m radius)	Medium	Medium	Adverse	Moderate
LCA - Rolling Hills (within the wider area, beyond approx. 200m radius)	Moderate	Negligible	Neutral	Slight

Receptor	Sensitivity	Magnitude of Landscape Change (at operation)	Quality of Landscape Effects	Significance of Landscape Effects
LCA – Lowland Landscape Co, Meath (within the wider area, beyond approx. 1km radius)	High	Negligible	Neutral	Not Significant
LCA – 'The Ward' (within the wider area, beyond approx. 1km radius)	High	Negligible	Neutral	Not Significant

14.8.2 Visual Effects

The embedded landscape mitigation measures will maximise the visual screening effects across the landscape, particularly along the proposed access road to the Proposed Substation Development and from the south of the study area.

Visual effects will remain localised and similar as in Year 1 and remain also confined to locations in close proximity, within an approximately 300m radius of the proposed substation and access road. Proposed planting will mature and help integrating the Proposed Development into its environs, which will reduce visual effects locally. There are no visual receptors located within 300m of the proposed substation boundary, with the exception of landowners and/or farmers tending livestock in the neighbouring fields. the SiteThe visual changes will remain noticeable but will not be totally uncharacteristic due to an existing overhead powerline running through the Proposed Substation Development.

The upper sections of the Proposed Development will remain visible in the middle distance, between 300m to 1km away. Visual effects continue to decrease with distance beyond 1km.

No residual impacts to landscape and visual are predicted as a result of the Proposed Grid Connection at operation.

Table 14-18 Summary of Residual Visual Effects

Receptor	Main Receptor Group	Sensitivity	Magnitude of Visual Change (at operation)	Quality of Visual Effects	Significance of Visual Effects
Close-distance views at the proposed development or within approximately 200m from the centre of the Proposed Development	Residential Farmers/Landowners Local road Vehicle Traffic,	Moderate	Medium	Adverse	Moderate
Medium-distance views within approximately 500-750m from the centre of the Proposed Development	Residents, Local road Vehicle Traffic, Pedestrians	High	Low	Neutral	Slight
Long-distance views beyond approximately 750m from the centre of the Proposed Development	Residents, Vehicle Traffic, Pedestrians,	High	Low-None	Neutral	Imperceptible

14.9 Cumulative Effects

14.9.1 Cumulative Effects in Conjunction with Fieldstown Solar Farm

Fieldstown Solar Farm is a 105ha PV Energy Development, 500m north of the Proposed Development posing the potential for visual effects in combination – "Where two or more features are seen together at the same time from the same place, in the same (arc of) view where their visual effects are combined"[79]. The PV panels have a linear arrangement with an east - west alignment within the established field boundary hedgerows.

The majority of available cumulative visual effects will be localised and confined to locations in close proximity of the Proposed Development. There are no sensitive visual receptors located within the immediate area where highest visual cumulative effects will be experienced (with the exception of landowners and/or farmers tending livestock and these receptors for which the view is incidental or unimportant are tolerant of a high degree of change and are considered to have a Low Susceptibility to visual change). Cumulative visual effects from available views in the immediate area are considered Low. Their significance/quality is Slight/Adverse.

The contained nature of the Site within a larger field network, the undulating character of the study area and general hedgerow vegetation restrict the opportunity to experience cumulative effects to distance views from isolated locations along the L122 local road. Where available, the in-combination views present both developments as integrated elements within a wider landscape context and will become quickly screened once the mitigation measures detailed in the Fieldstown Solar Farm Landscape Plan (including further enclosure of field boundaries with new hedgerows and infill planting) are implemented and begin to mature. Cumulative visual effects from available views from the north are considered Low. Their significance/quality is Slight/Adverse.

Changes to the wider landscape character resulting from cumulative effects in-combination are considered low-negligible where the topography and the screening effects of vegetation will limit or fully screen the development. The overall cumulative visual effects are considered Low. Their significance/quality is Slight/Adverse.

14.9.2 Cumulative Effects in Conjunction with Other Listed Projects Further Afield

A number of developments of scale (refer to Table 1-2) have been identified in the area. The listed projects are at least 4.6km away from the Proposed Development and will not result in any cumulative impact to the surrounding environment. Due to the scale, nature and distant location of the listed projects and given that the assessed impacts of the Proposed Development are not significant, this development does not have any potential to alter the significance of effects associated with the proposed development. Any cumulative effect will not be significant.

14.10 Summary

14.10.1 Landscape Effects

The Proposed Development is located in LCT 'Agriculture Rolling Hills' and 'Low Lying Character' which are designated as *'Modest Landscape Value'* and of *'Medium Sensitivity'* according to landscape character assessment contained in FDP 2023-2029. The adjacent site context is agricultural land. The introduction of the Proposed Substation Development will modify the landscape character locally and introduce an infrastructural character to the area.

The Proposed Substation Development will alter the landscape character rural to light industrial. The majority of the Proposed Substation Development site will continue to be screened by intervening mature/semi-mature vegetation along surrounding field boundaries resulting in mainly partial views obscured by intervening vegetation. The change in landscape character will therefore be confined locally.

The significance of landscape effects of the Proposed Substation Development will reduce quickly beyond approximately 200m to 300m distance from the substation boundary due to intervening vegetation. Changes to the landscape character will be discernible when travelling along the R122 regional road located to the west of the Proposed Substation Development, however, changes will be only seen briefly where there are gaps in vegetation or when crossing the Broadmeadow River. Changes to the landscape character in views from Rowlestown Drive to the east of the Proposed Substation Development will be barely discernible given the distance between the Proposed Development and the receptors along this route.

A recognisable modification in the landscape character outside the field boundaries and beyond the immediate local roads in middle distance and long distance views at approximately 600m to 1km and beyond or along the R125 regional road to the south are unlikely to be noticed, and will not be significant, due the nature of the development and mature vegetation intervening vegetation and built structures. The Proposed Substation Development will integrate in the overall pattern of the surrounding landscape character at that distance. It is considered likely the magnitude of landscape change of the Proposed Substation Development during operation is overall considered Moderate and the resulting significance/quality is Medium/Adverse.

It is anticipated the Proposed Grid Connection Development will not alter the landscape character; however, landscape and visual disturbance will be experienced within approximately 200m of the Proposed Grid Connection. It is considered likely the 13.3km cable trench route will range in magnitude of change from Negligible to Low magnitude of landscape change during Operation is overall considered Low and the resulting significance/quality is Slight/Adverse.

14.10.2 Visual Effects

The Proposed Substation Development includes 20m lightning masts which will be the most visible element associated with the Proposed Substation Development. The Proposed Substation Development is confined within the boundary of a large agricultural field. The nearest visual receptor is likely to be associated with a residential property located 300m west of the Proposed Substation Development boundary. The majority of the Proposed

Substation Development's immediate site is currently visually screened by a network of hedgerows and mature tree lines existing along field boundaries.

The majority of visual effects will be localised and confined to locations in close proximity, within approximately 200m to either side of the Proposed Substation Development. There are no visual receptors located within 200m of the Proposed Substation Development boundary, with the exception of landowners and/or farmers checking on livestock within the neighbouring fields. The visual change will be significant locally due to the introduction of a Proposed Substation Development within a previously arable field in a rural setting. The highest visual effects will be experienced within the immediate surrounds due to this introduction. The introduction of the Proposed Substation Development will result in a change in visual character from rural to light industrial at the proposed development site.

Sections of the Proposed Substation Development will become visible in the middle distance, 500m to 750m away. Visual effects at that distance are considered not significant. While the vertical elements of the Proposed Substation Development will be visible in the distance, it will be seen with other landscape elements including built structures. It will not substantially alter the visual amenity in views at that distance.

The majority of the visual receptors are located beyond 500m from the main elements of the Proposed Substation Development. A number of residential dwellings are set back from the local road and are at distance of just over 400m from the Proposed Substation Development boundary. Views of the Proposed Substation Development beyond 600m are limited due to intervening vegetation and built structures screening partially or fully the proposed development resulting in no significant visual effects.

The Proposed Substation Development mitigation planting will help screen the substation components at lower levels and as the proposed vegetation becomes fully established (at approximately 12 to 15 years). It is considered likely the magnitude of landscape change of the Proposed Substation Development during operation is overall considered Moderate and the resulting significance/quality is Medium/Adverse.

During the construction phase, temporary and significant adverse visual effects will arise as a result of construction works, which may involve some vegetation removal, the disruption of tree lines along the road network, earthworks and moving machines, and works related to the hard surfacing.

Once construction of the Proposed Grid Connection will be no material alteration to the landscape due to being located with the existing road infrastructure. As a result, the Proposed Grid Connection will have Low magnitude of on visual receptors resulting in a significance/quality of Slight/Adverse.

15. Traffic and Transport

A TTA has been prepared and is included in Appendix I.

16. Conclusion

This ECR has assessed the likely environmental impacts associated with the Proposed Development (a 110kV AIS substation and associated 13.3km grid connection). The potential environmental impacts arising from the Proposed Development have been considered with regards to the construction and operational phases.

In conclusion, there are no likely significant residual impacts associated with the Proposed Development, assuming the mitigation measures outlined in this report are implemented during the construction and operational phases. The potential impacts arising from the Proposed Development are considered not significant.

17. References

1. AECOM (2023), Fieldstown 110KV Substation and Grid Connection environmental Impact Assessment Screening Report
2. Department of Public Expenditure, NDP Delivery and Reform (2021), National Development Plan 2021-2030
3. AECOM (2023), Fieldstown 110kV Substation and Grid Route Planning Statement
4. AECOM (2023), Outline Construction Environmental Management Plan
5. EPA (2022), Guidelines on the information to be contained in Environmental Impact Assessment Reports
6. NHS (2019), HUDU Planning for Health – Rapid Health Assessment Tool
7. Failte Ireland (2011), Guidelines on the Treatment of Tourism in an Environmental Impact Statement
8. FCC (2023), Fingal Development Plan
9. Motorcycle, Scooter, Car or Van
10. EPA (2018), Corine Lancover 2018
11. Rolestown National School - https://rolestownns.ie/about-us/
12. European Commission (EC) (2017), Environmental Impact Assessment of Projects, Guidance on the Preparation of Environmental Impact Assessment Reports (as amended).
13. European Union (EU) (2018), Planning and Development Environmental Impact Assessment Regulations 2018 (Statutory Instrument) S.I. 296)
14. Institution of Geologists of Ireland (IGI) (2013), Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements.
15. Hydrogeological regime beneath the site is described in Chapter 8
16. EU (2000), EU Water Framework Directive
17. European Communities (2003) Water Policy Regulations
18. European Communities (2009) Environmental Objectives (Surface Water) Regulations (as amended)
19. European Communities (2010) Environmental Objectives (Groundwater) Regulations (as amended)
20. European Communities (2011), Environmental Impact Assessment of Projects – Guidance on Scoping (as amended)
21. EU (2007), EU Floods Directive
22. European Communities (2010), Assessment and Management of Flood Risks Regulations
23. DHPLG (2018), River Basin Management Plan 2018-2021.
24. https://www.npws.ie/protected-sites
25. Erste Allgemeine Verwaltungsvorschrift zum Bundes–Immissionsschutzgesetz (Technische Anleitung zur Reinhaltung der Luft – TA Luft) Vom 24. Juli 2002. https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Luft/taluft.pdf
26. EPA (2006), Environmental Management in the Extraction Industry (non-scheduled minerals)
27. Government of Ireland (2018), Project Ireland 2040 National Planning Framework. https://www.gov.ie/en/campaigns/09022006-project-ireland-2040/
28. FCC (2023), Fingal Development Plan 2023-209
29. TII (formerly the NRA) (2011), Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. https://www.tii.ie/technical-services/environment/planning/Guidelines-for-the-Treatment-of-Air-Quality-during-the-Planning-and-Construction-of-National-Road-Schemes.pdf
30. Holman et al. (2014), IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf.
31. IAQM (2023), Guidance on the Assessment of Dust From Demolition and Construction
32. EPA (2020), Air Quality in Ireland 2019.
33. https://airquality.ie/
34. UN Department of Economic and Social Affairs (2015), Transforming Our World: The 2030 Agenda for Sustainable Development
35. UN Framework Convention on Climate Change (2016), The Paris Agreement
36. Government of Ireland (2021), Climate Action and Low Carbon Development (Amendment) Bill
37. UN Framework Convention on Climate Change (1997), Kyoto Protocol
38. Government of Ireland (2020), Ireland's National Energy and Climate Plan 2021-2030

39. Government of Ireland (2022), Climate Action Plan 2023
40. Government of Ireland (2019), Project Ireland 2040, National Planning Framework
41. Eastern and Midlands Regional Assembly (2010), Regional Planning Guidelines for the Greater Dublin Area 2010-2022
42. FCC (2019), Climate Change Action Plan (2019-2024)
43. Carbon Trust (2016), PAS 2080 Carbon Management in Infrastructure
44. World Resources Institute (2004), Greenhouse Gas Protocol
45. ISO (2019), GHG Emissions Verification
46. Bath University (2019), The Inventory of Carbon and Energy (ICE) Database (Version 3) and the Cement, Mortar and Concrete Model (Version 1)
47. UK Government (2022), Greenhouse Gas Reporting: Conversion Factors 2022
48. IEMA (2020), Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation
49. EC (2010) Guidance for the Calculations of Land Carbon Stocks
50. IEMA (2017), Assessing Greenhouse Gas Emissions and Evaluating their Significance.
51. Intergovernmental Panel on Climate Change (2018)
52. Carbon Trust (2011), PAS 2050 – Specification for the Assessment of the Lifecycle Greenhouse Gas Emissions of Goods and Services
53. EPA (2015). Ensemble of Regional Climate Model Projections for Ireland
54. Harrison et al (2010), Projected Material Requirements for The Global Electricity Infrastructure – Generation, Transmission And Storage
55. where over 66% off the ensembles agree
56. EPA (2021), Ireland's National Inventory Report 2021
57. This is for energy consumed during the night. It is assumed that energy consumed during the day is from the solar PV park rather than the grid.
58. Government of Ireland (2018) Project Ireland 2040 National Planning Framework
59. National Roads Authority (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes
60. BSI Group (2014) BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites
61. Environment Protection Agency (2016) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities
62. HE, Design Manual for Roads and Bridges
63. Department of Transport, Welsh Office (1988) Calculation of Road Traffic Noise (CRTN). HMSO, London
64. Reilly, et al (2020), Vibrations Due to Horizontal Directional Drilling in Lucan Formation Rock and Dublin Boulder Clay
65. Keast and Gordon (1980) Assessment of the Need for Noise Control Research on Electric Power Transformers and Reactors Available: https://www.osti.gov/servlets/purl/5082211/ Accessed: 10/08/2021.
66. European Communities (1998), Construction Plant and Equipment) (Permissible Noise Levels) Regulations
67. Government of Ireland (1930-2004), National Monuments Act (as amended)
68. Government of Ireland (2018), Heritage Act (as amended)
69. Government of Ireland (2019), Heritage Ireland 2030
70. Government of Ireland (2000), Planning and Development Act (as amended)
71. Department of Arts, Heritage and the Gaeltacht (2013), NIAH Handbook
72. Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs and TII (2017), Code of Practice for Archaeology.
73. TII (formerly NRA) (2005), Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes
74. Department of Arts, Heritage Gaeltacht and the Islands (1999), Policy and Guidelines on Archaeological Excavation
75. Council of Europe (200), The European Landscape Convention
76. Department of Arts, Heritage and the Gaeltacht (2015), National Landscape Strategy for Ireland
77. AECOM (2023), Fieldstown 110kV Substation and Grid Connection Planning Statement
78. Meath County Council (2021), Meath County Development Plan 2021-2027

79. Landscape Institute (UK) and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition
80. Landscape Institute (2011), Photography and Photomontage in Landscape and Visual Impact Assessment
81. Landscape Institute (2019), Visual Representation of Development Proposals

Drawings

Drawing Reference	Title
HFCR-ROD-HUT-SW_KB-DR-CU-300001	Plan Layout
HFCR-ROD-HUT-SW_KB-DR-CU-300003	Site Layout
HFCR-ROD-HUT-SW_RO-DR-CU-300101	Photography Plan Layout
HFCR-ROD-HUT-SW_RO-DR-CU-300201	N2 HDD
HFCR-ROD-HUT-SW_RO-DR-CU-300211	Broadmeadow River HDD
HFCR-ROD-HUT-SW_RO-DR-CU-300221	Ward River HD
HFCR-ROD-HUT-SW_RO-DR-CU-300311	Access Track
XDC-CBL-STND-H-001-013	Ducting Layout
60657534_ACM_DWG_FT_101	Fieldstown 110kV Substation & Grid Connection Site Layout (Aerial)
60657534_ACM_DWG_FT_600	Fieldstown 110kV Substation Site Location @ 1:2500
60657534_ACM_DWG_FT_601	Fieldstown 110kV Substation Layout
60657534_ACM_DWG_FT_602	Fieldstown 110kV Substation Site Location @1:500 & Proposed 38kV OHL Diversion
60657534_ACM_DWG_FT_603	Fieldstown 110kV Substation Layout of Sections & Elevations Sheet 1/3
60657534_ACM_DWG_FT_604	Fieldstown 110kV Substation Sections 1 to 3 Sheet 2/3
60657534_ACM_DWG_FT_605	Fieldstown 110kV Substation Sections 4 & 5 Sheet 3/3
60657534_ACM_DWG_FT_606	Fieldstown 110kV Substation Mv Switchgear Container Layout And Elevations
60657534_ACM_DWG_FT_607	Fieldstown 110kV Substation EirGrid Building Layout & Elevations
60657534_ACM_DWG_FT_608	Fieldstown 110kV Substation Isometric View
60657534_ACM_DWG_FT_609	Fieldstown Drainage Layout
60657534_ACM_DWG_FT_610	Fieldstown Typical Drainage Details Sheet 1/2
60657534_ACM_DWG_FT_611	Fieldstown Typical Drainage Details Sheet 2/2
60657534_ACM_DWG_FT_612	Fieldstown 110kV Substation Typical Substation Fence Details
60657534_ACM_DWG_FT_613	Fieldstown 110kv Substation Typical Lighting Pole Details
60657534_ACM_DWG_FT_614	Fieldstown 110kV Substation Elevations 1 to 4
60657534_ACM_DWG_FT_615	Fieldstown 110kV Substation Typical Post & Rail Detail
60657534_ACM_DWG_FT_616	Fieldstown 110kV Substation Drainage Channel Crossing Standard Detail
60657534_ACM_DWG_FT_617	Fieldstown 110kV Substation Indicative Vehicle Tracking Sheet 1/2
60657534_ACM_DWG_FT_618	Fieldstown 110kV Substation Indicative Vehicle Tracking Sheet 2/2
60657534_ACM_DWG_FT_619	Fieldstown 110kV Substation Site Entrance
60657534_ACM_DWG_FT_620	Fieldstown 110kV Substation Landscape Mitigation Plan
60657534_ACM_DWG_FT_621	Fieldstown 110kV Substation Landscape Planting Plan

Appendix A Planning History Search

A desktop search of proposed and existing planning applications was carried out on 13 April 2023 and subsequently updated on 5 October 2023. The search used publicly available data from the MyPlan.ie's 'National Planning Application' database, ABP database and Council Planning Portals.

The scope of the search was based within a 5km radius from the approximate centrepoint of the Proposed Development. A specified criteria informed the search and omitted any planning applications greater than ten years old, refused, invalid and withdrawn applications. The criteria then focused on foreseeable developments to be considered in line with the Proposed Development. In respect of this, any small scale residential and extension type developments along with minor amendments, changes of use and small-scale farming/agricultural applications were omitted. Only reasonably foreseeable developments were considered and are presented below in Table A-1. Part 8 Applications are considered and presented in Table A-2.

The findings showcased no prevailing character of development, with applications relating mainly to residential and agricultural uses/development. Recent years have seen an emergence of solar developments in the surrounding environs.

Table A-1 Cumulative Planning Search (5km Radius)

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
An Bord Pleanála	317539	Local Centre lands, adjacent to the existing Tyrrelstown Local Centre, in the townland of Hollywoodrath, Dublin 15	Construction of a primary retail unit comprised of convenience floorspace and clothing sales area.	09/06/2023	c.5km west
Meath CC	23873	South Of Baltrasna Manor, Western Of The Dublin Road (R135), Ashbourne Co. Meath	the proposed development consists of 70 dwellings, comprised of 40 2, 3 and 4 bed, 2 storey, terraced and semi-detached houses, and 30 1, 2, and 3 bed apartments/duplex units, accommodated in 2x3 storey blocks. Access to the proposed development will via a new vehicular entrance off the Dublin Road. The proposed development also provides for all associated site development works, above & below ground, public open space, including hard and soft landscaping & boundary treatments, car parking, bin & bicycle stores, public lighting etc., all on an overall application site area of c.1.9ha.	02/11/2023	c.4.8m west
An Bord Pleanála	317480	Kilshane Road, Kilshane, Finglas, Dublin 11	Demolition of buildings, road improvement works and construction of gas turbine power generation station with all associated site works. EIAR has been prepared. EPA licence is required.	Proposed Decision Date Unavailable	c.2km west
Meath CC	23861	Hunters Lane, Dunreagh, Ashbourne Co. Meath	the construction of the following development: 1. Construction of a two and three storey 57-bedroom nursing home. 2. Provision of private open space amenities for the proposed development. 3. Construction of vehicular access from the link road connecting Hunters Lane with Cedar Road. 4. Provision of internal access road, footpaths including necessary car parking facilities. 5. Connection to the adjoining public watermains and foul sewer. 6. Installation of a storm water network including the installation of an attenuation tank and petrol interceptor. 7. Drainage improvements within site to include widening of stream channel on southern boundary and drainage ditch on eastern boundary. 8. Provision of onsite public lighting to serve the proposed development. 9. Provision of associates signage to the facade of proposed building. 10. A Natura Impact Statement is included with this planning application and is available for inspection/purchase. 11. All associated boundary treatments, landscaping and ancillary site development works.	01/11/2023	c.5km west
An Bord Pleanála	317436	Lands west of 1-10 The Orchard, Oldtown, Co. Dublin	The development will consist of the construction of 14 dwellings, consisting of 6 five-bedroom dormer dwellings with integrated garage, 4 4-bedroom two storey dwellings, 4 3-bedroom bungalows and associated site works.	25/10/2023	c.3.2km north

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F23A/0504	On Lands to the South of Rathbeale Road and to the North of Main Street and to the East of, Mooretown Distributor Road (Western Distributor Link Road), Mooretown, Swords, Co. Dublin	Planning permission sought for residential development. The proposed development will consist of the construction of 96 residential units (46 houses and 50 duplex units (comprising 25 duplex 'apartment' units and 25 duplex 'house' units)), all of which will be provided as follows: - 46 houses (30 3-bed houses and 16 x4-bed houses) in detached, semi-detached, end- terraced, and mid-terraced houses, all two storeys in height, with external bin stores and bike stores to front of mid-terraced units. - Duplex Block A containing a total of 12 units comprising of 6 x1 bed units and 6 3 bed units, in a building three storeys in height, and all units provided with private balconies/terraces. external bike stores. car parking and bicycle spaces. - Duplex Block B containing a total of 16 units comprising of 8 x 1 bed units and 8 3 bed units, in a building three storeys in height, and all units provided with private balconies/terraces. external bike stores. car parking and bicycle spaces. - Duplex Block C containing a total of 14 units comprising of 7 x 1 bed units and 7 3 bed units, in a building three storeys in height, and all units provided with private balconies/terraces. external bike stores. car parking and bicycle spaces. - Duplex Block D containing 8 units comprising of 4 1 bed units and 4 3 bed units, in a building three storeys in height, and all units provided with private balconies/terraces. external bike stores. car parking and bicycle spaces. The development will provide for a total of 128 car parking spaces and 326 bicycle spaces. bin stores. landscaping. boundary treatments. public lighting. future pedestrian access indicated at boundary with adjoining school lands subject to agreement. all associated site infrastructure and engineering works necessary 'to facilitate the development. À Natura Impact Statement (NIS) has been prepared and is submitted to the planning authority with the application.	11/10/2023	c.3.3km southeast
An Bord Pleanála	317218	Charlestown Place, St. Margaret's Road, Charlestown, Dublin 11	Grant of permission for 590 apartments.	02/10/2023	c.1.5km south
Meath CC	2360184	Ashbourne Retail Park, Ballybin Road, Ashbourne, Co. Meath.	The development will consist of 5 EV charging stations, each serving 2 vehicle charging bays, a total of 10 charging points, 1 8 bay canopy structure incorporating circa. 105m² of roof mounted solar panels. The proposed development also incorporates 1 ESB substation, the use of existing retail park access/egress and all associated above and below ground ancillary works.	19/09/2023	c.4.8km northwest
Fingal CC	F23A/0262	Uniplumo Ireland Facility, at Wyestown, Oldtown, Co. Dublin, A45 D797	The proposed development comprises: (i) construction of a biomass boiler with associated buffer tank and plantroom to the north of the existing glasshouse. (ii) extension of existing road to access proposed biomass boiler. (iii) works inclusive of filter drain, surface water overflow and surface water inspection chamber to facilitate drainage. (iv) and all associated site development ancillary works necessary to facilitate the development.	14/09/2023	c.4.7km northwest
Meath CC	23477	Fleenstown Little, Ashbourne, Co Meath	to construct a 30-meter lattice mobile and broadband tower with headframe carrying telecommunications equipment, together with associated equipment and cabinets enclosed within a 2.4m palisade fence compound with access track. Significant Further Information/revised plans submitted on this application.	10/09/2023	c.4.7km west
Meath CC	23703	Ashbourne Business Park, Ashbourne, Co. Meath	EXTENSION OF DURATION OF PLANNING PERMISSION AA180221 - (i) Film Studio Facility in 3 Blocks for the production of live action and animated film & television product, commercials, video games and all other media & multimedia products including computer generated imagery (CGI). The proposed development will include A) Areas for film production and sound stages, editing and production spaces, film demonstration facilities and facilities for the rental of film making articles - all provided in buildings as follows: Block A: 5,119 m² (18.8m high, including 2 69.4 m² Basement Areas to facilitate live action filming). Block B: 2,095 m² (18.8m high). Block C: 985 m² (15m high). B) Offices, resting, recreational & dining areas, make up rooms, workshops and film education & training areas, postproduction facilities, animation & CGI facilities, storage areas - all attached to the main buildings over 3 floors as follows: Block A: 1,602 m², Block B: 1,293m², Block C: 209m², Overall building area provided: 11,303m². (ii) For the construction of site access & circulation from the existing estate's internal access road, footpaths, public lighting and parking facilities for the proposed development. (iii) For the occasional temporary erection of film sets within the	05/09/2023	c.5km northwest

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
			curtilage of the proposed development if or when necessary. (iv) For the provision of foul sewer, surface water sewers and water mains including underground surface water attenuation facility. (v) And or in addition to the above, permission for the use of the said premises for warehousing/general light industrial uses. (vi) For all ancillary works and uses necessary for the above proposed developments such as landscaping, fencing, paving, utilities and services & all site development works.		
An Bord Pleanála	316907	Church Road and the Broadmeadow River, Rowlestown Drive, Rowlestown, Co. Dublin	Construction of a nursing home.	01/09/2023	c.1.2km southeast
Meath CC	2360122	Ashbourne Rugby Club, Milltown, Ashbourne, Co. Meath	the installation of an aircraft noise monitoring terminal on a standalone, tiltable mast structure (6m in height) along with associated works including electrical connection. On land adjoining the existing astroturf pitch in the eastern part of the Ashbourne Rugby Club grounds.	22/08/2023	c.4km northwest
Meath CC	23411	Baltrasna, Ashbourne, Co. Meath	the development consists of retention for single storey vehicle Charging Building Ref: A and Diesel Bunded Building Ref: B and ancillary site works and full planning permission is been sought (1) To demolish an existing cold storage building, an equipment storage building, portable offices, plant and generator storage areas and cold storage building (2) to construct a new cold storage building incorporating offices, staff room, toilets, covered loading bay and services room (3) To provide car and van parking spaces along with E.V. charging points (4) To close up an existing septic tank and soak-pit and to install a new proprietary waste water treatment unit and percolation area (5) construct single storey ESB Sub station (6) and all ancillary site development works.	17/08/2023	c.4.8km west
Fingal CC	F23A/0430	Ballyboughal National School, Ballyboughal, Co. Dublin.	For Planning permission for development on land within the grounds of Ballyboughal National School Co. Dublin. The development will consist of the installation of an aircraft noise monitoring terminal on a standalone tiltable mast structure (6m in height) along with associated works including electrical connection.	17/08/2023	c.5km northeast
Fingal CC	FW23A/0181	Huntstown Business Park, Cappagh Road, Huntstown, Dublin 11	Planning permission for the construction of two Light Industrial/Warehouse/Distribution units (A & B) with two-storey ancillary offices. All ancillary site development works to include underground duct work, drainage, utility services, access road, service yards, HGV loading/unloading areas, ESB sub-station, car parking, motorcycle parking, landscaping, cycle shelters, bin/recycling shelters, sprinkler tank & pumphouse, signage, boundary treatments, site lighting, security fencing and gates, storm water drainage network, underground foul, sustainable urban drainage systems to the proposed units, form part of this application. Unit A has a gross internal floor area of 4,718m² and Unit B has a gross internal floor area of 2,697m². The overall site area is 2.013haand is located at Huntstown Business Park, Cappagh Road, Huntstown, Dublin 11.	04/08/2023	c.3km southwest
Fingal CC	FW22A/0201	Irishtown, Spricklestown, Ward Lower, Dublin	Permission for development at a site of c. 61.1 hectares. The development will consist of a 10-year permission for the construction of a Solar Photovoltaic (PV) panel on ground mounted frames/support.	25/07/2023	c.2.4km west
Fingal CC	FW22A/00188	Lands at Powerstown, Damastown Rise, Damastown Industrial Estate, Macetown North, Dublin 15	A proposed single storey (1,060 m²) warehouse divided into 3 No stores for the storage and distribution of materials including chemicals. The height of the proposed building does not exceed 9.7m complete with ancillary site and civil works external ancillary plant to the rear complete with security gates and fencing 2.4m high. All located adjacent to an existing site, to which the chemicals act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I 209 of 2015) applies. Located on a 2.7 acres site at Powerstown, Damastown Rise, Damastown Industrial Estate, Macetown North, Dublin 15.	06/07/2023	c.4.7km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	FW23A/0149	Lands north of Meakstown Cottages access road, Dubber, Co. Dublin	The development will consist of an eco-self-storage facility comprising 300 storage containers (each 6.1m x 2.44m x 2.59m) provided in 9 rows internal circulation network, parking (9 spaces), landscaping, lighting and boundary palisade fence and gate with vehicular and pedestrian access taken from Meakstown Cottages. Relocation of existing gate and ESB pole at western end of Meakstown Cottages access road to the east of site entrance and minor widening of access road.	06/07/2023	c.1km southeast
Fingal CC	FW23A/0016	Site B, Cappogue Industrial Park, Ballycoolin Road, Dublin 11	The proposed development will consist of the construction of an industrial development facility for the processing and distribution of fresh and used cooking oils (UCO) including ancillary offices and staff amenities, roof-mounted photovoltaic array, delivery vehicle maintenance building, external covered storage area, weighbridge, lorry wash, tank farm, fuel tanks, signage, lighting, landscaping, car/lorry/trailer parking areas, and all associated site development works. Access to the proposed development will be from the existing industrial estate road abutting the Site to the west that connects to the Ballycoolin Road to the north. A Local Authority permit (Recovery Code 13) is required for the used cooking oil process.	05/07/2023	c.2.3km southwest
Fingal CC	F23A/0245	Site to the north of Hangar 6 and north Apron, west of Castlemoate Road, and south of Gatepost 1B, in the townlands of Cloghran and Corballis, Dublin Airport, Co. Dublin	Ryanair DAC, intend to seek planning permission for development which will consist of the construction of a single-storey, part two-storey four-bay hangar designed to accommodate up to 4 Code C Aircraft, with associated maintenance facilities, ancillary offices and staff areas. The proposed development will also consist of the demolition of the existing internal airport roadway on site and the development of new site access arrangements. external covered bin storage and chemical storage. new substation. provision of 20 airside vehicle parking spaces. new service connections. all other associated site and development works, all on a site to the north of Hangar 6 and North Apron, west of Castlemoate Road, and south of Gatepost 1B, in the townlands of Cloghran and Corballis, Dublin Airport, Co. Dublin. The proposed development does not propose any increase in passenger or operational capacity at Dublin Airport. A Natura Impact Statement has been prepared in respect of the proposed development.	30/06/2023	c.5km east
Fingal CC	FW23A/0120	Dunsoghly, Saint Margaret's, Co. Dublin	The proposed development will consist of the following: The construction of a single storey, on-farm abattoir (c. 916 m2), c. 61 m2 ancillary office, c. 132m² enclosed yard (lairage- including pens), provision of c. 22 car parking spaces, 2 motorcycle spaces and 16 bicycle parking spaces, onsite Wastewater Treatment Plant (WWTP), process waste holding tank and surface water drainage, a revised site entrance off Kilshane Road (L3120) and new access road to serve the development, landscaping and all associated site development works necessary to facilitate the development on a site of c. 3.77ha.	26/06/2023	c.2km south
Fingal CC	FW22A/0204	Kilshane Road, Kilshane, Finglas, Dublin 11.	The proposed development will consist of the following: The construction of a new Gas Turbine Power Generation Station with an output of up to 293 Megawatts. The proposed station will consist of 1 Gas Turbine and 1 28m high Exhaust Stack partially enclosed by a 12m high acoustic wall. 1 single storey Admin Building and Warehouse (c. 926m²), 1 single storey Packaged Electronic/Electrical Control Compartment (PEECC) (c. 72 m²), 1 single storey Continuous Emission Monitoring System (CEMS) Shelter (c. 14.8m²), 1 16.2m high x 024.4m Fuel Oil Tank, 1 15.3m high x 09.2m Raw/Fire Water Tank, 1 16.2m high x 018.3m Demin Water Tank, and miscellaneous plant equipment. The demolition of a detached residential dwelling (c. 142m² GFA) and associated farm buildings (c. 427m² GFA) located in the northwest corner of the subject site to facilitate the proposed development. Road improvement works to 493.34m Kilshane Road (L3120), including the realignment of a portion of the road (293.86 m) within the subject site boundary and the provision of new footpaths, off-road cycle ways, together with the construction of a new roundabout linking the proposed realignment of Kilshane Road back to the existing road network to the northeast of the subject site and to the proposed internal road network to serve the proposed development.	23/06/2023	c.1.6km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
			The construction of entrance gates, low wall and railings fronting the realigned Kilshane Road and a private internal road network providing for vehicular, cyclist and pedestrian access to serve the development. Construction of 3m high security fencing within development. Total provision of 26 car parking spaces including 1 disabled persons parking space and 2 EV electrical charging points. Provision of security lighting columns to serve the development and the installation of Closed-Circuit Television System (CCTV) for surveillance and security purposes. Provision of 20 sheltered bicycle parking spaces. Provision of hard and soft landscaping works, tree planting and boundary treatments including 3m high security fence along Kilshane Road and the perimeter of the subject site boundary. Provision of new onsite foul sewer pumping station to serve the development. Provision of underground surface water attenuation areas to serve the development. All associated site development and excavation works, above and below ground, necessary to facilitate the development. An Environmental Impact Assessment Report has been prepared in respect of the proposed development. This application relates to a development that will require an Industrial Emissions Directive licence from the Environmental Protection Agency. A subsequent application will be submitted for an Above Ground Installation (AGI) compound, underground gas supply installation and a subsequent Strategic Infrastructure Development (SID) Application will also be submitted for a Gas-Insulated Switchgear Substation (GIS), Air Insulated Switchgear Substation (AIS) and Proposed Grid Connection to serve the development.		
Fingal CC	FW23A/0076	Site adjacent to Texaco Service Station, Unit 15 Blanchardstown Corporate Park, Dublin 15	The proposed development will comprise. 5 EV charging stations each serving 2 vehicle charging bays, a total of 10 charging points, 8 bays are provided under a canopy structure with integrated roof mounted solar panels circa. 74 m² surface area. The proposed development also incorporates 1 ESB substation & 1 substation kiosk, with access and egress presented to the Site and all associated directional road surface markings and above and below ground ancillary works.	21/06/2023	c.3.2km west
Fingal CC	FW22A/030	College Business & Technology Park, Blanchardstown Road North, Blanchardstown, Dublin 15	Expansion of the existing Biopharmaceutical Manufacturing Campus, located at College Business and Technology Park, Blanchardstown, Dublin 15. The proposed expansion will include. (i) a new 5 storey Active Pharmaceutical Ingredient (API) manufacturing building (c. 10,315m² and maximum height 41.225m) (ii) a new 2 storey chemical materials store (c. 1,071m² and maximum height 15.12m) (iii) a new 4 storey laboratory building (c. 5,148m² and maximum height 27.35m) (iv) extensions to the existing warehouse building (c. 6,236m² and maximum height 24.00m), including alterations to the previously permitted extension to the warehouse (planning ref. FW21A/0174) (v) a bunded solvent tank storage area including tanker loading and unloading yard (vi) a chemical materials yard including liquid nitrogen storage tank, scrubbers and a thermal oxidiser abatement unit complete with c.46m high flue stack (vii) a manufacturing building utilities yard including chillers and other miscellaneous plant and equipment (viii) a medium voltage electrical building (c. 190m² and maximum height 4.717m) and solvent area control building (c. 89 m² and maximum height 4.717m) (ix) an extension to the existing high level pipe rack connecting all existing and new buildings and yard areas (x) 2 new diesel generators and 2 new bunded diesel storage tanks	13/06/2023	c.4.2km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
			(xi) modifications to site infrastructure, including. addition of 200 new car park spaces on the eastern side of the Site, expansion of the Site's existing storm water attenuation/fire water retention pond, and alterations and extensions to internal site roads, paving and underground services (xii) enhancements to the Site internal and boundary landscaping (xiii) provision of a temporary contractor's compound and parking area on lands to the east of the Site for the duration of the construction works. This application relates to development which comprises an activity which holds and Industrial Emissions Directive Licence (Reg no P1030). The application relates to the provision of an establishment to which the Major Accident Regulations apply. An environmental Impact Assessment Report (EIAR) has been prepared and submitted to the planning authority with the application.		
Fingal CC	FW23A/0111	Lands at Huntstown Townland and Coldwinters Townland, County Dublin	We Rathdrinagh Land Unlimited Company (Trading as Irish Recycling LTD) intend to apply to the aforementioned Planning Authority for permission for development on lands at Huntstown Townland and Coldwinters Townland, Co Dublin. The development will consist of the construction of a Materials Recovery Facility along with a Food Container Cleaning Plant. The development is phase one of the Huntstown Circular Economy Hub and will include for the following works: 1. The development will consist of the erection 2separate buildings and associated site area for use as a Circular Economy Hub. 2. The processes to be carried out within the Materials Recovery Facility building include for the sorting of range of wastes into recoverable and recyclable streams. Recoverable wastes to processed will include for potential recyclables. This building will include for an external odour control plant with associated flue. 3. The processes to be carried out in the Food Container Cleaning Plant building will provide a centralised washing/sterilisation facility for large food retailers in the area to facilitate re-use of containers. 4. The 2 buildings to be constructed will incorporate ancillary office and staff facilities along with solar PV panels and signage. 5. The development of associated access roads, turning/loading areas, footways, parking areas, electric vehicle charge points, landscaping, lighting, fencing, bicycle and bin storage facilities and associated site works. 6. The provision of an ESB substation. 7. The provision of ancillary external storage areas. 8. The reprofiling of existing ground levels within the Site and associated works to include for infilling and reprofiling of lands within the overall site area. 9. The provision of a new site entrance with associated works to facilitate vehicular and pedestrian access along with associated upgrade works to the adjacent public road to include for provision of footpaths and cycle paths. 10. The provision of a weighbridge and associated staff building at the entrance. 11 The provision of perimeter fencing and security gates. 12. The provision of all associated hard and soft landscaping works. 13. Provision of attenuation tanks and associated infrastructure as part of the surface water system along with installation of a bypass petrol interceptor. 14. All ancillary site development, landscaping and construction works to facilitate foul. water and service networks. The Materials Recovery Facility will require an EPA Industrial Emissions Licence. An Environmental Impact Assessment Report (EIAR) has been prepared and accompanies this application.	12/06/2023	c.0.9km west
Fingal CC	F23A/0104	Terminal 1, Dublin Airport, Collinstown, County Dublin	daa plc intend to seek planning permission for development at a site of c.361.5 m² on the northwest part of the roof (Level 40) of the T1X building at Terminal 1, Dublin Airport, Collinstown, Co. Dublin. The proposed development will consist of an extension to the existing rooftop plant room to provide a rooftop plant unit of c.185 m². The proposed development will accommodate additional mechanical equipment, including 2extract cowls, ducting, and 3roof cowls, all to serve a new food and beverage unit inside the T1X building on the Departures Level (Level 20), and will be screened with a louvre cladding to match the existing rooftop plant room in terms of elevational treatment and height. An external condenser unit is also proposed to be located immediately to the northwest of the proposed plant room extension.	09/06/2023	c.5km southeast

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	FW23A/0014	Site (known as Site H) at Northwest Business Park, Kilshane Drive, Ballycoolin, Dublin 15	The proposed development consists of the construction of 1 warehouse/ logistics unit (proposed Unit 735), including ancillary office floorspace over two levels, with a maximum height of c. 17.09m and total GFA of 5,132 m². The proposal includes three vehicular access points (for staff/ visitors and service vehicles) off the existing road network serving the Business Park. The proposal includes 51 car parking spaces and 20 cycle spaces. The development also includes a signage zone for the unit, PV panels at roof level, HGV service yard areas, landscaping, pedestrian and cycle infrastructure, boundary treatments, entrance gates, lighting, foul and surface water drainage, site clearance and all associated site works.	09/06/2023	c.2.9km west
Meath CC	2360084	Rath, Ashbourne, Co. Meath	The proposed development will consist of permission to construct: 1. A two storey building of 2,443.6m², to the south of the existing Pillo hotel site. The ground floor of the proposed building will consist of an area of 1315.4m², and the first floor will have an area of 1128.2m². The ground floor will contain a reception, soft drinks bar, bowling alley (8 lanes), toilets, laser maze, kitchen, freezer room, food area and double height storage area. The first floor will consist of communications room, bumping cars, games and 'party areas. 3. Permission is sought for advertisement signage (13.4 m²) to the North (front) and West (side) elevations on the proposed building. 4. Permission is also sought for 103 additional parking spaces, to the northeast of the proposed building, to accommodate adequate parking on site. 5. Alterations and replacement of 63 car parking spaces to the existing hotel parking to the west of the proposed building. 6. Connections to the existing services at Pillo Hotel, landscaping and all ancillary site works.	08/06/2023	c.5km northwest
Fingal CC	F22A/0533	The adjoining Roadstone Quarry on the West side of the Feltrim Road, Swords, Dublin	Permission sought for removal of some existing structures, construction of single storey industrial warehouse building with 2 storey ancillary offices, modification of the existing central entrance and front boundary walls, provision of car parking, new wastewater treatment and surface attenuation/disposal systems, landscaping and related ancillary works.	02/06/2023	c.5km east
An Bord Pleanála	315709	Lands at Site A (White Car Park), Blanchardstown Town Centre, Coolmine, Dublin 15	971 apartments and associated site works.	26/05/2023	c.5km southwest
Meath CC	23550	Tudor Grove, Killegland, Ashbourne, Co Meath	the following 3 buildings, 1. the construction of a two-storey medical centre building & service yard, 2. the construction of a two-storey gym & fitness centre building & service yard, 3. the construction of a single storey storage and maintenance building with open covered area for bicycle parking. Along with an access road, parking and all associated services, service connections, landscape, boundary treatment and site development work for the above	24/05/2023	c.4.5km northwest
An Bord Pleanála	315540	Sites No. s 5-33 inclusive, The Oaks, Archerstown Demesne, Milltown, Ashbourne, Co. Meath	Construction of 29 houses and all associated site works.	18/05/2023	c.4.8km northwest
Fingal CC	FW22A/0195	The Whitehouse, Newpark, The Ward, Co. Dublin.	The development will consist of a two-storey extension to the east of the existing hotel, bar and restaurant and will include the following. a) Partial demolition of existing premises Including metal fencing together with compound walls and storage sheds. b) Provision of 50 additional rooms over 2 no. Floors (ground floor and first floor) including reception lobby, administration, toilets, storage, and laundry rooms c) 88 car parking spaces including 3 no. wheelchair spaces, 20 bicycle parking spaces and bus parking d) Connection to foul sewer network e) Provision for free standing canopy and store plant room structure). Alterations to existing entrance. g) All other associated site works and landscaping. The overall proposed development will be 1946m² gross floor area.	05/05/2023	c.1.2km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	FW22A/0090	Plot 2A, Blanchardstown Corporate Park 2, Ballycoolin, Dublin 15	Provision of a single storey warehouse/logistics unit (max height 14.65m) including an ancillary 2 storey office component (max height 10m, excluding rooftop plant setback from building edge) with a total Gross Floor Area of c 2,7070 m² (inc. ESB substation and switch room). The development will also include the provision of 2 vehicular access points (2 entry/exit points) located to the south- east and east of the Site, connecting the proposed development to the internal road network within the Blanchardstown Corporate Park 2, an HGV service yard and loading bays. 25 surface car parking spaces (including 2 accessible space and 4 EV spaces with charging points), the provision of pedestrian/cyclist access to the southwest of the Site. bicycle parking. hard and soft landscaping. boundary treatments. changes in levels. signage. external lighting. piped infrastructure and ducting. SuDS. plant and waste management. pedestrian footpaths. solar PV panels and all ancillary site excavation and development works above and below ground.	04/05/2023	c.3.1km west
Meath CC	23238	Donaghmore, Ashbourne, Co Meath	Erection of a 30m high, free standing lattice type telecommunications structure, carrying antennae, dishes and ancillary equipment.	01/05/2023	c.3.7km west
Fingal CC	FW23A/0036	Within the curtilage of Hollywoodrath House (A Protected Structure), Lands at Ratoath Road and Gallanstown Road, Hollystown, Dublin 15	Planning Permission for a residential development of lands at Ratoath Road and Gallanstown Road, Hollystown, Dublin 15. The Site is within the curtilage of Hoolywoodrath House (a protected Structure). The proposed development will consist of the construction of 96 dwellings (9 2-bedroom, 2 storey terraced dwellings. 60 3-bedroom, 2- and-2.5 storey, terraced and semi-detached dwellings. 27 4-bedroom, two-storey, semi-detached and detached dwellings) with 192 car parking spaces and 62 bicycle parking spaces. The proposed development will provide public open space, landscaping, trees, and boundary treatments. public lighting. bin and cycle storage. ESB substation. foul drainage works along Ratoath Road together with all associated site infrastructure and engineering works necessary to facilitate the development. Vehicular and pedestrian access is proposed via Gallanstown Road together with pedestrian access, including 2 new pedestrian crossings, at Ratoath Road.	17/04/2023	c.3.7km southwest
An Bord Pleanála	TA06F.313362	Lands to the south of Rathbeale Road and to the north and south of Main Street, Mooretown Distributor Road, Celestica/Motorola site, Swords, Co. Dublin.	650 residential units (265 houses, 385 apartments) creche and associated site works.	30/03/2023	c.5km southeast
Fingal CC	F22A/0284	Brazil, Swords, Co. Dublin	Replacement of existing horticultural polytunnels with new horticultural polytunnels together with associated site works.	28/03/2023	c.4.5km southeast
Fingal CC	F23A/0089	Lispopple, Swords, Co. Dublin	(1) Proposed alterations to existing two existing two concreted skeet areas with 3.9-metre-high shelter. (2) magazine storage to include associated soakaway. Retention of the following: (3) Two concreted skeet areas with 3.9-metre-high shelter. (4) Two shooting areas with a 3.5-metre-high safety earthen berm separating the areas. (5) A 3.5-metre-high safety earthen berm along the Western and Northern boundaries. (6) A single storey members clubhouse with a gravel pathway. (7) A steel storage container (29.7 m²). (8) A member's toilet with proprietary effluent treatment system and percolation area. (9) Two launcher platforms, Four launching sheds and a storage shed: (10) Trench type soakaway systems connected to all structures on site. To include all associated Landscaping and site development works.	08/03/2023	c.1.9km east

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F23A/0080	Laurestown, St Margarets, Co Dublin	Construction of agricultural store building and farm office in yard.	02/03/2023	c.3.9km south
An Bord Pleanála	313302	Lands to the north of Rathbeale Road and to the west of and north of Miller's Avenue and Glen Ellan Road, Oldtown, Swords, Co. Dublin.	Removal of the temporary site structures, construction of a total of 377 residential units (173 houses, 204 apartments), creche and associated site works.	22/02/2023	c.4.9km southeast
An Bord Pleanála	314550	In the Townlands of Baltrasna and Milltown, Ashbourne, Co. Meath.	Demolition of existing structures on site, construction of 702 residential units (420 houses, 38 duplexes, 244 apartments), creche and associated site works.	04/01/2023	c.4.8km west
Fingal CC	F21A/0667	Ballyhack, Kilsallaghan, Dublin, K67 R984	The construction of 1 new Storage Building (c. 1,643m² GFA) and 1 Store (357 m2 GFA).	19/12/2022	c.2.9km south
Fingal CC	F22A/0493	Wrenwood Stables, Killeen, Oldtown, Dublin	Provision of 2stable blocks, stable block B (359m²) consisting in 10 stables, a wash bay and associated tack room and fodder storage. A further stable (472 m²) is proposed alongside associated covered dry manure storage area, site works and drainage provision, relocation of the existing vehicular entrance, associated landscaping and associated minor ancillary alterations.	11/11/2022	c.3.2km north
An Bord Pleanála	313922	Sites 1, 3, 6 and 8 - 14 incl. of unfinished housing estate, Oldtown Avenue, Fieldstown Road (R122), Oldtown, Fingal, Co Dublin.	Construction of 10 houses and all associated site works.	01/11/2022	c.1.4km north
Meath CC	2270	Hickey's Lane, Baltrasna, Ashbourne, Co. Meath	6 detached, two storey dwelling houses, access road and footpath.	12/10/2022	c.5km west
Meath CC	221235	Mahir House, Ratoath Road, Baltrasna & Milltown, Ashbourne, Co. Meath	Eleven two-storey detached houses, an altered pedestrian and vehicle entrance off the R125, a new pedestrian entrance off the R135 – FI Requested.	21/09/2022	c.5km west
Fingal CC	F21A/0607	Kilsallaghan, Co. Dublin	Revised solar PV panel arrangement resulting in a decrease to the overall panel footprint extent. a reconfigured internal access route network resulting in a decrease to the overall network length. revised inverter/transformer types and arrangements. revised CCTV arrangement relocation of a permitted communications cabin. omission of 2 permitted substations. provision of a 1 spare parts container and 3 weather station poles.	08/06/2022	c.2.1km south
An Bord Pleanála	311912	Lands at the Old Rowlestown National School and the Killossery Mill Complex & House (RPS 334), townlands of	21 houses, museum, restaurant, cafe and garden centre.	22/03/2022	c.0.8km east

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
		Killossery, Killossery, Newbarn and Rowlestown West, Rowlestown, Swords, Dublin			
Meath CC	211436	Ballaghaweary & Greenogue, Kilsallaghan, Co. Meath	Solar PV Energy Development with a total site area of 34.4ha. to include solar panels mounted on steel support structures, associated cabling and ducting, 7 MV Power Stations, 1 Client Substation, 1 No Temporary Construction Compound, access tracks, hardstanding area, boundary security fencing and security gates, CCTV, landscaping and ancillary works.	31/01/2022	c.2.5km southwest
An Bord Pleanála	TC06F.311441	Lands to the south of Rathbeale Road, Mooretown, Swords, Co. Dublin.	677 residential units (266 houses, 411 apartments), creche and associated site works.	29/10/2021	c.5km southeast
Fingal CC	F20A/0716	Ballyboughal GAA Club, Ballyboughal, Co. Dublin.	Additional parking with associated landscape and drainage works and the inclusion 0f 8 number football pitch lamp standards.	04/10/2021	c.4.6km northeast
Fingal CC	F20A/0640	Fieldstown, Kilsallaghan, Co. Dublin	The development relates to previously approved development works (Planning Reg. F18A/0640 which have commenced and include for extended site boundaries and general amendments as follows. The proposed works will consist of (1) extending the areas of infilling of agricultural lands to Zone 02 and Zone 03, in order successfully complete the agricultural land reclamation works, which will require imported fill material consisting of clean uncontaminated soil and stones (EWC Code - 1705 04 material only) for the purpose of improvement of ground levels to enable lands to be farmed safely, (2) For revised location for temporary internal stoned haul routes to Zone 1 and Zone 3 within site which will remain for the duration of infilling and will be removed once infilling has been completed, (3 the upgrading of an existing agricultural laneway and extension for use as a haul route to Zone 2 within the Site which will remain for the duration of infilling and will be revert to agricultural use once infilling has been completed, (4) Revised location within the Site of the temporary portacabin which will serve as an office for the duration of the infilling process, and (5) The provision of a temporary wheel wash facility within the Site which will remain for the duration of infilling and will be removed once filling is completed.	04/10/2021	c.2.1km south
Fingal CC	F21A/0042	Lands including Whitestown and Fieldstown, Kilsallaghan, Co. Dublin	Permission for a Solar PV Energy Development with a total site area of c 105 ha, to include solar panels mounted on steel supports, associated cabling and ducting, 1 client substation, 33 MV Power Stations, 8 Battery Storage Containers, 1 Temporary Construction Compound, access tracks, boundary security fencing and security gates, CCTV, landscaping and ancillary site works.	16/09/2021	c.2.2km northwest
Fingal CC	F21A/0295	Wild Geese GAA Club, Wyanstown, Oldtown, Co. Dublin, A45AY91	Erect 4 eighteen-metre-high poles to avail of full floodlight facilities to the existing grass pitch and associated site works.	24/08/2021	c.3.6km north
Meath CC	211042	Broadmeadow Country House, Bullstown, Donaghmore, Ashbourne, Co. Meath	Extension of duration of planning permission AA/160527	23/07/2021	c.3km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Meath CC	AA201395	Bullstown and Wotton, The Ward, Ashbourne, Co. Meath	Proposed 5 bay monopitch shed to facilitate processing of end-of-life vehicles. 2) Proposed increase in annual tonnage accepted at the facility to 4,000 tonnes per year. 3) Stormwater drainage infrastructure including proposed soakaway. 4) Works to facilitate the required sightlines along public road from existing site entrance. 5) All ancillary site development works.	08/07/2021	c.4.4km southwest
Fingal CC	F19A/0490	Lands located between Church Road, and the Broadmeadow River opposite, Rowlestown Drive, Rowlestown, Co Dublin	26 two storey dwellings, a two storey building, a 129.7m² ground floor retail unit, part three/part four storey nursing home building set around an internal courtyard comprising 90 nursing bedrooms with staff facilities, 7 assisted living apartments, 35 car parking spaces and 7 bicycle spaces with a servicing yard, a single storey building consisting of 4 one bedroom assisted living apartments, a new vehicular and pedestrian entrance, public open space, riverside walkway, landscaping, boundary treatments, street lighting, ESB substation, foul drainage pump station, SuDS drainage, piped and other services.	10/05/2021	c.1.2km southeast
Fingal CC	F20A/0399	Scatternagh, Swords, Co. Dublin	Milking parlour building, Cubicles sheds with slatted tanks and feeding area, Over ground slurry tower and Walled silage pits.	24/02/2021	c.1.3km northeast
An Bord Pleanála	TC06F.307498	Lands to the north of Rathbeale Road and to the west of Millers Avenue and Glen Ellan Road, Oldtown, Swords, Co. Dublin.	339 residential units (179 no houses, 160 apartments), creche and associated site works.	16/12/2020	c.5km southeast
Meath CC	AA201047	Bullstown & Wotton, The Ward, Ashbourne, Co. Meath	Extension of AA151273 to consist of a storage building for end-of-life vehicles, upgrade of entrance and new wastewater treatment system.	28/09/2020	c.4.4km southwest
Fingal CC	F19A/0101	Lands south of the Glen Ellan Road, east of Miller's Avenue and north of the Rathbeale Road, Miller's Glen, Swords, Co. Dublin.	Revisions to F11A/0473 to omit 47 units and to provide 57 units, plus 106 car parking spaces.	21/09/2020	c.5km southeast
Fingal CC	F19A/0638	Townlands of Toberburr and Westereave, Rivermeade, Toberburr Road, Swords, Co. Dublin.	Phase I of a two-phase masterplan for a residential, commercial and community services development, to consist of 99 houses, car parking, public open space, 321.9m². two-storey crèche, 192m². shop, 3.56ha public park, new access road, bridge over Ward River, sewerage pumping station, electricity substation and landscaping.	19/08/2020	c.4.1km south
Fingal CC	FW20A/0040	Claremount Filling Station, Coolquay, Co. Dublin.	Provision and construction of an ESB substation.	05/08/2020	c.4.6km southwest
Fingal CC	F20A/0068	Swords Nursing Home, Nevinstown, Mount Ambrose, Swords, Co. Dublin.	Alterations to the existing single storey 52-bed nursing home. Single storey extensions to the west, north and east elevations with to provide additional 18 bed spaces. Single storey detached utility building, new service road, 3 additional car parking spaces, 1 Electric Vehicle charge point, and all associated site works.	02/07/2020	c.4km southeast

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
An Bord Pleanála	306182	Rowlestown, Church Road and Rowlestown Drive, Rowlestown East, Rowlestown, Co. Dublin.	Demolition of existing structures, construction of 130 houses, creche and associated site works.	09/04/2020	c.1.2km southeast
Fingal CC	F18A/0701	Lands south of the Rathbeale Road, And east of the Swords Western Distributor Link Road, And north of Watermill Park, Mooretown, Swords, Co Dublin	Permission to omit 43 houses (58 units) to now provide 99 units in total, plus a 353m² crèche and 153 car parking spaces.	07/08/2019	c.4.8km southeast
Fingal CC	F18A/0522	The Rath, Rowlestown, Swords, Co Dublin	Construction of 9 dwellings.	12/07/2019	c.1.9km southeast
Fingal CC	FW19A/0024	Claremount, Coolquay, Co. Dublin.	Amendments to FW17A/0111 to include 74.8m². extension plus provision of additional queuing lane for car wash facility.	14/05/2019	c.4.5km southwest
Fingal CC	F18A/0313	Brazil Lands Nursery, Brackenstown Road, Swords, Co. Dublin.	Removal of 2 accommodation buildings, construction of 8 number new single storey accommodation buildings and provision of new public footpath.	02/04/2019	c.5km southeast
Meath CC	AA181432	Ashbourne Golf Club, Archerstown, Ashbourne, Co. Meath A84 R528	A new six bay covered practice range including safety netting, lighting and all associated site works.	19/03/2019	c.4.6km west
Fingal CC	F18A/0640	Fieldstown, Kilsallaghan, Co. Dublin.	Permission for infilling of lands with material consisting of clean, uncontaminated soil and stones.	19/02/2019	c.1km northwest
Fingal CC	F18A/0581	Ballyboughal GAA Club, Ballyboughal, Co Dublin	The construction of a clubhouse facility containing dressing rooms with ancillary spaces together with associated car parking, landscape and drainage works.	23/01/2019	c.4.6km northeast
An Bord Pleanála	PL17.301151	Harlockstown, Ashbourne, Co. Meath.	10-year permission for construction of a solar farm and all ancillary and associate site works.	11/12/2018	c.5km northwest
Fingal CC	F18A/0484	Lands within the new Swords Regional Park, Northwest of Millers Glen, Oldtown, Swords, Co. Dublin.	Permission for new internal access roads, carpark, footpaths, and all associated and ancillary works.	19/11/2018	c.5km southeast

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F18A/0472	Palmerstown, Oldtown, North County Dublin	Alteration to F17A/0564 to include additional car parking spaces plus increasing warehousing unit from 5496m² to 7322m², additional 99m² of charging room and additional 107m² office space.	13/11/2018	c.4.5km northwest
Fingal CC	F18A/0476	Ballyboughal National School, Grange, Ballyboughal, Co Dublin	New single storey classroom block, connecting link and associated circulation to existing school building.	13/11/2018	c.4.5km northeast
An Bord Pleanála	300230	Kilsallaghan, Co. Dublin	10-year permission for the construction of Solar PV energy development and all ancillary works.	30/10/2018	c.2.4km south
Fingal CC	F18A/0412	Lands north of the Glen Ellan Road and east of Miller's Avenue, Miller's Glen, Oldtown, Swords, Co. Dublin.	Revisions to F11A/0473 to omit 66 residential units, provide 91 units plus 186 car parking spaces.	16/10/2018	c.5km southeast
Meath CC	AA180701	Broadmeadows Equestrian Centre, Bullstown and Greenogue, Ashbourne, Co. Meath	Proposed lean-to extension to the side of existing arena building for use as storage, proposed judges' box and proposed spectator viewing stand.	04/10/2018	c.2.5km west
Fingal CC	F18A/0382	Development to be known as Cnoc Dubh, Main Street, Ballyboughal, Co Dublin	Retention for 57 dwellings & 4 commercial units, 2 new site entrances and all associated site works.	02/10/2018	c.4.3km northeast
Fingal CC	F17A/0650	Townland of Rathbeale, Swords, Co. Dublin.	1 cable interface mast c. 20.75m high with a square base c. 6m x 6m to facilitate the undergrounding of the existing Finglas-Glasmore 110kV overhead power line.	22/08/2018	c.4.2km southeast
Fingal CC	F17A/0639	Roganstown Hotel and Country Club, Naul Road, Swords, Co. Dublin.	A 63 bedroom two-storey hotel extension with ancillary storerooms, offices and toilets, provision of a first-floor level extension within the existing fitness centre to comprise a fitness studio and 2 meeting rooms along with a new external terrace. provision of a new single storey golf academy with ancillary store and workshop and 2 practice driving bays and 3 electric charging car parking points within the existing overflow car park.	07/08/2018	c.2.6km east
Fingal CC	F17A/0746	Jordanstown & Wolganstown, Oldtown, Co Dublin	4 Poultry Houses together with roofed/enclosed service yard, 1 office, 1 Generator Store, and 1 Bin/General Purpose Store along with all ancillary structures.	30/07/2018	c.3km northwest
Fingal CC	F17A/0718	Palmerstown, Oldtown, North County Dublin	Planning Permission for a 2.1659MW Solar Photovoltaic (PV) array to cover 13396.74m² of the roofs.	26/06/2018	c.4.4km northwest
Meath CC	AA171004	Masspool, The Ward, Ashbourne, Co. Meath	Complete the construction of the building.	01/06/2018	c.3.8km southwest

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F09A/0226/E1	Ballyboughal Village, Co. Dublin	Mixed use development on a site (1.232 hectares/3.044 acres) consisting of 17 houses and 8 apartments (total floor area 2,623m²), 2 ground floor retail units (60.8m² each), Raised site levels, 45 surface car parking spaces, new access road, ESB sub-station, new boundary treatments, hard and soft landscaping, private and public open space and pedestrian bridge over the Ballyboughal Stream.	25/04/2018	c.4.3km northeast
An Bord Pleanála	PL06F.301171	Wyestown, Oldtown, Co. Dublin.	The construction of an extension to the existing glasshouse (10,663m²) to extend the use of the wholesale horticultural nursery, increase capacity of the water storage reservoir, provide outdoor storage yard with perimeter fencing, new cargo door to front facade of existing building, 2 layby's to access road, provision of new carpark with 22 parking spaces, extension of existing carpark by 9 spaces, upgrade of existing onsite waste water treatment system and all associated site services.	13/04/2018	c.5km northwest
Meath CC	AA171054	Donaghmore, Milltown Road, Ashbourne, Co. Meath	Construction of 9 dwellings.	13/04/2018	c.3.7km west
Fingal CC	F18A/0069	Drishoge, Oldtown, Co Dublin	Retention for a 666m² agricultural pack house, packing shed and fridge unit.	10/04/2018	c.1.9km northeast
An Bord Pleanála	249174	Mainscourt, Ballyboghil, Co. Dublin.	10-year planning permission for the development of a solar photovoltaic (PV) energy development.	20/03/2018	c.4.9km northeast
Fingal CC	F17A/0627	Lands within the new Swords Regional Park, Northwest of Millers Glen, Oldtown, Swords, Co. Dublin.	A 274m² single storey clubhouse & changing facilities.	20/03/2018	c.5km southeast
An Bord Pleanála	300045	Lands west of 1-10 The Orchard, Oldtown, Co. Dublin.	The development will consist of the construction of 14 dwellings.	12/03/2018	c.3.3km north
Fingal CC	F17A/0357	Lands west of 1-10 The Orchard, Oldtown, Co. Dublin.	Construction of 14 dwellings.	12/03/2018	c.4km north
Fingal CC	F17A/0184	Main Street (bounded by the Naul Road & the Ballyboughal Road), Ballyboughal, Co. Dublin.	Mixed use development to consist of 2 vehicular entrances, 57 dwellings, 323m² commercial block, 2retail units, 2offices, 13car parking spaces, 4cycle spaces, plus internal roads and landscaping.	30/01/2018	c.4km northeast
Meath CC	AA171295	Ashbourne Community Centre, Ashbourne, Co. Meath	A new baseball facility consisting of an outer security fence, new international standard baseball field with 2 dugouts, field boundary fence, home base/bleachers 9m high protective netting, 2 9m high foul poles, single storey changing rooms, single storey general store, single storey materials store, single storey equipment's store, metal/concrete bleachers/seating on concrete base, 2 bullpens, 4 batters cages. 2 with clear storey roofing over and all associated site works	20/12/2017	c.5km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F17A/0564	Palmerstown, Oldtown, North County Dublin	A new warehouse at existing facility. The development (6,845m²) consists of warehouse area (5,496m², 16.6m high max) plus 635m² attached plantroom and forklift charging area, associated HGV marshalling yard, ancillary car parking, sewerage treatment plant and 135m³ fire-fighting water supply tank.	12/12/2017	c.4.3km northwest
Meath CC	AA170996	Archerstown, Ashbourne, Co. Meath	Completion of a new safety boundary along the third hole consisting of 7 11m high stanchions together with new safety netting between all stanchions.	23/11/2017	c.5km west
Fingal CC	F17A/0143	Brazil, Swords, Co. Dublin.	Re-contouring of agricultural land and associated site works using imported clean inert soil and stones within a farm holding of 1.954 hectares and an additional 0.334 hectares for the entrance and haul road.	20/11/2017	c.4.5km southeast
Fingal CC	F17A/0463	South of factory buildings, Palmerstown, Oldtown, Co. Dublin.	Retention Permission of an Integrated Constructed Wetland (ICW) that provides tertiary treatment of wash and waste waters from the facility.	31/10/2017	c.4.3km northwest
An Bord Pleanála	PL17.248105	Milltown Road, Ashbourne, Co. Meath.	Demolition of house and garage, construction of 9 houses, repositioning of entrance and construction of new boundary wall.	12/09/2017	c.5km west
Fingal CC	F17A/0323	Ballyboughal GAA Club, Ballyboughal, Co Dublin	Relocation of the vehicular entrance.	04/09/2017	c.4.6km northeast
Meath CC	AA170634	Archerstown, Ashbourne, Co. Meath	A new safety boundary along the third hole consists of 13 8m high stanchions together with new safety netting between all stanchions.	01/09/2017	c.5km west
Meath CC	AA170810	An Pairc, Wotton & Newtown Commons, The Ward, Ashbourne, Co. Meath	4 additional dwellings plus 10 detached garages for existing dwellings.	22/08/2017	c.4.9km southwest
Fingal CC	F17A/0095	Fingal Ravens G.F.C., Killeen, Oldtown, Co. Dublin	6 eighteen-metre-high poles to avail of full floodlight facilities to the existing main grass football pitch and partial floodlight facilities to the second grass pitch.	16/05/2017	c.1.3km north
Meath CC	AA170092	Wotton & Newtown Commoms, The Ward, Ashbourne, Co. Meath	Retention permission for 10 completed, detached, 4-bedroom houses, 1/2 stores in height together with all service roads, drainage works including sewage treatment system, landscaping and such additional ancillary works.	12/05/2017	c.4.9km southwest
Fingal CC	F16A/0574	Thorncroft, Newtown Lane, Oldtown, Co. Dublin, A45YR98.	4 polytunnels for horticultural use and associated ancillary site works.	21/03/2017	c.3.4km north
Meath CC	AA160553	Bullstown, Donaghmore, Ashbourne, Co. Meath.	Solar Photovoltaic (PV) development consisting of solar PV arrays with a surface area of approximately 58,000m², a grid control building, 5 inverter/transformer cabins, 2 battery enclosures, site entrance, access tracks, hardstanding area, boundary security fence, CCTV, landscaping and ancillary works.	21/02/2017	c.3.4km west

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Meath CC	AA160527	Broadmeadow Country House, Bullstown, Donaghmore, Ashbourne, Co. Meath	Construction of an 80-bed space nursing home facility.	21/02/2017	c.3km west
Meath CC	AA161042	Archerstown, Ashbourne, Co. Meath	A new safety boundary along the third hole consisting of 5 new 8.5m high stanchions to match the existing stanchions together with new safety netting.	22/12/2016	c.5km west
Meath CC	AA160506	Milltown & Archerstown, Ashbourne, Co. Meath	Amendments to permission under references DA/100175 & AA/151146 increasing the total number of houses from 57 to 67, plus landscaping.	14/09/2016	c.5km west
An Bord Pleanála	246453	Oldtown, Swords, Co. Dublin.	Construction of 147 houses and 99 apartments. New road connection and ancillary works to the Millers Glen development.	18/08/2016	c.4.8km north
Meath CC	AA151273	Bullstown, The Wotton, Ashbourne, Co. Meath	A storage building for end-of-life vehicles, upgrade of entrance and new wastewater treatment system.	09/06/2016	c.3.6km west
Fingal CC	F16A/0035	Boggyheary, Kilsallaghan, Swords, Co. Dublin.	Retain existing 24-metre-high telecommunications support structure (previously granted under F10A/0457) carrying antennae and link dishes, together with associated telecommunications equipment unit, security fencing and access track.	11/05/2016	c.2km south
Fingal CC	F15A/0586	Development to be known as Dooroge Woods, The Grove, Naul Road, Ballyboghil, Co. Dublin.	Increasing the overall site area by 208m² (0.02ha) on a site of 3,384m² (0.338ha) at the residential development known as Dooroge Woods.	22/03/2016	c.4.2km northeast
Fingal CC	F15A/0573	4 Jordanstown, Oldtown, Co. Dublin.	Retention of wastewater treatment plant.	14/03/2016	c.3.8km northwest
Meath CC	AA151313	Crenigans Banog, Milltown Road, Ashbourne, Co. Meath	Construction of 99 houses, vehicular entrance, roadways, cycleways, footpaths, landscaping/boundary treatment, car parking plus surface water sewer and attenuation tanks, across 3.5 ha/8.64 acres.	29/01/2016	c.4.9km west
Meath CC	AA151146	Milltown & Archerstown, Ashbourne, Co. Meath	Amendments to permission under references DA/100175 & AA/150025, increasing of houses from 44 to 57, plus realignment of boundaries and landscaping.	28/01/2016	c.5km west
Fingal CC	F15A/0176	Ballyboughal GAA Club, Ballyboughal, Co. Dublin.	An all-weather training surface with 8 lamp standards, ball catchment netting 8m in height 5m x 130m running track, 2m wide walking track, single storey changing facility, natural GAA pitch and 30 car parking spaces.	26/01/2016	c.4.5km northeast
Fingal CC	F15A/0306	Corrstown House, Kilsallaghan, Co. Dublin.	Retain 5 townhouses constructed under Planning Permission F06A/0794.	22/09/2015	c.3.8km south

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F15A/0149	Fingal Ravens G.F.C., Killeen, Oldtown, Co. Dublin	Erect 6 fifteen-metre-high poles to avail of floodlights and construct a 2.4m. high spectator wire fence with a 3.0m. high ball stop netting to achieve an overall height of 5.4m. around the proposed new 50x95m. synthetic pitch.	29/06/2015	c.1.3km north
Meath CC	AA141138	Milltown & Archerstown, Ashbourne, Co. Meath	Construction of 46 houses on the Site (area 2.66 hectares/5.69 acres), construction of a vehicular entrance of Archerstown Road, internal estate roadways, cycleways & footpaths, landscaping - including the planting of a buffer zone (8m in width) along part of the eastern boundary of the Site, boundary fencing and walls, car parking, lighting new foul and surface water sewers, attenuation tanks, & associated infrastructure.	16/02/2015	c.4.6km west
Fingal CC	F14A/0274	Dunworley, Rowlestown, Co. Dublin	Residential development of 16 detached, two storey residential dwellings, ESB Substation, landscaping works, open space, boundary treatments and all ancillary works.	28/01/2015	c.900m east
Meath CC	AA140651	Milltown Td., Ashbourne, Co. Meath	Retention of existing 32m high telecommunications support structure with antennas, equipment container and associated equipment within a fenced compound and access track.	16/10/2014	c.5km west
Fingal CC	F13A/0492	Balcartie, Roganstown Golf & Country Club, Swords, Co. Dublin.	5 detached dwellings and their associated wastewater treatment systems, percolation areas, landscaping and associated site development works on a site c. 1.32ha.	15/09/2014	c.1.7km east
Fingal CC	F08A/1311/E1	Beechtree Nursing Home, Murragh House, Oldtown, Co. Dublin	Extensions and alterations to the existing 53-bed Nursing Home/Residential Retirement Complex and 12 detached sheltered houses, comprising residential and ancillary accommodation for an additional 32 persons in a single and two storeys building of 1,766m² + 7additional car parking spaces and enclosed walkways.	10/07/2014	c.3.9km northeast
Fingal CC	F13A/0376	Rolestown, Swords, Co. Dublin	Service station development, consisting of single storey convenience building, forecourt area (4 pumps), 3 underground 40,000l storage tanks, car was facility, 10 parking space and site access.	30/05/2014	c.1km east
Fingal CC	F14A/0090	Ballyboughal GAA Club, Ballyboughal, Co. Dublin.	1015 m². all-weather training surface, 3 10m high lamp standards, ball catchment netting, and inclusion of 8 15m high lap standings on existing main pitch.	26/05/2014	c.4.5km northeast
Fingal CC	F08A/0333/E1	Weston Park, Fieldstown Road, (opposite Shamrock Park), Oldtown, Co. Dublin	Phase 2 of proposed residential development comprising of 5 additional two storey houses.	29/11/2013	c.3km north
Fingal CC	F08A/1078/E1	Clonmethan Health Centre, Oldtown, Co. Dublin	A new two storey 50 bed community nursing unit (approx. 3,160m²), 50 space surface carpark, a new ESB sub-station, site development, landscaping and ancillary siteworks across 3.8ha.	14/10/2013	c.2.7km north
Fingal CC	F13A/0049	McCann's Wholesale Horticultural Nurseries, Rathbeale Road, Swords, Co Dublin	A single-storey extension to a glasshouse (4,244m²), to extend the use of the wholesale horticultural nursery.	15/07/2013	c.4.7km southeast
Fingal CC	F13A/0015	Drishoge, Oldtown, Co Dublin	The demolition of existing timber agricultural shed within the curtilage of a protected structure to be replaced with extended - steel packing shed and machinery store.	09/07/2013	c.1.9km northeast

Planning Authority	Reference	Address	Summary of Proposed Development	Grant/Due Date	Distance from Site
Fingal CC	F07A/1676/E1	Ballyhack, Kilsallaghan, Swords, Co. Dublin	Construction of a new maintenance shed (total floor area 1990m²) on a site of 2.84ha. and ridge height of 8.184m, 50 car parking spaces and ESB substation.	27/06/2013	c.3.1km south
An Bord Pleanála	PL06F.241634	Lands at Mooretown, Swords, Co. Dublin.	A new distributor road forming part of the Swords Western distributor link road connecting the Rathbeale Road to the Mooretown local area plan lands.	24/06/2013	c.5km southeast

Table A-2 Relevant Part 8 Applications (Meath/Fingal)

Ref.	Address	Proposed Development	Received Date	Distance from Site
P822007	Killegland, Ashbourne, Co Meath	The construction of linear walkways throughout the area, installation of a skateboard park installation of a pedestrian footbridge linking areas either side of the river, installation of public lighting throughout the Site, upgrading of roadside boundary treatment, construction of a riverside board walk to link to Churchfields Housing Estate and landscaping throughout the Site.	04/04/2022	c.5km west
P8/20010	Castle Street, Ashbourne, County Meath	The construction of 74 housing units in total, including all site development works with access from existing Education Campus link road.	27/07/2020	c.5km west
Part 8	Rathbeale Road, Swords, Co Dublin.	Proposed development of 11 apartments including associated site works at Rathbeale Road, Swords, Co Dublin.	27/11/2019	c.5km southeast
P8/19001	Harlockstown Lane, Baltrasna, County Meath	The proposed works will be carried out in existing roadside verges, with some minor relocation/setting back of some private boundaries. Construction works along the route will involve the following elements. - Construction of new kerb lines for the new footpath. - Provision of 2 recessed bus stops. - Provision of 2 signal-controlled pedestrian crossing points. - Ducting for future Public Lighting installation along the scheme. - Some localised re-profiling of existing road cross falls/cambers. - Earthworks - excavations of portions of existing verges, of existing roadway/footpaths, for service ducts and road crossings, footpath etc. All associated civil works with the above i.e., ducting, drainage, concreting, macadam works etc.	01/04/2019	c.5km southwest
P8/18003	Milltown Road, Ashbourne, Co. Meath.	he proposed scheme includes for the construction of cycling and pedestrian facilities on Milltown Road from the junction with the R135 in Ashbourne town to Crenigans Banóg Housing Estate. The proposed scheme also consists of traffic calming measures, pedestrian improvements to the Milltown Bridge as well as the installation of a traffic signal shuttle system. The scheme also includes car parking provisions at the Milltown Estate, Community Playing Fields and the Ashbourne Community School set down area, which is sited along the 1,320m long scheme. It is also proposed to construct some local flood mitigation works at a private property along the Broadmeadow River. The works will also include for associated ancillary civil and grounds works such as: Kerbing, Ducting, Drainage and Boundary Treatments.	11/05/2018	c.5km west
Part 8	Rathbeale Road, Swords, Co Dublin.	Upgrading of the existing Rathbeale Road from the Murrough Road junction to the proposed junction with the Swords Western Distributor Road, a distance of approximately 1000m, which includes re-grading and re-alignment of the existing carriageway and the provision of new high quality pedestrian/cyclist facilities along the northern side of the Rathbeale Road and shared footpath/cycle facilities on the southern side of the Rathbeale Road from the Swords Western Distributor Road to the proposed toucan crossing at the proposed archaeological park. • Provision of a new right hand turn lane on the western approach to the existing Murrough Road Junction. • Provision of pedestrian/cycle ramp facilities to access Bunbury Gate Avenue located opposite 81 Bunbury Gate Avenue. • Provision of junction for access for proposed Local Authority Housing and for future access to third party lands. • Provision of toucan crossing facilities at entrance to the proposed archaeological park. • Provision of junction for secondary access from Mooretown Lands. • Provision of a signalised junction at the intersection of the Rathbeale Road with the Swords Western Distributor Road. • Provision of new/upgraded footpath facilities on both sides of the Rathbeale Road adjacent to Rathbeale Cottages. • Retention of existing natural boundary to the southern and northern side of the Rathbeale Road as indicated on Drawing P1000 and the provision of new boundary treatment consisting of a dwarf wall and railing along the perimeter of the new archaeological park and along the perimeter of the FCC Housing Department Development with associated landscaping measures. • All miscellaneous ancillary works including street lighting, lining, road signage, drainage, utility diversions, ducting, landscaping, planting and additional road boundary treatments where required.	15/08/2017	c.4.9km southeast

Ref.	Address	Proposed Development	Received Date	Distance from Site
P8/16007	Ashbourne Linear Park, Ashbourne, County Meath	The proposed works will form phase 1 of the Ashbourne Linear Park located in the centre of the town and will include the following: Installation of play area for older children. Installation of skateboard park. Construction of an amphitheatre and wall. Installation of toddler play area. Construction of new footpaths throughout the area. Re-installation of the pedestrian footbridge linking park to Ashbourne Town Centre. Landscaping throughout the area.	19/01/2017	c.5km west
P8/16001	Ashbourne, Co. Meath	Flood prevention works in various locations in Ashbourne, Co. Meath.	12/04/2016	c.5km west
Part 8	Broadmeadow River Swords	Proposed pedestrian bridge at Broadmeadow River and footpath and associated works.	01/03/2016	c.4.6km southeast
P8/13010	Development along the R135 (former N2) within Ashbourne, County Meath	The Proposed Phase II works will consist of: a) Provision of new cycle track/lanes on both sides of the R135 from the Rath roundabout on the N2 to the Nile Mile Stone roundabout at the Ratoath Road (R125). b) Enhanced pedestrian and cyclist facilities will be provided at each junction along the route, including additional traffic signals and pedestrian crossings to allow integration with the wider network. c) The provision of sections of new footpath. d) The reduction in width of the existing road carriageway in order to facilitate the new cycle tracks. e) The provision of improved signage, road markings, surfacing and public lighting necessary to provide the above. f) Utility diversions as necessary.	30/09/2013	c.4.8km west

Appendix B Consultation Report

Fieldstown 110 kV Substation Community Consultation Report

This report was prepared to record the engagement carried out with the local community in respect of the proposed Fieldstown 110 kV Substation. The Energia Renewables project team have engaged with local residents, businesses and local elected representatives in the area.

The report outlines the community engagement initiatives undertaken by our Community Liaison Officer (**CLO**) and wider project team prior to the submission of the planning application. It also outlines the main issues identified during this process which Energia are progressing solutions for.

1. Project Website

Energia Renewables launched a stand-alone project website for the Fieldstown 110kV Substation www.fieldstownsubstation.ie. The website is an important communications channel to keep members of the public informed about the proposed development.

Information on the website includes:

- Maps of the proposed substation location
- Information brochure for viewing and downloading
- Link to the project photomontage booklet
- FAQs
- Contact details for the Project CLO

This stand-alone website also links to the Energia Group web page (https://energiagroup.com/renewables/solar/fieldstown-substation-dublin), where information is provided on Energia's nearby solar developments.

2. Notification of Local Community

To inform local residents about the proposed Fieldstown 110 kV Substation, the CLO distributed information and contact details to households within a radius of just over 1 km of the proposed application site boundary. The CLO visited approximately 250 homes between 15th and 16th of November 2022. The information distributed to each household consisted of an information brochure on the proposed development (please see Appendix A.) Residents were also given a letter inviting them to a drop-in public information event (please see Appendix B), which was held on November 30th, 2022. Householders were also encouraged to discuss and share details of this event with neighbours and share information.

The project brochure contained the following information:

- Project overview
- Map of proposed substation location
- Photomontage of existing and proposed infrastructure
- Outline of the Strategic Infrastructure Development (SID) planning process
- FAQs
- Project contact details

3. Print Advertisement of Community Information Event

The drop-in public information event was advertised in the Northside People (estimated readership of 260,000) which was published on Wednesday 16th November. The notice informed the local community of the date, time and venue of the event and provided contact details for the CLO (please see Appendix C).

4. Engagement with near neighbour residents

In advance of the public information event held at Oldtown Community Hall, the Energia Renewables project team identified a household in close proximity to the proposed development and attempted to undertake engagement with them, delivering a letter and brochure and following up with phone calls to try and meet face-to-face with the CLO and project manager. This engagement is continuing as part of the project. This resident attended the engagement event and met the CLO and project manager.

5. Notification of Local Representatives

Energia also contacted Councillors representing the Swords and Rush-Lusk Local Electoral Areas within Fingal County Council and shared the project brochure, together with an invitation to attend the public information event held on November 30th, 2022.

The following Councillors were contacted by email on November 18th (Swords): Darragh Butler, Ian Carey, Ann Graves, James Humphreys, Brigid Manton, Dean Mulligan, Joe Newman; and (Rush-Lusk): Cathal Boland, Brian Dennehy, Adrian Henchy, Paul Mulville, Robert O'Donoghue.

6. Public information drop-in event

Energia held a public information drop-in event in Oldtown Community Hall (please see Appendix D) on November 10th from 3pm – 8pm. Approximately 40 people attended.

Oldtown Community Hall was chosen as a suitable venue due to its proximity to the proposed Fieldstown 110 kV Substation and surrounding Energia solar PV development sites.

Brochures and larger maps were available for attendees to take home. There were additional documents available to view, including photomontages and engineering drawings. The project team used iPads with Google Earth and .kmz files to show residents where their property was in proximity to the substation development. A television screen was also available to view maps, photomontages and drawings in greater detail.

The Energia project team were on hand to answer questions included electrical engineers, planning officers, project managers and community liaison officers. The main queries raised during the information session, as recorded by the Energia Renewables project team at the event, were:

1. Construction access
2. Construction duration
3. Height of lightning monopoles
4. Further Energia developments in the area

7. Follow up engagement and direct correspondence

Residents gave contact details so that the project team could contact them with follow-up information to answer their queries. Attendees interested in project updates were asked to fill out contact details on forms which set out Energia's GDPR policy with instructions on how to opt out and have details removed from the project log at any time.

Fieldstown 110 kV Substation Development

Fieldstown, Co. Dublin

energia Renewables

Dear Householder,

Energia Renewables are developing plans for a 110 kV transmission substation in the townland of Fieldstown, near Oldtown, Co. Dublin

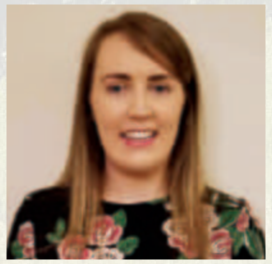
The proposed Fieldstown 110 kV Substation will facilitate the export of renewable energy from Energia solar developments in the local area into the national grid. This will help Ireland to reach its 80% renewable electricity target by 2030, reducing our reliance on fossil fuels and increasing security of energy supply.

This brochure provides an overview of the proposed substation development and project timeline. A planning application for the proposed Fieldstown 110 kV Substation is due to be submitted in the coming months.

Please don't hesitate to contact the project team with any questions you may have.

Yours sincerely,

Éanna Farrell
Solar Project Manager
Energia Renewables



Maria Eviston
Community Liaison Officer
Energia Renewables

Contents

1. Meet the team

Energia Renewables

Energia Renewables are part of the wider Energia Group – a modern, customer-centric utility provider, focusing on renewable technology. We are committed to our customers and trusted by thousands of homes and businesses throughout Ireland to meet their needs in an evolving energy environment.

We are a leading developer and operator of 15 onshore wind farm sites across the island of Ireland, generating over 300MW of green electricity.

The Group's ongoing €3bn 'Positive Energy' investment programme is developing onshore and offshore wind, solar, battery storage, bioenergy and green hydrogen production.

It is anticipated that this renewable energy programme will add 1.5 GW of additional renewable capacity to the system by 2030, facilitating the achievement of government Climate Action targets.

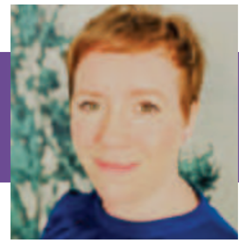
AECOM

AECOM is a leading provider of integrated design consultancy services across the Republic of Ireland and Northern Ireland. They have partnered with public and private sector clients, applying creative vision, technical excellence, interdisciplinary insight, and local expertise to solve their most complex challenges in new and better ways. Their agile teams provide multidisciplinary services and offer specialist expertise to every scale or project: from large regeneration schemes to local community-led initiatives. They connect across services, markets and geographies to deliver transformative outcomes, combining global expertise with local knowledge. From feasibility studies and detailed design, through to site supervision and construction, they support every stage of the development lifecycle, integrating sustainability and innovation in everything they do.

The Team

Éanna Farrell
Solar Project Manager
Energia Renewables

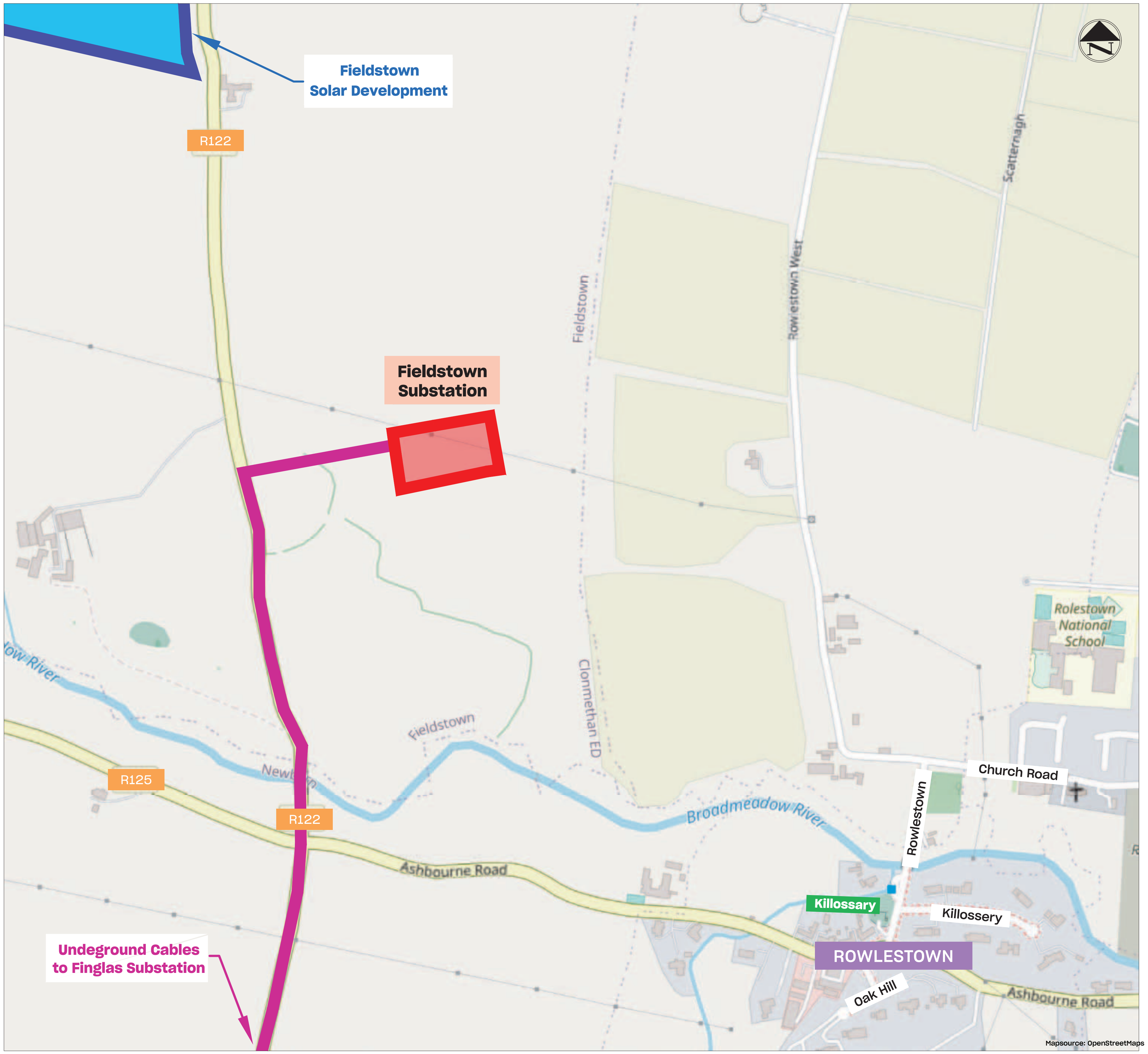
Richard Green
Corporate Development Manager
Energia Group



Sara Tinsley
Planning and Environmental Consents Manager
Energia Renewables

Maria Eviston
Community Liaison Officer
Energia Renewables

2. Proposed substation location and project overview

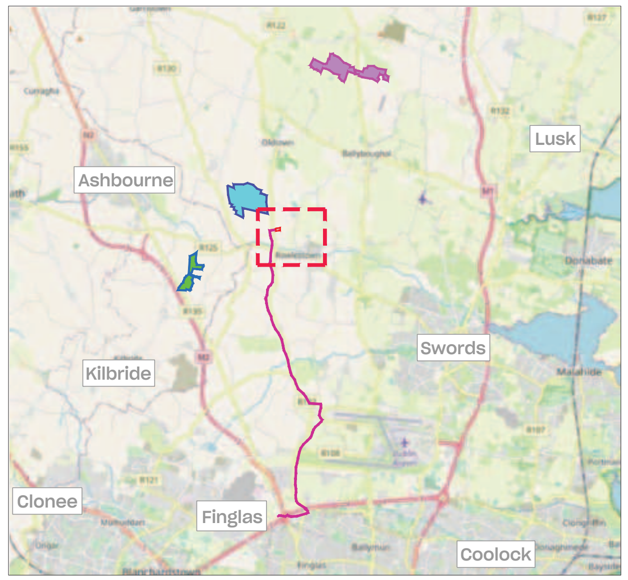


Fieldstown 110 kV Substation

Energia Renewables plan to construct a new 110 kV transmission substation in the townland of Fieldstown, Co. Dublin, to facilitate the export of renewable energy from our solar developments in the local area into the national grid. A 12.5 km underground cable will be installed to connect Fieldstown 110 kV Substation to the national electricity grid. The proposed Fieldstown 110 kV Substation will help Ireland to achieve its 2030 Climate Action targets.

Key

- Fieldstown 110kV Substation
- Gerrardstown Solar Development (Pre-Planning)
- Fieldstown Solar Development (Planning Granted)
- Ballaghaweary Solar Development (Planning Granted)
- Underground Cables
- Motorway
- Regional Roads
- Local Roads



0 125 250 meters

* Project details are correct at time of publication and are subject to further development and alteration prior to lodgement of the planning application.

3. About the site

The proposed substation site is located within an agricultural field and was identified based on a number of key considerations:

- The site is in a good location for connection to the existing national grid infrastructure.
- The site does not include any environmental designations, including Natural Heritage Areas, Special Areas of Conservation, Candidate Special Areas of Conservation or Special Protection Area.
- The site is accessible and close to main transport routes for the delivery of large components.
- The site has been subject to a comprehensive landscape and visual impact study to assess potential impacts on the landscape and sensitive receptors.

4. Planning process

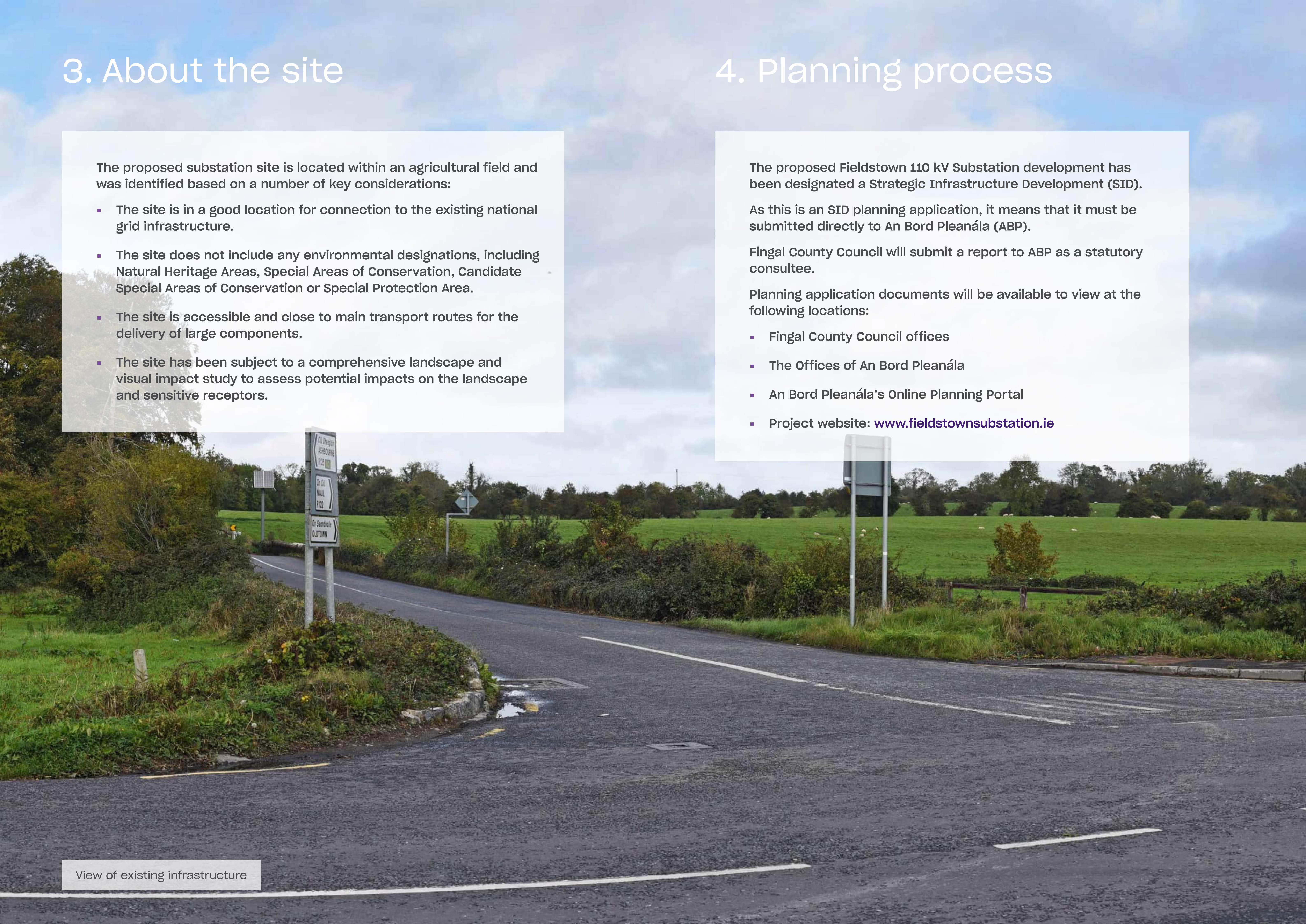
The proposed Fieldstown 110 kV Substation development has been designated a Strategic Infrastructure Development (SID).

As this is an SID planning application, it means that it must be submitted directly to An Bord Pleanála (ABP).

Fingal County Council will submit a report to ABP as a statutory consultee.

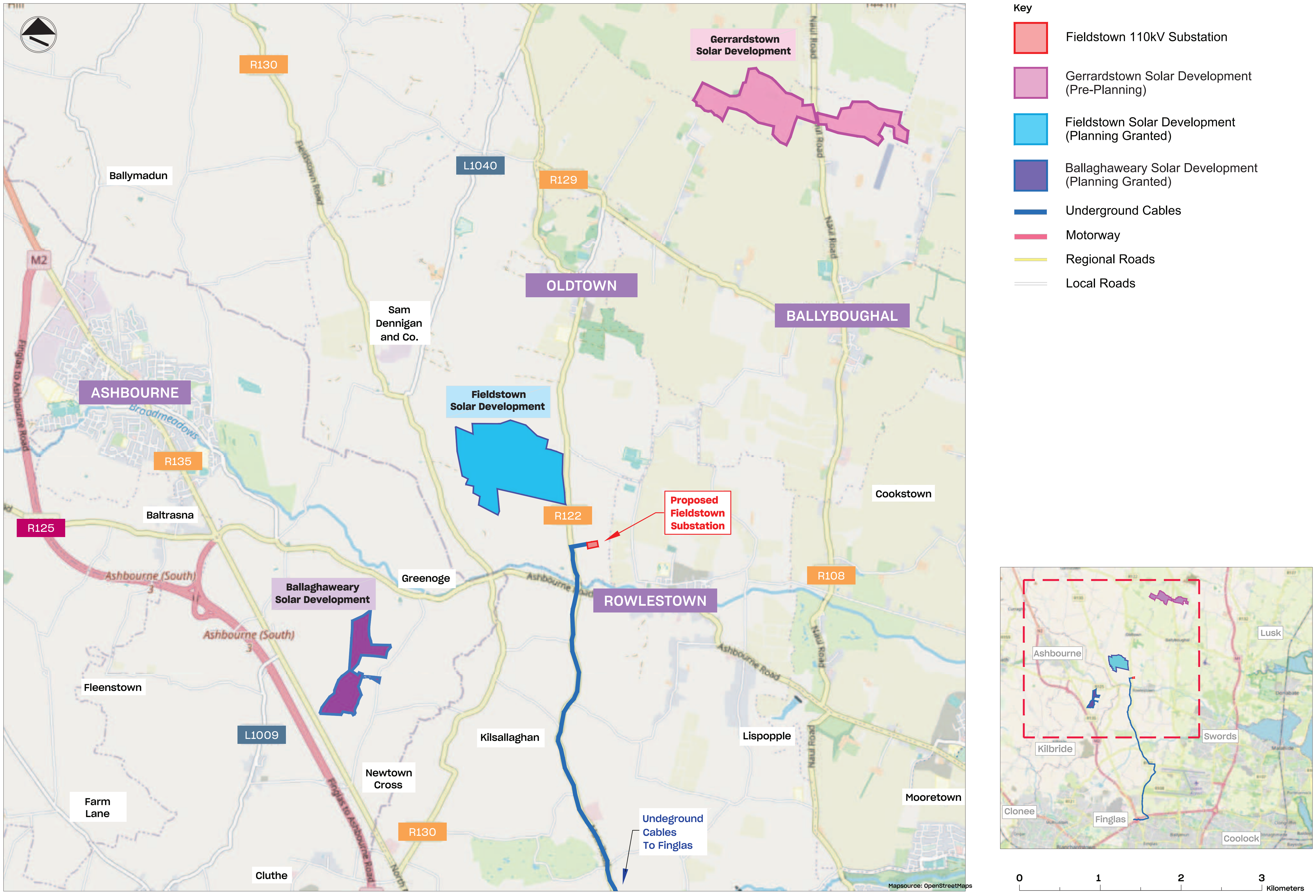
Planning application documents will be available to view at the following locations:

- Fingal County Council offices
- The Offices of An Bord Pleanála
- An Bord Pleanála's Online Planning Portal
- Project website: www.fieldstownsubstation.ie



View of existing infrastructure

5. Map of proposed Fieldstown 110 kV Substation and Energia solar developments



* Project details are correct at time of publication and are subject to further development and alteration prior to lodgement of the planning application.

6. Project website

We have created a project website where you can view photomontages or visual representations of what the proposed Fieldstown 110 kV Substation will look like from key viewing points around the site.

These photomontages can be viewed online at **www.fieldstownsubstation.ie**

View of existing infrastructure

Visualisation of proposed infrastructure

7. What happens next

- A planning application for the proposed Fieldstown 110 kV Substation is due to be submitted to An Bord Pleanála in the coming months.
- Once the application is lodged, all planning documentation associated with the proposed substation development will be made available on our website at **www.fieldstownsubstation.ie**
- Construction of the substation will take approximately 18 months. This will start with the initial site preparation works for access, followed by the construction of the substation compound and installation of the associated electrical equipment before the final commissioning and energisation stage.
- A traffic management plan will be put in place, setting out how we will manage construction traffic during the construction of the project.
- Our construction and community engagement team will liaise with local residents and businesses to minimise disruption.

8. Working with communities

The proposed Fieldstown 110 kV Substation development will serve Energia's solar developments in the local area, which will operate substantial community benefit funds to support community groups, voluntary organisations and environmental projects.

Energia already operates a number of renewable energy benefit funds, which are all administered on our behalf by independent charitable trusts.

Our funds are set up in conjunction with local communities to ensure that our funding has a positive and lasting impact.

We begin allocating community project grants one year after the commencement of commercial operation and energy generation. When it's time for community groups to apply for funding, we will advertise extensively through local media, local authorities and mailing list contacts.


Scout group


Community Garden


Martial arts classes


Community playgroup

9. Working with schools

Once up and running, Energia will be happy to facilitate school and college visits to our local solar developments. In the meantime, the Energia Renewables and Operations team are keen to arrange school workshops and classroom talks on renewable energy.

- *Learn…* about solar energy
- *Discover…*how wind turbines generate electricity
- *Explore…* the need for climate action and energy transition

10. FAQs

Why is this substation necessary?
Once operational, the proposed Fieldstown 110 kV Substation will facilitate the export of renewable energy from three local Energia solar farms, which are still in development, onto the national grid. The substation will help Ireland to reach its Climate Action targets and reduce our dependence on fossil fuels, while increasing security of energy supply.

How big is the site?
Fieldstown 110 kV Substation site will cover an area of approximately 1 hectare, with an approximate 12.5 km underground cable connecting the substation to the national electricity grid in Finglas.

What about visual impact?
The retention of existing hedgerows will support the screening of potential residential views of the proposed substation. The site will also benefit from additional landscape planting post construction, which will increase existing hedgerow boundaries with appropriate native species.

Will new overhead lines be created?
No additional overhead lines will be installed. All grid connection cables installed for this development will be underground.

How close to properties will the substation and new infrastructure be?
The nearest property is approximately 300 m from the main substation site.

Does a substation pose health risks to humans or animals?
Some people have concerns about the electric and magnetic fields (EMFs) found near electricity lines and cables. When electric current flows, EMFs are produced but register in the extremely low frequency end of the electro-magnetic spectrum. They occur in the home, in the workplace, or anywhere we use electricity. Natural sources of EMFs include the earth's geomagnetic field and electric fields from storm clouds. The consensus from health and regulatory authorities is that extremely low frequency EMFs do not present a health risk.

Is there audible sound from a substation?
The main noise heard from a substation is a low frequency 'hum' produced by the transformer. A typical new substation transformer will have a similar noise level of an outdoor air conditioning unit at approximately 1 metre distance. The sound level diminishes at a greater distance. For example, the sound will be barely perceptible at the substation perimeter fence. Noise surveys and reports are completed as part of the planning application and are available for review.

Will the substation be lit up at night?
Construction is planned to take place during daylight hours so that wildlife is not disturbed. If artificial lighting is required at any point during construction, it will be both temporary and directional and will only illuminate the section of the site where work is continuing.

Once energised and operational, the substation will not be lit up at night. However, emergency lighting will be installed to facilitate non-daylight hour access for emergency or non-routine repairs.

Will there be a fence around the substation?
A 2.6m palisade fence will be installed around the substation compound with an additional 1.4m post and rail fence positioned 3m along the outer perimeter boundary in line with EirGrid policy.

What safety measures will be in place?
The substation will be built to EirGrid and ESB Networks standards and will be subject to a rigorous design review process prior to the commencement of construction. The purpose of these design specifications and reviews is to ensure the safety of both the public and operational staff working in the substation. Safety is at the core of the development and construction of all our projects.

How often will maintenance be carried out?
Scheduled maintenance is generally completed on a monthly basis, with more intensive maintenance scheduled annually.

What about construction traffic?
A traffic management plan will be put in place, setting out how we will manage construction traffic during the construction of the project. Our construction and community engagement team will liaise with local residents and businesses to minimise disruption.

What are the next steps?
We are engaging with the local community to provide residents living near the proposed Fieldstown 110 kV Substation site with project information and an opportunity to ask questions and have their say. Our Community Liaison team will be visiting homes and delivering information in the immediate area. We will also be holding a public information evening so that members of the public can drop in to meet the project team and find out more. Residents can also contact our Community Liaison Officer by email or by telephone.

Once submitted, planning application documents will be available to view at the following locations:

- Fingal County Council offices
- The Offices of An Bord Pleanála
- An Bord Pleanála's Online Planning Portal
- Project website: **www.fieldstownsubstation.ie**

11. Contact us

We want to hear from you

If you have any questions, please contact us:

Telephone our Community Liaison Officer on
+353 (0)87 364 4274

You can also email us at **clo@energia.ie**

And don't forget to check the website for updates:
www.fieldstownsubstation.ie

energia Renewables

Mill House, Ashtown Gate, Navan Road, Dublin, D15 H70K
Telephone: +353 1 869 2000
www.energia.ie

energia group

November 2022

Dear Householder,

I called at your house today on behalf of Energia Group to inform you about our plans for a 110 kV substation development in the townland of Fieldstown, which will facilitate the export of renewable energy from Energia solar developments in the area into the national grid.

Energia will be holding a drop-in information session in Oldtown Community Hall on Wednesday November 30th. Please come along at any time between 3pm and 8pm to meet the team and find out more.

Fieldstown 110 kV Substation
Energia Renewables plan to construct a new 110 kV transmission substation in the townland of Fieldstown, Co. Dublin, to facilitate the export of renewable energy from our solar developments in the local area into the national grid. A 12.5 km underground cable will be installed to connect Fieldstown 110 kV Substation to the national electricity grid. The proposed Fieldstown 110 kV Substation will help Ireland to achieve its 2030 Climate Action targets.

* Project details are correct at time of publication and are subject to further development and alteration prior to lodgement of the planning application.

About Energia Group

Energia Group is a modern, customer-centric utility provider, focusing on renewable technology and flexible electricity generation. We are committed to our customers and trusted by thousands of homes and businesses throughout Ireland to meet their needs in an evolving energy environment.

Energia Solar Holdings Limited t/a Energia Renewables
Directors: Garrett Donnellan, Peter Baillie (British), Conor Keane, Peter Lyons, Brendan McGarr
Registered Office: The Liberty Centre, Blanchardstown Retail Park, Dublin 15, D15 YT2H **Registered No.** 657053 Registered in Dublin, Ireland. A member of the Energia Group

Energia has over 300MW of operational renewable energy projects in Ireland. Energia Group's ongoing €3 billion 'Positive Energy' investment programme is developing onshore and offshore wind, solar, battery storage, bioenergy and green hydrogen production.

It is anticipated that this renewable energy programme will add 1.5 GW of additional renewable capacity to the system by 2030, facilitating the achievement of government Climate Action targets.

Come along and meet the team

To find out more about this proposed development, please join us for our drop-in information session on Wednesday November 30th from 3pm to 8pm in Oldtown Community Hall.

In the meantime, please do not hesitate to contact me by email or phone: maria.eviston@energia.ie or call 087 364 4274.

Maria Eviston

Maria Eviston
Community Liaison Officer
Mob: +353 (0)87 364 4274
Email: maria.eviston@energia.ie

Moore Street buildings officially listed on Record of Protected Structures

Gary Ibbotson

DUBLIN City Councillors have voted unanimously to add six buildings on Moore Street, associated with the 1916 Rising, to the Record of Protected Structures.

The buildings are 10 and 20/21 Moore Street and the walls between 12 and 13 Moore Street, the ground floor facades of 17-18 Henry Place, and the O'Brien's Mineral Water Building at 4-8 Henry Place.

The buildings are due for demolition or partial demolition as part of plans to redevelop Moore Street and surrounding area by UK property developers Hammerson, who objected to their protected status.

10 Moore Street is one of addresses now listed on the Record of Protected Structures.

Sinn Fein councillor Mícheál Mac Donncha welcomed the vote by councillors.

The 5.5 acre site in question stretches from the old Carlton cinema on O'Connell Street to Moore Street, Henry Street and Parnell Street.

Sinn Fein Councillor Mícheál Mac Donncha, who is Secretary of the Moore Street Preservation Trust, welcomed the vote and said it is "highly significant".

"Dublin City Council has now given full protection to Numbers 10 and 20/21 Moore Street and partial protection to other important buildings," he said.

"While we would wish to go further in fully protecting the whole terrace 10-25 Moore Street which was occupied by the Volunteers in 1916, tonight's vote is highly significant and welcome.

"The councillors and the Executive of Dublin City Council have totally rejected the claim by the developer Hammerson that it would be 'inappropriate and unlawful' for us to protect these structures."

Councillors originally called for the structures between 10 and 25 Moore Street to be assessed in June 2021, but some of the addresses did not the requirements to be listed as protected structures.

"This has been a red letter day for the campaign to protect, conserve and sensitively re-develop Moore Street as a vibrant historic and cultural and trading quarter of our capital city," Mac Donncha says.

Green Party councillor Donna Cooney also welcomed the vote saying that "we now recognise that these buildings are significant and worthy to be protected for future generations."

Fine Gael councillor Paddy McCartan said he was worried that Hammerson may file a legal challenge against the council's decision.

McCartan asked what the legal status of the protection would be if An Bord Pleanála approved development on the site.

John O'Hara, a DCC planning officer, said ABP would now be required to take the protected status of the buildings "into account" when deciding on planning applications.

He also said adding the buildings to the record of protected structures would contribute to the "rejuvenation" of the area.

PLANNING

PLANNING DUBLIN

Dublin City Council
Lidl Ireland GmbH intend to apply for permission for development at this site at East wall Rd, East Wall, Co. Dublin. Permission for development will consist of modifications to the ground floor layout and shop façade and will include for: a)Single-storey extension to front of the existing store to provide a DRS facility to allow customers to return plastic beverage bottles to a reverse vending machine in store b) The removal of the existing entrance/exit pod.c) The removal of the existing trolley bay. d) Proposed free-standing trolley bay. e) Proposed alteration works to store elevation. f) Alteration works to car park area. g) All ancillary works required to complete to the required Building Regulations standards. The planning application may be inspected, or purchased at a fee not exceeding the reasonable cost of making a copy, at the offices of the Planning Authority during its public opening hours. A submission or observation in relation to the application may be made in writing to the Planning Authority on payment of the prescribed fee, €20, within the period of 5 weeks beginning on the date of receipt by the authority of the application, and such submissions or observations will be considered by the Planning Authority in making a decision on the application.

PLANNING

PLANNING DUBLIN

Fingal County Council
Lidl Ireland GmbH intend to apply for permission for development at this site at Grange Rd, Baldoyle, Co. Dublin. Permission for development will consist of modifications to the ground floor layout and shop façade and will include for: a)Single-storey extension to front of the existing store to provide a DRS facility to allow customers to return plastic beverage bottles to a reverse vending machine in store b) The removal of the existing entrance/exit pod. c) The removal of the existing trolley bay. d) Proposed free-standing trolley bay. e) Proposed alteration works to store elevation. f) Alteration works to car park area. g) All ancillary works required to complete to the required Building Regulations standards. The planning application may be inspected, or purchased at a fee not exceeding the reasonable cost of making a copy, at the offices of the Planning Authority during its public opening hours. A submission or observation in relation to the application may be made in writing to the Planning Authority on payment of the prescribed fee, €20, within the period of 5 weeks beginning on the date of receipt by the authority of the application, and such submissions or observations will be considered by the Planning Authority in making a decision on the application.

Appendix D

Appendix C Ecological Impact Assessment (EcIA)

Fieldstown Substation and Grid Connection

Ecological Impact Assessment

Energia Solar Holdings

Project number: 60657534
Document reference: 60657534_ACM_RP_EN_FT_008_1

1 December 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Anna Davies MCIEEM Associate Ecologist Laura Cappelli Senior Ecologist	Lewis Deacon CEnv, MCIEEM Technical Director	Tony Marshall CEcol MCIEEM Technical Director	Bernice Cahill Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	18 October 2023	Draft	Y	Bernice Cahill	Associate Director
1	1 December 2023	Final	Y	Bernice Cahill	Associate Director

Prepared for:

Energia Solar Holdings

Prepared by:

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
County Dublin A96 T927
Ireland

T: +353 1 696 6220
aecom.com

Table of Contents

1. Introduction

AECOM was commissioned by Energia Solar Holdings (hereafter referred to as the 'Applicant') to carry out an Ecological Impact Assessment (EcIA) for the proposed 110 Kilo Volt (kV) Air Insulated Switchgear (AIS) substation in Fieldstown County Dublin and 13.3 kilometre (km) underground cable route connecting this proposed substation to the Finglas Substation (hereafter referred to collectively as the 'Proposed Development'). The Proposed Development is located within an area of agricultural grassland, on lands at Fieldstown East, County Dublin and is located within the administrative area of Fingal County Council (FCC).

The location of the proposed substation is referred to as the 'Proposed Substation Development' and the location of the underground cable is referred to as the 'Proposed Grid Connection'. When referring to both the Proposed Substation Development and Proposed Grid Connection together it is referred to as the 'Site'.

This EcIA Report details the results of the desk study and field survey completed to establish the baseline conditions at the Site. The predicted effects arising from the Proposed Development on identified ecological features – which includes all designated nature conservation sites, habitats, flora and fauna species and ecosystems – are described and, where necessary, appropriate and proportionate mitigation measures are prescribed.

The purpose of this EcIA is to provide a detailed appraisal of the potential ecological impacts associated with the Proposed Development.

1.1 Description of the Proposed Development

The Applicant is proposing a 110kV AIS substation and grid connection to Finglas Substation. The AIS substation (hereafter referred to as the Proposed Substation Development) will facilitate the connection of three nearby solar developments to the local electricity network via a 13.3km underground cable (hereafter referred to as the Proposed Grid Connection).

It is intended that three solar energy projects (Fieldstown, County Dublin (c. 75 megawatt (MW)), Ballaghaweary Co. Meath (c. 18MW) and the proposed Gerradstown County Dublin (c. 55MW)) will connect to the proposed substation via underground cables with a maximum voltage of 33kV is to provide the necessary infrastructure to support the permanent power supply for the development of three solar projects.

The Proposed Substation Development comprises a 110kV AIS tail-fed substation compound (approximately 7.5 hectares (ha)), diversion of existing overhead lines (OHLs), a shunt filter, diesel generator and tank, twelve lighting protection masts, two service/maintenance carparking facilities, internal roads, new site access from R122 to the west and perimeter palisade fencing.

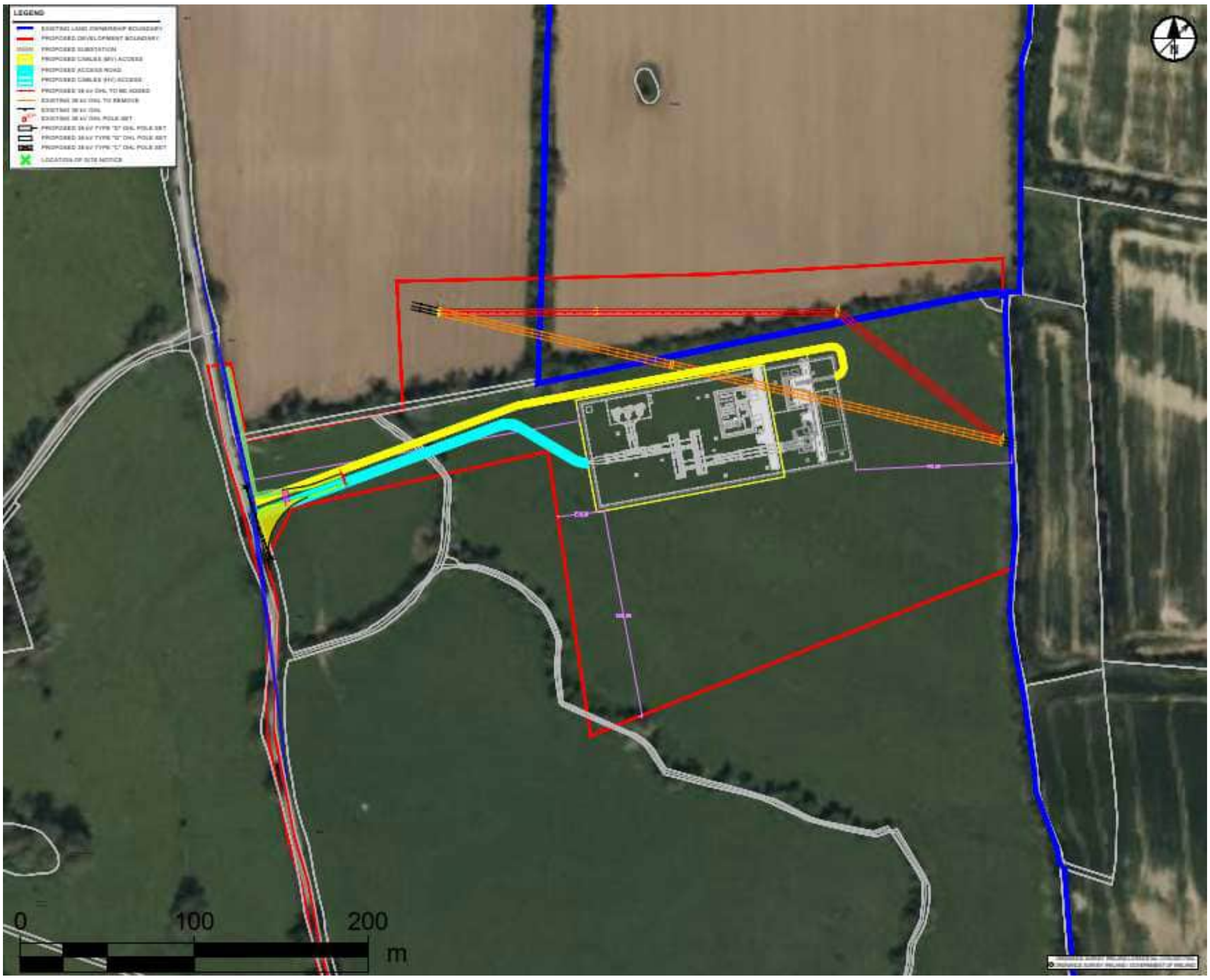
The Proposed Grid Connection, which will comprise 13.3km underground 110kV cable connection to Finglas Substation. It will involve twenty joint bays primarily within public roadways. Trenchless installation in the form of horizontal directional drilling (HDD) will be used at watercourse crossings at Broadmeadow River Bridge (before the junction of the R122 and R125, Ward River Bridge (on R122), and under the N2 prior to entering Finglas Station.

1.2 Overview of the Site

The Proposed Substation Development is located within an area of agricultural grassland on lands at Fieldstown East, County Dublin (Irish Transverse Mercator (ITM) coordinates: 711952, 750625). The Proposed Substation Development is bounded by the R122 regional road immediately west and agricultural lands to the east, north and south as shown in Figure 1-1.

The largest nearby towns are Ashbourne, approximately 4.5km east, and Swords, approximately 9.5km to the southeast. Oldtown is located approximately 2.5km directly north, Ballyboghill is approximately 4.5km east, and Rolestown is situated within 1km southeast of the site. There are dispersed one-off housing units located in proximity to the Proposed Substation Development, with the nearest property is located approximately 300m west.

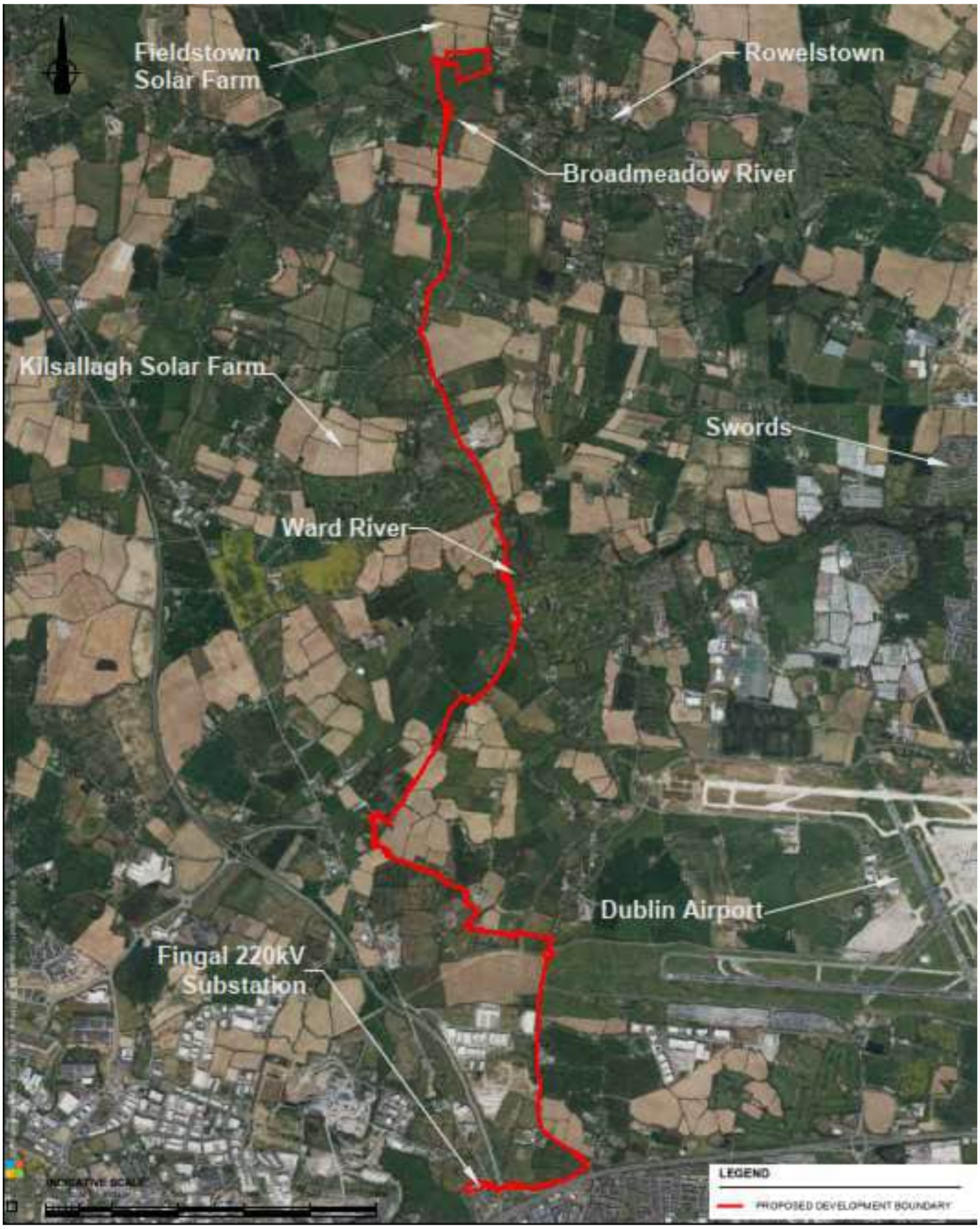
Figure 1-1 Location of Proposed Substation Development and Associated Infrastructure



The Proposed Substation Development and an area up to 50m from this boundary is located within arable land at Fieldstown County Dublin with several wet drainage ditches, treelines, and hedgerows. Broadmeadow River is located to the south of the Proposed Substation Development. The Proposed Substation Development is bounded by the R122 regional road immediately east and the R130 to the west and R125 regional road to the south. The largest nearby towns to the Proposed Substation Development are Ashbourne, approximately 4.5km east, and Swords, approximately 9.5km to the southeast.

The Proposed Grid Connection is approximately 13.3km and is primarily located within public roadways. The cable run will exit the substation compound travelling west before heading south and entering the R122 regional road. The proposed cable connection will follow the path of the R122 to the L7325 and L7231 before returning to the R122, before heading west adjacent to the M50, under the N2 to the boundary of Finglas Substation as shown in Figure 1-2.

Figure 1-2 Proposed Grid Connection



The majority of the Proposed Grid Connection is located within the public road with dispersed residential and commercial properties adjacent to the route. However, there are some offroad sections at the HDD crossings where the route traverses improved agricultural grassland, tilled land, dry meadows and grassy verges, watercourses and treelines. These offroad sections are located in one area to the west of the Substation Site, one location at Broadmeadow River, one location at the Ward River, and two locations east and west of the N2 nearby the intersection of the N2 and the M50 near the Finglas Substation. The planned tie in for the Proposed Grid Connection to Finglas substation is located to the north of Junction 5 of the M50 motorway, to the west of Junction 1 of the N2.

1.3 Legislation and Planning Context

This EcIA has been undertaken in the context of the following relevant legislative instruments and planning policies:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the ‘Habitats Directive’).
- Directive 2009/147/EC on the conservation of wild birds (the ‘Birds Directive’).

- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy ('Water Framework Directive' or 'WFD').
- Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (the 'Invasive Species Regulations').
- Convention on Wetlands of International Importance ('Ramsar Convention').
- European Communities (Birds and Natural Habitats) Regulations 2011-2021 (the 'Habitats Regulations').
- Wildlife Act 1976 and Wildlife (Amendment) Act (2000) including all amendments (together known as the 'Wildlife Acts').
- Flora (Protection) Order 2015 S.I 356/2015 (the 'Flora Protection Order').
- The Planning and Development Act, 2000-2014.
- Flora (Protection) Order 2015 S.I 356/2015 (the 'Flora Protection Order').
- National Biodiversity Plan[1].
- Fingal Development Plan (FDP) 2017-2023[2].
- Project Ireland 2040 National Planning Framework (NPF)[3].
- Fingal (County Dublin) Biodiversity Action Plan[4] (this BAP is currently under review and the 2018-2023 BAP has not been adopted at the time of preparing the Report).

Relevant local planning objectives concerning nature conservation within the Fingal Development Plan[5] are summarised in Table 1-1.

Table 1-1 Summary of relevant policies within the Fingal Development Plan

Planning Objective	Purpose
NH03	Implement the Fingal Biodiversity Action Plan 2015 and any revisions thereof in partnership with all relevant stakeholders.
NH13	Ensure that proposals for development do not lead to the spread or introduction of invasive species. If developments are proposed on sites where invasive species are or were previously present, the applicants will be required to submit a control and management program for the particular invasive species as part of the planning process and to comply with the provisions of the European Communities Birds and Habitats Regulations 2011 (S.I. 477/2011).
NH15	Strictly protect areas designated or proposed to be designated as Natura 2000 sites (i.e., Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). also known as European sites) including any areas that may be proposed for designation or designated during the period of this Plan.
NH16	Protect the ecological integrity of proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, and Habitat Directive Annex I sites.
NH17	Ensure that development does not have a significant adverse impact on proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, Habitat Directive Annex I sites and Annex II species contained therein, and on rare and threatened species including those protected by law and their habitats.
NH18	Protect the functions of the ecological buffer zones and ensure proposals for development have no significant adverse impact on the habitats and species of interest located therein.
NH24	Protect rivers, streams and other watercourses and maintain them in an open state capable of providing suitable habitat for fauna and flora, including fish.
NH27	Protect existing woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character and ensure that proper provision is made for their protection and management.

[1] Department of Culture, Heritage and the Gaeltacht (2017), National Biodiversity Action Plan 2017-2021 https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf
[2] Fingal County Council (2017), Fingal Development Plan 2017-2023 https://www.fingal.ie/sites/default/files/2019-03/Fingal%20Development%20Plan%202017-2023%20-%20Written%20Statement_compressed_compressed.pdf
[3] https://npf.ie/project-ireland-2040-national-planning-framework/
[4] Fingal County Council, Fingal Biodiversity Action Plan 2010-2015 http://www.fingalbiodiversity.ie/resources/general/Fingal%20Biodiversity%20Plan.pdf
[5] Fingal County Council (2017), Fingal Development Plan 2017-2023 https://www.fingal.ie/sites/default/files/2019-03/Fingal%20Development%20Plan%202017-2023%20-%20Written%20Statement_compressed_compressed.pdf

The third National Biodiversity Plan (2017-2021)[6] was launched in 2017. This plan includes 119 targeted actions for public authorities in relation to their obligations for biodiversity and outlines six main objectives to meet commitments under the Convention on Biological Diversity (CBD) and EU Biodiversity Strategy. These objectives include:

- Mainstream biodiversity into decision-making across all sectors.
- Strengthen the knowledge base for conservation, management and sustainable use of biodiversity.
- Increase awareness and appreciation of biodiversity and ecosystem services.
- Conserve and restore biodiversity and ecosystem services in the wider countryside.
- Conserve and restore biodiversity and ecosystem services in the marine environment.
- Expand and improve management of protected areas and species.
- Strengthen international governance for biodiversity and ecosystem services.

One particularly important policy change in the plan (Objective 1) relates to the 'mainstreaming' of biodiversity into decision-making across all sectors. Specifically, there is an action on all Public Authorities to "*move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure*". This and other relevant policies in the plan have informed the valuation of ecological features, assessment of potential impacts and development of mitigation in this report, as relevant.

The Fingal Biodiversity Action Plan[7] (BAP) aims to conserve and enhance Fingal's natural heritage. The objectives of the BAP are to:

- To maintain, and where practicable enhance, the wildlife and habitats that give Fingal it's character and natural diversity.
- To ensure that (inter)national targets for sites, species and habitats are translated into effective action at local level.
- To develop effective partnerships to ensure that programmes for biodiversity conservation are maintained in the long-term.
- To raise public awareness and encourage involvement in biodiversity by the wider community.
- To increase our knowledge and understanding of biodiversity through ecological research.,
- To ensure the full integration of biodiversity into FCCs policies and programmes as part of sustainable development in Fingal.

2. Methods

2.1 Target Ecological Features

For the purposes of all desk study and field survey, protected and notable habitats and species which were target features of this EcIA comprise:

- All habitats on Annex I of the Habitats Directive.
- All species listed on Annex II and Annex IV of the Habitats Directive.
- All species of birds on Annex I of the Birds Directive.
- All species listed under the Wildlife Acts 1976 to 2021.
- Plant species listed on the Flora (Protection) Order, 2015.
- Species and habitats listed on the National Biodiversity Action Plan 2017 - 2021.,
- Invasive non-native species of plants and animals listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) (as amended) (hereafter 'scheduled invasive

[6] Department of Culture, Heritage and the Gaeltacht (2017), National Biodiversity Action Plan 2017-2021 https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf
[7] Fingal County Council, Fingal Biodiversity Action Plan 2010-2015 http://www.fingalbiodiversity.ie/resources/general/Fingal%20Biodiversity%20Plan.pdf

species'), those of EU concern under the EU Invasive Alien Species Regulation, and those listed by the National Biodiversity Data Centre as High Risk in Ireland.

Other species or habitats that may be rare, scarce or otherwise notable were also included where deemed appropriate through available information and/or professional judgement.

2.2 Desk Study

A desk study was carried out to identify nature conservation designations, and records of protected and notable habitats and species potentially relevant to the Proposed Development.

The desk study areas were defined using a stratified approach based on the likely 'zone of influence' of the Proposed Development on different ecological features and an understanding of the maximum distances typically considered by statutory consultees. Accordingly, the desk study sought to identify:

- International nature conservation designations within 15km of the Proposed Development (Proposed Substation Development and Proposed Grid Connection).
- National statutory conservation designations within 2km of the Proposed Development (Proposed Substation Development and Proposed Grid Connection).
- Records of protected and notable habitats and species within 1km of the Proposed Development (Proposed Substation Development and Proposed Grid Connection).

Internationally designated sites within the search area are shown in Figure 1, Appendix A.

The desk study was carried out using the sources detailed in Table 2-1.

Table 2-1 Desk Study Data Sources

Data source	Accessed	Data obtained
National Parks and Wildlife Service (NPWS) webpages (https://www.npws.ie/protected-sites) and (https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data)	January 2023	International statutory designations within 15 km. Other statutory designations within 2 km.
Environment Protection Agency (EPA) webpage (https://gis.epa.ie/EPAMaps/)	January 2023	Information on watercourses.
Meath County Council website (https://www.meath.ie/)	January 2023	Policies relevant to nature conservation. County Meath Biodiversity Action Plan.
National Biodiversity Data Centre (NBDC) website (https://www.biodiversityireland.ie/)	January 2023	Notable and protected species records within 1km (records older than 50 years have not been considered).
Aerial photography (www.google.com/maps)	January 2023	Habitats and connectivity relevant to interpretation of planning policy and potential protected/notable species constraints.
National Survey of Native Woodland (NSNW) and Ancient Woodland inventory (https://www.npws.ie/maps-and-data)	January 2023	Information on woodlands within 1km

2.3 Field Survey

Field surveys of the Proposed Substation Development were carried out on 02 July 2021, and between 03 to 18 August 2021 by two suitably experienced AECOM ecologists. Walkover surveys to check if this baseline data was still applicable were carried out 14 December 2022 and 19 October 2023.

A windscreen survey was carried out on 04 November 2022 of the Proposed Grid Connection. An additional windscreen survey of the Grid Connection was carried out on 19 October 2023 to survey the amended route, which included Dunsoghly Lane. This accounted for any major visible constraints visible from a car. A walkover survey of the off-road areas was also carried out on 14 December 2022 and 19 October 2023.

The survey area is shown on Figure 2, Appendix A and comprised a 50 m buffer around the Substation Site and offroad sections at the Grid Connection on the side of the road where the offroad Grid Connection route is located where accessible. The lands immediately adjacent to the Grid Connection were also surveyed during the windscreen survey as described above.

2.4 Habitat Survey

A habitat survey was carried out using the Heritage Council classification system[8] and following and Heritage Council methodology[9]. Notes were made for each habitat of dominant, typical and notable plant species, and any relevant ecological characteristics, and these reflect conditions at the time of survey.

The surveyors recorded and mapped all habitat types in the survey area and any relevant ecological features, including invasive non-native plants.

2.4.1 Appraisal of Potential Suitability of Habitats to Support Protected and Notable Species

An appraisal was made of the potential suitability of the habitats present to support protected and notable species of plants or animals. Field signs, habitat features with potential to support protected species and any sightings or auditory evidence were recorded when encountered. no detailed surveys were carried out for any particular species, apart from undertaking a preliminary bat roost appraisal of all trees and carrying out badger surveys within the survey area.

2.5 Badger Survey

Surveys for badger (*Meles meles)* were carried out in suitable habitat within the survey area. The surveys followed guidance in published literature[10]. Evidence searched for included setts, spoil heaps, bedding, guard hairs, latrines, footprints, trails, scratch marks and foraging activity. If any badger activity or evidence was recorded this was mapped with the aid of aerial photography and GPS, with accompanying field notes.

In addition to the above, a field camera was installed on a tree facing a potential badger sett on 03 August 2021 and was collected on 18 August 2021.

2.6 Bat Roost Suitability

The bat roost suitability of all trees within the Site was assessed following guidance published by the Bat Conservation Trust[11]. Potential Roost Features (PRF) were identified from the ground, and trees were classified as having Negligible, Low, Moderate or High bat roost suitability, according to the definitions provided in the BCT survey guidance.

PRF searched for included suitable holes, cracks or splits in trees. Where such features existed, evidence of bat use searched for included droppings, staining, foraging remains, auditory evidence and sightings of live or dead bats.

There are no built structures within the Proposed Substation Development or Proposed Grid Connection.

2.7 Ecological Impact Assessment

2.7.1 Scope of Assessment

The Proposed Development is considered to be permanent and there is no expectation of a ‘decommissioning’ phase. This EcIA therefore considers only the construction and operation of the Proposed Development.

The field survey did not include searches for pine marten (*Martes martes*), red squirrel (*Sciurus vulgaris)* and common lizard (*Zootoca vivipara*) because they are considered absent from the relevant area for the reasons given below. Given their absence these features are not considered further in this EcIA.

The following ecological features were excluded from the field survey and will not be referred to any further within this assessment:

- Red squirrel– no survey was carried out because red squirrel is assumed to be absent from the area due to lack of suitable woodland habitats within the Site.
- Pine marten – no suitable habitat within the surrounding area to support this species, unlikely to be present within the Site.

[8] Fossitt, J.A. (2000) A Guide to Habitats in Ireland, The Heritage Council
[9] Smith, G.F., O’Donoghue, P. and Delaney, E. (2011). Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council, Kilkenny.
[10] Harris et al (1989) Surveying Badgers, The Mammal Society
[11] Collins (2016), Bat Surveys – Good Practice Guidelines (3rd Edition)

- Common lizard – there are no existing records of common lizard within 1km of the Site and there is insufficient suitable habitat to support a sustainable common lizard population and thus this species are unlikely to be affected by the Proposed Development.

2.7.2 Assessment Method

Assessment of ecological impacts in this EcIA broadly follows guidelines published by the Chartered Institute of Ecology and Environmental Management[12] (CIEEM). The principal steps involved in the CIEEM approach can be summarised as:

- Baseline conditions are determined by obtaining data on potentially affected ecological features through targeted desk study and field survey (both at expected Proposed Development commencement and, for comparison, at a future point in the absence of the Proposed Development).
- The importance of ecological features identified in the baseline is evaluated in a geographic context, determining those that require more detailed assessment.
- The potential impacts of the Proposed Development that could affect ecological features are described, considering embedded mitigation, and accounting for best practice and legislative requirements.
- The likely effects on ecological features are assessed and if possible quantified.
- Measures are developed to mitigate (by avoidance or reduction), or if necessary, compensate for likely significant adverse effects, in conjunction with other design elements.
- The significance of residual effects (beneficial or adverse) is reported.
- Scope for ecological enhancement is considered.

The assessment employs the professional judgement of experienced ecologists as necessary.

2.7.3 Assessing the Importance of Ecological Features

An ecological feature is a site, habitat, or species of nature conservation value. Only those that are ‘important’ and could be significantly affected by the project require detailed assessment: “*it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*”[13].

Existing data and criteria are considered when determining the importance of ecological features. Where these are lacking, it is necessary to apply professional judgement. Factors considered include:

- Abundance/rarity, endemicity, mobility and distribution (particularly if this changing).
- Size/extent, viability, rate of decline and vulnerability.
- Typicalness, species-richness, structure and connectivity/fragmentation.
- Function/value to other features (e.g., habitats of notable species or buffers against impacts).
- Restoration potential.

Requirements to comply with legislation are stated during the assessment, but legislative protection and priority listing does not necessarily translate to importance. For example, a transitory roost of a single bat would not be afforded the same importance as a regularly occurring maternity roost (although legal obligations must still be met), and areas of priority habitat could be unfavourably small or in poor condition and not practically restorable.

The importance of ecological features is described within a geographic scale. Examples of types of features which might fall into each geographic class are given in Table 2-2.

Table 2-2 Geographical Scale of Importance

Scale	Example Features (Subject to Professional Judgement)
International/European	Internationally-designated site (or candidate/proposed international site). Sustainable internationally-significant population or site supporting one.
National (Ireland)	Nationally-designated site (or site considered worthy of such designation).

[12] Chartered Institute of Ecology and Environmental Management (2018), Guidelines for Ecological Impact Assessment in the UK and Ireland
[13] Chartered Institute of Ecology and Environmental Management (2018), Guidelines for Ecological Impact Assessment in the UK and Ireland

Scale	Example Features (Subject to Professional Judgement)
	Sustainable area of a national priority habitat or notable Annex I habitat which is a significant proportion of the national resource. Sustainable nationally-significant population (e.g., 1% of national resource) or site supporting one.
Regional (e.g., Natural Heritage Areas)	Sustainable area of a priority habitat which is a significant proportion of the regional resource. Sustainable regionally-significant population (e.g., 1% of regional resource) or site supporting one.
County, or other Local Authority-wide Area	Sustainable area of priority habitat which is a significant proportion of the county resource. Sustainable county-significant population (e.g., 1% of county resource) or site supporting one.
Local (e.g., 10km radius)	Priority habitat not large enough for higher importance or degraded with low restoration potential. Habitat or population which appreciably enriches the local resource. Sustainable population of a notable species not considered of higher importance.
Site	Common, heavily managed or modified habitat, and common and widespread species, of low ecological value and not of value for features of higher importance.

2.7.4 Assessment of Impacts

Impacts may occur during the construction, operation and decommissioning phases of a development. They may be direct or indirect (also termed ‘secondary’). Direct impacts are attributable to an action associated with a development. Indirect impacts are often produced away from a development or as a result of other initial impacts.

Under the CIEEM guidance[14] there is a distinction between impact and effect. An impact is an action on an ecological feature (e.g., hedgerow removal. loss of a bat roost). An effect is the outcome of that impact on an ecological feature (e.g., effect of hedgerow loss on breeding birds. effect of bat roost loss on the conservation status of the bat species).

Likely impacts/effects are characterised using those parameters below that are necessary to understand them:

- Direction: whether the impact/effect be beneficial or adverse.
- Magnitude: the ‘size’, ‘amount’ or ‘intensity’ of an impact/effect, quantified as far possible.
- Extent: the spatial or geographical area or distance over which the impact/effect occurs.
- Duration: the time over which an impact/effect is expected to last before recovery or replacement (if possible) of the feature. Where appropriate, ecological aspects such as lifecycles are considered. The duration of an effect may be longer than the duration of an activity or impact.
- Timing/frequency: timing is important since an impact/effect might not occur if it avoids critical seasons or life stages. Frequency considers activity repetition, which may have greater impact.
- Reversibility: whether the impact/effect is temporary or permanent. A temporary impact/effect is one from which recovery is possible or for which effective mitigation is possible and enforceable. A permanent impact/effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

Consideration is given to conservation objectives, whether processes within sites will be altered, effects on habitats and species population size/viability, and whether these will have an effect on conservation status. Conservation status includes the abundance and distribution of species, and the extent, structure and function, and typical supported species of habitats.

Consideration is given to cumulative effects, since effects acting in combination may have a cumulative effect exceeding that of the separate effects. Cumulative effects may arise from a combination of effects from the development itself (e.g., effects at the construction and operation stages), or the combined effects from different developments.

2.7.5 Assessment of Significance

An effect (positive or negative) is significant at a specified geographical level if it affects the ecological integrity of a site or ecosystem or the conservation status of a species or habitat at that geographical level. If not significant at the level it was considered important, an effect could be significant at a lower geographic level (for example, an effect on a national priority species may not be significant to the national population). These assessments are based on quantitative evidence where possible, and as necessary through the professional judgement of experienced ecologists.

[14] Chartered Institute of Ecology and Environmental Management (2018), Guidelines for Ecological Impact Assessment in the UK and Ireland

Initially, the effect significance does not consider mitigation (avoidance or reduction) or compensation measures unless these are explicitly embedded into the design. The residual effect significance takes account of additional agreed and enforceable mitigation or compensation measures that are considered necessary, with the aim that, wherever possible, residual effects are not significant or are significant at a lower geographic level than the unmitigated effects.

CIEEM advise that where there is reasonable doubt and a conclusion of no significant effect cannot be robustly reached, this uncertainty should be acknowledged and a significant effect assumed, in line with the precautionary principle.

2.7.6 Mitigation Approach

Where impacts on relevant ecological features are predicted, the approach to mitigation engages the following hierarchy:

1. Avoid features where possible.
2. Minimise impact by design, method of working or other measures, for example by enhancing existing features.
3. Compensate for significant residual impacts (e.g., by providing suitable habitats elsewhere).

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted are lower levels considered. The rationale for the proposed level of mitigation is provided, with sufficient detail to show that the measures are feasible and would be provided.

Further to mitigation, this EcIA has considered the potential to secure biodiversity enhancement which is proportionate to the scale and impacts of the Proposed Development.

2.8 Appropriate Assessment Screening

An Appropriate Assessment (AA) Screening Report[15] has been completed, the purpose of which was to determine, in view of best available scientific knowledge, whether the Proposed Development, either alone or in combination with other plans or projects, could have Likely Significant Effects (LSE) on European sites identified within the ZoI of the Proposed Development, in view of the sites' conservation objectives. Note that the designated sites assessed in the AA Screening Report have not been identified based on arbitrary distances, but individually assessed as potentially relevant in relation to potential effects from the Proposed Development based on the "*the nature size and location of the project*" as per guidance published by the Department of Environment, Heritage and Local Government[16].

2.9 Limitations

Information obtained through desk study is intended to supplement fieldwork and relies on people and organisations having submitted records for the desk study area. As such, a lack of records for particular habitats or species does not necessarily equate to their absence from the desk study search area. Likewise, the presence of records for particular habitats and species does not imply their continued occurrence or relevance in the context of the Proposed Development.

Where habitat boundaries coincide with discernible boundaries on recent aerial photographs (where available) the resolution is as determined by the accuracy of the aerial photographs. Otherwise, habitat mapping is as estimated in the field. Where areas of habitat are given, they are approximate and should be verified by measurement on site where required for design or construction.

There were some areas that were non-accessible due to landownership and safety reasons (e.g., adjacent to a motorway). However, this did not pose a constraint to the assessment as they were either viewed from adjacent lands or the habitats, such as paved surfaces, were not considered suitable for notable species based on aerial imagery.

There are no other significant limitations to this EcIA.

[15] AECOM (2023), Fieldstown 110kV Substation and Grid Connection Screening for Appropriate Assessment
[16] DoEHLG (2010). Appropriate Assessment of plans and projects in Ireland. Guidance for Planning Authorities. Department of Environment, Heritage and Local Government: Ireland

3. Baseline Conditions

3.1 Nature Conservation Designations

There are no NHAs or pNHAs within 2km of the Proposed Development.

Eight SACs and six SPAs were identified within 15km of the Proposed Development, as detailed in Table 4. The locations of these sites are shown on Figure 1, Appendix A. Table 3-1 Sites for Nature Conservation within 15km of the Proposed Development

Site Name	Summary of Qualifying Interests	Distance from the Proposed Development (as the crow flies)
South Dublin Bay and River Tolka Estuary SPA [004024]	• Light-bellied Brent goose *Branta bernicla hrota* • Oystercatcher *Haematopus ostralegus* • Ringed plover *Charadrius hiaticula* • Grey plover *Pluvialis squatarola* • Knot *Calidris canutus* • Sanderling *Calidris alba* • Dunlin *Calidris alpina* • Bar-tailed godwit *Limosa lapponica* • Redshank *Tringa totanus* • Black-headed gull *Chroicocephalus ridibundus* • Roseate tern *Sterna dougallii* • Common tern *Sterna hirundo* • Arctic tern *Sterna paradisaea* • Wetland and waterbirds	Approximately 7.2km southeast of the Proposed Grid Connection.
Malahide Estuary SAC [000205]	• Mudflats and sandflats not covered by seawater at low tide • *Salicornia* and other annuals colonising mud and sand • Atlantic salt meadows • Mediterranean salt meadows • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes)	Approximately 7.4km southeast of the Proposed Substation Development. Approximately 7.4km southeast of the Proposed Grid Connection.
Malahide Estuary SPA [004025]	• Great crested grebe *Podiceps cristatus* • Light-bellied Brent goose • Shelduck *Tadorna tadorna* • Pintail *Anas acuta* • Goldeneye *Bucephala clangula* • Red-breasted merganser *Mergus serrator* • Oystercatcher • Golden plover *Pluvialis apricaria* • Grey plover • Knot • Dunlin • Black-tailed godwit *Limosa limosa* • Bar-tailed godwit • Redshank • Wetlands and waterbirds	Approximately 7.8km southeast of the Proposed Substation Development. Approximately 7.8km southeast of the Proposed Grid Connection.
Rogerstown Estuary SAC [000208]	• Estuaries • Mudflats and sandflats not covered by seawater at low tide • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Mediterranean salt meadows • Shifting dunes along the shoreline with *Ammophila* arenaria (white dunes)	Approximately 7.9km northeast of the Proposed Substation Development. Approximately 8.1km east of the Proposed Grid Connection.

Site Name	Summary of Qualifying Interests	Distance from the Proposed Development (as the crow flies)
	• Fixed coastal dunes with herbaceous vegetation (grey dunes)	
Rogerstown Estuary SPA [004015]	• Greylag goose *Anser anser* • Light-bellied Brent goose • Shelduck • Oystercatcher • Ringed plover • Grey plover • Knot • Dunlin • Black-tailed godwit • Redshank • Wetlands and waterbirds	Approximately 8.8km northeast of the Proposed Substation Development. Approximately 9.0km northeast of the Proposed Grid Connection.
North Dublin Bay SAC [000206]	• Mudflats and sandflats not covered by seawater at low tide • Annual vegetation of drift lines • *Salicornia* and other annuals colonising mud and sand • Atlantic salt meadows • Mediterranean salt meadows • Embryonic shifting dunes • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Humid dune slacks • Petalwort *Petalophyllum ralfsii*	Approximately 9.4km southeast of the Proposed Grid Connection.
North Bull Island SPA [004006]	• Light-bellied Brent goose • Shelduck • Teal *Anas crecca* • Pintail • Shoveler • Oystercatcher • Golden plover • Grey plover • Knot • Sanderling • Dunlin • Black-tailed godwit • Bar-tailed godwit • Curlew *Numenius arquata* • Redshank • Turnstone *Arenaria interpres* • Black-headed gull • Wetland and waterbirds	Approximately 9.4km southeast of the Proposed Grid Connection.
South Dublin Bay SAC [000210]	• Mudflats and sandflats not covered by seawater at low tide • Annual vegetation of drift lines • *Salicornia* and other annuals colonising mud and sand • Embryonic shifting dunes	Approximately 9.9km southeast of the Proposed Grid Connection.
Baldoyle Bay SAC [000199]	• Mudflats and sandflats not covered by seawater at low tide • *Salicornia* and other annuals colonising mud and sand • Atlantic salt meadows • Mediterranean salt meadows	Approximately 13.7km southeast of the Proposed Substation Development. Approximately 10.5km east of the Proposed Grid Connection.
Baldoyle Bay SPA [004016]	• Light-bellied Brent goose • Shelduck	Approximately 13.7km southeast of the Proposed Substation Development.

Site Name	Summary of Qualifying Interests	Distance from the Proposed Development (as the crow flies)
	• Ringed plover • Golden plover • Grey plover • Bar-tailed godwit • Wetland and waterbirds	Approximately 10.5km east of the Proposed Grid Connection.
North-west Irish Sea SPA [004236]	• Common scoter *Melanitta nigra* • Red-throated diver *Gavia stellata* • Great northern diver *Gavia immer* • Fulmar *Fulmarus glacialis* • Manx shearwater *Puffinus puffinus* • Shag *Phalacrocorax aristotelis* • Cormorant *Phalacrocorax carbo* • Little gull *Larus minutus* • Kittiwake *Rissa tridactyla* • Black-headed gull • Common gull *Larus canus* • Lesser black-backed gull *Larus fuscus* • Herring gull *Larus argentatus* • Great black-backed gull *Larus marinus* • Little tern *Sterna albifrons* • Roseate tern • Common tern • Arctic tern • Puffin *Fratercula arctica* • Razorbill *Alca torda* • Guillemot *Uria aalge*	Approximately 12.4 km east of the Substation Site. Approximately 12.2 km east of the Grid Connection.
Rye Water Valley/Carton SAC [001398]	• Petrifying springs with tufa formation *Cratoneurion* • Narrow-mouthed whorl snail *Vertigo angustior* • Desmoulin's whorl snail *Vertigo moulinsiana*	Approximately 12.4km southwest of the Proposed Grid Connection.
Howth Head SAC [000202]	• Vegetated sea cliffs of the Atlantic and Baltic coasts • European dry heaths	Approximately 14.0km southeast of the Proposed Grid Connection.
Rockabill to Dalkey Island SAC [003000]	• Reefs • Harbour porpoise *Phocoena phocoena*	Approximately 14.7km southeast of the Proposed Grid Connection.

3.2 Woodlands

There are no ancient woodlands within 1km of the Proposed Development and there are no native woodland blocks within or immediately adjacent to the Proposed Development.

3.3 Habitats

The results of the habitat survey are described below and are shown on Figure 2, Appendix A, illustrative photographs of the Site are presented within Appendix B, Target Notes are presented within Appendix C.

3.3.1 Arable Crops (BC1)

Arable crops are present in the north and east of the Proposed Substation Development. At the time of the survey, the arable crop in the north was covered in netting, Photograph 1, Appendix B. Arable crops are located in the northern section of the Proposed Development boundary.

3.3.2 Buildings and artificial surfaces (BL3)

The Proposed Grid Connection runs along the R122 road and Dunsoghly Lane. Where the Proposed Grid Connection meets the Finglas substation there is a mix of hardstanding paths, roads, pavement, and buildings.

3.3.3 Depositing/Lowland Rivers (FW2)

The Proposed Grid Connection crosses several lowland rivers. These include the Broadmeadow River, Rowlestown West River, Ward River, Huntstown River, and Dunbro River. The Proposed Grid Connection also passes in close proximity to other watercourses including Castlefarm River, Fieldstown River, Skephubble River and Ballystraha River.

Broadmeadow River (Target Note 1) is located approximately 220m to the south of the Proposed Substation Development. The stream was slow flowing, flowed east, is 6-8m wide and 20-100 centimetres (cm) deep with a clay substrate. There was limited aquatic vegetation instream, but the banks were vegetated with reed canary grass (*Phalaris arundinacea*), willow (*Salix* sp.), elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), bittercress (*Cardamine* sp.) and butterbur (*Petasites hybridus*). Broadmeadow River is not located within the Proposed Substation Development boundary.

At the off-road location where the Broadmeadow River is crossed by the Proposed Grid Connection the river is approximately 7m wide, has a moderate flow east and is gently sloped at the banks. There is low lying bramble (*Rubus fruticosus* agg.) scrub present on the southern bank and grassland that is grazed short on the northern bank.

At the off-road location where the Ward River is crossed by the Proposed Grid Connection the river is approximately 5m wide with turbid water and a moderate eastern water flow. There is grassland at the southern bank and bramble at the northern bank with occasional willow present.

3.3.4 Drainage Ditch (FW4)

A drainage ditch was present within the northwest and central area of the Proposed Substation Development (Target Note 6). The Proposed Grid Connection crosses a section of this wet ditch to the west of the Substation Site. The ditch was largely dry, however there were sections holding shallow water (less than 5 cm depth), stagnant with no instream vegetation and steep slopes. Ivy (*Hedera helix*) and hart's-tongue fern (*Asplenium scolopendrium*) were present along the banks of the ditches. This habitat is located within the Proposed Substation Development boundary.

The Proposed Grid Connection crosses another wet drainage ditch nearby the Finglas Substation. It is approximately 1m wide. The ditch is wet and the majority of the ditch is covered with instream vegetation dominated by watercress (*Nasturtium officinale*). There is also occasional teasel (*Dipsacus fullonum*) present on the banksides.

3.3.5 Dry Meadows and Grassy Verges (GS2)

The Proposed Grid Connection crosses an area of grassy verges for approximately 500m in lands just west of the R122 before it reaches the Finglas Substation. This grassy verge comprises tall swards and also herbaceous plants. It is dominated by perennial rye grass (*Lolium perenne*), fescue grasses (*Festuca* spp.), and cock's-foot (*Dactylis glomerata*). Other species also include teasel, broad-leaved dock (*Rumex obtusifolius*), common ragwort (Senecio jacobaea), colt's-foot (*Tussilago farfara*), dandelion (*Taraxacum officinale*), creeping buttercup (*Ranunculus repens*), and occasional bush vetch (*Vicia sepium*) and creeping cinquefoil (*Potentilla reptans*). Occasional bramble scrub is also present at the edges of this habitat.

3.3.6 Hedgerows (WL1)

A species-poor section of hedgerow (Target Note 3) was present to the east of the Proposed Substation Development and comprises hawthorn and bramble. Two species-rich, intact, hedgerows (Target Note 7) are located along the road (R122) in the northwest of the Proposed Substation Development dry ditches are adjacent to both hedgerows. These hedgerows contained occasional mature sycamore (*Acer pseudoplatanus*), with wych elm (*Ulmus glabra*), common nettle (*Urtica dioica*), willowherb (*Epilobium* sp.), bittersweet (*Solanum dulcamara*), meadowsweet (*Filipendula ulmaria*), hedge bindweed (*Calystegia sepium*) and honeysuckle (*Lonicera periclymenum*). One section of this hedgerow (eastern side of the R122) is located within the Proposed Substation Development boundary at the proposed site entrance boundary. The Proposed Grid Connection crosses a small section of hedgerow dominated by bramble and hawthorn beside the Ward River.

3.3.7 Improved Agricultural Grassland (GA1)

The Substation Site almost entirely comprises an improved grassland field comprising Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), common nettle with occasional speedwell (*Veronica* sp.) and curled dock (*Rumex crispus*), Photograph 2, Appendix B. Furthermore, the majority of the lands within off-road sections and adjacent to the Proposed Grid Connection are improved agricultural grassland fields.

3.3.8 Scrub (WS1)

A small patch of scrub comprising bramble and common nettle was present to the northeast of the Proposed Substation Development. Scrub habitat is not located within the Proposed Substation Development boundary. A small area of scrub adjacent to the N2 motorway is located within the Proposed Grid Connection.

3.3.9 Tilled Land (BC3)

There is a large area of tilled land near the Finglas Substation that the Proposed Grid Connection crosses. At the time of the survey, the land had recently been tilled and is likely still in use for arable crops.

3.3.10 Treelines (WL2)

Several treelines were present within the Proposed Substation Development. along the northern and eastern boundaries and adjacent to the drainage ditch. The treelines (Target Note 2) are dense with a shrub layer, comprising largely hawthorn, ash (*Fraxinus excelsior*) with ivy, elder, common nettle, sycamore, thistle (*Cirsium* sp.), bramble, rose species (*Rosa* sp.), occasional beech (*Fagus sylvatica*), honeysuckle and gorse (*Ulex europaeus*). Treelines are present within the Proposed Substation Development boundary.

The Proposed Grid Connection crosses a small section of treeline near the R122 to the east of the Finglas Substation. This treeline comprises semi-mature planted hawthorn trees that are very thin and approximately 6 to 7m tall.

3.4 Protected and Notable Species

3.4.1 Plants/Invasive Plant Species

The field survey conducted on the 04 November 2022 recorded the presence of the non-scheduled invasive species butterfly bush (*Buddleja davidii*) (medium-impact), winter heliotrope (*Petasites pyrenaicus)* (low-impact) and snowberry (*Symphoricarpos albus*) (low-impact) along the Proposed Grid Connection as shown in Figure 3, Appendix A.

The NBDC and NPWS database search conducted as part of the desk study four species of non-native invasive species within 1km of the Site. The species returned by the NBDC and NPWS database search include traveller's-joy (*Clematis vitalba)*, Canadian fleabane (*Conyza canadensis)*, Russian-vine (*Fallopia baldschuanica)* and cherry laurel *(Prunus laurocerasus)*.

3.4.2 Amphibians

The desk study identified existing records of common frog (*Rana temporaria*) within 1km of the Site. There is also a record of a smooth newt south of the Proposed Grid Connection. However, the exact location of this record is not given on the NBDC database.

The Broadmeadow River (Target Note 1) to the south of the Proposed Substation Development may support breeding common frog. The drainage ditch is less suitable as it was largely dry during the survey (Target Note 6). Furthermore, the watercourses that the Proposed Grid Connection crosses may also support common frog.

There are no suitable habitats present within the Site to support breeding smooth newt (*Lissotriton vulgaris)*. No suitable breeding habitats were identified within 250m from the Proposed Substation Development boundary or in the vicinity of the Proposed Grid Connection.

3.4.3 Bats

Existing records of Leisler's bat (*Nyctalus leisleri*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton’s bat (*Myotis daubentonii*) and brown long-eared bat (*Plecotus auritus*) were identified within 1km of the Site.

There are two trees with Low bat roost suitability within the Proposed Substation Development (Target Notes 4 and 5). The tree located at Target Note 4 is a semi-mature beech with a knot hole facing east, approximately 1.5m high. The tree at Target Note 5 is also a semi-mature beech with a linear crack in the main trunk facing southwest, a knot hole facing northeast.

The linear features within and nearby the Proposed Substation Development (Broadmeadow River, Target Note 1, treelines Target Note 2, drainage ditch, Target Note 6 and hedgerows, Target Notes 3 and 7) and the Proposed Grid Connection may support foraging and commuting bats.

3.4.4 Badgers

There are no existing records of badger within 1km of the Site.

A potential badger sett was identified at Target Note 8 during the initial ecology survey. The single hole potential sett was identified.

A field camera was then positioned opposite the potential sett entrance, on 04 August and 18 August 2021 an individual badger was recorded in close proximity to the entrance of this sett. During collection of the field camera badger prints were recorded at Target Note 9, suggesting this is likely to be an occasionally-used outlier badger sett.

The sett is located outside of the Proposed Substation Development boundary.

No evidence of badger was identified at the Proposed Grid Connection.

3.4.5 Breeding and Wintering Birds

The desk study identified the following relevant records of Red-Listed Birds of Conservation Concern in Ireland (BoCCI)[17]: barn owl (*Tyto alba*), kestrel (*Falco tinnunculus*) and grey partridge (*Perdix perdix*) within 1km of the Site. Other notable and relevant records within 1km were kingfisher (*Alcedo atthis*) and curlew (*Numenius arquata*). The following BoCCI birds were recorded within 1km of the Proposed Grid Connection: red kite (*Milvus milvus)*, redwing (*Turdus iliacus)* and yellowhammer (*Emberiza citrinella)*. Red kite is also listed as an Annex I species, along with hen harrier (*Circus cyaneus)*, another species returned by the NBDC and NPWS database search.

There are no habitats present within the Site which are suitable to support breeding barn owl, however they may use the Site for foraging. Kingfisher may be present along the Broadmeadow River (Target Note 1) and other watercourses along the Proposed Grid Connection for commuting and foraging, however the banks of these watercourses are not suitable for nesting kingfisher.

The habitats within the Proposed Substation Development and off-road sections of the Proposed Grid Connection are highly likely to be used for nesting by a common assemblage of breeding birds. During winter the Proposed Substation Development and off-road sections of the Proposed Grid Connection may also support a common and widespread wintering bird species. However, both are unlikely to support a large numbers of wintering birds of conservation concern due to the use of these lands for agricultural purposes and proximity to roads that are likely to be subject to high levels of disturbance.

3.4.6 Fish

There are no existing records of protected or notable fish within 1km of the Site.

The watercourses within the Site including Broadmeadow River (Target Note 1) may support common species of fish.

3.4.7 Hedgehog

No existing records of hedgehog (*Erinaceus europaeus*) were identified within 1km of the Proposed Substation Development. Records of hedgehog were returned within 1km in multiple locations south of the Proposed Grid Connection.

No observations or evidence of hedgehog was recorded during field surveys; however, they are nocturnal and field signs are less frequently observed than for other mammals. Suitable habitat for feeding, nesting, and hibernating hedgehogs is present within the Site, including treelines and hedgerows.

3.4.8 Invertebrates

There are no relevant protected or notable terrestrial or aquatic invertebrate records within 1km of the Site. However, the NBDC and NPWS database search revealed one species of non-native invasive invertebrate

[17] Gilbert, G., Stanbury, A. and Lewis, L. (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds* **43**, pp 1-22

species. Jenkins' spire snail (*Potamopyrgus antipodarum)* was recorded in one location southwest of the Proposed Substation.

Due to the limited ecological value of the habitats present, it is unlikely that any protected/notable terrestrial invertebrate species would be found within the Site. However, a common assemblage of invertebrates is likely to be present.

3.4.9 Irish Hare

Existing records of Irish hare (*Lepus timidus hibernicus)* were identified within 1km of the Site.

Irish hare was not observed during field surveys. The habitats present within the Site are largely sub-optimal, however the improved agricultural grassland may support this species.

3.4.10 Otter

The NBDC and NPWS database search returned three records of otter (*Lutra lutra)* within 1km of the Proposed Development and Cable Route. Two of the sightings were of live animals about 1km southwest of the Proposed Substation. The third record was of droppings near the Ward River along the Proposed Grid Connection.

During the field survey no evidence of otter was recorded. However, they may use the Broadmeadow River (Target Note 1) and drainage ditch (Target Note 6) for foraging/ranging.

3.4.11 Other Mammals

The Site may support Irish stoat (*Mustela erminea hibernica*) and pygmy shrew (*Sorex minutus*) which are both protected under the Wildlife Acts. There are two records of live sightings of pine marten (*Martes martes)* south of the Proposed Grid Connection. One was in horticultural lands east of the R122. The other was northwest of the Finglas substation. Grey squirrel (*Sciurus carolinensis*) and rabbit (*Oryctolagus cuniculus)*, two mammalian invasive species, were recorded in multiple locations along the Proposed Grid Connection.

3.5 Future Baseline

3.5.1 Baseline at Time of Construction

The exact programme of works is yet to be finalised, but it is expected that:

- Application is made for Planning Permission in quarter Q4 of 2023.
- Commence site enabling and construction works in Q4 of 2024 (subject to grant of planning permission).
- Completion of construction and commissioning in Q4 of 2026.

Given the nature of the Site, which lies on improved agricultural land, it is unlikely that in the interim period between field survey and construction there will be any substantial changes to the baseline conditions described in this document.

3.5.2 Baseline in the Absence of the Proposed Development

If construction of the Proposed Development did not take place, it is likely that the Proposed Substation Development will continue to be used for agricultural purposes. The Proposed Substation Development is not earmarked or designated as a future development area. The majority of the Proposed Grid Connection footprint is located on existing hardstanding road and would also continue to be used as a road.

The Proposed Development footprint almost entirely covers the arable field and paved road which provides very limited ecological value and, should the field and paved road continue to be used for this purpose would continue to provide limited biodiversity value.

4. Impact Assessment

4.1 Features Excluded from Further Assessment

Relevant ecological features are those that are considered to be 'important' and have the potential to be affected by the Proposed Development[18]. In view of the baseline data obtained through desk study and field survey, the following features have been excluded from further assessment because there is considered to be no possible effect on them, through absence of the feature or clear absence of an impact pathway:

- European sites, including Malahide Estuary SAC and SPA, Rogerstown Estuary SAC and SPA and Baldoyle Bay SAC and SPA, amongst others – the Appropriate Assessment Screening Report[15] concluded that there would be no Likely Significant Effects on these or any other European site, either alone or in-combination with other plans or projects.
- Ancient and native woodlands – there are no ancient woodlands within 1km of the Site and no woodland within or immediately adjacent to the Site.
- Arable land, scrub and improved agricultural grassland - these habitats are of very limited ecological value.
- Notable native plant species - none identified during the field survey or desk study.
- Smooth newt – lack of suitable breeding habitat within the Site. The desk study found one recording of the species to the west of the Finglas Substation but not within the Site boundary.
- Terrestrial and aquatic invertebrates – unlikely to be protected/notable species within the Site.

4.2 Importance of Ecological Features

Ecological features identified in the baseline conditions and not scoped out of detailed assessment, i.e., those that are considered 'important' (following CIEEM guidance), are set out in Table 4-1 together with the rationale. Ecological importance has been assessed on a geographic scale following CIEEM guidance.

Table 4-1 Importance of Ecological Features

Ecological Feature	Importance	Rationale
Depositing/Lowland River (FW2)	County	Fingal County has an extensive network of rivers and streams and they are included within the Fingal Biodiversity Action Plan[19]. The Broadmeadow River is located within the south of the Site and provides a valuable linear feature within the area. This habitat is of County importance.
Drainage Ditch (FW4)	Site	The drainage ditch within the Site is largely dry with sporadic pools of stagnant water with no aquatic vegetation. However, it does provide connectivity and some ecological value and is therefore considered to be of Site importance.
Dry meadows and grassy verges (GS2)	Site	There is a small area of grassy verges by the Finglas Substation that the Proposed Grid Connection is located on. It provides some ecological value and therefore is considered to be of Site importance.
Hedgerows (WL1)	Local	This habitat is present in the Site and surrounding area and is very common and widespread. Several of the hedgerows are species-rich and provide valuable connectivity to the surrounding area and are of Local importance.
Scrub (WS1)	Site	The Proposed Grid Connection will traverse a small area of scrub near the Finglas Substation. This habitat provides some suitability for other species such as birds and is considered to be of Site importance.
Treelines (WL2)	Local	This habitat is present in the Site and surrounding area and is very common and widespread. The treelines provide some connectivity to the surrounding area and are of Local importance.
Invasive non-native flora	County	There are several invasive non-native plant species present along the Proposed Grid Connection Route. The spread of these species could negatively affect surrounding lands. Therefore, invasive non-native plant species are considered to be of County importance.
Common frog	Local	Suitable habitat for breeding common frog is present within the Site, although this is limited to the Broadmeadow River. The drainage ditch may be suitable but due to the majority of it being dry, it is sub-optimal. There is potential for terrestrial common frog to be using the Site.

[18] Chartered Institute of Ecology and Environmental Management (2018), Guidelines for Ecological Impact Assessment in the UK and Ireland
[19] FCC (2010), Fingal Biodiversity Action Plan 2010-2015

Ecological Feature	Importance	Rationale
Bats (foraging and commuting)	Local	There are two trees within the Site with Low bat roost suitability. No other roosting habitat was recorded within the Site. The linear features within the Site may support foraging and commuting bats, although this habitat is common and widespread within the local area. The Site is therefore considered to be of Local importance.
Badger	Local	A single hole sett considered likely to be an outlier and badger prints were recorded outside of the Proposed Substation Development boundary. During subsequent field visits, a badger was recorded within the Site and the likely outlier sett appears to be occasionally-used. In addition, badgers are highly likely to use the Site for foraging purposes. This sett will not require closure but the Proposed Development will result in a minor loss of potential foraging habitat. Badgers are fairly common and widespread in the area and the Site is considered to be of Local importance only.
Birds (breeding and wintering)	Local	Suitable habitat for breeding and wintering bird is present on Site and common and widespread species are likely to occur. No specially protected breeding/wintering species are likely to be present. Given that the species present can reliably be expected to be abundant species with wide distributions that are adapted to arable environments, the breeding/wintering bird assemblage is likely to be of Site importance only.
Fish	Site	Suitable habitat for fish species is present within the Site, although this is limited to the Broadmeadow River, the drainage ditch would not support fish species as it is largely dry. There is potential for fish species to be present within the river and is therefore likely to be of Site importance.
Hedgehog, Irish hare and other mammals (Irish stoat and pygmy shrew)	Site	These species may use the habitats within the Site. These species are relatively widespread and common and are deemed to be important at a Site level only.
Otter	Local	Suitable habitat for otter is present within the Site, although this is limited to the Broadmeadow River. The drainage ditch may be suitable but the majority of this habitat was dry and the time of survey and therefore sub-optimal. The presence of breeding otter in proximity to the Proposed Development is unlikely due to habitats present and no evidence of otter was recorded during the survey. There is potential for foraging/commuting otter to be using the Site and is therefore likely to be of Local importance.

4.3 Embedded Mitigation

Embedded mitigation are those measures which have been incorporated into the design of a development and which aim to avoid or reduce adverse effects, including on ecological features. Embedded mitigation which is achieved through the design of a development can be considered at the impact assessment stage whereas mitigation measures which are not an integral part of the design (‘specific mitigation’) are considered following an initial assessment of the ecological impacts, giving rise to an assessment of residual effects which would occur following the implementation of mitigation.

4.4 Predicted Impacts and Effects

Predicted impacts and effects of construction and operation of the Proposed Development are provided in Table 6 below, alongside proposed mitigation. An assessment of the residual effects of the Proposed Development following implementation of mitigation is then provided.

Table 4-2 Predicted Impacts and Effects

Ecological Feature	Summary of Baseline	Importance (see Table 5 for rationale)	Construction Impacts and Effects	Operational Impacts and Effects	Specific Mitigation	Residual Effects
Depositing/Lowland River	The Proposed Grid Connection crosses several rivers including the Broadmeadow River and the Ward River.	County	Loss of or physical damage to river The river or adjacent bankside vegetation will not be lost as a result of the Proposed Development. The watercourses will be protected to ensure that there is no damage during construction activities. There are no requirements for in-channel works. Pollution of river Pollution from fuel spillage, materials wash off or dust, run off resulting in loss of habitat quality.	None	Implementation of pollution control measures as part of the Construction Environmental Management Plan (CEMP). Fencing to ensure habitat is not damaged during construction activities, minimum of 10m stand-off implemented from the watercourse. At the watercourse crossings for the Proposed Grid Connection there will be trenchless installation in the form of horizontal directional drilling.	Negligible
Drainage Ditch	A small section of ditch is located within the Proposed Substation Development boundary. There are also two small sections of ditch that the Proposed Grid Connection crosses near the Finglas Substation.	Site	Loss of or physical damage to ditch A small section of the drainage ditch will be permanently lost to facilitate the access road to the Proposed Development. The remainder of the ditch will be retained and protected during construction activities. The length of ditch likely to be lost will be approximately 5 metres. Given that this habitat is of limited ecological value, the loss of the small section is not thought to be an adverse impact. Pollution Pollution from fuel spillage, materials wash off or dust, run off resulting in loss of habitat quality.	None	Implementation of pollution control measures as part of the CEMP. Fencing to ensure habitat is not damaged during construction activities, minimum of 10m stand-off implemented from the ditch where this habitat will be retained and protected. At the watercourse crossings for the Proposed Grid Connection there will be trenchless installation in the form of horizontal directional drilling.	Negligible
Dry meadows and grassy verges	There is a small area of grassy verges at the Proposed Grid Connection near the Finglas Substation.	Site	Loss of or physical damage to grassy verges The Proposed Grid Connection crosses grassy verges for approximately 500m near the R122 and Finglas Substation. The works for the Proposed Grid Connection will be minimal and there will only be a temporary loss of grassy verges for the installation of the underground cable route.	None	None	Negligible
Hedgerows	A small section of hedgerow is located within the Proposed Substation Development boundary.	Local	Loss of or physical damage to hedgerow A small area of hedgerow (190 m^2) on the western boundary of the Proposed Substation Development will be permanently lost to facilitate the access road for the Proposed Development. A gate is located at this area and this existing gap should be utilised to reduce the amount of hedgerow to be removed. A small section of hedgerow adjacent to the Ward River will be crossed by the Proposed Grid Connection. No other hedgerows within the Site will be damaged or removed.	None	Like for like replacement of hedgerow lost within the Site. A Contractor CEMP and/or relevant method statements must be produced by the appointed Contractor describing how loss or damage to the retained hedgerows will be avoided. Such mitigation must be implemented in full. Root protection zones should be implemented.	Negligible

Ecological Feature	Summary of Baseline	Importance (see Table 5 for rationale)	Construction Impacts and Effects	Operational Impacts and Effects	Specific Mitigation	Residual Effects
Scrub	A small area of scrub is located within the Proposed Grid Connection boundary.	Site	Loss of or physical damage to scrub A small section of scrub will be lost to the Proposed Grid Connection. However, the works for the Proposed Grid Connection will be minimal and cover a small linear section of approximately 20m along the underground cable route.	None	Like for like replacement planting of scrub and hedges lost within the Site.	Negligible
Treelines	A small section of treeline is located within the Proposed Substation Development boundary. A small section of treeline is located within the Proposed Grid Connection boundary near the Finglas Substation.	Local	Loss of or physical damage to treeline A small section of treeline habitat (approximately 4 to 5m wide) will be lost to facilitate an access road. A small section of treeline habitat will be lost to facilitate the Proposed Grid Connection, which will also be only a few metres wide. The remaining treelines will be retained and will be protected during construction.	None	Like for like replacement of treeline habitat lost within the Site. A Contractor CEMP and/or relevant method statements must be produced by the appointed Contractor describing how loss or damage to the retained treeline will be avoided. Such mitigation must be implemented in full. Root protection zones should be implemented.	Negligible
Invasive non-native flora species	Several non-scheduled invasive non-native flora species are located adjacent to the Proposed Grid Connection	County	Spread of invasive non-native species There is the potential for invasive non-native flora species to spread to the wider area during the construction works for the Proposed Grid Connection if these species are not avoided during the works or managed prior to the works commencing.	None	Invasive non-native species (INNS) should be avoided during the works where possible. If not possible in any areas, a Biosecurity Management Plan (BMP) will be prepared. The BMP will set out measures to prevent spread of INNS, and include actions for avoiding disturbance of INNS, cleaning of equipment and Personal Protective Equipment (PPE) used in the vicinity of INNS, and careful management of any arisings (including potentially contaminated substrate). Note that it is best practice, more sustainable and more cost effective, where feasible, for INNS arisings to be left in the existing INNS area, rather than removing INNS material off-Site, and removal to landfill is the least sustainable and often the most expensive option.	Negligible
Common frog	The habitats present within the Site may support common frog due to suitable terrestrial habitat	Local	Habitat loss The watercourses including the Broadmeadow River will be retained and protected throughout development. There will be minor permanent loss of ditch which may support this species, although it is sub-optimal for breeding. Injury/death/disturbance Where excavations are required as part of any works there is potential for this species to become trapped and injured or killed.	None	Standard measures to ensure that this species is not killed or injured in Contractor CEMP and method statements to include: • Excavations to be covered overnight to prevent animals from falling in, and a means of escape to be provided. • Standard pollution prevention measures to be implemented. Minimum of 10m stand-off implemented from the watercourse.	Negligible

Ecological Feature	Summary of Baseline	Importance (see Table 5 for rationale)	Construction Impacts and Effects	Operational Impacts and Effects	Specific Mitigation	Residual Effects
Bats	Presence of two trees within the Site with Low suitability to support roosting bats in the Proposed Substation Development Suitable habitat (hedgerow and treeline) for foraging and commuting bats was identified within the Proposed Substation Development and immediately adjacent to the Proposed Substation Development.	Local	Loss/disturbance to foraging and commuting habitat The majority of linear features (hedgerows and treelines) will be retained and protected. Compensatory planting of hedges and treelines will be implemented as discussed in above habitat sections. Inappropriately placed construction lighting has the potential to prevent the use of certain areas by foraging or commuting bats. Disturbance/loss of bat roosts Construction activities could result in disturbance or loss of bat roosts due to noise, vibrations and night-time lighting during construction and due to presence of personnel.	Disturbance to roosting, foraging and commuting habitat. Operational light spill, if required, could permanently affect linear features which may be used by roosting, foraging and commuting bats.	Construction works should be restricted to the hours of daylight, as far as possible. Should artificial lighting be required for construction, this must be directional and illuminate the intended working area only, with light spill onto adjacent habitats managed with the use of cowls etc. The treeline and hedgerow should be protected from light spill. Any additional lighting required for the Proposed Development should be designed to prevent light spill onto the adjacent habitats. This light spill should be no higher than 1 lux. The mitigation described must be detailed in the appointed Contractor's method statement. Trees with bat roost suitability to be retained and protected from damage.	Negligible
Badger	No badger setts within the Proposed Development boundary. Presence of a likely outlier sett outside the footprint of Proposed Development. Suitable foraging habitat within the Proposed Substation Development.	Local	Loss of foraging habitat The Proposed Development will result in the permanent loss of approximately 10,000m^2 of improved agricultural grassland which may be used by foraging badger. The Proposed Development will also result permanent loss of hedgerow and treeline. As there is alternative suitable habitat immediately outside the Site and in the wider area, the loss of this relatively small area of potential foraging habitat is not considered to be a significant impact to badger. Injury/death/disturbance Where excavations are required as part of any works there is potential for badgers to become trapped and injured or killed. Loss/disturbance to badger sett The sett is located beyond the distance at which disturbance from construction activities is likely to occur. There is therefore no requirement to licence the closure /destruction or disturbance of the sett.	Disturbance to foraging and commuting habitat. Operational light spill, if required, could permanently affect linear features which may be used by badger.	Pre-construction checks for the presence of badgers are required, this must be undertaken no more than six months prior to construction. Should the presence of a badger sett be identified within the Proposed Development then appropriate mitigation will be implemented as described below and detailed within the Contractor CEMP/ method statement. To prevent injury/death to badger during construction, excavations will be covered overnight to prevent animals from falling in and provided with a means of escape (means of escape includes battering of slopes sufficient to allow badger or other mammals to escape). The badger sett will be clearly marked/fenced with a 30m stand-off to ensure that badgers are not disturbed/harmed during construction activities. Construction works must be restricted to the hours of daylight. Should artificial lighting be required for construction, this must be directional and illuminate the intended working area only, with light spill onto adjacent habitats managed with the use of cowls etc. The treelines and hedgerows should be protected from light spill.	Negligible
Breeding and wintering birds	The Proposed Substation Development provides	Local	Habitat loss (arable field only)	None	Vegetation removal required to facilitate works for the Proposed Development should be	Negligible

Ecological Feature	Summary of Baseline	Importance (see Table 5 for rationale)	Construction Impacts and Effects	Operational Impacts and Effects	Specific Mitigation	Residual Effects
	suitable habitat for common and widespread breeding and wintering birds.		860m^2 of improved agricultural grassland will be lost to the Proposed Development in addition to small sections of hedgerow and treeline. This will result in a loss of wintering and breeding bird habitat. The bird species present on Site can reliably be expected to be common and widespread, both locally and nationally, and a large area of suitable wintering habitat will remain both on Proposed Substation Development and in the wider area. As such the overall populations/conservation status of species likely to be present will not be affected. However, if vegetation works took place within the bird nesting season, obstruction and/or destruction of active birds' nests may occur.		carried out outside the bird nesting season (taken to be from March to August, inclusive). Where there is no alternative but to clear vegetation in the bird breeding season, a suitably experienced ecologist must check for active bird nests prior to the clearance taking place. Where active nest(s) are found, the ecologist will establish exclusion zone(s) of appropriate size from which machinery, personnel and materials will be excluded until the nesting attempt(s) have finished. Note that it is difficult to locate all bird nests in extensive habitat, therefore checking for nests will be treated as a last resort, and vegetation clearance in the period September to February is preferred.	
Fish	Fish may be present within the watercourses that the Proposed Grid Connection will cross.	Local	<u>Habitat loss</u> The Proposed Development will not result in the loss of any habitat that may support fish species. <u>Pollution</u> Pollution from fuel spillage, materials wash off or dust, run off resulting in loss of habitat quality.	None	Implementation of pollution control measures as part of the Contractor CEMP. Minimum of 10m stand-off implemented from the watercourse. At the watercourse crossings for the Proposed Grid Connection there will be trenchless installation in the form of horizontal directional drilling.	Negligible
Hedgehog, Irish hare and other mammals (Irish stoat and pygmy shrew)	The habitats present within the Site may support these species.	Site	<u>Habitat loss</u> Permanent loss of 860 m^2 of improved agricultural grassland to the Proposed Development at the Proposed Substation Development. This habitat is considered to be sub-optimal for these species, and the loss of this area will not result in a significant impact. <u>Injury/death/disturbance</u> Where excavations are required as part of any works there is potential for these species to become trapped and injured or killed. Inappropriately placed construction lighting has the potential to prevent the use of certain areas by foraging or commuting mammals.	<u>Disturbance to foraging and commuting habitat.</u> Operational light spill, if required, could permanently affect linear features which may be used by foraging and commuting mammals.	Preparation of Method Statement to ensure these species are not killed/injured and habitats that may support these species are retained and protected during construction activities. To prevent injury/death to mammal species during construction, excavations will be covered overnight to prevent animals from falling in and provided with a means of escape (means of escape includes battering of slopes sufficient to allow mammals to escape). Construction works must be restricted to the hours of daylight. Should artificial lighting be required for construction, this must be directional and illuminate the intended public area only, with light spill onto adjacent habitats managed with the use of cowls etc. The treeline and hedgerow should be protected from light spill.	Negligible

Ecological Feature	Summary of Baseline	Importance (see Table 5 for rationale)	Construction Impacts and Effects	Operational Impacts and Effects	Specific Mitigation	Residual Effects
					Any additional lighting required for the Proposed Development should be designed to prevent light spill onto the adjacent habitats. This light spill should be no higher than 1 lux. The mitigation described must be detailed in the appointed Contractor's method statement.	
Otter	Otter may use the Broadmeadow River and drainage ditch for commuting or foraging.	Local	<u>Potential pollution of watercourse/ditch</u> Pollution from fuel spillage, materials wash off or dust, run off resulting in loss of habitat quality. <u>Injury/death/disturbance</u> Where excavations are required as part of any works there is potential for these species to become trapped and injured or killed.	<u>Disturbance to foraging and commuting habitat.</u> Operational light spill, if required, could permanently affect linear features which may be used by foraging and commuting mammals.	Preparation of method statements to ensure these species are not killed/injured and habitats that may support these species are retained and protected during construction activities. To prevent injury/death to mammal species during construction, excavations will be covered overnight to prevent animals from falling in and provided with a means of escape (means of escape includes battering of slopes sufficient to allow mammals to escape). Construction works must be restricted to the hours of daylight. Should artificial lighting be required for construction, this must be directional and illuminate the intended public area only, with light spill onto adjacent habitats managed with the use of cowls etc. The treeline and hedgerow should be protected from light spill. Any additional lighting required for the Proposed Development should be designed to prevent light spill onto the adjacent habitats. This light spill should be no higher than 1 lux. The mitigation described must be detailed in the appointed Contractor's method statement.	Negligible

4.5 Cumulative Assessment

A search was carried out of planning applications within 5km of the Proposed Development using the FCC planning website[20] and the National Planning Application Map Viewer[21]. Only planning applications within the last five years were considered.

The Proposed Development is required to provide the necessary infrastructure to support the permanent power supply for the development of the Fieldstown, Ballaghaweary/Greenogue and the Gerradstown solar farms. Although this solar farm and the Proposed Development which is the subject of this EcIA Report are intrinsically-linked, owing to the proximity of the Fieldstown Solar Farm (500m north), they are subject to two separate planning applications. The solar farm will occupy a total of fourteen fields surrounding the Site. These are generally well-enclosed and are used for mixed agriculture. The fields are bounded by treelines, hedgerows and/or post-and-wire fences, with internal drainage ditches along several field boundaries[22].

Therefore, there is the potential for the Proposed Development to result in a very slight increase in the total loss of agricultural land when considering the cumulative impacts of this project and the planned solar farm. However, such habitat is of very limited ecological value at this location, and the ecological effects of the combined loss of arable and pasture fields from the two projects will not be significant. As set out above, the Proposed Development will result in the loss small sections of treeline and hedgerows, and there is therefore the potential for a minor cumulative increase in the loss of these more ecologically valuable habitat features. However, as set out in Table 4-2, as mitigation for these losses, compensatory tree and hedgerow planting will be carried out. Following this mitigation, therefore, there will be no cumulative loss of these habitat features from the Proposed Development.

Furthermore, given the nature of the Proposed Grid Connection development, which will involve temporary works to install an underground cable route mainly along an existing road, it is not anticipated that the Proposed Grid Connection will result in any significant effects acting cumulative with other plans or projects.

It is therefore concluded that there will be no significant effects arising from the Proposed Development acting cumulatively with other plans or projects, including the proposed solar farm surrounding the Site.

4.6 Enhancement and Monitoring Proposals

4.6.1 Enhancement Measures

Enhancement of the drainage ditch, treelines and hedgerows with native species (that are appropriate to the locality and landscape character) of local provenance could be actioned. Non-native species should not be included.

Given the limited availability of bat roosting opportunities present, the provision of bat boxes within the Site could be considered. These would have to be of appropriate specification for the species likely to be present and suitably located, specifically not within areas which may be lit as a result of the Proposed Development.

Bird nest boxes could also be installed as inexpensive, simple but valuable enhancement.

4.6.2 Monitoring

No specific ecological monitoring is recommended.

Pre-construction surveys may be required, especially if survey data becomes more than 18 months old.

5. Summary and Conclusions

In summary, the Proposed Development is anticipated to result in Negligible (not significant) effects on ecological features following the implementation of mitigation. Beneficial effects are possible via the improvement of habitats, planting of native species, and installation of bat and bird boxes.

Summary of required mitigation:

- Careful design of the Proposed Development to avoid unnecessary loss or damage to the hedgerow, drainage ditch and treeline.

[20] https://fingalcoco.maps.arcgis.com/apps/webappviewer/index.html?id=3fa7d9df584c4d93aab202638db9dd1a
[21] https://myplan.ie/national-planning-application-map-viewer/
[22] Neo Environmental Ltd (2020). Fieldstown Solar Farm. Volume 1 Appropriate Assessment Screening. September 2020.

- A Contractor CEMP and/or relevant method statements must be produced.
- A Contractor CEMP will be prepared and must be approved by Fingal County Council, prior to commencement of the Proposed Development. The Contractor CEMP will set out general environmental management measures, including in relation to pollution prevention, and the roles and responsibilities of Site personnel. It will include, as a minimum, construction method statements, pollution prevention plan (PPP) and species protection plans/method statements (SPP).
- All Site personnel involved in the construction and operation of the Proposed Development will be made aware of the ecological features present and the mitigation measures and working procedures which must be adopted. This will be achieved as part of the Site induction process through the delivery of a toolbox talk. In addition, as required, briefings will be provided to all Site personnel in advance of works which are considered to present an increased risk of impacting upon ecological features.
- There will be trenchless installation in the form of horizontal directional drilling at the watercourse crossings for the Proposed Grid Connection.
- Root protection zones will be clearly demarcated around retained trees and hedgerow. No machinery will enter these areas, nor will any material be stored within them.
- Construction works should be restricted to daylight hours. Should construction take place and artificial lighting be required, lighting must be directional and illuminate the works area only, with light spill onto adjacent habitats managed with the use of cowls etc.
- Excavations to be provided with a means of escape overnight (means of escape includes battering of slopes sufficient to allow otter/badger or other mammals to escape).
- Preparation and implementation of a method statement for bats, badger, common frog, hedgehog, and other notable mammals to ensure that these species are not harmed during construction activities.
- Invasive non-native species will be avoided where possible to ensure they are not spread. If it is not possible to avoid areas with invasive non-native species a biosecurity management plan will be prepared to prevent spread of these species.
- Vegetation clearance to be undertaken in the period September to February, inclusive, to avoid the breeding bird season (taken to be March to August, inclusive) where possible. Where vegetation clearance must take place in the bird breeding season a suitably experienced ecologist will check for active bird nests prior to the clearance taking place.
- Pre-construction surveys for badger.

Appendix A Drawings and Figures

60657534_ACM_DWG_FT_101 Fieldstown 110kV Substation & Proposed Grid Connection Site Layout (Aerial)

Figure 1 – Relevant Designated Sites and Watercourses

Figure 2 – Survey Area and Habitats

Figure 3 – Invasive Non-Native Species

Figure 4 – Target Notes (to be read in conjunction with Appendix C) (Confidential)

AECOM

PROJECT

FIELDSTOWN 110 kV SUBSTATION & GRID CONNECTION

CLIENT

ENERGIA SOLAR HOLDINGS LTD.

energia

CONSULTANT

AECOM
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
County Dublin
Ireland
T +353 (0)1 2383100
www.aecom.com

LEGEND

PROPOSED DEVELOPMENT BOUNDARY

X SITE NOTICE LOCATION

NOTES

1. DRAWINGS ARE FOR PLANNING ONLY

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P1	01.12.2023	RLB UPDATE
P0	02.11.2023	ISSUE

STATUS

FOR PLANNING

PROJECT NUMBER	SCALE
60657534	1:15000 @ A1

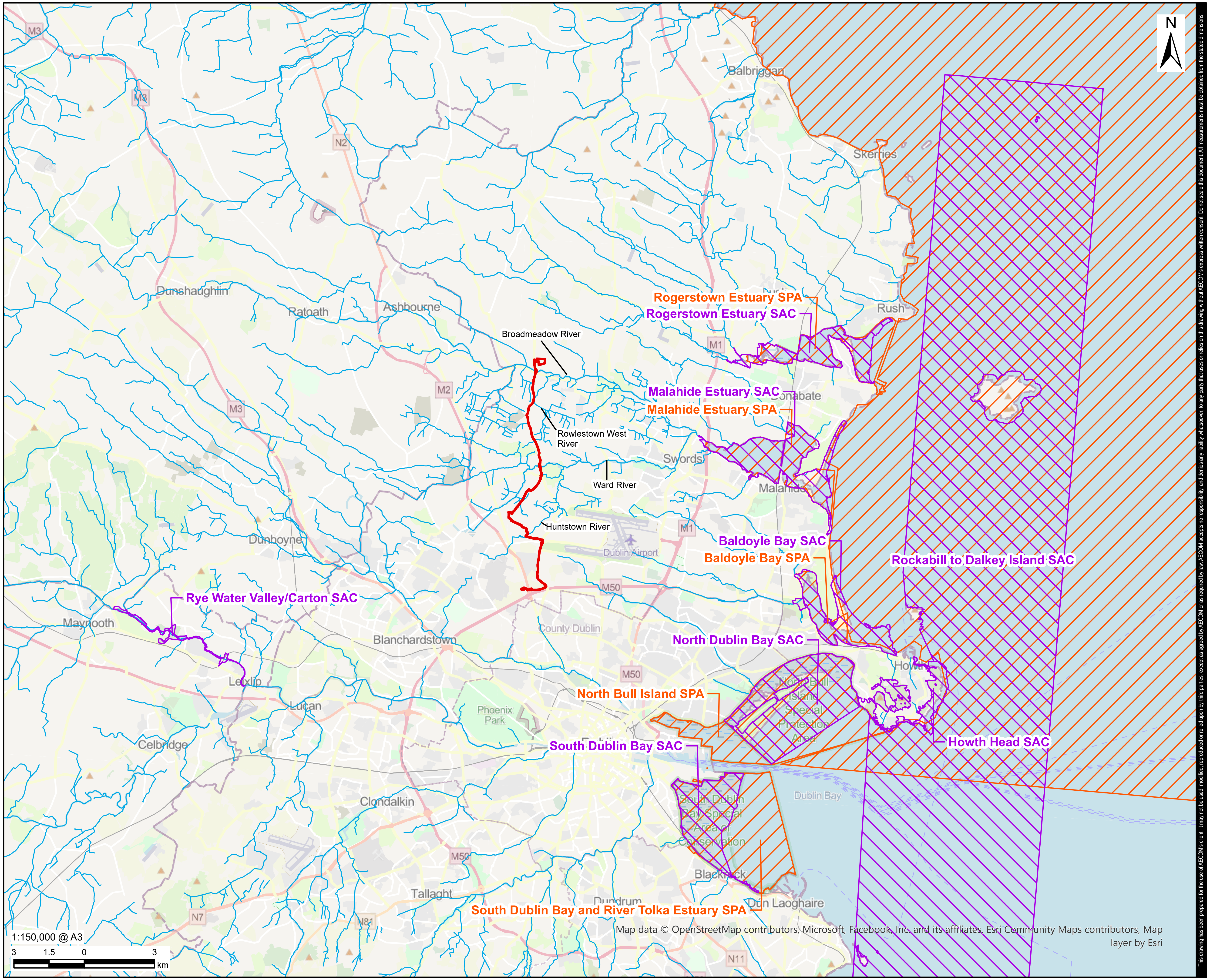
SHEET TITLE

FIELDSTOWN 110kV SUBSTATION & GRID CONNECTION SITE LAYOUT

SHEET NUMBER	REV
60657534-ACM-DWG-FT-100	P1

Last saved by: BERNICE.CAHILL(2023-11-02) Last Plotted: 2023-12-01
Filename: \\NA.AECOMNET.COM\LFS\EMEA\DUBLIN-IEDBL2\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP60657534_SUMMERHILLFIELDSTOWNSID\900_CAD_GIS\910_CAD\FIELDSTOWN\PLANNING FOLDER\60657534-ACM-DWG-101.DWG
PM Initials : Designer dk Checked LOB Approved BC

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28



AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

- Proposed Development boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Watercourses

NOTES

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY -SA Copyright Copyright Government of Ireland. Licensed for re-use under the Creative Commons Attribution 4.0 International License.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

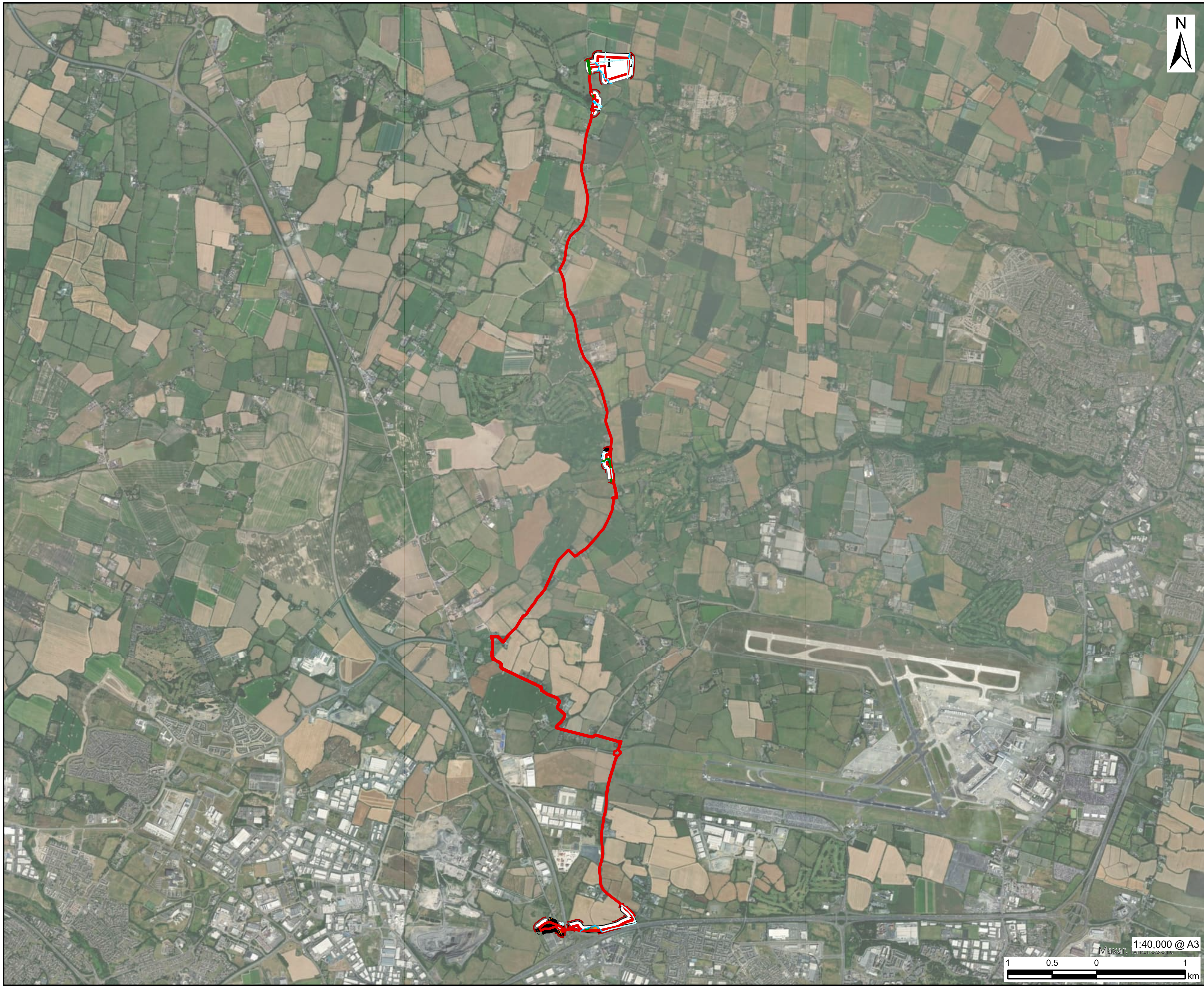
FIGURE TITLE

European sites

FIGURE NUMBER

Figure 1

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28



AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

- Proposed Development boundary
- Survey Area

Habitat

- FW2 Depositing/lowland rivers
- FW4 Drainage ditches
- WL1 Hedgerows
- WL2 Treelines
- BC1 Arable crops
- BL3 Buildings and artificial surfaces
- ED2 Spoil and bare ground
- GA1 Improved agricultural grassland
- GA2 Amenity grassland
- GS2 Dry meadows and grassy verges
- WS1 Scrub

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

FIGURE TITLE

Survey area and habitats

FIGURE NUMBER

Figure 2

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28

AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

- Proposed Development boundary
- Survey Area

Habitat

- FW2 Depositing/lowland rivers
- FW4 Drainage ditches
- WL1 Hedgerows
- WL2 Treelines
- BC1 Arable crops
- BL3 Buildings and artificial surfaces
- ED2 Spoil and bare ground
- GA1 Improved agricultural grassland
- GA2 Amenity grassland
- GS2 Dry meadows and grassy verges
- WS1 Scrub

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

FIGURE TITLE

Survey area and habitats

FIGURE NUMBER

Figure 2a

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28

AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

Proposed Development boundary
Survey Area
Habitat
FW2 Depositing/lowland rivers
FW4 Drainage ditches
WL1 Hedgerows
WL2 Treelines
BC1 Arable crops
BL3 Buildings and artificial surfaces
ED2 Spoil and bare ground
GA1 Improved agricultural grassland
GA2 Amenity grassland
GS2 Dry meadows and grassy verges
WS1 Scrub

NOTES

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY -SA Copyright Copyright Government of Ireland. Licensed for re-use under the Creative Commons Attribution 4.0 International License.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

FIGURE TITLE

Survey area and habitats

FIGURE NUMBER

Figure 2b

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28

AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

- Proposed Development boundary
- Survey Area

Habitat

- FW2 Depositing/lowland rivers
- FW4 Drainage ditches
- WL1 Hedgerows
- WL2 Treelines
- A A BC1 Arable crops
- BL3 Buildings and artificial surfaces
- SSS ED2 Spoil and bare ground
- I I I GA1 Improved agricultural grassland
- gA gA GA2 Amenity grassland
- Dm Dm GS2 Dry meadows and grassy verges
- WS1 Scrub

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

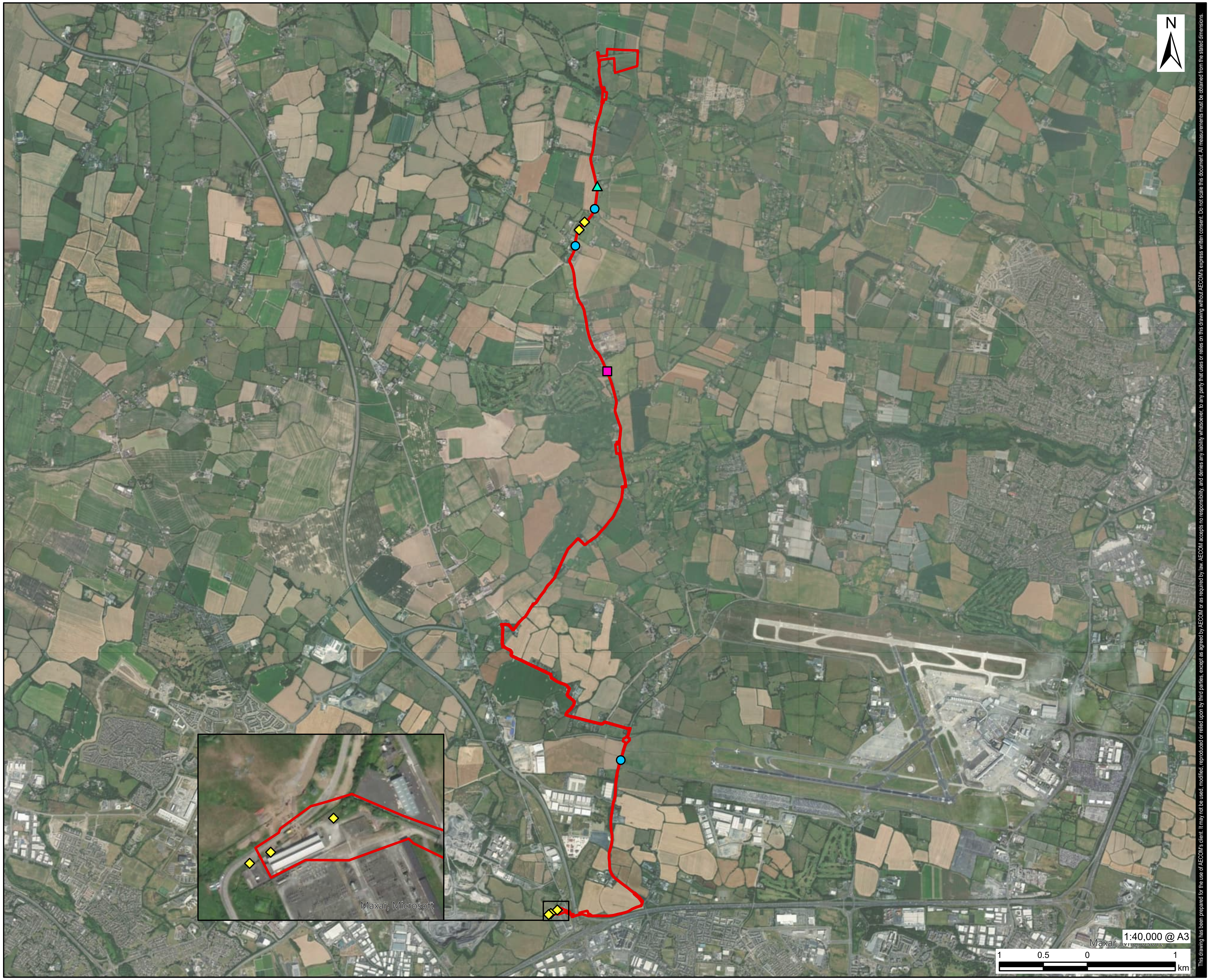
FIGURE TITLE

Survey area and habitats

FIGURE NUMBER

Figure 2c

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28



AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

Proposed Development boundary

Invasive non-native species

- Butterfly bush
- Snowberry
- Winter heliotrope
- Snowberry and Winter heliotrope

NOTES

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY -SA Copyright.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

FIGURE TITLE

Invasive non-native species

FIGURE NUMBER

Figure 3

Revision: 0 Drawn: TS Checked: JB Approved: LK Date: 2023-11-28

AECOM

PROJECT

Fieldstown Substation and Grid Connection

CLIENT

energia group

CONSULTANT

AECOM Limited
Adelphi Plaza
George 's Street Upper
Dun Laoghaire
Co. Dublin
www.aecom.com

LEGEND

Proposed Development boundary

Target Note

NOTES

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY -SA Copyright.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60657534

FIGURE TITLE

Target notes (to be read in conjunction with Appendix C) (Confidential)

FIGURE NUMBER

Figure 4

Appendix B Photographs

Table B1. Photographs

Photograph Number	Photograph
1	
2	

Appendix C Target Notes

Table C1. Target Notes

Target Note	Description	Photograph
1	Broadmeadow River located in the south of the Site.	
2	Treelines present adjacent to the river and drainage ditch, along the eastern and northern boundaries of the Site.	

Target Note	Description	Photograph
3	Species-poor section of hedgerow in the east of the Site.	
4	Semi-mature beech with Low bat roost suitability in northeast corner of the Site.	

Target Note	Description	Photograph
5	Semi-mature beech with Low bat roost suitability in northeast corner of the Site.	
6	Drainage ditch within the Site.	

Target Note	Description	Photograph
7	Species-rich hedgerows located adjacent to the R122.	
8	Badger sett	

Target Note	Description	Photograph
9	Badger prints located next to gate on field margin.	

Appendix D Flood Risk Assessment

Fieldstown 110kV Substation & Grid Connection

Flood Risk Assessment

Energia Solar Holdings

Project number: 60657534
Document reference: 60657534_AC_RP_EN_004_3

22 November 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Miguel Headley Civil Engineer	Richard Reid Principal Engineer	Karol McCusker Associate Director	Bernice Cahill Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	29 June 2021	Draft	Y	Richard Reid	Principal Engineer
1	21 July 2021	Second Draft	Y	Jason Doherty	Principal Engineer
2	24 October 2023	Final Draft	Y	Bernice Cahill	Associate Director
3	22 November 2023	Final	Y	Bernice Cahill	Associate Director

Prepared for:

Energia Solar Holdings

Prepared by:

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin A96 T927
Ireland

T: +353 1 696 6220
aecom.com

Table of Contents

Figures

Tables

1. Introduction

This Flood Risk Assessment (FRA) report has been prepared by AECOM Ireland Limited (AECOM) on behalf of Energia Solar Holdings (herein referred to as the 'Applicant'). Energia Solar Holdings Ltd are a subsidiary of the Energia Group, who are a major all-Ireland energy provider and infrastructure investor across renewable technologies.

The applicant is seeking planning permission for a 110 kilo Volt (kV) Air Insulated Switchgear (AIS) substation, named Fieldstown 110kV Substation and associated 13.3 kilometres (km) underground cable grid connection to Finglas Substation (hereafter referred to collectively as the 'Proposed Development'). The Proposed Development is located within the administrative area of Fingal County Council (FCC).

1.1 Background

In accordance with the 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' there is a requirement to undertake a Flood Risk Assessment Report, which will accompany the planning application.

1.2 Scope of Services

AECOM is required to undertake a Site-Specific Flood Risk Assessment (FRA) for the proposed works.

This FRA study has been undertaken in consideration of the following guidance document:

- 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009.

The assessment will demonstrate that the Proposed Development will:

- Not increase flood risk elsewhere and, if practicable, will reduce overall flood risk.
- Include measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.
- Include measures to ensure that residual risks to the area and/or development can be managed to an acceptable level.

2. Site Information

2.1 Proposed Development

The Applicant is proposing a 110kV AIS substation (the Proposed Substation Development) and 13.3km underground cable (to Finglas Substation (Proposed Grid Connection). The Proposed Development includes:

Proposed Substation Development:

- A 110kV AIS tail-fed substation compound comprising:
  - A single storey 110kV AIS substation building [total floor area comprising circa 450m², height approximately 6.3m).
  - MV switchgear container and switchboard total floor area comprising circa 60m².
  - 110kV grid transformer and two-house transformers within bunded enclosures (height approximately 6m).
  - Diversion of existing 38kV overhead line (OHL).
  - 160MV transformer positioned within bunded enclosures (height approximately 6m).
  - A shunt filter.
  - Diesel generator & diesel tank.
  - Twelve lightning protection masts (height approximately 20m).
  - Two service/maintenance carparking facilities.
- Internal access roads and car parking.
- New site entrance from the R122 regional road.

- Drainage infrastructure.
- 420m of 2.6m high perimeter palisade fencing and post and rail (1.4m high) fencing.
- 200m of internal separation fencing (2.6m high).
- All associated and ancillary site development works including localised alterations to the landscape.

Proposed Grid Connection:

- A 13.3km underground 110kV cable connection to Finglas Substation to facilitate connection to national grid.
- Approximately 20 joint bays primarily within public roadways.
- Trenchless installation in the form of horizontal directional drilling (HDD) will be used at the following locations:
  - Broadmeadow River Bridge before the junction of the R122 and the R125 regional
  - roads. Ward River Bridge on the R122 regional road.
  - Under the N2 prior to entering Finglas Substation.

2.2 Site Location

2.2.1 Proposed Substation Development

The Proposed Substation Development is located within an area of agricultural grassland on lands at Fieldstown East, County Dublin (Irish Transverse Mercator (ITM) coordinates: 711952, 750625). The Proposed Substation Development is bounded by the R122 regional road immediately west and agricultural lands to the east, north and south as shown in Figure 2-1.

The largest nearby towns are Ashbourne, approximately 4.5km east, and Swords, approximately 9.5km to the southeast. Oldtown is located approximately 2.5km directly north, Ballyboghill is approximately 4.5km east, and Rolestown is situated within 1km southeast of the site. There are dispersed one-off housing units located in proximity to the Proposed Substation Development, with the nearest property is located approximately 300m west.

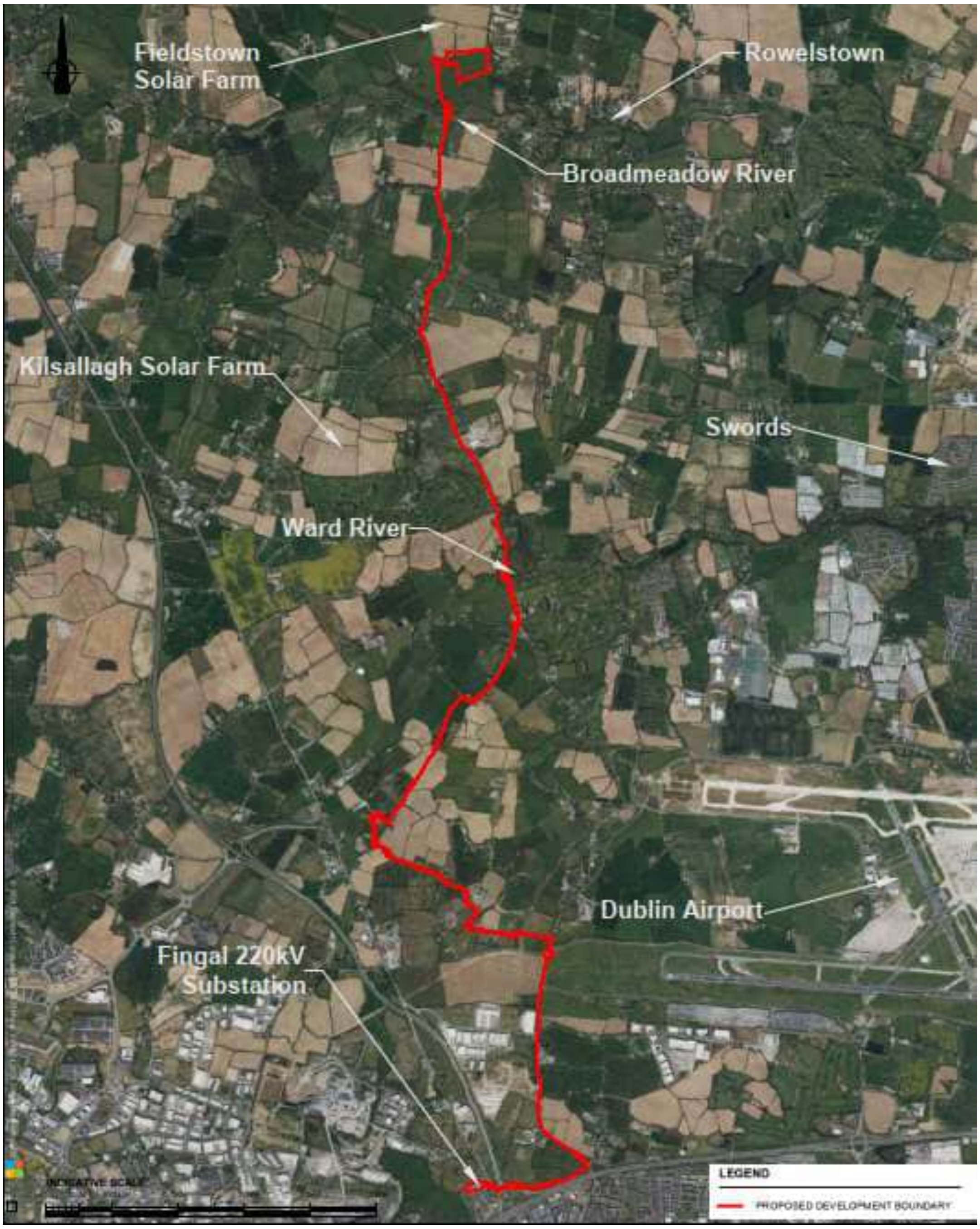
Figure 2-1 Location of Proposed Substation Development and Associated Infrastructure

The proposed onsite electrical substation will be served by an access road from the R122 regional road which will allow access for maintenance of the substation by ESB/EirGrid.

2.2.2 Proposed Grid Connection

In order to connect the substation to the transmission network, it is proposed to connect the 110kV substation to the Finglas substation by means of a 110kV underground cable. The Proposed Grid Connection is approximately 13.3km in length. This cable run will exit the Proposed Substation Development compound travelling west before heading south and entering the R122 regional road. The proposed cable connection will follow the path of the R122 regional road to the L7325 and L7231 local roads before returning to the R122, before heading west adjacent to the M50 (motorway), under the N2 to the boundary of Finglas Substation as shown in Figure 2-2.

Figure 2-2 Proposed Grid Connection



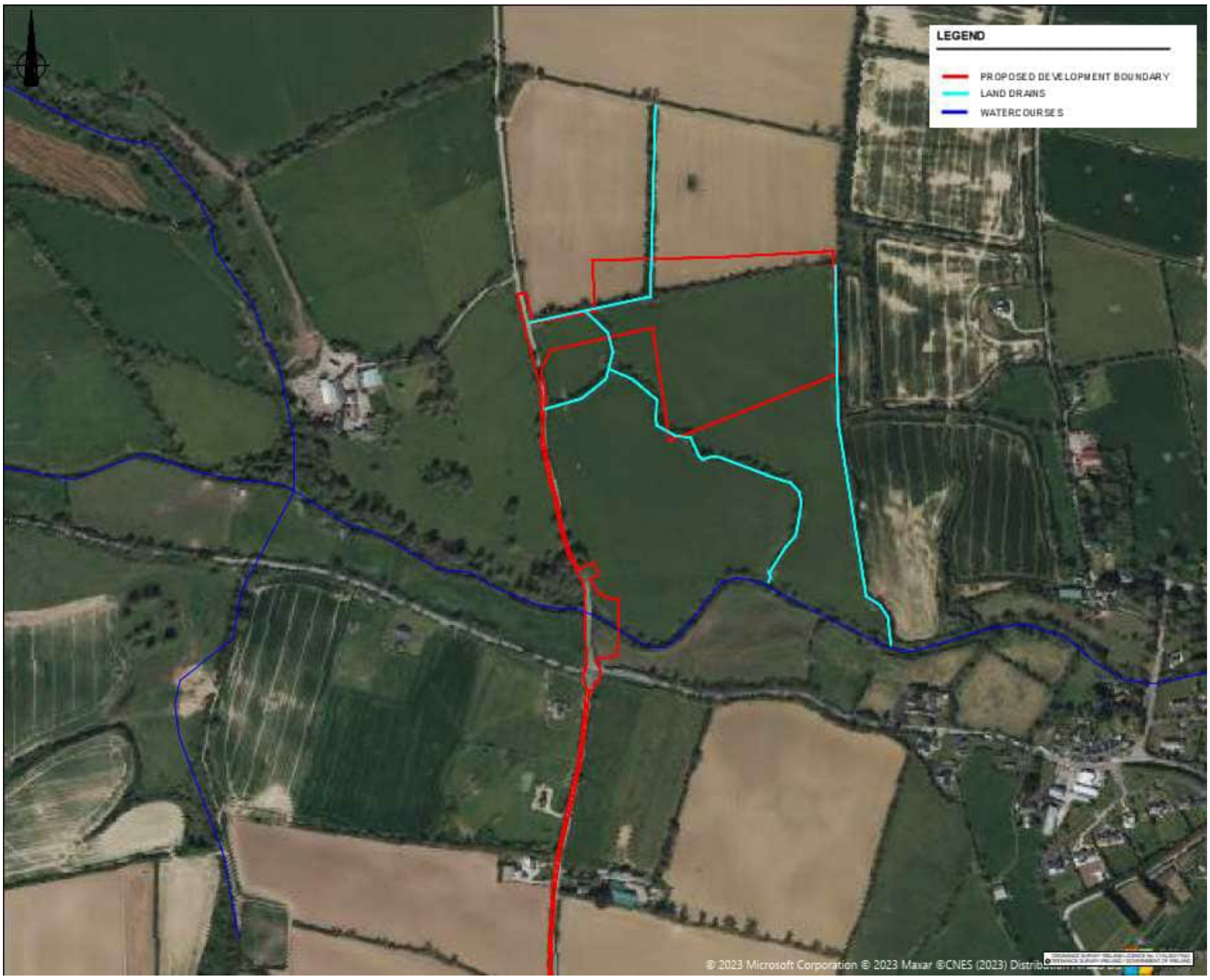
The majority of the Proposed Grid Connection is located within the public road with dispersed residential and commercial properties adjacent to the route. The planned tie in for the Proposed Grid Connection to Finglas substation is located to the north of junction 5 of the M50, to the west of junction 1 of the N2.

2.3 Local Hydrology and Existing Drainage

2.3.1 Proposed Substation Development

The closest major watercourse is the Broadmeadow River that flows immediately south of the Proposed Substation Development. The Broadmeadow River continues to flow easterly towards the Greater Dublin area discharging into the Malahide Estuary. Figure 2-3 below illustrates the location of the Broadmeadow watercourse and its corresponding tributaries in relation to the Proposed Substation Development.

Figure 2-3 Proposed Substation Development Hydrology



There are also several drains located within the Proposed Substation Development boundary. Figure 2-3 shows an ordinary watercourse originating from north and west of the site and flowing from west to south through the site where it discharges to Broadmeadow River. Further, a land drain is located along the eastern boundary of the site and flows from north to south towards Broadmeadow River.

2.3.2 Proposed Grid Connection

The Broadmeadow River and Ward River intersect the Proposed Grid Connection and flows eastwards towards the Malahide Estuary. Figure 2-4 below illustrates the location of the Broadmeadow and Ward River(s) with corresponding tributaries in relation to the Proposed Grid Connection.

Figure 2-4 Proposed Grid Connection Hydrology

2.4 Local Topography

2.4.1 Proposed Substation Development

A topographic survey of the Proposed Substation Development was undertaken by Apex Surveys in May 2021, and Civils 3D surface of Proposed Substation Development was created to inform a description of levels at the Proposed Substation Development. The topographic survey shows the southern part of the site comprised of elevations up to 43.71m Above Ordnance Datum (AOD), and the substation would be constructed on land comprising of elevations between 39.4m AOD and 42.2m AOD.

The topographic survey in Figure 2-5 also revealed the presence of a watercourse flowing from west to south within the redline boundary. The top bank level of the watercourse was recorded between 32m AOD and 36.6m AOD. An additional ditch is noted east of the Proposed Substation Development with top bank levels of 44.6m AOD and a water level of 43.7m AOD.

As the ground levels at the proposed location of the substation structure are approximately 7m higher than the ordinary watercourse within the boundary and the flow conveyed southwards towards the Broadmeadow River (away from the site), the Proposed Substation Development is not considered to be at fluvial risk from flows in the ditch. The eastern ditch is approximately 90 metres adjacent from the Proposed Substation Development, flowing south.

Figure 2-5 Topographic Survey

The Proposed Substation Development will utilise adequate drainage solutions through a drainage design to manage surface water runoff.

2.4.2 Proposed Grid Connection

The Proposed Grid Connection is to be buried and therefore a topographic survey was not conducted.

2.5 Geology and Soil Permeability

Geological Survey Ireland (GSI) Spatial Resources[1] mapping defines the underlying bedrock as 'dark grey to black limestone & shale' which covers the west and northwest while the remainder of the Proposed Development within 'mixed sandstones, shales and limestones' as shown in Figure 2-6.

[1] Geological Survey Ireland (GSI) Spatial Resources; All Data. Source: Geological Survey Ireland Spatial Resources (arcgis.com) Last Accessed 20th October 2023.

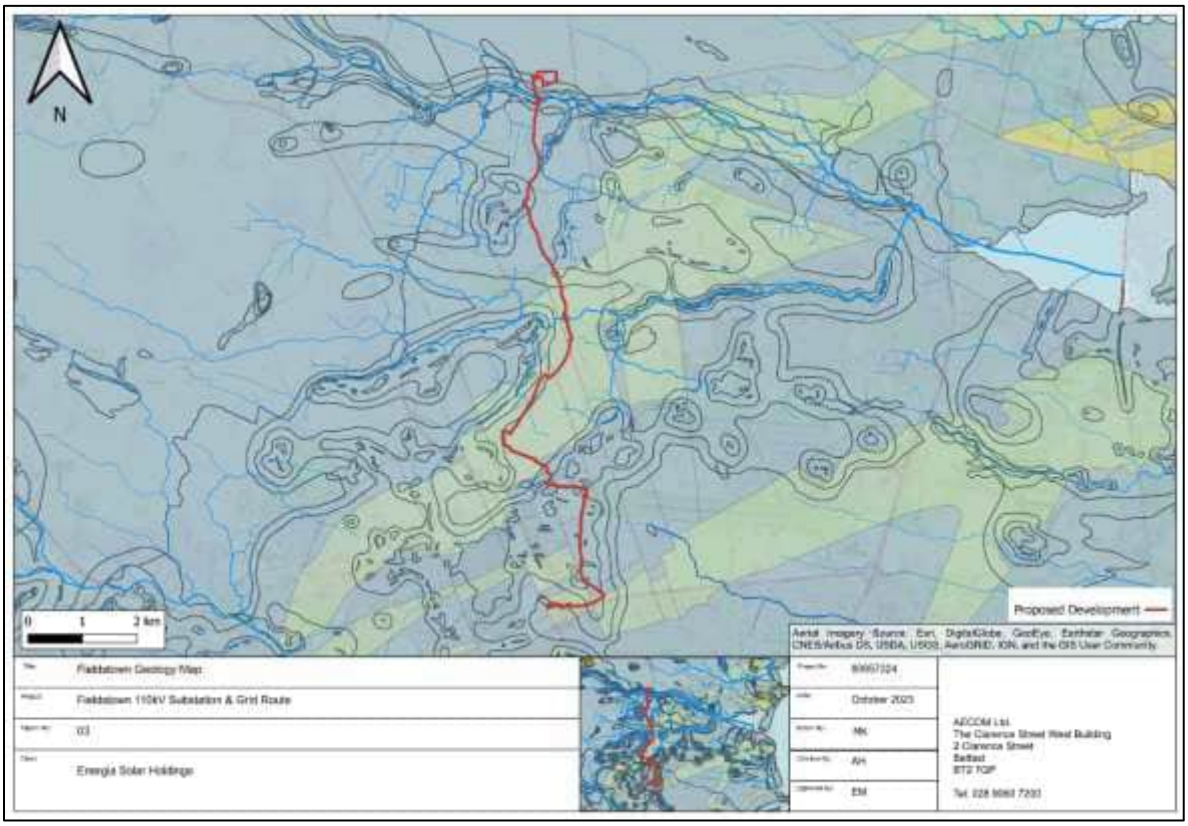


Figure 2-6 Regional Geology

According to GSI, the Proposed Substation Development is located within an area of 'Low' groundwater recharge and 'Low' soil permeability. This indicates there is potentially low seepage (infiltration) of the surface water to the ground and where applicable, steady seepage into underlying aquifers or streams.

3. Stage 1 – Flood Risk Identification

The purpose of Stage 1 is to establish whether a flood-risk issue exists or may exist in the future. If there is a potential flood risk issue then, in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities (DOEHLG 2009)', the flood risk assessment procedure should move to 'Stage 2 – Initial Flood Risk Assessment'. If no potential flood risk is identified during Stage 1 then the overall flood risk assessment can be concluded.

The potential flood risk mechanisms are also discussed in this Section. These include the risk the flooding from fluvial sources which result from the overtopping of the embankments of rivers and streams; the risk of tidal/coastal flooding where tides influence the water levels within watercourses; the flood risk from pluvial sources which occur when the ground becomes saturated and surface water runoff from rainfall events cannot effectively infiltrate or results in the surface water drainage systems becoming overwhelmed. Lastly, the flood risk from groundwater which may be exacerbated by high groundwater levels is discussed.

The following information and data have been collated as part of the screening assessment for the Proposed Development.

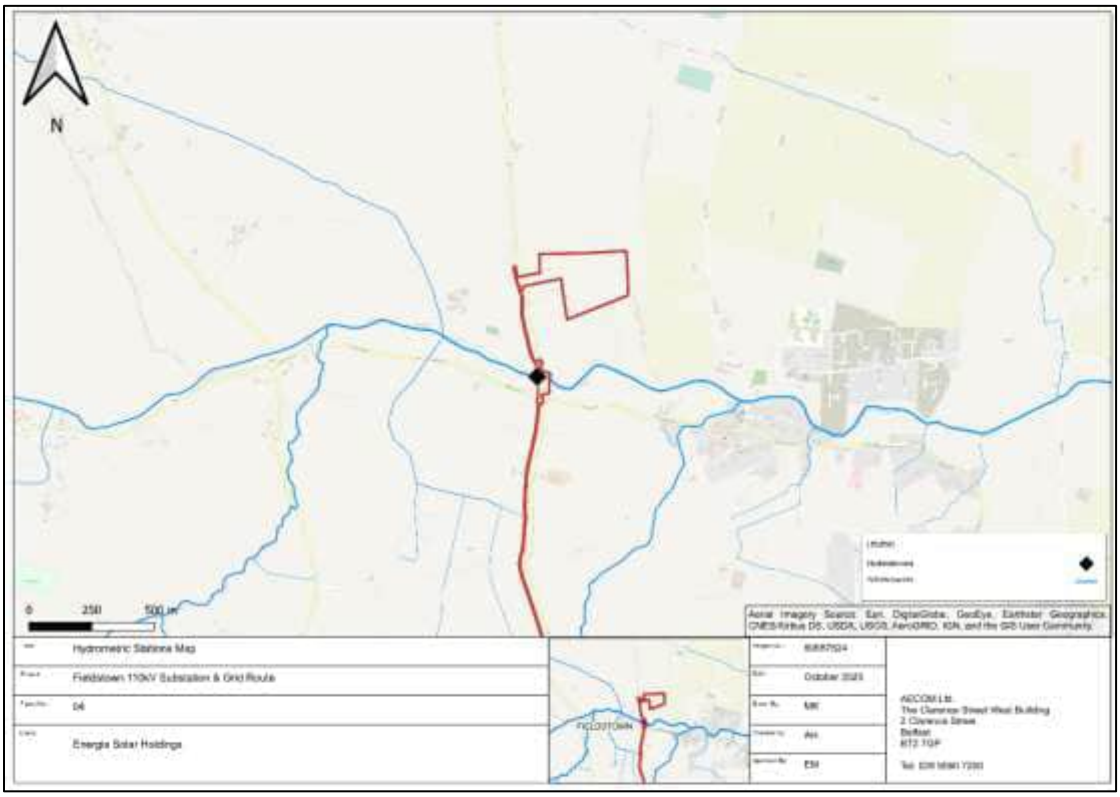
3.1 Proposed Substation Development

3.1.1 Hydrometric Data

Existing sources of hydrometric data[2] from the Environmental Protection Agency (EPA) were reviewed and determined that there is only one gauging station in proximity to the Proposed Substation Development as shown in Figure 3-1.

[2] Environment Protection Agency: Water level and flow data on HydroNet. Source: https://gis.epa.ie/EPAMaps/Water. Last Assessed: October 2023

Figure 3-1 Locations of Hydrometric Gauging Stations



The hydrometric gauge is summarised in Table 3-1 and states that the station is only utilised for spot flow measurements .

Table 3-1 Hydrometric Gauging Stations

Station No.	Name	Status	Owner	Available Data
8003	Fieldstown	(Assumed) Inactive	Fingal County Council	Spot flow measurements only - No continuous water level or flow records available.

The presence of the Fieldstown gauging station is noted at this stage of the FRA. However, there is no flow measurement datasets available and therefore river flow datasets based on estimates of naturalised river flow duration percentiles for the catchment are summarised in Table 3-2. These datasets comprise of estimates of naturalised river flow duration percentiles and represent flows that could be expected in rivers under naturalised conditions[3].

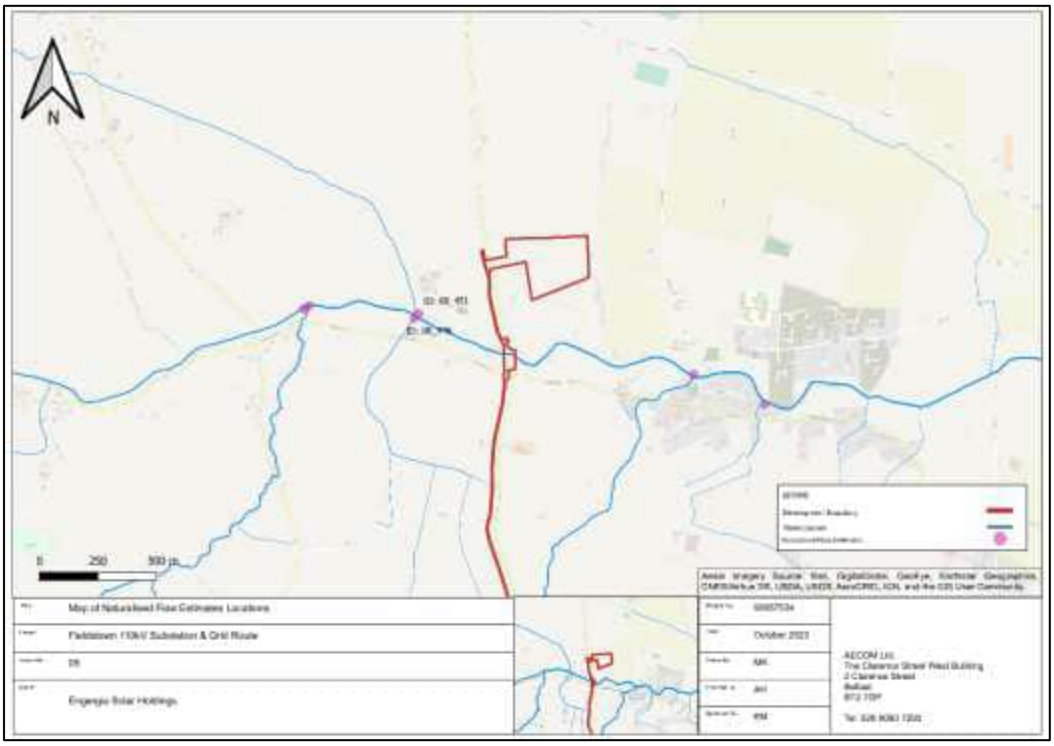
Table 3-2 River Flow Estimates - Hydrotool

Catchment ID	Catchment Area	River Flow Duration Percentiles (m^3/s)		
		Q1	Q30	Q95
08_451	74.271	6.933	1.195	0.073
08_446	8.147	0.862	0.113	0.007

The location of each of the flow measurements are illustrated in Figure 3-2 and are positioned upstream of the Proposed Substation Development.

[3] Naturalised River Flow Duration Percentiles. Available at: https://gis.epa.ie/geonetwork/srv/eng/catalog.search#/metadata/bac8d094-70fa-4c70-98d7-b3e0d91fef9f. Last accessed 11th of October 2023.

Figure 3-2 Locations of River Flow Estimates



3.1.2 OPW Hazards Maps

The Office of Public Works (OPW) Flood Hazard Maps Website was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrence in the vicinity of the Proposed Substation Development. No flood events have been recorded within the site boundary. Figure 3-3 shows mapping from the aforementioned website, which indicates that there are a few historical records of flooding which have occurred in the wider surrounding area.

Figure 3-3 OPW Hazard Maps

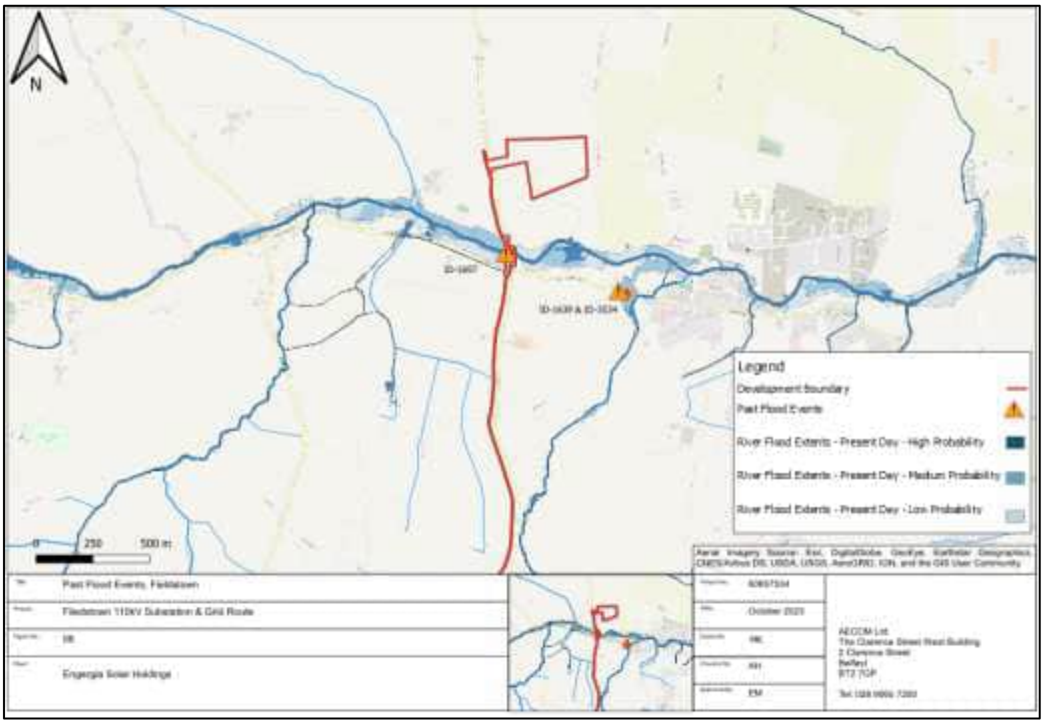


Table 3-3 Historic Flood Events

ID No.	Event Type	Title	Description
ID-1697	Specific: 13/11/2002	Flooding in the Broadmeadow Catchment November 2002	"*A total rainfall of 86.8mm fell in the day period 13th – 15th November 2002*". In the flood which occurred at Station 08003 Fieldstown on the Broadmeadow River in November 2002, debris marks would indicate that the peak level in the flood of November 2002 corresponded to a staff gauge reading of 2.51 m on the staff gauge.
ID-1639	Specific: 14/11/2002	Fingal County Meeting Roads East - Minutes	Swords – Ashbourne Road at Rolestown school (Flood ID No 1639) Road was impassable. Part of school building flooded.
	Specific: 13/11/2002 to 15/11/2002	Flooding in Fingal Area in 2000 and 2002	Swords/Ashbourne Road – Flooding occurred at Rathbeale Cross and Rolestown.
ID-3534	Specific: 01/01/1948	Flooding in Kilossery north Dublin in 1948	"*State of the river*" resulted in flooding of a property near "*the Broadmeadow River and bridge at Killossery*".

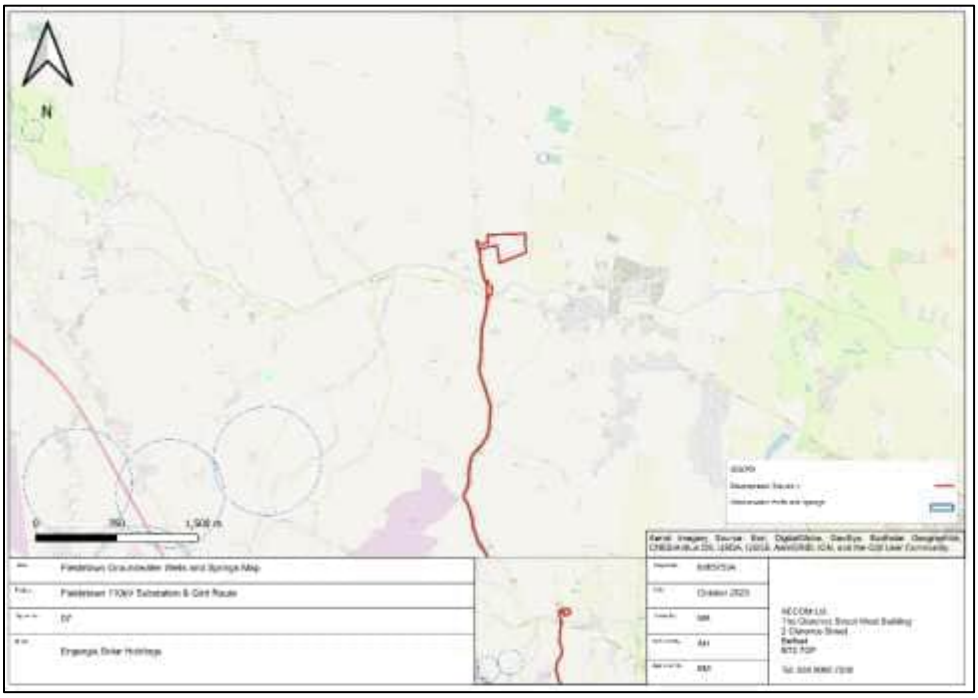
Of particular note from Table 3-3 are the events November 2002 which led to wide-spread flooding in the vicinity of the site at Rolestown school. While no flood history is recorded within the Proposed Substation Development, this might be due to the rural nature of the area with any flooding not having been reported.

3.1.3 Groundwater Wells and Springs

An investigation into the rise and abstraction of water from underground wells and springs around the site was taken from the Department of Communications, Climate Change and Environment (DCCE). This was to identify if there are any areas of rising groundwater that could contribute to flooding.

Figure 3-4 indicates the closest springs or wells in close proximity to the Proposed Substation Development to be approximately 680m north. There have been no recorded issues with these groundwater sources contributing to flooding within the area.

Figure 3-4 Groundwater Wells and Springs



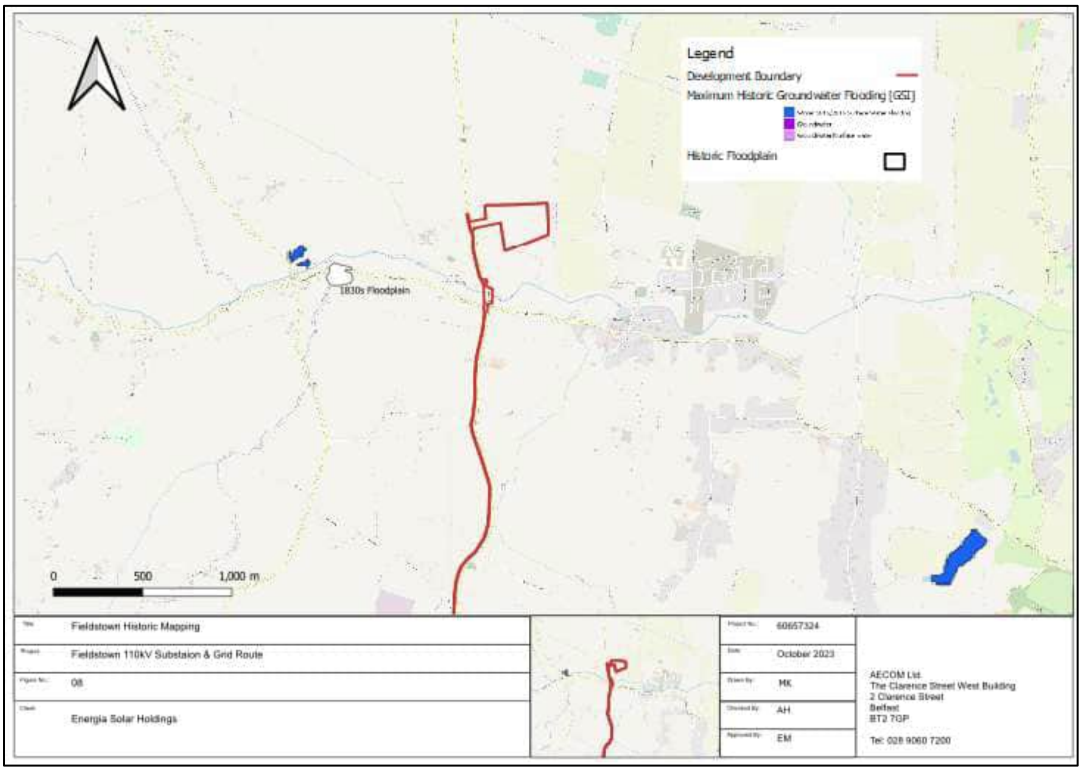
DEEC groundwater flooding mapping indicates there are no recorded groundwater flooding incidents in the area.

3.1.4 Historic Groundwater Flooding

According to GSI no records of groundwater flooding are shown within the area of the Proposed Substation Development. In addition, by utilising the GSI Maximum Historic Groundwater Flooding layer illustrates that there are no known areas of historic flooding within the Proposed Development boundary.

According to Ordnance Survey Ireland (OSI) mapping, the nearest historic floodplain is located approximately 1.15km west from the Proposed Development as shown in Figure 3-5.

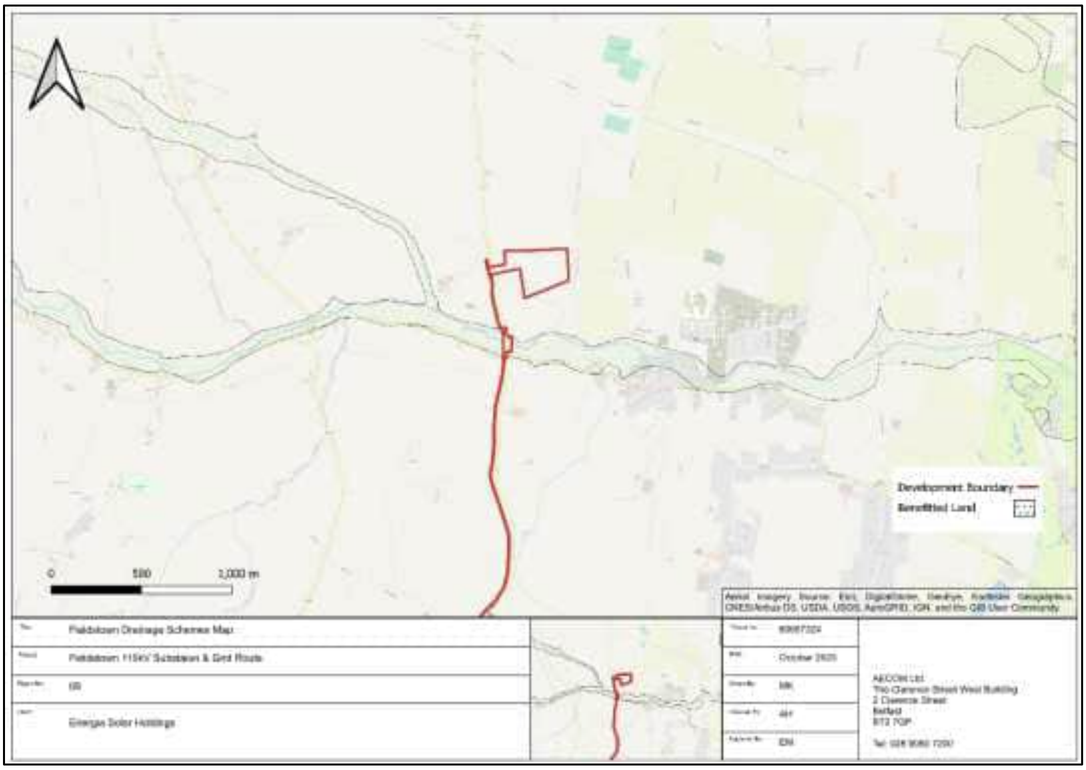
Figure 3-5 Historic Groundwater Flooding Map



3.1.5 OPW Land Benefitting Maps

The Proposed Development is adjacent to an OPW Arterial Drainage Scheme (ADS) with the closest scheme being in the Broadmeadow and Ward scheme to the south of the Proposed Substation Development.

Figure 3-6 Land Benefitted from OPW Schemes



ADSs 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.

It is noted that these schemes were only designed to retain the 3-year flood which is a standard well below what would be required for development of any land. The Proposed Substation Development lies outside the benefitting area.

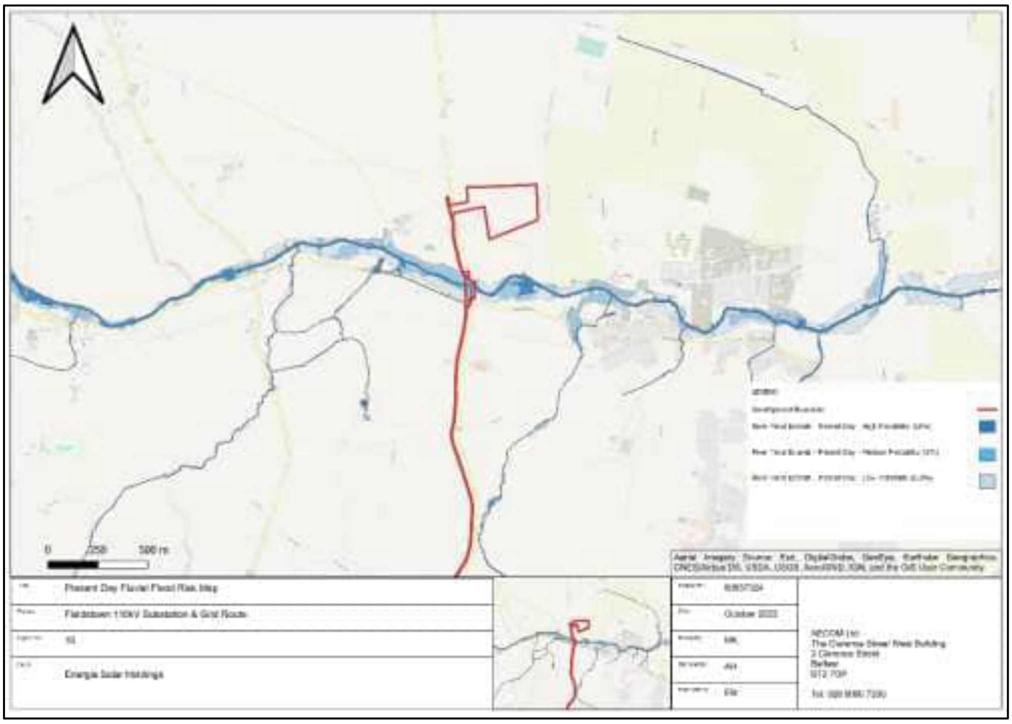
3.1.6 OPW Catchment Flood Risk Assessment and Management Mapping

The Catchment Flood Risk Assessment and Management (CFRAM) Programme was developed under the EU Floods Directive and national flood policy. As part of the programme, mapping has been produced by OPW and provides flood risk maps for present day and future scenarios for both coastal and fluvial flooding events.

3.1.6.1 Fluvial Mapping

The CFRAM predictive mapping in Figure 3-7 does not identify a direct risk to the Proposed Substation Development from fluvial flooding, however the fluvial 0.1% Annual Exceedance Probability (AEP) extents attributed to the Broadmeadow River are 250m south of the Proposed Substation Development.

Figure 3-7 CFRAM Present Day Fluvial Flood Extents



The topographic survey (Figure 2-5) indicates the existing ground levels where the Proposed Substation Development will be constructed vary from circa 39.4m AOD and 42.2m AOD. The topographic survey also indicates the watercourse south of Proposed Development joins the Broadmeadow River at circa 30m AOD. This verifies the Proposed Development (i.e., the substation) falls in Flood Zone C.

3.1.6.2 Coastal Mapping

CFRAM Present Day mapping for coastal flooding does not extend to the Proposed Substation Development and indicates there is negligible risk of coastal flooding to the proposed development.

3.1.7 Climate Change

3.1.7.1 Fluvial Mapping

In order to take a precautionary approach, it is necessary to understand the flood risk when accounting for climate change. Figure 3-8 shows the Mid-Range Future Scenario (MRFS) flood extents and illustrates that the Proposed

Development site is situated outside the predicted future flooding zones of low (0.1% AEP), medium (1% AEP) and high (10% AEP) probability.

Figure 3-8 CFRAM Mid-Range Future Scenario Fluvial Flood Extents

3.1.7.2 Coastal Mapping

CFRAM coastal flood extends are also available for the MRFS scenarios and illustrates that the Proposed Substation Development in not within the predicted future flooding zones of low (0.1% AEP), medium (0.5% AEP) and high (10% AEP) probability as shown in Figure 3-9.

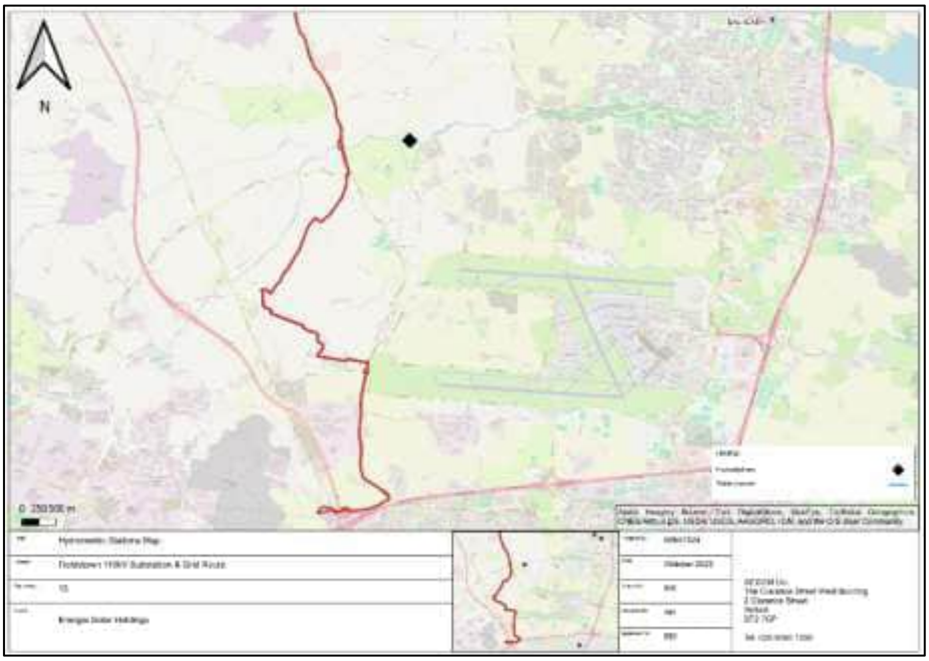
Figure 3-9 CFRAM Mid-Range Future Scenario Coastal Flood Extents

3.2 Proposed Grid Connection

3.2.1 Hydrometric Data

Existing sources of hydrometric data identified an additional hydrometric gauge on the River Ward called Ownes Bridge (station Number 8004).

Figure 3-10 Hydrometric Stations - Proposed Grid Connection

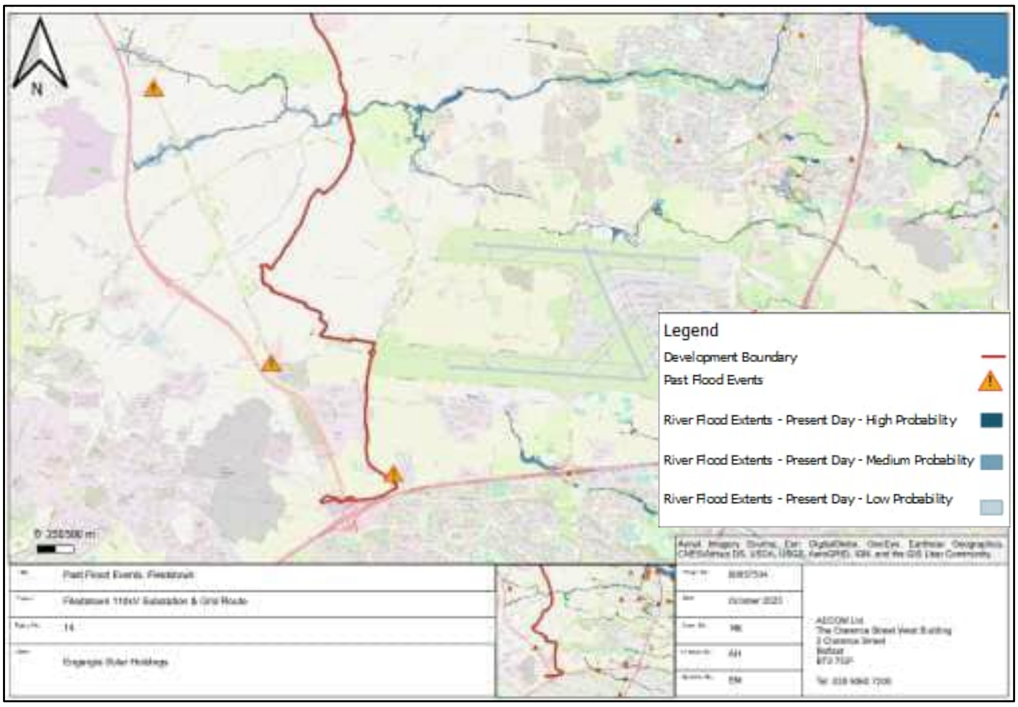


Due to the characteristics of the works proposed, the flows of the watercourse should not be impacted by the Proposed Grid Connection.

3.2.2 OPW Hazards Map

As outlined in Section 3.1.2, the OPW Flood Hazard Maps were utilised to determine if flood events were recorded within close proximity of the Proposed Grid Connection. No flood events have been recorded within the vicinity as shown in Figure 3-11 but have occurred in the wider surrounding area.

Figure 3-11 OPW Hazard Maps – Proposed Grid Connection

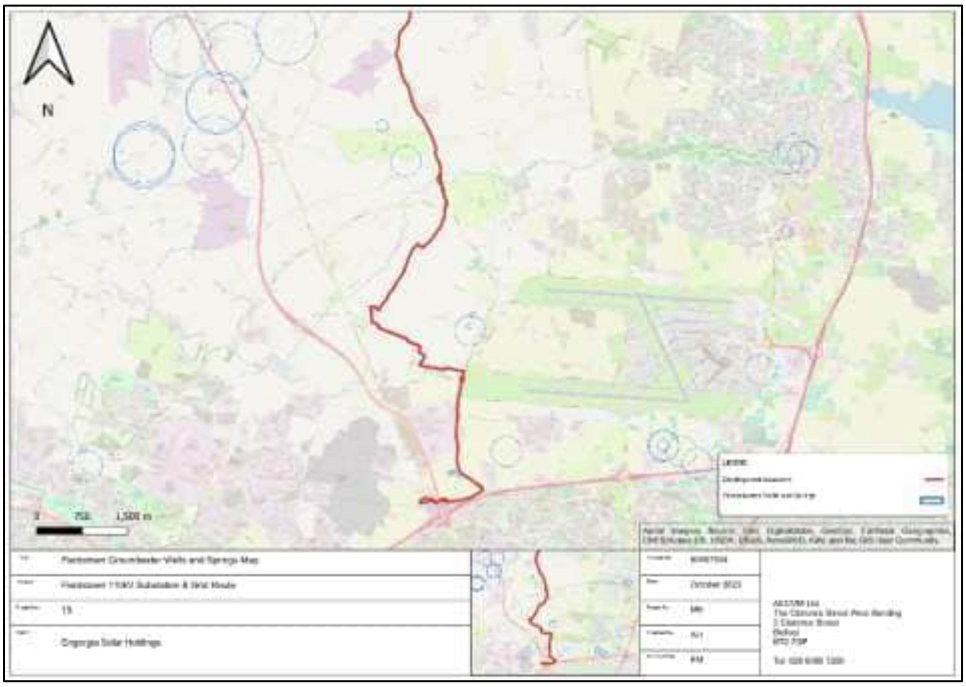


3.2.3 Groundwater Wells and Springs

An investigation into the rise and abstraction of water from underground wells and springs around the site was taken from the DCCCE. This was to identify if there are any areas of rising groundwater that could contribute to flooding.

Figure 3-12 indicates the closest springs or wells in close proximity to the Proposed Grid Connection to be approximately 260m. There have been no known recorded issues with these groundwater sources contributing to flooding within the area.

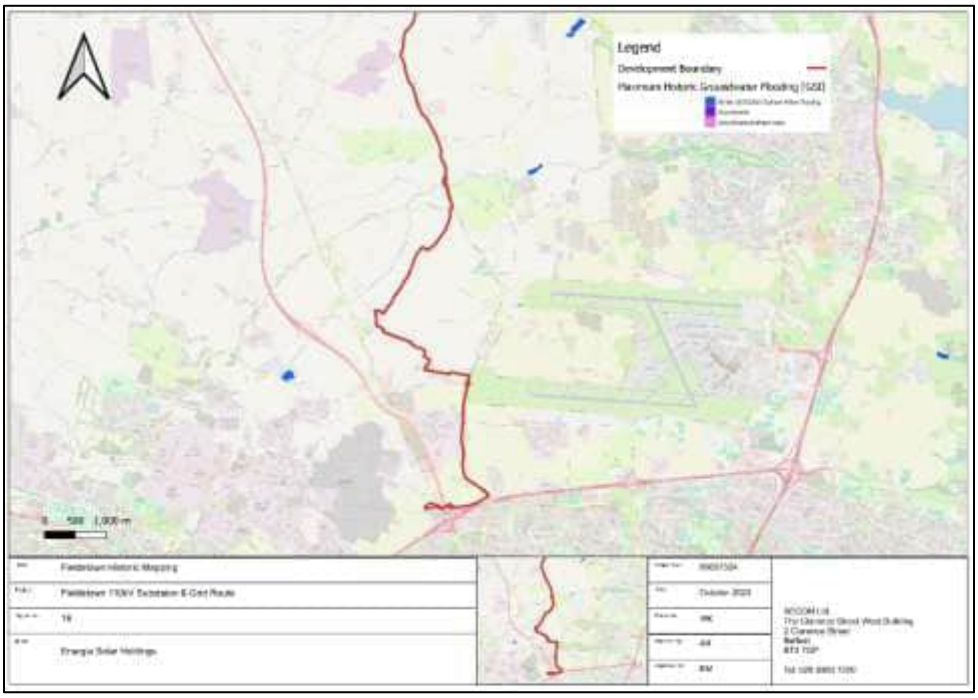
Figure 3-12: Groundwater Wells and Springs - Proposed Grid Connection



3.2.4 Historic Groundwater Flooding

According to GSI, no known records of groundwater flooding are shown within the area of the Proposed Grid Connection as shown in Figure 3-13.

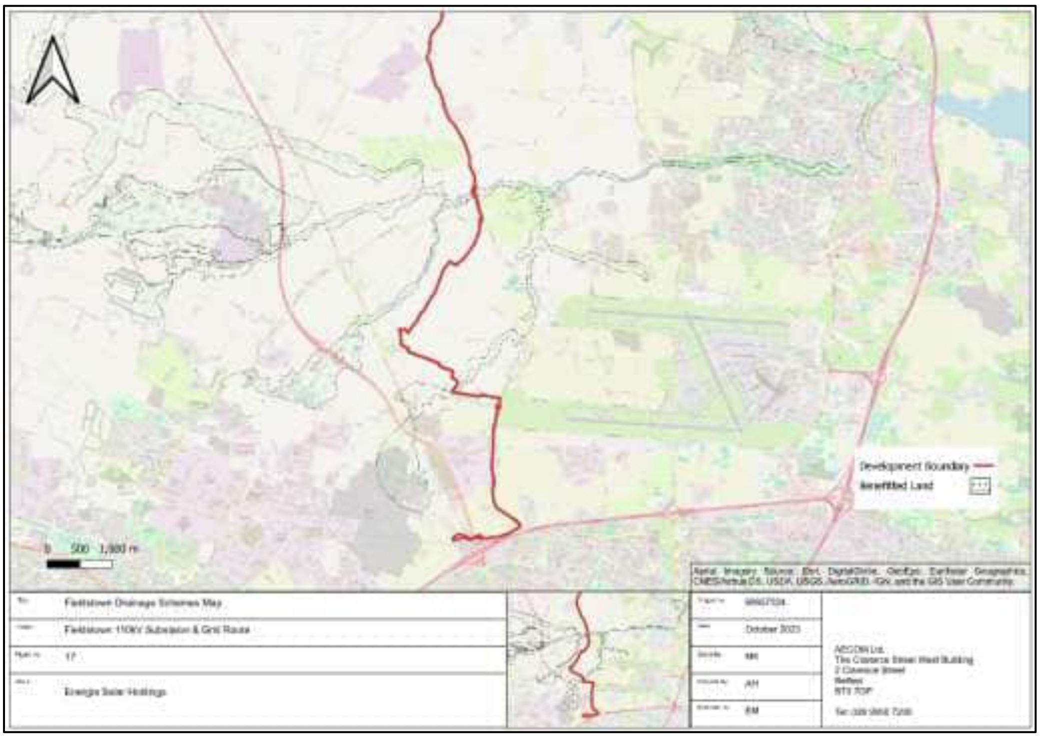
Figure 3-13 Historic Flooding – Proposed Grid Connection



3.2.5 OPW Land Benefitting maps

In Section 3.1.5, the OPW ADS areas are outlined. Figure 3-14 illustrates that ADS areas intersect the HDD locations however should not be impacted by the Proposed Grid Connection.

Figure 3-14: Land Benefitting Mapping – Proposed Grid Connection



3.2.6 Climate Change

3.2.6.1 Fluvial Mapping

The Proposed Grid Connection intersects the MRFS extent at the HDD crossings. The Proposed Grid Connection is buried and there for the risk of increase fluvial flood risk is negligible.

3.2.6.2 Coastal Mapping

CFRAM coastal flood extends are also available for the MRFS scenarios and illustrates that the Proposed Development in not within the predicted future flooding zones of low (0.1% AEP), medium (0.5% AEP) and high (10% AEP) probability as shown in Figure 3-9. The Proposed Grid Connection intersects the MRFS extent at the HDD crossings. The grid connection is buried and there for the risk of increase coastal flood risk is deemed negligible.

3.3 Fingal Development Plan 2023 - 2029

The Fingal Development Plan (FDP) 2023 – 2029[4] sets out in the FDP's Strategic Flood Risk Assessment[5] (SFRA) flooding policies and objectives to be applied in the preparation of future town development plans and in the assessment of planning applications, referring to the 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities (DOEHLG 2009)' and the Circular PL02/2014 (August 2014).

The SFRA outlines guidance related to flooding as follows:

- Avoid inappropriate development in areas that are at risk of flooding.
- Prevent new developments from increasing flood risk elsewhere, including flood risk that may arise from surface water runoff.
- 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.

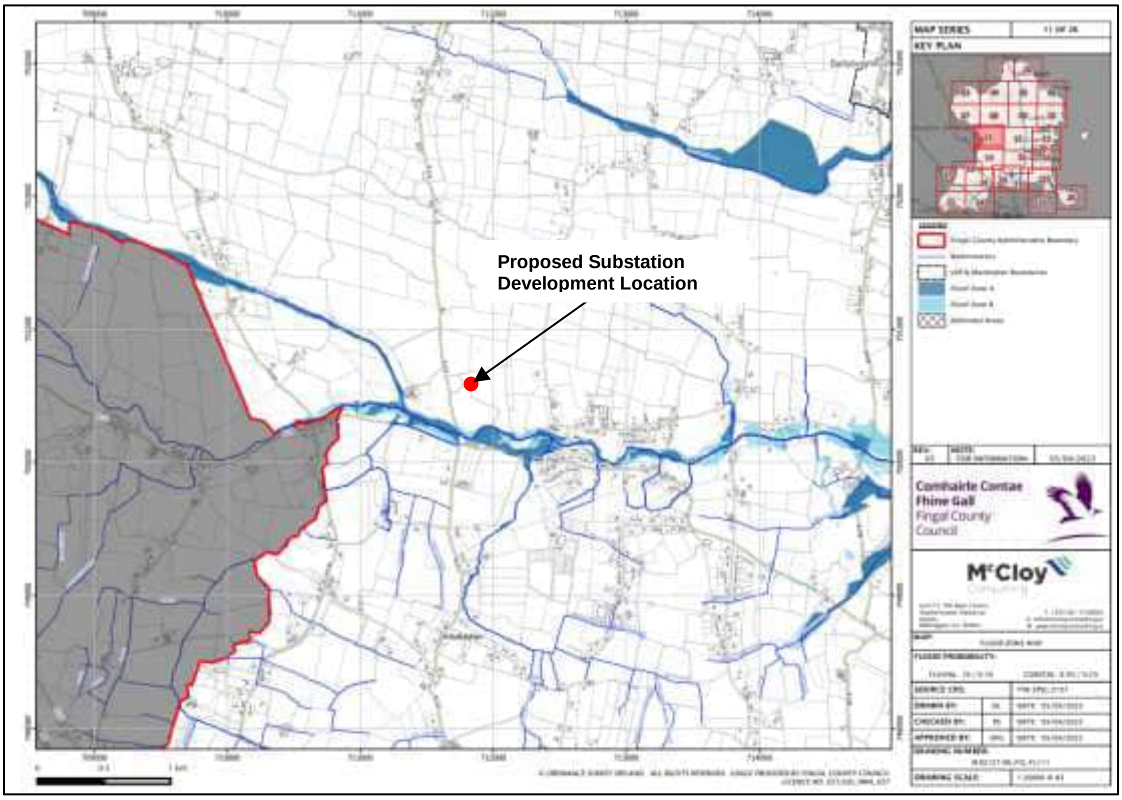
[4] Fingal Development Plan 2023 – 2029 Source: Development Plan 2023-2029 | Fingal County Council
[5] Strategic Flood Risk Assessment for the Fingal Development Plan 2023 – 2029

- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The SFRA recommends that Flood Risk Assessments (FRA) be carried out at different scales to identify the risk of flooding to land, property and people. The FRA Scales are:

- Regional Flood Risk Appraisal (RFRA)
- Strategic Flood Risk Assessment (SFRA)
- Site Specific Flood Risk Assessment (SSFRA)

Figure 3-15 Flood Zone Mapping[6], Fingal Development Plan SFRA 2023-2029



The extent of flood zone shown on the SFRA mapping extract indicates Proposed Development lies in Flood Zone C.

3.4 Screen Assessment Conclusion

The possible flooding mechanisms in consideration of the Proposed Development are summarised in Table 3-4.

Table 3-4 Possible Flood Mechanisms

Source of Flooding	Significant?	Comment/Reason
Tidal/Coastal	No	The Proposed Development is not located in an area subject to tidal/coastal flooding. The Proposed Grid Connection intersects with the CFRAM coastal extent for MRFS, however taking into consideration the scope of works, the risk of coastal flooding is deemed low.
Fluvial	No	The Proposed Substation Development is not located in within CFRAM fluvial flood extents, and the FCC SFRA flood zone map indicates the Proposed Development is in Flood Zone C. The Proposed Grid Connection intersects with the CFRAM fluvial extent for Present Day or MRFS, however taking into consideration the scope of works, the risk of fluvial flooding is low.
Pluvial (Urban Drainage)	No	The Proposed Substation Development is a greenfield site. The Proposed Grid Connection is located primarily with existing roadways. There are no records and no known instances of failure of the associated drainage systems.

[6] Fingal Development Plan 2023 – 2029 Flood Zone Mapping Source: Strategic Flood Risk Assessment SFRA_Appendix A.pdf (fingal.ie)

Source of Flooding	Significant?	Comment/Reason
Pluvial (Overland Flow)	No	Flooding is not likely to occur from overland flow however appropriate drainage will be provided by a drainage design to manage any surface water.
Groundwater	No	There are no springs and groundwater discharges recorded in the immediate vicinity of the Proposed Development.

4. Stage 2 – Initial Flood Risk Assessment

In order to undertake the initial flood assessment a determination of the flood zone in which the Proposed Development is located along with a determination of the vulnerability of the proposed works is required.

4.1 Determination of Vulnerability

The vulnerability of the proposed works is classified into three classes as given in Table 4-1.

Table 4-1 Classification of Vulnerability

Vulnerability Class	Land Uses and Types of Development*
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding. Hospitals. Emergency access and egress points. Schools. Dwelling houses, student halls of residence and hostels. Residential institutions such as residential care homes, children's homes and social services homes. Caravans and mobile home parks. Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility. Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and substations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions. Land and buildings used for holiday or short-let caravans and camping (subject to specific warning and evacuation plans). Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste). Mineral working and processing. Local transport infrastructure.
Water-compatible development	Flood control infrastructure. Docks, marinas and wharves. Navigation facilities. Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation and tourism (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms. Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
* Uses not listed here should be considered on their own merits	

Source: The Planning System and Flood Risk Management - Guidelines for Planning Authorities

The guidelines would indicate that the Proposed Substation Development, as a substation, should be considered to be **highly vulnerable development**.

4.2 Determination of Flood Zone

In accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities (DOEHLG 2009)', there are three flood zones designated in the consideration of flood risk to a particular site. The three flood zones are described in Table 4-2.

Table 4-2 Flood Zone Description

Flood Zone	Description
Flood Zone A	Where the probability of flooding from watercourses is the highest (greater than 1% or 1 in 100 years for watercourse flooding or 0.5% or 1 in 200 for coastal flooding)
Flood Zone B	Where the probability of flooding from watercourses is moderate (between 0.1% or 1 in 1000 year and 1% or 1 in 100 years for watercourse flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding)
Flood Zone C	Where the probability of flooding from watercourses and the sea is low or negligible (less than 0.1% or 1 in 1000 years for both watercourse and coastal flooding). Flood Zone C covers all areas which are not in Zones A or B.

Source: The Planning System and Flood Risk Management - Guidelines for Planning Authorities

The planning implications for each of the flood zones are:

- Zone A - High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.
- Zone B - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to an FRA to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.
- Zone C - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

4.2.1 Coastal Flooding

CFRAM Present Day mapping for coastal flood risk is not available for to the Proposed Development however MRFS extents were available. The extents did not encroach into the Proposed Development boundary and therefore indicates there is negligible risk of coastal flooding.

4.2.2 Fluvial Flooding

The FCCDP SFRA 2023 - 2029 flood zone mapping indicates the Proposed Development lies in Flood Zone C.

Upon a detailed review of the topographic data and the available flood mapping data the following information has been determined regarding the fluvial risk.

As the ground levels at the proposed location of the substation structure are approximately 7m higher than the ordinary watercourse and flow in the ditch is conveyed southwards towards the Broadmeadow River (away from the site), the substation is not considered to be at fluvial risk from flows in this ditch.

Review of the OPW Flood Mapping (Figure 3-7) show the 0.1%AEP flood extents for the Broadmeadow River is in the vicinity of the site on the southern boundary, however it does not enter into the site boundary. Therefore, the substation is not considered to be at fluvial risk from the Broadmeadow River in a 0.1% AEP event.

4.3 Justification Test Requirement

The requirement for a justification test was reviewed for this study to determine whether the proposed works would be considered acceptable in terms of flood risk. The conclusion of 'Stage 1 – Flood Risk Identification' noted that the works may be impacted by fluvial flooding.

The requirement for a Justification Test is determined based on the type of development and flood zone designation as indicated in Table 4-3 below.

Table 4-3 Justification Test Matrix

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	Justification Test	Justification Test	**Appropriate**
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water-Compatible Development	Appropriate	Appropriate	Appropriate

Source: The Planning System and Flood Risk Management - Guidelines for Planning Authorities

Given the determination of the Proposed Development is located is Flood Zone C and is characterised as a 'Highly Vulnerable Development', the application of the justification test will not be required.

5. Conclusion

The purpose of the scoping stage is to identify possible flood risks and to implement the necessary level of detail required to assess these possible flood risks, and to ensure these can be adequately addressed in the FRA. The scoping exercise should also identify that sufficient quantitative information is already available to complete an FRA appropriate to the scale and nature of the development.

The SFRA is set out in the FDP 2023 – 2029. The Flood Zone mapping in the SFRA for the area covering Fieldstown indicates the Proposed Development is in Flood Zone C, and as the Proposed Development is characterised as 'Highly Vulnerable', the application of the Justification Test is not required.

The Proposed Substation Development comprises existing greenfield land and it is assumed the land currently drains naturally. The Proposed Grid Connection is located primarily with existing roadways. No historic overland flow flooding has been identified in the vicinity of the Proposed Development, and therefore the pluvial flood risk is considered to be low.

The Proposed Development will utilise adequate drainage solutions to fully contain a 1:100-year storm event with an allowance for 20% for climate change, in accordance with the requirements stipulated in the Greater Dublin Regional Code of Practice for Drainage Works[7]..

The Proposed Development is not located near groundwater springs and wells. The groundwater flooding map also indicates there are no recorded groundwater flooding incidents in the area. Therefore, the groundwater flood risk to the Proposed Development is considered to be low.

The topographic survey indicated that the substation would be constructed on land comprising of elevations between 39.4m AOD and 42.2m AOD while the watercourse has a top bank level between 32m AOD and 36.6m AOD. Ground levels at the proposed location of the substation structure are approximately 7m higher than the ordinary watercourse and flow in the ditch is conveyed southwards towards the Broadmeadow River (away from the site), the Proposed Substation Development is not considered to be at fluvial risk from flows in the ditch. The Proposed Grid Connection is buried and there for the risk of increase fluvial flood risk is negligible. Therefore, the fluvial flood risk to the Proposed Development is considered to be low.

Review of the OPW Flood Mapping (Figure 3-7) show the 0.1%AEP flood extents for the Broadmeadow River is in the vicinity of the southern boundary of the Proposed Substation Development, however it does not appear to enter the boundary. As the ground levels at the Proposed Substation Development are higher than the Broadmeadow River flood extents, the substation is not considered to be at fluvial risk from the Broadmeadow River in a 0.1% AEP event.

This verifies the Proposed Substation Development falls in Flood Zone C, i.e., and would not be within the 1 in 100 or 1 in 1000-year predicted fluvial flood extent.

The evidence provided in the Stage 2 assessment (underpinned by the Stage 1 assessment and the topographic survey assessment) indicates that a Stage 3 FRA is not required.

[7] Fingal County Council, et. al (2005), Greater Dublin Regional Code of Practice, as amended.

Appendix E Air Quality

STEP 1: Screen the Requirement for a Detailed Assessment

Sensitive receptors were identified and the distance to the Site and construction routes were determined according to the examples of sensitivity shown in Table D1. According to the IAQM, an assessment will normally be required where there are sensitive receptors within 350m of the boundary of a site and/or within 50m of route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance.

A human receptor, as considered within the IAQM guidance, is any location where a person or property may experience:

- The annoyance effects of airborne dust or dust soiling e.g., dwellings, industrial or commercial premises such as a vehicle showroom, food manufacturers, electronics manufacturers, amenity areas and horticultural operations. or
- Exposure to PM_{10} over a period relevant to the air quality objectives.

Ecological receptors within 50m of the boundary of the Site or routes used by construction vehicles on the public highway, up to 500m from the Site entrance, also need to be identified.

There are no ecological receptors which need to be considered as part of this assessment.

Table D1 Examples of Dust Sensitive Receptors

Sensitivity	Dust Soiling	Human Health	Ecological
High	• Dwellings • Museum and other culturally important collections, • Medium- and long-term car parks • Car showrooms	• Residential properties. • Hospitals, • Schools • Residential care homes	• Locations with an international or national designation (e.g., SAC) and the designated features may be affected by dust soiling
Medium	• Parks • Places of work	• Office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	• Locations with a national designation (e.g., NHA) where the features may be affected by dust deposition
Low	• Playing fields • Farmland (unless commercially sensitive horticultural) • Footpaths • Short term car parks • Roads	• Public footpaths • Playing fields • Parks • Shopping streets	• Locations with a local designation where the features may be affected by dust deposition local Nature Reserve with dust sensitive features.

STEP 2: Assess the Risk of Dust Impacts

The risk of dust arising in sufficient quantities to cause annoyance and/or health effects was determined for each activity (demolition, earthworks, construction works and track out), taking account of:

- The scale and nature of the works, which determines the potential dust emission magnitude (small, medium or large) (Step 2A).
- The sensitivity of the area (low, medium or high) (Step 2B).

These factors were then combined to give the risk of dust effects with no mitigation applied, as Negligible, Low, Medium or High.

It should be noted that where detailed information was not available to inform the risk category, professional judgement and experience was used and a cautious approach adopted, in accordance with the guidance.

STEP 2A – Define the Potential Dust Emission Magnitude

Earthworks

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. The classifications in Table D3 are based on examples of suitable criteria. Factors such as existing land use, topography, seasonality, duration and scale were also taken into consideration, where possible.

Table D3 Potential Earthworks Dust Emission Classification

Emission Magnitude	Examples
Large	• Total site area: >10,000m² • Potentially dusty soil type (e.g., clay) • >10 heavy earth moving vehicle active at any one time • Formation of bunds >8m in height • Total material moved >100,000 tonnes
Medium	• Total site area: 2,500 - 10,000m² • Moderately dusty soil type (e.g., silt) • 5 -10 heavy earth moving vehicle active at any one time • Formation of bunds 4 - 8m in height • Total material moved 20,000 – 100,000 tonnes
Small	• Total site area: <2,500m² • Soil type with large grain size (e.g., sand) • < 5 heavy earth moving vehicle active at any one time • Formation of bunds < 4m in height • Total material moved <20,000 tonnes • Earthworks during wetter months

Construction

The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials and duration of build. The classifications in Table D4 are based on examples of suitable criteria. Factors such as seasonality, building type, duration and scale were also taken into consideration, where possible.

Table D4 Potential Construction Works Dust Emission Classification

Emission Magnitude	Examples
Large	• Total building volume >100,000m^3
Medium	• Piling, on site concrete batching, sandblasting
Small	• Total building volume 25,000 – 100,000m^3

Track-out

Track-out is the transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the local road network. The classifications in Table D5 are based on examples of suitable criteria. Factors such as vehicle size, speed, numbers, geology and duration were also taken into consideration, where possible.

Table D5 Potential Track-out Dust Emission Classification

Emission Magnitude	Examples
Large	• 50 HGV (>3.5t) outward movements in any one day • Potentially dusty surface material • Unpaved road length >100m
Medium	• 25 – 100 HGV (>3.5t) outward movements in any one day • Moderately dusty surface material • Unpaved road length 50 – 100m
Small	• <25 HGV (>3.5t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50m

STEP 2B – Define the Sensitivity of the Area

The sensitivity of the area takes account of the following factors:

- The specific sensitivities of receptors in the area.
- The proximity and number of those receptors.
- In the case of PM_{10}, the local background concentrations.
- Site specific factors, such as whether there are natural shelters, such as trees to reduce the risk of wind-blown dust.

The sensitivity of the area is determined separately for dust soiling impacts on people and properties (Table D6, human health impacts (Table D7).

Table D6 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20 m	<50 m	<100 m	<350 m
High	>100	High	High	Medium	Low
Medium	10 – 100	High	Medium	Low	Low
Low	1 – 10	Medium	Low	Low	Low

Table D7 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual	Number of Receptors	Distance from the Source (m)			
			<20 m	<50 m	<100 m	<350 m
High	>32 µg/m^3	>100	High	High	High	Medium
		10 – 100	High	High	Medium	Low
		1 – 10	High	Medium	Low	Low
	28 - 32 µg/m^3	>100	High	High	Medium	Low
		10 – 100	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low
	24 - 28 µg/m^3	>100	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low
		1 – 10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10 – 100	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low
	-	1 – 10	Medium	Low	Low	Low
Low	-	1 – 10	Low	Low	Low	Low

STEP 2C - Define the Risk of Impacts

The dust emission magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of effects with no mitigation applied (Table D8). This Step is undertaken for each activity undertaken on site.

Table D8 Nearby planning applications

Activity	Sensitivity of Area	Dust Emission Classification		
		Large	Medium	Small
Earthworks	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible

Activity	Sensitivity of Area	Dust Emission Classification		
		Large	Medium	Small
Construction	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Track-out	High	High	Medium	Medium
	Medium	Medium	Low	Negligible
	Low	Low	Low	Negligible

STEP 3: Identify the Need for Site-Specific Mitigation

Based on the risk of effects determined in Step 2C for each activity, appropriate site-specific mitigation measures were recommended. Appropriate mitigation measures are set out in the IAQM Guidance.

STEP 4: Define Impacts and Their Significance

Finally, the significance of the potential residual dust impacts, i.e., after mitigation, was determined. According to the IAQM Guidance the residual impacts assumes that all mitigation measures (recommended in Step 3) to avoid or reduce impacts are adhered to, and therefore the residual impacts should be ‘not significant’.

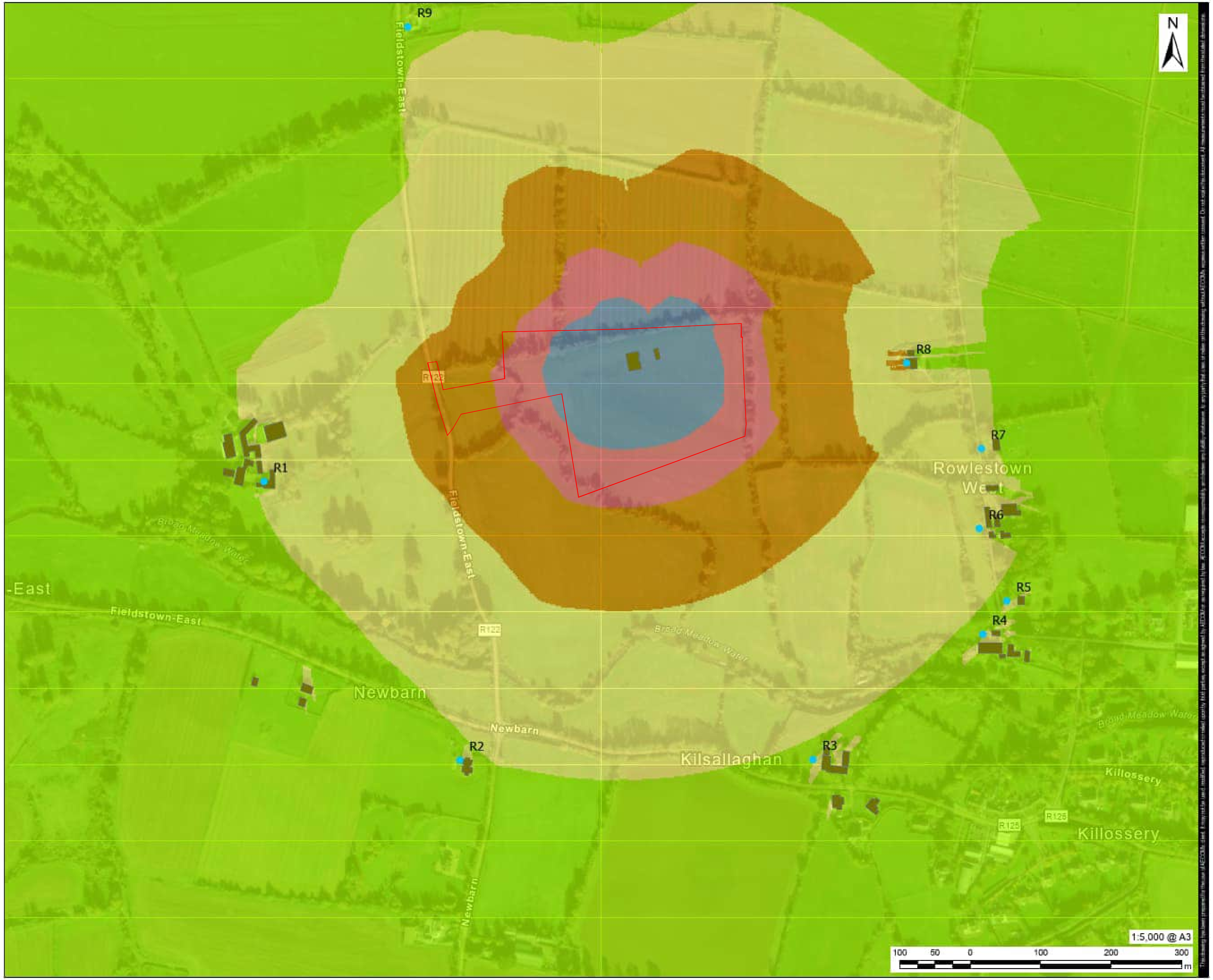
Appendix F Acoustic Modelling

Acoustic modelling has been undertaken using the CadnaA 2020 3D Sound modelling package.

The following model settings have been adopted:

- Maximum search radius of 2km.
- Maximum number of reflections: 1.
- Noise predictions carried out at 1.5m and 4m above ground to represent ground and first floor levels respectively.
- Existing residential buildings assumed to be approximately 6m high.
- Ground absorption has been set to G=0.0 (corresponding to 100 % hard ground) to represent reflective surfaces such as roads, water and hardstanding within the proposed site boundary. This is a robust worst-case assumption.

Revision: 0 Drawn: GC Checked: BB Approved: AY Date: 2023-09-22



AECOM

PROJECT

Fieldstown 110kV Substation & Grid Connection

CLIENT

Energia Solar Holdings

CONSULTANT

AECOM Limited
12 Regan Way
Chetwynd Business Park
Chilwell
Nottingham, NG9 6RZ
www.aecom.com

LEGEND

Proposed Substation Development
Buildings
dB LAeq,T - 4m above Ground
<30
30 - 35
35 - 40
40 - 45
>45
Receptors_Update

NOTES

Contains data from Maxar, Microsoft, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

ISSUE PURPOSE

PROJECT NUMBER

60687165

FIGURE TITLE

Receptor Locations

FIGURE NUMBER

Figure 11.1

Appendix G Heritage

G.1 Gazetteer 1: Recorded Monuments Within, or Just Outside, 1km of the Proposed Development

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
DU011-001	0328		Ringfort-unclassified	Early Medieval	Situated in a field of rich pastureland on ground falling south to road and the Broadmeadow River. Comprises a roughly circular earthen platform (diam c. 70m, H 1.5m) with an outer earthen bank (Wth 3m, H1.2m). It is splayed on the downslope side and disturbed in the N. Trees had been planted around the perimeter but several had been removed leaving large holes and rotten stumps. Ditch evident around base except to the south. Immediate area to the SE has been extensively quarried.	Some remains
DU011-002001-	0326		Church	Medieval	Situated on the grounds of Fieldstown House north of the Broadmeadow River. The remains comprise a raised oval area (45m E-W) defined by a bank and external fosse best defined to the north. The foundations of a church, dedicated to St Catherine, was visible as a grassed over mound (ext. dims. L 18.8m, Wth 6m, H 0.6m) in the 1992 report but there has since been intense tree planting and overgrowth. Remains of an earlier field system (DU011-002003-) defined by scarps and ditches lie to the north, east and west. The chapel of St Catherine was a place of pilgrimage until 1555 when devotions were laid aside due to 'persons have been at divers times vexed and molested'. The church was ruinous by 1615 (Donnelly 1917, 153).	Some remains
DU011-002002	0326		Graveyard	Medieval	Situated on the grounds of Fieldstown House N of the Broadmeadow River. The remains comprise a raised oval area (45m E-W) defined by a bank and external fosse within which are the foundations of a church (DU011-002001-). Just two stone grave markers visible and an iron cross recovered by landowner and chained to a tree. The graveyard has been used for unbaptised children. This graveyard is no longer in use for burials.	Some remains
DU011-002003			Field System	Medieval	Situated on the grounds of Fieldstown House north of the Broadmeadow River. Notable as a hollow way running NNW/SSE between church and well, almost parallel to existing road. Defined by drop to the east from level ground c.3m width, possible drainage either side. Lots of undulations imply deserted settlement.	Some remains
DU011-002004-	0327		Ritual site – holy well	Early Medieval	This spring well is located in the west face of a field bank in a hollow under trees, in the grounds of Fieldstown House. It is enclosed by a brick and stone arched structure with an iron lattice door. Traditionally associated with St. Catherine. Known locally as a former holy well where an annual pattern was held. No longer venerated (ÓDanachair1958, 74, Healy 1975, 22).	Substantial remains

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
DU011-004	0329		Mound	Unknown	Situated on a N-facing slope in grassland that falls south to the Broadmeadow River. This was a circular mound (diam. 16m; H 2.5m) with a lone bush on the top. A cross was erected on the mound in modern times (Healy 1975, 22). Mound has been quarried /cut away to northeast and there is some evidence for poaching. Mound topped with a lone bush and an ESB pole (inserted post-1992). Terraced to east and south-some stones visible (c.5m width, 1m H.).	Some remains
DU011-005001	0335		Church	Medieval	On an elevation south of Rolestown Village above the Broadmeadow River are the remains of the medieval parish church of Killossery within a walled graveyard. This church was described as ruinous in the Civil survey (1654-6) (Simington 1945, 208). It is a plain rectangular building (L 13m, Wth.5.90m), aligned E-W with a doorway in the W end of the N side wall. This had a round arch in the 19th-century (Walsh 1888, 238). A plain, widely splayed window in the E gable lights the interior. A font from the church was moved to Swords RC Church (DU011-070----). East and west gables survive to window height. North wall survives 0.5m-1.5m, slight traces of south wall.	Substantial remains
DU011-005002	0335		Graveyard	Post-Medieval	On an elevation S of Rolestown Village above the Broadmeadow River are the remains of a walled graveyard (Diam. C 30m) which encloses the remains of a medieval church (DU011-005001-). The graveyard appears to be artificially raised c. 2m above immediate ground level indicating that the church may have been built on an earlier monument. According to Walsh (Walsh 1888, 238) the 'Danes' had made a rath at this place. The graveyard is bounded by a curved road to the east and houses and gardens to the west. Distinct drop down to the north where there may have been a bank-now tree lined beyond which is a very steep drop down to the river. Stone and gated entranceway to southeast beside which is a stile that has a grave slab cemented in place at an angle. Gravestones within the church predominantly 19th century. Tall pillar stone to the northwest of the church by yew tree. Concentration of older grave markers to east of church. The eastern graveyard wall is threatened by tree root growth. There has also been significant ugly cement re-pointing which will damage the stonework.	Some remains
DU011-057002	0334		Water mill - unclassified	Post-Medieval	The Civil survey (1654-6) mentions a mill at Killossery belonging to Philip Hore of Kilsallaghan. This is also marked on the Down Survey (1655-6) map. To the N of Killossery Church (DU011-005----) tucked into a hillslope	Substantial remains

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
					is a mill complex comprising the mill building which stands to the W of the yard and a dwelling that runs at right angles to it with some later out-buildings off to the N. The mill building is oriented roughly N-S and changes from a two-storey building to one storey as it ascends the hillslope. It has stone foundations with mud walls and gables which are hipped (ext. dims. L16.4m, Wth 6.6m). There are remains of a millrace that runs along the N gable. The thatched roof is covered in galvanised iron. Most of the mill works are present in the N end of the building. There is a kiln in the S end.	
DU011-057002-	0334		Building	Post-Medieval	To the north of Killossery Church (DU011-005001-) tucked into a hillslope south of the Broadmeadow River is a mill complex comprising the mill building which stands to the west of the yard and a dwelling that runs at right angles to it with some later out-buildings off to the north. The mill building is T-shaped, orientated roughly N-S and changes from a two-storey building to one storey as it ascends the hillslope. It has stone foundations with mud walls and gables which are hipped (ext. dims. L16.4m, Wth 6.6m). There are remains of a millrace that runs along the N gable. The thatched roof is covered in galvanised iron.	Substantial remains
DU011-67			House – 16th/17th century	16th/17th century	The Down Survey (1655-6) map shows a farmhouse roughly at the Site of a small vernacular building of hearth-lobby type (pers. comm. Barry O'Reilly). Access to the interior is blocked. Located by the roadside on a right-angle bend in a low-lying situation. Dwelling has been modernised with a new slate roof dotted with skylights and new render.	Some remains?
DU011-170			Enclosure	Uncertain	Located c. 1.6km to the NW of St Margaret's. Cropmarks forming a subcircular enclosure are visible on Google Earth imagery (24 June 2018 and 4 July 2008). The enclosure (dims c. 48.6m N–S and c. 56m E–W) is defined by a ditch (Wth c. 2.3m). Portion of a curvilinear ditch on exterior to SE perimeter may form an annexe.	No visible remains
DU011-187			Earthwork	Uncertain	In tillage field. Cropmark of circular-shaped area defined by the cropmark of a ditch visible on Google Earth orthoimage taken 26/04/2021. Cropmarks of internal divisions visible on orthoimage.	No visible remains
DU011-188			Ring-ditch	Bronze Age	In tillage field, 20m E of stream which marks townland boundary with Shallon. Cropmark of circular-shaped area (diam. c. 8m; ext. diam. 12m) defined by the cropmark of a ditch visible on Digital Globe orthoimage taken between 2011-13.	No visible remains
DU014-005001		NM 230	Castle/Towerhouse	Late 15th century	Located with a farmyard, this late 15th-century tower house is a National Monument. Associated with the	Well preserved

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
					Plunkett family it rises to four storeys with four large corner towers. Built of coursed limestone blocks with dressed stone quoins and a base batter. Entrance on the ground floor is through a three-centred arched doorway in the N wall. The main chamber is barrel vaulted on a N-S alignment, with wicker-work centring evident (int. dims. L 10.5m; Wth 8.1m). There are chambers in all the corner turrets except the NE turret which contains the stairs. The ground floor is lit by slit opes in the S, W and N. NW chamber is entered through a pointed arched doorway. It is vaulted (dims. L 3.4m; Wth 2.8m). A curving passage, which is only partially roofed, leads into the SW tower. The SE tower is also vaulted (dims. L 3.2m; Wth 2.8m). The first-floor chamber is lit by tall rectangular windows. Off this, the NW angle tower contains a brick fireplace, which incorporates some chamfered jambs. It is lit by a tall rectangular window in the W and a pointed arched window in the NW. There is a garderobe and wall press in SW tower with musket hole in the N wall. The SE tower on first floor contains a hollowed basin with a drain hole and a musket hole in a wall recess. Corbels for the main second floor chamber are still in place. A substantial percentage of the original roof timbers are present over third floor. A fireplace in the W wall has a flat arch with chamfered jambs. There are stepped window embrasures on the E, W and S walls. The corner chambers have corbelled roofs. Tudor style chimneys are still present. The battlements are entered through a pointed arched doorway in the NE tower (Healy 1975, 26; Crawford 1922, 85-87; Anon 1897, 448-50). Remains of a dwelling (DU014-005006-) attached by wall to NW end of tower house. Possible house-sites are visible on aerial photograph (CUCAP, AID 57) E of the tower house (Harbison 1998, 164-5; Sweetman 1999, 138-9). The surrounding lands were subject to a geophysical survey (Licence no. 10R033) as part of a Conservation Plan that explored the development potential of the castle and its surroundings, in the context of its archaeological, historical, landscape and wildlife significance. The survey did not provide any clear evidence for features although agricultural activity was prevalent with numerous ploughing trends and linear responses suggestive of former field divisions. It is possible that some of these responses reflect former field systems and ridge and furrow cultivation and may be contemporary with Dunsoghly Castle (Leigh 2010, 11).	
DU014-005002			Chapel	Late 15th century	Connected to the southwest corner of Dunsoghly castle (DU014-005001-) by a wall with entrance. The chapel is an	Well preserved

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
					oblong, single storey building. It is built of randomly coursed masonry with roughly dressed limestone quoins. Entrance is in the west end of north wall through round arched doorway which contains punch dressed jambs with double roll moulding and a hood moulding that terminates in a rosette and fleur-de-lis (int. dims. L 6.60m, W 4.40m). Sizeable crack from door to roof resulting in some water damage around door and arch and between wall and chapel. Above the door is an inscribed limestone tablet (DU014-005005-). Interior is lit by a double light window with semi-elliptical arches in the W gable and blocked up rectangular window in the S wall alongside a pointed arch single light window with cusps and punch-dressed jambs. The southeast corner is slightly battered with remains of (blocked) round arched opening. Within the interior are wall presses in E and W end of N the wall (Tutty 1979, 32, 156).	
DU014-005004			House-indeterminate date	Uncertain	East of Dunsoghly castle (DU014-005001-) two square trenched areas are visible on an aerial photograph (CUCAP AID57). The Site has been partially built on since the photographs were taken. The general area is disturbed. Not visible at ground level.	No visible remains
DU014-005005			Crucifixion Plaque	1573	Above the door of the chapel (DU014-005002-) is an inscribed limestone tablet with symbols of the passion, a date of 1573 A. D. and initials J. P. M. D. D. S. i. e. John Plunkett, Miles de Dunsoghly, and wife's surname 'Sarsefield'.	Well preserved
DU014-005006			House- 16th/17th century	16th/17th century	Attached to bawn wall that extends from the northwest of Dunsoghly Castle (DU014-005001-). The west wall and north gable with Tudor style chimney is all that survives, and these have been incorporated into farm outbuildings. This is probably the building mentioned in the Civil survey (1654-6) as a 'dwelling house' with the castle at Dunsoghly (Simington 1945, 210).	Some remains
DU014-005096			Standing Stone	Prehistoric/uncertain	A standing stone was identified on the Fás Finglas Heritage Project in 1988/89(pers.comm. Marcus Nolan). Supposedly located in a field on a turn of bend across from Dunsoghley Castle ((DU014-005001-), a neglected field adjacent to an old farmyard which is being currently used as a garage. The Site is completely overgrown with evidence of dumped material. No local knowledge of a stone.	Unlocated
DU014-094			Habitation site	Multi-period	Investigations in 1988 for the Phase 2, NE Gas Pipeline revealed an area of occupation debris, containing artifacts of multi-period date including three iron objects. Located on slight N-facing incline (Gowen 1989, 8).	Excavated
DU014-102			Enclosure		A large circular enclosure located on low lying fields north of the M50 and	No visible remains

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
					west of N2. The crop mark is visible on aerial photography.	
DU014-130----			Ring Ditch		The ring ditch is located in a large field, close to the field's northern boundary. There are four ring ditches that are visible on Google Earth aerial photography. Zone of Notification extends over the scheme.	Some remains
DU014-131----			Ring Ditch		The ring ditch is located in a large field, close to the field's northern boundary. There are four ring ditches that are visible on Google Earth aerial photography. Zone of Notification extends over the scheme.	Some remains
DU014-132----			Ring Ditch		The ring ditch is located in a large field, close to the field's northern boundary. There are four ring ditches that are visible on Google Earth aerial photography. Zone of Notification extends over the scheme.	Some remains
DU014-133----			Ring Ditch		The ring ditch is located in a large field, close to the field's northern boundary. There are four ring ditches that are visible on Google Earth aerial photography. Zone of Notification extends over the scheme.	Some remains
DU014-137----			Ring Ditch		The circular shaped cropmark is in a tillage field and is visible on Google Earth.	Some remains
DU014-017----			Enclosure		The curvilinear enclosure is in a low-lying area under tillage. The feature is visible on the 1st edition OS 6-inch map (1837). Zone of Notification extends over the scheme.	No visible remains on ground level
DU014-047----			Inn		An OS 6-inch map shows an existing pub listed as the 'Old Red Lion'. The Inn was also mentioned in the Vestry Books for the Year 1675. The Site is located within overgrown pasture. Zone of Notification extends over the scheme.	No visible remains
DU014-098----			Ring Ditch		Crop mark of ring ditch shown on aerial photography.	No visible remains
DU014-104----			Enclosure		The oval enclosure is located in the middle of a large field and is visible on Google Earth. The oval enclosure is defined by a continuous fosse. North of the enclosure are three ring ditches.	Some visible remains
DU014-002001-	0626		Church	Medieval	The remains consist of a medieval parish church. The church lies in the west end of a graveyard in St Margaret's village. Originally, the medieval church was named 'Donaghmore' and was likely disturbed between 1630-1650. The only surviving feature of the church is the western portion.	Some remains
DU014-002002-		11348001	Graveyard		The graveyard is surrounded by a stone wall and has a sub-rectangular plan. Towards the southern boundary of the graveyard is a 18th century mausoleum.	Substantial remains

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
DU014-002003-			Chapel		This 16th century rectangular chapel was built by the Plunkett family. The chapel has a highly decorative entrance, blocked out windows and an L-shaped wall which extends from the northeast angle of the chapel. An early 19th century mausoleum is attached to the chapel. In addition to this, there are also internal burials and a big tree.	Substantial remains
DU014-003----	0624		Holy Well – ritual site		The enclosed spring well is dedicated to St. Brigid. The well was enclosed by Sir. John Plunkett (1582) The well has a stone wall, iron railings and a gate. The well started to dry out in the early 2000s.	Substantial remains
DU014-004----			Building		The hall contains a rectangular stone tablet with carvings of two rings side by side.	Substantial remains
DU014-099----			Ringfort		A curvilinear enclosure defined by a fosse was discovered by aerial photography.	No visible remains
DU014-108----			Enclosure		Circular enclosure visible on aerial photography. Located within a arable field.	Some visible remains
DU014-109----			Enclosure		Sub circular enclosure visible on aerial photography.	Some visible remains
DU011-124----			Enclosure		A large circular enclosure visible on aerial photography.	No visible remains at ground level
DU011-125----			Field System		A field system visible as a crop mark.	No visible remains at ground level
DU011-023001-			Ringfort-unclassified		An oval enclosure is shown on the 1837 OS 6-inch map, the feature could possibly be a ringfort. An archaeological investigation recovered nothing of archaeological significance. Zone of Notification extends over the scheme.	No visible remains
DU011-023002-			Graveyard		Tradition in the local area suggests that the Site was either an 'old fort or a burying place'. Zone of Notification extends over the scheme.	Not visible on ground level
DU011-156----			Enclosure		Circular enclosure predates a field boundary (formed townland boundary between Common and Corrstown. Possible that the area was a site of 'an old fort or burial ground'.	No visible remains
DU011-022001-	0641		Church		The only surviving feature of the church is the west tower. Zone of Notification extends over the scheme.	Some remains
DU011-022002-	0641		Graveyard		The graveyard is located amongst tilled fields. The walled graveyard encloses a raised area. Within the graveyard there is a mixture of 18th, 19th and 10th century headstones, the base of the west tower. The graveyard is still in use. Zone of Notification extends over the scheme.	Substantial remains

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
DU011-129----			Enclosure		The circular enclosure is visible from aerial photography.	No remains at ground level.
DU011-020----		0644	Castle/motte		The features have been included into a field boundary. The features are located on an elevated east facing ground at the highest point of the ridge and the north of the field boundary has a slight curve at the highest point.	Some remains
DU011-011004-			Castle-tower house		The castle-tower was located south of the church in Kilsallaghan. The only surviving feature of the castle is the western tower house which incorporates a southwest turret and a northwest stair turret. Historically, the castle was the Site of an engagement between Royalists and parliamentarians under Sir Charles Coote (1642). Zone of Notification extends over the scheme.	Some remains
DU011-011006-			Earthwork		The flat-topped earthwork is located towards the southeastern section of the castle. This feature is marked as a moat on historical maps. Zone of Notification extends over the scheme.	No visible remains
DU011-010----			Cross		The OS 1840 edition map lists the base of stone cross. The cross was located in between three roads. Zone of Notification extends over the scheme.	No visible remains
DU011-011001-		11333001	Church		Originally, the Site was a medieval chapel, now the Site is occupied by 'board of First Fruits Structure (1812). The wall footing is visible to the south of the church. Zone of Notification extends over the scheme.	Some visible remains
DU011-011002-			Graveyard		The raised sun-rectangular graveyard is bounded to the north, east and south by a breeze block wall. To the west the graveyard is bounded by a limestone wall. The St David's church of Ireland lies in the centre. The graveyard also has 18th/19th century headstones. Zone of Notification extends over the scheme.	Substantial remains
DU011-011003-			Ecclesiastical Enclosure	Pre-Norman	Towards the northwestern section of the church there is feature representing a flat wide embankment, this is likely the remains of an ecclesiastical enclosure. Further investigation has revealed a double enclosure that extends from the southwest to the northeast near the road. Aerial photography has identified a low curving bank enclosing the north and eastern area of the churchyard. Zone of Notification extends over the scheme.	Some visible remains
DU011-011005-			Field System		Towards the eastern section of the church there is a large level field. Within the field was evidence of a field system with drains and banks. The field system was evident on bird's eye mapping on Bing maps. However, archaeological investigations have identified nothing of archaeological significance. Zone of Notification extends over the scheme.	Some visible remains

RMP Ref	RPS ref	NIAH Ref/NMS Ref	Type	Period	Description	Condition
DU011-100----			Battlefield		Site of the Battle of Kilsallaghan (1642). The fighting took place in the immediate area around Kilsallaghan castle and the churchyard of St. David's. Zone of Notification extends over the scheme.	No visible remains
	0655		Motte	Anglo-Norman	Site of a flat-topped mound	Some visible remains
	0654		Castle	Medieval	Remains of a medieval stone tower house in Kilsallaghan	Some visible remains
	0627		Bridge		Stone bridge on road from St. Margaret's to Kilsallaghan	Still in use
	0628		Windmill	Late medieval	Remains of a circular stone tower	Some visible remains
	0644		Freedagh Mound	Anglo-Norman	Part of an earthwork incorporated into a field boundary.	Some visible remains
	0641		Chapelmidway church	Medieval	Remains of a base tower of a medieval church	
			Enclosure and Graveyard			Unknown
11342007			Figeal Bridge			Unknown
Unknown			Enclosure		Earthwork	Unknown
IA/16/75					Cemetery	
IA/234/64					Polished stone axe head	
Unknown			Historic grave	Fields town		
Unknown			Historic Grave	St Davids, Kilsallaghan		
DU-CHMW			Historic Grave	Chapelmidway		

G.2 Gazetteer 2: Architectural Heritage within 1km of the Proposed Development

RPS Ref	NIAH Ref/NMS Ref	Name	Description
0325		Fieldstown House, Oldtown Road (R122), Fieldstown, Fingal	18th century country house, walled garden and stone outbuildings
0330	11327007	Rowlestown House, Rowlestown West, Fingal	Detached five-bay two-storey over basement house, c.1760, retaining original fenestration. Single-bay three-storey return to rear and two-storey extension to left. Detached farm buildings to site. ROOF: Double pitched slate roof with terracotta ridge tiles and rough cast rendered chimney stacks with terracotta pots at gable ends. WALLS: Rough cast rendered; nap rendered plinth course. OPENINGS: Square headed window openings with rendered reveals, stone sills and 6/6 timber sash windows; single pane timber sashes to rear; round headed door with stone block and start surround; radial timber fanlight and probably original raised and fielded timber door.
0331	11327006	Rowlestown West, Fingal	Detached three-bay two-storey house, c.1890, with projecting entrance porch to ground floor flanked by bow windows. Single-storey extension to rear, c.1970. Stable yard, c.1900 to site. Detached three-bay single-storey former thatched cottage and detached four-bay single-storey farm building, c.1800, to site. ROOF: Hipped slate roof with terracotta ridge tiles and a rough cast rendered chimney stack with nap rendered cornice and terracotta pots. WALLS: Rough cast rendered to ground floor; nap rendered, ruled and lined to first floor; nap rendered plinth course. OPENINGS: Square headed window openings with rendered reveals, concrete cills, timber sash window; square headed door with patent reveals; timber panelled and glazed door with sidelights.
0332	11327001	Church of Our Lady Queen of Peace, Rowlestown East, Rowlestown, Fingal	Detached Roman Catholic church, c.1860, with five-bay side elevation to nave with single-storey chancel, having adjoining sacristy. Gable-fronted projecting entrance porch to street elevation. Gable-fronted projecting entrance porch to rear elevation, c.2000. ROOF: Double pitched; slate; terracotta crest tiles; cast-iron rainwater goods; cut limestone bellcote to left gable; asbestos tiled and ridging to porch, c.2000. WALLS: Snecked limestone; limestone quoins; limestone plinth course; buttresses flanking window openings. OPENINGS: Lancet windows with limestone surrounds; canted cills and hood mouldings; original diamond pattern leaded casements; Gothic arch entrance with limestone surround; tongue and groove timber door; bi-partite opening to right gable end, circular opening, above with rose window having four-trefoil window openings within with hood moulding - tri-partite to apse. INTERIOR: Single cell; open timber truss; painted stone archway before apse; stained glass tri-partite window to apse; mosaic tiles, c.1940, to walls; timber panelled gallery to rear.
0333		Rowlestown Bridge, Rowlestown East, Rowlestown, Fingal	Stone road bridge over the Broadmeadow River.
0335	11327005	Rowlestown Graveyard Killossery Fingal	Graveyard, with various cut stone grave markers from c.1725. Rubble stone church now in ruins.
	11342007	Chapelmidway Bridge	The triple arch rubble stone bridge was constructed in 1820.

G.3 Gazetteer 3: Planned Landscapes within 1km of the Proposed Development

NIAH Ref	Name	Description
2171	Fieldstown House, Balrothery West, Clonmethan, Fieldstown, Fingal.	Shown on the First Edition and Second Edition OS mapping. The Site footprint is visible with the boundary defined on current mapping and the principal building intact. Farming units have been built to the west of the house. The landscape includes woodlands, a formal garden, a kitchen/walled garden and water features.
2174	Rowlestown House, Killossery, Fingal.	Buildings indicated, area to north labelled Rowlestown West on current mapping. The Site footprint is visible while the principal building is still intact as woodlands, parkland, formal garden and water features. The entrances and the drive have changed. The Site is shown on the First Edition OS map. The Second edition shows the area as slightly reduced.
2296	Newbarn House, Nethercross, Kilsallaghan, Newbarn Fingal.	Shown on the First Edition and reduced on the Second Edition OS mapping. The Site footprint is visible with the boundary defined on current mapping and the principal building intact. It is labelled Newbarn on current mapping. Parkland and formal garden are still intact, but the woodland footprint has changed.
2301	Corrstown House Nethercross Kilsallaghan Corrstown	Shown on the First Edition sheet, reduced on the Second Edition and the Revised Edition.
2302	Kilcoskan House Nethercross Kilsallaghan Kilcoskan	Shown on the First Edition sheet, reduced on the Second Edition and the Revised Edition.

G.4 Heritage Asset Figures

AECOM

PROJECT

FIELDSTOWN 110KV SUBSTATION & GRID ROUTE

CLIENT

ENERGIA SOLAR HOLDINGS LTD.

energia

CONSULTANT

AECOM
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
County Dublin
Ireland
T +353 (0)1 2383100
www.aecom.com

LEGEND

- PROPOSED DEVELOPMENT BOUNDARY
- STUDY AREA
- HERITAGE ASSET
- PROTECTED STRUCTURE
- ZONES OF NOTIFICATION

NOTES

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P0	09.10.23	FIRST ISSUE FOR PLANNING

STATUS

FOR PLANNING

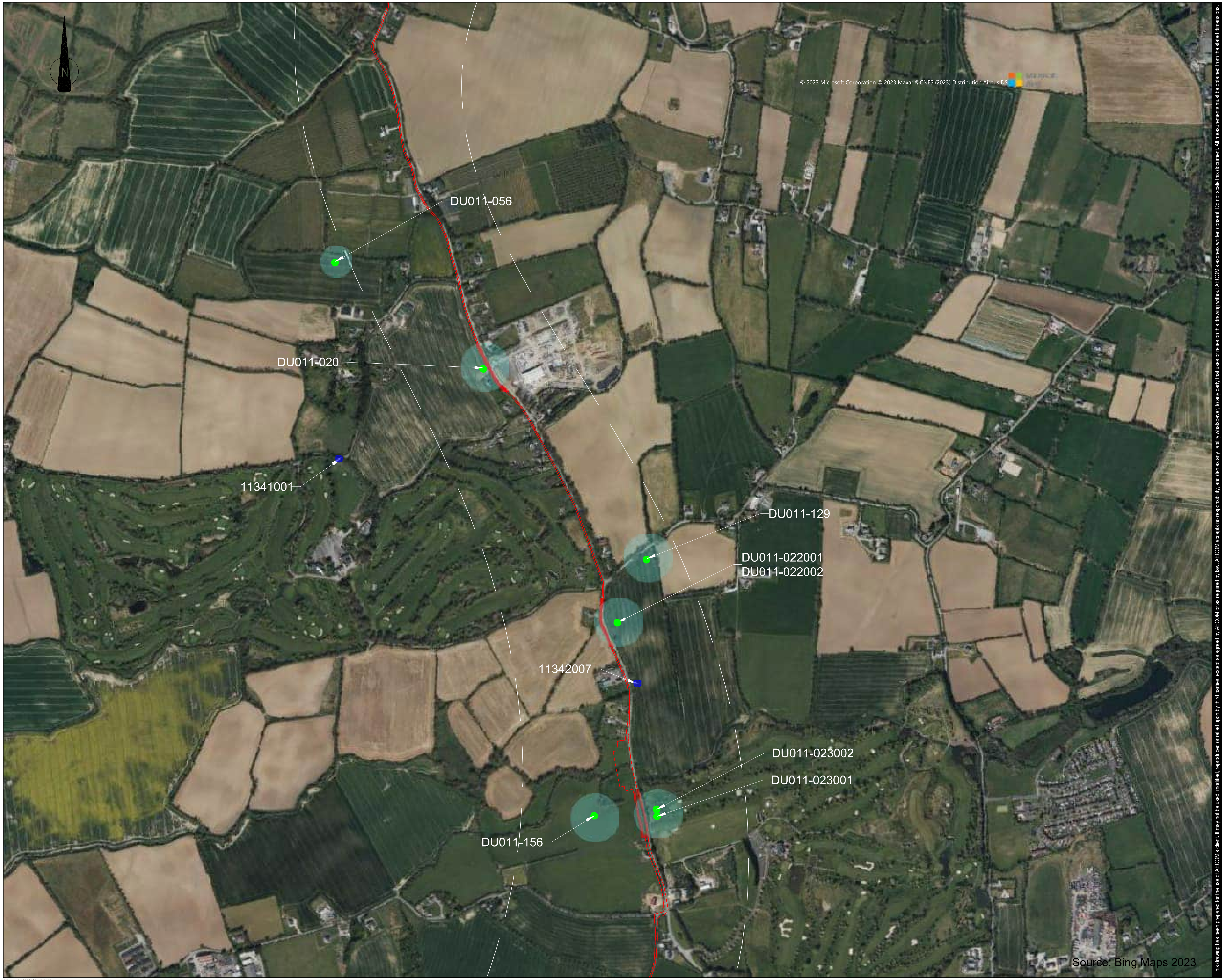
PROJECT NUMBER	SCALE
60657534	1:5000 @ A1

SHEET TITLE

FIELDSTOWN 110KV SUBSTATION & GRID ROUTE HERITAGE ASSETS SHEET 1 OF 4

SHEET NUMBER	REV
FIGURE 14-1	P0

Last saved by: BERNICE.CAHILL(2023-11-13) Last Plotted: 2023-12-01
Filename: \\NA.AECOMNET.COM\LFS\EMEA\DUBLIN-IEDBL2\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP\60657534_SUMMERHILL\FIELDSTOWN\SID\900_CAD_GIS\910_CAD\FIELDSTOWN\ENVI FIGURES\60657534_FIELDSTOWN_HERITAGE_V1.DWG
Initials : Designer DR Checked BC Approved DK
Printed on ___% Post-Consumer Recycled Content Paper



AECOM

PROJECT

FIELDSTOWN110KV SUBSTATION & GRID ROUTE

CLIENT

ENERGIA SOLAR HOLDINGS LTD.

energia

CONSULTANT

AECOM
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
County Dublin
Ireland
T +353 (0)1 2383100
www.aecom.com

LEGEND

- PROPOSED DEVELOPMENT BOUNDARY
- STUDY AREA
- HERITAGE ASSET
- PROTECTED STRUCTURE
- ZONES OF NOTIFICATION

NOTES

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P0	09.10.23	FIRST ISSUE FOR PLANNING

STATUS

FOR PLANNING

PROJECT NUMBER	SCALE
60657534	1:5000 @ A1

SHEET TITLE

FIELDSTOWN 110KV SUBSTATION & GRID ROUTE
HERITAGE ASSETS SHEET 2 OF 4

SHEET NUMBER	REV
FIGURE 14-2	P0

Last saved by: BERNICE.CAHILL(2023-11-13) Last Plotted: 2023-12-01
Filename: \\NA.AECOMNET.COM\LFS\EMEA\DUBLIN-IEDBL2\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP60657534_SUMMERHILL\FIELDSTOWN\SID\900_CAD_GIS\910_CAD\FIELDSTOWN\ENVI FIGURES\60657534_FIELDSTOWN_HERITAGE_V1.DWG
Initials : Designer DR Checked BC Approved DK

AECOM

PROJECT

FIELDSTOWN 110KV SUBSTATION & GRID ROUTE

CLIENT

ENERGIA SOLAR HOLDINGS LTD.

energia

CONSULTANT

AECOM
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
County Dublin
Ireland
T +353 (0)1 2383100
www.aecom.com

LEGEND

- PROPOSED DEVELOPMENT BOUNDARY
- STUDY AREA
- HERITAGE ASSET
- ZONES OF NOTIFICATION

NOTES

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P0	09.10.23	FIRST ISSUE FOR PLANNING

STATUS

FOR PLANNING

PROJECT NUMBER: 60657534

SCALE: 1:5000 @ A1

SHEET TITLE

FIELDSTOWN 110Kv SUBSTATION & GRID ROUTE HERITAGE ASSETS SHEET 3 OF 4

SHEET NUMBER: FIGURE 14-2

REV: P0

Approved DK Checked BC Initials : Designer DR

Last saved by: BERNICE.CAHILL(2023-11-13) Last Plotted: 2023-12-01

Filename: \\NA.AECOMNET.COM\LFS\EMEA\DUBLIN-IEDBL2\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP\60657534_SUMMERHILL\FIELDSTOWN\SID\900_CAD_GIS\910_CAD\FIELDSTOWN\ENVI FIGURES\60657534_FIELDSTOWN_HERITAGE_V1.DWG

AECOM

PROJECT

FIELDSTOWN 110KV SUBSTATION & GRID ROUTE

CLIENT

ENERGIA SOLAR HOLDINGS LTD.

energia

CONSULTANT

AECOM
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
County Dublin
Ireland
T +353 (0)1 2383100
www.aecom.com

LEGEND

- PROPOSED DEVELOPMENT BOUNDARY
- STUDY AREA
- HERITAGE ASSET
- ZONES OF NOTIFICATION

NOTES

ISSUE/REVISION

I/R	DATE	DESCRIPTION
P0	09.10.23	FIRST ISSUE FOR PLANNING

STATUS

FOR PLANNING

PROJECT NUMBER	SCALE
60657534	1:5000 @ A1

SHEET TITLE

FIELDSTOWN 110KV SUBSTATION & GRID ROUTE HERITAGE ASSETS SHEET 4 OF 4

SHEET NUMBER	REV
FIGURE 14-4	P0

Last saved by: BERNICE.CAHILL(2023-11-13) Last Plotted: 2023-12-01

Designer DR Checked BC Approved DK

Printed on ___% Post-Consumer Recycled Content Paper

Appendix H Landscape Photomontages

Proposed Fieldstown Substation

Photomontage Booklet

November 2023


Viewpoint Location Map
Hill of Tara
N
1
2
10
3
4
5
6
7
8a
8b
9

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	52.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	544m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 13:56	Location:	E711591 N751134		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP01

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	52.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	544m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 13:56	Location:	E711591 N751134		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP01

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	52.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	544m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 13:56	Location:	E711591 N751134		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP01

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	52.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	544m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 13:56	Location:	E711591 N751134		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP01

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	52.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	544m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 13:56	Location:	E711591 N751134		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP01

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	43.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	251m
Paper Size:	A1	Direction of View:	East		
Date / Time:	20/10/2022 13:44	Location:	E711619 N750697		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP02

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G
Enlargement Factor:	96%	Horizontal Field of View:	90°
Paper Size:	A1	Direction of View:	East
Date / Time:	20/10/2022 13:44	Location:	E711619 N750697

Eye level:	43.1m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	251m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP02

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	43.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	251m
Paper Size:	A1	Direction of View:	East		
Date / Time:	20/10/2022 13:44	Location:	E711619 N750697		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP02

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	43.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	251m
Paper Size:	A1	Direction of View:	East		
Date / Time:	20/10/2022 13:44	Location:	E711619 N750697		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP02

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	43.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	251m
Paper Size:	A1	Direction of View:	East		
Date / Time:	20/10/2022 13:44	Location:	E711619 N750697		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP02

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3
Projection:	Cylindrical
Enlargement Factor:	96%
Paper Size:	A1
Date / Time:	20/10/2022 13:14

Camera:	Nikon D750
Lens:	Nikon 50mm f/1.4G
Horizontal Field of View:	90°
Direction of View:	North East
Location:	E711731 N750129

Eye level:	36.2m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	497m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP03

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	43.1m AOD
Projection:	Cylindrical	Lens:	Nikon fixed 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	251m
Paper Size:	A1(resized to A3 for EIAR)	Direction of View:	East		
Date / Time:	20/10/2022 13:44	Location:	E711619, N750697		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP03

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	43.1m AOD
Projection:	Cylindrical	Lens:	Nikon fixed 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	251m
Paper Size:	A1(resized to A3 for EIAR)	Direction of View:	East		
Date / Time:	20/10/2022 13:44	Location:	E711619, N750697		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP03

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	36.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	497m
Paper Size:	A1	Direction of View:	North East		
Date / Time:	20/10/2022 13:14	Location:	E711731 N750129		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP03

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	36.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	497m
Paper Size:	A1	Direction of View:	North East		
Date / Time:	20/10/2022 13:14	Location:	E711731 N750129		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP03

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	38.4m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	584m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:36	Location:	E712470 N750269		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP04

45°	40°	35°	30°	25°	20°	15°	10°	5°	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	38.4m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	584m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:36	Location:	E712470 N750269		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP04

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	38.4m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	584m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:36	Location:	E712470 N750269		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP04

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	38.4m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	584m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:36	Location:	E712470 N750269		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP04

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	38.4m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	584m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:36	Location:	E712470 N750269		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP04

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3
Projection:	Cylindrical
Enlargement Factor:	96%
Paper Size:	A1
Date / Time:	20/10/2022 12:22

Camera:	Nikon D750
Lens:	Nikon 50mm f/1.4G
Horizontal Field of View:	90°
Direction of View:	North
Location:	E712192 N750059

Eye level:	35.2m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	598m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP05

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	35.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	598m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 12:22	Location:	E712192 N750059		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP05

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	35.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	598m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 12:22	Location:	E712192 N750059		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP05

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3
Projection:	Cylindrical
Enlargement Factor:	96%
Paper Size:	A1
Date / Time:	20/10/2022 12:22

Camera:	Nikon D750
Lens:	Nikon 50mm f/1.4G
Horizontal Field of View:	90°
Direction of View:	North
Location:	E712192 N750059

Eye level:	35.2m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	598m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP05

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	35.2m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	598m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 12:22	Location:	E712192 N750059		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP05

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	800m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:03	Location:	E711683 N749827		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP06

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	800m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:03	Location:	E711683 N749827		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP06

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	800m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:03	Location:	E711683 N749827		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP06

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	800m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:03	Location:	E711683 N749827		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP06

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	800m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:03	Location:	E711683 N749827		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP06

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	54.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	1615m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:28	Location:	E710828 N749380		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP07

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	54.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	1615m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:28	Location:	E710828 N749380		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP07

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	54.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	1615m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:28	Location:	E710828 N749380		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP07

WIRELINE (NO PLANTING)

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	54.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	1615m
Paper Size:	A1	Direction of View:	North		
Date / Time:	20/10/2022 13:28	Location:	E710828 N749380		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP07

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G
Enlargement Factor:	96%	Horizontal Field of View:	90°
Paper Size:	A1	Direction of View:	North
Date / Time:	20/10/2022 13:28	Location:	E710828 N749380

Eye level:	54.8m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	1615m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP07

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G
Enlargement Factor:	96%	Horizontal Field of View:	90°
Paper Size:	A1	Direction of View:	North West
Date / Time:	20/10/2022 11:53	Location:	E712321 N750662

Eye level:	47.8m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	311m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08a

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	311m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:53	Location:	E712321 N750662		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08a

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	311m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:53	Location:	E712321 N750662		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08a

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	311m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:53	Location:	E712321 N750662		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08a

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.8m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	311m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:53	Location:	E712321 N750662		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08a

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.5m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	377m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:59	Location:	E712389 N750630		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.5m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	377m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:59	Location:	E712389 N750630		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G
Enlargement Factor:	96%	Horizontal Field of View:	90°
Paper Size:	A1	Direction of View:	North West
Date / Time:	20/10/2022 11:59	Location:	E712389 N750630

Eye level:	47.5m AOD
Height of Camera:	1.6m
Distance to Main Development Area:	377m

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.5m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	377m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:59	Location:	E712389 N750630		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	47.5m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	377m
Paper Size:	A1	Direction of View:	North West		
Date / Time:	20/10/2022 11:59	Location:	E712389 N750630		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP08b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	154.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	21892m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 14:51	Location:	E691913 N759647		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP09

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	154.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	21892m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 14:51	Location:	E691913 N759647		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP09

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	154.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	21892m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 14:51	Location:	E691913 N759647		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP09

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	154.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	21892m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 14:51	Location:	E691913 N759647		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP09

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Nikon D750	Eye level:	154.1m AOD
Projection:	Cylindrical	Lens:	Nikon 50mm f/1.4G	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	21892m
Paper Size:	A1	Direction of View:	South East		
Date / Time:	20/10/2022 14:51	Location:	E691913 N759647		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP09

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Canon EOS 5D Mark III	Eye level:	39m AOD
Projection:	Cylindrical	Lens:	EF50mm f/1.4 USM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	224m
Paper Size:	A1	Direction of View:	East		
Date / Time:	19/10/2023 13:47	Location:	711648 N750607		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP10b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Canon EOS 5D Mark III	Eye level:	39m AOD
Projection:	Cylindrical	Lens:	EF50mm f/1.4 USM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	224m
Paper Size:	A1	Direction of View:	East		
Date / Time:	19/10/2023 13:47	Location:	711648 N750607		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP10b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Canon EOS 5D Mark III	Eye level:	39m AOD
Projection:	Cylindrical	Lens:	EF50mm f/1.4 USM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	224m
Paper Size:	A1	Direction of View:	East		
Date / Time:	19/10/2023 13:47	Location:	711648 N750607		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP10b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Canon EOS 5D Mark III	Eye level:	39m AOD
Projection:	Cylindrical	Lens:	EF50mm f/1.4 USM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	224m
Paper Size:	A1	Direction of View:	East		
Date / Time:	19/10/2023 13:47	Location:	711648 N750607		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP10b

45° 40° 35° 30° 25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35° 40° 45°

AECOM Delivering a better world

Visualisation Type:	3	Camera:	Canon EOS 5D Mark III	Eye level:	39m AOD
Projection:	Cylindrical	Lens:	EF50mm f/1.4 USM	Height of Camera:	1.6m
Enlargement Factor:	96%	Horizontal Field of View:	90°	Distance to Main Development Area:	224m
Paper Size:	A1	Direction of View:	East		
Date / Time:	19/10/2023 13:47	Location:	711648 N750607		

Note:
Images to be viewed at a comfortable arm's length.

Proposed Fieldstown Substation

VP10b

Appendix I Traffic and Transport Assessment

AECOM

Fieldstown 110kv Substation and Grid Route

Traffic and Transport Assessment

Energia Solar Holdings Ltd.

Project number: 60657534
Document reference: 60657534_ACM_RP_EN_FT_002_2

1 December 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Hilary Herlihy Consultant	Paul Kirk Senior Consultant	Jen Searle Associate Director	Jen Searle Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	24 May 2023	Draft	JS	Jen Searle	Associate Director
1	19 October 2023	Second Draft	BC	Bernice Cahill	Associate Director
2	1 December 2023	Final	BC	Bernice Cahill	Associate Director

Prepared for:

Energia Solar Holdings Ltd.

Prepared by:

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin A96 T927
Ireland

T: +353 1 696 6220
aecom.com

Table of Contents

Figures

Tables

1. Introduction

This Traffic and Transport Assessment (TTA) has been prepared by AECOM on behalf of Energia Solar Holdings (herein referred to as the 'Applicant').

The Applicant is proposing a 110kV AIS substation and grid connection to Finglas Substation (hereafter referred to collectively as the Proposed Development). The Proposed Development is located within the administrative area of Fingal County Council (FCC).

This document presents the likely traffic and transport impacts associated with Proposed Development and associated works and determine appropriate mitigation measures to reduce those impacts.

1.1 Legislation Policy and Guidance

The following is a list of sources of information consulted for use in this report.

- Fingal County Development Plan 2023-2029
- Traffic Signs Manual, (Department of Transport, Tourism and Sport, August 2019).
- PE-PDV-02045, Transport Assessment Guidelines, (Transport Infrastructure Ireland (TII), May 2014).
- PE-PAG-02016, Project Appraisal Guidelines for National Roads Unit 5.2 – Data Collection (Transport Infrastructure Ireland, October 2016).
- PE-PAG-02017, Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (Transport Infrastructure Ireland, May 2019).
- PE-PAG-02039, Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts (Transport Infrastructure Ireland, October 2016).
- DN-GEO-03031, Rural Road Link Design (Transport Infrastructure Ireland, June 2017)
- DN-GEO-03060, Geometric Design of Junctions (Priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions (Transport Infrastructure Ireland, June 2017).
- The Design Manual for Urban Roads and Streets, (Department of Transport, Tourism and Sport, May 2019).
- National Development Plan (Department of Public Expenditure and Reform, February 2018).

1.2 Methodology

The assessment detailed in this report has been undertaken combining desktop study, site observations and reference to current policy advice and best practice in line with consultation with statutory agencies. Predicted construction vehicle movement volumes have been compared to baseline traffic flows to identify if there are likely to be periods where the increase in traffic, either all traffic or specifically Heavy Goods Vehicle (HGV) traffic, exceeds standard thresholds. Such additional traffic has potential to cause detrimental effects, for example, on driver delay, road safety or community.

1.2.1 Study Area

The study area includes the Proposed Development as well as the surrounding road network.

1.2.2 Determination of the Baseline Environment

The baseline environment has been determined through data obtained from various desk top studies and site audits of the local road network, subsequently enabling the identification of existing local travel characteristics and an appreciation of the local receiving environment from a transportation perspective.

2. Description of Proposed Development

2.1 Site Location

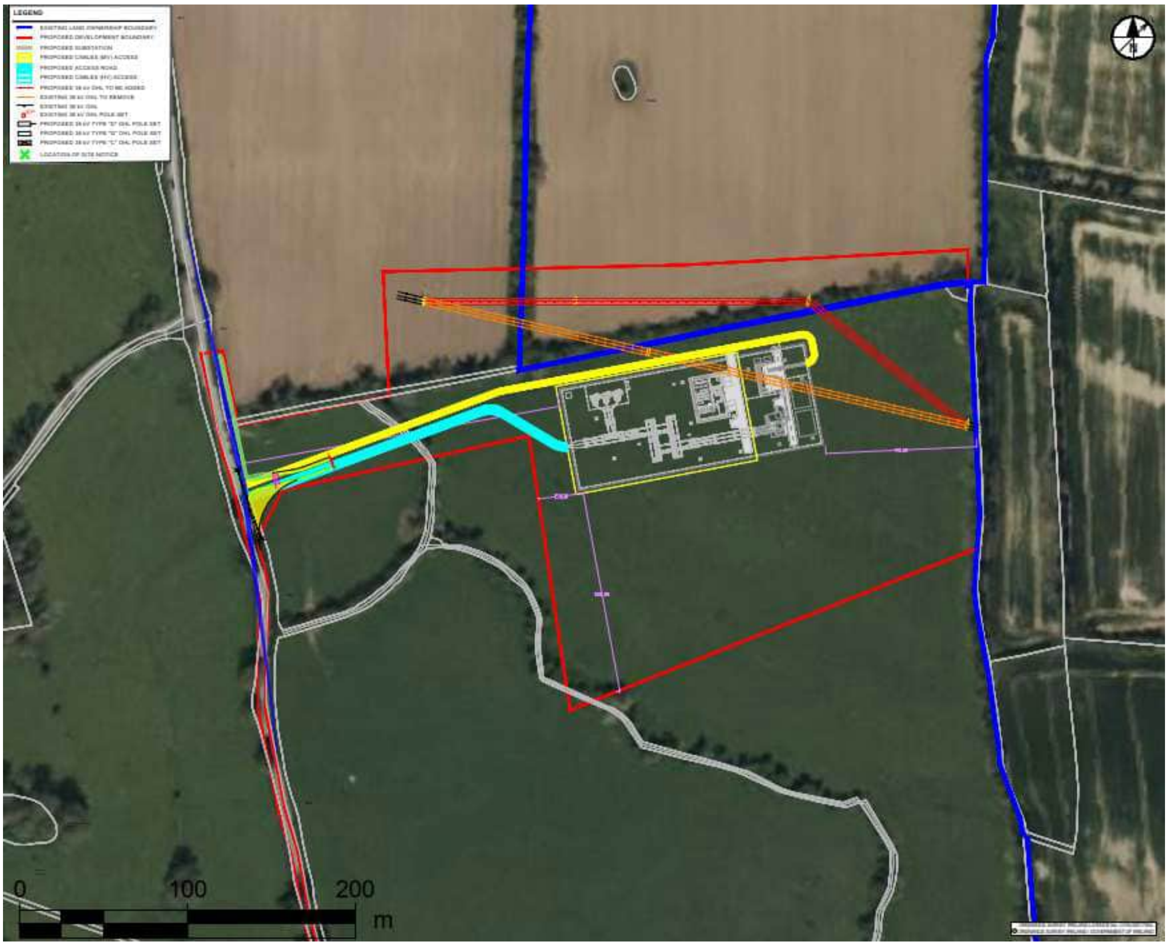
The Site is comprised of the Proposed Substation Development and Proposed Grid Connection.

2.1.1 Proposed Substation Development

The Proposed Substation Development is located within an area of agricultural grassland on lands at Fieldstown East, County Dublin (Irish Transverse Mercator (ITM) coordinates: 711952, 750625). The Proposed Substation Development is bounded by the R122 regional road immediately west and agricultural lands to the east, north and south as shown in Figure 2-1.

The largest nearby towns are Ashbourne, approximately 4.5km east, and Swords, approximately 9.5km to the southeast. Oldtown is located approximately 2.5km directly north, Ballyboghill is approximately 4.5km east, and Rolestown is situated within 1km southeast of the site. There are dispersed one-off housing units located in proximity to the Proposed Substation Development, with the nearest property is located approximately 300m west.

Figure 2-1 Location of Proposed Substation Development and Associated Infrastructure

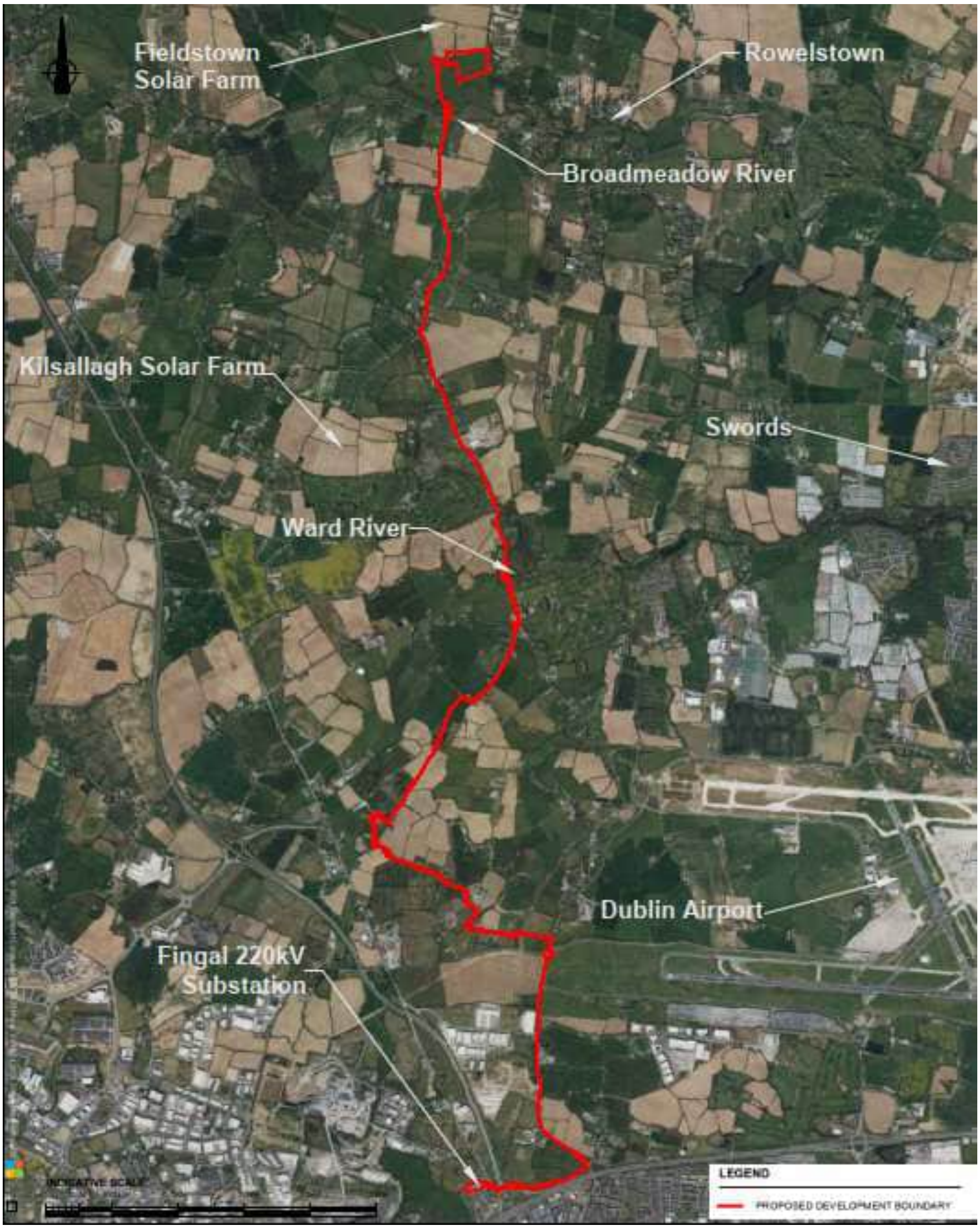


The proposed onsite electrical substation will be served by an access road from the R122 which will allow access for maintenance of the substation by ESB/EirGrid.

2.1.2 Proposed Grid Connection

In order to connect the substation to the transmission network, it is proposed to connect the 110kV substation to the Finglas substation by means of a 110kV underground cable. The Proposed Grid Connection is approximately 13.3km. This cable run will exit the substation compound travelling west before heading south and entering the R122 regional road. The proposed cable connection will follow the path of the R122 to the L7325 and L7231 before returning to the R122, before heading west adjacent to the M50, under the N2 to the boundary of Finglas Substation as shown in Figure 2-2.

Figure 2-2 Proposed Grid Connection



The majority of the Proposed Grid Connection is located within the public road with dispersed residential and commercial properties adjacent to the route. The planned tie in for the Proposed Grid Connection to Finglas substation is located to the north of Junction 5 of the M50 motorway, to the west of Junction 1 of the N2.

2.2 Details of the Proposed Development

The Proposed Development includes:

Proposed Substation Development:

- A 110kV AIS tail-fed substation compound comprising:
  - A single storey 110kV AIS substation building [total floor area comprising circa 450m², height approximately 6.3m).
  - MV switchgear container and switchboard total floor area comprising circa 60m².
  - 110kV grid transformer and two-house transformers within bunded enclosures (height approximately 6m).

- Diversion of existing 38kV overhead line (OHL).
- 160MV transformer positioned within bunded enclosures (height approximately 6m).
- A shunt filter.
- Diesel generator & diesel tank.
- Twelve lightning protection masts (height approximately 20m).
- Two service/maintenance carparking facilities.

- Internal access roads and car parking.
- New site entrance from the R122 regional road.
- Drainage infrastructure.
- 420m of 2.6m high perimeter palisade fencing and post and rail (1.4m high) fencing.
- 200m of internal separation fencing (2.6m high).
- All associated and ancillary site development works including localised alterations to the landscape.

Proposed Grid Connection:

- A 13.3km underground 110kV cable connection to Finglas Substation to facilitate connection to national grid.
- Approximately 20 joint bays primarily within public roadways.
- Trenchless installation in the form of horizontal directional drilling (HDD) will be used at the following locations:
  - Broadmeadow River Bridge before the junction of the R122 and the R125 regional
  - roads. Ward River Bridge on the R122 regional road.
  - Under the N2 prior to entering Finglas Substation.

2.2.1 Proposed Substation Development Access

Access to the Proposed Substation Development is currently provided via an existing gated entrance from the R122. It is proposed to move the existing site entrance approximately 20m south to achieve required sightlines. The creation of the new site entrance will require the removal of existing hedgerow but there are no mature trees in this area. The entrance will be suitably splayed (refer to Drawing No. 60657535-ACM-DWG-FT-619 submitted as part of this planning application).

2.3 Construction Phase

The exact programme of works is yet to be finalised, but it is expected that:

- Application is made for Planning Permission in quarter Q4 of 2023.
- Commence site enabling and construction works in Q4 of 2024 (subject to grant of planning permission).
- Completion of construction and commissioning in Q4 of 2026.

Construction activities will include the following elements as shown in Table 2-1.

Table 2-1 Main Construction Elements and Associated Activities

Element	Description of activities
Site Preparation and Enabling Works	Site establishment. Site clearance works. Construction of temporary site drainage. Bulk earthworks including excavation and removal of topsoil/soil. Infilling of material for internal access road, site compound and laydown area. Landscaping/reinstatement.
Underground Cables	Trenching and installation of underground cables, cable joint bays and pulling pits. Installation of the associated above ground infrastructure (cable marker posts, communication boxes and access points). HDD of water and road crossings.

Element	Description of activities
OHL Diversion	The site preparation required for OHL diversion will be limited with minimal site clearance required. Excavation. Pouring of concrete foundations for mast structures. Backfill and tower body installation.
Substation Construction	Pouring of concrete foundations (potentially piling works if required). Erection of steel frame and cladding walls and roofs for any required buildings. Permanent foul and surface water drainage works. Installation of above ground and underground cabling. Electrical installation, commissioning and operation. Other miscellaneous civil works including erection of fencing, provision of site entrance, paving etc.

Consideration should be given at the detailed design stage to ensure coordination between the construction phasing and equipment delivery schedules.

Construction activities will gradually phase out from pre-construction followed by commissioning and testing of the substation and equipment. It is expected that the number of construction workers required throughout the duration of the construction phase will peak at approximately 50 persons (peak during construction). It is anticipated that the construction of the Proposed Development will be completed during normal construction hours, i.e., 07.00 and 19.00 Monday to Friday and 08.00 to 13.00 on Saturday.

The proposed programme for the construction works will be approximately 24 months from initial enablement works through to commissioning. It is expected that the civil works will take approximately 5 to 6 months, with a further 6 months estimated for cable installation, jointing and testing and reinstatement.

Consideration should be given at the detailed design stage to ensure coordination between the construction phasing and equipment delivery schedules.

2.3.1 Haulage Route and Construction Traffic

Construction materials will be brought to site by road along the R122 and R125 from the wider environs. Construction materials will be transported in clean vehicles and lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent escape of material along the public roadway. Materials will be sourced locally where possible to minimise transportation distances and will be scheduled to avoid queues/increased traffic on local routes.

Construction of the site is anticipated to take 24 months additional traffic movements are expected to peak at 80 vehicles per day, with 30 of those movements being Heavy Goods Vehicle (HGV).

2.3.2 Proposed Substation Development Access

Access to the Proposed Substation Development is currently provided via an existing gated entrance from the R122. It is proposed to move the existing site entrance approximately 20m south to achieve required sightlines. The creation of the new site entrance will require the removal of existing hedgerow but there are no mature trees in this area. The entrance will be suitably splayed. A 4m wide compacted access track will extend from the entrance to the substation compound. The track will include a geotextile base and filter membrane and 200mm of Clause 804 sub-base.

2.3.3 Site Preparation and Enabling Works

The preparation phase for the Proposed Development will involve site clearance, excavations and levelling of the Proposed Substation Development Site to the necessary base level for construction, surveying and setting out for structures and any rerouting of services/connections to services. A combination of bulldozer, excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

A temporary construction compound of approximately 2,500m² will be located adjacent to the Proposed Development boundary.

Temporary access roads will be constructed by stripping surface soils, placing geotextile reinforcement at subgrade level followed by a layer of granular material in accordance with the specification to form a working surface for vehicle. Roadside drains within the temporary works area will be culverted and check dams made from stone or sandbags covered with terram will be inserted upstream and downstream of these culverts to intercept any solids generated during the works.

2.3.4 Levelling/Cut and Fill

The site preparation phase for the substation will involve site clearance, excavations and levelling of the site to the necessary base level for construction, surveying and setting out for structures and any rerouting of services/connections to services. A combination of bulldozer, excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

Approximately 10,000m³ (circa 18,000 tonnes) of clean backfill would be brought to Proposed Substation Development from licensed quarries. All material will undergo validation sampling to confirm suitability from a geotechnical and environmental perspective. In so far as possible, contractors will be required to utilise quarries local to the site.

The Proposed Grid Connection is anticipated to require earthworks associated excavation works for the underground cabling. For the purpose of this assessment, the volume of earthworks is estimated to be in the order of 10,000m³, however, excavated spoil will be reused for trench reinstatement purposes, reducing the volume of offsite import and/or disposal.

Any excess spoil not suitable and/or required for reuse on site will be removed offsite for appropriate reuse, recovery and/or disposal as reused.

2.3.5 Substation

The footprint of the proposed onsite electrical substation covers an area of approximately 7.5ha. It will include an EirGrid control building, MV switchgear building and the electrical substation components necessary to consolidate the electrical energy generated by the associated solar farms and export the electricity to the national grid. The layouts of the Proposed Substation Development and its compound are shown in Drawing 60657534-ACM-DWG-FT-601 accompanying this planning application. The construction and exact layout of electrical equipment in the onsite electrical substation will be to EirGrid/ESB Network specifications.

2.3.6 Proposed Grid Connection

The Proposed Grid Connection will comprise a single circuit connection with three 160mm diameter HDPE power cable ducts and two 125mm diameter High Density Polyethylene (HDPE) communication ducts installed in an excavated trench, typically 600mm wide by 1,250mm deep primarily within public roadways. Existing utility services of varying diameters and depths are located along the route and some will be required to be crossed. Where existing utilities/services are found, the works will be diverted around the service/utility or below them.

Road and lanes closures will be required to facilitate in-road works associated with the Proposed Grid Connection.

Before the junction of the R122 and R125, the Proposed Grid Connection will cross under the Broadmeadow River, before the junction of the R122 and R125 it will cross under the Ward River and will also cross under the N2/M50 prior to entering Finglas Substation. The cables will be installed by HDD at these three locations via entrance and exit pits on either side of the crossings. The underground cabling will cross existing culverts using undercrossing or overcrossing method.

HDD crossings will be installed using specialist equipment along a predetermined route. Two temporary pits (entry and exit) are excavated at each side of the HDD route, locations are selected based on drilling requirements including angle, depth, diameter, curvature, vertical clearance underneath water courses and structures, etc.

Access to the entry and exit pits will be via a newly constructed temporary access or existing access road/track. Works area will be a minimum of 15m back from watercourses and will be levelled where required in accordance with the specification to form access roads and temporary work platform. The depth of the drill below the riverbed will be determined from site investigations. Once the route has been drilled, the ducts will be towed into the bore.

Upon completion, temporary platforms at entry and exit pits will be removed and area reseeded where required.

All works will be carried out in accordance with international best practice and full compliance with health and safety requirements.

2.3.7 Reinstatement

Once all construction works are complete, the work areas will be reinstated with excavated soil and either seeded out with native species, allowed to vegetate naturally, or reinstated with excavated grass turves and will be restored to their original condition.

Following duct installation, roads will be reinstated to the standard required by FCC.

Landscaping consists of native meadow planting surrounding the compound with native hedgerow planting to the north and woodland planting within the visual screening mitigation planting (refer to Drawing 60657534-ACM-DWG-FT-620 submitted as part of this application).

3. Baseline Environment

The road network within the environs of the Proposed Develpoment route comes under the jurisdication of FCC. The hierarchy of roads within the county (which is same as throughout Ireland) are outlined in Table 3-1 and Table 3-2.

Table 3-1 Road Classifications

Road Category	Description
National Primary Road	These roads generally run along arterial routes between the main centres of urban population and to/from ports. They may be motorways, dual carriageways or simply wide two-way roads.
National Secondary Road	These generally run between centres of lesser population but still important towns, many of which are tourist routes that become quite busy with tourist buses in the summer. They tend mainly to be good quality two-way roads and some are to dual carriageway standard.
Regional Road	These roads provide the link between National Routes and towns and villages that are not located on the busier routes. They also provide strategic links between the towns and villages themselves.
Local Roads (Primary, Secondary and Tertiary)	The local road system is operated in three tiers defining local importance, usage, and maintenance priorities. They form a network of single carriageway roads of varying quality.

Table 3-2 Number and Classification of Roads Crossed by Proposed Grid Connection

Classification/ Location	National Primary	National Secondary	Regional	Local	Total
Dublin	1	0	3	1	4

The route of the Proposed Grid Connection will cross one National Primary Road, the N2 and three Regional Roads, the R125, R121 and R122. It will also cross one local road.

Currently the road network in the vicinity of the Proposed Substation Development is operating well below capacity with users experiencing no significant delays.

4. Traffic Impacts of the Proposed Development

4.1 Existing Road Network

The study area for this report was defined by the assumed distribution of trips generated from the Site on to the local road network. This was based on the local roads diverging off from the site access point. From here it was assumed that all immediate junction to more high priority roads would be impacted from the Site traffic generation. Figure 2-2 illustrates the road network within the study area of the Site.

4.1.1 R125

The R125 is a single lane regional road. The R125 connects to Ratoath from the west of the study area and connects to Swords via the east of the study area.

The section of the R125 to the west of the R122/R125 crossroad junction predominantly has no pedestrian facilities until it reaches the town of Ratoath. For a small section from Nine Mile Roundabout to Harlockston Lane (approx. 1.3km) a pedestrian footway is provided on the southern side of the R125 carriageway. The carriageway width is approx. 5.5m. The speed along the R125 is 80kph.

There is a bus stop located on the R125 at Harlockstown Lane which Bus Eireann route 105 and 105x (Drogheda – Ashbourne – Ratoath – Blanchardstown) with services every 30 mins in the peak hours.

The section of the R125 to the east of the R122/R125 crossroad junction has a footpath provided on the northern side of the carriageway which ends at the centre of Rolestown. The footpath then continues on southern side of the R125 carriageway for approximately 900m. There is no public lighting provided for this section of the R125. From this point, there is no pedestrian footway or public lighting provided for approximately 3.4km. From the crossroads at Rathbeale Road/ Mooretown into Swords, footpaths are provided on both sides of the R125 carriageway in addition to public lighting on both sides of the road. Dedicated controlled pedestrian crossings are provided at the Rathbeale Rd/ Moorestown junction in addition to dedicated cycle paths.

There is a bus stop along the R125 located approximately 650m east of the R125/R122 crossroads, and approximately 1km to the southeast of the site. Bus route 197 (Swords to Ashbourne) operates services along the R125 averaging 16 services a day.

Figure 4-1 illustrates the characteristics and approximate measurements of the R125 as described above.

Figure 4-1 R125 Approximate Measurements (Source: Bing Maps)

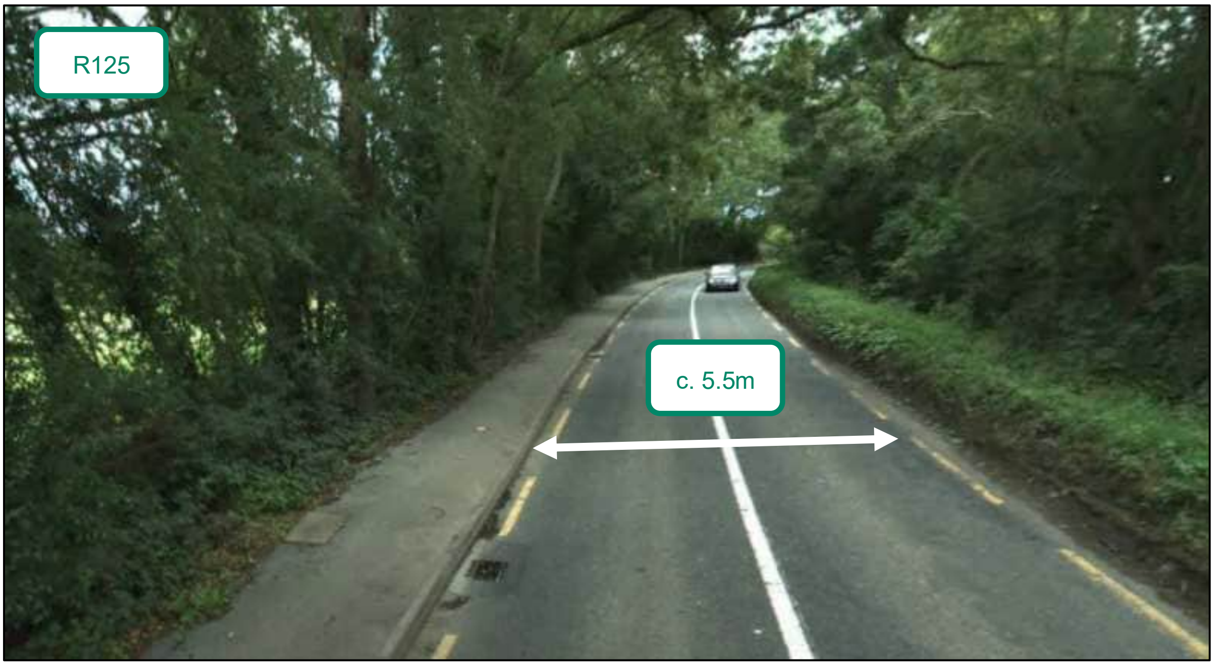


Figure 4-2 R125 Approximate Measurements (Source: Bing Maps)

4.1.2 R122

The R122 is a single lane regional road. The R122 travels in a northerly direction from the site. The R122 leads to the towns of Oldtown, Naul and Balbriggan. The carriageway width is approximately 5m. Currently there are no pedestrian facilities or cycling facilities along the R122 corridor.

Travelling in a southerly direction from the site the R122 leads to the townlands of Kilsallaghan, Surgalstown and Meakstown. The carriageway width is approx. 5m in this southerly direction also. There are no pedestrian footways provided and no public lighting. There are also no cycle lanes or cycle paths provided.

Figure 4-3 illustrates the road characters as described above for the R122.

Figure 4-3 R122 Approximate Measurements (Source: Bing Maps)

4.1.3 M2

The M2 is situated southwest of the proposed development and is approximately 26 metres in width. The M2 connects the M50 in Dublin to the N2 in Ashbourne Co. Meath. The M2 is a dual lane motorway with a speed limit of 120km/hr. The M2 runs in a northwest direction from Dublin. There are no designated cycle lanes and all connecting junctions to and from the M2 are non-signalised slip road access/egress points. There is no public lighting located along the M2, instead motorists depend on ‘cats’ eyes’ during the hours of darkness. Figure 4-4 illustrates the characteristics of the M2.

Figure 4-4 M2 (Source: Bing Maps)

4.2 Proposed Trip Generation

The purpose of this section is to determine the overall number of trips that will be generated by the Proposed Development in terms of vehicular traffic.

As outlined in Section 2.3.1, construction of the site is anticipated to take 24 months additional traffic movements are expected to peak at 80 vehicles per day, with 30 of those movements being HGVs.

Construction activities will gradually phase out from pre-construction followed by commissioning and testing of the substation and equipment. A combination of bulldozer, excavators, trucks, and other soil shifting plant will commence the main site clearance and levelling aspects.

A Construction Traffic Management Plan (CTMP) will be prepared, prior to the commencement of construction. Temporary access tracks on the consented land (if required due to ground conditions and/or landowner requirements) will consist of timber or aluminium bog mats to spread the weight of machinery over a greater area to prevent damage to the ground. If necessary, a low ground pressure excavator may also be utilised.

4.2.1 Traffic Generation Construction

For the Proposed Development, a construction period of 24 months is assumed. Over the course of the construction period HGVs account for an increase in Average Annual Daily Traffic (AADT) along the R122 of 30 additional HGV vehicles. Construction staff travelling to and from the site during the construction phase will also account for additional traffic, accounting for an additional AADT increase of 50 vehicles. This will total an expected peak of an additional traffic movements at a peak of 80 vehicles per day.

Therefore, the proposed construction peak period will account for an additional 80 two-way vehicles (i.e.,40 no. arrivals and 40 departures per day) on the R122. Due to the nature of the site, temporary access tracks may be required. If required, these tracks will be placed on the consented land in order to access the site from the road network, in accordance with the CTMP.

4.2.2 Traffic Generation Operation- Expected Staff Trips

Due to the nature of the Proposed Development, it is understood it will have a low number of operational staff based at the Proposed Substation Development. It is estimated that traffic during the operational phase would average one visit by two people periodically and the impact on the public road network is considered negligible.

4.2.3 Base Traffic Flows

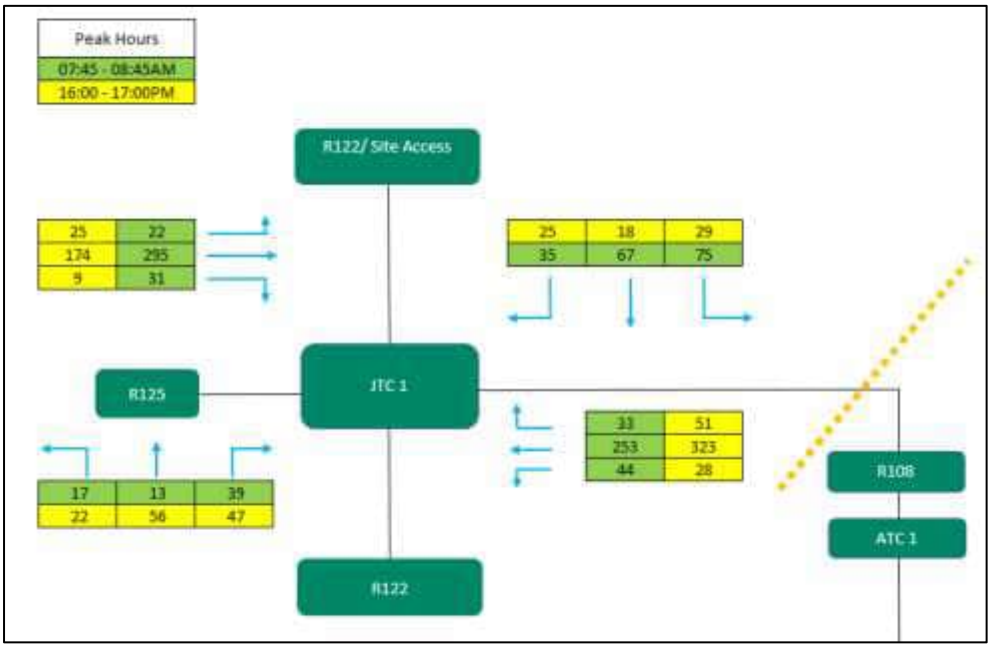
Irish Traffic Surveys (ITS) undertook Junction Turning Counts at various junctions within the designated study area on 2 February 2023 at the following locations.

- JTC 1: R125/R122 (3-arm Priority Junction).
- JTC 2: R108/Naul Road (3-arm Roundabout).
- JTC 3: Cloghran Roundabout -Naul Road/ R132 (3-arm Roundabout).
- JTC 4: Airport Roundabout R132/R108/Naul Road (4-arm Roundabout).
- JTC 5: M1 exit 2 onto Airport Roundabout (slip road).
- JTC 6: M50/Promenade Road (3-arm Signalised Junction).
- JTC 7: Promenade Road/ Bond Drive (4-arm Roundabout).
- ATC 1: R108 near the R108/R125 junction.

The surveys were undertaken over 12 hours on a neutral weekday within the school term. This was to understand existing traffic conditions in the study area of the site. The outlined route above indicated the desired construction route from Dublin Port that would host most of the AADT.

For the base traffic flows, the typical weekday morning (07:45 – 08:45) and evening (16:00 – 17:00) peak hour periods were identified. These are the periods when traffic flows are greatest, and therefore will be used for the purpose of the modelling analysis. Figure 4-5 illustrates the existing baseline traffic observed in the vicinity of the site address with the full network flow diagram located in Appendix B.

Figure 4-5 Baseline Traffic Flows Observed 2022

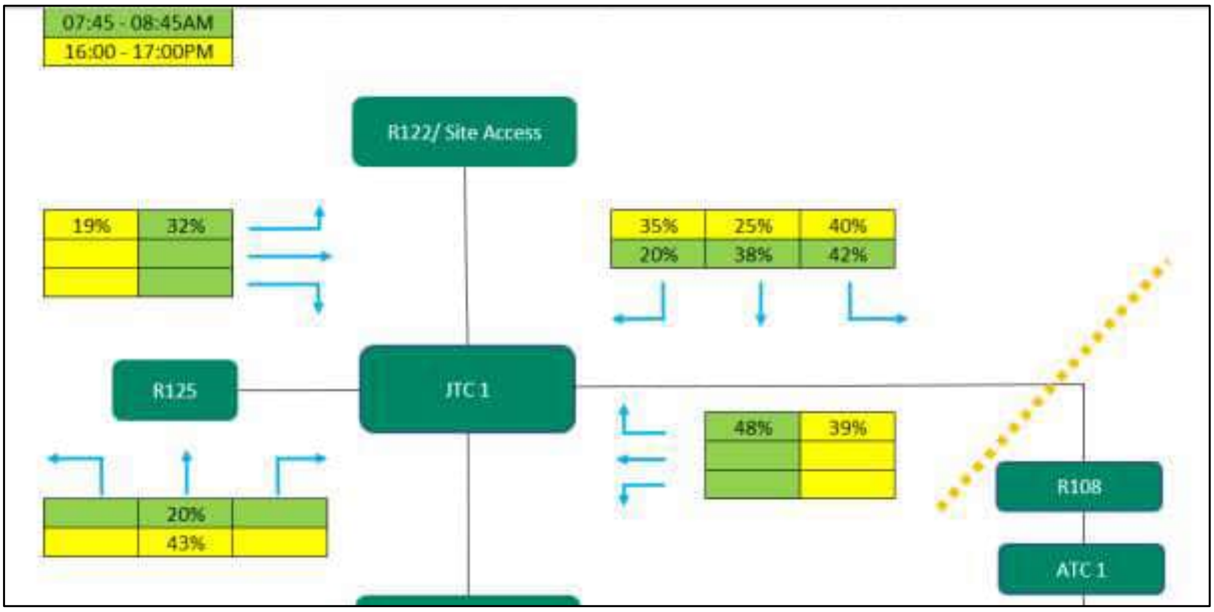


4.2.4 Trip Distribution

To understand the potential distribution of trips arriving and departing the site, the base traffic survey data have been interrogated. The traffic volumes along the R122 split evenly at the crossroads with a slightly larger majority turning east towards Dublin City Centre. In the evening peak, the trend remains of similar proportions, with trips predominately travelling eastbound towards the city centre.

Figure 4-6 illustrates the trip distribution observed at the time the traffic surveys were undertaken in the locality of the Site access, a full distribution diagram is located in Appendix B.

Figure 4-6 Trip Distribution from R122/Site Access



4.2.5 Growth Rates

The TII '*Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021)*' provides guidance on the preparation of future travel demand projects for use in scheme modelling and appraisal. The guidelines present in Table 6.1 Growth Rates based on an annual factor per region.

The guidelines have been interrogated by AECOM to determine a suitable growth factor for the proposed opening year (assumed 2026) and the horizon assessment years, which are the Opening Year + 5 Years (2031) and + 15 Years (2041) as per the TII Traffic Assessment Guidelines.

It is proposed to apply the 'LV' (light vehicles) growth factor given the characteristics of the surrounding road network which typically serves car and light vehicular traffic associated with residential and commuting journeys.

The High Growth Rate for the 'Dublin Metropolitan Area' is projected as 1.0162 (1.62%) growth per annum from 2016 – 2030, and 1.0051 (0.51%) per annum from 2030 – 2040. The applied growth rates to the base traffic surveys are summarised as follows:

- 2026 Opening Year: 10494 (4.94%).
- 2031 Horizon Year, Growth Rate: 1.1372 (13.72%).
- 2041 Horizon Year, Growth Rate: 1.1712 (17.12%).

4.2.6 Percentage Impact of the Proposed Development

The TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

- "Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway."
- "Traffic to and from the development exceeds 5% of the existing two-way traffic flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations".

Table 4-1 details the junctions with the highest percentage impact and over the TII threshold stated above are the site access junction and Junction 1 R122/R125.

A comparison was made between the pre-development and development construction scenarios, to identify the percentage impact of the development. The operational traffic of the proposed site is to be low at a rate of 1 to 2 vehicles a week that the operational traffic flows in relation to the site were not investigated.

The future growth years are not included due to the construction period in the Opening year being the predicted heaviest flow of traffic for the lifetime of the site.

Table 4-1 Junction Percentage Impacts

Junction	Time Period	Existing Flows	Proposed Development Flows	% Impact
Site Access	AM	304	305	100%
	PM	242	89	37%
J1 R122/R125	AM	993	96	10%
	PM	805	96	12%
J2 R108/ Naul	AM	1945	49	3%
	PM	1799	35	2%
J3 Stockhole Lane/ R132/ R836/ Naul	AM	2471	38	2%
	PM	10172	25	0%
J4 R132/ Dublin Airport/ M1 Intro	AM	4055	25	1%
	PM	4936	18	0%
J5 M1/ M50	AM	10132	10	0%
	PM	10969	17	0%
J6 R131/ M1/M50	AM	1296	18	1%
	PM	1153	9	1%
J7 Promenade Road/ Bond Drive	AM	803	17	2%
	PM	867	16	2%

Junction modelling of the site access and junction 1 will be analysed as the percentage impacts for these two junctions are above the TII thresholds and in addition any new site access is required to be modelled.

4.2.7 Summary

It is considered that the traffic generation will be low overall due to the nature of the Site. The impact the proposed development has on the existing road network during construction will be moderate due to the existing low traffic number volumes on the local roads surrounding the Site access point. The traffic generated during the construction period will be temporary and of low impact. It is anticipated there will be negligible traffic when the Site is operational.

4.3 Network Analysis

4.3.1 Introduction

This chapter presents the impact analysis to identify the potential effects of the proposed development upon the surrounding road network at the junctions as identified in Chapter 3 of this report. As the junctions are priority-controlled junctions which are not signalised they will be assessed using the industry standard Junctions 10 (PICADY) software developed by Transport Research Laboratory (TRL).

4.3.2 Junction Analysis

The operational assessment of the local road network has been undertaken using TRL Junctions 10 for non-signalised junctions. When considering priority-controlled junctions, a Ratio to Flow Capacity (RFC) of greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly resulting in traffic congestion in the form of longer queues.

Junctions 10 is an industry standard software to model the capacity and queuing of non-signalised junctions (Priority controlled, intersections, roundabouts). The meaning of the acronyms used within the capacity assessment results are discussed below.

- RFC (Ratio to Flow Capacity) (for non-signalised junctions)
- Q (Queue Length) (PCU's) i.e., 1 PCU equates to a 5.75m long car

It is generally accepted that RFC values of 0.85 (85%) and less are indicators that a junction is operating within capacity. Junctions are only identified as operating over capacity if these values are exceeded.

4.3.3 R122/Proposed Site Access

A model was completed using the aforementioned traffic surveys to assess the traffic volumes for the morning and evening peak period and future assessment year with construction traffic in place on the network at the proposed site access along the R122. A summary of the results is shown in Table 4-2 with the full Junctions 10 outputs contained within Appendix C.

Table 4-2 R122/Proposed Site Access Junctions 10 Outputs

Assessment Year	Arm	AM Peak		PM Peak	
		Queue (PCU)	RFC	Queue (PCU)	RFC
2022 Baseline	Proposed Site Access	0.0	0.00	0.0	0.00
	R122 South	0.0	0.00	0.0	0.00
2026 Without Development (Opening Year)	Proposed Site Access	0.1	0.09	0.1	0.08
	R122 South	0.1	0.08	0.1	0.07
2026 With Combined Construction Traffic	Proposed Site Access	0.1	0.10	0.1	0.10
	R122 South	0.1	0.09	0.1	0.08

Based on the analysis of this new priority-controlled junction, with the inclusion of the proposed site access along the R122, the junction would operate within capacity throughout the 2026 (opening year considering the predicted construction traffic generated). While in operation the development is expected to create a very minimal amount of traffic flow.

As demonstrated in the 2026 assessment year with Construction Traffic, the proposed site access would result in an RFC value of 0.08 with a corresponding queue of 0.1 PCU during the morning peak period whilst during the evening peak period it is anticipated that the RFC would be 0.06 with a PCU factor of 0.1.

4.3.4 R125/R122

A model was completed using the aforementioned traffic surveys to assess the traffic volumes for the morning and evening peak period and future assessment years with construction traffic in place on the network at the junction of the R122 and the R125. A summary of the results is shown in Table 4-3 with the full Junctions 9 outputs contained within Appendix C.

Table 4-3 R125/ R122 Junction 10 Outputs

Assessment Year	Arm	AM Peak		PM Peak	
		Queue (PCU)	RFC	Queue (PCU)	RFC
2022 Baseline	R122 South to West and North	0.1	0.07	0.2	0.16
	R125 South to East and North	0.2	0.16	0.3	0.24
	R125 East to South, West and North	0.2	0.08	0.3	0.12
	R122 North to East and South	0.4	0.30	0.1	0.09
	R122 North to south and West	0.3	0.22	0.1	0.11
	R125 West to South and North	0.2	0.07	0.0	0.02
2026 Without Development (Opening Year)	R122 South to West and North	0.1	0.07	0.2	0.18
	R125 South to East and North	0.2	0.17	0.3	0.25
	R125 East to South, West and North	0.2	0.09	0.3	0.13
	R122 North to East and South	0.5	0.33	0.1	0.09
	R122 North to south and West	0.3	0.24	0.1	0.11
	R125 West to South and North	0.2	0.09	0.0	0.02
2026 With Combined Construction Traffic	R122 South to West and North	0.1	0.08	0.2	0.18
	R125 South to East and North	0.2	0.19	0.3	0.26
	R125 East to South, West and North	0.2	0.19	0.3	0.14
	R122 North to East and South	0.5	0.33	0.1	0.10
	R122 North to south and West	0.3	0.25	0.1	0.12
	R125 West to South and North	0.2	0.10	0.0	0.02

Based on the analysis of this priority-controlled junction, it is clear that the with the inclusion of the proposed development along the R122 this junction would continue to operate within capacity throughout the 2026 (opening year with construction traffic included as a consideration to ensure a robust traffic analysis). While in operation the development is expected to create a very minimal amount of traffic flow.

As demonstrated in the 2026 assessment year with Combined Construction Traffic, the proposed development would result in have an RFC of 0.24 and a queue of 0.3 PCU on the R122 Northern arm of the junction leading to the east and the south.

During the evening peak period it is anticipated that the RFC would increase to 0.23 with an anticipated increase to 0.3 PCU on the R125 Southern arm of the junction leading to the east and north.

From the analysis undertaken at both junctions, this indicates that the proposed development would not negatively impact on the surrounding road network during its construction period and would remain within capacity.

5. Outline Mobility Management Plan

5.1 General

The environmental impacts created from traffic congestion due to road transport have led to increasing the priority of more sustainable modes of transport. The aim of an Outline Mobility Management Plan (OMMP) is to encourage modes of travel other than the car, whilst recognising that some staff relating to the Proposed Development would still need to use the car and the guidance suggested is to be undertaken where applicable to the Proposed Development. This OMMP is intended for the short-term construction traffic related to the Proposed Development.

This section will present an overview of the mobility management measures for the Proposed Development as a development plan objective in the Fingal County Development Plan 2023-2029. Under Policy CMP5 – Mobility Management and travel Planning. The policy states there to be the promotion of best practice mobility management and travel planning through the requirement for proactive mobility strategies for developments focussed on prioritising sustainable modes of travel including walking, cycling and public transport.

Subject to receipt of grant of the application for the Proposed Development, a detailed MMP will be prepared by the contractor for the development primarily intended for the construction period with reference to the smaller operational scale of the Site. The plan will encourage the use of sustainable modes of transport during the construction period such as potential car share initiatives over single private vehicle trips.

With the Proposed Development it is planned that there will be 1-2 employees working at the Site periodically during its operation and therefore the mobility management plan can be assumed for guidance for both operation and construction. However, this OMMP focuses on the construction period mostly as this is estimated to be the period when the most access will be required to the Site in terms of vehicles trip. Throughout this OMMP where suggestions have been stated, it has been considered for these suggestions to be undertaken only 'where applicable' within either the construction or the operation of the Site. The OMMP details the mobility management measures and targets that will be outlined as part of the planning application. The MMP will collate these outlines and form a binding MMP set out by the contractor for the staff of the site to aim for as the development impacts can be more closely assessed.

5.2 Benefits

Mobility Management Plans are intended to bring the following benefits:

- A partnership approach between construction staff and management to influence travel behaviour.
- Encourage safe and viable alternatives for accessing the Site.
- Pragmatic initiatives based on the initial appraisal of construction staff travel modes.
- Reduction in potential air pollution.
- Fewer single passenger vehicular trips than would otherwise be the case.

5.3 Aims

An OMMP broadly seeks to reduce the number of single passenger car journeys associated with the Proposed Development during construction, which in turn reduces the environmental impact associated with the Proposed Development on the receiving environment. The specific aims of this OMMP are.

- To discourage single private car use as a means of travel to and from the development during construction.
- To increase and facilitate the number of people choosing to car share, or travel by public transport to and from the development if possible.
- To develop an integrated and unified plan for private vehicle, business fleet management and suppliers of commercial services to the development.

To achieve the above aims, measures have been proposed for the specific modes of transport. These are based on existing infrastructure and transport systems.

These objectives and measures are preliminary and will be further developed considering the initial modal monitoring as the Proposed Development begins construction and information becomes available on future staff and visitor travel behaviour.

5.4 Monitoring

A critical part of any MMP is monitoring during the peak staff travel period for this site being the construction period. It is proposed that an initial evaluation of the transport operation of the plan will take place at the beginning of the construction period.

Campaigns and promotions would be run throughout the construction period to maintain public awareness of modes of travel other than single car use focussing car sharing where possible and the benefits accrued to both the individual and the environment.

5.5 Measures

5.5.1 Mobility Management Plan Partners

This section presents a 'Toolkit' of measures, identifying several 'hard' and 'soft' measures that could be promoted and delivered where possible, to ensure that the theme of sustainability is considered within the Proposed Development.

This section identifies key individuals and groups that will be responsible for the managing the delivery of the MMP. These are.

- A member of the local Garda Siochana.
- Site developer.
- MMP advisor (engineer).

5.5.2 Mobility Management Plan 'Toolkit'

A 'Toolkit' contains a range of 'soft' and 'hard' options, to encourage sustainable travel and achieve the aims of the plans during the construction period. Example of 'softer' measures include, promoting sustainable travel via marketing material via staff correspondence whilst examples of 'harder' measures include setting up a car sharing scheme. Table 5-1 presents a list of sustainable travel planning initiatives for the Proposed Development.

Table 5-1 Recommended Mobility Management Measures and Actions During Construction Phase

Initiatives	Responsibility/Ownership	Timescale
Public Transport		
Display a local area map with public transport stops/route numbers marked. Due to the nature of the Site public transport may be part of a combined trip. Provide good quality walking routes to the existing public transport infrastructure where possible.	Designated Member of staff	To be commenced prior to construction
Car Sharing		
Encouragement of staff and visitors of the Proposed Development to use other modes of travel other than single use private car. Where it is necessary for car use to travel to and from work, staff should be made aware of other people who are either within close proximity of their homes or on their route into work	Designated Member of staff	To be commenced prior to construction
Construction Phase		
Provide a preliminary Construction Traffic Management Plan to provide detailed mitigation of construction traffic associated with the Proposed Development.	The Contractor /FCC Roads & Traffic Department	To be commenced prior to construction

6. Outline Construction Traffic Management Plan

6.1 Introduction

This chapter of the report deals directly with the impacts of construction of the Proposed Development. As with any construction project, the contractor will be required to prepare a comprehensive traffic management plan for the construction phase. The purpose of such a plan is to outline measures to manage the expected construction traffic activity during the construction period.

This chapter will provide an overview of the likely routing of construction vehicles, based on the most likely scenario of construction. It should be noted that the impacts of the construction will be temporary, and it will be the contractor's responsibility to prepare a Traffic Management Plan for the approval of Fingal County Council in advance of any works.

Subject to receipt of grant of the application for the Proposed Development, a detailed Construction Traffic Management Plan will be prepared by an appointed contractor. The appointed contractor will be responsible for preparing and seeking agreement with FCC ensuring that FCC's requirements are met, prior to undertaking the works on Site.

Due to the nature of the Site, temporary access tracks may be required. These tracks will be placed on the consented land in order to access the Site from the road network, in accordance with the CTMP.

6.2 Policy Guidance

Guidance for the temporary control of traffic at road works to facilitate the safety of the public during the works is provided below:

- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign for Roadworks (2019).
- Traffic Management Guidelines, Department of Transport (2003).
- Requirements of Fingal County Council.

6.3 Development Construction Schedule

The exact programme of works is yet to be finalised, but it is expected that:

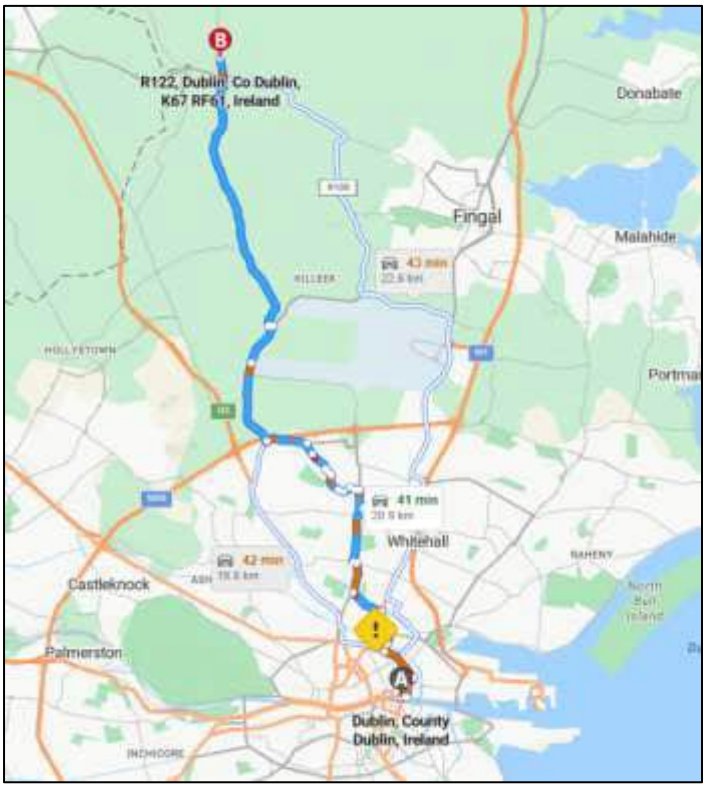
- Application is made for Planning Permission in Q3 of 2023.
- Commence site enabling and construction works in Q4 of 2024 (subject to planning permission).
- Completion of construction and commissioning in Q2 of 2026.

6.4 Haulage Route

For construction traffic originating from Dublin Port the following route is suggested to minimise construction impacts upon the surrounding road network. It is recommended that all construction traffic access the site from the R122.

It is recommended that all construction traffic from Dublin take the R122 north to the site. The route distance is approximately 20km from Dublin City. This routing has been illustrated in Figure 6-1.

Figure 6-1 Proposed Construction Routing from Dublin (Source Bing Maps)



6.5 Parking

All contractors' vehicles will park within the Site compound, it is recommended that as part of the CTMP, the contractor designates an area within the confines of the Site dedicated to operative car parking. There will be no parking permitted on the surrounding road network by the contractor or Site operatives.

6.6 Construction Traffic Management Measures

The proposed works will create additional traffic upon the local road network. The presence of slow-moving construction plant on the road network may cause some short-term congestion, however the impacts are envisaged to be temporary, short term and minor.

To address the potential impacts from construction traffic, the appointed contractor will be required to prepare a CTMP which would include mitigation measures.

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor's responsibility to prepare a detailed construction traffic management plan.

- An Abnormal Load Assessment (ALA) for any abnormal loads including horizontal swept path analysis and mitigation measures, if required, for any identified pinch points on the delivery route. The assessment will also consider escort arrangements and relevant signage.
- Prior to delivery of abnormal loads, the Applicant or their representatives, will consult with An Garda Síochána and FCC to discuss the requirement for a Garda escort. The Applicant will also outline the intended timescale for deliveries and efforts can be made to avoid peak times such as school drop off times, church services, peak traffic times where it is considered this may lead to unnecessary disruption, and abnormal loads may travel at night and outside the normal construction times as may be required by An Garda Síochána. Local residents at sensitive locations along the affected route will be notified of the timescale for abnormal load deliveries.
- A survey of the agreed route will be undertaken to identify if any overhead lines will need to be lifted along the route to allow abnormal loads to be delivered.
- All works on the public road network shall be carried out under a road opening licence and an approved traffic management plan. The location of works shall be signposted in accordance with the Traffic Signs

Manual. Works shall be carried out within a dedicated work zone and fenced to prevent unauthorised access.

- Access for emergency services shall be provided at all times through the works within the public road network.
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons.
- The contractor shall appoint a liaison officer who will inform the public of the location and expected duration of works on the public road network.
- Works on the public road will be carried out during normal working hours in order to minimise disruption from noise and vibration. Dust and debris resulting from construction activities shall be controlled by wetting down and street sweeping.
- Warning signs/advanced warning signs will be installed at appropriate locations in advance of the construction access locations.
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes.
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material.
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds.
- Parking of site vehicles will be managed and will not be permitted on public roads.
- A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public roads leading away from the construction works.
- Onsite wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to remove any potential debris on the local roads.
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out offsite will not be carried out on the public highway. .

The mitigation measures will therefore ensure that the presence of construction traffic will not lead to any significant environmental degradation or safety concerns in the vicinity of the Site. Furthermore, it is in the interests of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

7. Summary and Conclusions

The Proposed Development will utilise the existing regional and local road network, comprising the R125 and R122. The proposed construction period will account for an estimated average increase of 80 total vehicles per day (HGV and LGV) during the construction period between the Site and Dublin City. Traffic modelling was completed for the proposed site access and the R122/R125 junction on the network. Both junctions are predicted to operate within capacity during the construction period.

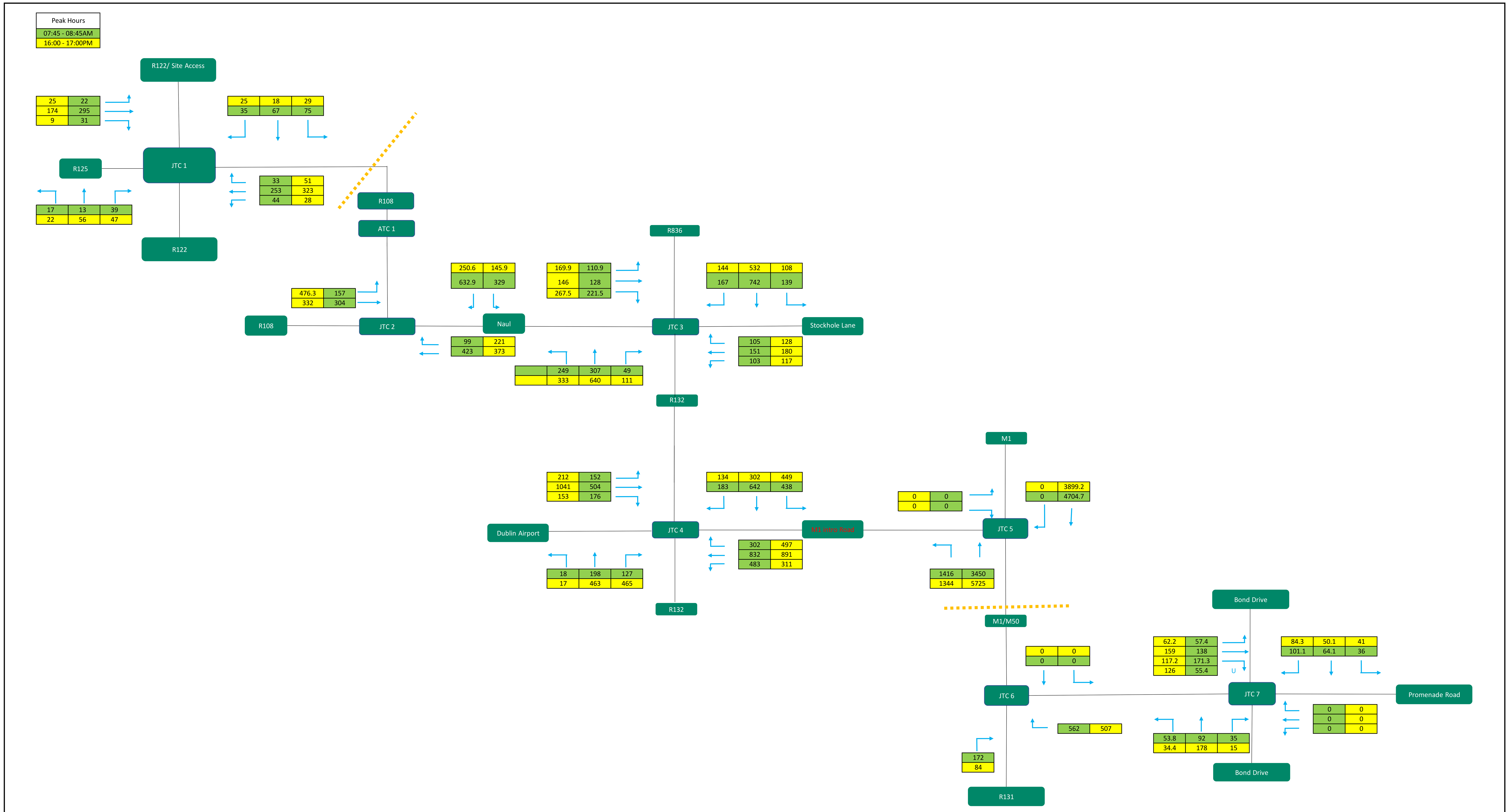
Traffic volumes associated with the Proposed Development relate primarily to the delivery of construction equipment and materials and substation installation operations.

The implementation of an approved CTMP and MMP will minimise the potential for traffic and transport impacts during construction activities.

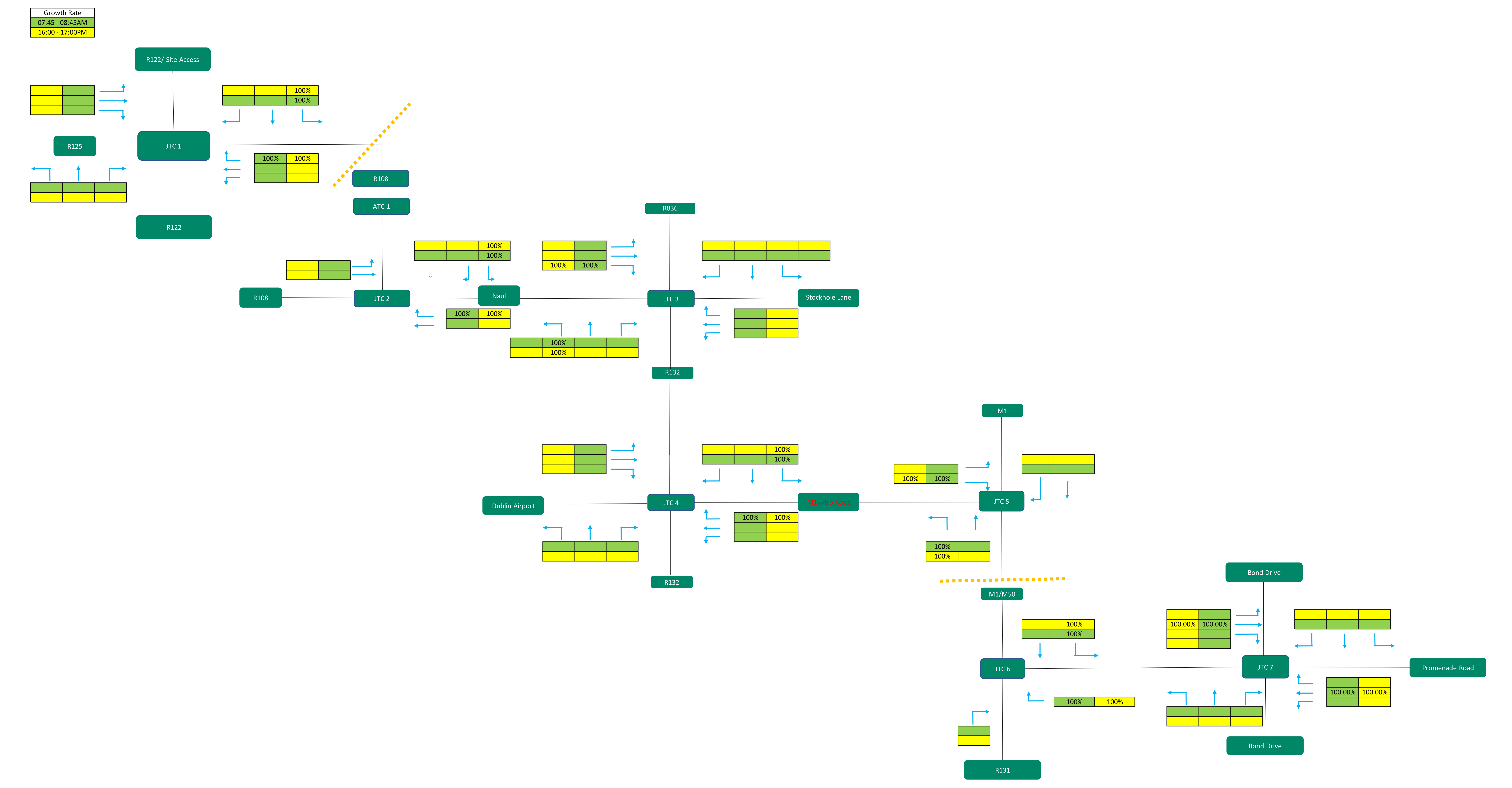
The lifespan of the Proposed Development is 40 years, and it will be maintained, and periodic upgrading undertaken over a long lifetime to meet future demand and upgrade in technology.

If the substation is no longer required, then full decommissioning in accordance with prevailing best practice will be undertaken.

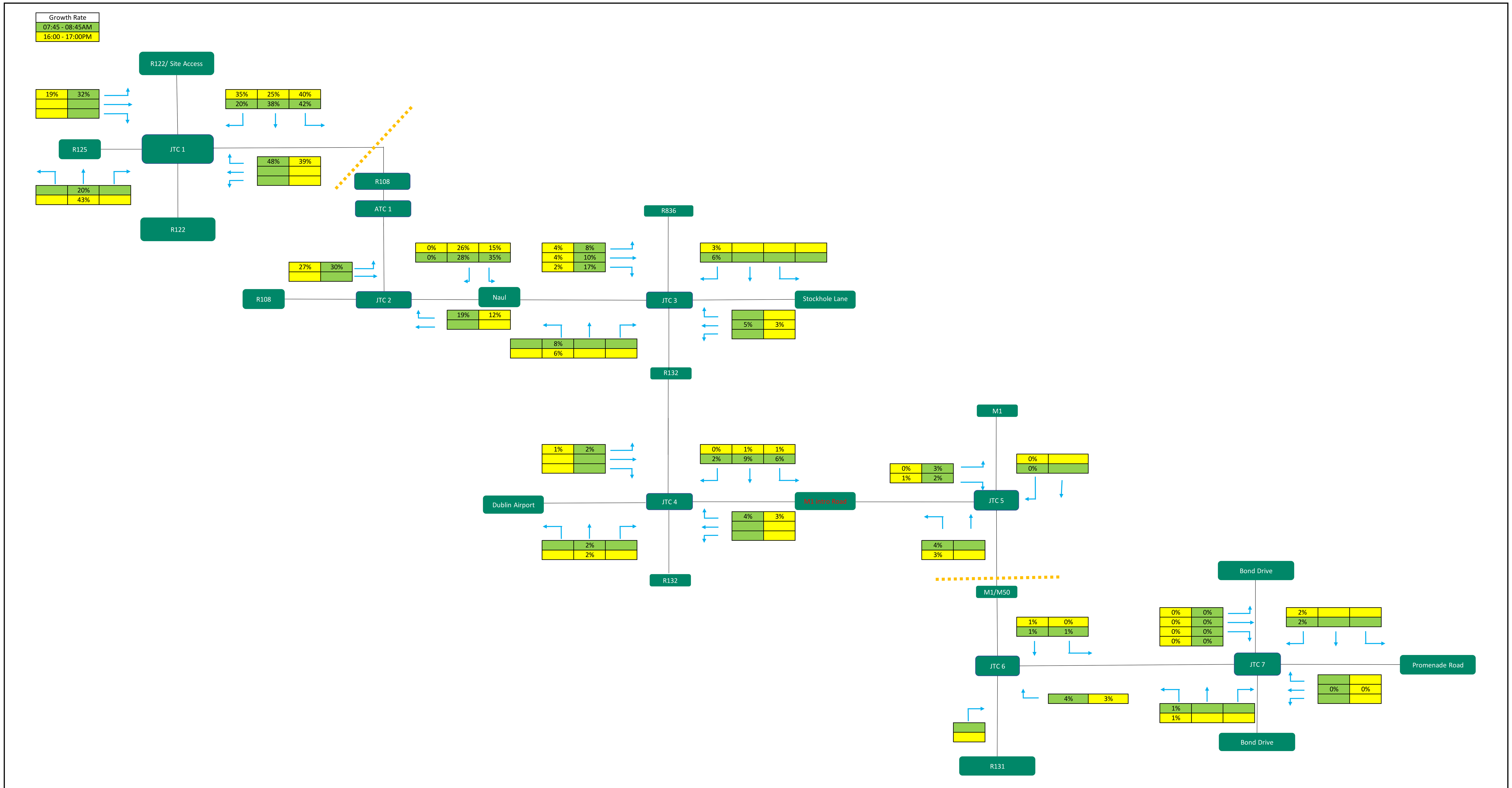
Appendix A Flow Diagrams



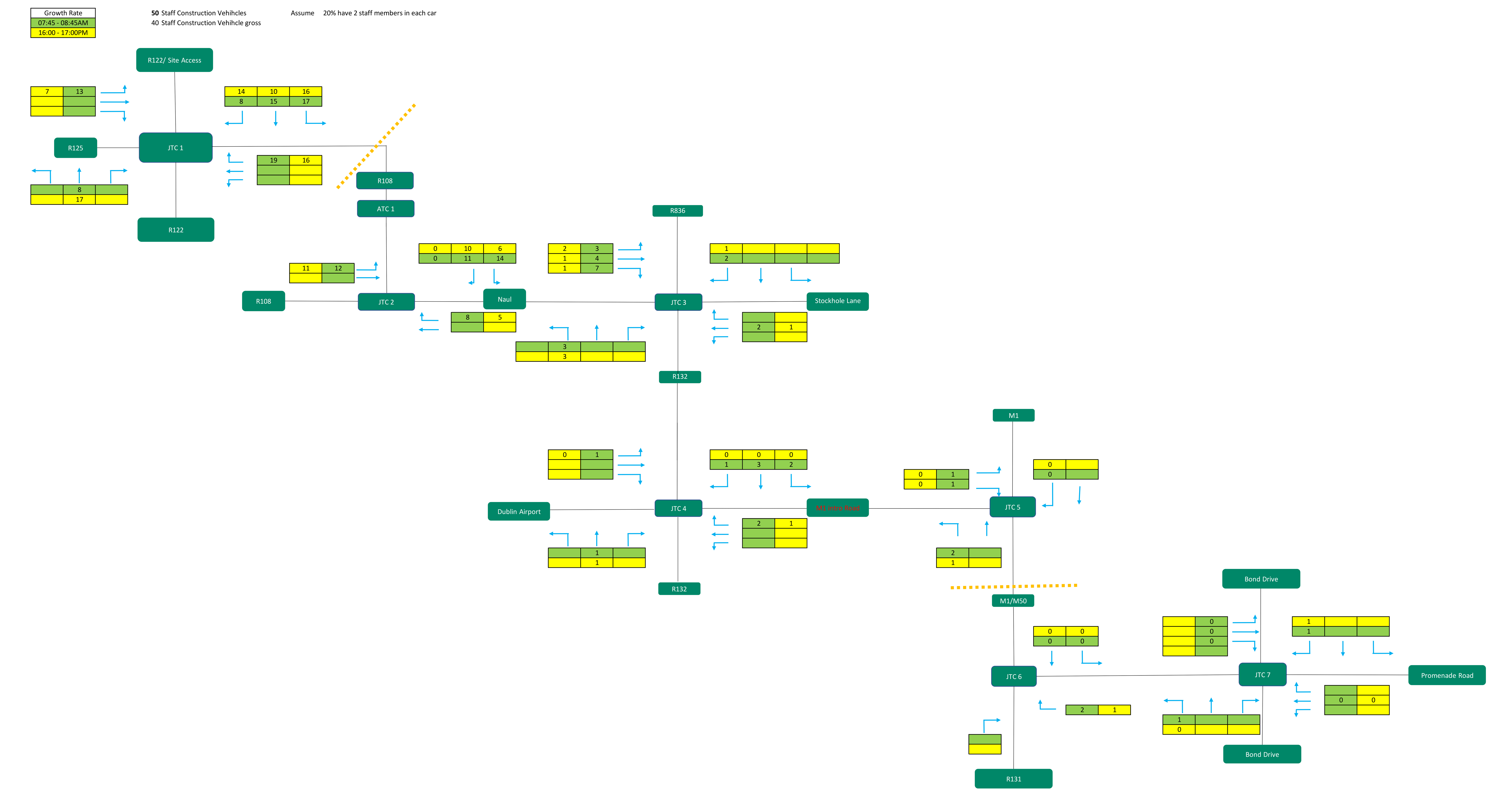
Client: Energia Solar Holdings Ltd.	Title: 2022 Base		Date:	2023
			Design:	M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked: H.H
			Approved:	S.H



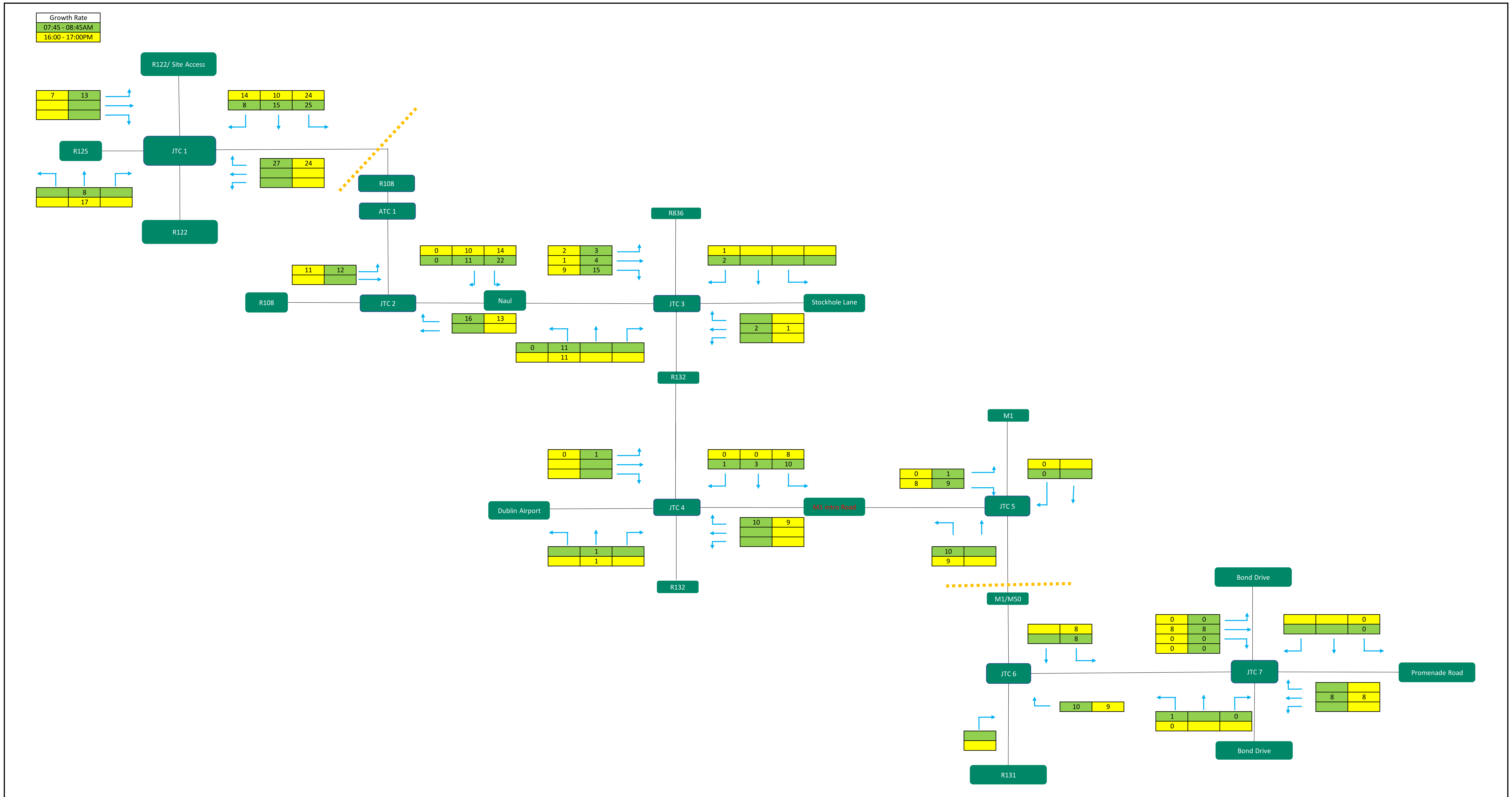
Client: Energia Solar Holdings Ltd.	Title: Trip Distribution Construction HGV	Date:	2023
		Design:	M.J
Project: Fieldstown	AECOM / Drawing Number: 1 / Revision: 1	Checked:	H.H
		Approved:	S.H



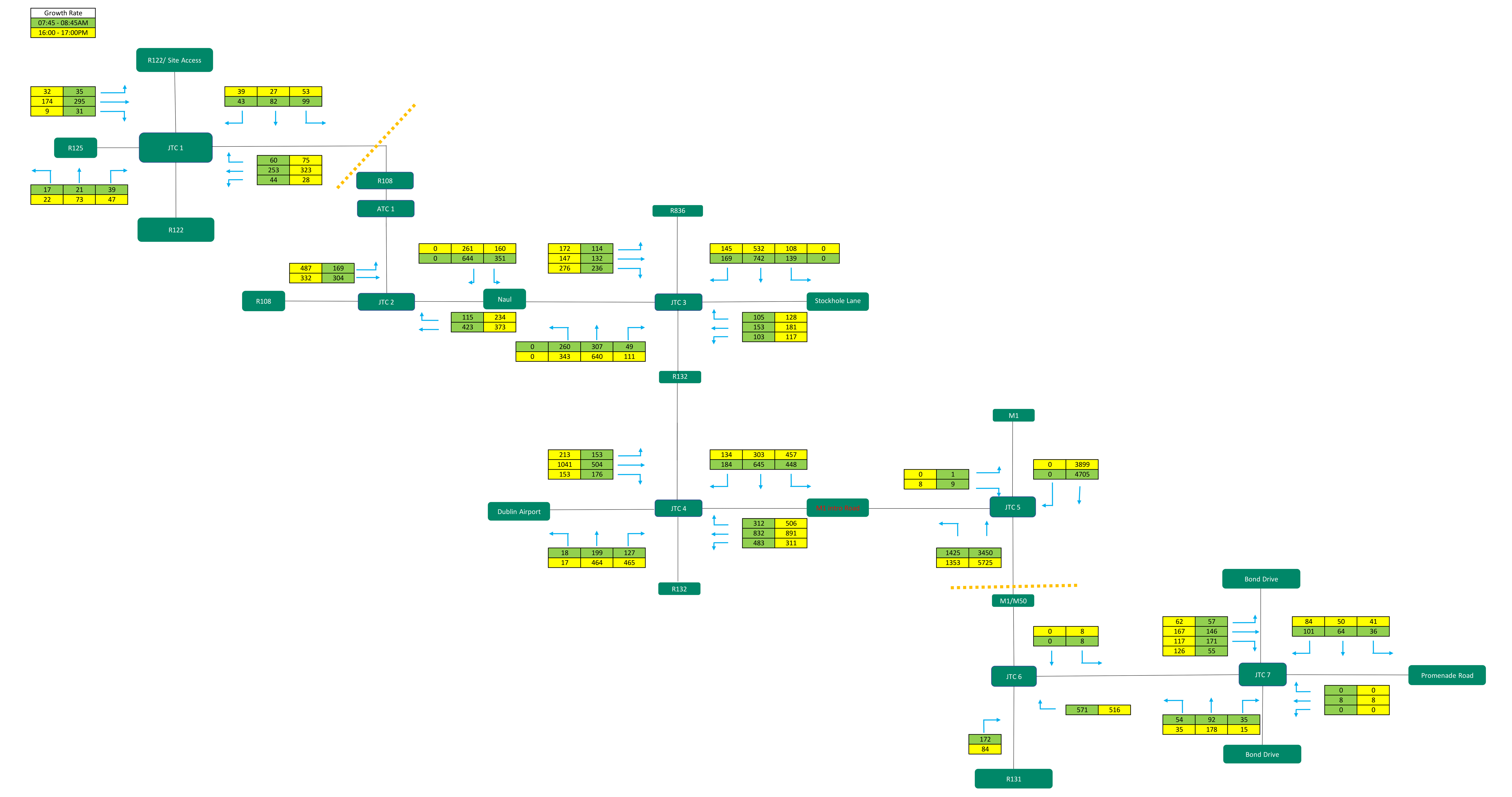
Client: Energia Solar Holdings Ltd.	Title: Trip Distribution Construction Staff Vehicles			Date:	2023
				Design:	M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked:	H.H
				Approved:	S.H



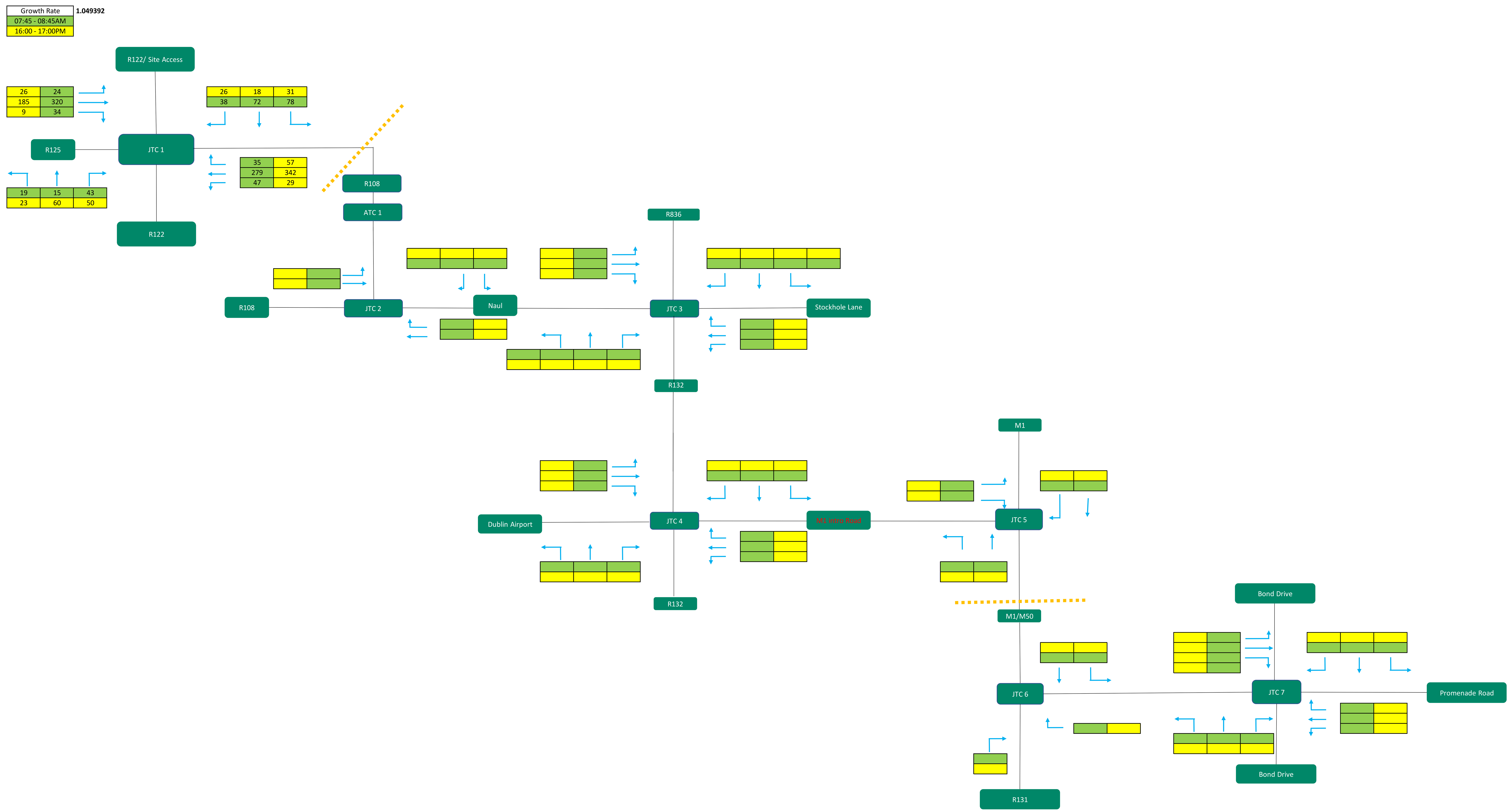
Client: Energia Solar Holdings Ltd.	Title: Trip Generation Construction Staff	Date:	2023
		Design:	M.J
Project: Fieldstown	AECOM / Drawing Number: 1 / Revision: 1	Checked:	H.H
		Approved:	S.H



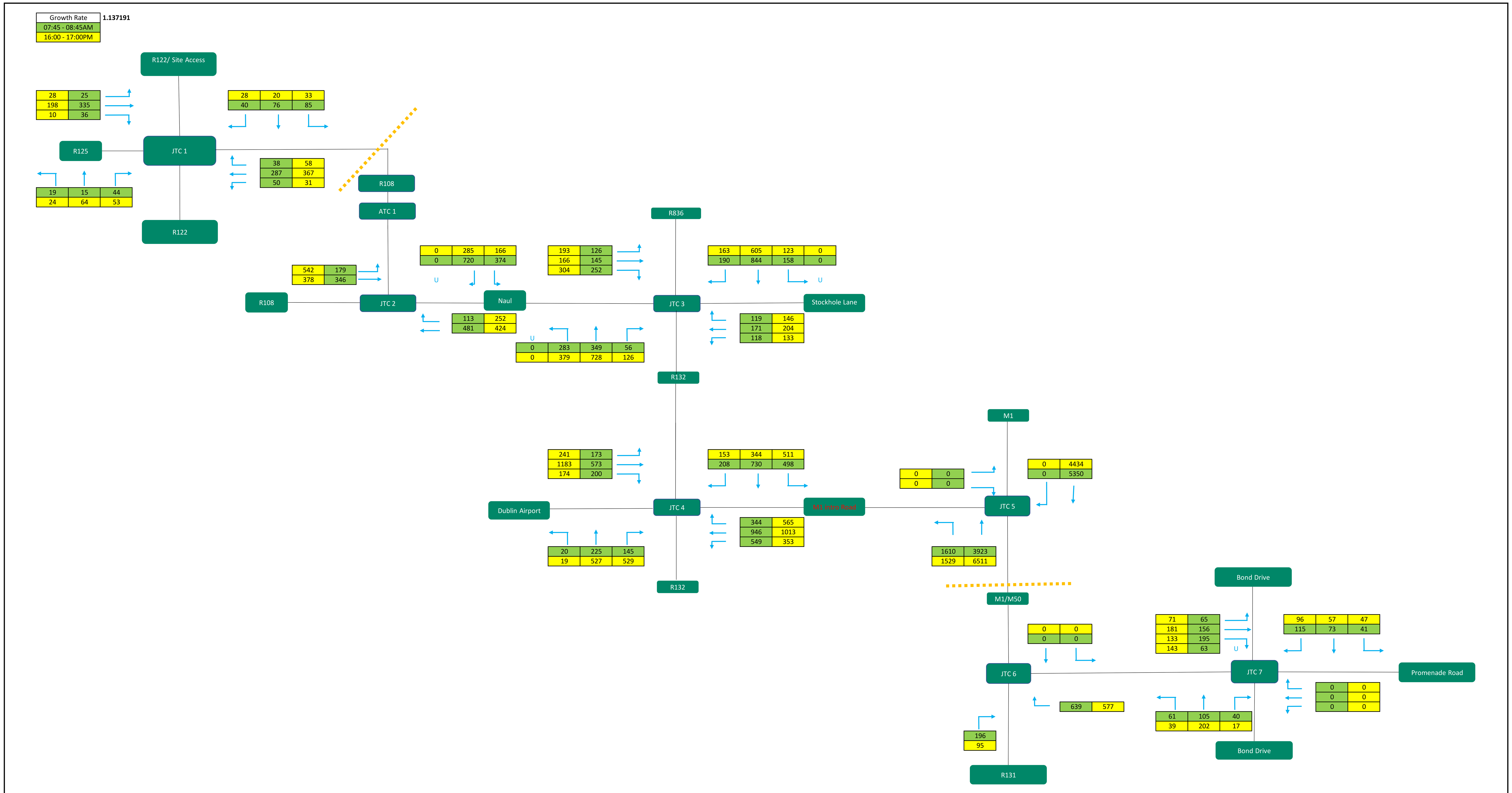
Client: Energia Solar Holdings Ltd.	Title: Trip Generation Construction Combined			Date:	2023
				Design:	M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked:	H.H
				Approved:	S.H



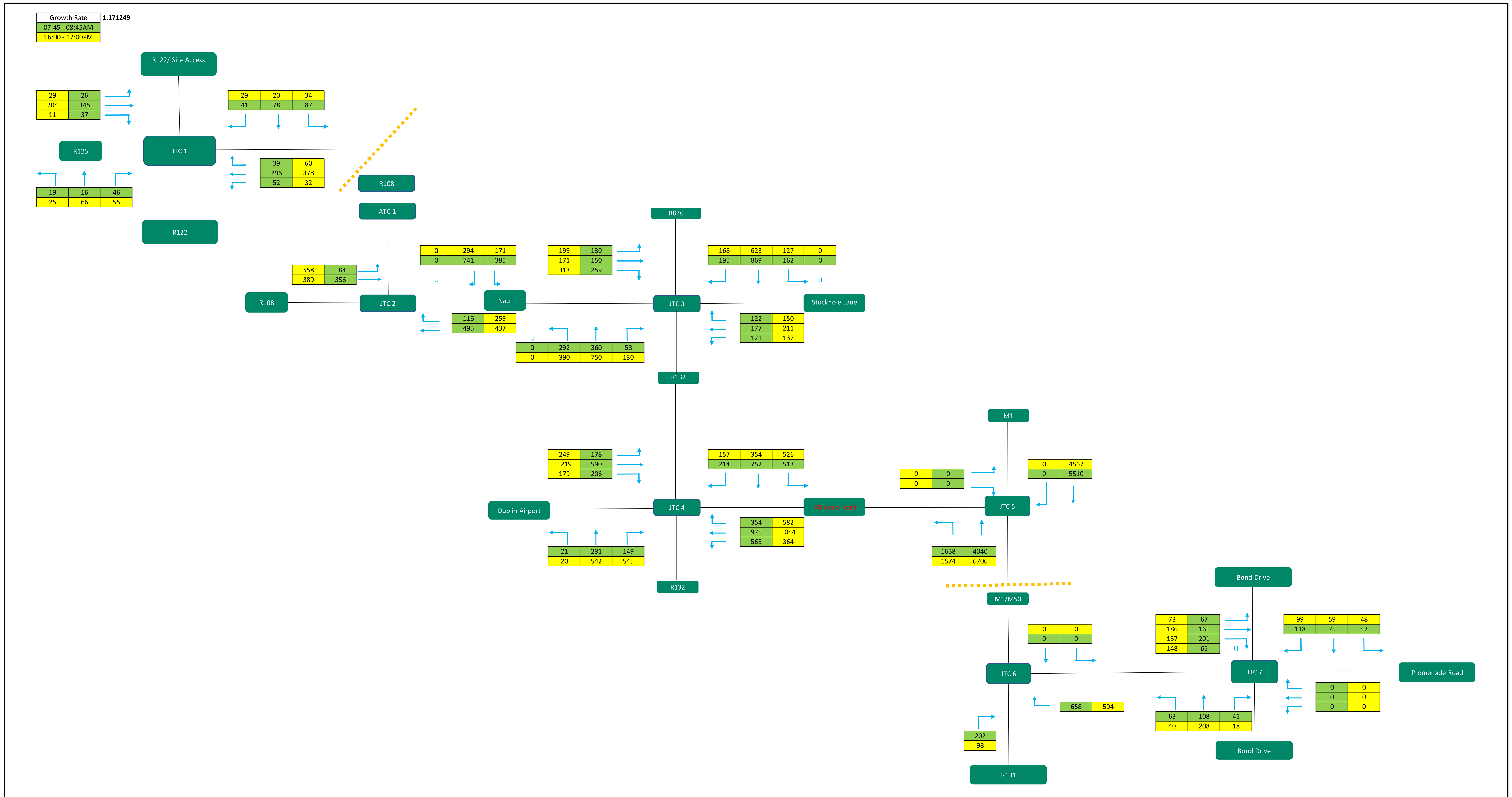
Client: Energia Solar Holdings Ltd.	Title: Base Plus Development Construction Traffic		Date: 2023
			Design: M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked: H.H
			Approved: S.H



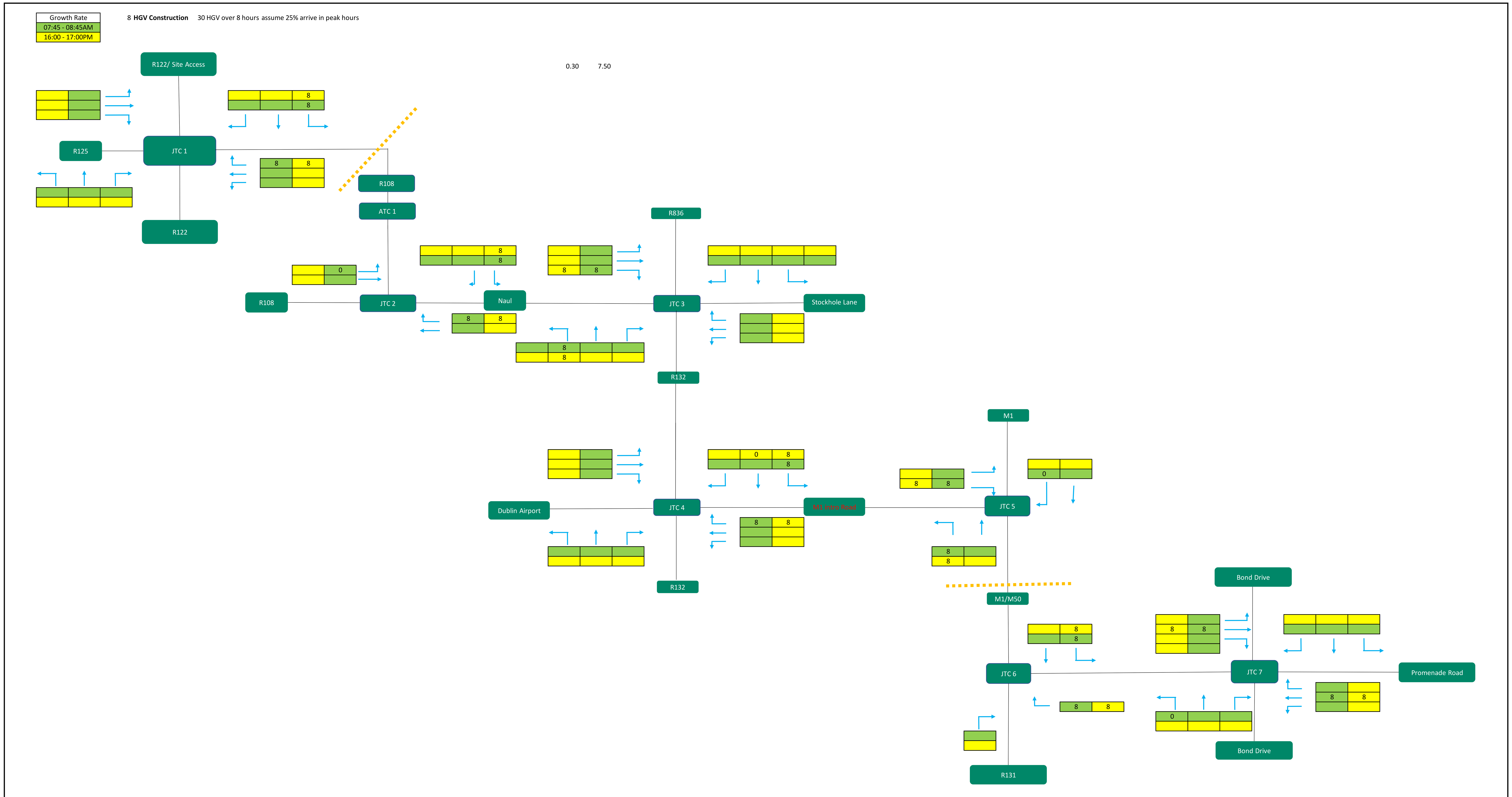
Client: Energia Solar Holdings Ltd.	Title: 2026 Opening Year			Date:	2023
				Design:	M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked:	H.H
				Approved:	S.H



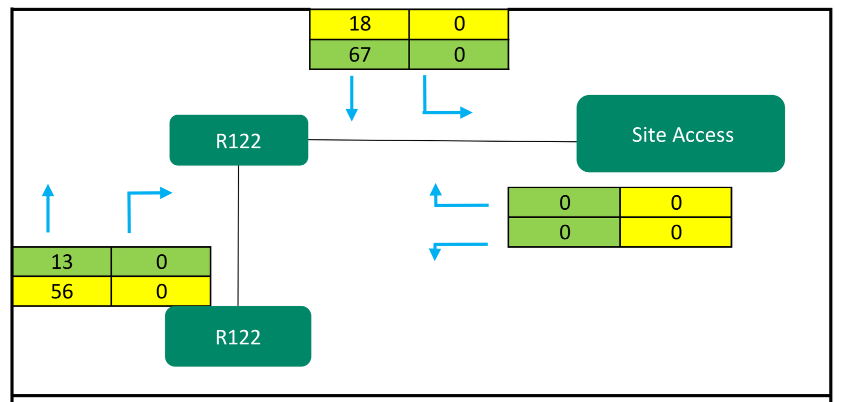
Client: Energia Solar Holdings Ltd.	Title: 2031 - Opening Year + 5 Years			Date:	2023
				Design:	M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked:	H.H
				Approved:	S.H



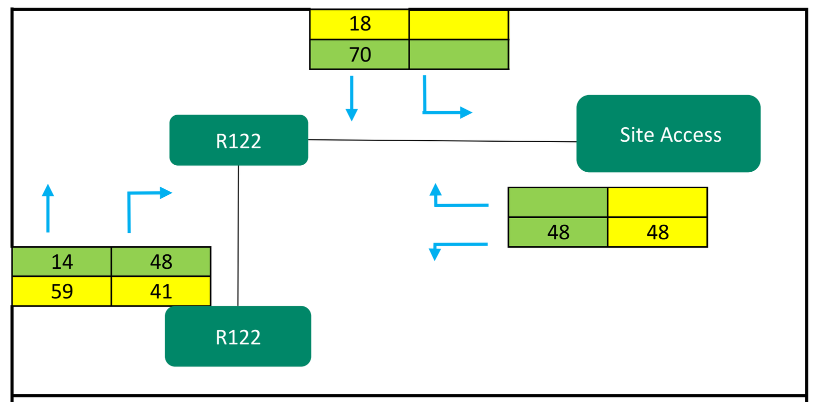
Client: Energia Solar Holdings Ltd.	Title: 2036 - Opening Year + 10 Years	Date:	2023
		Design:	M.J
Project: Fieldstown	AECOM / Drawing Number: 1 / Revision: 1	Checked:	H.H
		Approved:	S.H



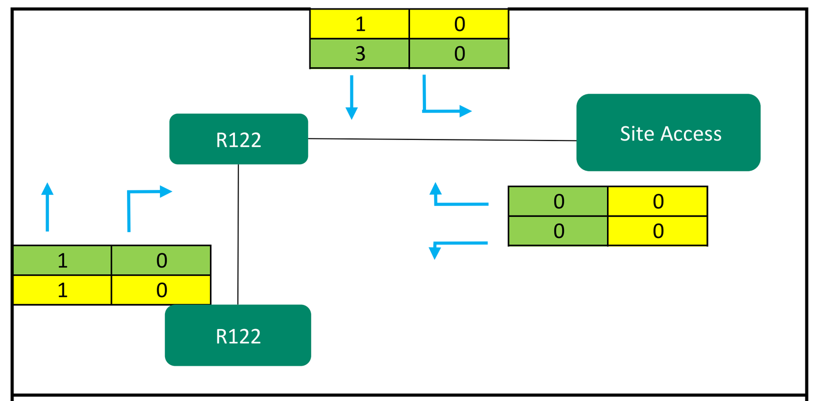
Client: Energia Solar Holdings Ltd.	Title: Trip Generation Construction HGV			Date:	2023
				Design:	M.J
Project: Fieldstown	AECOM	Drawing Number: 1	Revision: 1	Checked:	H.H
				Approved:	S.H



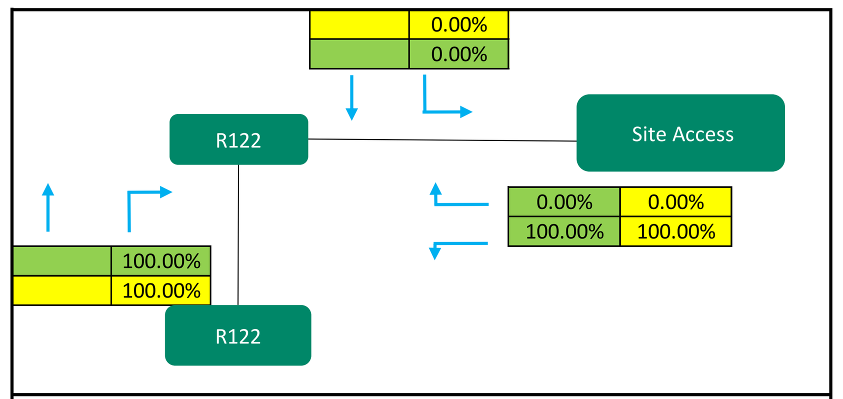
Site Access - Base



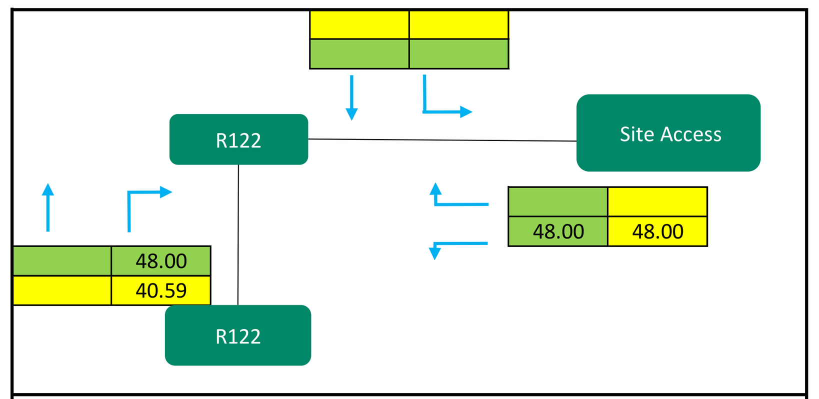
Site Access Opening Year 2026 Growth Rate 1.049392



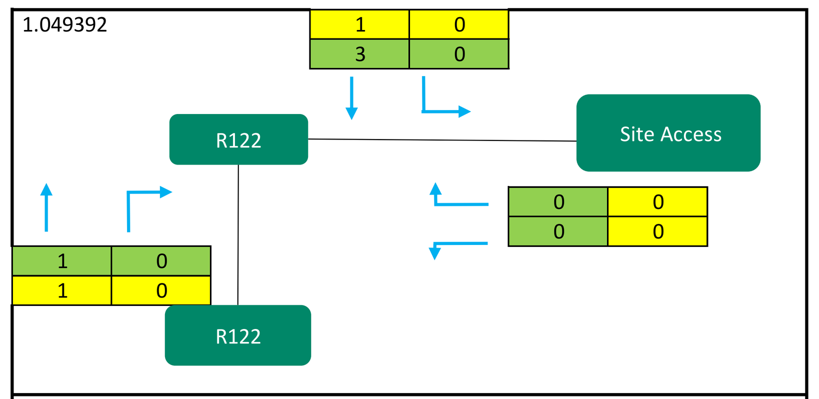
Site Access - HGV Mix Base 2022



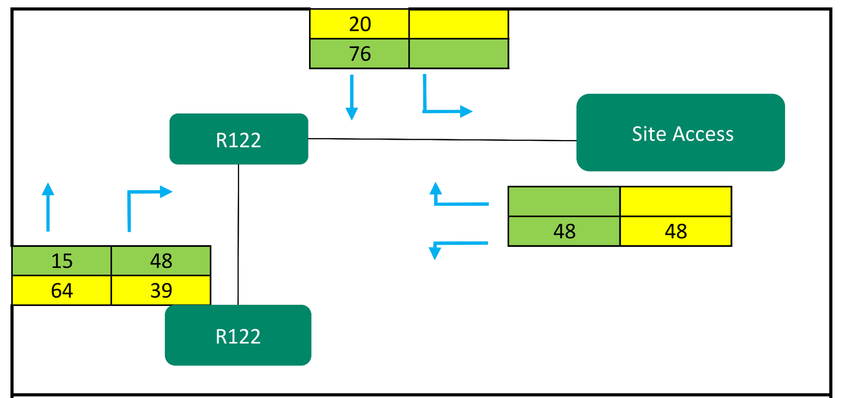
Site Access - Distribution Construction HGV Traffic



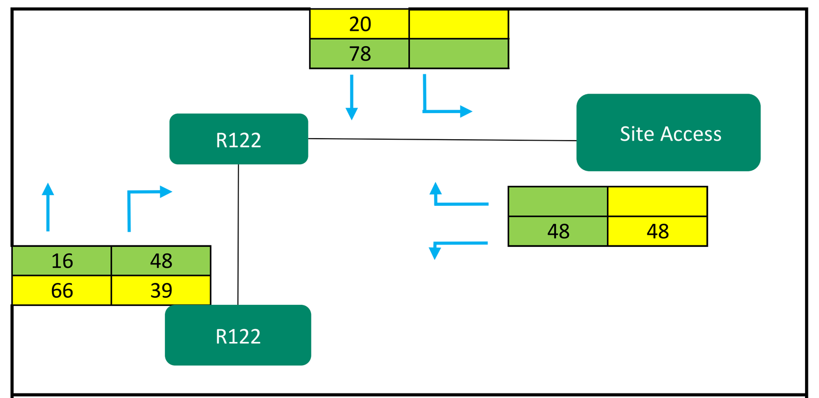
Site Access - Traffic Generation all Construction Traffic



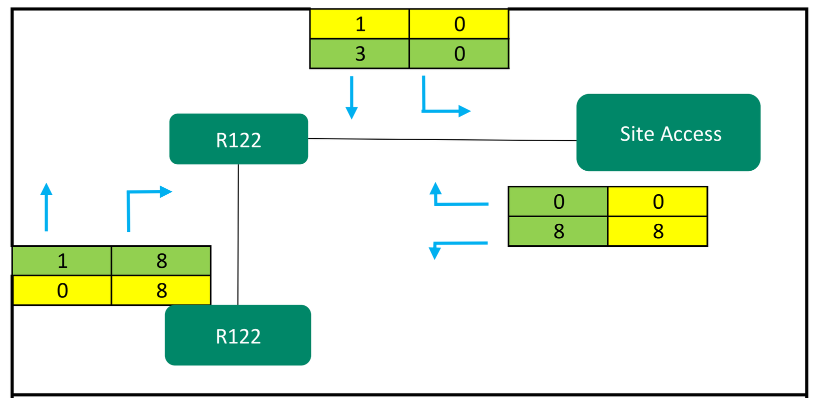
Site Access - HGV Mix Opening 2026



Site Access Opening Year 2026 Growth Rate 1.137191



Site Access Opening Year 2026 + 15 Years Growth Rate 1.171249

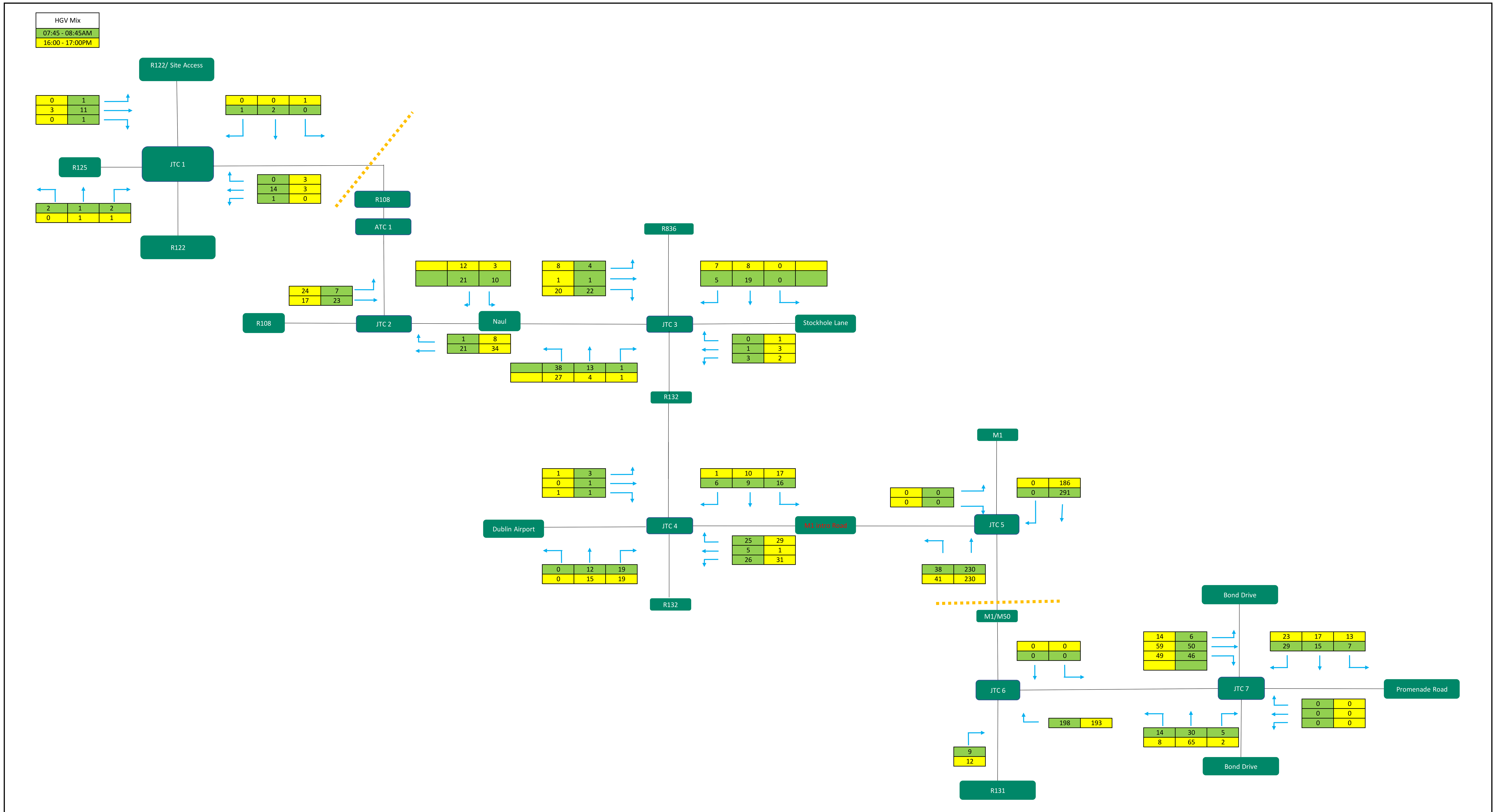


Site Access - HGV Mix with HGV Construction Traffic.

Energia Solar Holdings Ltd.

Fieldstown 1 1

2023
M.J
H.H
S.H



Client: Energia Solar Holdings Ltd.	Title: HGV Mix	Date:	2023
		Design:	M.J
Project: Fieldstown	AECOM | Drawing Number: 1 | Revision: 1	Checked:	H.H
		Approved:	S.H

Appendix B Traffic Modelling Outputs

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: Fieldstown Junction 1 SH.j10
Path: \\na.aecomnet.com\lfs\EMEA\Dublin-IEDBL2\Legacy\iedbl2fp001 \DATA\DCS\Projects\BP\60657534_SummerhillFieldstownSID\400_Technical\430_Technical_Working_Documents\Traffic\02_FielTS\Traffic Modelling
Report generation date: 06/09/2023 13:01:07

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2022 Base									
Stream B-CD	D1	0.1	9.47	0.07	A	D2	0.2	11.91	0.16	B
Stream B-AD		0.2	14.35	0.16	B		0.3	14.39	0.24	B
Stream A-BCD		0.2	5.36	0.08	A		0.3	5.11	0.12	A
Stream D-AB		0.4	12.79	0.30	B		0.1	8.54	0.09	A
Stream D-BC		0.3	14.66	0.22	B		0.1	12.02	0.11	B
Stream C-ABD		0.2	5.67	0.08	A		0.0	5.91	0.02	A
	2026 Opening Year									
Stream B-CD	D3	0.1	10.58	0.07	B	D4	0.2	12.30	0.18	B
Stream B-AD		0.2	16.15	0.17	C		0.3	14.82	0.25	B
Stream A-BCD		0.2	5.68	0.09	A		0.3	4.95	0.13	A
Stream D-AB		0.5	14.79	0.33	B		0.1	8.57	0.09	A
Stream D-BC		0.3	16.79	0.24	C		0.1	12.34	0.11	B
Stream C-ABD		0.2	5.96	0.09	A		0.0	5.85	0.02	A
	2026 Opening Year Combined Construction Traffic									
Stream B-CD	D5	0.1	9.75	0.08	A	D6	0.2	12.47	0.18	B
Stream B-AD		0.2	15.22	0.19	C		0.3	15.04	0.26	C
Stream A-BCD		0.2	5.34	0.09	A		0.3	4.97	0.14	A
Stream D-AB		0.5	13.84	0.33	B		0.1	8.59	0.10	A
Stream D-BC		0.3	15.70	0.25	C		0.1	12.44	0.12	B
Stream C-ABD		0.2	5.40	0.10	A		0.0	5.85	0.02	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

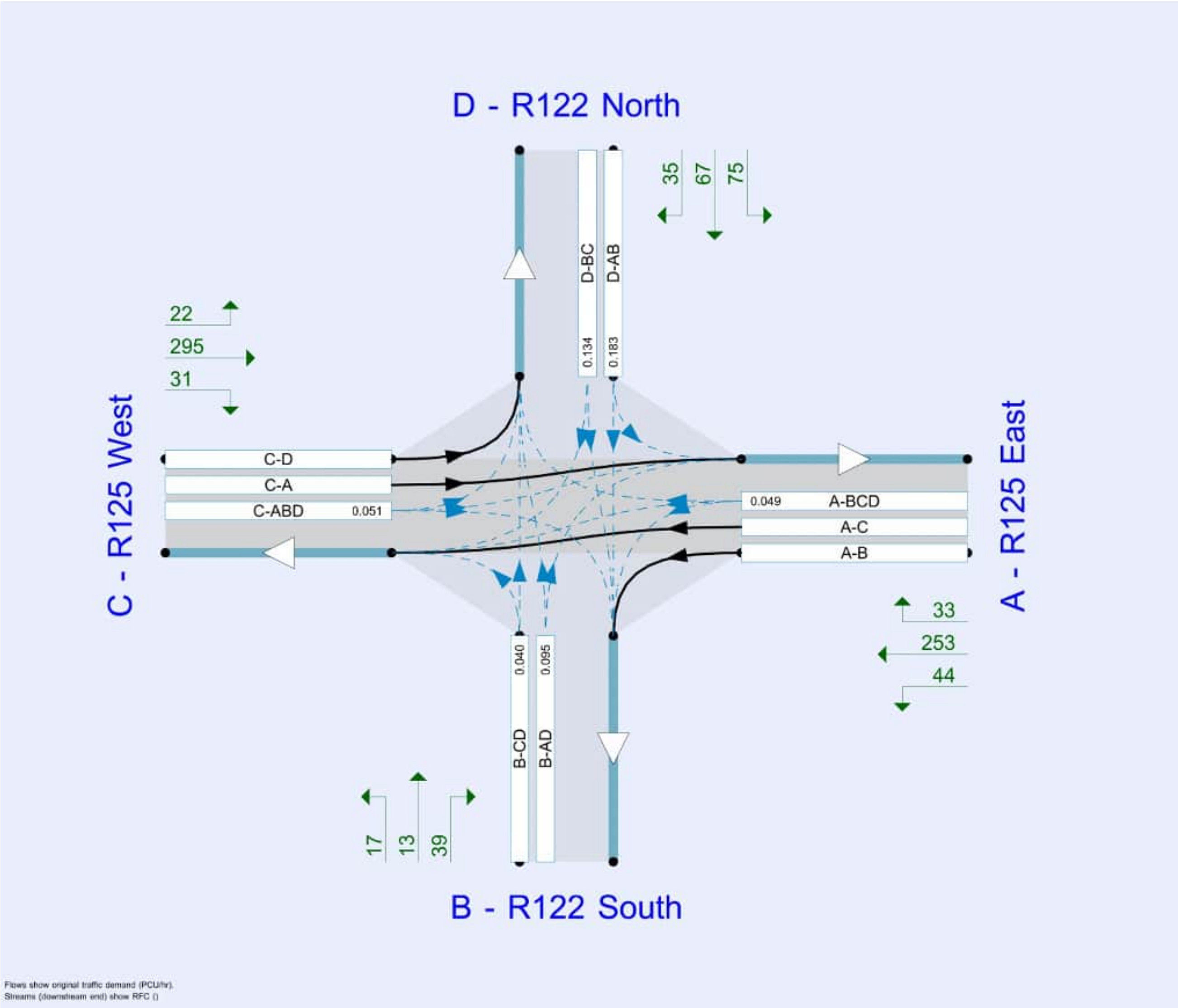
File summary

File Description

Title	
Location	
Site number	
Date	15/05/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EU\hilary.herlihy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use iterations with HCM roundabouts	Max number of iterations for roundabouts
5.75						0.85	36.00	20.00		500

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 Base	AM	ONE HOUR	07:30	09:00	15	✓
D2	2022 Base	PM	ONE HOUR	15:45	17:15	15	✓
D3	2026 Opening Year	AM	ONE HOUR	07:30	09:00	15	✓
D4	2026 Opening Year	PM	ONE HOUR	15:45	17:15	15	✓
D5	2026 Opening Year Combined Construction Traffic	AM	ONE HOUR	07:30	09:00	15	✓
D6	2026 Opening Year Combined Construction Traffic	PM	ONE HOUR	15:45	17:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2022 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		4.16	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.16	A

Arms

Arms

Arm	Name	Description	Arm type
A	R125 East		Major
B	R122 South		Minor
C	R125 West		Major
D	R122 North		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A - R125 East	6.00			130.0	✓	0.00
C - R125 West	6.00			25.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - R122 South	One lane plus flare	4.40	2.20	2.20	2.20	2.20		1.00	25	34
D - R122 North	One lane plus flare	4.40	2.20	2.20	2.20	2.20		1.00	36	38

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
A-D	649	-	-	-	-	-	-	0.252	0.359	0.252	-	-	-
B-A	465	0.085	0.214	0.214	-	-	-	0.135	0.306	-	0.214	0.214	0.107
B-C	575	0.088	0.223	-	-	-	-	-	-	-	-	-	-
B-D, nearside lane	448	0.082	0.206	0.206	-	-	-	0.130	0.294	0.130	-	-	-
B-D, offside lane	465	0.085	0.214	0.214	-	-	-	0.135	0.306	0.135	-	-	-
C-B	588	0.228	0.228	0.326	-	-	-	-	-	-	-	-	-
D-A	596	-	-	-	-	-	-	0.231	-	0.091	-	-	-
D-B, nearside lane	467	0.135	0.135	0.307	-	-	-	0.215	0.215	0.085	-	-	-
D-B, offside lane	467	0.135	0.135	0.307	-	-	-	0.215	0.215	0.085	-	-	-
D-C	467	-	0.135	0.307	0.108	0.215	0.215	0.215	0.215	0.085	-	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 Base	AM	ONE HOUR	07:30	09:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R125 East		ONE HOUR	✓	330	100.000
B - R122 South		ONE HOUR	✓	69	100.000
C - R125 West		ONE HOUR	✓	348	100.000
D - R122 North		ONE HOUR	✓	177	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	44	253	33
	B - R122 South	39	0	17	13
	C - R125 West	295	31	0	22
	D - R122 North	75	67	35	0

Proportions

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0.00	0.13	0.77	0.10
	B - R122 South	0.57	0.00	0.25	0.19
	C - R125 West	0.85	0.09	0.00	0.06
	D - R122 North	0.42	0.38	0.20	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	1	14	0
	B - R122 South	2	0	2	1
	C - R125 West	11	1	0	1
	D - R122 North	0	2	1	0

Average PCU Per Veh

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	1.000	1.010	1.140	1.000
	B - R122 South	1.020	1.000	1.020	1.010
	C - R125 West	1.110	1.010	1.000	1.010
	D - R122 North	1.000	1.020	1.010	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	A - R125 East	248	248
	B - R122 South	52	52
	C - R125 West	262	262
	D - R122 North	133	133
07:45-08:00	A - R125 East	297	297
	B - R122 South	62	62
	C - R125 West	313	313
	D - R122 North	159	159
08:00-08:15	A - R125 East	363	363
	B - R122 South	76	76
	C - R125 West	383	383
	D - R122 North	195	195
08:15-08:30	A - R125 East	363	363
	B - R122 South	76	76
	C - R125 West	383	383
	D - R122 North	195	195
08:30-08:45	A - R125 East	297	297
	B - R122 South	62	62
	C - R125 West	313	313
	D - R122 North	159	159
08:45-09:00	A - R125 East	248	248
	B - R122 South	52	52
	C - R125 West	262	262
	D - R122 North	133	133

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.07	9.47	0.1	A	22	33
B-AD	0.16	14.35	0.2	B	41	62
A-BCD	0.08	5.36	0.2	A	48	73
A-B					38	57
A-C					217	325
D-AB	0.30	12.79	0.4	B	103	154
D-BC	0.22	14.66	0.3	B	60	90
C-ABD	0.08	5.67	0.2	A	49	73
C-D					19	28
C-A					252	378

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	18	5	455	0.040	18	0.0	0.0	8.367	A
B-AD	34	8	356	0.095	33	0.0	0.1	11.344	B
A-BCD	36	9	732	0.049	35	0.0	0.1	5.339	A
A-B	32	8			32				
A-C	181	45			181				
D-AB	83	21	457	0.183	83	0.0	0.2	9.652	A
D-BC	50	12	371	0.134	49	0.0	0.2	11.328	B
C-ABD	35	9	698	0.051	35	0.0	0.1	5.648	A
C-D	16	4			16				
C-A	211	53			211				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	5	438	0.050	22	0.0	0.1	8.786	A
B-AD	40	10	335	0.120	40	0.1	0.1	12.448	B
A-BCD	46	12	750	0.062	46	0.1	0.1	5.299	A
A-B	37	9			37				
A-C	213	53			213				
D-AB	100	25	437	0.229	100	0.2	0.3	10.743	B
D-BC	59	15	351	0.168	59	0.2	0.2	12.509	B
C-ABD	46	12	721	0.064	46	0.1	0.1	5.564	A
C-D	19	5			19				
C-A	248	62			248				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	27	7	414	0.065	27	0.1	0.1	9.460	A
B-AD	49	12	305	0.161	49	0.1	0.2	14.310	B
A-BCD	63	16	776	0.081	63	0.1	0.2	5.265	A
A-B	44	11			44				
A-C	256	64			256				
D-AB	124	31	407	0.304	123	0.3	0.4	12.738	B
D-BC	71	18	320	0.222	71	0.2	0.3	14.608	B
C-ABD	64	16	754	0.085	64	0.1	0.2	5.469	A
C-D	22	6			22				
C-A	297	74			297				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	27	7	414	0.065	27	0.1	0.1	9.469	A
B-AD	49	12	305	0.161	49	0.2	0.2	14.345	B
A-BCD	63	16	776	0.081	63	0.2	0.2	5.288	A
A-B	44	11			44				
A-C	256	64			256				
D-AB	124	31	407	0.304	124	0.4	0.4	12.794	B
D-BC	71	18	320	0.222	71	0.3	0.3	14.657	B
C-ABD	64	16	754	0.085	64	0.2	0.2	5.490	A
C-D	22	6			22				
C-A	297	74			297				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	5	438	0.050	22	0.1	0.1	8.802	A
B-AD	40	10	334	0.120	40	0.2	0.1	12.492	B
A-BCD	46	12	750	0.062	46	0.2	0.1	5.343	A
A-B	37	9			37				
A-C	213	53			213				
D-AB	100	25	436	0.230	101	0.4	0.3	10.814	B
D-BC	59	15	350	0.168	59	0.3	0.2	12.564	B
C-ABD	46	12	721	0.064	47	0.2	0.1	5.601	A
C-D	18	5			18				
C-A	248	62			248				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	18	5	455	0.040	18	0.1	0.0	8.387	A
B-AD	34	8	356	0.095	34	0.1	0.1	11.403	B
A-BCD	36	9	732	0.049	36	0.1	0.1	5.364	A
A-B	31	8			31				
A-C	181	45			181				
D-AB	84	21	457	0.183	84	0.3	0.2	9.726	A
D-BC	50	12	371	0.134	50	0.2	0.2	11.398	B
C-ABD	36	9	698	0.051	36	0.1	0.1	5.672	A
C-D	16	4			16				
C-A	211	53			211				

2022 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		3.61	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.61	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2022 Base	PM	ONE HOUR	15:45	17:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R125 East		ONE HOUR	✓	402	100.000
B - R122 South		ONE HOUR	✓	125	100.000
C - R125 West		ONE HOUR	✓	208	100.000
D - R122 North		ONE HOUR	✓	72	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	28	323	51
	B - R122 South	47	0	22	56
	C - R125 West	174	9	0	25
	D - R122 North	29	18	25	0

Proportions

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0.00	0.07	0.80	0.13
	B - R122 South	0.38	0.00	0.18	0.45
	C - R125 West	0.84	0.04	0.00	0.12
	D - R122 North	0.40	0.25	0.35	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	0	3	3
	B - R122 South	1	0	0	1
	C - R125 West	3	0	0	0
	D - R122 North	1	0	0	0

Average PCU Per Veh

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	1.000	1.000	1.030	1.030
	B - R122 South	1.010	1.000	1.000	1.010
	C - R125 West	1.030	1.000	1.000	1.000
	D - R122 North	1.010	1.000	1.000	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
15:45-16:00	A - R125 East	303	303
	B - R122 South	94	94
	C - R125 West	157	157
	D - R122 North	54	54
16:00-16:15	A - R125 East	361	361
	B - R122 South	112	112
	C - R125 West	187	187
	D - R122 North	65	65
16:15-16:30	A - R125 East	443	443
	B - R122 South	138	138
	C - R125 West	229	229
	D - R122 North	79	79
16:30-16:45	A - R125 East	443	443
	B - R122 South	138	138
	C - R125 West	229	229
	D - R122 North	79	79
16:45-17:00	A - R125 East	361	361
	B - R122 South	112	112
	C - R125 West	187	187
	D - R122 North	65	65
17:00-17:15	A - R125 East	303	303
	B - R122 South	94	94
	C - R125 West	157	157
	D - R122 North	54	54

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.16	11.91	0.2	B	49	74
B-AD	0.24	14.39	0.3	B	65	98
A-BCD	0.12	5.11	0.3	A	79	118
A-B					23	35
A-C					267	400
D-AB	0.09	8.54	0.1	A	35	53
D-BC	0.11	12.02	0.1	B	31	46
C-ABD	0.02	5.91	0.0	A	12	18
C-D					22	34
C-A					157	235

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	40	10	414	0.096	39	0.0	0.1	9.642	A
B-AD	54	14	373	0.146	54	0.0	0.2	11.356	B
A-BCD	58	14	784	0.074	57	0.0	0.1	5.098	A
A-B	20	5			20				
A-C	225	56			225				
D-AB	29	7	499	0.058	29	0.0	0.1	7.708	A
D-BC	25	6	378	0.067	25	0.0	0.1	10.177	B
C-ABD	9	2	623	0.014	9	0.0	0.0	5.901	A
C-D	19	5			19				
C-A	129	32			129				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	48	12	394	0.122	48	0.1	0.1	10.470	B
B-AD	64	16	355	0.181	64	0.2	0.2	12.475	B
A-BCD	75	19	812	0.093	75	0.1	0.2	5.034	A
A-B	23	6			23				
A-C	263	66			263				
D-AB	35	9	486	0.071	35	0.1	0.1	8.034	A
D-BC	30	8	360	0.083	30	0.1	0.1	10.891	B
C-ABD	11	3	630	0.018	11	0.0	0.0	5.853	A
C-D	22	6			22				
C-A	154	38			154				

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	60	15	364	0.165	60	0.1	0.2	11.882	B
B-AD	78	19	330	0.235	77	0.2	0.3	14.346	B
A-BCD	103	26	850	0.121	103	0.2	0.3	4.961	A
A-B	27	7			27				
A-C	312	78			312				
D-AB	43	11	467	0.091	43	0.1	0.1	8.535	A
D-BC	37	9	336	0.109	36	0.1	0.1	12.007	B
C-ABD	15	4	642	0.023	15	0.0	0.0	5.785	A
C-D	27	7			27				
C-A	187	47			187				

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	60	15	364	0.165	60	0.2	0.2	11.909	B
B-AD	78	19	330	0.235	78	0.3	0.3	14.393	B
A-BCD	103	26	851	0.122	103	0.3	0.3	4.963	A
A-B	27	7			27				
A-C	312	78			312				
D-AB	43	11	467	0.091	43	0.1	0.1	8.541	A
D-BC	37	9	336	0.109	37	0.1	0.1	12.022	B
C-ABD	15	4	642	0.023	15	0.0	0.0	5.792	A
C-D	27	7			27				
C-A	187	47			187				

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	48	12	393	0.122	48	0.2	0.1	10.500	B
B-AD	64	16	355	0.181	65	0.3	0.2	12.527	B
A-BCD	75	19	812	0.093	76	0.3	0.2	5.039	A
A-B	23	6			23				
A-C	263	66			263				
D-AB	35	9	486	0.071	35	0.1	0.1	8.044	A
D-BC	30	8	360	0.083	30	0.1	0.1	10.912	B
C-ABD	11	3	630	0.018	11	0.0	0.0	5.865	A
C-D	22	6			22				
C-A	154	38			154				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	40	10	414	0.096	40	0.1	0.1	9.685	A
B-AD	54	14	373	0.146	55	0.2	0.2	11.427	B
A-BCD	58	15	784	0.074	58	0.2	0.1	5.108	A
A-B	20	5			20				
A-C	225	56			225				
D-AB	29	7	499	0.058	29	0.1	0.1	7.724	A
D-BC	25	6	378	0.067	25	0.1	0.1	10.216	B
C-ABD	9	2	622	0.014	9	0.0	0.0	5.910	A
C-D	19	5			19				
C-A	129	32			129				

2026 Opening Year, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		4.72	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.72	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2026 Opening Year	AM	ONE HOUR	07:30	09:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R125 East		ONE HOUR	✓	346	100.000
B - R122 South		ONE HOUR	✓	72	100.000
C - R125 West		ONE HOUR	✓	365	100.000
D - R122 North		ONE HOUR	✓	185	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	46	265	35
	B - R122 South	41	0	17	14
	C - R125 West	309	33	0	23
	D - R122 North	78	70	37	0

Proportions

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0.00	0.13	0.77	0.10
	B - R122 South	0.57	0.00	0.24	0.19
	C - R125 West	0.85	0.09	0.00	0.06
	D - R122 North	0.42	0.38	0.20	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	10	10	10	10
	B - R122 South	10	10	10	10
	C - R125 West	10	10	10	10
	D - R122 North	10	10	10	10

Average PCU Per Veh

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	1.100	1.100	1.100	1.100
	B - R122 South	1.100	1.100	1.100	1.100
	C - R125 West	1.100	1.100	1.100	1.100
	D - R122 North	1.100	1.100	1.100	1.100

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	A - R125 East	260	260
	B - R122 South	54	54
	C - R125 West	275	275
	D - R122 North	139	139
07:45-08:00	A - R125 East	311	311
	B - R122 South	65	65
	C - R125 West	328	328
	D - R122 North	166	166
08:00-08:15	A - R125 East	381	381
	B - R122 South	79	79
	C - R125 West	402	402
	D - R122 North	204	204
08:15-08:30	A - R125 East	381	381
	B - R122 South	79	79
	C - R125 West	402	402
	D - R122 North	204	204
08:30-08:45	A - R125 East	311	311
	B - R122 South	65	65
	C - R125 West	328	328
	D - R122 North	166	166
08:45-09:00	A - R125 East	260	260
	B - R122 South	54	54
	C - R125 West	275	275
	D - R122 North	139	139

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.07	10.58	0.1	B	23	34
B-AD	0.17	16.15	0.2	C	43	65
A-BCD	0.09	5.68	0.2	A	53	79
A-B					39	59
A-C					226	339
D-AB	0.33	14.79	0.5	B	107	161
D-BC	0.24	16.79	0.3	C	63	94
C-ABD	0.09	5.96	0.2	A	53	80
C-D					20	29
C-A					262	393

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	19	5	447	0.041	18	0.0	0.0	9.228	A
B-AD	36	9	351	0.102	35	0.0	0.1	12.514	B
A-BCD	39	10	736	0.052	38	0.0	0.1	5.671	A
A-B	33	8			33				
A-C	189	47			189				
D-AB	87	22	452	0.193	86	0.0	0.3	10.803	B
D-BC	52	13	366	0.143	51	0.0	0.2	12.580	B
C-ABD	39	10	703	0.055	38	0.0	0.1	5.953	A
C-D	16	4			16				
C-A	220	55			220				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	6	429	0.052	22	0.0	0.1	9.736	A
B-AD	42	11	328	0.129	42	0.1	0.2	13.834	B
A-BCD	50	13	756	0.066	50	0.1	0.1	5.613	A
A-B	39	10			39				
A-C	222	56			222				
D-AB	105	26	430	0.244	104	0.3	0.3	12.155	B
D-BC	62	15	343	0.180	61	0.2	0.2	14.035	B
C-ABD	50	13	728	0.069	50	0.1	0.1	5.848	A
C-D	19	5			19				
C-A	258	65			258				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	28	7	402	0.069	28	0.1	0.1	10.562	B
B-AD	52	13	297	0.174	51	0.2	0.2	16.094	C
A-BCD	69	17	783	0.088	68	0.1	0.2	5.543	A
A-B	46	12			46				
A-C	266	67			266				
D-AB	129	32	397	0.326	129	0.3	0.5	14.698	B
D-BC	74	19	310	0.239	74	0.2	0.3	16.710	C
C-ABD	70	18	762	0.092	70	0.1	0.2	5.723	A
C-D	23	6			23				
C-A	309	77			309				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	28	7	402	0.069	28	0.1	0.1	10.577	B
B-AD	52	13	297	0.174	52	0.2	0.2	16.146	C
A-BCD	69	17	783	0.088	69	0.2	0.2	5.550	A
A-B	46	12			46				
A-C	266	66			266				
D-AB	129	32	397	0.326	129	0.5	0.5	14.793	B
D-BC	74	19	310	0.240	74	0.3	0.3	16.791	C
C-ABD	70	18	762	0.092	70	0.2	0.2	5.726	A
C-D	23	6			23				
C-A	309	77			309				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	6	428	0.052	22	0.1	0.1	9.757	A
B-AD	42	11	328	0.129	43	0.2	0.2	13.896	B
A-BCD	50	13	756	0.066	50	0.2	0.1	5.622	A
A-B	39	10			39				
A-C	222	56			222				
D-AB	105	26	429	0.244	105	0.5	0.4	12.254	B
D-BC	62	15	343	0.180	62	0.3	0.2	14.117	B
C-ABD	51	13	728	0.070	51	0.2	0.1	5.855	A
C-D	19	5			19				
C-A	258	65			258				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	19	5	447	0.042	19	0.1	0.0	9.253	A
B-AD	36	9	351	0.102	36	0.2	0.1	12.590	B
A-BCD	39	10	736	0.053	39	0.1	0.1	5.681	A
A-B	33	8			33				
A-C	189	47			189				
D-AB	87	22	451	0.193	87	0.4	0.3	10.906	B
D-BC	52	13	365	0.143	52	0.2	0.2	12.674	B
C-ABD	39	10	703	0.055	39	0.1	0.1	5.964	A
C-D	16	4			16				
C-A	220	55			220				

2026 Opening Year, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		3.67	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.67	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2026 Opening Year	PM	ONE HOUR	15:45	17:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R125 East		ONE HOUR	✓	422	100.000
B - R122 South		ONE HOUR	✓	131	100.000
C - R125 West		ONE HOUR	✓	217	100.000
D - R122 North		ONE HOUR	✓	74	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	29	339	54
	B - R122 South	49	0	23	59
	C - R125 West	182	9	0	26
	D - R122 North	30	18	26	0

Proportions

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0.00	0.07	0.80	0.13
	B - R122 South	0.37	0.00	0.18	0.45
	C - R125 West	0.84	0.04	0.00	0.12
	D - R122 North	0.41	0.24	0.35	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	0	0	0
	B - R122 South	0	0	0	0
	C - R125 West	0	0	0	0
	D - R122 North	0	0	0	0

Average PCU Per Veh

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	1.000	1.000	1.000	1.000
	B - R122 South	1.000	1.000	1.000	1.000
	C - R125 West	1.000	1.000	1.000	1.000
	D - R122 North	1.000	1.000	1.000	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
15:45-16:00	A - R125 East	318	318
	B - R122 South	99	99
	C - R125 West	163	163
	D - R122 North	56	56
16:00-16:15	A - R125 East	379	379
	B - R122 South	118	118
	C - R125 West	195	195
	D - R122 North	67	67
16:15-16:30	A - R125 East	465	465
	B - R122 South	144	144
	C - R125 West	239	239
	D - R122 North	81	81
16:30-16:45	A - R125 East	465	465
	B - R122 South	144	144
	C - R125 West	239	239
	D - R122 North	81	81
16:45-17:00	A - R125 East	379	379
	B - R122 South	118	118
	C - R125 West	195	195
	D - R122 North	67	67
17:00-17:15	A - R125 East	318	318
	B - R122 South	99	99
	C - R125 West	163	163
	D - R122 North	56	56

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.18	12.30	0.2	B	52	78
B-AD	0.25	14.82	0.3	B	68	102
A-BCD	0.13	4.95	0.3	A	86	129
A-B					24	36
A-C					278	417
D-AB	0.09	8.57	0.1	A	36	55
D-BC	0.11	12.34	0.1	B	32	47
C-ABD	0.02	5.85	0.0	A	12	18
C-D					23	35
C-A					164	246

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	42	10	409	0.102	41	0.0	0.1	9.774	A
B-AD	57	14	369	0.154	56	0.0	0.2	11.477	B
A-BCD	63	16	791	0.079	62	0.0	0.1	4.937	A
A-B	20	5			20				
A-C	235	59			235				
D-AB	30	7	497	0.060	29	0.0	0.1	7.690	A
D-BC	26	6	374	0.070	26	0.0	0.1	10.336	B
C-ABD	9	2	624	0.014	9	0.0	0.0	5.852	A
C-D	19	5			19				
C-A	135	34			135				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	51	13	387	0.131	50	0.1	0.1	10.680	B
B-AD	67	17	350	0.192	67	0.2	0.2	12.684	B
A-BCD	82	20	820	0.100	81	0.1	0.2	4.877	A
A-B	23	6			23				
A-C	274	69			274				
D-AB	36	9	484	0.074	36	0.1	0.1	8.031	A
D-BC	31	8	355	0.087	31	0.1	0.1	11.099	B
C-ABD	12	3	632	0.018	11	0.0	0.0	5.797	A
C-D	23	6			23				
C-A	161	40			161				

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	63	16	356	0.178	63	0.1	0.2	12.269	B
B-AD	81	20	324	0.250	81	0.2	0.3	14.746	B
A-BCD	113	28	861	0.131	112	0.2	0.3	4.812	A
A-B	28	7			28				
A-C	324	81			324				
D-AB	44	11	464	0.094	44	0.1	0.1	8.559	A
D-BC	38	9	330	0.114	38	0.1	0.1	12.320	B
C-ABD	15	4	645	0.024	15	0.0	0.0	5.718	A
C-D	28	7			28				
C-A	196	49			196				

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	63	16	356	0.178	63	0.2	0.2	12.303	B
B-AD	81	20	324	0.250	81	0.3	0.3	14.817	B
A-BCD	113	28	861	0.131	113	0.3	0.3	4.816	A
A-B	28	7			28				
A-C	324	81			324				
D-AB	44	11	464	0.094	44	0.1	0.1	8.565	A
D-BC	38	9	329	0.114	38	0.1	0.1	12.336	B
C-ABD	15	4	645	0.024	15	0.0	0.0	5.721	A
C-D	28	7			28				
C-A	196	49			196				

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	51	13	387	0.131	51	0.2	0.2	10.718	B
B-AD	67	17	350	0.192	68	0.3	0.2	12.752	B
A-BCD	82	20	820	0.100	82	0.3	0.2	4.884	A
A-B	23	6			23				
A-C	274	69			274				
D-AB	36	9	484	0.074	36	0.1	0.1	8.039	A
D-BC	31	8	355	0.087	31	0.1	0.1	11.123	B
C-ABD	12	3	632	0.018	12	0.0	0.0	5.799	A
C-D	23	6			23				
C-A	161	40			161				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	42	10	409	0.102	42	0.2	0.1	9.821	A
B-AD	57	14	369	0.154	57	0.2	0.2	11.555	B
A-BCD	63	16	791	0.079	63	0.2	0.1	4.948	A
A-B	20	5			20				
A-C	235	59			235				
D-AB	30	7	497	0.060	30	0.1	0.1	7.704	A
D-BC	26	6	373	0.070	26	0.1	0.1	10.371	B
C-ABD	9	2	624	0.015	9	0.0	0.0	5.855	A
C-D	19	5			19				
C-A	135	34			135				

2026 Opening Year Combined Construction Traffic, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		4.38	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.38	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2026 Opening Year Combined Construction Traffic	AM	ONE HOUR	07:30	09:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R125 East		ONE HOUR	✓	361	100.000
B - R122 South		ONE HOUR	✓	77	100.000
C - R125 West		ONE HOUR	✓	378	100.000
D - R122 North		ONE HOUR	✓	188	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	47	279	35
	B - R122 South	43	0	19	15
	C - R125 West	320	34	0	24
	D - R122 North	78	72	38	0

Proportions

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0.00	0.13	0.77	0.10
	B - R122 South	0.56	0.00	0.25	0.19
	C - R125 West	0.85	0.09	0.00	0.06
	D - R122 North	0.41	0.38	0.20	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	1	14	0
	B - R122 South	0	0	0	0
	C - R125 West	0	0	0	0
	D - R122 North	0	0	0	0

Average PCU Per Veh

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	1.000	1.010	1.140	1.000
	B - R122 South	1.000	1.000	1.000	1.000
	C - R125 West	1.000	1.000	1.000	1.000
	D - R122 North	1.000	1.000	1.000	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	A - R125 East	272	272
	B - R122 South	58	58
	C - R125 West	285	285
	D - R122 North	142	142
07:45-08:00	A - R125 East	325	325
	B - R122 South	69	69
	C - R125 West	340	340
	D - R122 North	169	169
08:00-08:15	A - R125 East	397	397
	B - R122 South	85	85
	C - R125 West	416	416
	D - R122 North	207	207
08:15-08:30	A - R125 East	397	397
	B - R122 South	85	85
	C - R125 West	416	416
	D - R122 North	207	207
08:30-08:45	A - R125 East	325	325
	B - R122 South	69	69
	C - R125 West	340	340
	D - R122 North	169	169
08:45-09:00	A - R125 East	272	272
	B - R122 South	58	58
	C - R125 West	285	285
	D - R122 North	142	142

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.08	9.75	0.1	A	25	38
B-AD	0.19	15.22	0.2	C	45	68
A-BCD	0.09	5.34	0.2	A	54	81
A-B					40	60
A-C					237	356
D-AB	0.33	13.84	0.5	B	108	162
D-BC	0.25	15.70	0.3	C	64	96
C-ABD	0.10	5.40	0.2	A	56	84
C-D					20	30
C-A					271	406

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	20	5	447	0.046	20	0.0	0.0	8.425	A
B-AD	37	9	347	0.108	37	0.0	0.1	11.603	B
A-BCD	39	10	742	0.053	39	0.0	0.1	5.308	A
A-B	34	8			34				
A-C	199	50			199				
D-AB	88	22	447	0.197	87	0.0	0.2	9.967	A
D-BC	54	13	362	0.148	53	0.0	0.2	11.617	B
C-ABD	40	10	708	0.057	40	0.0	0.1	5.393	A
C-D	17	4			17				
C-A	227	57			227				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	25	6	428	0.058	25	0.0	0.1	8.919	A
B-AD	45	11	323	0.138	44	0.1	0.2	12.903	B
A-BCD	51	13	762	0.067	51	0.1	0.1	5.267	A
A-B	39	10			39				
A-C	234	58			234				
D-AB	106	26	425	0.249	105	0.2	0.3	11.263	B
D-BC	63	16	339	0.186	63	0.2	0.2	13.016	B
C-ABD	53	13	733	0.072	53	0.1	0.1	5.298	A
C-D	20	5			20				
C-A	267	67			267				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	31	8	400	0.076	30	0.1	0.1	9.737	A
B-AD	54	14	291	0.186	54	0.2	0.2	15.170	C
A-BCD	71	18	792	0.089	70	0.1	0.2	5.230	A
A-B	47	12			47				
A-C	280	70			280				
D-AB	131	33	391	0.334	130	0.3	0.5	13.749	B
D-BC	76	19	306	0.249	76	0.2	0.3	15.629	C
C-ABD	74	19	769	0.096	74	0.1	0.2	5.181	A
C-D	24	6			24				
C-A	318	80			318				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	31	8	400	0.076	31	0.1	0.1	9.750	A
B-AD	54	14	291	0.186	54	0.2	0.2	15.220	C
A-BCD	71	18	792	0.089	71	0.2	0.2	5.252	A
A-B	47	12			47				
A-C	280	70			280				
D-AB	131	33	391	0.335	131	0.5	0.5	13.838	B
D-BC	76	19	305	0.249	76	0.3	0.3	15.702	C
C-ABD	74	19	769	0.096	74	0.2	0.2	5.186	A
C-D	24	6			24				
C-A	318	80			318				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	25	6	428	0.058	25	0.1	0.1	8.939	A
B-AD	45	11	323	0.138	45	0.2	0.2	12.961	B
A-BCD	51	13	762	0.067	52	0.2	0.1	5.314	A
A-B	39	10			39				
A-C	234	58			234				
D-AB	106	26	424	0.249	106	0.5	0.3	11.355	B
D-BC	63	16	339	0.187	64	0.3	0.2	13.091	B
C-ABD	53	13	733	0.073	53	0.2	0.1	5.305	A
C-D	20	5			20				
C-A	267	67			267				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	20	5	447	0.046	21	0.1	0.0	8.447	A
B-AD	37	9	346	0.108	38	0.2	0.1	11.671	B
A-BCD	40	10	742	0.053	40	0.1	0.1	5.336	A
A-B	33	8			33				
A-C	199	50			199				
D-AB	88	22	447	0.197	88	0.3	0.2	10.058	B
D-BC	54	13	362	0.148	54	0.2	0.2	11.702	B
C-ABD	41	10	708	0.057	41	0.1	0.1	5.403	A
C-D	17	4			17				
C-A	227	57			227				

2026 Opening Year Combined Construction Traffic, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		3.74	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.74	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2026 Opening Year Combined Construction Traffic	PM	ONE HOUR	15:45	17:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R125 East		ONE HOUR	✓	428	100.000
B - R122 South		ONE HOUR	✓	133	100.000
C - R125 West		ONE HOUR	✓	220	100.000
D - R122 North		ONE HOUR	✓	75	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	29	342	57
	B - R122 South	50	0	23	60
	C - R125 West	185	9	0	26
	D - R122 North	31	18	26	0

Proportions

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0.00	0.07	0.80	0.13
	B - R122 South	0.38	0.00	0.17	0.45
	C - R125 West	0.84	0.04	0.00	0.12
	D - R122 North	0.41	0.24	0.35	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	0	0	0	0
	B - R122 South	0	0	0	0
	C - R125 West	0	0	0	0
	D - R122 North	0	0	0	0

Average PCU Per Veh

		To			
		A - R125 East	B - R122 South	C - R125 West	D - R122 North
From	A - R125 East	1.000	1.000	1.000	1.000
	B - R122 South	1.000	1.000	1.000	1.000
	C - R125 West	1.000	1.000	1.000	1.000
	D - R122 North	1.000	1.000	1.000	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
15:45-16:00	A - R125 East	322	322
	B - R122 South	100	100
	C - R125 West	166	166
	D - R122 North	56	56
16:00-16:15	A - R125 East	385	385
	B - R122 South	120	120
	C - R125 West	198	198
	D - R122 North	67	67
16:15-16:30	A - R125 East	471	471
	B - R122 South	146	146
	C - R125 West	242	242
	D - R122 North	83	83
16:30-16:45	A - R125 East	471	471
	B - R122 South	146	146
	C - R125 West	242	242
	D - R122 North	83	83
16:45-17:00	A - R125 East	385	385
	B - R122 South	120	120
	C - R125 West	198	198
	D - R122 North	67	67
17:00-17:15	A - R125 East	322	322
	B - R122 South	100	100
	C - R125 West	166	166
	D - R122 North	56	56

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-CD	0.18	12.47	0.2	B	53	79
B-AD	0.26	15.04	0.3	C	70	104
A-BCD	0.14	4.97	0.3	A	91	136
A-B					24	35
A-C					278	417
D-AB	0.10	8.59	0.1	A	37	56
D-BC	0.12	12.44	0.1	B	32	47
C-ABD	0.02	5.85	0.0	A	12	18
C-D					23	35
C-A					166	250

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	42	11	407	0.104	42	0.0	0.1	9.844	A
B-AD	58	14	368	0.157	57	0.0	0.2	11.567	B
A-BCD	66	17	792	0.084	66	0.0	0.1	4.956	A
A-B	20	5			20				
A-C	236	59			236				
D-AB	30	8	498	0.061	30	0.0	0.1	7.698	A
D-BC	26	6	372	0.070	26	0.0	0.1	10.386	B
C-ABD	9	2	625	0.015	9	0.0	0.0	5.848	A
C-D	19	5			19				
C-A	137	34			137				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	51	13	385	0.133	51	0.1	0.2	10.781	B
B-AD	68	17	349	0.196	68	0.2	0.2	12.825	B
A-BCD	87	22	821	0.105	86	0.1	0.2	4.902	A
A-B	23	6			23				
A-C	275	69			275				
D-AB	37	9	484	0.075	36	0.1	0.1	8.045	A
D-BC	31	8	353	0.088	31	0.1	0.1	11.168	B
C-ABD	12	3	633	0.018	12	0.0	0.0	5.792	A
C-D	23	6			23				
C-A	163	41			163				

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	64	16	353	0.182	64	0.2	0.2	12.438	B
B-AD	82	21	322	0.256	82	0.2	0.3	14.989	B
A-BCD	120	30	863	0.139	119	0.2	0.3	4.848	A
A-B	27	7			27				
A-C	324	81			324				
D-AB	45	11	464	0.097	45	0.1	0.1	8.585	A
D-BC	38	9	327	0.115	38	0.1	0.1	12.426	B
C-ABD	16	4	646	0.024	15	0.0	0.0	5.711	A
C-D	28	7			28				
C-A	199	50			199				

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	64	16	353	0.182	64	0.2	0.2	12.475	B
B-AD	82	21	322	0.256	82	0.3	0.3	15.040	C
A-BCD	120	30	863	0.139	120	0.3	0.3	4.851	A
A-B	27	7			27				
A-C	324	81			324				
D-AB	45	11	464	0.097	45	0.1	0.1	8.591	A
D-BC	38	9	327	0.115	38	0.1	0.1	12.442	B
C-ABD	16	4	646	0.024	16	0.0	0.0	5.712	A
C-D	28	7			28				
C-A	199	50			199				

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	51	13	384	0.133	51	0.2	0.2	10.824	B
B-AD	68	17	348	0.196	69	0.3	0.2	12.887	B
A-BCD	87	22	822	0.106	87	0.3	0.2	4.909	A
A-B	23	6			23				
A-C	275	69			275				
D-AB	37	9	484	0.075	37	0.1	0.1	8.055	A
D-BC	31	8	353	0.088	31	0.1	0.1	11.193	B
C-ABD	12	3	633	0.018	12	0.0	0.0	5.796	A
C-D	23	6			23				
C-A	163	41			163				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	42	11	406	0.104	42	0.2	0.1	9.895	A
B-AD	58	14	367	0.157	58	0.2	0.2	11.647	B
A-BCD	67	17	792	0.084	67	0.2	0.2	4.968	A
A-B	20	5			20				
A-C	236	59			236				
D-AB	30	8	497	0.061	31	0.1	0.1	7.714	A
D-BC	26	6	372	0.070	26	0.1	0.1	10.422	B
C-ABD	9	2	624	0.015	9	0.0	0.0	5.851	A
C-D	19	5			19				
C-A	137	34			137				

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: Fieldstown Site Access SH.j10
Path: \\na.aecomnet.com\lfs\EMEA\Dublin-IEDBL2\Legacy\iedbl2fp001\DATA\DCS\Projects\BP\60657534_SummerhillFieldstownSID\400_Technical\430_Technical_Working_Documents\Traffic\02_FielTS\Traffic Modelling
Report generation date: 11/09/2023 12:56:54

»2026 Opening , AM
»2026 Opening , PM
»2026 Opening with Combined Construction Traffic, AM
»2026 Opening with Combined Construction Traffic, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2026 Opening									
Stream B-C	D1	0.1	6.17	0.08	A	D2	0.1	6.02	0.08	A
Stream B-A		0.0	0.00	0.00	A		0.0	0.00	0.00	A
Stream C-AB		0.1	5.52	0.08	A		0.1	5.12	0.07	A
	2026 Opening with Combined Construction Traffic									
Stream B-C	D3	0.1	6.78	0.10	A	D4	0.1	6.60	0.09	A
Stream B-A		0.0	0.00	0.00	A		0.0	0.00	0.00	A
Stream C-AB		0.1	6.03	0.09	A		0.1	5.57	0.08	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

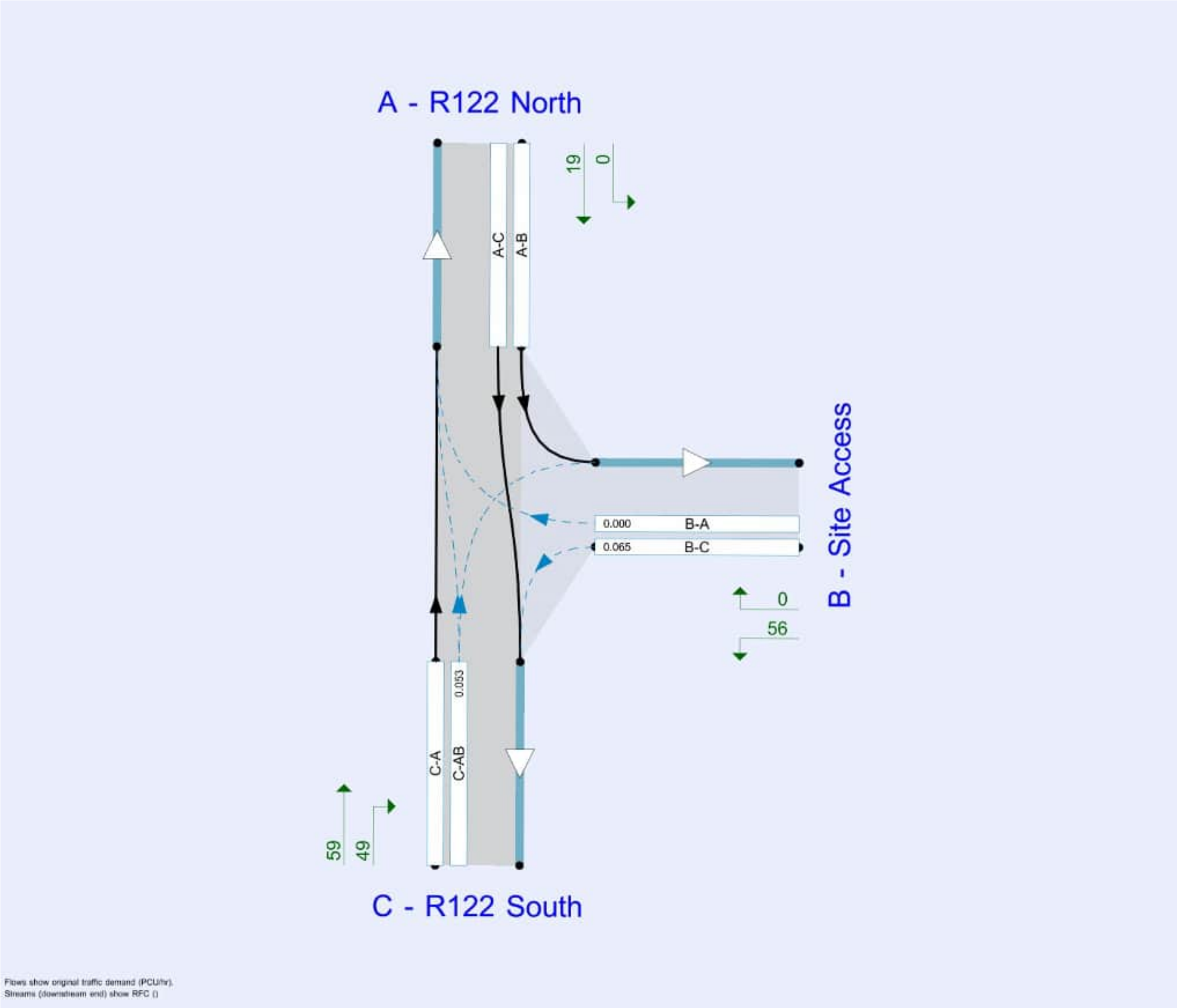
File summary

File Description

Title	
Location	
Site number	
Date	15/05/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EU\hilary.herlihy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use iterations with HCM roundabouts	Max number of iterations for roundabouts
5.75						0.85	36.00	20.00		500

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Opening	AM	ONE HOUR	07:30	09:00	15	✓
D2	2026 Opening	PM	ONE HOUR	15:45	17:15	15	✓
D3	2026 Opening with Combined Construction Traffic	AM	ONE HOUR	07:30	09:00	15	✓
D4	2026 Opening with Combined Construction Traffic	PM	ONE HOUR	15:45	17:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 Opening , AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access Fieldstown	T-Junction	Two-way	Two-way	Two-way		3.15	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.15	A

Arms

Arms

Arm	Name	Description	Arm type
A	R122 North		Major
B	Site Access		Minor
C	R122 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - R122 South	6.00			250.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Site Access	One lane plus flare	10.00	3.70	2.75	2.75	2.60		1.00	18	14

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	588	0.107	0.271	0.170	0.387
B-C	656	0.100	0.254	-	-
C-B	719	0.278	0.278	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Opening	AM	ONE HOUR	07:30	09:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R122 North		ONE HOUR	✓	70	100.000
B - Site Access		ONE HOUR	✓	48	100.000
C - R122 South		ONE HOUR	✓	62	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	70
	B - Site Access	0	0	48
	C - R122 South	14	48	0

Proportions

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0.00	0.00	1.00
	B - Site Access	0.00	0.00	1.00
	C - R122 South	0.23	0.77	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	3
	B - Site Access	0	0	0
	C - R122 South	1	0	0

Average PCU Per Veh

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	1.000	1.000	1.030
	B - Site Access	1.000	1.000	1.000
	C - R122 South	1.010	1.000	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	A - R122 North	53	53
	B - Site Access	36	36
	C - R122 South	47	47
07:45-08:00	A - R122 North	63	63
	B - Site Access	43	43
	C - R122 South	56	56
08:00-08:15	A - R122 North	77	77
	B - Site Access	53	53
	C - R122 South	68	68
08:15-08:30	A - R122 North	77	77
	B - Site Access	53	53
	C - R122 South	68	68
08:30-08:45	A - R122 North	63	63
	B - Site Access	43	43
	C - R122 South	56	56
08:45-09:00	A - R122 North	53	53
	B - Site Access	36	36
	C - R122 South	47	47

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.08	6.17	0.1	A	44	66
B-A	0.00	0.00	0.0	A	0	0
C-AB	0.08	5.52	0.1	A	45	67
C-A					12	18
A-B					0	0
A-C					64	96

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	36	9	642	0.056	36	0.0	0.1	5.938	A
B-A	0	0	558	0.000	0	0.0	0.0	0.000	A
C-AB	37	9	710	0.052	36	0.0	0.1	5.340	A
C-A	10	2			10				
A-B	0	0			0				
A-C	53	13			53				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	43	11	640	0.067	43	0.1	0.1	6.035	A
B-A	0	0	552	0.000	0	0.0	0.0	0.000	A
C-AB	44	11	709	0.062	44	0.1	0.1	5.414	A
C-A	12	3			12				
A-B	0	0			0				
A-C	63	16			63				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	53	13	636	0.083	53	0.1	0.1	6.172	A
B-A	0	0	544	0.000	0	0.0	0.0	0.000	A
C-AB	54	14	707	0.076	54	0.1	0.1	5.516	A
C-A	14	4			14				
A-B	0	0			0				
A-C	77	19			77				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	53	13	636	0.083	53	0.1	0.1	6.172	A
B-A	0	0	544	0.000	0	0.0	0.0	0.000	A
C-AB	54	14	707	0.076	54	0.1	0.1	5.518	A
C-A	14	4			14				
A-B	0	0			0				
A-C	77	19			77				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	43	11	640	0.067	43	0.1	0.1	6.039	A
B-A	0	0	552	0.000	0	0.0	0.0	0.000	A
C-AB	44	11	709	0.062	44	0.1	0.1	5.417	A
C-A	12	3			12				
A-B	0	0			0				
A-C	63	16			63				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	36	9	642	0.056	36	0.1	0.1	5.942	A
B-A	0	0	558	0.000	0	0.0	0.0	0.000	A
C-AB	37	9	710	0.052	37	0.1	0.1	5.346	A
C-A	10	2			10				
A-B	0	0			0				
A-C	53	13			53				

2026 Opening , PM

Data Errors and Warnings
No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access Fieldstown	T-Junction	Two-way	Two-way	Two-way		3.11	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.11	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Opening	PM	ONE HOUR	15:45	17:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R122 North		ONE HOUR	✓	18	100.000
B - Site Access		ONE HOUR	✓	48	100.000
C - R122 South		ONE HOUR	✓	100	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	18
	B - Site Access	0	0	48
	C - R122 South	59	41	0

Proportions

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0.00	0.00	1.00
	B - Site Access	0.00	0.00	1.00
	C - R122 South	0.59	0.41	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	1
	B - Site Access	0	0	0
	C - R122 South	1	0	0

Average PCU Per Veh

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	1.000	1.000	1.010
	B - Site Access	1.000	1.000	1.000
	C - R122 South	1.010	1.000	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
15:45-16:00	A - R122 North	14	14
	B - Site Access	36	36
	C - R122 South	75	75
16:00-16:15	A - R122 North	16	16
	B - Site Access	43	43
	C - R122 South	90	90
16:15-16:30	A - R122 North	20	20
	B - Site Access	53	53
	C - R122 South	110	110
16:30-16:45	A - R122 North	20	20
	B - Site Access	53	53
	C - R122 South	110	110
16:45-17:00	A - R122 North	16	16
	B - Site Access	43	43
	C - R122 South	90	90
17:00-17:15	A - R122 North	14	14
	B - Site Access	36	36
	C - R122 South	75	75

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.08	6.02	0.1	A	44	66
B-A	0.00	0.00	0.0	A	0	0
C-AB	0.07	5.12	0.1	A	41	61
C-A					51	77
A-B					0	0
A-C					17	25

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	36	9	652	0.055	36	0.0	0.1	5.841	A
B-A	0	0	565	0.000	0	0.0	0.0	0.000	A
C-AB	33	8	742	0.044	33	0.0	0.1	5.078	A
C-A	42	11			42				
A-B	0	0			0				
A-C	14	3			14				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	43	11	651	0.066	43	0.1	0.1	5.917	A
B-A	0	0	561	0.000	0	0.0	0.0	0.000	A
C-AB	40	10	746	0.053	40	0.1	0.1	5.098	A
C-A	50	13			50				
A-B	0	0			0				
A-C	16	4			16				

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	53	13	651	0.081	53	0.1	0.1	6.022	A
B-A	0	0	554	0.000	0	0.0	0.0	0.000	A
C-AB	49	12	752	0.066	49	0.1	0.1	5.124	A
C-A	61	15			61				
A-B	0	0			0				
A-C	20	5			20				

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	53	13	651	0.081	53	0.1	0.1	6.022	A
B-A	0	0	554	0.000	0	0.0	0.0	0.000	A
C-AB	49	12	752	0.066	49	0.1	0.1	5.125	A
C-A	61	15			61				
A-B	0	0			0				
A-C	20	5			20				

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	43	11	651	0.066	43	0.1	0.1	5.918	A
B-A	0	0	561	0.000	0	0.0	0.0	0.000	A
C-AB	40	10	746	0.053	40	0.1	0.1	5.102	A
C-A	50	13			50				
A-B	0	0			0				
A-C	16	4			16				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	36	9	652	0.055	36	0.1	0.1	5.846	A
B-A	0	0	565	0.000	0	0.0	0.0	0.000	A
C-AB	33	8	742	0.044	33	0.1	0.1	5.084	A
C-A	42	11			42				
A-B	0	0			0				
A-C	14	3			14				

2026 Opening with Combined Construction Traffic, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access Fieldstown	T-Junction	Two-way	Two-way	Two-way		3.62	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.62	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2026 Opening with Combined Construction Traffic	AM	ONE HOUR	07:30	09:00	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R122 North		ONE HOUR	✓	73	100.000
B - Site Access		ONE HOUR	✓	56	100.000
C - R122 South		ONE HOUR	✓	71	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	73
	B - Site Access	0	0	56
	C - R122 South	15	56	0

Proportions

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0.00	0.00	1.00
	B - Site Access	0.00	0.00	1.00
	C - R122 South	0.21	0.79	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	3
	B - Site Access	0	0	8
	C - R122 South	1	8	0

Average PCU Per Veh

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	1.000	1.000	1.030
	B - Site Access	1.000	1.000	1.080
	C - R122 South	1.010	1.080	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:30-07:45	A - R122 North	55	55
	B - Site Access	42	42
	C - R122 South	53	53
07:45-08:00	A - R122 North	66	66
	B - Site Access	50	50
	C - R122 South	64	64
08:00-08:15	A - R122 North	80	80
	B - Site Access	62	62
	C - R122 South	78	78
08:15-08:30	A - R122 North	80	80
	B - Site Access	62	62
	C - R122 South	78	78
08:30-08:45	A - R122 North	66	66
	B - Site Access	50	50
	C - R122 South	64	64
08:45-09:00	A - R122 North	55	55
	B - Site Access	42	42
	C - R122 South	53	53

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.10	6.78	0.1	A	51	77
B-A	0.00	0.00	0.0	A	0	0
C-AB	0.09	6.03	0.1	A	52	79
C-A					13	19
A-B					0	0
A-C					67	100

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	11	642	0.066	42	0.0	0.1	6.480	A
B-A	0	0	555	0.000	0	0.0	0.0	0.000	A
C-AB	43	11	710	0.060	43	0.0	0.1	5.813	A
C-A	11	3			11				
A-B	0	0			0				
A-C	55	14			55				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	13	639	0.079	50	0.1	0.1	6.605	A
B-A	0	0	549	0.000	0	0.0	0.0	0.000	A
C-AB	51	13	709	0.072	51	0.1	0.1	5.906	A
C-A	13	3			13				
A-B	0	0			0				
A-C	66	16			66				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62	15	635	0.097	62	0.1	0.1	6.778	A
B-A	0	0	540	0.000	0	0.0	0.0	0.000	A
C-AB	63	16	706	0.089	63	0.1	0.1	6.033	A
C-A	15	4			15				
A-B	0	0			0				
A-C	80	20			80				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62	15	635	0.097	62	0.1	0.1	6.778	A
B-A	0	0	540	0.000	0	0.0	0.0	0.000	A
C-AB	63	16	706	0.089	63	0.1	0.1	6.035	A
C-A	15	4			15				
A-B	0	0			0				
A-C	80	20			80				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	13	639	0.079	50	0.1	0.1	6.609	A
B-A	0	0	549	0.000	0	0.0	0.0	0.000	A
C-AB	51	13	709	0.072	51	0.1	0.1	5.908	A
C-A	13	3			13				
A-B	0	0			0				
A-C	66	16			66				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	11	642	0.066	42	0.1	0.1	6.486	A
B-A	0	0	555	0.000	0	0.0	0.0	0.000	A
C-AB	43	11	710	0.060	43	0.1	0.1	5.820	A
C-A	11	3			11				
A-B	0	0			0				
A-C	55	14			55				

2026 Opening with Combined Construction Traffic, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access Fieldstown	T-Junction	Two-way	Two-way	Two-way		3.63	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.63	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2026 Opening with Combined Construction Traffic	PM	ONE HOUR	15:45	17:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - R122 North		ONE HOUR	✓	19	100.000
B - Site Access		ONE HOUR	✓	56	100.000
C - R122 South		ONE HOUR	✓	108	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	19
	B - Site Access	0	0	56
	C - R122 South	59	49	0

Proportions

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0.00	0.00	1.00
	B - Site Access	0.00	0.00	1.00
	C - R122 South	0.55	0.45	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	0	0	1
	B - Site Access	0	0	8
	C - R122 South	0	8	0

Average PCU Per Veh

		To		
		A - R122 North	B - Site Access	C - R122 South
From	A - R122 North	1.000	1.000	1.010
	B - Site Access	1.000	1.000	1.080
	C - R122 South	1.000	1.080	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
15:45-16:00	A - R122 North	14	14
	B - Site Access	42	42
	C - R122 South	81	81
16:00-16:15	A - R122 North	17	17
	B - Site Access	50	50
	C - R122 South	97	97
16:15-16:30	A - R122 North	21	21
	B - Site Access	62	62
	C - R122 South	119	119
16:30-16:45	A - R122 North	21	21
	B - Site Access	62	62
	C - R122 South	119	119
16:45-17:00	A - R122 North	17	17
	B - Site Access	50	50
	C - R122 South	97	97
17:00-17:15	A - R122 North	14	14
	B - Site Access	42	42
	C - R122 South	81	81

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.09	6.60	0.1	A	51	77
B-A	0.00	0.00	0.0	A	0	0
C-AB	0.08	5.57	0.1	A	49	73
C-A					51	76
A-B					0	0
A-C					17	26

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	11	652	0.065	42	0.0	0.1	6.370	A
B-A	0	0	563	0.000	0	0.0	0.0	0.000	A
C-AB	39	10	742	0.053	39	0.0	0.1	5.506	A
C-A	42	11			42				
A-B	0	0			0				
A-C	14	4			14				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	13	651	0.077	50	0.1	0.1	6.469	A
B-A	0	0	558	0.000	0	0.0	0.0	0.000	A
C-AB	47	12	746	0.064	47	0.1	0.1	5.536	A
C-A	50	12			50				
A-B	0	0			0				
A-C	17	4			17				

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62	15	650	0.095	62	0.1	0.1	6.604	A
B-A	0	0	551	0.000	0	0.0	0.0	0.000	A
C-AB	59	15	752	0.079	59	0.1	0.1	5.573	A
C-A	60	15			60				
A-B	0	0			0				
A-C	21	5			21				

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62	15	650	0.095	62	0.1	0.1	6.604	A
B-A	0	0	551	0.000	0	0.0	0.0	0.000	A
C-AB	59	15	752	0.079	59	0.1	0.1	5.573	A
C-A	60	15			60				
A-B	0	0			0				
A-C	21	5			21				

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	13	651	0.077	50	0.1	0.1	6.474	A
B-A	0	0	558	0.000	0	0.0	0.0	0.000	A
C-AB	47	12	746	0.064	48	0.1	0.1	5.531	A
C-A	50	12			50				
A-B	0	0			0				
A-C	17	4			17				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	11	652	0.065	42	0.1	0.1	6.376	A
B-A	0	0	563	0.000	0	0.0	0.0	0.000	A
C-AB	39	10	742	0.053	39	0.1	0.1	5.509	A
C-A	42	11			42				
A-B	0	0			0				
A-C	14	4			14				

aecom.com