2025

Ballyloo Substation & Grid Connection - Construction Methodology

BALLYLOO SOLAR FARM LIMITED

NOVEMBER 2025

1 Contents

List of Figures

Revision	Date	Author	Checked	Notes
03	03/11/2025	RH	ND/MMC	Planning Issue

1 Introduction

1.1 Overview

The purpose of this document is to set out the construction techniques and methodologies which will be implemented during the construction of the proposed Ballyloo substation and underground grid connection cable in County Carlow.

The purpose of the substation and underground grid connection is to transport the electricity generated at the proposed Ballyloo, Park and Ballybannon Solar Farms to the national electricity grid.

The substation will be at either 110kV or 220kV voltage and will be either an Air Insulated Switchgear (AIS) or Gas Insulated Switchgear (GIS) tail fed substation with the associated 110kV or 220kV grid connection comprising underground cabling which will connect to the national electricity grid via the existing 220/110kV Kellis substation.

This document is intended as an aid to understand the construction methods and timelines of the proposed substation and grid connection and should be read in conjunction with all other specialist reports submitted with the Strategic Infrastructure Development (SID) application to An Coimisiún Pleanála. This document will be updated prior to the commencement of any construction activities by the construction contractor. The final Construction Method Statement will be agreed with the Planning Authority in advance of commencement of construction.

1.2 Planning Context

The purpose of the proposed substation and grid connection is to transport the electricity generated at the proposed Ballyloo, Park and Ballybannon Solar Farms to the national electricity grid via the existing 220/110kV Kellis substation.

The planning status of those solar farms is set out below:

- An application for the Ballyloo Solar Farm was made to Carlow County Council on the 28th February 2024 (Council Reference: 24/60043). The Council issued a Notification of Decision to Refuse Permission on the 25th March 2025 and a First Party Appeal was submitted by to An Coimisiún Pleanala on the 22nd April 2025. Permission was granted by An Coimisiún Pleanala on the 5th September 2025.
- An application for the Park Solar Farm was made to Carlow County Council on the 19th July 2024 (Council Reference: 24/60205). The Council issued a Notification of Decision to Grant Permission on the 24th April 2025.
- An application for the Ballybannon Solar Farm was made to Carlow County Council on the 22nd May 2025 (Council Reference: 25/60137). A Notification of Decision to Grant Permission was issued on the 31st October 2025.

The substation and grid connection options referenced in this report are subject to a SID application to An Coimisiún Pleanala in accordance with section 182A of the Planning and Development Act 2000.

1.3 Structure of Report

The structure of the remainder of this report is as follows:

- Section 2: provides details the proposed substation and grid connection infrastructure.
- Section 3: provides information on the preliminary site investigations to be undertaken;
- Section 4: provides details of the substation construction methodologies;
- Section 5: provides details of the underground cable grid connection construction methodologies.
- Section 6: provides details on the Emergency Response Plan;
- Section 7: provides information on relevant best practice design and construction mitigation; and
- Section 8: provides a summary of the report.

2 Description of Proposed Substation & Grid Connection Infrastructure

2.1 Overview

The substation will be either 110kV or 220kV voltage. The 110kV substation will use Air Insulated Switchgear (AIS) switchgear, whilst the 220kV substation might use AIS or Gas Insulated Switchgear (GIS) depending on the requirements of EirGrid.

The underground cable grid connection from the proposed substation to the existing 110/220kV Kellis substation will be at either 110kV or 220kV voltage.

The underground cable grid connection is located primarily in the public road network. However, after ca. 8.3km there are two options proposed for its final entry into the existing 220/110kV Kellis substation.

- Option A is to leave the L30535 local road and enter onto private lands where it will cross agricultural farmland into the existing 220/110kV Kellis substation.
- Option B is to be situated within the L30535 local road which provides road access into the existing 220/110kV Kellis substation.
- It should be noted that the options described above apply to both the 110kV and 220kV underground grid connection cables.

It should be noted that the red line development application boundary is identical for all substation and grid connection options described in this report. The location of the proposed substation, grid connection and its associated solar farms are shown in Figure 1.

Figure 1: Solar Farms, Substation & Grid Connection

The reason why different options are proposed for the substation and grid connection are as follows:

- The associated solar farms are subject to a grid connection application being made to EirGrid via the ECP-GSS 1 batch process. After this application has been made, EirGrid will assess the 'least cost, technically acceptable' method of connecting the project to the national network. The expected point of connection for the project will be the Kellis 220/110kV substation due to its proximity. However, depending on the outcome of their studies, EirGrid may conclude that the project should connect at either the 110kV side or the 220kV side of the Kellis substation. This will be driven by factors such as space/bay availability on the 110kV and 220kV busbars in Kellis; capacity of the 110kV and 220kV lines feeding power in and out of Kellis vis-à-vis the MW output of Ballyloo solar farm; and the interaction of the solar farm projects with any other projects applying at the same time. Therefore, for the purposes of this SID application, it is sought that design flexibility is accommodated between developing a 110kV or a 220kV substation and grid connection cable. Substations at either voltage use fundamentally the same type of equipment, except, when using air-insulated (AIS) switchgear, the clearance distances required between individual components becomes greater at 220kV and therefore it has a larger footprint. To allow for this potentially greater footprint area requirement at 220kV, it is also sought to incorporate an option for developing the substation with gas-insulated (GIS) switchgear instead

which, although more expensive, allows for significantly smaller clearance distances to be maintained between the switchgear components. The decision between using AIS or GIS switchgear for the 220kV substation option will ultimately be dependent on the level of future expandability and number of 'bays' that EirGrid will seek the Ballyloo substation to have when it comes to study the project prior to issuing a grid offer.

- The other aspect of flexibility relates to the routing of the final section of the grid connection cable before it enters Kellis substation. Kellis substation is becoming a busy node on the network with multiple underground cable connections planned to travel up the L30535 public road to reach the substation. This is a narrow, single lane, road and as a result, there may not be sufficient space for all cables to fit within the carriageway without derating effects occurring. Therefore, an 'off-road' route option is included on adjacent private lands to the east which would allow the grid connection cable to reach Kellis without being impacted by other cables travelling in the L30535, if this is required.

2.2 Substation Options

2.2.1 110kV AIS Substation

The substation will be based on EirGrid design specifications. The 110kV AIS substation will consist of both EirGrid and Independent Power Producer (IPP) including IPP Control Room buildings, HV electrical equipment and associated infrastructure including palisade fences and concrete post and rail fences. The installation of HV electrical equipment will include a Transformer (TRAFO) with associated equipment along with:

- Cable Sealing End (CSE);
- Surge Arrestor (SA);
- Earth Disconnect (DT);
- Current /Voltage Transformer (CT/VT);
- House Transformer (HT);
- Circuit Breaker (CB);
- Lightning Mast (LM);
- Diesel Generator;
- Security Fencing and Cameras;
- Drainage, access etc.

The 110kV AIS substation layout is indicated in Figure 2.

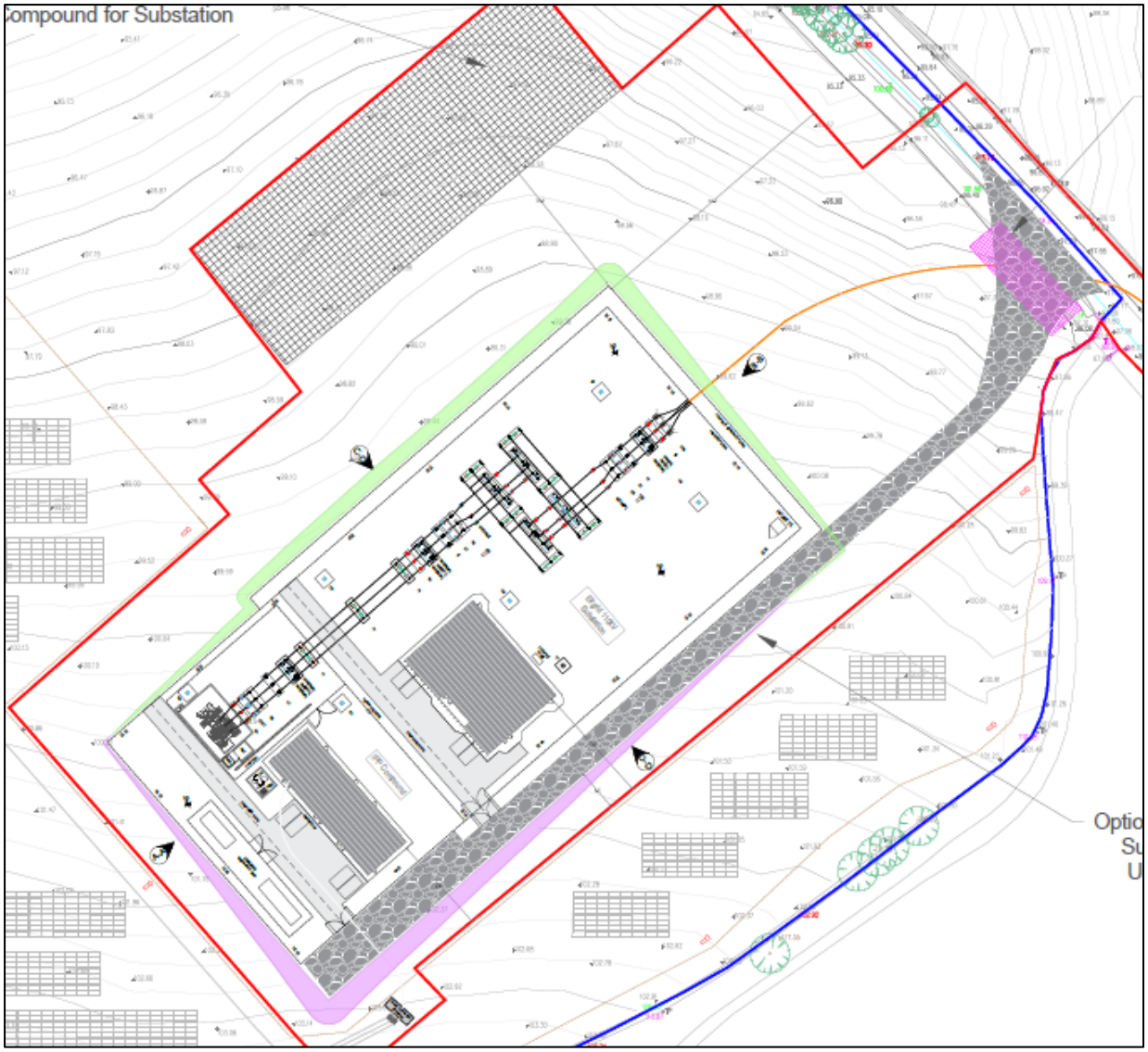

Figure 2: 110kV AIS Substation

2.2.2 220kV AIS Substation

The 220kV AIS substation will comprise the same infrastructure and equipment as the 110kV AIS substation option. The key difference is that the clearance distances required between individual components becomes greater at 220kV and therefore it has a larger footprint.

The 220kV AIS substation layout is indicated in Figure 3.

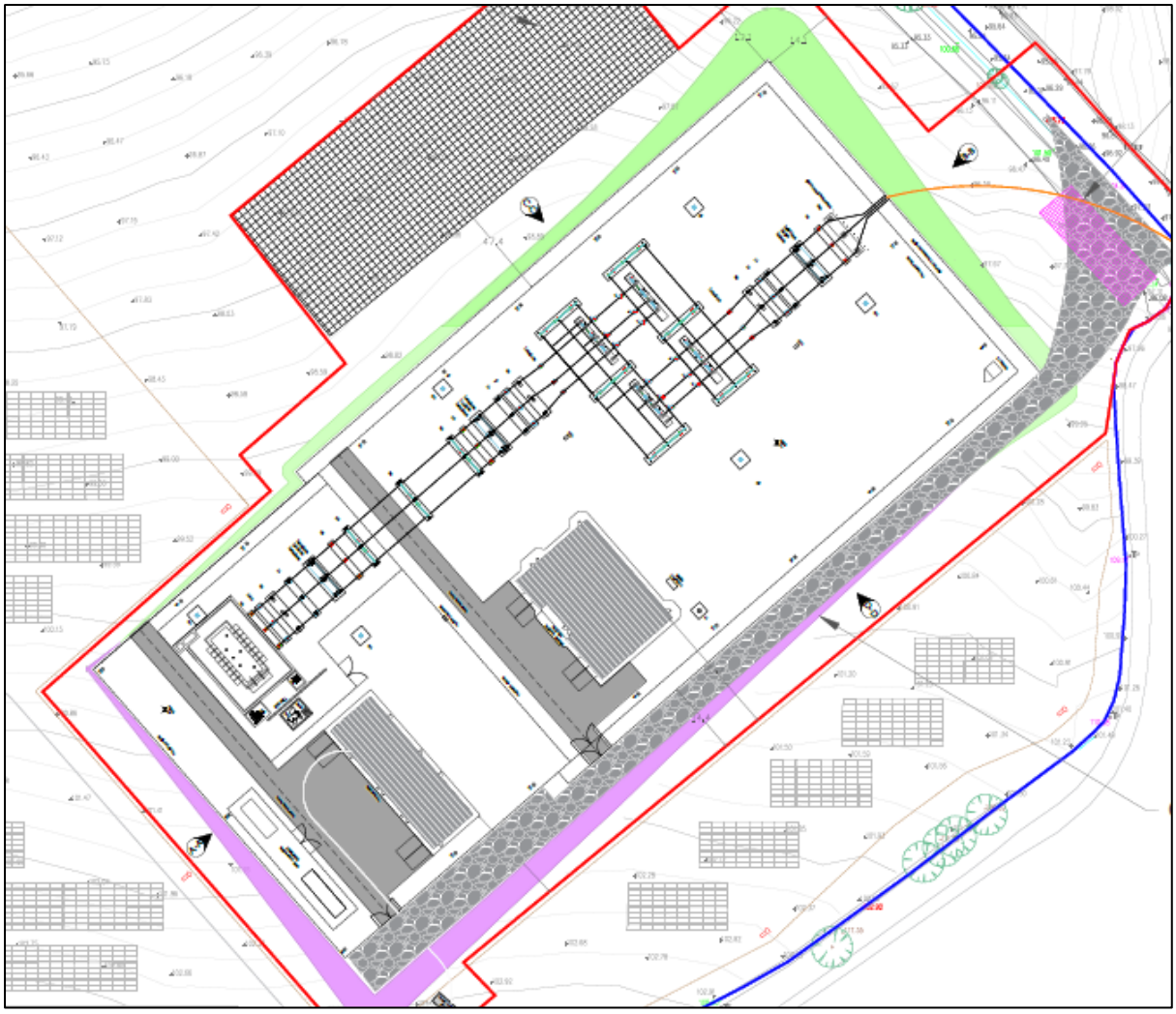

Figure 3: 220kV AIS Substation

2.2.3 220kV GIS Substation

The substation will be based on EirGrid design specifications. The substation compound will consist of a two storey GIS substation building, IPP Control Room building, High Voltage (HV) electrical equipment and associated infrastructure including palisade fences and concrete post and rail fences. The installation of HV electrical equipment will include a transformer with associated equipment along with:

- Lightning Masts (LM);
- Back-Up Diesel Generator;
- Harmonic filters if required by EirGrid;
- Capacitor Bank if required by EirGrid;
- Fire/Blast Wall;
- Telecoms Pole.

The 220kV GIS substation layout is indicated in Figure 4.

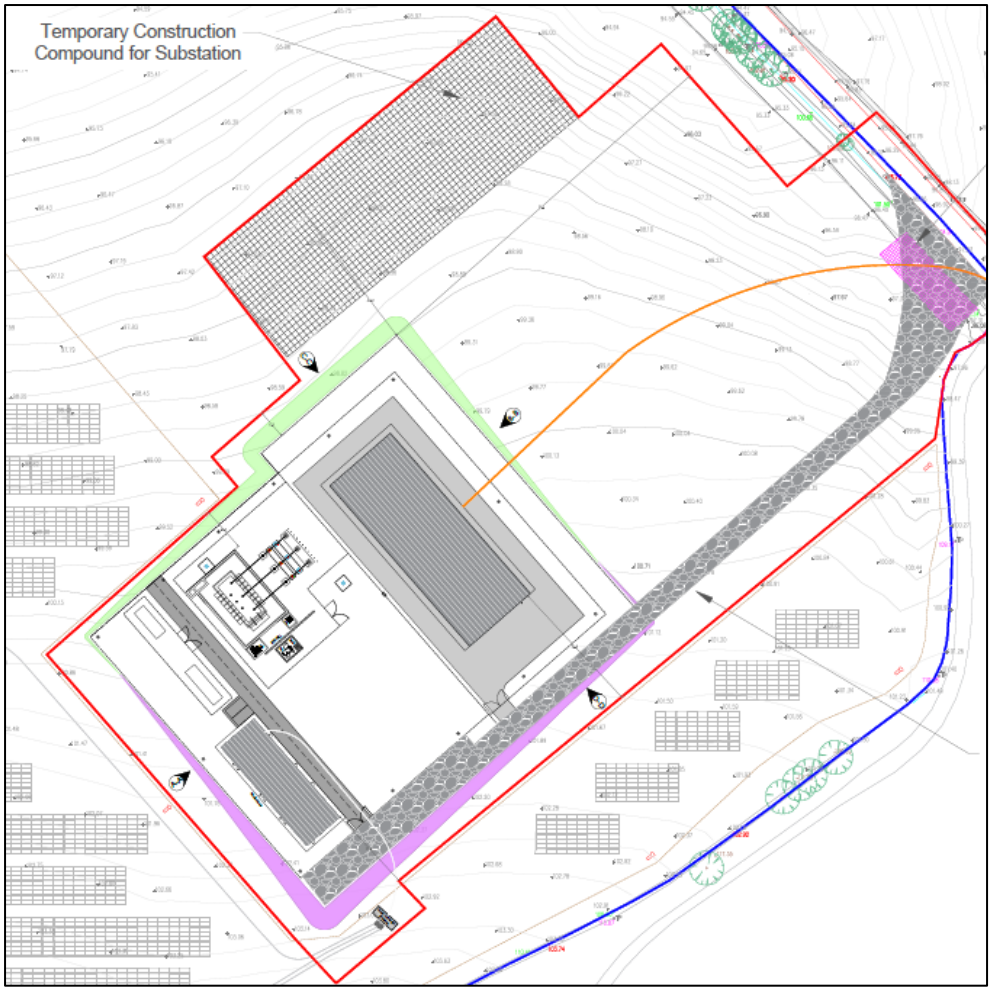

Figure 4: 220kV GIS Substation

2.3 Grid Connection Options

The substation will connect to the existing 220/110 kV Kellis substation via a proposed 110kV or 220 kV underground grid connection cable.

The overall length of the grid connection is approximately 8.9km. The route is shown in Figure 1. An indicative section of a 110kV underground cable trench is provided in Figure 5 and an indicative section of a 220kV underground cable trench is provided in Figure 6. Further section drawing are included in the SID planning application drawing pack.

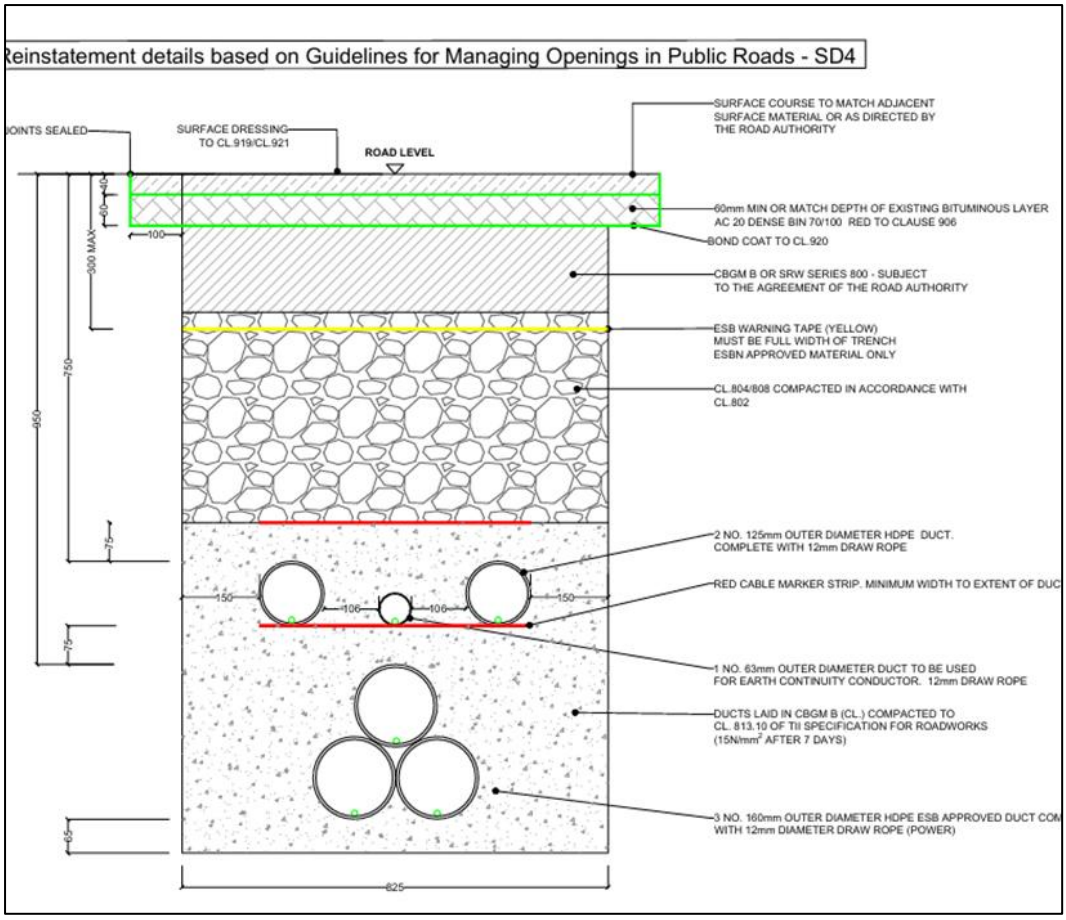

Figure 5: Typical Installation in Roadway for 110kV UGC Grid Connection

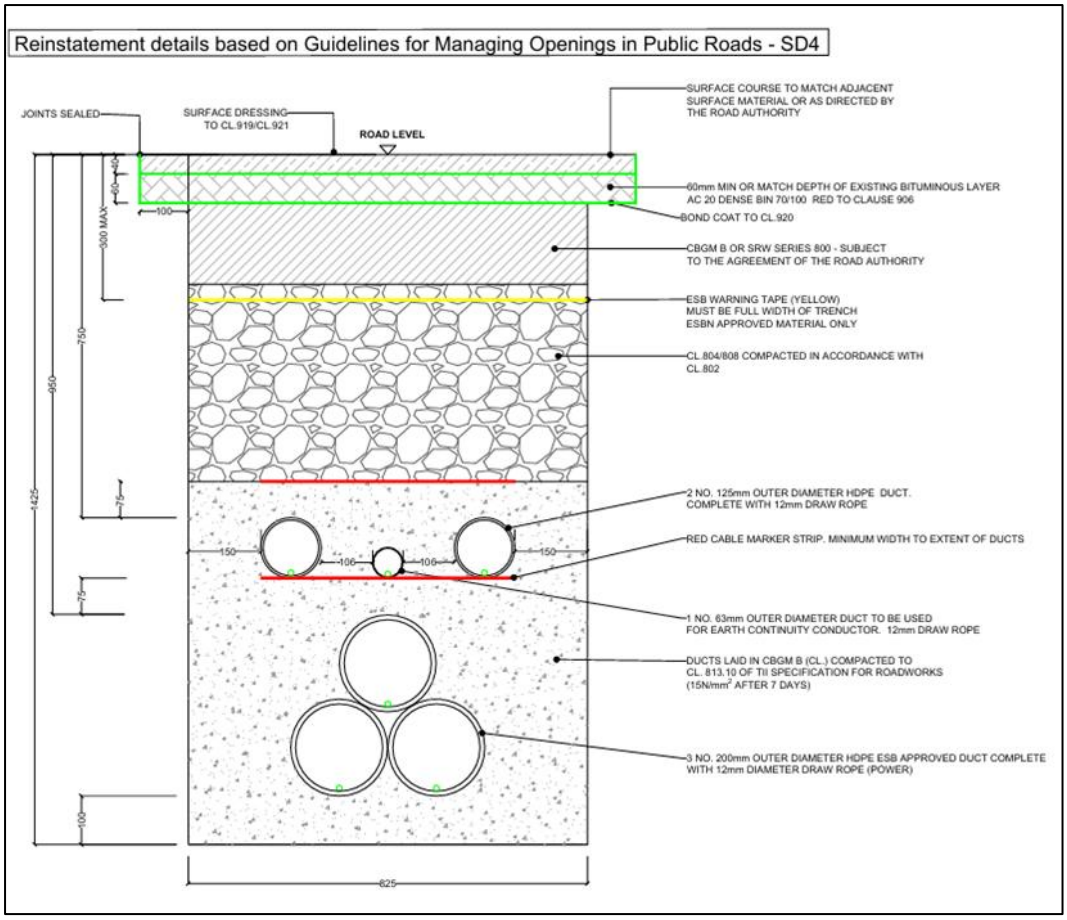

Figure 6: Typical Installation in Roadway for 220kV UGC Grid Connection

It should be noted that the red line development application boundary is identical for both the 110kV and 220kV grid connection cable options. The route travels east from the proposed substation on the L3050 before turning north onto the L30504. It then crosses the N80 at Castletown Cross Roads and continues east on the L7148 before turning south onto the L3053. The cable would then turn east onto the L30535 which is the main road access to the existing 220/110kV Kellis substation. As described in section 2.1, there are two options proposed for accessing the substation. One option is the L30535 local road and the other option is within privately owned agricultural lands. Both options are indicated in Figure 7.

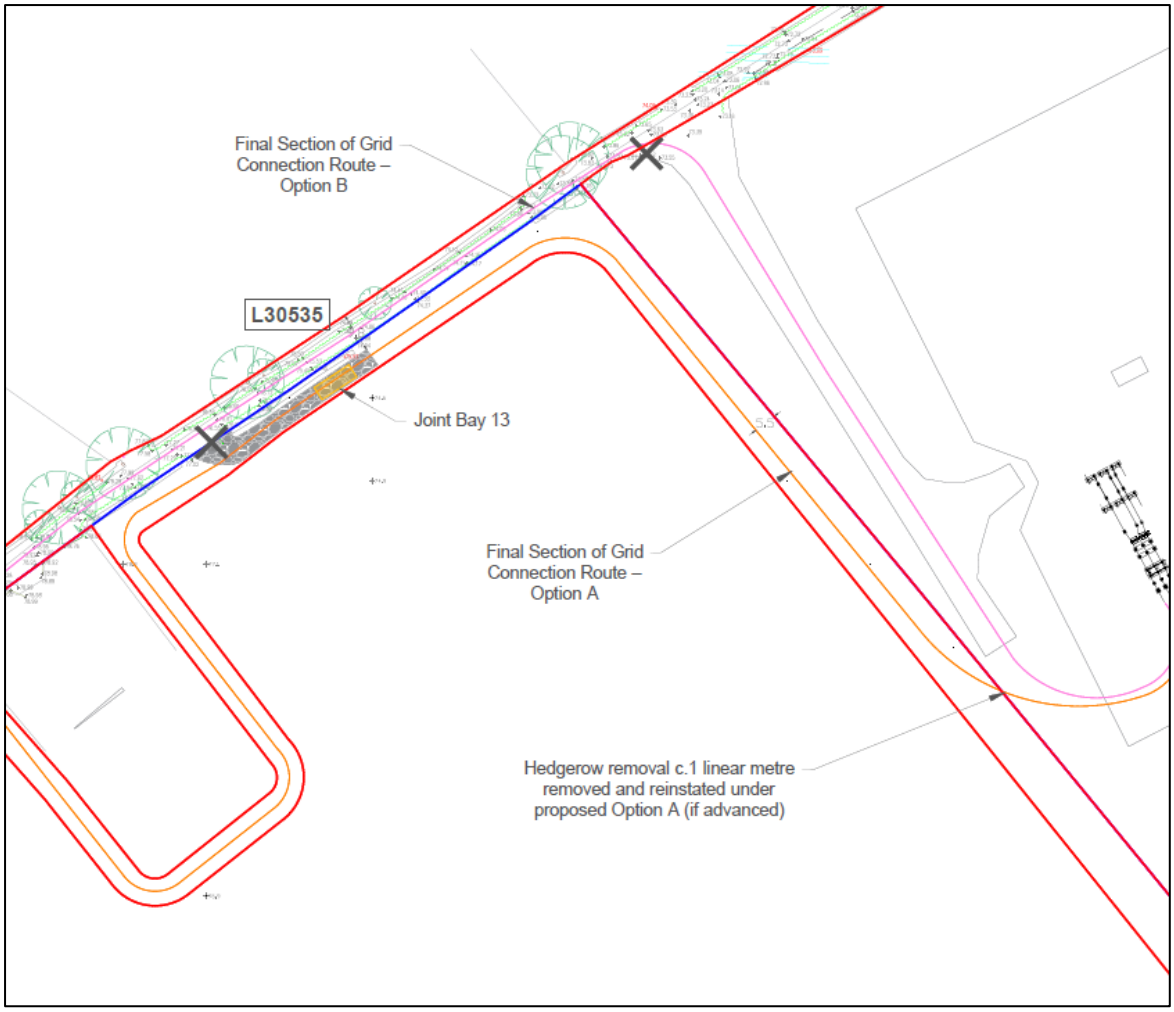

Figure 7: Connection Options into Existing Kellis Substation

3 Site Investigations

3.1 Substation

Site Investigations will be required for the detailed design of foundations and compound build-ups prior to construction and to inform project costs prior to detailed design.

The site investigation works will be scoped and specified by a geotechnical engineer during detailed design but will generally include the following:

- Boreholes: will be carried out at the location of the substation buildings to determine the depth of bedrock.
- Trial holes: will be carried out in order to obtain information on the ground conditions and measure the thermal resistivity of the soil.
- Dynamic probes: will be carried out to determine soil strength/density characteristics.
- Dynamic Cone Penetrometers and Pavement Cores: will be carried out for pavement design.

It is anticipated that these site investigation works will take approximately 2-3 weeks to complete for all substation options.

3.2 Underground Grid Connection

Site investigations for the underground grid connection will be determined following detailed design, however it is anticipated that a single closure Stop/Go system can be implemented for the slit trenches on all the roads in each of the three options.

Depending on the final route selected, it is anticipated that these preliminary site works associated with the grid connection cable will take approximately 2-3 weeks to complete.

Where temporary road closures are necessary, a suitable diversion will be implemented using appropriate signage, following consultation and agreement with Carlow County Council.

4 Substation Construction Methodology

4.1 AIS Substation Construction Methodology

The proposed 110kV AIS substation compound area is approximately 8,385m^2 including the surrounding fence. The proposed 220kV AIS substation compound area is approximately 13,600m^2. The substation area for both options will be secured by a 2.6m high palisade fence. The construction sequence for both options will be as follows;

- Any mitigation measures or conditions of the planning permission will be implemented.
- An Assigned Certifier will be appointed in accordance with Building Control Regulations.
- The AF2 Commencement Notice will be submitted upon completion of a comprehensive Preliminary Safety and Health Plan (PSHP) by the PSDP. This Health and Safety Plan will be built up from the Preliminary Plan;
- A temporary construction compound with appropriate mobile sanitary facilities will be set up to facilitate the construction process. The location of this temporary construction compound is shown in on the site location drawings submitted with this planning application. Sanitary facilities will be pumped to a holding tank which will be monitored and disposed off-site by a suitably licensed waste contractor;
- The extents of substation compound and drainage will be marked out by a qualified engineer.
- Earthworks will be undertaken in order to create a level compound level across the entire substation footprint. The cut material is unlikely to be suitable for reuse as fill under EirGrid standards and therefore it will be transported off site to a suitably licensed facility. For the 110kV substation option, the amount of cut to be transported off site is expected to be ca. 3,443m^3. Similarly, the necessary amounts of fill material will be transported onto site. This is expected to be ca. 3,838m^3. For the 220kV substation option, the amount of cut to be transported off site is expected to be ca. 7,229m^3. Similarly, the necessary amounts of fill material will be transported onto site. This is expected to be ca. 7,868m^3.
- A drainage system will be excavated and installed around the compound area.
- Topsoil and subsoil will be removed from the footprint of the compound using an excavator.
- A layer of geotextile material will be laid over the footprint of the compound.
- Using an excavator, a base layer of Clause 804 material will be laid followed by a 6F2 capping layer which will provide the finished surface.

- Each layer will be compacted using a vibrating roller.
- Earthing cable will be laid underground around the substation for connection to the various electrical components during the electrical fit out phase.
- The construction of the substation compound comprising of EirGrid substation control building, IPP Control building and all associated outdoor electrical equipment, including 1 no. transformer, associated internal access track, 2.6m high station perimeter fencing and concrete post and rail property boundary fence will be built.
- The construction of the substation control building will begin by setting out the foundations. The building foundations will consist of reinforced concrete rafts or footings. Pre-formed works will be constructed to the specifications of the detailed design. The concrete will be mixed off site and transported in on cement trucks where the foundations will be poured in-situ in the preformed works.
- Adequate lighting will be installed around the compound on the lighting columns.
- Lightning protection masts will be installed to protect the station from direct lightning strike.
- An underground cable chamber will be installed outside the IPP compound entrance to act as the common interface point for the 33kV interconnector cables coming from the solar farm inverter/transformer stations going into the substation. The solar farm contractors will be typically responsible for routing all the interconnector cables into this chamber and then the separate substation contractor will manage the short connection of the 33kV cables from this chamber into the switchgear housed in the IPP control building.

Following the completion of construction works, the electrical infrastructure can be installed. The following electrical installation works will take place.

- Delivery and installation of transformer. The delivery of the transformer will be managed in accordance with regulations governing the movement of abnormal loads. In advance of undertaking abnormal load deliveries necessary permitting, approvals and infrastructure accommodation works will be agreed with An Garda Síochána and implemented accordingly. Delivery vehicles will only follow agreed routes and where possible will be delivered overnight to minimise potential for delay and obstruction to general traffic.
- Delivery and installation of all other HV equipment.
- Wiring and cabling of HV/LV equipment, protection and control cabinets.
- Commissioning of all newly installed equipment.

The following equipment is required for the construction of the substation compound (both options):

- Tracked Excavators;
- 360˚ tracked excavators (13 ton normally, 22 ton for rock breaker);
- Tracked dumpers / tractors and trailers;
- Vibrating rollers;
- Power Tools;
- Scaffolding;
- Crane;
- Hoist; and
- Generator.

4.2 GIS Substation Construction Methodology

The proposed 220kV GIS substation compound area is approximately 7,660m^2 including the surrounding fence. The substation area will be secured by a 2.6m high palisade fence. The construction sequence will be as follows;

- Any mitigation measures or conditions of the planning permission will be implemented.
- An Assigned Certifier will be appointed in accordance with Building Control Regulations.
- The AF2 Commencement Notice will be submitted upon completion of a comprehensive Preliminary Safety and Health Plan (PSHP) by the PSDP. This Health and Safety Plan will be built up from the Preliminary Plan;
- A temporary construction compound with appropriate mobile sanitary facilities will be set up to facilitate the construction process. The location of this temporary construction compound is shown in on the site location drawings submitted with this planning application. Sanitary facilities will be pumped to a holding tank which will be monitored and disposed off-site by a suitably licensed waste contractor;
- The extents of substation compound and drainage will be marked out by a qualified engineer.
- Earthworks will be undertaken in order to create a level compound level across the entire substation footprint. The cut material is unlikely to be suitable for reuse as fill under EirGrid standards and therefore it will be transported off site to a suitably licensed facility. The amount of cut to be transported off site is expected to be ca. 3,495m^3. Similarly, the necessary amounts of fill material will be transported onto site. This is expected to be ca. 3,472m^3.

- A drainage system will be excavated and installed around the compound area.
- Topsoil and subsoil will be removed from the footprint of the compound using an excavator.
- A layer of geotextile material will be laid over the footprint of the compound.
- Using an excavator, a base layer of Clause 804 material will be laid followed by a 6F2 capping layer which will provide the finished surface.
- Each layer will be compacted using a vibrating roller.
- Earthing cable will be laid underground around the substation for connection to the various electrical components during the electrical fit out phase.
- The construction of the substation compound comprising of two- storey GIS substation building, IPP Control building and all associated outdoor electrical equipment, including 1 no. transformer, associated internal access track, 2.6m high station perimeter fencing and concrete post and rail property boundary fence will be built.
- The construction of the substation control building will begin by setting out the foundations. The building foundations will consist of reinforced concrete rafts or footings. Pre-formed works will be constructed to the specifications of the detailed design. The concrete will be mixed off site and transported in on cement trucks where the foundations will be poured in-situ in the preformed works.
- Adequate lighting will be installed around the compound on the lighting columns.
- Lightning protection masts will be installed to protect the station from direct lightning strike.
- An underground cable chamber will be installed outside the IPP compound entrance to act as the common interface point for the 33kV interconnector cables coming from the solar farm inverter/transformer stations going into the substation. The solar farm contractors will be typically responsible for routing all the interconnector cables into this chamber and then the separate substation contractor will manage the short connection of the 33kV cables from this chamber into the switchgear housed in the IPP control building.

Following the completion of construction works, the electrical infrastructure can be installed. The following electrical installation works will take place.

- Delivery and installation of transformer. The delivery of the transformer will be managed in accordance with regulations governing the movement of abnormal loads. In advance of undertaking abnormal load deliveries necessary permitting, approvals and infrastructure accommodation works will be agreed with An Garda Síochána and

implemented accordingly. Delivery vehicles will only follow agreed routes and where possible will be delivered overnight to minimise potential for delay and obstruction to general traffic.

- Delivery and installation of all other HV equipment.
- Wiring and cabling of HV/LV equipment, protection and control cabinets.
- Commissioning of all newly installed equipment.

The following equipment is required for the construction of the substation compound:

- Tracked Excavators;
- 360˚ tracked excavators (13 ton normally, 22 ton for rock breaker);
- Tracked dumpers / tractors and trailers;
- Vibrating rollers;
- Power Tools;
- Scaffolding;
- Crane;
- Hoist; and
- Generator.

4.3 Access Track

It should be noted that the construction access is the same for all substation options described in this report.

Construction access to the substation will be provided by private lands, with an entrance from the public road L3050. A traffic management plan will be implemented for the delivery of the 33kV/110kV transformer.

4.4 Surface Water Drainage

4.4.1 AIS Substation

It should be noted that the surface water drainage proposals are similar for both the 110kV and 220kV AIS substation options described in this report.

Surface water drainage for the substation compound have been designed to mimic the natural drainage patterns of the site and thereby be in accordance with the Best Management Practices (BMPs) of Sustainable Drainage Systems (SuDS).

This is achieved when the following parameters are considered:

- The compound construction is formed with permeable stone thus mimicking a soakaway scenario. ESB compound stone is single sized for the first 150mm for safety purposes. It then changes to a graded 6F2 material. The area of this permeable surface is circa 8,315m^2 for the 110kV AIS substation option and 13,600m^2 for the 220kV AIS substation option.
- The main areas to be drained includes the roofs and the compound road. These equate to approximately 1,592m² for the 110kV AIS substation option and 2,023m^2 for the 220kV AIS substation option. These areas are modest in themselves and in comparison to the overall compound area. The compound road will be drained via series of road gullies.
- Assuming even the most basic of infiltration rates down through the permeable compound stone, the existing greenfield situation is easily maintained.

The surface water generated in the hardstanding areas and in the bunded areas within the substation compound will discharge to soakaway via Class 1 Full Retention Oil Separators. The electrical transformer in the substation is oil filled equipment and, as such, is protected with impermeable bunds. Surface water generated in this bund will be pumped out by an oil sensitive pump ensuring that only non-contaminated water enters the site drainage network.

4.4.2 GIS Substation

Surface water drainage for the substation compound have been designed to mimic the natural drainage patterns of the site and thereby be in accordance with the Best Management Practices (BMPs) of Sustainable Drainage Systems (SuDS).

This is achieved when the following parameters are considered:

- The compound construction is formed with permeable stone thus mimicking a soakaway scenario. ESB compound stone is single sized for the first 150mm for safety purposes. It then changes to a graded 6F2 material. The area of this permeable surface is circa 7,660m^2 for the GIS substation.
- The main areas to be drained includes the roofs and the compound road. These equate to approximately 2,746m². The compound road will be drained via series of road gullies.

The surface water generated in the hardstanding areas and in the bunded areas within the substation compound will discharge to soakaway via Class 1 Full Retention Oil Separators. The electrical transformer in the substation is oil filled equipment and, as such, is protected

with impermeable bunds. Surface water generated in this bund will be pumped out by an oil sensitive pump ensuring that only non-contaminated water enters the site drainage network.

4.5 Foul Water

It should be noted that the foul water drainage proposals are the same for all AIS and GIS substation options described in this report.

There are no existing foul sewer water drains on or near the proposed substation site.

The foul drainage proposal must cater for the wastewater generated in the welfare facilities of the proposed substation. These welfare facilities include a toilet and wash hand basin both the EirGrid and IPP control buildings. The station will be unmanned in normal operation so demand for facilities which generate foul flows will be low.

Onsite treatment and disposal of foul waste was considered by using a suitable septic tank and intermittent filter system and polishing unit or packaged wastewater treatment system and polishing unit. This option would be subject to the results of the site characteristic testing as part of detailed pre-construction site investigations. However, the low volumes of foul waste that will be generated and consequently the low biological loading may impact on the successful continual operation of a treatment system reliant on bacterial action. For this reason, the alternative of a foul holding tank to be emptied periodically is proposed. Foul holding tanks are normally used in EirGrid and ESB substations.

The foul holding tanks will have a capacity of 5m^3 which is a multiple of the foul water generated over three months of normal operation of the station. The foul holding tank will also be inspected by a suitably qualified and indemnified person at these intervals and records of inspections will be held on site for inspection by the local authority. A freeboard of 300mm will be provided for and the foul holding tank will be fitted with a high-level alarm. This alarm will be connected to a manned control station via the substation's Supervisory Control and Data Acquisition (SCADA) telecom relay system. This will allow for non-scheduled maintenance and emptying of the tank between the regular three monthly intervals in the unlikely event that this is required. The foul holding tank will also be vented to the atmosphere to avoid the buildup of noxious and dangerous gases.

The proposed station will be unmanned and as such will generate small quantities of foul waste. There will be visits to the station for scheduled and unscheduled inspections, maintenance and repairs as necessary. It is anticipated that this will result in a contribution of 60 litres of foul waste per week. In the unlikely event that such a high visitation rate would be extrapolated throughout the year, this would result in 6,323 litres per annum. While such a

consistently high visitation is improbable, there is the possibility of increased numbers of staff being present on site for short durations during the commissioning of electrical elements of the station from time to time. It is envisaged that these extraordinary occurrences would balance out with the ordinary operation of the unmanned station to produce foul flows no greater than the 6,323 litres per annum as a “worst-case” scenario.

It is common for much lower usage of the facilities on unmanned stations and therefore a much lower foul loading. A common problem on such unmanned stations is odours in the toilet areas due to the drying out of the water trap in the WC through evaporation resulting from the lack of use. For this reason, it is proposed to use self-flushing toilets in the station, which would flush automatically twice a week. The station will include two 6 litre flush WCs so a minimum weekly foul flow of 24 litres can be expected. The self-flushing WCs will therefore contribute 1,248 litres per annum.

Combining the automatic flush and maximum user demand figures would result in a maximum annual generation of 7,571 litres (7.5m³) of foul sewer water waste. The 5m³ tank proposed will be emptied approximately every three months. As outlined, the capacity provided is well in excess of what is required.

4.5.1 Water Supply

It is proposed to provide the required potable water demand of the station (all options) with a bored well on site. The potable water demand within the site will be low as the proposed station is to be unmanned. To avoid issues like stagnation in the water supply line and problems resulting from this, there will be a continual water demand of 24 litres per week from automatically flushing WCs within the station.

The water demand within the proposed development will be low and will be similar to the figures for foul sewer water generation as set out above in this report.

4.6 Earthworks

Topographical data for the location the proposed substation shows the site does not have any severe or steep slopes, with most areas being relatively flat or with moderate slopes.

Analysis of available topographic data suggest that cutting and filling of the existing terrain will be required to establish a level platform for the substation compound. See below the proposed compound levels for the 110kV/220kV AIS Substation and GIS Substation.

Substation Layout	**Compound Level (m)**	**Cut (m^3)**	**Fill (m^3)**
110kV AIS	100.72	3,443	3,383
220kV AIS	100.20	7,229	7,868
220kV GIS	100.75	3,495	3,472

5 Grid Connection Construction Methodology

5.1 Overview

The underground grid connection is proposed to run primarily within the public road network with the exception of the final section of the grid connection cable before it enters Kellis substation. Kellis substation is becoming a busy node on the network with multiple underground cable connections planned to travel up the L30535 public road to reach the substation. This is a narrow, single lane, road and as a result, there may not be sufficient space for all cables to fit within the carriageway without derating effects occurring. Therefore, an 'off-road' route option is included on adjacent private lands to the east which would allow the grid connection cable to reach Kellis without being impacted by other cables travelling in the L30535, if this is required.

5.2 Underground Cable Construction Methodology

The bullet points below outline the construction methodologies to be used during trenching works for the underground cables associated with both the 110kV an 220kV options:

- Prior to construction the Contractor and the appointed Site Manager will prepare a detailed Method Statement for each section of the cabling based on the detailed design of same. The Method Statements will take into account any mitigation measures where required, or any conditions of planning.
- All works will be subject to a road opening licence from Carlow County Council.
- A detailed traffic management plan will be prepared by the appointed contractor and agreed with Carlow County Council at construction stage, outlining how traffic will be managed during the course of the works on the public road. Where road closures and diversions are required to facilitate the works, these will be agreed with Carlow County Council and An Garda Siochana and the appropriate road closure licenses will be applied for.
- All existing underground services shall be identified on site prior to the commencement of construction works. Exact locations will be determined via slit trenches as referenced in Section 3;
- Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height. Stockpiles will be in suitably safe locations and all stockpiling locations will be subject to approval by the Site Manager;

- Excavated material shall be employed to backfill the trench where appropriate and any surplus material will be transported off site and disposed of at a fully authorised soil recovery site;
- Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement;
- Where required, grass will be reinstated by either seeding or by replacing with grass turves.
- The trench will be excavated in 100m sections;
- The trench will be laid with a bedding layer for the ducts. This layer will be compacted in accordance with the design specifications.
- The ducts will be lowered into the trench and laid in a trefoil formation. Spacers will be used where appropriate to ensure the ducts are centred within the trench section.
- The ducts will then be carefully covered with the bedding layer and compacted to the required standards, as per the detailed design. The layer with be levelled to the appropriate height. Care will be taken to not damage or displace the ducts.
- A backfill will be placed on top the of the bedding layer and compacted as per the detailed design specifications.
- At the required level a yellow warning tape will be laid in accordance with the ESB Code 2955092.
- The ducts will then be cleaned and tested by pulling through a brush and mandrel. Following this a 12mm draw rope will be installed in each duct. The ducts will then be sealed using end seals, each fitted with rope attachment eyes to allow for cable installation.
- All the above works should be witnessed by ESBN Clerk of Works as required.
- Public road trenching will be reinstated in line with Carlow County Council requirements and as per the Guidelines for Managing Openings in Public Roads (Purple Book – April 2017);
- Cable lubricant will be applied to jacket (outer sheath) of the cables. This reduces friction between the cable and the rollers and also prevents the cable from snagging.
- The specialised winch will monitor the tension on the cables being pulled, ensuring the cables do not exceed their tensile limit.
- Works will only be conducted in normal working hours of Monday to Friday 08:00 to 18:00 and Saturday 08:00 to 13:00, with no works on Sundays or Bank Holidays except in exceptional circumstances or in the event of an emergency;
- The excavation, installation and reinstatement process typically take an average of 1 day to complete a 50m section; and

- Following the installation of ducting, pulling the cable will take approximately 1 no. day between each joint bay, with the jointing of cables taking approximately 2 no. days.

The following equipment is required for trench construction:

- 2-3 General Operatives;
- 1 Excavator Operator;
- 1 no. tracked excavator (only rubber tracked machines will be allowed on public roads); and
- 1 no. dumper or tractor and trailer.

The following materials are required for trench construction:

- 110mm diameter HDPE ducting;
- Sand for pipe bedding;
- Ready-mix Concrete where necessary;
- Trench backfilling material to relevant specifications;
- Temporary Surface Reinstatement Materials; and
- Permanent Surface Reinstatement Materials to Carlow County Council specifications.

5.3 Joint Bays and Associated Chambers Construction Methodology

The final location and number of joint bays will be determined by the electrical contractor during the detailed design phase.

The location of the joint bays for the proposed grid connection cable (both options) will be determined as part of detailed design. Typical joint bays are 8 x 2.1m consists of a precast concrete unit with have link boxes and communication chambers located adjacent to them. These are required approximately every 400-600 metres. A typical joint bay section is provided in Figure 8 for a 110kV cable and Figure 9 for a 220kV cable.

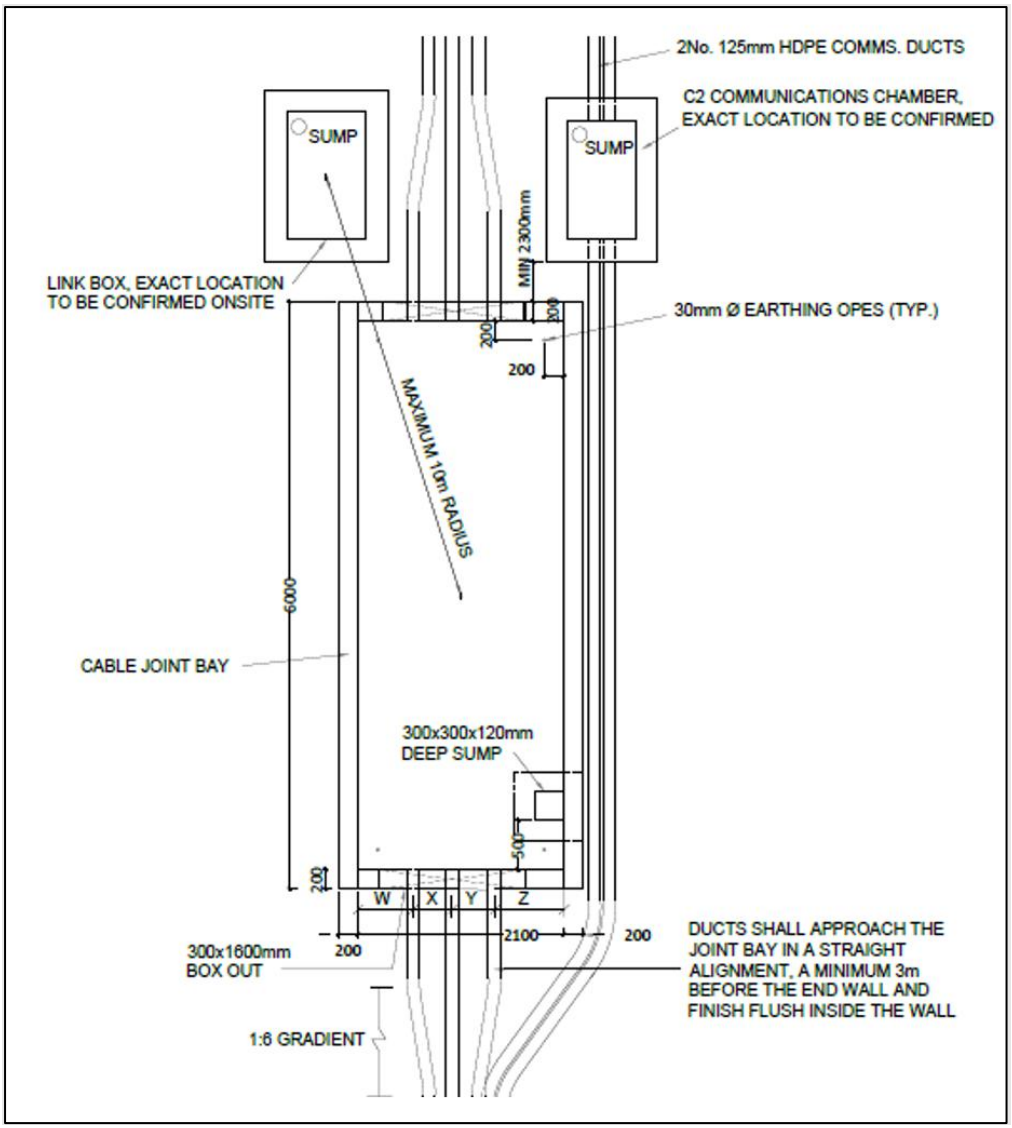

Figure 8: Typical 110kV Joint Bay

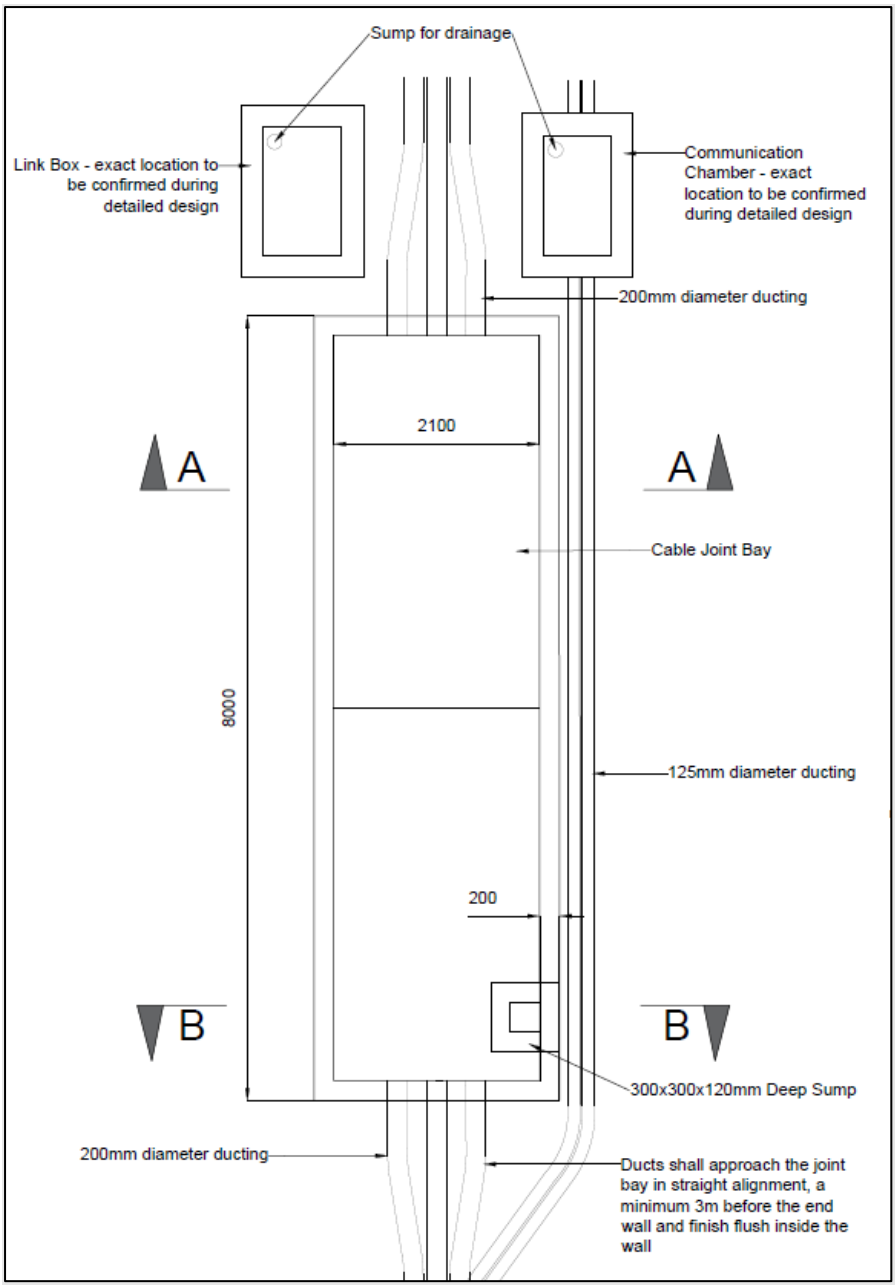

Figure 9: Typical 220kV Joint Bay

5.4 Utilities Crossings

Irish Water services are located along the public road L3050 where the proposed underground cable grid connection will cross. As built drawings and slit trenches are required to determine the depth of services and whether a cable undercrossing or cable overcrossing is required. A typical service undercrossing is shown below in Figures 10. The Applicant has consulted with Uisce Eireann in respect of the proposed crossing and UE has provided a provisional Confirmation of Feasibility (CoF) which is subject to further consultation and agreement post planning. A copy of the CoF is included in Appendix A of this report.

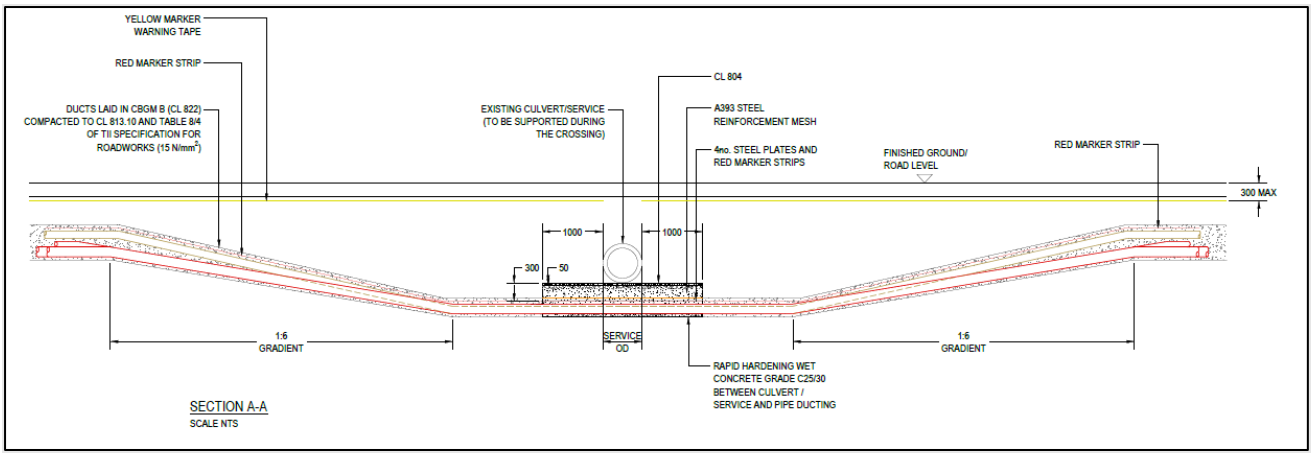

Figure 10: Typical Cable Service Pipe Undercrossing Detail

5.5 Watercourse Crossings

The underground cable grid connection route will cross a bridge/stream along the L30504 road. The cable will cross this stream via HDD, involving no in-stream works or alterations to the bridge. Further detail on HDD is provided in the following section.

5.6 Horizontal Directional Drill Methodology

A HDD is proposed for the bridge/stream along the L30504 road (HDD 1), the N80 (HDD 2) and at the junction between the L-3053 & L-30535 (HDD 3) which provides access to the existing Kellis 110/220kV substation. These locations are shown in Figures 11 and 12.

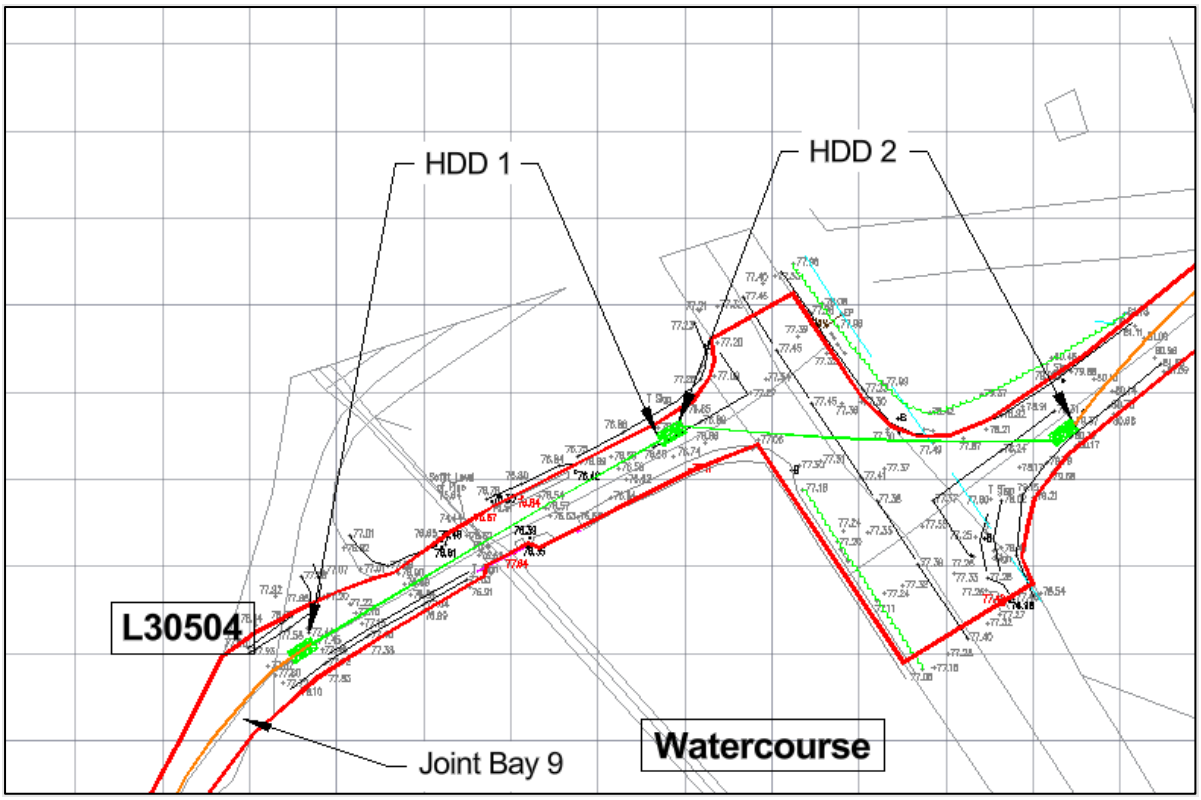

Figure 11: HDD under L30504 and N80

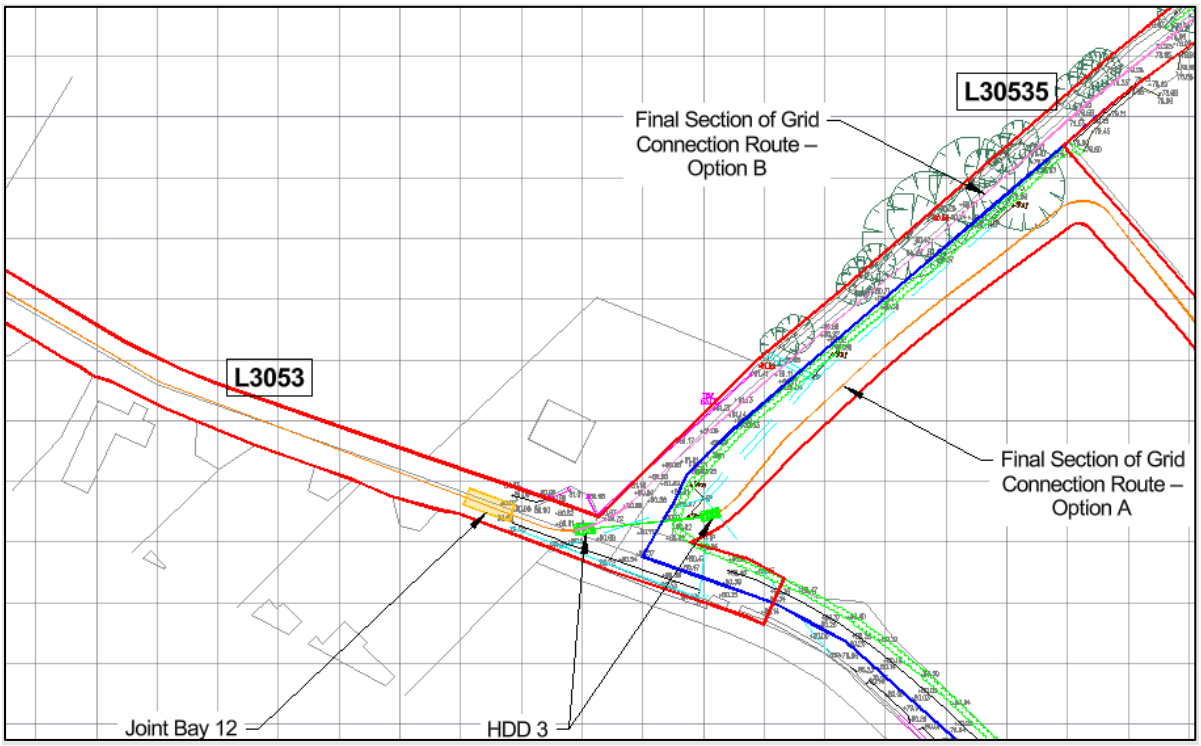

Figure 12: HDD between L-3053 & L-30535

The proposed drilling methodology for each HDD is as follows:

- A works area of approximately 40m^2 will be fenced on both sides creating an easement/wayleave.
- The drilling rig and fluid handling units located on one side of the crossing will be stored on double bunded 0.5mm PVC bunds which will contain any accidental fluid spills and storm water run-off.
- Entry and exit pits (1m x 1m x 2m) will be excavated; the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility.
- A 1m x 1m x 2m steel box will be placed in each pit. This box will capture any drilling fluid returns from the borehole.
- The drill bit will be set up by a surveyor, and the driller will push the drill string into the ground and will steer the bore path under the stream.
- A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded.
- The drilled cuttings will be flushed back by drilling fluid to the steel box in the entry pit.
- Once the first pilot hole has been completed a hole-opener or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side.
- When all bore holes have been completed, a towing assembly will be set up on the drill and this will pull the ducting into the bore.
- The steel boxes will be removed, and the drilling fluid disposed of to a licensed facility.
- The ducts will be cleaned and proven and their installed location surveyed.
- The entry and exit pits will be reinstated as per the landowners' requirements.

It should be noted that the applicant, through its parent company Terra Solar Development, has engaged with various planning authorities and Transport Infrastructure Ireland (TII) in relation to proposed HDDs under the national road network. Most recently, on the Park Solar Farm (Council Reference: 24/60205), the issues raised by TII as part of a request for further information on that application were resolved following consultation with TII's Network Management and TII's Land Use Planning Unit. The Park Solar Farm is considered directly relevant to this SID application as 1) both developments require a crossing of road

infrastructure for which TII are the responsible authority and 2) there are similar construction haulage considerations.

The context provided by the Park Solar Farm is as follows:

1. As part of the solar farm planning application RFI, TII Land Use Planning Unit advised in relation to the HDD crossing under the M9 that this would require Works Specific Deeds of Indemnities and consent from TII in accordance with Section 53 of the Roads Act, 1993. It was advised that consultation should be undertaken with TII Network Management / Third Paty Works in respect of same.
    - The applicant subsequently consulted with TII Network Management / Third Party Works who confirmed that 1) at the 'planning' stage of projects any queries should be directed to TIIs Land Use Planning Unit and 2) the Third Party Works process is only for developments that have already secured planning permission.
    - Following on from the above confirmation, the Applicant consulted with the Land Use Planning Unit who advised that they only consult with the planning authority during the planning application process.
    - In response to the RFI, the applicant noted that its understanding and experience of projects of this nature is that Works Specific Deeds of Indemnities and consent take place in advance of the commencement of construction, once planning permission has already been secured. The RFI response noted that this understanding has been confirmed by TIIs Network Management / Third Party Works. The Applicant further noted its commitment to consulting with TII at this time and agreeing all necessary statutory requirements. This commitment will apply to the subject substation and grid connection development also.
2. As part of the RFI on the Park Solar Farm, TII Land Use Planning Unit had raised a point in relation to the technical information submitted with the planning application and whether it had demonstrated the feasibility of the HDD crossing under the M9.
    - The Applicant responded that the details in relation to the HDD were set out in the 'Electrical Infrastructure - Construction Methodology' report submitted with the planning application. The level of detail provided was comparative to other projects where the Applicants team has agreed a Deed of Indemnity with TIIs

Network Management / Third Party Works team for HDD works. The same level of detail is provided in this report to An Coimisiún Pleanála.

- In addition to the above, the Applicant also proposed to consult with TII again when finalising the detailed design of the proposed HDD crossing prior to the commencement of the construction phase of development. This Method Statement would set out additional detail on engineering, environmental and safety management procedures of relevance to such works. It is highlighted that this is a process that the Applicant and TIIs Network Management / Third Party Works teams have navigated successfully on other projects.

3. TII also outlined in its RFI its general requirements for HDD under a motorway. These requirements, and how they are considered as part of the N80 crossing, are outlined below:

    - *Requirement 1: "The launch and receptions pits for the crossing are located outside the motorway boundary*" As per the planning application drawings the launch and receptor pits for the Horizontal Directional Drills (HDDs) will be outside the N80 road boundaries. The final Contractor led CEMP will include a detailed Method Statement relating to the HDD crossings and will provide for any short term temporary traffic management measures associated with this and all other HDD crossings.

    - *Requirement 2: "The crossing will be installed at such a depth so as not to conflict with the drainage of the motorway."* The N80 HDD crossing will follow TII Guidelines and will be placed at depths where there is no conflict with any drainage assets belonging to TII within its ownership boundary. The HDD crossing will be kept at a minimum of 3m below any drainage assets TII have installed in the area. During detailed design as built records for the drainage will be requested from TII by the designer and the design of the crossing will be submitted to TII and its representatives for comment and input prior to construction.

    - *Requirement 3: "Neither the works nor the crossing will damage or interfere with the motorway".* The HDDs will not damage or interfere with the N80. HDD crossings of motorways and national roads are common practice. Works at any one location will be temporary and of short duration. It was proposed that the final Contractor led CEMP would include a detailed Method Statement relating to the HDD crossings. There have been numerous crossings of this style carried out throughout the country on

behalf of independent power producers and ESBN/ EirGrid in recent years. The undertaker of construction works will ensure that best practice is adhered to with respect to safeguarding the motorway from damage or interference.

- *Requirement 4: "There are no bolted joints in that part of the crossing within the motorway fence line".* HDD crossings do not use pipes/ducts with bolted joints. HDD ducts are a continuous pipe that are welded together to ensure a smooth transition for the cable pulling process. The pipe/duct will be made from High Density Polyethylene (HDPE). This proven process and material will ensure that there are no potential locations for repair, in contrast with bolted joints which fatigue over time.
- *Requirement 5: "Specific requirements may also arise for these proposed works".* The applicant is committed to consulting with TII and agreeing all necessary technical details relating to the HDDs prior to the commencement of construction.

4. As part of the RFI, TII provided details of construction stage considerations for the implementation of any permission related to the national road network. These relate to the content of a future Construction Traffic Management Plan (CTMP) and will include:
    - Any proposed works to the national road network including signage shall comply with TII publications and shall be subject to a road safety audits. All necessary licences or agreements shall be secured from TII, PPP Concession, Motorway Maintenance, MMaRC Companies, local road authorities, as necessary.
    - Any proposals or agreements referred to above will be shared with TII;
    - Any damage caused to the pavement of the existing national road shall be rectified in accordance with TII Pavement Standards.

The Applicant can confirm in the case of the development subject to this SID application that it will reference the above requirements in the final CTMP and will consult with TII, and other parties where necessary, prior to the commencement of development. It should be noted also that on the Park Solar Farm, this detail was considered acceptable by TII who on review of same advised no objection to the proposed development.

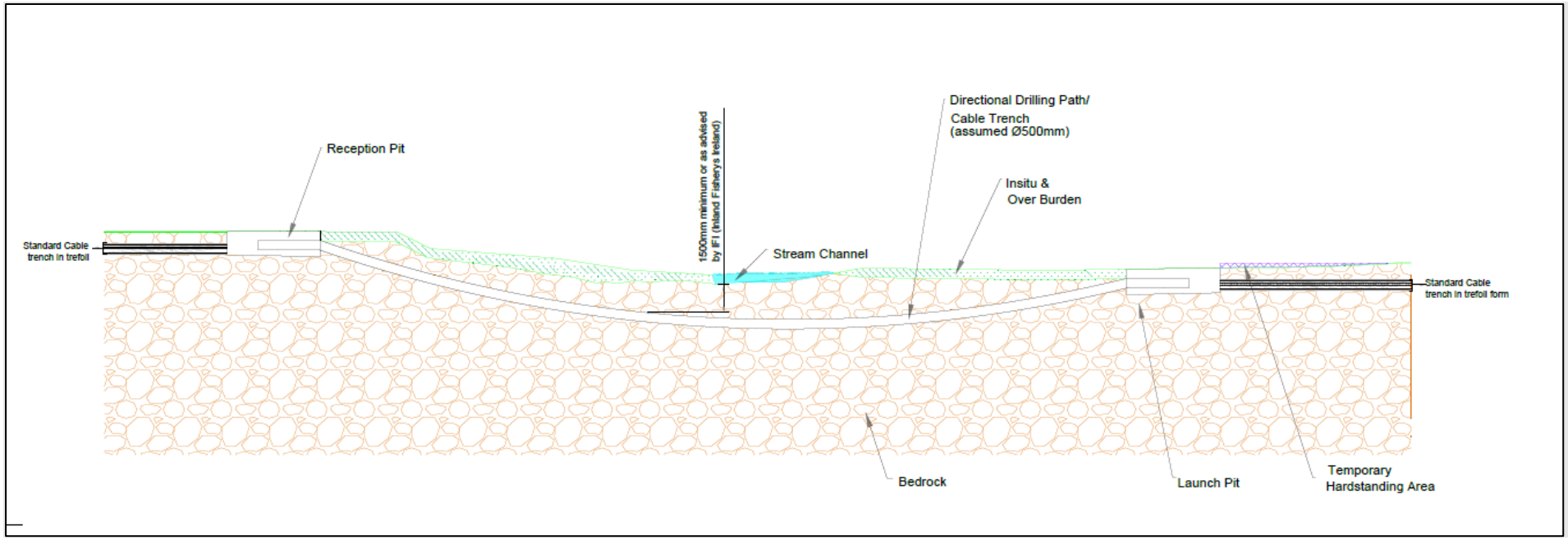

Figure 13: Typical Horizontal Directional Drill Water Crossing

5.7 Traffic Management

Road opening licenses will be submitted to cover the full extent of the underground cable grid connection within the public roads. In relation to the underground grid connection cable, the length of work exceeds 1000m of rural road and as such a T1 License Notification will be submitted through the MapRoadWorks licensing system to Carlow County Council to facilitate coordination and planning of these works with the Roads department. T2 (Road Works) Licenses will be prepared and applied for under the overarching T1 Notification.

Where road widths permit, the underground cable construction works will allow for one side of the road to be open to traffic at all times by means of a 'Stop/Go' type traffic management system, where a minimum 2.5m roadway will be maintained at all times. Temporary traffic signals will be implemented to allow road users safely pass through the works area by directing them onto the open side of the road. The underground cables will be installed in 100m sections with no more than 100m will be excavated without the majority of the previous section being reinstated.

Some work areas may require a temporary road closure where it is not possible to safely implement a Stop/Go system. Where temporary road closures are necessary, a suitable diversion will be implemented using appropriate signage, following consultation and agreement with Carlow County Council.

Full details of any traffic management plan for these works will be developed as part of the Road Opening License application process with a Traffic Management provider and shall be in accordance with Chapter 8 of the Traffic Signs Manual, but the following considerations are identified at this stage:

- Statutory processes for road closures as outlined in Section 75 of the Roads Act 1993 and expanded in Section 8.6.3 of Traffic Signs Manual will be followed – i.e. any proposed road closure is to be approved/implemented by the local Road Authority with consultation of the public, and proposed diversions will need to be approved by the Road Authority.
- An information campaign (letter drop/notification on local radio/advance information signs etc.) will be undertaken to inform local residents of the works.
- The process for applying for, and securing a road closure is separate to that of applying for a Road Opening Licence, but both are to be in place and valid for the full period of works. Carlow County Council advise that a Road Closure Application must be submitted within 5 weeks of the proposed closure. It is intended to engage with the

Roads Authority as early as possible due to the length of the works requiring road closures and road opening licenses to be in place.

- Provision of local access to residences along the active works area will be maintained with minimal disruption. This will be coordinated through signposted detour routes, advance notice to residents of anticipated works dates and details and facilitating access and egress of residences adjoining the works area during the periods where the UGC will be installed in the road outside these. The length of closure (as defined on site by signage/cones etc) is intended to be kept to the minimum length practicable for the works to be undertaken where homes are adjacent, and to avoid access restrictions to local residences being in place for multiple working days.
- Minimising the closure period of junctions with other local roads will dictate maximum length of any one closure (unless specified otherwise by Roads Authority) to avoid excessive disruption to the local area.
- Where ground conditions, weather, and third party services permit, approximately 100m of the route can be excavated, ducting installed, backfilled, and reinstated within one working day. This permits indicative time estimates for closures to be provided to locals, and will similarly permit works to be programmed so that restrictions on access to local houses can be kept to a minimum, such as by phasing works between driveways so that disruption to access from the works area is limited to the start or end of a single work day.

Temporary and Permanent Road Reinstatements are envisaged to be in accordance with the standard details provided in the Purple Book – namely SD1 & SD4 where the existing road consists of an Asphaltic Concrete build-up, or SD2 & SD5 in the event that the roads are surface dressed, unless otherwise directed by the roads authority during the T1 consultation period or approval process of specific T2 licenses. All longitudinal and transverse openings will be carried out in accordance with Purple Book drawings GA1 and GA2 respectively.

6 Emergency Response Plan

All site personnel will be inducted in the provisions of the Emergency Response Plan. The following outlines some of the information, on the types of emergencies, which must be communicated to site staff (list not exhaustive)

- Release of hazardous substance – Fuel or oil spill;
- Concrete spill or release of concrete;
- Flood event – extreme rainfall event;
- Environmental buffers and exclusion zones breach;
- Housekeeping of materials and waste storage areas breach; and
- Stop Works order due to environmental issue or concern.

The Emergency Response Plan will be completed by the appointed Contractor before the project begins.

7 Best Practice Design and Construction Mitigation

Prior to commencement of construction works the contractor will draw up a final Method Statement including a Construction Environmental Management Plan which will be based on established best practice measures. These documents will be adhered to by the contractors and will be overseen by the project representative/foreman.

The following documents will contribute to the preparation of the Method Statement and CEMP:

- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin,
- National Roads Authority (2008) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. National Roads Authority, Dublin.
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects.* Technical guidance (C648). CIRIA.
- E. Murnane et al., (2006) Control of water pollution from linear construction projects. Site guide (C649). CIRIA.
- Murphy, D. (2004) Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.
- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532).
- Enterprise Ireland (unknown). Best Practice Guide (BPGCS005) Oil storage guidelines.
- Law, C. and D'Aleo, S. (2016) *Environmental good practice on site pocketbook*. (C762) 4th edition. CIRIA.
- CIRIA Environmental Good Practice on Site (fourth edition) (C741) 2015.

The final Construction Method Statement and CEMP will comply with any conditions of planning. The environmental measures to be included in the final CEMP will include the measures as set out in the following sections:

7.1 General

The environmental control measures for the solar farm include the following:

- Materials, plant and equipment shall be stored in the proposed site compounds.

- All hazardous liquid materials shall be stored in a bunded area and spill containment measures will be in place.
- Re-fuelling of machinery, plant or equipment will be carried out in the site compounds.
- Fuel pipes on plant, outlets at fuel tanks etc. will be regularly checked and maintained to ensure that no drips or leaks to ground occur. The following precautions will also be installed on fuel delivery pipes:
- Any flexible pipe, tap or valve must be fitted with a lock where it leaves the container and be locked when not in use.
- Flexible delivery pipes must be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use.
- Warning notices including “No smoking” and “Close valves when not in use” shall also be displayed.
- Any pouring of concrete will only be carried out in dry weather. Washout of concrete trucks shall be strictly confined to designated and controlled impermeable wash-out areas remote from watercourses, drainage channels and other surface water features.
- Spill kits will be available within each plant/vehicle on site and located close to identified pollution sources or sensitive receptors (fuel storage areas, etc.).
- Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water. Plant and site vehicles are to be well maintained and any vehicles leaking fluids must be repaired or removed from site immediately. Any servicing operations shall take place over drip trays.
- Areas used to store fuel and oil on the site will be appropriately lined and bunded to prevent the downward percolation of contaminants to natural soils and groundwater.
- Fuel for construction vehicles will be stored on an impervious base within a bund able to contain at least 110% of the volume stored. Rainwater will not be allowed to accumulate within the bund and in any way compromise the required 110% volume capacity. No tanks or containers may be perforated or dismantled on site. A competent operator shall empty all contents and residues for safe disposal elsewhere.
- Suitable wheel wash facilities, complete with C/W silt traps will be put in place to ensure vehicles entering/existing the site do not carry/transport debris.
- If very wet ground must be accessed during the construction process bog mats will be used to enable access to these areas by machinery.
- Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works.

7.2 Water Quality

- A buffer of 10 m from the closest drain or watercourse will be established and clearly marked out prior to the commencement of construction activities where possible. The buffer will be maintained with the exception of localised areas where fencing, access, crossing or cable trenching is required.
- Silt fencing will be installed within the works area for the proposed interconnector cables. The silt fence will provide protection from sediment and potential site water runoff.
- The silt fencing will be checked twice daily during construction and once per day thereafter to ensure that it is working satisfactorily until such time as the re-instated ground/material has been fully established.
- If dewatering is required as part of the proposed works e.g., in trenches for underground cabling or in wet areas, water must be treated prior to discharge. The Contractor shall employ best practice settling systems to ensure maximum removal of suspended solids prior to discharge of any surface water or groundwater from excavations to receiving waterbodies. This may include treatment via settlement tanks. There will be no direct pumping of water from the works to any watercourses or drains at any time.
- An emergency-operating plan will be established to deal with incidents or accidents during construction that may give rise to pollution within any nearby watercourses or drains. This will include means of containment in the event of accidental spillage of hydrocarbons or other pollutants (spill kits etc.).
- The contractor will ensure that good housekeeping is always maintained and that all site personnel are made aware of the importance of the nearby estuary/aquatic environments and the requirement to avoid pollution of all types.

7.3 Soils

- Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height.
- No stockpiles associated with the excavation works associated with the proposed grid connection will be located within 10m of drains.
- Imported materials and any site won materials will be tested prior to use to determine its geotechnical and geo-environmental properties to assess their suitability for use
- Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement.

7.4 Ecology

- No removal of habitats or movement of construction machinery will occur outside of the development works area/footprint during the construction phase, where the works area/footprint will be clearly marked for associated site staff.
- The following best practice measures form part of the construction methodology and will help to contain and/or prevent the introduction of invasive species on the site as follows:
- When deemed necessary, all plant and equipment employed on the proposed works (e.g., diggers, tracked machines, footwear etc.) will be thoroughly cleaned down using a power washer unit, and washed into a dedicated and contained area prior to arrival on site and on leaving site to prevent the spread of invasive aquatic / riparian species. A sign off sheet will be maintained by the contractor to confirm cleaning.
- Material gathered in the dedicated and contained clean down area will need to be appropriately treated as contaminated material on site.
- For any material entering the site, the supplier must provide an assurance that it is free of invasive species.
- Ensure all site users are aware of invasive species management plan and treatment methodologies. This can be achieved through “toolbox talks” before works begin on the site.
- Adequate site hygiene signage should be erected in relation to the management of non-native invasive material.
- All excavations/trenches should be covered at night, or a suitable means of escape provided for nocturnal mammals.

7.5 Archaeology

An Archaeological, Architectural and Cultural Heritage Impact Assessment undertaken for the project includes a suite of construction management measures devised as part of a considered mitigation strategy. Identified measures, including the capacity for preservation in situ by design, and any actions arising from associated findings will be integrated into the final pre-construction CEMP. The proposed layout of the development has been adjusted during the Request for Further Information stage of the Ballyloo Solar Farm planning application to take account of findings from the extensive archaeological site investigations undertaken and consultation with National Monuments Service (NMS). The NMS confirmed as part of those consultations that the location of the proposed substation is acceptable.

7.6 Noise

All plant will be required to conform to the British Standards (BS) 5228 Code of practice for noise and vibration control on construction and open site. BS5228 provides a comprehensive guidance on construction noise including details of typical noise levels associated with various items of plant or activities, prediction methods and measures and procedures and is an accepted standard for construction practise in Ireland given the absence of statutory Irish guidelines.

7.7 Air Quality

The main activities that may give rise to dust emissions during construction include the following:

- Excavation and removal of earthworks.
- Materials handling and storage.
- Movement of vehicles (particularly HGV's) and mobile plant.
- Suspended solids in surface water runoff.

7.8 Waste Management

All waste arising during the construction phase will be managed and disposed of in a way that ensures the provisions of the Waste Management Act 1996 and associated amendments, and regulations of the Waste Management Plan are followed.

8 Summary

The construction of the proposed substation and underground cable grid connection can be summarised as follows:

- The purpose of the substation and underground grid connection is to transport the electricity generated at the proposed Ballyloo, Park and Ballybannon Solar Farms to the national electricity grid.
- The substation will be at either 110kV or 220kV voltage and will be either an Air Insulated Switchgear (AIS) or Gas Insulated Switchgear (GIS) tail fed substation with the associated 110kV or 220kV grid connection comprising underground cabling which will connect to the national electricity grid via the existing 220/110kV Kellis substation.
- All substation construction activities will take place at fixed construction sites within the extents of the proposed site boundary.
- Earthworks will be required to create a level compound area for the substation, with export of cut material and import of fill material required by truck from/to the site.
- The duration of the construction works will be confirmed and agreed with the Local Authority prior to construction. The construction programme for the entire substation and grid connection is estimated to be a total of 24 months. Further detail on this programme is provided in Appendix B.
- Prior to commencement of development, a detailed Construction Environment Management Plan (CEMP) shall be submitted to, and agreed in writing with, the planning authority, following consultation with relevant statutory agencies.
- All planning conditions will be complied with in full and contractor(s) will be supervised and managed closely to ensure full compliance.

APPENDICES

APPENDIX A

UISCE ÉIREANN PROVISIONAL CONFIRMATION OF FEASIBILITY

Ballyloo Solar Farm Limited
191 Stepaside Park
Stepaside
Dublin 18
D18 X20F

9 September 2024

Uisce Éireann
Teach Colvill
24-26 Sráid Thalbóid
Baile Átha Cliath 1
D01 NP86
Éire

Uisce Éireann
Colvill House
24-26 Talbot Street
Dublin 1
D01 NP86
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

Dear Mr McCarthy,

Re: Diversion Reference DIV24201 Diversion enquiry. Subject to contract | Contract denied

Uisce Éireann has reviewed your enquiry in relation to a build-over of Uisce Éireann's water network as part of the proposed Development at townlands of Ballybar Upper, Ballyloo, Ballyryan, Garryhundon and Linkardstown County Carlow, as indicated on drawings no. BYLOO-DR-01(A), BYLOO-DR-01, BYLOO-DR-02(A), BYLOO-DR-02, BYLOO-DR-03(A), BYLOO-DR-03, BYLOO-DR-04(A), BYLOO-DR-04, BYLOO-DR-05(A), BYLOO-DR-05, BYLOO-DR-06(A), BYLOO-DR-06, BYLOO-DR-07(A), BYLOO-DR-07, BYLOO-DR-08(A), BYLOO-DR-08, BYLOO-ED-DR-12_Service Crossing - 33kV Interconnectors and EirGrid Drawing XDC-CBL-STND-H-004.

Based upon the details you have provided with your enquiry and as assessed by Uisce Éireann, we wish to advise you that, subject to valid agreement/s being put in place, the proposed build over can be facilitated.

1. Uisce Eireann must be provided with a detailed method statement and risk assessment for working in the vicinity of Uisce Eireann assets as part of the build-over or near agreement process.
2. Ballyloo Solar Farm Limited will submit project specific drawings as part of the Build over/ near Agreement application following grant of planning permission and completion of site investigations and detailed design. The specific clearance requirements will be agreed with Uisce Éireann during this process and 500 mm vertical separation provided if deemed necessary.
3. Private water schemes are indicated on UÉ records at locations covered on drawings BYLOO-DR-02(A)/ BYLOO-DR-02, BYLOO-DR-03(A)/ BYLOO-DR-03, and BYLOO-DR-04(A)/ BYLOO-DR-04 you will need to engage separately with these schemes to get agreement for works in the vicinity of their water mains.

You are advised that this correspondence does not constitute an agreement in whole or in part to provide a diversion or to build near any Uisce Éireann infrastructure and is provided subject to build over agreement being executed at a later date. You are advised to make contact with the diversions team at diversions@water.ie once planning permission has been granted and prior to any works commencing on site in order to enter into a build over agreement with Uisce Éireann Water.

If you have any further questions, please contact Stephen O'Beirne from the diversions team on 083 087 8337 or email sobeirne@water.ie. For further information, visit www.water.ie/connections.

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

APPENDIX B

CONSTRUCTION PROGRAMME AND CONSTRUCTION TRAFFIC

Estimated Construction Programme & Vehicle Numbers

	Construction Programme (Months)																							
Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Substation Construction																								
Enabling Works	175	175	150																					
Civil Works				20	20	20	20	20	20	20														
Electrical Works											20	20	15	10	5									
Grid Connection Construction																								
Substation Electrical Commissioning																								
Civil and Electrical Works											205	205	205	205	205	205	205	205						
Pre-commissioning																								
ESB Commissioning																								
Solar Farm Construction																								
Solar Farm Electrical Commissioning																								
Solar Farm Site Set Up & Installation							264.4	344	158.4	223.7	112.6	112.6	112.6	142.8	135.9	135.9	247	247	242.8	17	17	4	118.1	71
Electrical Commissioning																					100	100	80	
Close Out																							80	80
Estimated Vehicles Per Month	**175**	**175**	**150**	**20**	**20**	**20**	**284.4**	**364**	**178.4**	**243.7**	**337.6**	**337.6**	**332.6**	**357.8**	**345.9**	**340.9**	**452**	**452**	**242.8**	**17**	**117**	**104**	**278.1**	**151**
Estimated Vehicles Per Week	**43.75**	**43.75**	**37.5**	**5**	**5**	**5**	**71.11**	**91**	**44.59**	**60.93**	**84.4**	**84.4**	**83.15**	**89.45**	**86.47**	**85.22**	**113**	**113**	**60.7**	**4.25**	**29.25**	**26**	**69.53**	**37.75**
Estimated Vehicles Per Day (5.5 days)	**8**	**8**	**7**	**1**	**1**	**1**	**13**	**17**	**8**	**11**	**15**	**15**	**15**	**16**	**16**	**15**	**21**	**21**	**11**	**1**	**5**	**5**	**13**	**7**
Peak Daily Vehicles	**21**																							
Peak Hourly Vehicles	**2.625**																							
Average Daily Vehicles	**10**																							
Average Hourly Vehicles	**1**																							

- The duration of the construction works will be confirmed and agreed with the Local Authority prior to construction. The construction programme for the entire substation and grid connection is estimated to be a total of 24 months. Given that the substation is located adjacent to the Ballyloo Solar Farm and that construction timelines will overlap, the cumulative construction traffic volumes associated with both developments are considered in the above table.