East Meath - North Dublin Grid Upgrade Environmental Impact Assessment Report (EIAR): Volume 2

Chapter 4 – Proposed Development Description

EirGrid

March 2024

Contents

4. Proposed Development Description

4.1 Introduction

The East Meath – North Dublin Grid Upgrade (hereafter referred to as the Proposed Development) includes approximately 37.5 kilometres (km) of new 400 kilovolt (kV) underground cable circuit (also referred to as the proposed cable route) between the existing Woodland Substation in the townland of Woodland in County Meath and the existing Belcamp Substation in the townlands of Clonshagh and Belcamp in Fingal, County Dublin. The Proposed Development will also involve works in the substations to facilitate the connection of the underground cable circuit to the electrical grid. Approximately 20.5km of the proposed underground cable route will be located in County Meath and approximately 17km of the proposed underground cable route will be located in Fingal, County Dublin. Approximately 70% of the proposed underground cable route will be located within public roads and approximately 30% will be located in private lands, to avoid location-specific constraints.

This Chapter has been written in line with the requirements of Directive 2014/52/EU of the Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (hereafter referred to as the EIA Directive) (as outlined in Table 1.1 of Chapter 1 (Introduction and the Environmental Impact Assessment Process) in Volume 2 of this Environmental Impact Assessment Report (EIAR)).

The design of the Proposed Development has evolved through the application of a comprehensive design iteration process with particular emphasis on minimising the potential for environmental impacts, where practicable, whilst ensuring the objectives of the Proposed Development are maintained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and outline design development programme have been incorporated, where appropriate.

4.2 Proposed Development Description

The Proposed Development is illustrated in Figure 4.1 (Sheet 1 to Sheet 48) in Volume 4 of this EIAR. A summary of the Proposed Development, as described in the public notices, is outlined below and described in more detail throughout this Chapter.

The Proposed Development consists of the following principal elements:

A. Installation of an underground cable circuit, approximately 37.5km in length, connecting Woodland Substation (400kV) in the townland of Woodland in County Meath, and Belcamp Substation (220kV) in the townlands of Clonshagh and Belcamp in Fingal. The development of the underground cable circuit will include the following:
    - Construction of a trench of approximately 1.5m in width and approximately 1.3m in depth in the public road (approximately 26km) and approximately 1.8m in depth in private lands (approximately 11.5km) in which the underground cable circuit is laid in flat formation, with associated above ground route marker posts. Route marker posts will be located at field boundaries where the proposed underground cable circuit is laid in private land, at regular intervals in road verges when the proposed underground cable circuit is in-road, in road verges where the proposed underground cable circuit crosses any roads, and at Horizontal Directional Drilling (HDD) crossing locations;
    - Construction of 49 Joint Bays (on average every 750m), primarily in the public roads, each approximately 10m in length, 2.5m in width and 2.5m in depth, with adjacent communication chambers and link boxes, along the full alignment of the underground cable circuit. Where the Joint Bays are located off-road, permanent hardstanding areas will be created around the Joint Bays;

- The laying of communication links and fibre optic cables between both substations, running in the same trench as the underground cable circuit;
- The provision of seven Temporary Construction Compounds located along the route and adjacent to substations – sizes for each of the seven Temporary Construction Compounds ranging from approximately 0.8ha to 1.6ha;
- The provision of a Temporary HDD Compound at both the reception and launch locations for three HDD motorway crossings, (i.e., six temporary HDD Compounds in total), and associated laydown area for each HDD crossing (i.e., three laydown areas in total) - sizes for each of the six HDD Compounds (plus laydown area where applicable) ranging from approximately 0.15ha to 0.45ha;
- The provision of temporary Passing Bays during construction at certain Joint Bay locations, each approximately 95m in length and 5.5m in width;
- The laying of unbound temporary access tracks, 5m wide in private lands (approximately 12km in total length);
- The laying of 12 unbound, permanent access tracks, 4m wide in private land (approximately 4km in total length);
- All associated water, rail, road, and utility underground crossings using either trenchless drilling or open cut techniques as appropriate for the particular crossing; and
- All associated and ancillary above and below-ground site development works, including works comprising or relating to permanent and temporary construction and reinstatement, roadworks, utility diversions and site and vegetation clearance.

B. Upgrades to the existing 400kV Woodland Substation in the townland of Woodland in County Meath. This will include:
   - Installation of a 400kV feeder bay and associated electrical shunt reactor (approximately 8m in height);
   - Installation of insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors (up to 12.6m in height) in order to connect the bay to the busbar;
   - Installation of two gantries, 25m in height, with one 3m tall lightning rod on top of each gantry; and
   - All ancillary site development works including site preparation works, underground cabling, drainage and earthgrid, as required to facilitate the Proposed Development.

C. Upgrades to the existing 220kV Belcamp Substation in the townlands of Clonshagh and Belcamp in Fingal. This will include:
   - Construction of a new steel framed and clad building (73m long, 17.8m wide by 16m high) to house a new 400kV Gas Insulated Switchgear (GIS) Hall, plus eight lightning rods on the roof of the GIS Hall (each 3m in height);
   - Installation of 400kV switchgear to facilitate the connection of the new underground cable circuit to the existing substation;
   - Installation of associated electrical shunt reactor (approximately 8m in height) with insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors (up to 12.8m in height) in order to connect the reactor to the cable circuit;
   - Installation of two lightning masts (each 15m in height);
   - Installation of a new 400/220kV transformer adjacent to the new GIS Hall and connections to the existing 220kV substation via cable circuit;
   - Internal access road; and

- All ancillary site development works including site preparation works, site clearance and levelling, drainage, access tracks, and use of existing access points off Stockhole Lane and the R139.

4.3 Underground Cable

4.3.1 Overview

There are three key elements of the proposed underground cable:

- **Cable Trench** - approximately 1.5m in width, 1.3m in depth in the public road and 1.8m in depth in private lands in which the underground cable is laid (see Image 4.1);
- **Joint Bay** - the cable will be delivered in lengths and will need to be connected (jointed) together. This will happen at the Joint Bays which are underground chambers located at various points on the route. Joint Bays are used as locations to pull the cables into the pre-installed ducts and to connect ('joint') together the individual cables and create a single, overall continuous circuit; and
- **Passing Bay** – a temporary traffic lane to allow traffic flow around Joint Bays while construction works are ongoing.

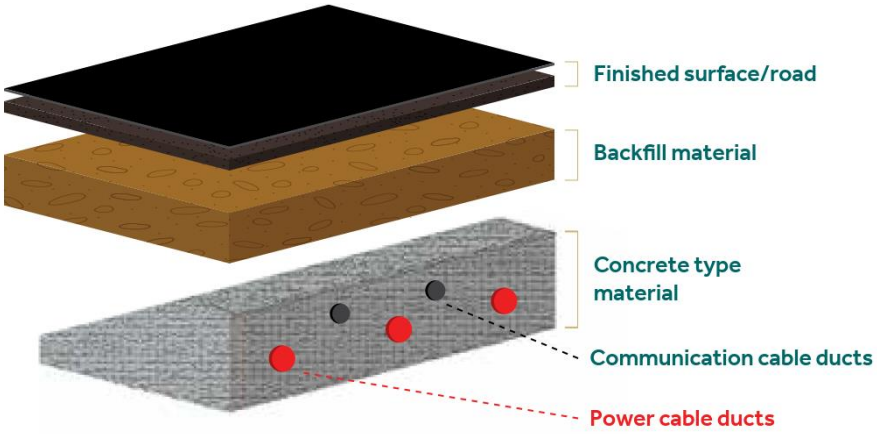

Image 4.1: Proposed Cable Trench

The width and depth of the cable trench can vary for the crossing of watercourses or utilities and for other technical reasons.

The proposed underground cable will be delivered to site in individual lengths on cable drums. These lengths will be installed along the proposed cable route by using 'Joint Bays'.

Smaller buried chambers ('manholes') will be installed alongside Joint Bay locations, of which there are two types:

- C2 chambers, which are used to join the fibre optic communication cables pulled into the pre-installed communications ducts; and
- Link box chambers, which are used to accommodate the link box (a device which earths the outer sheaths of the power cables).

As with any telecommunications facilities, these chambers will be provided with removable covers to facilitate access for ongoing maintenance and commissioning works. While the Joint Bays will not require ongoing maintenance, access from the surface is still required in the unlikely event of a cable failure needing replacement.

A Joint Bay under construction is shown in Image 4.2. An image of a reinstated road after Joint Bay construction is shown in Image 4.3. Passing Bays to facilitate road traffic management will be provided in 14 locations, where the Joint Bays are to be located in the road carriageway. There will be 33 Joint Bays along the public road / verge and 16 Joint Bays in off road sections. A Passing Bay is shown in Image 4.4. Further detail on the construction of Joint Bays and Passing Bays is provided in Section 4.5.1.

Image 4.2: Example of a Joint Bay During Construction

Image 4.3: Example of a Reinstated Road Over a Joint Bay (Darker Asphalt) with the C2 Chamber Cover Visible

Image 4.4: Example of a Passing Bay (Ensuring Road Traffic Continues Around a Working Area)

EirGrid has carefully considered the previous investments made by Meath and Fingal County Councils in maintaining and upgrading their road surfaces. The ESB will establish key principles and agree appropriate methodologies with the County Councils for road reinstatement, where the proposed underground cable and associated infrastructure has been constructed. This could include reinstatement of road surfacing wider than the proposed underground cable trench and Joint Bays, subject to planning approval by the planning authorities. This will be in accordance with the accepted standard for underground cable development; The

Guidelines for Managing Openings in Public Roads (hereafter referred to as The Purple Book) (Department of Transport, Tourism and Sport 2017). This can also be assured by way of an appropriate Condition of planning approval.

It is noted that, the specific location and design of Joint Bays and Passing Bays are subject to refinement at the detailed design stage, within the parameters set out in this planning application.

4.3.2 Underground Cable Route Description

The majority (70%) of the proposed cable route between the existing Woodland Substation and Belcamp Substation will be installed within the existing public road network. Off-road routes are proposed at particular locations to avoid specific constraints.

From Woodland Substation, the proposed cable route will travel south through private lands for around 3.5km until it joins the R156 Regional Road at Barstown Industrial Estate. From there, the proposed cable route will travel east as far as Dunboyne, turning north along the R157 Regional Road until it reaches the north-western outskirts of the town (Image 4.5).

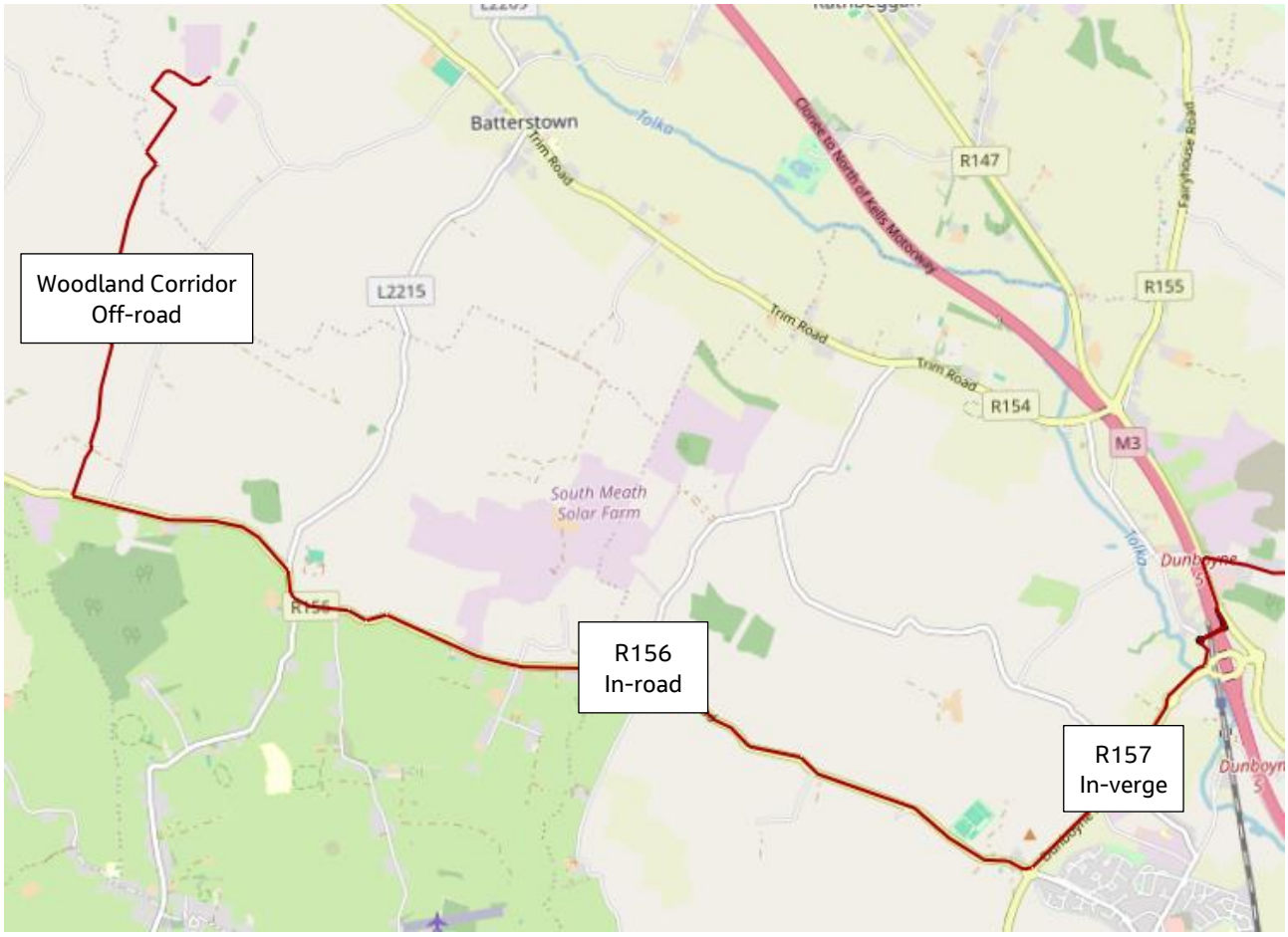

Image 4.5: Proposed Cable Route Woodland Corridor, R156 and R157 Regional Roads

The proposed cable route will follow an off-road corridor, crossing the River Tolka, the railway line at M3 Parkway and the M3 Motorway at Junction 5. The railway and motorway will be crossed via HDD. The proposed cable route will then briefly progress north along the R147 Regional Road before travelling east once more along the L5026 Local Road. At the junction with the L1010 Local Road, the proposed cable route will turn to the north-east, following the L1010 Local Road, before turning east again through Nuttstown, and

following an off-road route to facilitate the crossing of a watercourse, which is a tributary of the Pinkeen_010 (Image 4.6).

Image 4.6: Proposed Cable Route M3 Parkway Railway and M3 Motorway Crossing, Along L5026 and L1010 Local Roads

As the proposed cable route continues eastward toward Kilbride, there will be an off-road section required to cross the Ward_010 watercourse. The proposed cable route will pass through Priest Town, and before reaching the junction with the L1007 Local Road, will follow a localised off-road section again crossing the Ward_010 watercourse (Image 4.7).

Image 4.7: Proposed Cable Route Along Local Roads through Nuttstown, Priest Town to the L1007 Local Road

From this location, the proposed cable route will turn south-east following an on-road route along the L1007 Local Road. Approaching Hollystown, the proposed cable route will follow a localised off-road section to facilitate a watercourse crossing. Immediately north of Hollystown, opposite Kilmartin Lane, the proposed cable route will turn off-road to the east / south-east. Following the off-road section at Hollystown, the proposed cable route will turn back on-road at Killamonan, following the R121 Regional Road towards the

north-east. At the M2 Motorway, the proposed cable route will follow a localised off-road section, to allow for an HDD crossing to the south of the overbridge (Image 4.8).

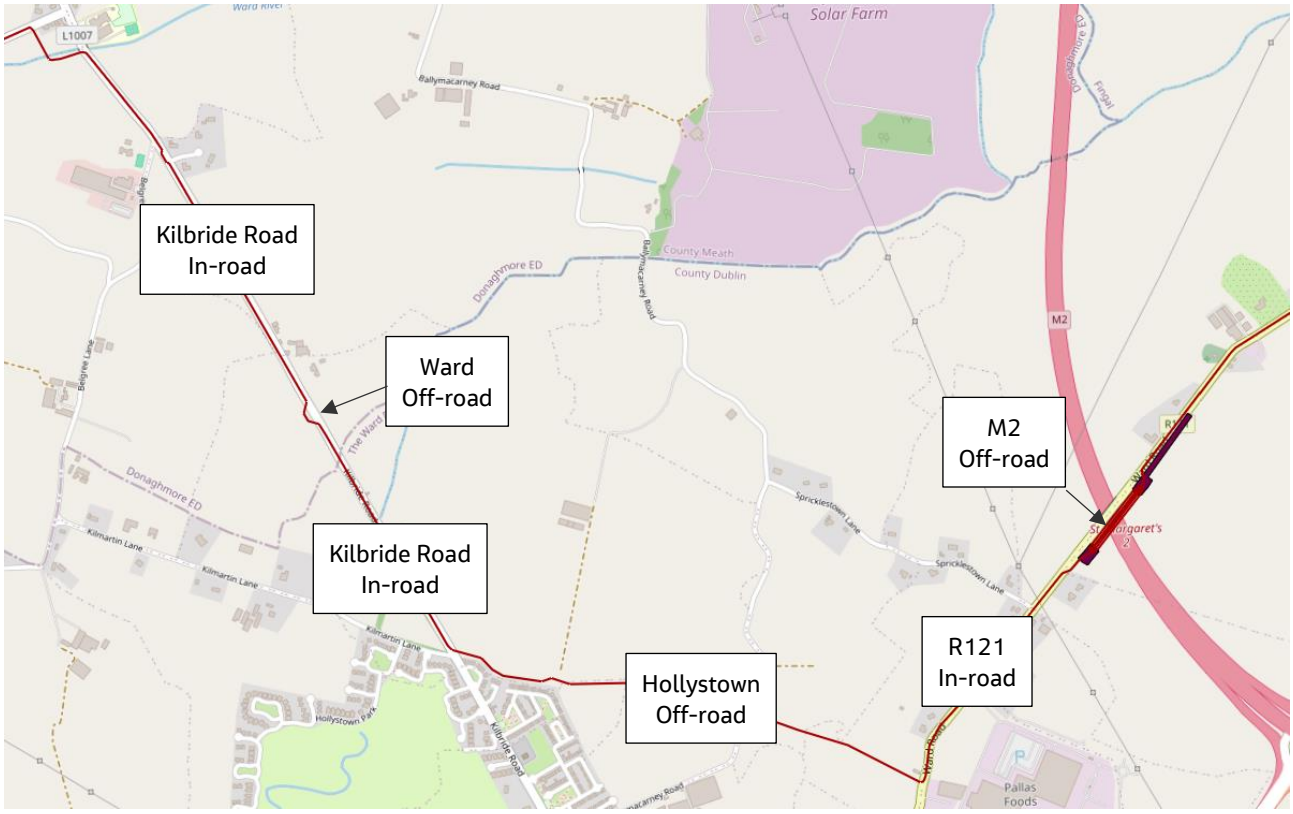

Image 4.8: Proposed Cable Route Along Kilbride Road, Off-Road to the R121 Regional Road and M2 Motorway Crossing

The proposed cable route will remain in-road to cross the roundabout with the R135 Regional Road and will continue to follow the R121 Regional Road through the townlands of Ward Lower, Newpark and Shallon. As the proposed cable route will pass from Newpark to Shallon, there will be a localised off-road section in order to cross the Ward_030 watercourse on the south side of the existing road. At the junction with the R122 Regional Road in Skephubble, the proposed cable route will turn to the south-east following an on-road route through Ballystrahan (Image 4.9).

Image 4.9: Proposed Cable Route Along R121 Regional Road to the R122 Regional Road

At the junction with Toberburr Link Road (known locally as Kilreesk Lane), the proposed cable route will turn from the R122 Regional Road onto Toberburr Link Road in an easterly direction towards St. Margaret's, where the proposed cable route will follow an off-road section, crossing a watercourse, Toberburr Road and a short section of agricultural land. Following the off-road section near St. Margaret's, the proposed cable route will turn back on-road, following the R108 Naul Road to the east and remaining in-road. At the roundabout at Forest Great, the proposed cable route will remain on-road, following the L2020 Local Road to the east, passing through Forest Little (Image 4.10).

Image 4.10: Proposed Cable Route Along R108 Regional Road and Naul Road (North of Dublin Airport)

The proposed cable route will remain on-road to cross the roundabout with the R132 Regional Road and will follow the L2753 Local Road in an easterly direction, through the townland of Cloghran towards the M1 Motorway. The proposed cable route will follow an off-road section at the M1 Motorway, to allow for an HDD crossing to the north of the overbridge. Following the motorway crossing, the proposed cable route will remain off-road, crossing the L2055 Baskin Lane and following an off-road corridor to Belcamp Substation (Image 4.11).

Image 4.11: Proposed Cable Route Along the L2753 Local Road, across the M1 Motorway to Belcamp Substation

Table 4.1 describes the local constraints associated with the off-road sections of the proposed cable route.

Table 4.1: Description of the Off-Road Sections of the Proposed Cable Route

Off-Road Section		Length (km)	Local Constraints
1	Woodland to R156	3.6	The use of the local road network in this area was technically challenging due to two existing masonry arch road bridges on the Red Road that were unsuitable. An off-road corridor also minimises the risk of disrupting access to the Woodland Substation and adjacent converter station. The Proposed Development also makes optimal use of a corridor shared with another EirGrid project, CP0966 Kildare Meath Grid Upgrade.
2	M3	0.9	At the M3 Motorway, the proposed cable route follows a localised off-road section, to allow for an HDD crossing to the north of the junction (it was not feasible to cross the junction overbridge due to a lack of space for the cable).
3	Pinkeen River	0.6	An off-road watercourse crossing was required to avoid two existing bridges on the road, the depth of which has been determined by technical assessments to be insufficient to accommodate the proposed cable circuit.
4	Ward River – Nuttstown	0.1	An off-road watercourse crossing was required to avoid an existing bridge on the road, the depth of which has been determined by technical assessments to be insufficient to accommodate the proposed cable circuit.
5	Ward River – Priest Town	0.2	An off-road watercourse crossing was required to avoid close proximity to a school and an existing bridge on the road, the depth of which has been determined by technical assessments to be insufficient to accommodate the proposed cable circuit.
6	Ward River – Kilbride Road	0.1	An off-road watercourse crossing was required to avoid an existing bridge on the road, the depth of which has been determined by technical assessments to be insufficient to accommodate the proposed cable circuit.
7	Hollystown	1.4	The use of the local road through the village of Hollystown was considered challenging from a deliverability perspective due to potential disruption during construction and the presence of numerous existing utilities in the road. An off-road corridor will minimise disruption to the local community, businesses and road users.
8	M2	0.4	At the M2 Motorway, the route follows a localised off-road section, to allow for an HDD crossing to the south of the overbridge (it was not feasible to use the overbridge due to a lack of space for the cable).
9	Ward River - Shallon	0.1	An off-road watercourse crossing was required to avoid an existing bridge on the road, the depth of which has been determined by technical assessments to be insufficient to accommodate the proposed cable circuit.
10	St. Margaret's	0.8	The use of the local road network in this area was considered to be technically challenging due to potential risk of disruption to strategic infrastructure associated with the airport (i.e., runway landing lights).
11	M1 to Belcamp	3.7	At the M1 Motorway, the route follows an off-road section, to allow for an HDD crossing to the north of the overbridge (it was not feasible to cross in the bridge due to a lack of space for the cable). The use of the local road (Stockhole Lane) was challenging from a deliverability perspective due to the presence of numerous existing utilities in the road and potential disruption during construction. An offroad corridor minimises disruption to the local community, businesses and road users.

TCCs will provide laydown areas where construction materials, plant and equipment can be temporarily stored, in addition to office accommodation, vehicle parking and welfare facilities. These will be temporary and will be removed on completion of the Construction Phase of the Proposed Development, and the land will be reinstated to its original condition. These areas will all be within the Planning Application Boundary for the Proposed Development and are described in more detail in Section 4.5.6.

4.4 Substations

4.4.1 Woodland Substation

The Proposed Development at Woodland Substation will consist of the provision of new electricity transmission infrastructure, comprising the elements outlined Point B in Section 4.2 (refer to Figure 4.1 (Sheet 2) in Volume 4 of this EIAR for a graphic of the proposed works at Woodland Substation). This infrastructure will be located within the extension to the hardstand compound at Woodland Substation which forms part of a planning application which has been recently granted permission (in April 2023) by Meath County Council (planning reference 221550).

4.4.1.1 Woodland Substation Construction Phase Activities

The proposed works at Woodland Substation will be undertaken in parallel with the proposed underground cable works between Woodland and Belcamp Substations. Proposed construction access for the works at Woodland Substation will be via the existing substation access road (i.e., Redbog Road, off Red Road). A TCC (TCC0) will be set up in the south-east corner of the substation and will provide site office and welfare facilities, as well as material and plant storage for the substation works. There will be no access to the proposed cable route easement from this TCC. The area for the proposed works in Woodland Substation will be cleared and shallow founded reinforced concrete bases will be installed for the new Air Insulated Switchgear (AIS) plant, as well as a Reinforced Concrete (RC) bund for the reactor. The AIS plant will be installed on the RC base slabs and associated connections installed. The reactor will be delivered to site as an abnormal load, with the appropriate measures to minimise any potential impacts to local traffic outlined in Appendix B (Construction Traffic Management Plan) of the Construction Environmental Management Plan (CEMP) (included as standalone documents in the planning application pack). The reactor will be slid into place on its bund off the delivery trailer. A mobile crane will be used to lift the new AIS plant into place. The proposed underground cable will be trenched across the substation from the south-west corner to connect to the new cable sealing end. Once the proposed underground cable has been installed, and the works at Belcamp and Woodland Substations have been completed, the whole system will be tested and commissioned.

4.4.2 Belcamp Substation

The Proposed Development, at Belcamp Substation, will consist of the provision of new electricity transmission infrastructure, comprising the elements outlined in Point C in Section 4.2 (refer to Figure 4.1 (Sheet 48) in Volume 4 of this EIAR for a graphic of the proposed works at Belcamp Substation).

This infrastructure will be located within the extension to the hardstand compound at Belcamp Substation which forms part of a planning application that has been recently granted permission (in December 2023) by Fingal County Council (planning reference F23A/0040). This is likely to require modifications to the permitted development per Planning Ref. F23A/0040 – such modifications are separate to, and thereby do not form part of, the Proposed Development.

4.4.2.1 Belcamp Substation Construction Phase Activities

The works at Belcamp Substation will be undertaken in parallel with the proposed underground cable construction works. A TCC (TCC6) will be established to the west of the substation accessed along a temporary access track off Stockhole Lane. This access track was recently constructed as part of the Belcamp to Shellybanks 220kV project. Construction materials will be delivered to site via the existing substation main entrance off the R139 Regional Road.

The area for the proposed works at Belcamp Substation will be prepared to install the new in-situ reinforced concrete bases for the proposed GIS Hall, transformers and other miscellaneous AIS plant. The steel frame of the proposed GIS Hall will be erected and then the roof and wall cladding added to make it weather tight. A

mobile crane will be used for the erection of the steel frame and cladding. The GIS equipment will be craned into place inside the proposed GIS Hall using the gantry crane within the building, and then the proposed GIS Hall will be fitted out with all associated protection and control equipment, Low Voltage Alternating Current (LVAC) equipment etc.

At the same time, the external AIS equipment and associated connections will be installed. The reactor and transformer will be delivered to site as abnormal loads with all the relevant traffic management requirements / restrictions in place for such abnormal loads (refer to Appendix B (Construction Traffic Management Plan) of the CEMP, which are included as standalone documents in the planning application pack). These will be slid into place directly from their transport trailer onto their RC bunds. The new proposed underground cable will be trenched into Belcamp Substation and under the perimeter wall to connect up to the AIS cable sealing end, outside of the proposed GIS Hall. Once the new proposed underground cable has been installed and tested, and the works at Woodland Substation completed, the whole system will be connected together, tested and then commissioned.

4.5 Cable Construction Phase Activities

The following sections describe the proposed Construction Phase activities associated with the installation of the new proposed underground cable. The laying of the new proposed underground cables is a standard construction technique undertaken by a range of utility and other services providers. The proposed underground cables will be installed in a flat formation in the following phases:

- Phase 1 – Installation of Joint Bays and Passing Bay structures;
- Phase 2 – Excavation and installation of cable ducts; and
- Phase 3 – Installation and jointing of cables.

Duct and Joint Bay installation are the most construction-intensive and invasive elements of cable route installation, as digging of a trench is required. For in-road cable laying, this phase will have the largest potential impact on traffic, including the potential need for rolling road closures (to through traffic) and diversions.

While the specifics of any cable-laying schedule are dependent upon the appointed contractor and the nature and location of the development, it is anticipated that the cable ducts will be laid in a road at a rate of 40m to 50m per day, although a reduced rate of 10m to 20m per day is anticipated in constrained sections of the proposed cable route, for example where existing utilities are present.

Joint Bays are proposed to be located at typical intervals of 750m along the proposed cable route of the Proposed Development. However, intervals between Joint Bays will vary (approximately 550m to 900m) depending on complexity of route alignment, site conditions and technical constraints. Joint Bays are anticipated to be installed in three days. Road reinstatement along the proposed cable route trench will follow the completion of the trenching and ducting, moving in sequence along the proposed cable route.

Cable pulling and jointing, which will commence when the trenching and ducting is well advanced along the proposed cable route, will be executed from the Joint Bay locations. Where this activity is likely to require a road closure, the provision of a Passing Bay at the location of the Joint Bay, where possible, will facilitate movement of traffic along the road by means of a signal-controlled lane adjacent to the Joint Bay.

Image 4.12 shows an example of a cable trench in a public road after installation of ducts and prior to backfilling. Marker boards can be seen within the trench prior to final reinstatement. Image 4.13 presents an example of a reinstated road following laying of the underground cable circuit.

Image 4.12: Example of a Cable Trench In-Road with Cables in Flat Formation

Image 4.13: Example of a Reinstated Road Following the Laying of Underground Cables

4.5.1 Phase 1 – Installation of Joint Bays and Passing Bay Structures

4.5.1.1 Joint Bays

Joint Bays will consist of precast concrete walls and bases located below-ground. The Joint Bays will be 10m long x 2.5m wide x 2.5m deep overall. Lean mix concrete (blinding) will be used as a regulating layer to the underside of the chamber. The ducts will be installed to each end of the chamber, then checked, cleaned and

sealed. The open concrete chamber will temporarily support the retained ground on the outside of the chamber during the ducting activities. Once these activities are completed, the open chamber will be temporarily backfilled with appropriate material and the road temporarily reinstated until cable installation. During cable installation, the Joint Bay will be reopened, and material within the chamber will be removed and replaced following completion of the cable installation.

The proposed Joint Bay locations are provided in Table 4.2.

Table 4.2: Proposed Joint Bay Locations

Joint Bay Number	Approximate Chainage	Approximate Distance from Previous Joint Bay	Joint Bay Location	Passing Bay Provision	Side of Road Passing Bay to be Located	Maintenance Hardstanding Provision
1	812	812	Off-road	Not required	-	Yes
2	1560	748	Off-road	Not required	-	Yes
3	2384	824	Off-road	Not required	-	Yes
4	3080	696	Off-road	Not required	-	Yes
5	3807	727	In-carriageway	Yes	South	Not required
6	4587	780	In-verge	Not required	-	Yes
7	5390	803	In-verge	Not required	-	Yes
8	6022	632	In-verge	Not required	-	Yes
9	6821	799	In-carriageway	Passing Bay not provided	-	Not required
10	7646	825	In-carriageway	Yes	North	Not required
11	8358	712	In-carriageway	Passing Bay not provided	-	Not required
12	9088	730	In-verge	Not required	-	Yes
13	9936	848	In-verge	Not required	-	Yes
14	10771	835	In-verge	Not required	-	Yes
15	11577	806	In-verge	Not required	-	Yes
16	12417	840	Off-road	Not required	-	Yes
17	13163	746	Off-road	Not required	-	Yes
18	13764	601	In-carriageway	Not required	-	Not required
19	14549	785	In-carriageway	Passing Bay not provided	-	Not required
20	15327	778	In-carriageway	Passing Bay not provided	-	Not required
21	15920	593	Off-road	Not required	-	Yes
22	16719	799	In-carriageway	Passing Bay not provided	-	Not required
23	17518	799	In-carriageway	Passing Bay not provided	-	Not required
24	18366	848	In-carriageway	Yes	South	Not required
25	19037	671	In-carriageway	Yes	South	Not required
26	19749	712	In-verge	Not required	-	Yes
27	20613	864	In-carriageway	Yes	South-west	Not required
28	21393	780	Off-road	Not required	-	Yes
29	22036	643	Off-road	Not required	-	Yes
30	22593	557	Off-road	Not required	-	Yes
31	23349	756	Off-road	Not required	-	Yes
32	24215	866	In-carriageway	Passing Bay not provided	-	Not required
33	25100	885	In-carriageway	Yes	South	Not required
34	25875	775	In-carriageway	Yes	South	Not required
35	26481	606	In-carriageway	Yes	North	Not required
36	27111	630	In-verge	Not required	-	Yes
37	27929	818	In-verge	Not required	-	Yes
38	28767	838	Off-road	Not required	-	Yes
39	29484	717	In-carriageway	Yes	North	Not required
40	30187	703	In-carriageway	Yes	North	Not required
41	30940	753	In-carriageway	Yes	North	Not required
42	31651	711	In-carriageway	Yes	North	Not required
43	32531	880	In-carriageway	Yes	North	Not required
44	33088	557	In-verge	Not required	-	Yes
45	33838	750	In-carriageway	Yes	South	Not required

Joint Bay Number	Approximate Chainage	Approximate Distance from Previous Joint Bay	Joint Bay Location	Passing Bay Provision	Side of Road Passing Bay to be Located	Maintenance Hardstanding Provision
46	34657	819	Off-road	Not required	-	Yes
47	35424	767	Off-road	Not required	-	Yes
48	36172	748	Off-road	Not required	-	Yes
49	36960	788	Off-road	Not required	-	Yes

4.5.1.2 Passing Bays

Passing Bays are short sections of temporary road around Joint Bays where insufficient space would otherwise have potentially resulted in closure of the road to traffic. The Passing Bays will include temporary traffic management arrangements, such as signage and traffic signals, as agreed with the relevant local authority. The proposed Passing Bay locations, of which there will be 14 in total, are outlined in Table 4.2.

The installation of a Passing Bay will require removing and temporarily storing topsoil in an area of land adjacent to the road. This material will be used for reinstatement of the ground at a later stage in the construction process. The Passing Bays will be subject to detailed design and constructed in accordance with the relevant local authority's requirements. The Passing Bay will be constructed to a similar finished road level to the existing roadway. Subject to detailed design, and site-specific conditions, this may require the placing and provision of fill material. Roadside drainage, including filter drains, drainage carrier pipes and drainage culverts, will be extended under Passing Bays using temporary measures, where required. Passing Bays will be designed to allow suitable runoff from the temporary road surface and to avoid ponding.

Image 4.14 illustrates the proposed arrangement of a Passing Bay and associated traffic management where the Joint Bay is located in the roadway. Image 4.15 illustrates the proposed arrangement of a construction platform and associated traffic management where the Joint Bay is located in the road verge. Image 4.16 and Image 4.17 show examples of Passing Bays that have been developed for other cable projects.

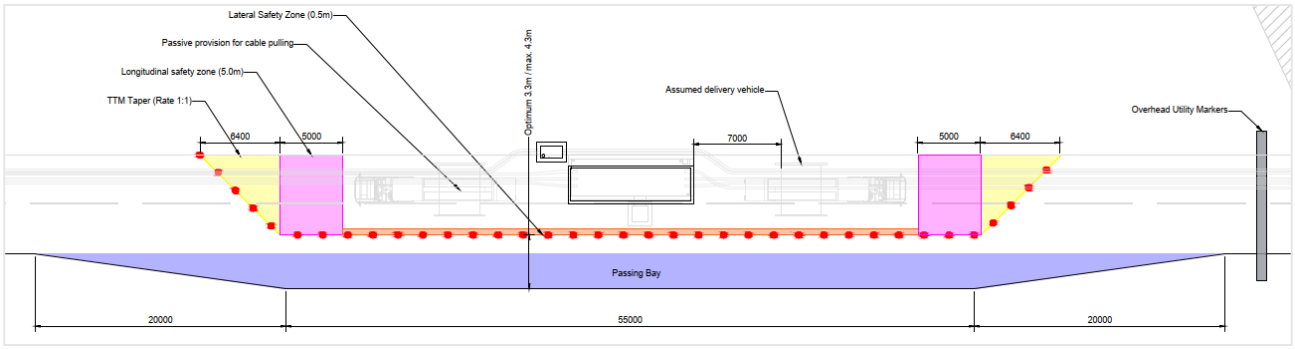

Image 4.14: Proposed Traffic Management and Passing Bay Arrangement for a Joint Bay in the Roadway (Indicative Layout)

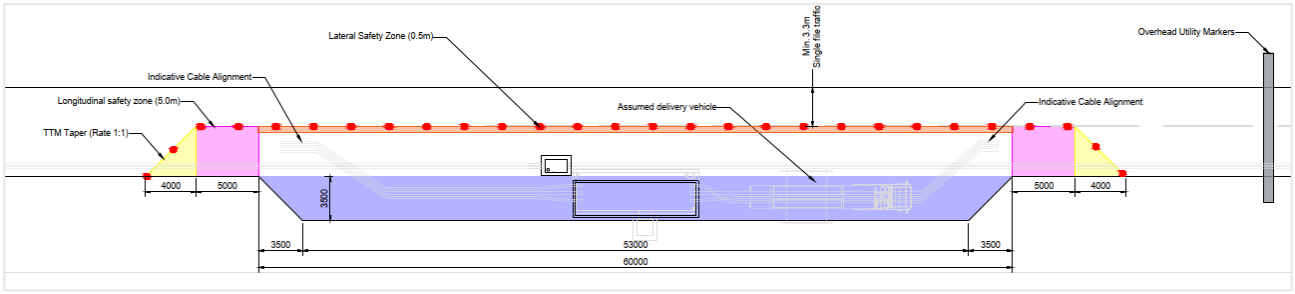

Image 4.15: Proposed Traffic Management and Construction Platform Arrangement for a Joint Bay in the Road Verge (Indicative Layout)

Image 4.16: Example of Passing Bay Construction

Image 4.17: Example of an Operational Passing Bay with Joint Bay under Construction

Where a Passing Bay is not provided due to local constraints, or where it is otherwise unsuitable for a Passing Bay and depending on the available space, a partial or full road closure may be required to safely undertake

the construction works. Further detail on proposed road closures and diversions is provided in Appendix B (Construction Traffic Management Plan) to the CEMP, which is included as a standalone document in the planning application pack.

The Passing Bays will not be in use for the full duration of the Construction Phase. The Passing Bays will be used during the Joint Bay construction, cable pulling and cable jointing and testing processes, as follows:

- During Joint Bay construction, for approximately three working days;
- During the cable pulling process, for approximately five to 10 working days (depending on requirement for single or double pull); and
- During the cable jointing and testing process, for approximately 20 to 25 working days.

When the Passing Bays are not in use, measures will be put in place to prevent parking.

The reinstatement of the Passing Bays will occur on the completion of Phase 3 of the Construction Phase. The materials used to construct the Passing Bays will be removed from site and taken to a suitably licensed facility. The area will be reinstated and relandscaped to reflect the previous landform at each location. In line with best practice, no ash trees will be planted, and only native species will be used. Where affected, species-rich hedgerows will be planted. The adjacent road surface, painted lines, and other requirements will be restored in line with The Purple Book (Department of Transport, Tourism and Sport 2017).

4.5.2 Phase 2 – Excavation and Installation of Cable Ducts

4.5.2.1 Duct Installation

The proposed underground cables will be pulled into ducts pre-installed in the cable trench. When a length of trench has been excavated, the ducts will be laid on bedding material of cement bound granular mixture. Once laid, the ducts will be backfilled with a thermally suitable material. The fibre optic ducts will be laid and backfilled before the trench is reinstated.

Associated route marker posts (refer to Image 4.18) will be positioned at regular intervals within the Planning Application Boundary. This is a common safety measure for underground utilities and the markers will be located at:

- Field boundaries where the proposed underground cable is laid in private land;
- At regular intervals in road verges when the proposed underground cable is in-road;
- In road verges where the proposed underground cable crosses any roads; and
- At HDD crossing locations.

The markers will be positioned to be visible for safety reasons but located in a manner that is not obstructive.

Duct installation will progress sequentially, starting at one Joint Bay and moving towards the next along the proposed cable route. The construction area will move along in tandem with the progress of the duct installation, with only the area necessary to provide a safe working area cordoned off. It is anticipated that multiple crews will work at several locations along the approximate 37.5km proposed cable route simultaneously.

Image 4.18: Examples of an Above-Ground Cable Route Marker Post

4.5.2.2 Underground Cable Installation in Roads

The primary difference between construction in off-road areas and in-road areas is that there is generally little space within road areas for local storage of construction materials, such as excavated material and new fill material. This means that designated laydown areas may be required along the road to support construction activities.

For trench excavation works in roads where there is a reasonable availability of space, vacuum excavation or mechanical excavators will be used. In constrained locations, excavation will be undertaken using hand operated tools. The excavated material will be loaded into lorries for removal off site at a suitably licensed facility.

The average rate of construction for the proposed cable route is anticipated to be approximately 40m to 50m per day. Excavation for the proposed underground cable in areas of road with heavy utility congestion can become slower (10m to 20m per day) due to the challenges of working around high numbers of existing utilities. Generally, it is proposed to retain the existing services in place by working around them. The utilities may either be parallel to the Proposed Development (i.e., alongside the duct run) or may cross the duct run.

The appointed contractor or contracting authority for the Proposed Development will engage with the relevant utility owners, prior to construction, and in accordance with discharging the relevant planning conditions, consents and licence requirements. Significant consultation has already taken place with utility providers and construction principles have been established, subject to further consideration at the detailed design stage. Arrangements will be in place to ensure that utilities are crossed by the proposed underground cable safely and with appropriate methodologies to support and protect existing assets. In some instances, where there is an interface with a particularly sensitive utility, works will be carried out with prior agreement and / or supervision by the utility provider.

Hand digging methods and smaller excavators will be used, if required. To protect the working area, temporary traffic management may be required to divert traffic.

For roads with heavy congestion of existing utilities, the progress rate for site preparation, excavation, cable duct installation and reinstatement is estimated at approximately 20m to 50m per day.

4.5.2.3 Underground Cable Laying in Agricultural Lands

For agricultural lands, such as grassland and tillage, the proposed underground cable design is essentially similar to that which will be installed in the roads, with the exception of the restoration of subsoil and topsoil instead of road construction material. The methodology for duct construction is similar with construction of Joint Bays, ducting, and cable installation and jointing being essentially the same.

As these construction works will be located off-road in agricultural lands, the Planning Application Boundary includes a temporary working area for the appointed contractor. The width of this temporary construction swathe will vary depending on the off-road section, and will range from 20m to 70m. A 30m wide corridor is illustrated in Image 4.19.

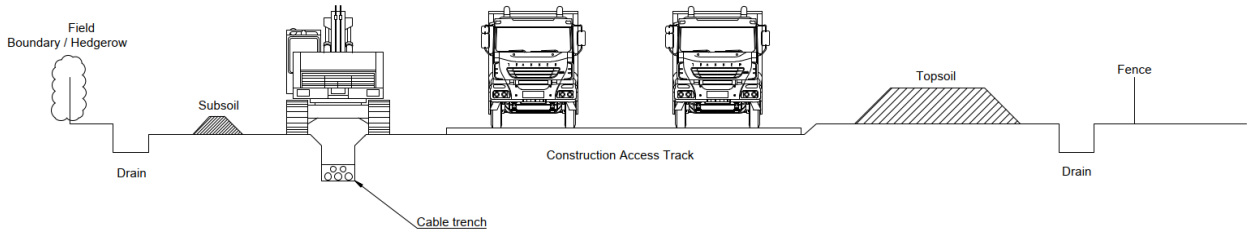

Image 4.19: Construction Swathe in Agricultural Lands (30m Wide Corridor)

The temporary working area is required to:

- Facilitate temporary storage of subsoil and topsoil which must be removed from:
  - The footprint of the proposed temporary construction access track (6m wide);
  - The footprint of the proposed underground cable trench; and
  - A safety buffer strip between the proposed temporary access track and the proposed underground cable trench.
- Allow construction of a proposed temporary construction access track alongside the proposed underground cable trench to allow for the movement of construction equipment and materials along the section of the route on the agricultural land;
- Ensure sufficient working space for the excavation of the proposed underground cable trench and the installation of the cable ducting; and
- Allow segregated storage of the various types of topsoil and subsoils from the proposed underground cable trench for later reuse or disposal from site.

Image 4.20 shows an example of a typical temporary working strip on agricultural land for an electricity cable project. Stripped topsoil can be seen stored to the left of the strip with a temporary construction access track in the centre right. Subsoil is also temporarily stripped from areas either side to create space for trench installation, materials storage and subsoil storage.

Where possible, an off-road cable alignment will seek to follow field boundaries to minimise potential impacts on farm operations. However, where the route of the Proposed Development crosses between adjacent fields, there will be a requirement to cross field boundaries, including ditches, hedgerows and other features, as necessary.

Image 4.20: Example of Underground Cable Construction in Agricultural Lands

The cable installation and jointing will be undertaken as part of a separate phase later in the construction programme since access is provided via the public road network. On agricultural land, the temporary access tracks need to remain in place until after the completion of the cable pulling and jointing works. This is due to the fact that there is no other way to provide access to these off-road locations. For this reason, it is proposed that for the Proposed Development, any off-road working strip will be unavailable to an affected landowner for the duration of the Construction Phase. This will include from initial fencing-off, to the removal of the fence, following reinstatement of land along the working strip.

Temporary access tracks, totalling approximately 12km in length, are proposed to provide access at each of the off-road sections and to provide access to TCC5 and TCC6, which are setback from adjacent public roads. The proposed temporary access tracks will be provided within the Planning Application Boundary.

After construction, the proposed temporary access tracks will be removed. However, the Proposed Development will require 12 proposed permanent access tracks, which will be unbound, 4m wide tracks. These will allow access to off-road Joint Bays from either existing access tracks or entrances. These tracks will be used infrequently for operational maintenance by the ESB. Where an access track will cross an existing field boundary, a gate will be provided to maintain the boundary. Where adjacent fields belong to different landowners, access will be provided for the ESB only, with measures in place to ensure control of livestock during ESB access (e.g. the use of locking double gates).

Permanent access tracks are proposed to provide access to the following Joint Bays (as shown on Figure 4.1 (Sheet 1 to Sheet 48) in Volume 4 of this EIAR):

- JB 1, JB 2, JB 3 and JB 4 (access track to be shared with the Kildare Meath Grid Upgrade An Bord Pleanála planning application reference number 316372));
- JB 17;

- JB 21, JB 28 and JB 29;
- JB 30, JB 31 and JB 38; and
- JB 46, JB 47, JB48 and JB 49.

The proposed permanent access track leading to Joint Bays 1 and 2 will cross a watercourse (Watercourse ID 1 – Dunboyne Stream_010). This watercourse will also be crossed by the cable as an open-cut trench. A culvert or bridge structure may be used to facilitate the proposed permanent access track watercourse crossing. The culvert or bridge structure will be designed in accordance with the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016) so that there are no significant environmental impacts.

The use of HDD below existing infrastructure (e.g., motorways) will require temporary HDD Compounds. These areas will be required to create launch and reception pits for the HDD equipment and to facilitate logistics and storage works.

Watercourse crossings will employ an open trench method. Where water bodies are located adjacent to, or in close proximity to field boundaries, these will be removed and ditches culverted to ensure continuity of drainage. Each work area will be demarcated securely with fencing, and this will prevent works outside of the agreed areas.

Further details of open cut crossings and HDD and are provided in the sections below, as applicable.

4.5.2.4 Cable Crossings (Water, Utility, Bridges etc.)

The proposed cable route will cross existing structures, utilities and watercourses at various locations. These crossings will be facilitated by either open cut trenching or HDD, as appropriate. Descriptions of open cut trenching and HDD methods is provided in Section 4.5.2.6 and Section 4.5.2.7, respectively. The proposed underground cable will be a minimum of 300mm from existing services as per EirGrid's 110kV, 220kV and 400kV Underground Cable Functional Specification (EirGrid 2021).

Prior to the cable crossing works, detailed utility and services surveys will be undertaken. The identification of crossings along the proposed cable route thus far has been based on consultation with utility providers, site walkovers, field studies, and reviews of publicly available information such as EPA datasets and mapping (refer to Chapter 17 (Material Assets) for details of utility crossings). All crossings will be confirmed at the detailed design stage within the parameters proposed in this planning application, and the mitigation detailed and proposed as part of this EIAR will be implemented when dealing with any such features. Where it would be necessary for third party services to be diverted, it is considered that this will not have any material impact on assessments given the highly localised extent of such diversions and short duration (only a few days in each instance) of associated works.

4.5.2.5 Watercourse Crossings

Details of the proposed Water Framework Directive (WFD) designated water body crossings, and any unnamed non-designated water body crossings are provided in Chapter 12 (Hydrology) in this EIAR.

In summary:

- No watercourse crossings (WFD designated or non-designated) are proposed to be undertaken by HDD;
- Ten watercourse crossings of WFD designated water bodies, are proposed to be undertaken by open cut trench crossing;
- Nine watercourse crossings of WFD designated water bodies, are proposed to be crossed within the road structure;
- Seven crossings of unnamed non-designated water bodies are proposed via open cut trenching;

- 21 in-road crossings of unnamed non-designated water bodies are proposed;
- There are five water bodies for which it is currently unclear if they will be crossed. However, if the water body extends upstream, then the crossing will be in-road;
- There is one water body for which it is currently unclear if it will be crossed, but if the water body extends upstream, it will be crossed off-road;
- One watercourse (WFD designated water body) is predicted to be affected by a Passing Bay; and
- A permanent crossing of one watercourse will be required to maintain access to Joint Bay 1 during the Operational Phase.

Trench crossings of watercourses have the potential to stir up sediment in the water body, increasing turbidity, which has the potential to result in negative impacts to the hydromorphology, and water quality of the receptor. To reduce the risk of discharging sediment, it is proposed to carry out all of these works in a dry works area.

A number of design options for open cut crossings were assessed by the project team, in consultation with IFI, to-date. The options considered were temporary watercourse diversions, fluming and over pumping. An exercise was undertaken to look at the required space needed to temporarily realign the channels during construction, and this concluded that temporary realignment would not be feasible within the footprint of the Proposed Development due to the limited space available within the Planning Application Boundary and / or the presence of nearby infrastructure. Following consultation with IFI to-date, fluming was agreed to be the preferred option to over pumping. Where watercourses are flumed, the dry works area will be isolated by installing an impermeable barrier between the watercourse and the works area, as per consultation with IFI to-date. The impermeable barrier will be tailored to the watercourse in question. Techniques will include the use of inflatable dams, frame dams, or sandbags in smaller watercourses. For larger watercourses, water will be carried over or around the isolated dry works area. The appointed contractor will consult IFI prior to a final decision being made on water crossing techniques.

The proposed fluming arrangement is illustrated in Image 4.21.

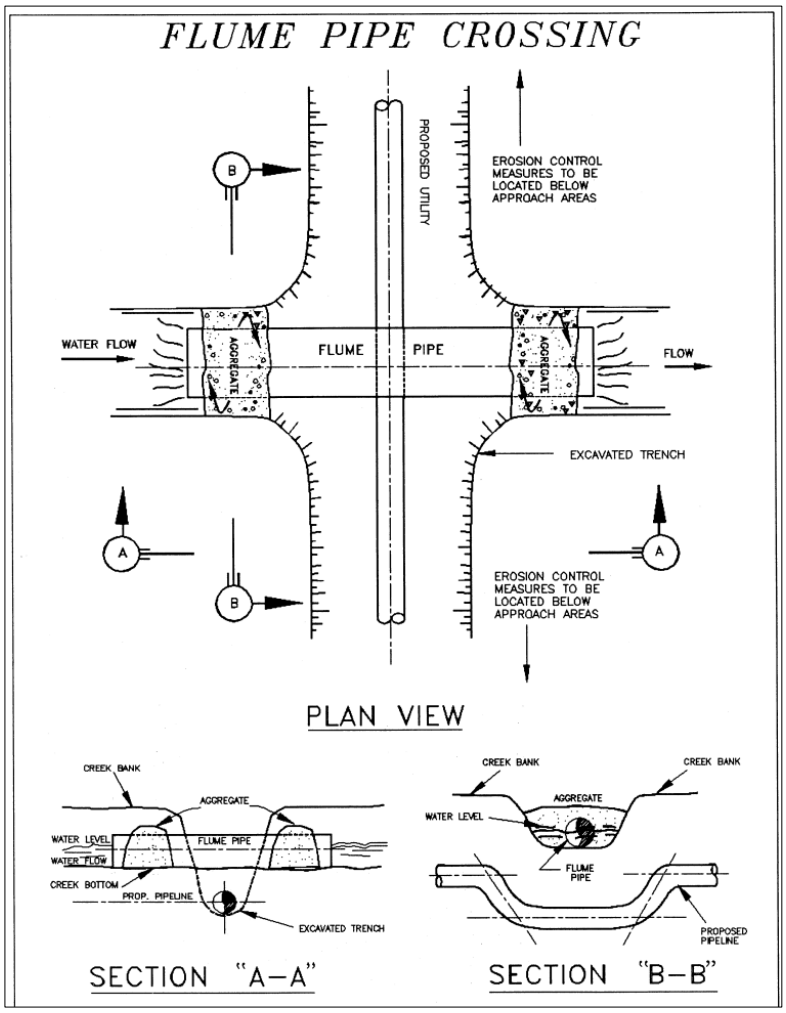

Image 4.21: Example Diagram of a Flume Pipe Crossing (Construction Industry Compliance Assistance Centre 1992)

Where over pumping is required due to site constraints, water pumped from the dry works area will be treated using settlement tanks to remove sediment prior to discharge back to the watercourse. Discharge water will be to a standard agreed with IFI. Silt fences and silt traps will be installed prior to the commencement of works and will be inspected daily by the site team and Environmental Clerk of Works (EnCoW) to inform adaptive management as required. The locations of the same will be determined by the EnCoW.

Water will be carried over or around the isolated dry works area. This may be achieved by either fluming, pumping or if there is enough space, temporary diversion. Where possible, provided that there is no risk of excessive scour, the diversion will be within the footprint of the existing channel. The existence of a temporary impermeable barrier within the channel will have a direct impact on the cross section of the channel and is expected to give rise to localised changes in water depth, velocities and sediment erosion / deposition. Once the underground cable crossing is completed, the landscape will be restored in accordance with agreed requirements. These works will include riverbank stabilisation, gravel replacements, bank profiling and planting where required. In all cases, the site will be restored post installation.

Open cut trenching works will not be carried out during extreme rainfall or high flow events. Met Éireann provides a five-day weather forecast via its website (Met Éireann 2024). Generally, works will not take place during certain categories (i.e., during red weather warnings). Depending on the specific circumstances, works may also not take place during yellow and orange warnings based on the site-specific conditions and based on an assessment by the appointed contractor. The appointed contractor's EnCOW will monitor watercourse crossings and weather warning forecasts and ensure that appropriate records are maintained for audit.

At this stage of the design process, the design details associated with the permanent crossing of Dunboyne Stream_010 are unknown. This water body crossing will be subject to options appraisal during the detailed design stage and will likely take the form of a culvert or bridge crossing.

Given the requirement for a temporary culvert in the same location it is likely that the permanent structure would take the form of a culvert. This would allow the appointed contractor to construct the permanent structure prior to the formation of construction access and would allow for the structure to be retained post-construction to allow permanent access to Joint Bay 1 during the Operational Phase. However, given that this design decision has not yet been confirmed, the crossing has been assessed within Chapter 12 (Hydrology) in Volume 2 of the EIAR for both a bridge and culvert crossing, with appropriate mitigation measures outlined for each structure type in Chapter 12 (Hydrology).

4.5.2.6 Open-Cut Trenches at Utility Crossings

Numerous existing utility services will be crossed by the proposed cable route, as described in Appendix A4.1 in Volume 3 of this EIAR. Where these occur, the proposed crossing options will be as follows:

- **Located below the existing service**: The proposed underground cable will be positioned locally below the existing service. This will be to the minimum allowed spacing, as per utility owner requirements;
- **Located above the existing service**: The depth to the top of the proposed underground cable ducts could be reduced to a minimum of 450mm below surface level as per the Health and Safety Authority's (HSA's) paper entitled, Code of Practice for Avoiding Danger from Underground Services (HSA 2010). This depth will accommodate the required separation from the service being crossed and will provide protection to the proposed underground cable system. Steel plates and steel mesh will be installed above concrete-encased ducts; and
- **Realignment of existing utility**: The works required to realign an existing utility will be coordinated with the service / utility provider and a complete coordinated methodology will be mutually agreed between all parties, prior to the commencement of any work.

All proposed work methodologies will aim to prevent any outages or loss of services. If the risk cannot be avoided, prearranged agreements on outages will be in place prior to the commencement of the works.

4.5.2.7 Horizontal Directional Drilling

There will be three HDD crossings along the proposed underground cable route:

1. M1 Motorway;
2. M2 Motorway; and
3. M3 Motorway and adjacent rail line.

HDD technology has been widely used on infrastructure projects for several decades. Competent specialist contractors will be appointed to undertake the work. The appointed HDD contractor will conduct the drilling works in a safe and controlled manner with appropriate planning for site and environmental constraints. The HDD design and the appointed HDD contractor's methodologies will ensure that the proposed works do not adversely affect existing utilities, third-party infrastructure and groundwater.

Temporary HDD Compounds (six in total at three crossing locations) have been included within the Planning Application Boundary for the Proposed Development. The sites will be temporarily covered with a gravel hardstanding to allow construction plant to operate safely. Launch and reception pits of approximately 3m x 5m will be constructed for the HDD tunnel.

The drill rig will bore a pilot tunnel between one side of the crossing to the other. The HDD technique will use a drilling fluid called bentonite to support the borehole during construction. The bentonite fluid also carries away flushings which are the unwanted materials removed by the drill bit. The drill bit will be kept on its

planned alignment using technology such as guidance systems and sensors which will be continuously monitored by the drill rig operator.

The drilled arisings will be flushed to the surface where they will be separated from the fluid fraction for disposal. The drilling fluid will be maintained in a closed loop, meaning that the bentonite will be pumped, captured, cleaned and circulated again. An example of an HDD rig is shown in Image 4.22.

Image 4.22: Example of an HDD Rig

Continuous monitoring by the specialist drilling team of fluid volume pressure, pH, weight and viscosity will be carried out. The volume of cuttings produced will also be monitored to ensure that no over-cutting takes place, and that tunnel cleaning is maintained. The nature of the cuttings will also be monitored to understand the ground conditions as the drilling progresses.

After the initial pilot tunnel is completed, it will be reamed in a number of passes. This will enlarge the tunnel to the required bore size to enable the cable ducts to be pulled through. The specialist drilling team will constantly monitor the operation, and will:

- Check that actual load stress matches designed load stress, to ensure hoop stress and buckling stress is not exceeded; and
- Monitor drilling progress to identify voids or changes in geological conditions.

When the HDD works are completed, the working platform will be removed, and the site reinstated to its original condition.

4.5.3 Phase 3 – Installation and Jointing of Cables

4.5.3.1 Cable Installation

The cables will be brought to site on cable drums. The cable drums will be moved into position using specialist trailers. For in-road sections, these trailers will be lorry type, while for off-road sections, the trailers may be tractor type. The drums will be brought to the Joint Bay location for cable installation by 'pulling' the cable into the pre-installed duct.

Once the drum is set up, a winch system at the next Joint Bay including a pulling cable will be attached to the nose of the cable and rollers will be used to guide the cable end towards the duct. The cables will then be pulled into the duct with lubrication being applied to the cable and duct throughout the process to control pulling tensions.

4.5.3.2 Cable Jointing

The individual lengths of cable need to be joined or 'jointed' together to create a single circuit. This will be carried out at the Joint Bays along the cable route. The cables will be pulled into each end of the chamber and the cable ends jointed together within the chamber. Jointing is expected to take approximately one to two weeks per Joint Bay.

The cable jointing process is highly skilled, labour intensive, technically demanding and essential to the effective operation of the cables. For worker safety and comfort, a temporary waterproof shelter system with the same visual appearance as a shipping container will either be placed or constructed around the Joint Bay chamber. This will provide a clean environment for the jointing process to be undertaken in. In some areas, the width of the Joint Bay and shelter may require temporary traffic management, including use of Passing Bays. Road closures and diversions will be required in some areas along the route during construction and operation, depending on the width of the Joint Bays and the nature of the road network in the area.

Following jointing, the Joint Bay will be backfilled, and the road surface permanently reinstated. An example of proposed cable pulling is shown in Image 4.23. An example of a proposed joint bay shelter used during jointing is shown in Image 4.24.

Image 4.23: Example of a Cable Pulling at a Joint Bay

Image 4.24: Example of a Joint Bay Shelter

4.5.4 Construction Traffic

A Construction Traffic Management Plan has been prepared for the Proposed Development and is contained as Appendix B of the CEMP, which is included as a standalone document in this planning application pack.

The proposed construction sequence to support the temporary traffic measures for the in-road sections of the proposed cable route is as follows:

- Phase 1 – Installation of Passing Bay and Joint Bay structures: The Passing Bays (where required) will be constructed at the Joint Bay locations. Following the completion of the Passing Bay, the installation of the Joint Bay will take place under the same phase;
- Phase 2 – Excavation and installation of ducts: A trench will be dug along the proposed cable route, ducts will be installed, the trench backfilled, and the ground reinstated to match existing conditions; and
- Phase 3 – Installation of cables: The cables will be installed at Joint Bay locations within the ducts. The cables will then be jointed (connected) at each Joint Bay location to allow the installation of a continuous circuit.

The scale and nature of the temporary traffic management will vary from phase to phase due to the different effects. Works during Phase 1 and Phase 3 will be discrete locations along the proposed cable route, whereas Phase 2 will be a rolling working area as the proposed cable trench will run the entire length of the Proposed Development.

In Phase 1 and Phase 3, the following measures will be applied:

- Lanes closure: Where the road width at the location of the Joint Bay is greater than 10.5m, a Passing Bay is not expected to be required and only lanes closure will be required;
- Passing Bay with lanes closure: Where the road width is less than or equal to 10.5m, and where land is available, a Passing Bay with lanes closure will be constructed; and
- Full road closure (with local access arrangements): Where the road width is less than or equal to 10.5m, and where there is no land available to construct a Passing Bay, a road closure with local access arrangements will be provided for the affected area with signposted diversions.

In Phase 2, the following measures will be applied:

- Full road closure (with local access arrangements): Where the residual open carriageway is less than 2.5m, the road will be required to be closed, with local access arrangements, where necessary. Allowing vehicles to pass on a carriageway less than this width would pose significant risk to road users and the delivery teams (please note that the length of road that will be closed will be minimised and made appropriate to the area of the works). The closed section will be based on the nearest diversion point and the works required in that area;
- Lane Closure with Heavy Goods Vehicles (HGV) Diversion: Where the residual open carriageway is between 2.5m and 3m, the road will be required to be closed to HGVs but open to Light Goods Vehicles (LGVs) (e.g. Ford Transit vans) and cars. All HGVs will be required to use the diversion route, requiring signage to mitigate the risk of HGVs passing the works sites; and
- Lane Closure: Where the residual open carriageway is greater than 3m, it is proposed to keep the road open to all road users, using traffic signal control. Automatic or intelligent signalling should be used to account for the traffic flow and demand in order to reduce potential delays. The lane closures will remain during the entirety of the section of works (i.e., out of hours included) to ensure safety to all road users and delivery teams.

Table 4.3 provides a description of the Traffic Management Sections of the proposed underground cable route. Table 4.4 summarises the proposed indicative temporary traffic measures that will be applied during Phase 2 for the Proposed Development. The proposed cable route has been divided into a number of sections due to the different sections being in-carriageway, in verge or off-road; the nature of the works in that area; the difference in road widths; and other factors.

Table 4.4 contains only those sections where temporary traffic measures will be required and also identifies the maximum diversion length where they will be required in certain sections. The diversions have been calculated on a like-for-like basis (i.e., where a regional road is to be affected by the Proposed Development,

the proposed diversion will only use regional roads and will not include local roads in the area). In some areas, this approach will significantly increase the length of the diversion.

Table 4.3: Description of the Traffic Management Sections of the Proposed Underground Cable

Section Number	Section Name	Length (m)	Start Chainage	End Chainage	Type	Number of HDD Crossings	HDD Locations	Roads
1.01	Woodland	3635	0	3635	Off-road			N/A
1.02	R156	7185	3635	10820	In-carriageway			R156
1.03	R157	1530	10820	12350	In-verge			R157
1.04	M3	873	12350	13223	Off-road	1	M3	N/A
1.05	R147	327	13223	13550	In-carriageway			R147
1.06	L5026	1610	13550	15160	In-carriageway			L5026
1.07	L1010 West	695	15160	15855	In-carriageway			L1010
1.08	Pinkeen River	605	15855	16460	Off-road			N/A
1.09	L1010 East	340	16460	16800	In-carriageway			L1010
1.10	Nuttstown Road	1410	16800	18210	In-carriageway			Nuttstown Road
1.11	Ward River	70	18210	18280	Off-road			N/A
1.12	Priestown Road	915	18280	19195	In-carriageway			Priestown Road
1.13	Priest Town	195	19195	19390	Off-road			N/A
1.14	Kilbride Road North	1115	19390	20505	In-carriageway			Kilbride Road
1.15	Kilbride Off-road	80	20505	20585	Off-road			N/A
1.16	Kilbride Road South	695	20585	21280	In-carriageway			Kilbride Road
1.17	Hollywood	1346	21280	22626	Off-road			N/A
1.18	M2 HDD South	684	22626	23310	In-carriageway			R121
1.19	M2 HDD	360	23310	23670	Off-road	1	M2	N/A
1.20	M2 HDD North	950	23670	24620	In-carriageway			R121
1.21	The Ward Cross / R121	1575	24620	26195	In-carriageway			R121
1.22	Ward River	70	26195	26265	Off-road			N/A
1.23	R121	805	26265	27070	In-carriageway			R121
1.24	R122	1250	27070	28320	In-carriageway			R122
1.25	Kilreesk Lane	50	28320	28370	In-carriageway			Kilreesk Lane
1.26	Kingstown	790	28370	29160	Off-road			N/A
1.27	R108	1640	29160	30800	In-carriageway			R108
1.28	Naul Road	2450	30800	33250	In-carriageway			Naul Road
1.29	Stockhole Lane West	810	33250	34060	In-carriageway			Stockhole Lane
1.30	M1 East	3706	34060	37766	Off-road	1	M1	N/A

Table 4.4: Summary of the Proposed Temporary Traffic Measures for Phase 2

TTM Sections	Name of Section	Length (km)	Average Road Width (m)	Phase TTM	Diversion Length (km)	Diversion Council Authority
1.02	R156	7.2	6.5	Full Road Closure	24.1	Meath
1.03	R157	1.5	14.5	Hard Shoulder Closure	N/A	N/A
1.05	R147	0.3	14.5	Lanes Closure – min 4.2m wide construction space	N/A	N/A
1.06	L5026	1.6	5.0	Full Road Closure	3.3	Meath
1.07	L1010 West	0.7	5.3	Full Road Closure	20.9	Meath
1.09	L1010 East	0.3	5.3	Full Road Closure	21.3	Meath
1.10	Nuttstown Road	1.4	5.5	Full Road Closure	20.2	Meath
1.12	Priestown Road	0.9	5.3	Full Road Closure	20.7	Meath
1.14	Kilbride Road North	1.1	5.7	Full Road Closure	13.8	Meath / Fingal
1.16	Kilbride Road South	0.7	5.7	Full Road Closure	14.2	Meath / Fingal
1.18	M2 HDD South	0.7	5.8	Full Road Closure	6.5	Fingal
1.20	M2 HDD North	0.9	6.0	Full Road Closure	6.3	Fingal
1.21	The Ward Cross / R121	1.6	5.5	Full Road Closure	8.5	Fingal
1.23	R121	0.8	5.3	Full Road Closure	9.2	Fingal
1.24	R122	1.2	5.0	Full Road Closure	8.7	Fingal
1.25	Kilreesk Lane	0.1	6.5	Full Road Closure	2.5	Fingal
1.27	R108	1.6	7.5	Lane Closure	11.7	Fingal
1.28	Naul Road	2.5	7.5	Lane Closure	10.9	Fingal
1.29	Stockhole Lane West	0.8	7.5	Lane Closure	11.7	Fingal

4.5.4.1 Construction Staff and Vehicle Movements

Construction of the Proposed Development will require the movement of workers to and from various points along the proposed cable route, throughout the entire Construction Phase. Due to the typically rural nature of the proposed cable route, it is expected that all workers will use private vehicles to travel to and park at a TCC. From each TCC they will consolidate to a smaller number of LGVs to travel to specific construction locations. The appointed contractor will also be required to ensure that their staff may not park on public roads (except within the work areas).

Summing projections for required personnel for the entire Construction Phase of the Proposed Development, the total average estimated number of daily workers at any time does not exceed 215, as shown in Table 4.5. The peak workforce attracted by any of the TCCs will be highest, with an estimated 80 workers at TCC3 at peak construction.

Table 4.5: Average Daily Workforce Numbers

TCC	2026		2027				2028				2029			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
TCC0	0	0	0	0	0	0	0	0	6	33	45	14	8	0
TCC1	32	50	46	22	24	30	13	5	5	5	5	5	5	8
TCC2	20	7	27	54	6	5	7	16	16	7	5	5	5	8
TCC3	45	80	20	34	52	5	5	7	11	15	17	16	9	8
TCC4	24	25	54	26	19	21	16	17	5	5	5	5	5	8
TCC5	25	17	5	55	48	14	5	7	17	16	17	20	7	8
TCC6	12	5	5	24	45	45	45	45	24	6	5	5	5	8
Total	158	184	157	215	194	120	91	97	84	87	99	70	44	48

Generally, the number of construction workers required during the Construction Phase at the substations is expected to peak at approximately 20 persons for each of the two substation sites. Crew sizes for the activities of cable trenching, ducting, and resurfacing is estimated at approximately 12 persons per crew with two crews (teams) working simultaneously. Crew sizes for the installation of the proposed underground cables is estimated at approximately six persons per crew. Additionally, it is estimated that there will be approximately up to four traffic management operatives with each crew. The project offices located at the Temporary Construction Compounds is estimated at approximately five staff (engineers, project managers etc.) at seven locations.

The estimated peak daily traffic movements associated with the installation of the proposed underground cable are presented in Table 4.6. It should be noted though that the ultimate approach will be determined by the appointed contractor, within the parameters assessed in this EIAR.

The Construction Phase of the Proposed Development will require the delivery and removal of various construction materials and equipment including excavated material, asphalt, engineered fill, concrete and facility equipment. The vehicles used for this purpose will be HGVs and ready mixed trucks and their volumes are estimated based on the Construction Phase programme requirements to deliver and remove these various materials from along the proposed cable route. Table 4.6 shows the peak construction traffic associated with each of the Temporary Traffic Management Sections. It should be noted though that the ultimate approach will be determined by the appointed contractor, within the parameters assessed in this EIAR.

Table 4.6: Estimate of Peak Daily Construction Vehicles Movements

TTM Sections	HGV Movements	LGV Movements	Total Movements	Number of Peak Days
1.01	75	134	209	2
1.02	107	117	224	2
1.03	55	7	62	2
1.04	77	5	82	2
1.05	14	1	15	13
1.06	64	9	73	6
1.07	22	5	27	3
1.08	64	7	71	2
1.09	24	2	26	16
1.10	37	6	43	3
1.11	20	3	23	4
1.12	71	7	78	6
1.13	13	3	16	3
1.14	31	4	35	2
1.15	40	0	40	40
1.16	62	6	68	3
1.17	52	153	205	2
1.18	14	1	15	16
1.19	94	9	103	5
1.20	23	2	25	18
1.21	86	8	94	6
1.22	14	1	15	13
1.23	49	10	59	1
1.24	74	8	82	4
1.25	12	1	13	17
1.26	41	4	45	2
1.27	89	9	98	6
1.28	117	11	128	6
1.29	56	7	63	3
1.30	155	177	332	3

4.5.4.2 Cable Drum Delivery

The cable will be delivered to site on cable drums with an approximate length of 750m of cable per drum (the exact lengths will be sized to suit the distance between each Joint Bay). Each cable drum will be approximately 4.3m in external diameter, and 4m wide. This will require a large trailer to allow for transport and will be classed as an abnormal load.

There are no high-voltage cable manufacturers in Ireland. Therefore, it is assumed that the cable drums will be delivered by ship from an overseas manufacturer. An assessment has been made of Dublin Port and Belview Port in Waterford for the arrival of these drums. Both ports are well suited for the delivery and transportation from the port to the construction area. However, due to the size of the cable drums these will be an abnormal load. An assessment has been undertaken as part of the Construction Traffic Management Plan (refer to Appendix B of the CEMP which is included as a standalone document in the planning application) for the Proposed Development, but further assessment and consultation will be required at the detailed design stage (e.g., delivery schedules, selection of port, etc).

It is estimated that there will be approximately 300 abnormal load deliveries. Depending on manufacturing details, these could be completed directly from the port to the construction area, or from the port to a TCC and onwards to the construction area.

Following consultation with an abnormal load specialist (see Appendix B (Construction Traffic Management Plan) to the CEMP, which is included as a standalone document in this planning application pack), at this stage it is not foreseen that specific road closures will be required to transport the drums, provided that they are accompanied by escort vehicles. The escort vehicles will ensure the safety of all road users but also to support the oversized load vehicle with overcoming particular obstructions. The requirement and number of escort vehicles and support from An Garda Síochána is at the discretion of the Permits Officer for each County Council or Consenting Authority along the route. On agreement of the final number and design of cable drums, the delivery port, and specific abnormal load vehicle, the consenting authorities can be engaged and the exact requirements for permits can be jointly agreed.

It is likely that an element of enabling works may be required. This is expected to be vegetation trimming (within the permissible environmental timeframes), the temporary movement of some street furniture, and raising any low overhead lines.

The Construction Traffic Management Plan (Appendix B to the CEMP, which is included as a standalone document in this planning application pack) provides a minimum level of requirements for the appointed contractor to adhere to. The Construction Traffic Management Plan will be further developed during detailed design, based on specific design proposals within the parameters assessed in this EIAR, and as approved by the relevant local authority. A Temporary Traffic Management Designer will be appointed and will prepare Detailed Temporary Traffic Management Designs for all locations where works are planned to, or have the potential to impact, any public road. Prior to commencing the works, the plan will be developed into an Operational Traffic Management Plan by the Project Supervisor Construction Stage (PSCS). The appointed PSCS / appointed contractor for the Proposed Development will be required to carry out the Safety Audit on Operational Traffic Management Plans prior to commencing the works. The PSCS will coordinate the implementation of the developed Construction Traffic Management Plan during construction of the works. The Construction Traffic Management Plan requirements will include the provision of facilities for the safe passage of pedestrian and vehicular traffic and measures to keep the impact of the works on the roads, and local communities and road users, to a minimum. All traffic management controls proposed by the appointed contractor will be in accordance with standards and guidance documents referenced in the Construction Traffic Management Plan.

4.5.4.3 400kV Transformer Delivery

The 400kV transformer will be delivered directly from port to Belcamp Substation. The transformer will be lifted via a crane onto the specialist multi-axle vehicle trailer at port and the vehicle will transport the transformer to the substation where it will be lifted from the trailer into position during the proposed substation works. Although dependent on shipping logistics, it is anticipated that a route from Belview Port to Belcamp Substation, largely comprising the motorway network, will be considered.

The vehicle to be used will be a multi-axle trailer and tractor unit, adopting a conventional approach for abnormal deliveries of this nature. The multi-axle trailer is generally comprised of several modular platform vehicles, which are typically available in 2-axle, 3-axle, 4-axle and 6-axle versions.

Considering the overall length of the tractor and trailer unit, which is approximately 40m in length, this load is not expected to be covered under the remit of the permitting process administered by An Garda Síochána, and independent authorisation from the relevant local authorities and / or the Minister for Transport is likely to be required.

4.5.5 Outline Construction Schedule and Timing of Works

Subject to the grant of statutory approvals, it is anticipated that the Construction Phase will commence in Q2, 2026 with the underground cable element of the Proposed Development becoming fully operational after construction and testing in Q4, 2029.

The works at the Woodland Substation are expected to last approximately seven months, while the works at Belcamp Substation are expected to last approximately 17 months. Works to both substations will run concurrently with cable installation works.

Construction activities will gradually phase out from pre-construction to predominantly civil activities, followed by commissioning and testing.

In general, it is anticipated that construction will occur during normal working hours (i.e., Monday to Friday 7am to 7pm and Saturday from 8am to 2pm). There may be localised instances where night-time working is required to facilitate traffic management. However, work outside these hours and days will only be undertaken with prior agreement with Meath and Fingal County Councils.

Clearance of hedgerow, treeline or scrub vegetation, where required, will take place after 31 August and before 1 March in order to protect breeding birds (i.e., outside of the bird breeding season). Clearance may take place during the restricted period, if a suitably qualified ecologist has determined that nesting birds and other protected species are absent. Enabling works are provisionally programmed for Q3 2026. This will allow sufficient time for habitat clearance outside of the breeding season.

Any element of the Proposed Development requiring in-stream works in watercourses with fisheries value will be restricted to the fisheries open season (i.e., will only take place during the period July to September), unless there is an agreement in place with IFI.

The duration of the installation of each Joint Bay and each Passing Bay (Phase 1 of the works) will be approximately six days in total. Installation and reinstatement of the Joint Bays and Passing Bays is expected to start in Q4 2026 and last until Q3 2029.

The duration of the construction of each TCC will be approximately 20 days, though they will be in operation for the full duration of the Construction Phase. Construction of the TCCs / HDD Compounds is likely to begin in Q3 2026.

The duration of HDD works at each location will be approximately 54 days and will be undertaken during Phase 2 of the works. HDD works are likely to begin in Q3 2026 and be completed in Q2 2027.

Excavation and installation of ducts (Phase 2 of the works) are expected to progress at a rate of 50m per day. These activities are likely to begin in Q3 2026 and be completed in Q4 2027.

Installation and jointing of cables (Phase 3 of the works) is likely to begin in Q4 2026 and last until Q3 2029. Proposed works are summarised schematically in Table 4.7.

Table 4.7: Indicative Preliminary Construction Programme

Description	Est. Construction Programme (Months)	2026				2027				2028				2029			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposed Development - Construction Duration																	
Overall Construction Duration	42		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Preliminary & Planning Works	3		■	■													
Enabling Works (including TCC / HDD Compound, devegetation, temporary haul roads and permanent access tracks)	39			■	■	■	■	■	■	■	■	■	■	■	■	■	■
Phase 1: Installation and reinstatement of joint bay and passing bays structures	34				■	■	■	■	■	■	■	■	■	■	■	■	
Phase 2: Excavation and Installation of cable ducts	12			■	■	■	■	■									
Phase 3: Installation and Jointing of Cables	32				■	■	■	■	■	■	■	■	■	■	■	■	
Substation works	24						■	■	■	■	■	■	■	■	■		
Testing & Commissioning	3															■	■
Energisation and permanent works construction complete	3															■	■

Subject to the grant of consents, it is anticipated that construction (including testing, commissioning and energisation) of the Proposed Development will take approximately 42 months in total. However, safety requirements for the installation operations / procedures, detailed design considerations and weather conditions will ultimately dictate the final programme within the parameters assessed in the EIAR.

The majority of the construction activities will not be dependent on outages on the existing transmission system. However, specific activities associated with the connection at the existing Woodland and Belcamp Substations on to the existing transmission infrastructure will be planned and programmed into EirGrid's multi-year outage programme, as the existing live infrastructure will need to be switched off during such connection activities. EirGrid, as Transmission System Operator, develops a detailed plan for such outages each year to ensure the safe and efficient undertaking of construction and maintenance activities involving, or in proximity to, existing infrastructure.

4.5.6 Temporary Construction Compounds

All TCCs will be secured with hoarding / fencing around their perimeter, as appropriate. TCCs will include facilities such as Construction Phase car parking, welfare facilities, offices and temporary material storage areas, as necessary. Any sewage discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed off-site by a licensed contractor to an approved and licensed facility. Temporary surface water drainage will also be provided to control run-off from the compound, including any runoff from trafficked areas such temporary access tracks, plant/equipment storage and car parking.

Where a construction access track is required, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed, and the land will be reinstated to its original condition.

All construction workers will be required to use the designated access / egress routes only. Storage of fuel and refuelling will be undertaken within bunded areas. Water will be brought to site via tankers, as required.

Security lighting will be directional and cowled. The appointed contractor will regularly review security lighting in this regard, to inform adaptive management if necessary and to report the monitoring findings regularly to ESB, EirGrid and the relevant local authority.

The TCCs will be located within the Planning Application Boundary and are as follows:

- TCC0: Chainage 0, located off the Redbog Road, with an approximate area of 1ha (refer to Image 4.25);
- TCC1: Chainage 3,550, located off the R156, with an approximate area of 0.8ha (refer to Image 4.26);
- TCC2: Chainage 10,600, located off the R156, with an approximate area of 1ha (refer to Image 4.27);
- TCC3: Chainage 21,600, located off the Ballymacarney Road, with an approximate area of 1.6ha (refer to Image 4.28);
- TCC4: Chainage 26,850, located off the R121, with an approximate area of 1ha (refer to Image 4.29); and
- TCC5: Chainage 34,800, located off the Stockhole Lane, with an approximate area of 1ha (refer to Image 4.30).
- TCC6: Chainage 37,700, located off the Stockhole Lane adjacent to Belcamp Substation, with an approximate area of 1.6ha (refer to Image 4.31).

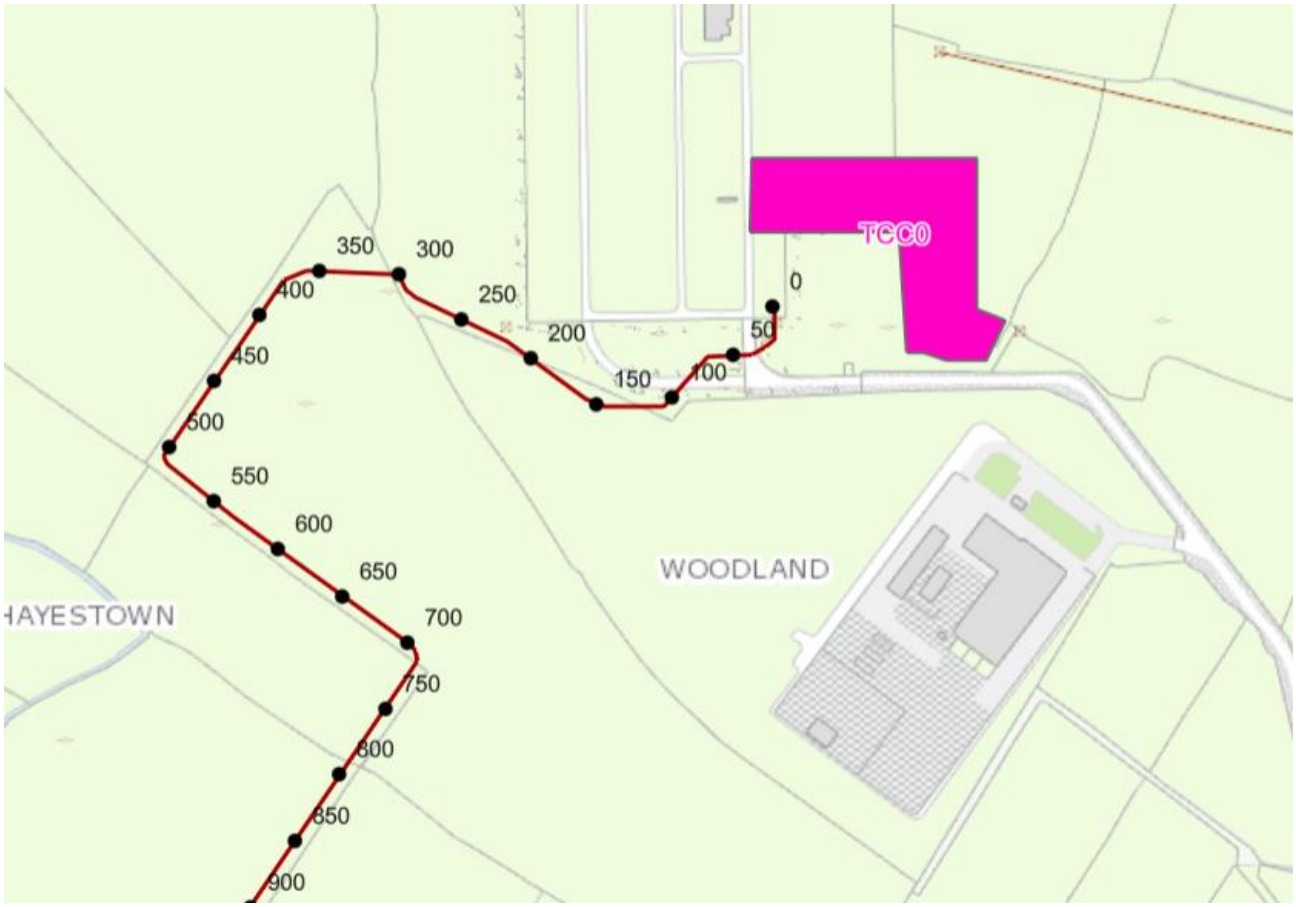

Image 4.25: Proposed TCC0

Image 4.26: Proposed TCC1

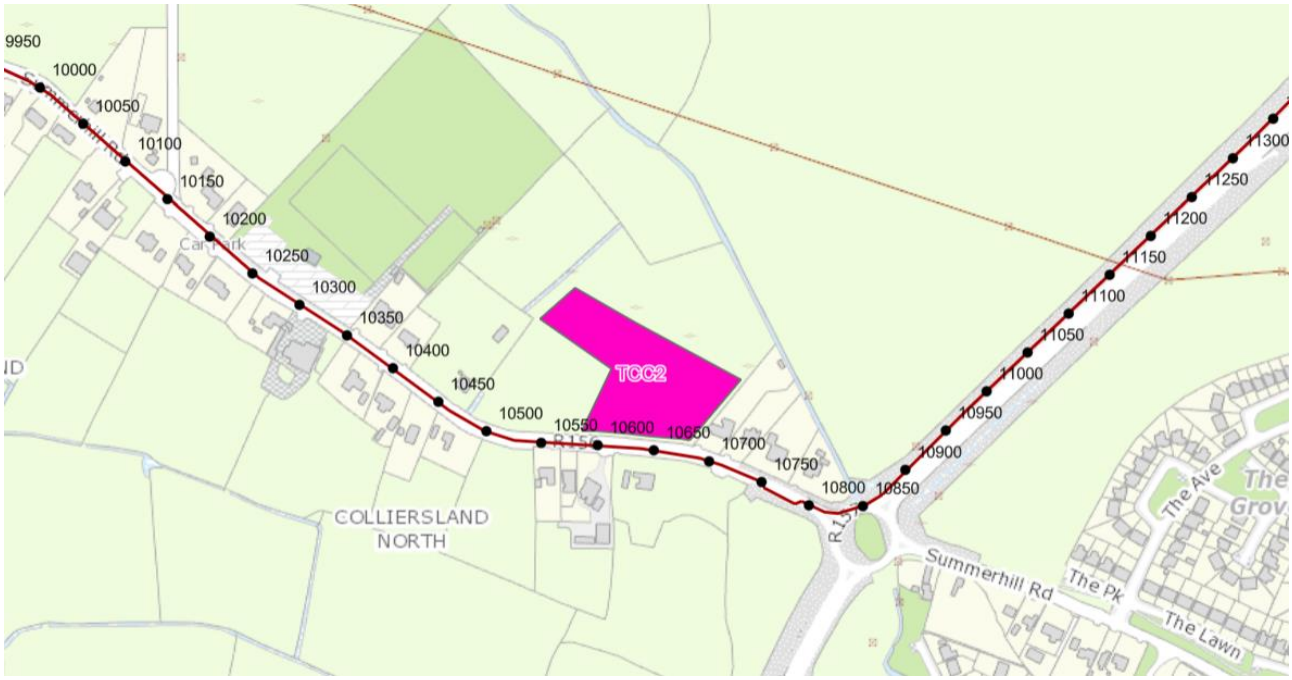

Image 4.27: Proposed TCC2

Image 4.28: Proposed TCC3

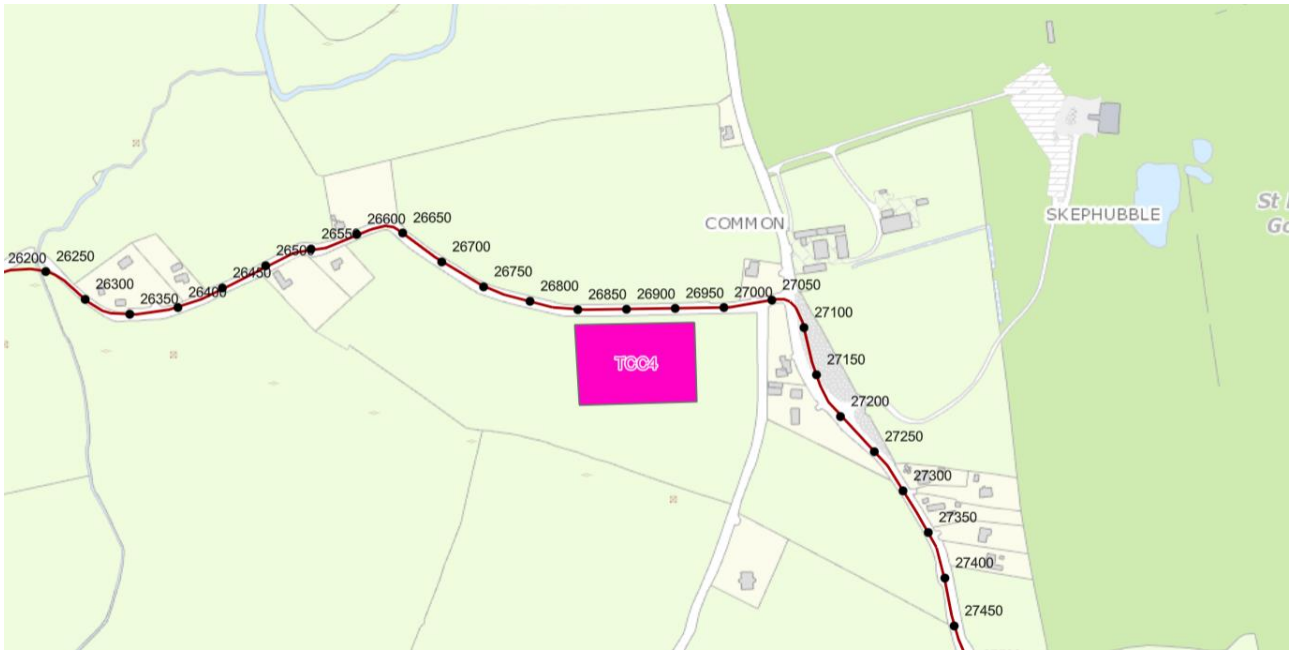

Image 4.29: Proposed TCC4

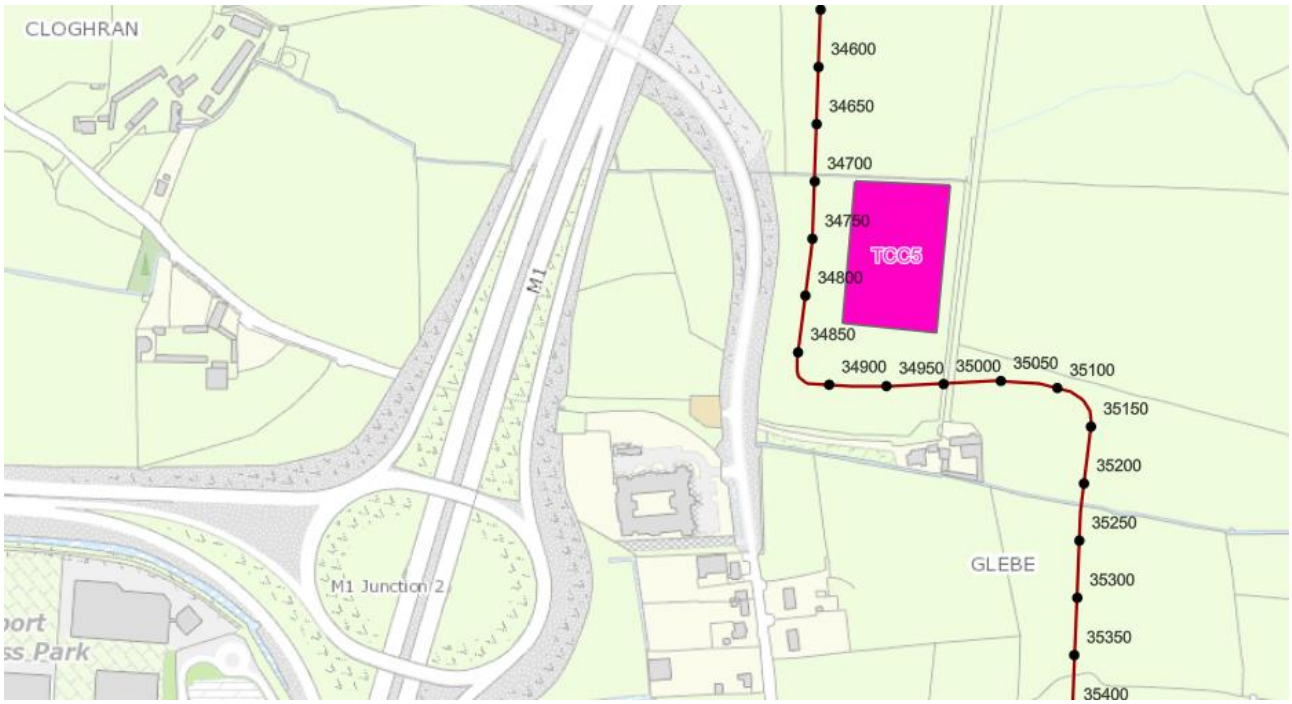

Image 4.30: Proposed TCC5

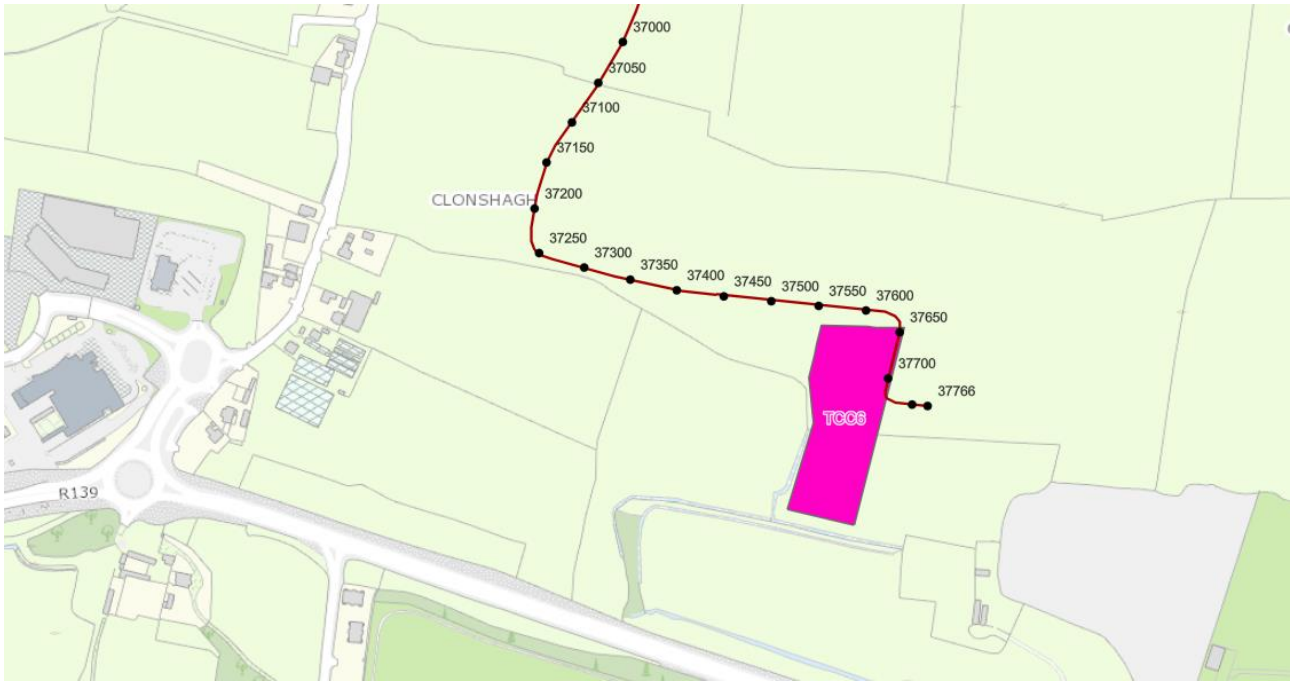

Image 4.31: Proposed TCC6

There will also be a temporary HDD Compound at both the reception and launch locations at each of the three HDD crossings. These temporary HDD Compounds will not be used for the storage of materials for the wider route or for site offices but will be used to facilitate the works required adjacent to and under the motorways and railway. A laydown area is also required for each HDD crossing. The temporary HDD Compounds will be located within the Planning Application Boundary and are as follows:

- M3 HDD Compound West (HDD 1a): Chainage 12,850, located off the Woodpark Road, with an approximate area of 0.23ha (refer to Image 4.32);

- M3 HDD Compound East and Laydown Area (HDD 1b): Chainage 13,050, located off the R147, with an approximate area of 0.31ha (refer to Image 4.32);
- M2 HDD Compound South (HDD 2a): Chainage 23,400, located off the R121, with an approximate area of 0.15ha (refer to Image 4.33);
- M2 HDD Compound North and Laydown Area (HDD 2b): Chainage 23,600, located off the R121, with an approximate area of 0.45ha (refer to Image 4.33);
- M1 HDD Compound West (HDD 3a): Chainage 34,250, located off the Stockhole Lane, with an approximate area of 0.22ha (refer to Image 4.34); and
- M1 HDD Compound East and Laydown Area (HDD 3b): Chainage 34,450, located off the Stockhole Lane, with an approximate area of 0.43ha (refer to Image 4.34).

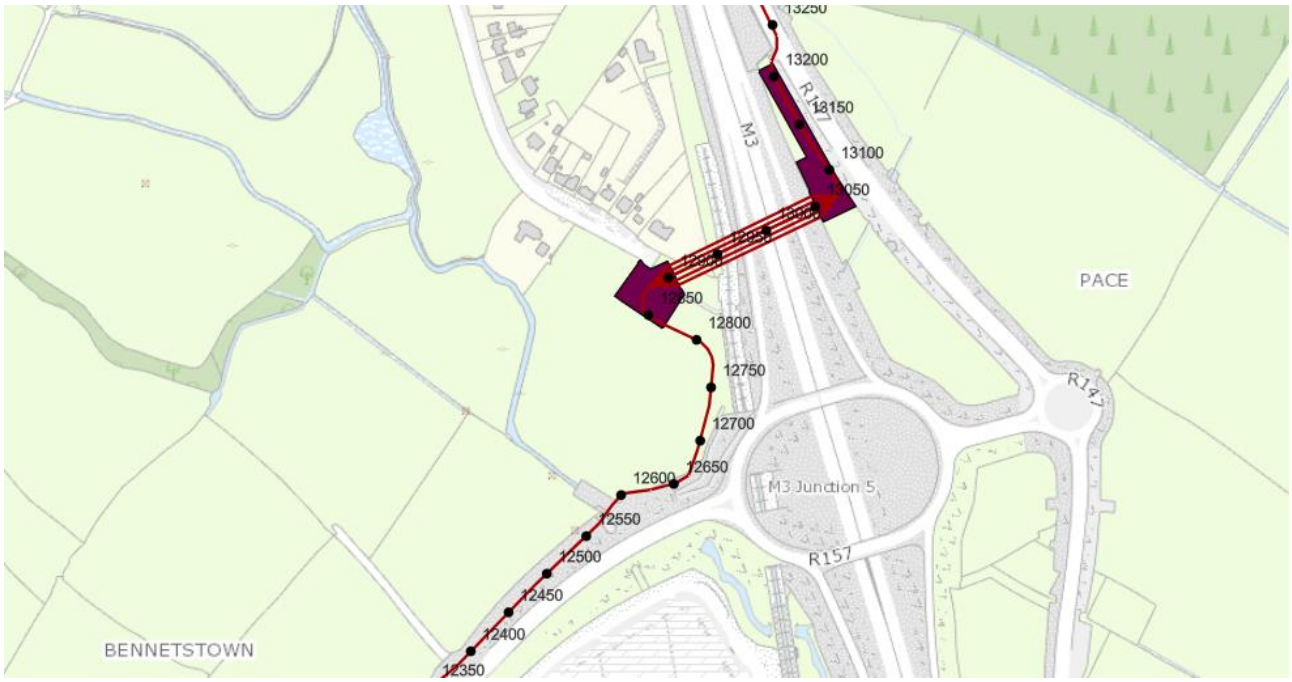

Image 4.32: Proposed M3 HDD Compounds and Laydown Area (HDD1a and HDD1b)

Image 4.33: Proposed M2 HDD Compounds and Laydown Area (HDD 2a and HDD 2b)

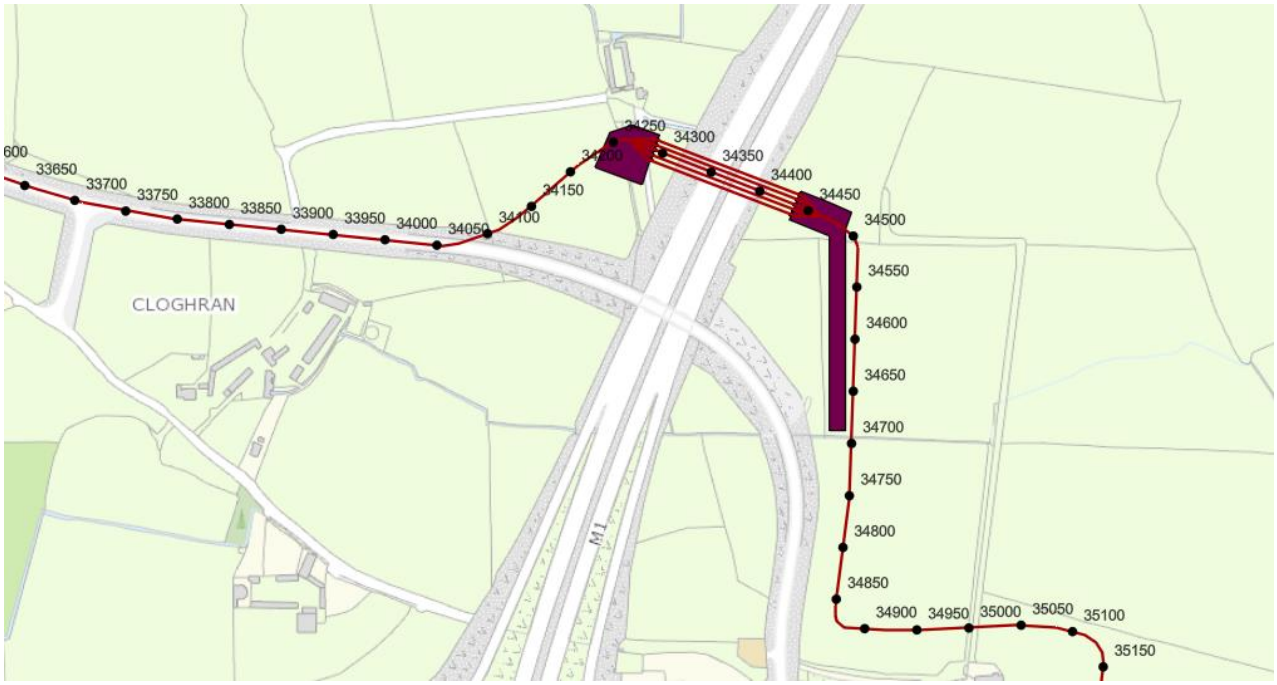

Image 4.34: Proposed M1 HDD Compounds and Laydown Area (HDD 3a and HDD 3b)

4.5.7 Construction Environmental Management Plan

A CEMP is included as a standalone document in this planning application pack and will be implemented during the Construction Phase in consultation with Meath County Council and Fingal County Council. This CEMP will be a key construction contract document, which will ensure that all Pre-Construction and Construction Phase mitigation measures that are considered necessary to protect the environment, are implemented.

The CEMP will remain a 'live' document which will be reviewed regularly and revised as necessary in consultation and agreement with the two local authorities to ensure that the measures implemented are effective, as part of an ongoing review throughout the Construction Phase of the Proposed Development. This will confirm the efficacy and implementation of all relevant mitigation measures and commitments identified in the planning application documentation.

The primary objective of the CEMP is to safeguard the environment, site personnel and nearby sensitive receptors from site activity which may cause harm or nuisance. As such, the CEMP sets out a framework to ensure that key mitigation measures and conditions set out as part of the planning consent process are translated into measurable actions and are appropriately implemented during the Construction Phase of the Proposed Development. As part of this framework, transparent and effective monitoring of the receiving environment during construction will be used to inform and manage ongoing activities on-site and to demonstrate effectiveness of the measures outlined therein.

The ESB will monitor the appointed contractor's performance on a regular basis and will undertake various compliance checks throughout the duration of the Construction Phase, including the following:

- Review appointed contractor documents against the requirements of the CEMP;
- Undertake regular audits;
- Ensure site records are checked regularly;
- Set up a reporting structure for the appointed contractor; and
- Conduct regular meetings (at least fortnightly) where Environmental Health and Safety is an agenda item.

4.5.7.1 Construction Traffic Management Plan

The appointed contractor will implement the Construction Traffic Management Plan, included as Appendix B of the CEMP, which is included as a standalone document in the planning application, in ongoing consultation with Meath County Council and Fingal County Council. The Construction Traffic Management Plan may be subject to iterative updates in consultation and agreement with the two local authorities, as part of ongoing review and design development throughout detailed design and the Construction Phase of the Proposed Development. The implementation of the Construction Traffic Management Plan will mitigate potential construction traffic impacts on the public road network. All construction activities, including construction traffic, will be managed through the Construction Traffic Management Plan.

4.5.7.2 Construction Resource and Waste Management Plan

Prior to commencement of the Proposed Development, the appointed contractor will implement the Construction Resource and Waste Management Plan (see Appendix C of the CEMP, which is included as a standalone document in the planning application pack), which will ensure that optimum levels of waste prevention, reduction, reuse, recycling, and recovery are achieved. As with the CEMP and the Construction Traffic Management Plan, the Construction Resource and Waste Management Plan may be subject to iterative updates in consultation and agreement with the two Local Authorities.

The Construction Resource and Waste Management Plan has been prepared in accordance with waste management guidance and principles as outlined in the EPA's Best Practice Guidelines For The Preparation of Resource and Waste Management Plans For Construction and Demolition Projects (EPA 2021).

All operations during the Construction Phase will be managed and programmed in such a manner as to prevent / minimise waste production and maximise upper-tier waste management (i.e., reuse, recycling and recovery) in line with the Waste Hierarchy, where technically and economically feasible.

The requirement to develop, maintain and operate the Construction Resource and Waste Management Plan will form part of the contract documents for the Proposed Development and will be updated by the appointed contractor (as set out above) in advance of the commencement of construction activities on-site. Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor, and transported from the Proposed Development site to an authorised site of recovery / disposal, in a manner which will not adversely affect the environment. All construction employees will be required to comply with the obligations under the Construction Resource and Waste Management Plan.

4.5.8 Environmental Clerk of Works

The appointed contractor will appoint an EnCoW, who will have suitable environmental qualifications. The EnCoW will have the necessary experience and knowledge appropriate to the role (including experience of linear infrastructure projects and HDD) to ensure all monitoring and mitigation measures are properly implemented. The EnCoW will be a member of a relevant professional body, such as the Institute of Environmental Management and Assessment (IEMA)). The suitability of qualifications / experience of the proposed EnCoW will be confirmed by a senior/ principal environmentalist / ecologist from ESB. The EnCoW will be delegated sufficient powers under the construction contract so that they will be able to instruct the appointed contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations. The EnCoW will also manage consultation with environmental bodies including the National Parks and Wildlife Service (NPWS) and IFI. The EnCoW will be responsible for carrying out regular monitoring of the CEMP and will report monitoring findings in writing to ESB on a regular basis (at least weekly, but immediately in the case of incidents or accidents).

4.5.9 Habitat Restoration Works

The following enhancement measures will be incorporated into the Proposed Development:

- Unless otherwise agreed with the ESB and the local authority, the appointed contractor will reinstate hedgerows and treelines to a species-rich condition (i.e., five woody species per 30m), comprising only native species of local provenance; and
- All other sites will be returned as close as possible to their pre-existing condition, using the same woody species removed, or similar verge seed mixes, under the supervision and direction of the appointed contractor's EnCoW.

4.6 Operation and Maintenance

4.6.1 Underground Cable

A permanent easement of 5m will generally be required above the proposed cable trench. A wider easement will be required on certain land holdings for proposed permanent access tracks and Joint Bays, HDD splayed sections and other features. Specifically, a wider permanent easement will be required at the following off-road sections:

- Woodland Substation to the R156 Regional Road – a 15m wide permanent easement is assumed for assessment purposes; and
- M1 Motorway to Belcamp Substation – a 30m wide permanent easement is assumed for assessment purposes.

This will be discussed and agreed with the affected landowners and all permanent easement areas are included within the Planning Application Boundary for the Proposed Development.

Routine maintenance will be required along the proposed cable route. Access to link boxes and communications chambers will be required on an annual basis for inspection and for any necessary

maintenance. The ESB will undertake maintenance of the Proposed Development as electricity Transmission System Owner, through its business unit ESB Networks. A crew size of three persons is expected for inspection of the Joint Bays and their associated communications chambers and link boxes. Traffic management may be required for Joint Bay locations positioned in-road or on verges. Access to off-road Joint Bays will be provided via the proposed permanent access tracks, as described in Section 4.5.2.3. Access to these locations will be coordinated with the landowners to minimise disruption. Prior to the works commencing, consultation will be undertaken with the local authorities. Traffic management will likely be stop-go systems and specific measures will be presented within a Traffic Management Plan for the Operational Phase.

4.6.2 Substations

Following the Construction Phase, operation and maintenance of Woodland and Belcamp Substations will be managed by the ESB. The substations do not currently require any personnel for operation and this will remain the case following the implementation of the Proposed Development. Scheduled maintenance of the substations will continue to occur approximately once a year, in line with the current maintenance schedule. It is expected that approximately five persons would attend each of the substation sites.

4.7 Health and Safety Considerations

4.7.1 Project Supervisor for the Construction Phase

A PSCS will be appointed for the Proposed Development when the contractors are appointed to carry out the works. The PSCS will be responsible for developing the Construction Phase Health and Safety Plan, coordinating the works of appointed contractors and providing the Project Supervisor Design Process (PSDP) with information required in the Safety File.

4.7.2 Project Supervisor Design Phase Process

The PSDP will ensure coordination of the work of designers throughout the Proposed Development. This will ensure that they are addressing and coordinating safety and health matters from the very early stages of the Proposed Development.

4.8 Reinstatement and Decommissioning

All temporary works such as Passing Bays, HDD Compounds and TCCs, and working areas within the Planning Application Boundary will be restored to their current land use. The materials such as temporary culverts or roadside drains or stoning will be removed in the reverse of the process described above. Planting will be provided where existing vegetation has been removed for temporary works areas. Species-rich hedgerows will be provided where existing hedgerows are affected to seek to improve existing biodiversity levels. Trees will also be provided, where it is appropriate, ensuring sufficient set-back from the proposed cable route.

Permanent works will include the Joint Bays and 12 proposed permanent access tracks, and hardstanding areas around the off-road Joint Bays. These areas will be maintained by the ESB, as necessary. Hedgerows / treelines within the permanent easement will not be replanted. However, offsite compensatory planting will be undertaken considering all permanent losses within the easement.

The following will apply for field boundaries within the permanent easement:

- For field boundaries between the same landowner, affected hedgerows will be replaced with a suitable stock-proof fence. Where one currently exists, access will be provided with a gate (standard 3.6m width unless wider is required by the landowner);
- For field boundaries between different landowners, affected hedgerows will be replaced with a suitable stock-proof fence and no gates will be provided; and

- For field boundaries between different landowners on the Woodland Corridor, affected hedgerows will be replaced with a suitable stock-proof fence. A double gate will be provided so that access along the Joint Bay permanent access track is possible for ESB, but it will not be possible for adjacent landowners to access each other's land. The double gate will be a gate on either side of the landowner boundary and will ensure no issue with livestock escaping in the adjacent field. This will be one gate width (standard 3.6m width).

All affected landowners will be provided with detailed plans outlining the location(s) of permanent works on their land. The location of the cable route and associated permanent works will be provided to all statutory undertakers, Meath and Fingal County Councils, and will be included on ESB's register for its 'Dial Before You Dig' programme (ESB 2023).

The works within the substations will also be permanent features.

Affected roads will be resurfaced in agreement with Meath and Fingal County Councils in line with the principles of The Purple Book (Department of Transport, Tourism and Sport 2017).

It is not intended to decommission the proposed electricity infrastructure. Equipment will be replaced but decommissioning is not intended. In the highly unlikely event that decommissioning is required, the effects would be similar, but less, than those assessed during construction of the proposed underground cables.

4.9 References

Construction Industry Compliance Assistance Centre (1992). STD & SPEC 3.25 Utility Stream Crossing. [Online] Available at https://www.cicacenter.org/bmp/0591.pdf.pdf

Department of Transport, Tourism and Sport (2017). The Guidelines for Managing Openings in Public Roads (The Purple Book)

EirGrid (2021). 10 kV, 220 kV and 400 kV Underground Cable Functional Specification

Electricity Safety Board (2023). ESB Register for Dial Before You Dig' programme. [Online] Available from https://www.esbnetworks.ie/contact-us/safe-digging

Environmental Protection Agency (2021). Best Practice Guidelines For The Preparation of Resource and Waste Management Plans For Construction and Demolition Projects

Health and Safety Authority (2010). Code of Practice for Avoiding Danger from Underground Services

IFI (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters

Met Éireann (2024). National Forecast. [Online] Available from https://www.met.ie/forecasts/national-forecast

Directives and Legislation

Directive 2014/52/EU of the Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment